Instantaneous (Tankless) Water Heater

Community Development – Building Division
Telephone number (650) 259-2330

What permits do I need to replace an existing storage water heater and install a new Instantaneous (Tankless) Water Heater?

A *plumbing* permit is required for the installation, alteration, repair, relocation, replacement, of water heaters within the City of Millbrae as regulated the California Plumbing Code.

Obtain a Plumbing Permit.
An application for a plumbing permit is required to be filed online with the Building Division through the City of Millbrae web page building permit portal at:
https://millbrae.ca.eprocess360.com

What we need to know about Instantaneous Water Heater.
Instantaneous water heaters, commonly referred to as tankless or on-demand water heaters, use natural gas, electricity, or propane.

A tankless water heater cannot just be connected to an existing natural gas line which is supplying other fuel burning appliances. A properly sized fuel piping supply is required to provide adequate fuel to these appliances to function efficiently. To ensure that piping is

properly sized, an isometric gas piping diagram and gas demand calculations shall be submitted for review prior to the permit issuance. The diagram must include the make, model, and BTU rating of the tankless water heater including all existing gas burning appliances. See the pipe sizing table for reference.

California Energy Code.
The California Energy Code requires that all water heaters, including instantaneous water heater, align with the minimum Federal Uniform Efficiency Factor.

Sizing the gas line shall be based on a 200,000 BTU per hour gas supply capacity to the instantaneous water heater in addition to existing fuel burning appliances to accommodate future upgrade or retrofit to an instantaneous gas water heater.

An instantaneous water heater requires a 120 VAC, 60Hz electrical connection to operate the electronic igniter. The power cord should be plugged into the receptacle that is connected to a properly grounded circuit within six feet of the water heater. Extension cords are not allowed.

Maintenance of Instantaneous Water Heaters.
The primary maintenance activities for instantaneous water heaters are flushing the heat exchanger to remove scale buildup and inspecting and

cleaning the inlet water filter screen, which helps minimize the amount of debris or sediment that enters the water heater.

Pipe Sizing Table - Natural Gas
Schedule 40 Metallic Pipe

Inlet Pressure: less than 2 psi (55 inches W.C.)
Pressure Drop: 0.3 inches W.C.
Specific Gravity: 0.60

cubic feet per hour

Length	Pipe Size (inches)			
	3/4	1	1 1/4	1 1/2
10	273	514	1060	1580
20	188	353	726	1090
30	151	284	583	873
40	129	243	499	747
50	114	215	442	662
60	104	195	400	600
70	95	179	368	552
80	89	167	343	514
90	83	157	322	482
100	79	148	304	455

CALIFORNIA ENERGY COMMISSION | EFFICIENCY DIVISION

Water Heater Efficiency Guide

These tables list the minimum uniform energy factors required by federal regulations for some of the most common types and sizes of water heaters.

Consumer Gas-Fired Instantaneous (> 50,000 Btu/h, ≤ 200,000 Btu/h) - Minimum UEF*

Volume (gallons)	Max Rating 0 ≤ GPM < 1.7	Max Rating 1.7 ≤ GPM < 2.8	Max Rating 2.8 ≤ GPM < 4.0	Max Rating GPM ≥ 4.0
≤ 2	0.80	0.81	0.81	0.81

Consumer Gas-Fired Storage (≤ 75,000 Btu/h) - Minimum UEF*

Volume (gallons)	0 ≤ FHR < 18	18 ≤ FHR < 51	51 ≤ FHR < 75	FHR ≥ 75
30	0.29	0.54	0.60	0.65
40	0.27	0.52	0.58	0.64
50	0.25	0.50	0.56	0.63
55	0.24	0.49	0.55	0.62
60	0.61	0.74	0.77	0.79
75	0.60	0.73	0.76	0.78
80	0.60	0.73	0.76	0.78

TABLE 501.1(2)
FIRST HOUR RATING[1]

Number of Bathrooms	1 to 1.5			2 to 2.5				3 to 3.5		
Number of Bedrooms	1	2	3	2	3	4	5	3	4	5
First Hour Rating,[2] Gallons	38	49	49	49	62	62	74	62	74	74

For SI units: 1 gallon = 3.785 L
Notes:
[1] The first-hour rating is found on the "Energy Guide" label.
[2] Solar water heaters shall be sized to meet the appropriate first-hour rating as shown in the table.

Gas Stove & Oven
40,000 btu

Gas Dryer
40,000 btu

10'

Exterior Wall

20'

10'

Flow

8'

5'

Tee

2'

Gas Furnace
70.000 btu

Tankless WH.
200,000 btu

Valve
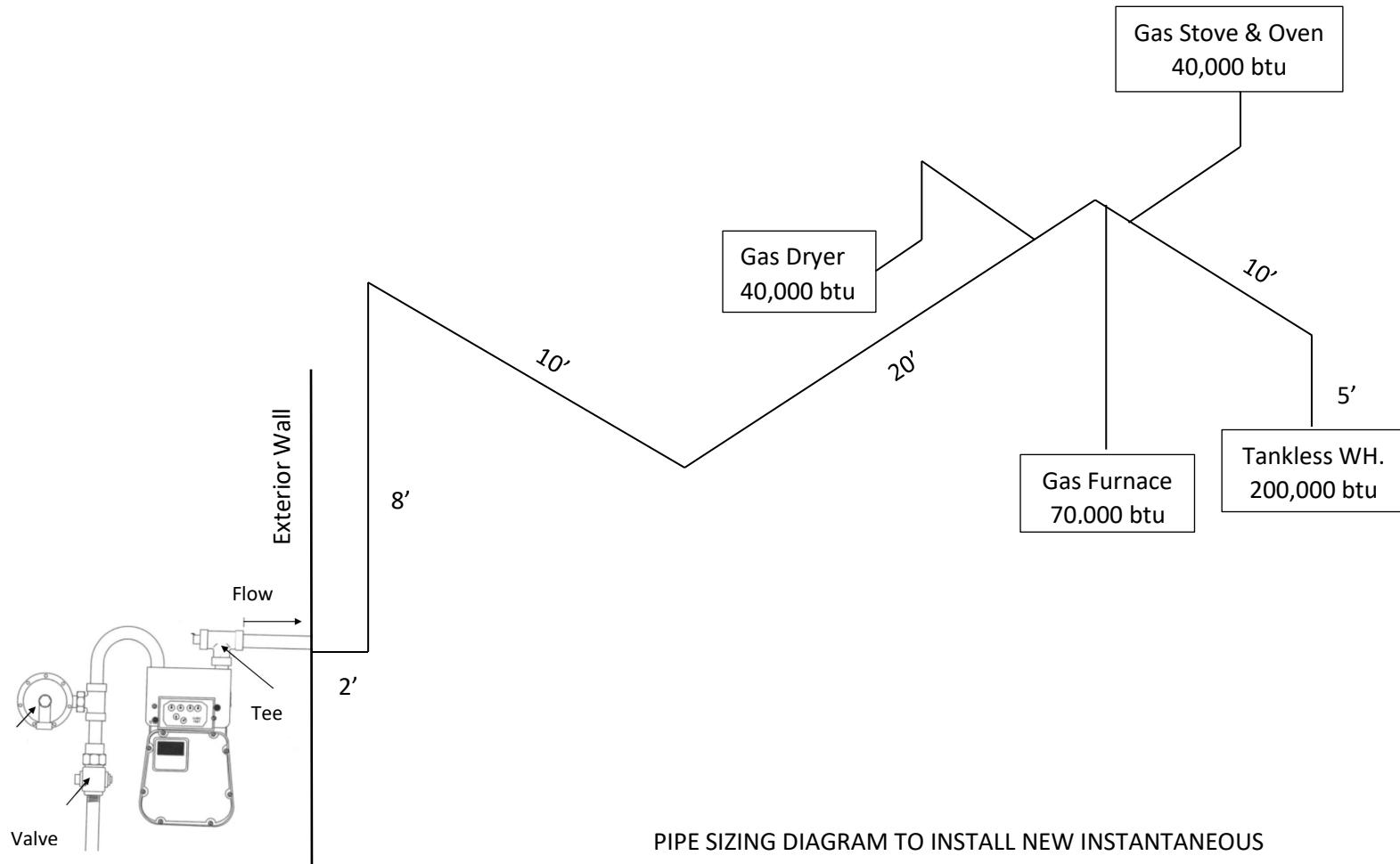
PIPE SIZING DIAGRAM TO INSTALL NEW INSTANTANEOUS