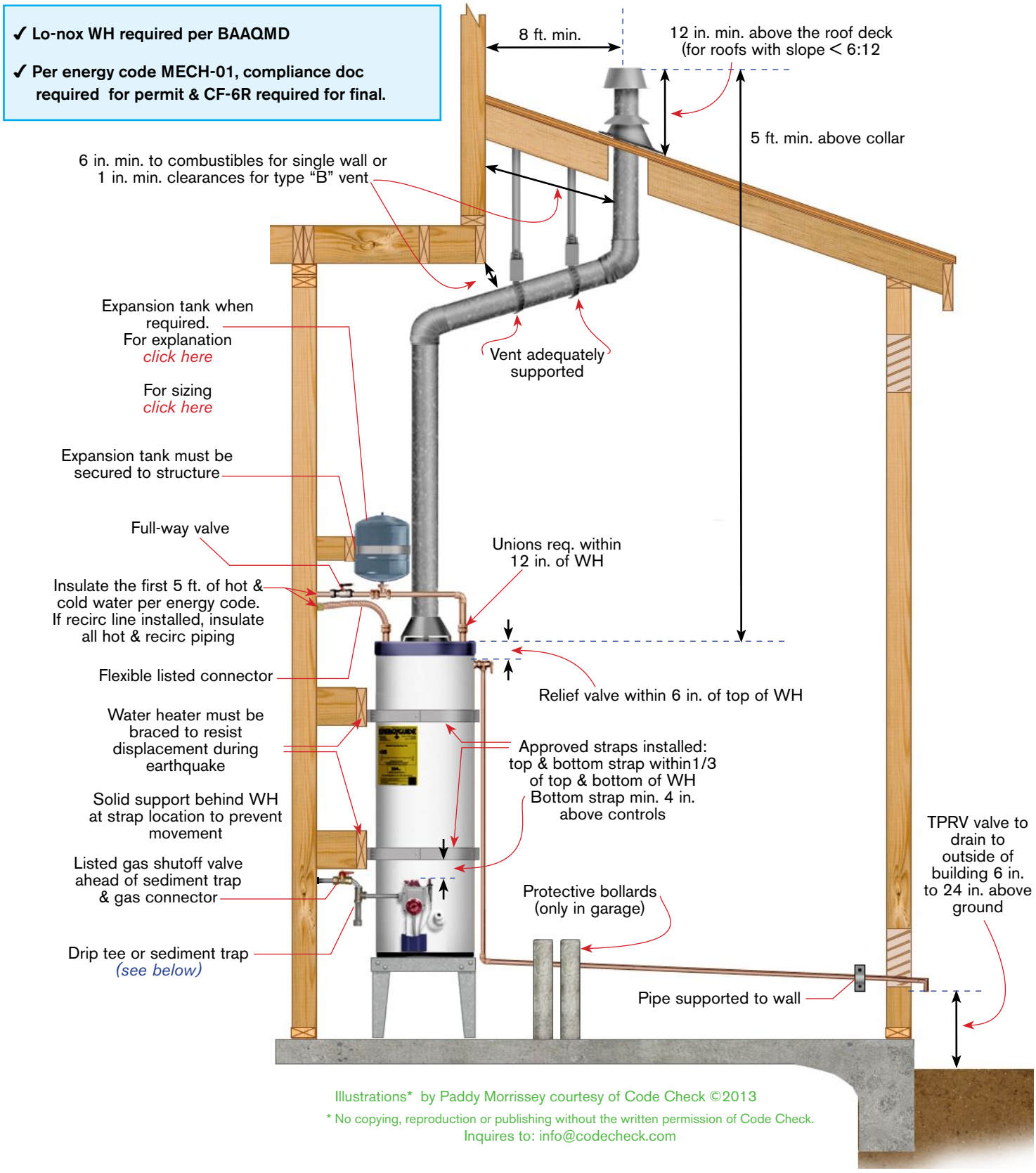
Water Heater Requirements

- ✓ **Lo-nox WH required per BAAQMD**
- ✓ **Per energy code MECH-01, compliance doc required for permit & CF-6R required for final.**



Illustrations by Paddy Morrissey courtesy of Code Check ©2013*

* No copying, reproduction or publishing without the written permission of Code Check.

Inquires to: paddy@codecheck.com

Illustrations by Paddy Morrissey courtesy of Code Check ©2013*

* No copying, reproduction or publishing without the written permission of Code Check.

Inquires to: info@codecheck.com

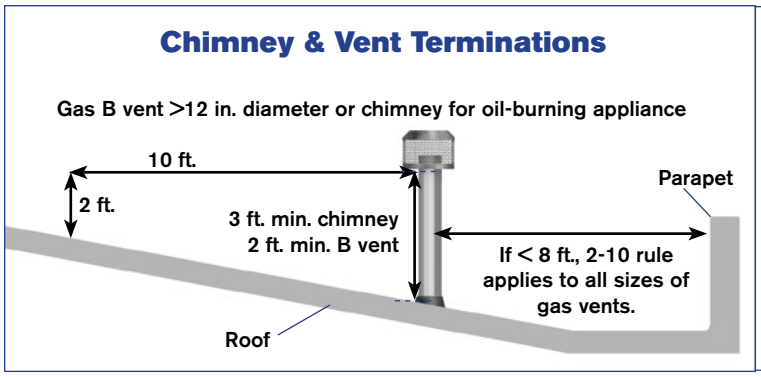
Water Heater Requirements

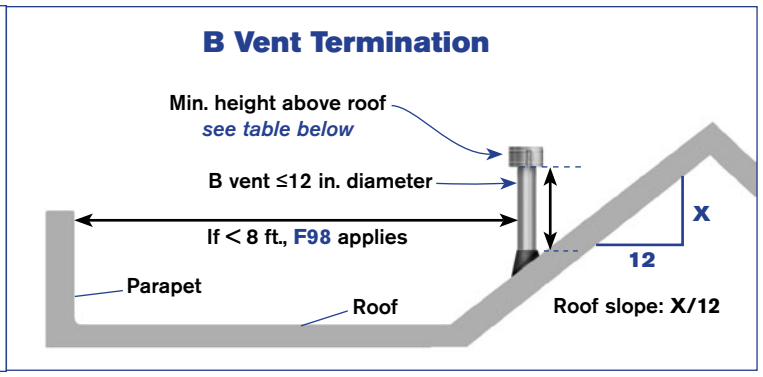
Permit Requirements

A plumbing permit is required to install, remove, replace, raise, lower or relocate a water heater. (2010 CPC Sec. 503.0). A permit must be obtained before beginning the work. Work performed without proper permits is subject to additional fee.

Venting of Water Heater

Type “B” vents shall extend above the roof surface, through a flashing, and terminate in a listed vent cap or roof jack which shall be installed according to its listing and manufacturers installation instruction.





B VENT TERMINATION HEIGHT 09 UMC F2427.6.3			
Roof Slope	Min. Height (ft.)	Roof Slope	Min. Height (ft.)
Flat to 6/12	1	>11/12 to 12/12	4
>6/12 to 7/12	1¼	>12/12 to 14/12	5
>7/12 to 8/12	1½	>14/12 to 16/12	6
>8/12 to 9/12	2	>16/12 to 18/12	7
>9/12 to 10/12	2½	>18/12 to 20/12	7½
>10/12 to 11/12	3¼	>20/12 to 21/12	8

Type “B” gas vent shall terminate at least 5 feet in vertical height above the highest connected equipment draft hood or fluecollar.

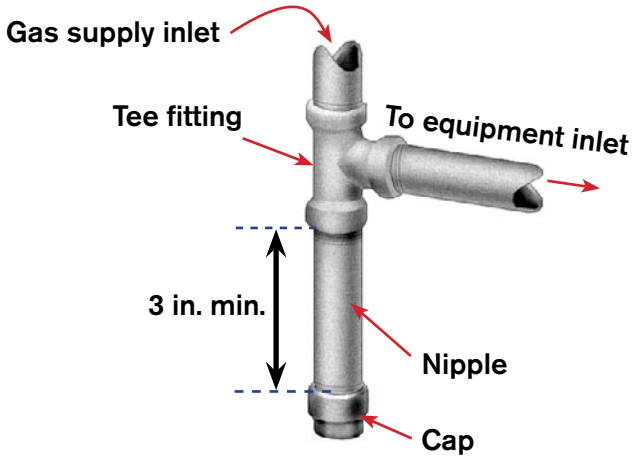
Type “B” vents must maintain 1 inch clearance from any combustible materials. Single wall connector must be installed with minimum of 6 inch clearance from any combustible materials. (2010 CPC Table 5-3)
Single wall vent connector shall not be located in or pass through an attics and crawl spaces. (2010 CPC Sec. 510.10.2.3). The entire length of a vent connector shall be readily accessible for inspection. (510.10.12).

Single wall vent connector sections must be attached to each other with 3 sheet metal screws at each joint. Use of listed transition fitting from single- wall to a type “B” vent is recommended. Screws and other fasteners shall not penetrate the inner wall of double wall vent. Cutting of double wall vent is not permitted. Use of tapes to seal joints or to support vent is not permitted.

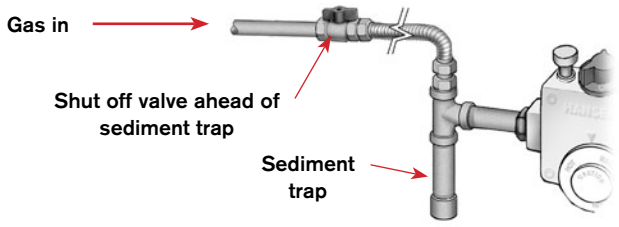
Water Heater Requirements

TYPICAL GAS CONNECTOR FLOW CAPACITY (BTUs NATURAL GAS)								
Size	12”	18”	24”	30”	36”	48”	60”	72”
3/4”	290,900	290,900	290,900	270,500	255,900	215,000	197,400	173,900
1/2”	180,000	164,200	150,000	136,000	125,000	106,000	93,200	86,000
3/8”	102,000	93,100	85,000	77,100	71,100	60,500	53,200	49,100
1/4”	48,000	43,800	40,000	36,400	33,400	28,300	24,900	23,100

Sediment Trap



Sediment traps should be placed as close as possible to appliance inlets.



For more information, click here:
http://www.watts.com/pages/learnAbout/thermalExpansion.asp?catId=64#generalinfo

For sizing calculator, click here:
http://www.watts.com/pages/support/sizing_DET.asp

Water Heater Requirements
For Water Heaters & Other Category 1 Appliances

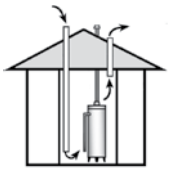
Gas vent shall be supported, strapped or braced in accordance with their listings and manufacturers installation instruction. (2010 CPC Sec. 510.6.5).

The maximum horizontal length of a single-wall connector shall not exceed 75 percent of the height of vent. The maximum horizontal length of a Type "B"· connector shall not exceed 100 percent of the height of vent. (2010 CPC Sec. 510.10.9.2 (3)).

Air for Combustion, Ventilation & Dilution

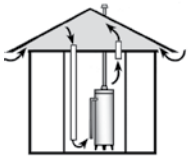
Combustion air must be provided per 2010 CPC Section 507.0. For water heaters located in room large enough to support combustion process (minimum 50 cubic feet of space per 1000 BTU/Hr. of appliances input rating (507.2.1) additional openings not required. In all other instances, please refer to the Code for specific details and requirements.

Vertical Ducts to Outdoors



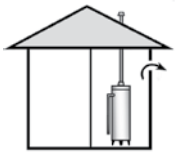
2 vertical ducts
min. 1 sq.in./4kBtu each

Vertical Ducts to Attic



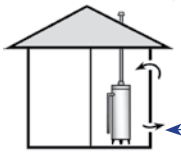
2 openings to ventilated attic
min. 1 sq.in./4kBtu each &
sleeved min 6 in. above joist

Single-Opening Method



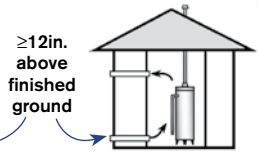
1 opening in upper
12in. of exterior wall
min. 1 sq.in./3kBtu

2 Direct Exterior Openings



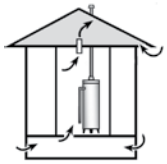
2 openings in exterior wall
min. 1 sq.in./4kBtu each

Horizontal Ducts



2 openings in exterior wall
min. 1 sq.in./2kBtu each

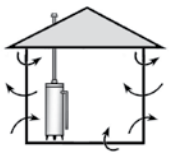
Crawl-Space & Attic Openings



Attic & crawl space
min. 1 sq.in./4kBtu each

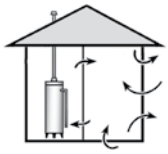
Crawl Space Cannot Be Upper Air Source

All Air from Indoors



Space w/ >0.40 ACH sufficient
if volume ≥50 cu.ft./kBtu.

Confined Space Indoors



Openings from enclosed appliance space to building interior min. 100sq.in. each and per table below. One in upper 12 in. & 1 in. lower 12 in. of enclosed space.

COMBUSTION AIR OPENING SIZES

	Indoor Air[A]		Outdoor Air Openings	
Btu	Opening size[B]	cu.ft. min. (sq.ft.[C])	1 in./4kBtu/hr.	1 in./2kBtu/hr.
30k	100 sq.in.	1,500 (188)	15 sq.in.	7.5 sq.in.
40k	100 sq.in.	2,000 (250)	20 sq.in.	10sq. n.
50k	100 sq.in.	2,500 (313)	25 sq.in.	12.5 sq.in.
60k	100 sq.in.	3,000 (375)	30 sq.in.	15 sq.in.
80k	100 sq.in.	4,000 (500)	40 sq.in.	20 sq.in.
100k	100 sq.in.	5,000 (625)	50 sq.in.	25 sq.in.
125k	125 sq.in.	6,250 (781)	62.5 sq.in.	31.3 sq.in.
150k	150 sq.in.	7,500 (938)	75 sq.in.	37.5 sq.in.

A. For construction w/ known air infiltration rate >0.40/hr.
B. Req'd opening between confined space (<50 cu.ft. per kBtu's) & unconfined space.
C. Ex: sq. ft. for 8 ft. ceiling – use actual room volume.

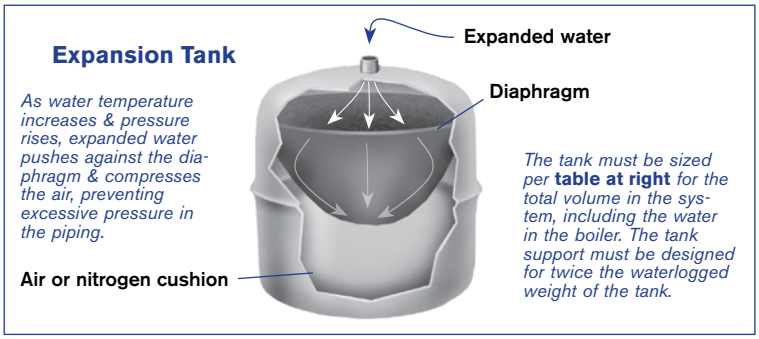
Water Heater Requirements

Pressure Temperature Relief Valve

Relief Valve shall be provided with the drain of galvanized steel, hard-drawn copper or CPVC (CPVC shall be installed with minimum of 6" metallic separation from valve) and shall extend to the outside of the building, with the end of the pipe not more than 2 feet nor less than 6 inches above the ground. (2010 CPC Sec. 608.5). Discharge from a relief valve into a water heater pan is prohibited. (2010 CPC Sec. 508.5). Watts 210 Valve is an approved alternative for water heaters installed in basements or other locations where extending of pressure relief drain to outside is not possible.

Expansion Tank

Any water system provided with a check valve, backflow preventer or any other normally closed device (including pressure regulator, no exceptions) that prevents dissipation of building pressure back into the water main shall be provided with an approved, listed and adequately sized expansion tank or other approved device to control thermal expansion. (2010 CPC Sec. 608.3).



MIN. EXPANSION TANK CAPACITY [T2003.2]

System Volume (gallons)	Pressurized Tank	Open Tanks
10	1.0	1.5
20	1.5	3.0
30	2.5	4.5
40	3.0	6.0
50	4.0	7.5
60	5.0	9.0
70	6.0	10.5
80	6.5	12.0
90	7.5	13.5
100	8.0	15.0

Installation

Water heaters shall be located or protected so it is not subject to physical damage by a moving vehicle. (508.14) When a Water Heater is located in an attic or any other areas within the structure where damage may result from a leaking water heater, a watertight pan shall be installed beneath the water heater with a minimum of 3/4 inch drain to outside of the building. Storage tanks for non-recirculating system must have pipe insulation on both hot and cold water pipes for a length of 5'. Minimum one inch of R-4 insulation is required. The entire length of piping, whether buried or exposed, of recirculating system must be insulated.

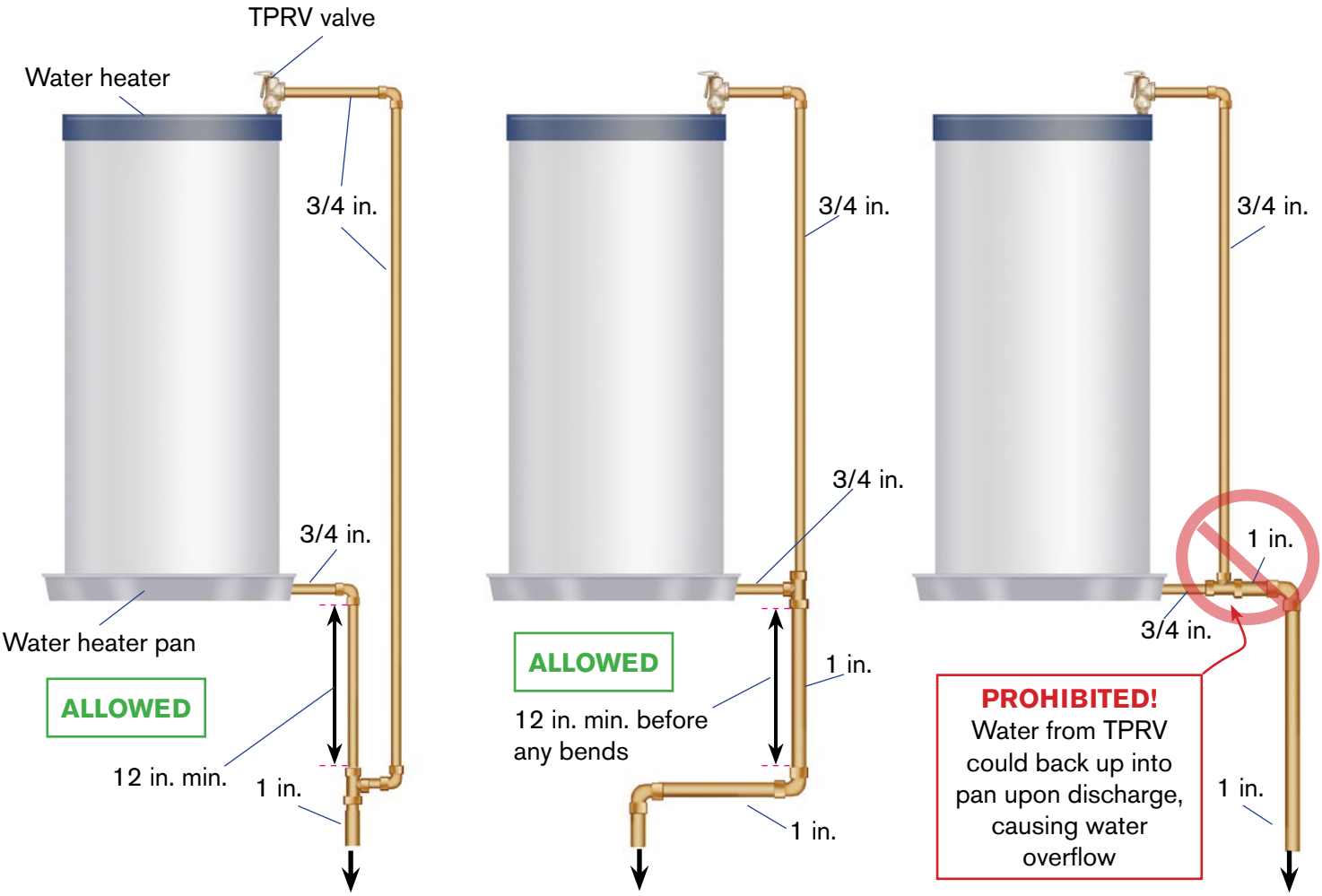
INSPECTION

A final inspection is required after the water heater has been installed and all work completed. The Permit and the Approved Job Copy of the Drawings (if any) must be presented to the inspector. Permit holder (contractor or home owner) is responsible for the all necessary tools and equipment required to conduct the inspection. Re-inspection fee may be assessed if access to the inspection is not provided, job is not ready for the inspection or when required corrections have not been made. Once the MECH-01 compliance form is verified by the CF6R installation form and no corrections are required, the WH permit will be final.

Approved Water Heater Locations

- ☑ Garage
- ☑ Within Dwelling
- ☑ Exterior within Enclosure
- ☑ Closet off of Bedroom
- ☑ Tankless at Exterior (Sound Control)

Oakland Allowance for Water Heater Pans



All materials for the pan drain and T&P relief drain must conform to the standards for T&P Relief drain materials and termination.

This is The City of Oaklands' interpretation and allowance only and does not represent the CPC requirement for separate drains.