Gas Calculations
Table & Example Drawings
2007 CPC

INFORMATION GUIDELINE

January 2008

City of Concord • Building & Neighborhood Services • 1950 Parkside Drive, MS/51 • Concord, CA 94519 • (925) 671-3107 • Fax (925) 680-4877

TABLE 12-1

Approximate Gas Input for Typical Appliances

	Demand in Btu/H
Space Heating Units	
Warm Air Furnace	
Single Family	**100,000**
Multifamily, per unit	**60,000**
Hydronic Boiler	
Single Family	**100,000**
Multifamily, per unit	**60,000**
Space-and-Watering Units	
Hydronic Boiler	
Single Family	**120,000**
Multifamily, per unit	**75,000**
Water-Heating Appliances	
Automatic Water heater Storage Tank	
30 to 40 gal. storage tank	**35,000**
50 gal. storage tank	**50,000**
Automatic Water heater Instantaneous	
Capacity 2 gal./minute	**142,000**
Capacity at 4 gal./minute	**285,000**
Capacity at 6 gal./minute	**428,400**
Water Heater, domestic	
Circulating or side-arm	**35,000**
Cooking Appliances	
Range – Freestanding, domestic	**65,000**
Built-in over or broiler unit, domestic	**25,000**
Built-in top unit, domestic	**40,000**
Other Appliances	
Refrigerator	**3,000**
Clothes dryer, Type 1, domestic	**35,000**
Gas Fireplace direct vent	**40,000**
Gas log	**80,000**
Barbecue	**40,000**
Gaslight	**2,500**

Table 12-3
Support of Piping

	Size of Steel Pipe	Spacing of Supports	Size of Smooth Wall Tubing (O.D)	Spacing of Supports
	Inches	**Feet**	**Inches**	**Feet**
	½”	6	**½”**	4
	¾ or 1”	8	5/8” or ¾”	6
Horizontal	1 ¼” or larger	10	7/8” or 1”	8
Vertical	1 ¼” or larger	Every Floor Level		Every Floor Level

Table 12-8
Size of Gas Piping
Maximum Delivery Capacity of Cubic Feet of Gas Per Hour of IPS Pipe Carrying
Natural Gas of 0.60 Specific Gravity Based on Pressure Drop of 0.5 Inch Water Column

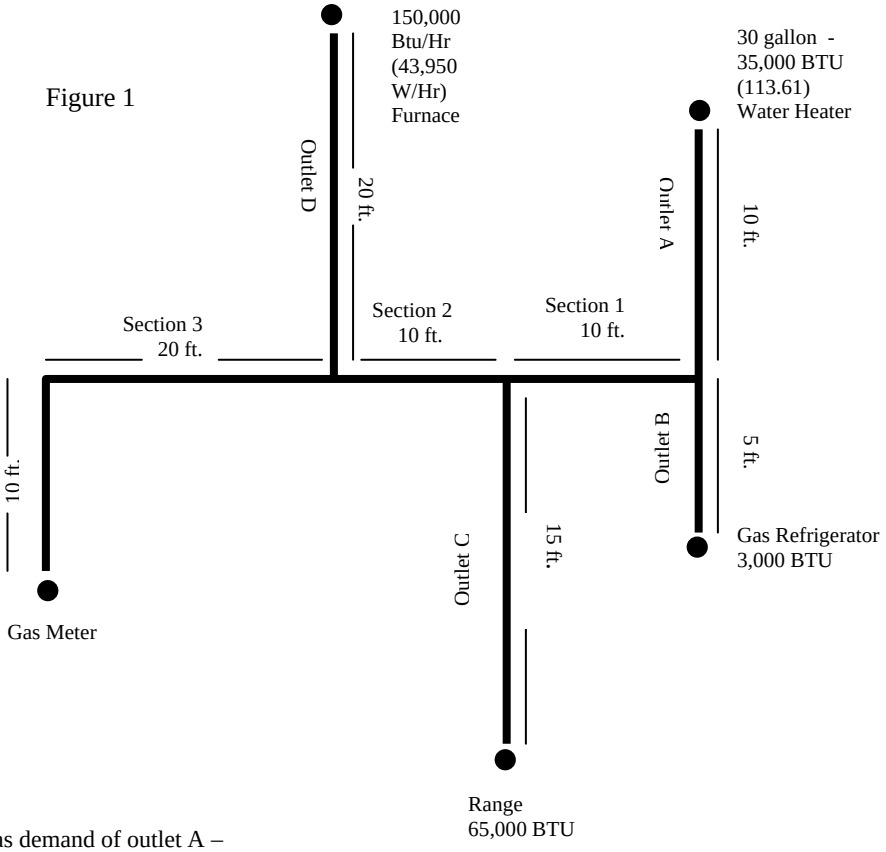
Pipe Size Inches	Length in Feet										
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**125**
½	172	118	95	81	72	65	60	56	52	50	44
¾	360	247	199	170	151	137	126	117	110	104	92
1	678	466	374	320	284	257	237	220	207	195	173
1 ¼	1390	957	768	657	583	528	486	452	424	400	355
1 ½	2090	1430	1150	985	873	791	728	677	635	600	532
2	4020	2760	2220	1900	1680	1520	1400	1300	1234	1160	1020
2 ½	6400	4400	3530	3020	2680	2430	2230	2080	1950	1840	1630
3	11300	7780	6250	5350	4740	4290	3950	3670	3450	3260	2890
4	23100	15900	12700	10900	9660	8760	8050	7490	7030	6640	5890

	Length in Feet										
	150	**175**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**
½	40	37	34	30	27	25	23	22	21	20	19
¾	83	77	71	63	57	53	49	46	43	41	39
1	157	144	133	119	108	99	92	86	82	78	74
1 ¼	322	296	275	244	221	203	189	177	168	159	152
1 ½	482	443	416	366	331	305	283	266	251	239	228
2	928	854	794	704	638	587	546	512	484	459	438
2 ½	1480	1360	1270	1120	1020	935	870	816	771	732	699
3	2610	2410	2240	1980	1800	1650	1540	1440	1360	1290	1240
4	5330	4910	4560	4050	3670	3370	3140	2940	2780	2640	2520

Example Illustrating Use of Tables 12-1 and 12-8

Problem: Determine the required pipe size of each section and outlet of the piping system shown in Figure 12-2. 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 mm) water column pressure.

Figure 1



Solution:

(1) Maximum gas demand of outlet A –
32 cubic feet per hour (from Table 12-1)
Maximum gas demanod of outle B –
3 cubic feet per hour (from Table 12-1)
Maximum gas demand of outlet C –
59 cubic feet per hour (from Table 12-1)
Maximum gas demand of outlet D –
136 cubic feet per hour (150,000 Btu/Hour divided by 1100 Btu per cubic foot)

(2) The length of pipe from the gas meter to the most remote outlet (outlet A) is 60 feet

(3) Using the column marked 60 feet in Table 12-7:
Outlet A, supplying 32 cubic feet per hour, requires ½" pipe. Section 1, supplying outlets A and B, or 35 cubic feet per hour requires ½" pipe.
Section 2, supplying outlets A, B, C, and D, or 94 cubic feet per hour, requires ¾" pipe.
Section 3, supplying outlets A,B,C and D, or 230 cubic feet per hour, requires 1 ¼" inch pipe.

(4) Using the column marked 60 feet in Table 12-7 (n column for actual length of 55 feet) Outlet B supplying 3 cubic feet per hour, requires ½" pipe.)
Outlet B supplying 3 cubic ft. per hr., requires ½" pipe
Outlet C, supplying 59 cubic ft. per hr., requires ½" pipe

(5) Using the column marked 50 ft. in Table 12-7:
Outlet D, supplying 136 cubic feet per hour, requires 1" pipe.