

Submittal Requirements - Fuel Gas Pipe Sizing

2019 California Plumbing Code, Chapter 12 Fuel Piping

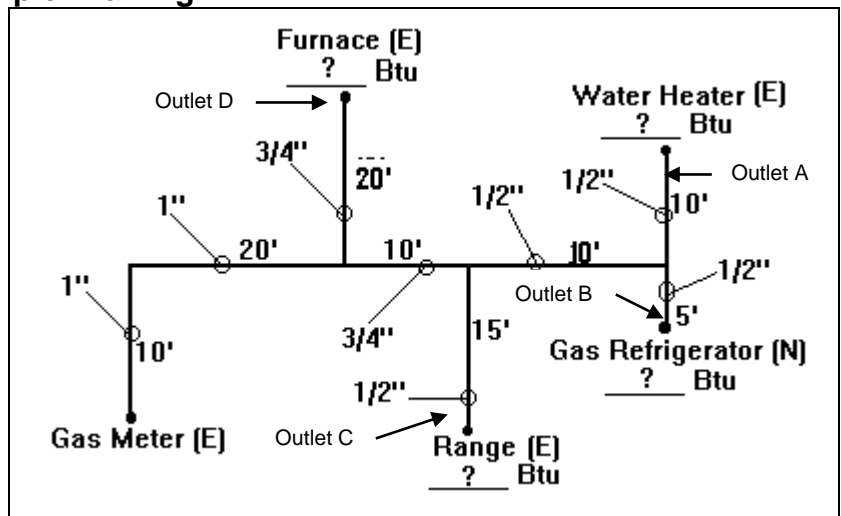
Please provide the following information on your plan:

- Show the size and length of each section of pipe, both existing (E) and new (N). Remember to count vertical and horizontal distance.
- Show all appliances, existing (E) and new (N) that will be connected to the gas line. Label each appliance and the Btu rating (*see sample below*).
- Show whether the new gas line will connect directly to the existing (E) meter or at a point along the existing line creating a new branch. If the line is connected directly to the existing meter, you need to show only the new piping on your drawing.

Sample Drawing

Please provide copies of your drawings.

If you submit complete drawings, your permit may be issued over-the-counter. Incomplete drawings may result in delay.



Notes:

- Section 1213.3 New gas piping is required to be tested at a minimum of 10 psi, for 15 minutes, with no pressure loss. The new gas piping must be under “pressure-test” at time of inspection. Pressure gauges shall have a pressure range not exceeding twice the test pressure applied
- Sediment traps (3” minimum length) shall be installed as close to the inlet of the equipment as practical.

Exceptions: Illuminating gas appliances, ranges, clothes dryers, decorative vented appliances for installation in vented fireplaces, gas fireplaces, and outdoor grills shall not be required to have sediment traps.

Example Problem: Determine the required pipe size of each section and outlet of the piping system shown in Figure 1. Gas to be used has a specific gravity of sixty-hundredths (0.60) and eleven hundred (1100) Btu per cubic foot (11.4 W/L), delivered at eight (8) inch (203.2mm) water column pressure. **Note: to determine cubic feet of gas per hour divide the BTU rating by 1100.**

Solution:

- 1) Maximum gas demand of OUTLET A – 32 cubic feet per hour (0.21 L/sec) (from Table 12-1)
 Maximum gas demand of OUTLET B – 3 cubic feet per hour (0.02 L/sec) (from Table 12-1)
 Maximum gas demand of OUTLET C – 59 cubic feet per hour (0.46 L/sec) (from Table 12-1)
 Maximum gas demand of OUTLET D – 136 Cubic feet per hour (1.1 L/sec) (150,000 Btu/hr (43,950 W/hr) divided by 1100 Btu per cubic foot (11.4 W/L)
- 2) The length of pipe from the gas meter to the most remote outlet (OUTLET A) is 60 feet (18.2 m)
- 3) Using the column marked 60 feet (18.2 m) in Table 12-8:
 OUTLET A, supplying 32 cubic feet per hour (0.21 L/sec), requires one-half (1/2) inch (12.7 mm) pipe. Section 1 supplying OUTLETS A & B, or 35 cubic feet per hour (0.24 L/sec) requires one-half (1/2) inch (12.7 mm) pipe. Section 2, supplying OUTLETS A, B, and C, or 94 cubic feet per hour (0.7 L/sec) requires three-quarter (3/4) inch (19.2 mm) pipe. Section 3, supplying OUTLETS A, B, C & D, or 230 cubic feet per hour (1.8 L/sec), requires one (1) inch (25.4 mm) pipe.
- 4) Using the column marked 60 feet (18.2 m) in Table 12-3 (no column for actual length of 55 feet (16.7 m):
 OUTLET B, supplying 3 cubic feet per hour (0.02 L/sec.), requires one-half (1/2) inch (12.7 mm) pipe.
 OUTLET C, supplying 59 cubic feet per hour (0.46 L/sec.), requires one-half (1/2) inch (12.7 mm) pipe.
- 5) Using the column marked 50 feet (15.2 m) in Table 12-3:
 OUTLET D, supplying 136 cubic feet per hour (1.1 L/sec), requires three-quarter (3/4) inch (19.1 mm) pipe.

Table 12-1: (Approximate Gas BTU Input for Typical Appliances)

Appliance	Input BTU/h (Approx.)
Space Heating Units	
Warm air furnace	
Single family	100,000
Multifamily, per unit	60,000
Water Heating Appliances	
Water heater, tank type (automatic)	
Storage, 30 to 40 gal.	35,000
Storage, 50 gal.	50,000
Cooking Appliances	
Range, freestanding,	
Domestic	65,000
Build-in oven or broiler unit,	
Domestic	25,000
Built-in top unit,	
Domestic	40,000
Other Appliances	
Refrigerator	3,000
Clothes dryer (residential)	35,000
Gas fireplace (direct vent)	40,000
Gas log	80,000
Barbecue	40,000
Gaslight	2,500

TABLE 1215.2(1)
SCHEDULE 40 METALLIC PIPE [NFPA 54: TABLE 6.2(b)]^{1, 2}

														GAS: NATURAL	
														INLET PRESSURE: LESS THAN 2 psi	
														PRESSURE DROP: 0.5 in. w.c.	
														SPECIFIC GRAVITY: 0.60	
PIPE SIZE (inch)															
NOMINAL:	½	¾	1	1¼	1½	2	2½	3	4	5	6	8	10	12	
ACTUAL ID:	0.622	0.824	1.049	1.380	1.610	2.067	2.469	3.068	4.026	5.047	6.065	7.981	10.020	11.938	
LENGTH (feet)	CAPACITY IN CUBIC FEET OF GAS PER HOUR														
10	172	360	678	1390	2090	4020	6400	11 300	23 100	41 800	67 600	139 000	252 000	399 000	
20	118	247	466	957	1430	2760	4400	7780	15 900	28 700	46 500	95 500	173 000	275 000	
30	95	199	374	768	1150	2220	3530	6250	12 700	23 000	37 300	76 700	139 000	220 000	
40	81	170	320	657	985	1900	3020	5350	10 900	19 700	31 900	65 600	119 000	189 000	
50	72	151	284	583	873	1680	2680	4740	9660	17 500	28 300	58 200	106 000	167 000	
60	65	137	257	528	791	1520	2430	4290	8760	15 800	25 600	52 700	95 700	152 000	
70	60	126	237	486	728	1400	2230	3950	8050	14 600	23 600	48 500	88 100	139 000	
80	56	117	220	452	677	1300	2080	3670	7490	13 600	22 000	45 100	81 900	130 000	
90	52	110	207	424	635	1220	1950	3450	7030	12 700	20 600	42 300	76 900	122 000	
100	50	104	195	400	600	1160	1840	3260	6640	12 000	19 500	40 000	72 600	115 000	
125	44	92	173	355	532	1020	1630	2890	5890	10 600	17 200	35 400	64 300	102 000	
150	40	83	157	322	482	928	1480	2610	5330	9650	15 600	32 100	58 300	92 300	
175	37	77	144	296	443	854	1360	2410	4910	8880	14 400	29 500	53 600	84 900	
200	34	71	134	275	412	794	1270	2240	4560	8260	13 400	27 500	49 900	79 000	
250	30	63	119	244	366	704	1120	1980	4050	7320	11 900	24 300	44 200	70 000	
300	27	57	108	221	331	638	1020	1800	3670	6630	10 700	22 100	40 100	63 400	
350	25	53	99	203	305	587	935	1650	3370	6100	9880	20 300	36 900	58 400	
400	23	49	92	189	283	546	870	1540	3140	5680	9190	18 900	34 300	54 300	
450	22	46	86	177	266	512	816	1440	2940	5330	8620	17 700	32 200	50 900	
500	21	43	82	168	251	484	771	1360	2780	5030	8150	16 700	30 400	48 100	
550	20	41	78	159	239	459	732	1290	2640	4780	7740	15 900	28 900	45 700	
600	19	39	74	152	228	438	699	1240	2520	4560	7380	15 200	27 500	43 600	
650	18	38	71	145	218	420	669	1180	2410	4360	7070	14 500	26 400	41 800	
700	17	36	68	140	209	403	643	1140	2320	4190	6790	14 000	25 300	40 100	
750	17	35	66	135	202	389	619	1090	2230	4040	6540	13 400	24 400	38 600	
800	16	34	63	130	195	375	598	1060	2160	3900	6320	13 000	23 600	37 300	
850	16	33	61	126	189	363	579	1020	2090	3780	6110	12 600	22 800	36 100	
900	15	32	59	122	183	352	561	992	2020	3660	5930	12 200	22 100	35 000	
950	15	31	58	118	178	342	545	963	1960	3550	5760	11 800	21 500	34 000	
1000	14	30	56	115	173	333	530	937	1910	3460	5600	11 500	20 900	33 100	
1100	14	28	53	109	164	316	503	890	1810	3280	5320	10 900	19 800	31 400	
1200	13	27	51	104	156	301	480	849	1730	3130	5070	10 400	18 900	30 000	
1300	12	26	49	100	150	289	460	813	1660	3000	4860	9980	18 100	28 700	
1400	12	25	47	96	144	277	442	781	1590	2880	4670	9590	17 400	27 600	
1500	11	24	45	93	139	267	426	752	1530	2780	4500	9240	16 800	26 600	
1600	11	23	44	89	134	258	411	727	1480	2680	4340	8920	16 200	25 600	
1700	11	22	42	86	130	250	398	703	1430	2590	4200	8630	15 700	24 800	
1800	10	22	41	84	126	242	386	682	1390	2520	4070	8370	15 200	24 100	
1900	10	21	40	81	122	235	375	662	1350	2440	3960	8130	14 800	23 400	
2000	NA	20	39	79	119	229	364	644	1310	2380	3850	7910	14 400	22 700	

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm, 1 cubic foot per hour = 0.0283 m³/h, 1 pound-force per square inch = 6.8947 kPa, 1 inch water column = 0.249 kPa

Notes:

¹ Table entries are rounded to 3 significant digits.

² NA means a flow of less than 10 ft³/h (0.283 m³/h).