

TABLE 8. STEAM PIPE CAPACITIES FOR 30 PSIG STEAM SYSTEMS^a
Capacity Expressed in Pounds per Hour
(Steam and Condensate Flowing in Same Direction)

PIPE SIZE INCHES	DROP IN PRESSURE—POUNDS PER 100 FT IN LENGTH					
	1/8	1/4	3/8	1/2	3/4	1
3/4	15	22	31	38	45	63
1	31	46	63	77	89	125
1 1/4	69	100	141	172	199	281
1 1/2	107	154	219	267	309	437
2	217	313	444	543	627	886
2 1/2	358	516	730	924	1,030	1,460
3	651	940	1,330	1,630	1,820	2,660
3 1/2	979	1,410	2,000	2,450	2,830	4,000
4	1,390	2,000	2,830	3,460	4,000	5,660
5	2,560	3,640	5,230	6,400	7,390	10,500
6	4,210	6,030	8,590	10,400	12,100	17,200
8	9,760	12,600	17,900	21,900	25,300	35,100
10	16,300	23,500	33,200	40,600	46,900	66,400
12	25,600	36,900	52,300	64,000	74,000	104,500

^a Note: Steam at an average pressure of 30 psig is used as the basis for calculating the above table.

are based on Babcock's formula, and have been used as the basis of design for a number of years.

Return pipe capacities given in Tables 10 and 11 are based on the following assumed pressures in the return piping:

PRESSURE DROP LB/100 FT	PRESSURE IN RETURN LINE (Psig)		PRESSURE DROP LB/100 FT	PRESSURE IN RETURN LINE (Psig)	
	30 psi System	150 psi System		30 psi System	150 psi System
1/8	1/2	1 1/4	3/4	3	7 1/2
1/4	1	2 1/2	1	4	10
1/2	2	5	2		20

The pressure loss and line loss as given were substituted in the Babcock steam flow formula (see Table 2 of this chapter), and the resulting capacity was multiplied by 12 for 30-pound systems and by 16 for 150-pound systems to obtain the values given in Tables 10 and 11. The return line pressures used were found by observation of operating systems.

TABLE 9. STEAM PIPE CAPACITIES FOR 150 PSIG STEAM SYSTEMS^a
Capacity Expressed in Pounds per Hour
(Steam and Condensate Flowing in Same Direction)

PIPE SIZE INCHES	DROP IN PRESSURE—PSI PER 100 FT IN LENGTH						
	1/8	1/4	3/8	1/2	3/4	1	5
3/4	29	41	58	71	82	116	184
1	58	82	117	143	165	233	369
1 1/4	130	185	262	320	370	523	827
1 1/2	203	287	407	497	575	813	1,290
2	412	583	825	1,010	1,170	1,650	2,600
2 1/2	683	959	1,360	1,650	1,920	2,710	4,290
3	1,240	1,750	2,480	3,020	3,500	4,940	7,820
3 1/2	1,880	2,630	3,720	4,550	5,250	7,420	11,700
4	2,630	3,720	5,260	6,430	7,430	10,500	16,600
5	4,860	6,880	9,730	11,900	13,800	19,500	30,800
6	7,960	11,300	16,000	19,500	22,600	31,900	50,400
8	16,600	23,500	33,200	40,600	47,000	66,400	105,000
10	30,300	43,400	61,700	75,600	87,300	123,000	195,000
12	48,600	68,800	97,300	119,000	138,000	194,000	307,500

^a Note: Steam at an average pressure of 150 psig is used as the basis for calculating the above table.

TABLE 10. RETURN PIPE CAPACITIES FOR 30 PSIG STEAM SYSTEMS^a
Capacity Expressed in Pounds per Hour

PIPE SIZE INCHES	DROP IN PRESSURE—POUNDS PER 100 FT IN LENGTH				
	1/8	1/4	3/8	1/2	1
3/4	115	170	245	303	365
1	230	340	490	615	730
1 1/4	485	710	1,025	1,290	1,530
1 1/2	790	1,160	1,670	2,100	2,500
2	1,580	2,360	3,400	4,300	5,050
2 1/2	2,650	3,900	5,600	7,100	8,400
3	4,850	7,100	10,300	12,900	15,300
3 1/2	7,200	10,600	15,300	19,200	22,800
4	10,200	15,000	21,600	27,000	32,300
5	19,000	27,800	40,300	55,500	60,000
6	31,000	45,500	65,500	83,000	98,000

^a Note: The above table is based on steam at pressures of 0 to 4 psig.

SIZING PIPING FOR ONE-PIPE GRAVITY SYSTEMS

Gravity one-pipe air-vent systems, in which the equivalent length of run does not exceed 200 ft, should be sized by means of Tables 5, 6 and 7 as follows:

1. For the steam main and dripped runouts to risers where the steam and condensate flow in the same direction, use 1/8-psi drop (Column D).
2. Where the riser runouts are not dripped and the steam and condensate flow in opposite directions, and also in the radiator runouts where the same condition occurs, use Column L.
3. For up-feed steam risers carrying condensate back from the radiators, use Column J.
4. For down-feed systems, the main risers of which do not carry any radiator condensate, use Column H.
5. For the radiator valve size and the stub connection, use Column K.
6. For the dry-return main, use Column U.
7. For the wet-return main, use Column T.

On systems exceeding an equivalent length of 200 ft, it is suggested that the total drop be not over 1/4 psi. The return piping sizes should correspond with the drop used on the steam side of the system. Thus, where 1/4-psi drop is being used, the steam main and dripped runouts would be

TABLE 11. RETURN PIPE CAPACITIES FOR 150 PSIG STEAM SYSTEMS^a
Capacity Expressed in Pounds per Hour

PIPE SIZE INCHES	DROP IN PRESSURE—PSI PER 100 FT IN LENGTH					
	1/8	1/4	3/8	1/2	1	2
3/4	156	232	360	465	560	890
1	313	462	690	910	1,120	1,780
1 1/4	650	960	1,500	1,950	2,330	3,700
1 1/2	1,070	1,580	2,460	3,160	3,800	6,100
2	2,160	3,300	4,950	6,400	7,700	12,300
2 1/2	3,600	5,350	8,200	10,700	12,800	20,400
3	6,500	9,600	15,000	19,500	23,300	37,200
3 1/2	9,600	14,400	22,300	28,700	34,500	55,000
4	13,700	20,500	31,600	40,500	49,200	78,500
5	25,600	38,100	58,500	76,000	91,500	146,000
6	42,000	62,500	96,000	125,000	150,000	238,000

^a Note: The above table is based on steam at pressures of 1 to 20 psig.