LIVERMORE
CALIFORNIA

Submittal Requirements - Fuel Gas Pipe Sizing

2007 California Plumbing Code, Chapter 12 Fuel Piping

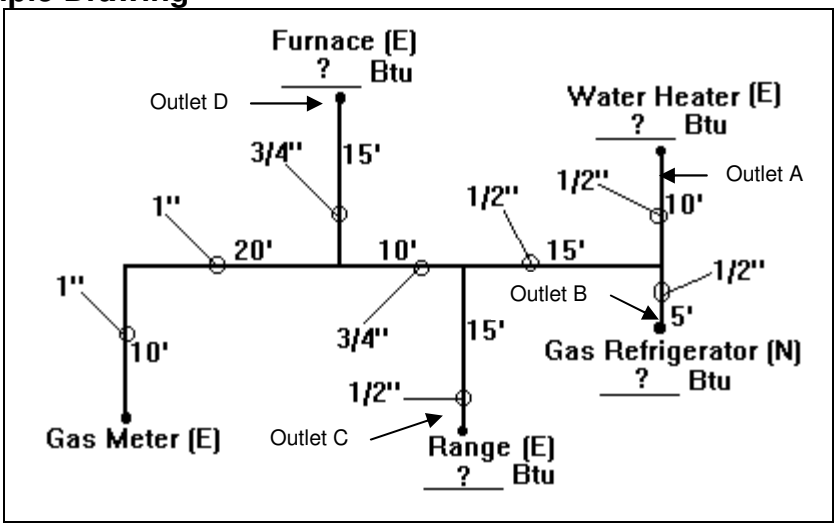
Please provide the following information on your plan:

- 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:

- New gas piping is required to be tested at a minimum of 3 psi, for 10 minutes, with no pressure loss. The new gas piping must be under "pressure-test" at time of inspection. Mechanical gauges used to measure test pressures shall not exceed 15 lbs. psi.
- <u>Sediment traps</u> (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.

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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 – 27 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 12-3:
   OUTLET A, supplying 27 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 30 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 89 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 225 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	
Clothes dryer (residential)	35,000
Gas fireplace (direct vent)	40,000
Gas log	80,000
Barbecue	40,000
Gaslight	2,5000

Table 12-8 Schedule 40 Metallic Pipe [NFPA Table 6.2 (b)]										Gas:	Natural			
										Inlet Pressure:	Less than 2 psi			
										Pressure Drop:	0.5 in. w.c.			
										Specific Gravity:	0.60			
	Pipe Size (in.)													
Nominal:	½	¾	1	1 ¼	1 ½	2	2 ½	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(ft)	**Capacity in Cubic Feet of Gas per Hour**													
10	172	360	678	1,390	2,090	4,020	6,400	11,300	23,100	41,800	67,600	139,000	252,000	399,000
20	118	247	466	957	1,430	2,760	4,400	7,780	15,900	28,700	46,500	95,500	173,000	275,000
30	95	199	374	768	1,150	2,220	3,530	6,250	12,700	23,000	37,300	76,700	139,000	220,000
40	81	170	320	657	985	1,900	3,020	5,350	10,900	19,700	31,900	65,600	119,000	189,000
50	72	151	284	583	873	1,680	2,680	4,740	9,660	17,500	28,300	58,200	106,000	167,000
60	65	137	257	528	791	1,520	2,430	4,290	8,760	15,800	25,600	52,700	95,700	152,000
70	60	126	237	486	728	1,400	2,230	3,950	8,050	14,600	23,600	48,500	88,100	139,000
80	56	117	220	452	677	1,300	2,080	3,670	7,490	13,600	22,000	45,100	81,900	130,000
90	52	110	207	424	635	1220	1,950	3,450	7,030	12,700	20,600	42,300	76,900	122,000
100	50	104	195	400	600	1,160	1,840	3,260	6,640	12,000	19,500	40,000	72,600	115,000
125	44	92	173	355	532	1,020	1,630	2,890	5,890	10,600	17,200	35,400	64,300	102,000
150	40	83	157	322	482	928	1,480	2,610	5,330	9,650	15,600	32,100	58,300	92,300
175	37	77	144	296	443	854	1,360	2,410	4,910	8,880	14,400	29,500	53,600	84,900
200	34	71	134	275	412	794	1,270	2,240	4,560	8,260	13,400	27,500	49,900	79,000
250	30	63	119	244	366	704	1,120	1,980	4,050	7,320	11,900	24,300	44,200	70,000
300	27	57	108	221	331	638	1,020	1,800	3,670	6,630	10,700	22,100	40,100	63,400
350	25	53	99	203	305	587	935	1,650	3,370	6,100	9,880	20,300	36,900	58,400
400	23	49	92	189	283	546	870	1,540	3,140	5,680	9,190	18,900	34,300	54,300
450	22	46	86	177	266	512	816	1,440	2,940	5,330	8,620	17,700	32,200	50,900
500	21	43	82	168	251	484	771	1,360	2,780	5,030	8,150	16,700	30,400	48,100
550	20	41	78	159	239	459	732	1,290	2,640	4,780	7,740	15,900	28,900	45,700
600	19	39	74	152	228	438	699	1,240	2,520	4,560	7,380	15,200	27,500	43,600
650	18	38	71	145	218	420	669	1,180	2,410	4,360	7,070	14,500	26,400	41,800
700	17	36	68	140	209	403	643	1,140	2,320	4,190	6,790	14,000	25,330	40,100
750	17	35	66	135	202	389	619	1,090	2,230	4,040	6,540	13,400	24,400	38,600
800	16	34	63	130	195	375	598	1,060	2,160	3,900	6,320	13,000	23,600	37,300
850	16	33	61	126	189	363	579	1,020	2,090	3,780	6,110	12,600	22,800	36,100
900	15	32	59	122	183	352	561	992	2,020	3,660	5,930	12,200	22,100	35,000
950	15	31	58	118	178	342	545	963	1,960	3,550	5,760	11,800	21,500	34,000
1,000	14	30	56	115	173	333	530	937	1,910	3,460	5,600	11,500	20,900	33,100
1,100	14	28	53	109	164	316	503	890	1,810	3,280	5,320	10,900	19,800	31,400
1,200	13	27	51	104	156	301	480	849	1,730	3,130	5,070	10,400	18,900	30,000
1,300	12	26	49	100	150	289	460	813	1,660	3,000	4,860	9,980	18,100	28,700
1,400	12	25	47	96	144	277	442	781	1,590	2,880	4,670	9,590	17,400	27,600
1,500	11	24	45	93	139	267	426	752	1,530	2,780	4,500	9,240	16,800	26,600
1600	11	23	44	89	134	258	411	727	1,480	2,680	4,340	8,920	16,200	25,600
1,700	11	22	42	86	130	250	398	703	1,430	2,590	4,200	8,630	15,700	24,800
1,800	10	22	41	84	126	242	386	682	1,390	2,520	4,070	8,370	15,200	24,100
1,900	10	21	40	81	122	235	375	662	1,350	2,440	3,960	8,130	14,800	23,400
2,000	NA	20	39	79	119	229	364	644	1,310	2,380	3,850	7,910	14,400	22,700
NA means a flow of less than 10 cfh.														
Note: All table entries are rounded to 3 significant digits.														