TABLE 7. WARM AIR CARRYING CAPACITY, BTU DELIVERED, SECOND STORY REGISTERS[a,b,c,d]

Length of Leader Pipe—in Feet

UNIT NOS.[e,f]	NO OF ELBOWS	4 FT	6 FT	8 FT	10 FT	12 FT	14 FT	16 FT	18 FT	20 FT	22 FT	24 FT
11-22	1	8,370	8,140	7,900	7,670	7,430	7,190	6,950	6,710	6,470	6,240	6,000
12-24		10,040	9,760	9,470	9,190	8,900	8,620	8,330	8,050	7,770	7,480	7,200
13		10,880	10,570	10,260	9,960	9,650	9,340	9,030	8,730	8,420	8,110	7,800
14		11,710	11,380	11,050	10,720	10,390	10,060	9,720	9,390	9,060	8,730	8,400
15		16,200	15,750	15,300	14,840	14,380	13,920	13,460	13,000	12,550	12,100	11,640
16		18,920	18,390	17,850	17,310	16,780	16,240	15,710	15,180	14,640	14,100	13,570
11-22	2	7,940	7,720	7,500	7,280	7,050	6,830	6,600	6,370	6,150	5,930	5,700
12-24		9,640	9,270	9,000	8,730	8,460	8,190	7,920	7,650	7,380	7,110	6,840
13		10,340	10,050	9,750	9,460	9,170	8,880	8,580	8,290	8,000	7,700	7,410
14		11,120	10,810	10,500	10,180	9,870	9,550	9,230	8,920	8,610	8,290	7,980
15		15,400	14,970	14,530	14,100	13,670	13,230	12,800	12,360	11,930	11,500	11,070
16		17,980	17,470	16,960	16,450	15,950	15,430	14,830	14,420	13,910	13,400	12,890
11-22	3	7,530	7,320	7,110	6,900	6,680	6,470	6,250	6,040	5,830	5,620	5,400
12-24		9,030	8,780	8,520	8,270	8,010	7,750	7,500	7,240	6,990	6,730	6,470
13		9,800	9,520	9,240	8,960	8,690	8,410	8,130	7,850	7,580	7,300	7,020
14		10,530	10,240	9,940	9,650	9,350	9,050	8,750	8,450	8,160	7,860	7,560
15		14,580	14,180	13,780	13,370	12,950	12,530	12,120	11,710	11,300	10,890	10,480
16		17,040	16,550	16,070	15,580	15,110	14,620	14,140	13,660	13,180	12,700	12,210
11-22	4	7,120	6,920	6,720	6,520	6,310	6,110	5,900	5,700	5,500	5,300	5,100
12-24		8,530	8,290	8,050	7,810	7,570	7,330	7,080	6,840	6,600	6,360	6,120
13		9,250	8,990	8,720	8,460	8,200	7,940	7,680	7,410	7,150	6,890	6,630
14		9,950	9,670	9,390	9,110	8,830	8,550	8,260	7,980	7,700	7,420	7,140
15		13,780	13,390	13,000	12,610	12,220	11,830	11,440	11,050	10,670	10,280	9,890
16		16,080	15,620	15,170	14,710	14,260	13,810	13,350	12,900	12,440	11,980	11,530
11-22	5	6,700	6,510	6,320	6,130	5,940	5,750	5,560	5,370	5,180	4,990	4,800
12-24		8,040	7,810	7,580	7,350	7,130	6,900	6,670	6,440	6,220	5,990	5,760
13		8,710	8,460	8,210	7,970	7,720	7,470	7,230	6,980	6,730	6,490	6,240
14		9,370	9,110	8,850	8,580	8,310	8,050	7,780	7,510	7,250	6,980	6,720
15		12,970	12,600	12,240	11,870	11,500	11,140	10,770	10,400	10,040	9,680	9,310
16		15,140	14,710	14,280	13,850	13,420	13,000	12,570	12,140	11,710	11,280	10,850

[a] *Btu deliveries* shown in Table 7 apply only to baseboard locations of warm air registers. *When floor registers are used deduct 15 per cent* from the *Btu deliveries.*

[b] Consider each 45 deg elbow as equal to one-half of a 90 deg elbow.

[c] Consider the two sharp elbows in a cross-over connection as equivalent to three 90 deg round elbows.

[d] Consider each 90 deg offset between boot and stackhead equal to one 90 deg round elbow.

[e] No. 21 for Btu values multiply 11-22 values by 0.83.

[f] No. 23 for Btu values multiply 12-24 values by 0.83.

TABLE 8. RETURN AIR—CARRYING CAPACITY—BTU SERVICED

UNIT NO.	TYPE A BTU PER HOUR	TYPES B AND C BTU PER HOUR	TYPE D BTU PER HOUR	TYPE E BTU PER HOUR
31	11,300	9,500	7,800	5,000
32	16,300	13,700	11,300	7,200
33	22,200	18,700	15,300	9,800
34	29,000	24,400	20,000	12,800
35	36,700	30,800	25,300	16,200
36	45,300	38,000	31,300	20,000
37	54,800	46,000	37,800	24,100
38	65,200	54,800	45,000	28,700

the Btu serviced and the type of return air system. Then from Table 5 select the duct and grille sizes, etc., corresponding to the same unit number.

7. Select a furnace having a capacity rating, in Btu per hour, equal to the total heat loss from the structure.

Examples

Examples 1 and 2 will illustrate the use of the tables in selecting warm air and return system sizes.

Example 1. For a room which has a heat loss of 22,500 Btu per hour select the size of first story warm air system. There are three elbows and the leader is approximately 10 ft long.

Solution: Since 22,500 Btu is beyond the capacities shown in Table 6, it is necessary to select two units of 11,250 each. From Table 6 in 10 ft leader column and in section for three elbows find 11,400 as nearest capacity which corresponds to Unit No. 4 in first column. Refer to Unit No. 4 in Table 2 and find that the leader should be 12 in. in diameter and should be used with a 12 x 14 in. floor register or a 13 x 11 in. baseboard register with a 5¼ in. extension.

Example 2. What is the size of a return system of Type D which is to service 35,000 Btu per hour?

Solution: From Table 8 find Unit No. 37 which will service 37,800 Btu per hour. Refer to Table 5 to find that Unit No. 37 will require a 22-in. diameter duct, a shoe area of 420 sq in., a metal grille 18 x 30 in., a duct 42 x 10 in. or 36 x 12 in. If joist lining is used the minimum depth should be 15 in. for two 2-joist spaces 14 in. wide, or 10 in. for three joist spaces.

FURNACE CAPACITY

The size of the furnace should be such as will provide the necessary air heating capacity. In the case of gas, oil, and some coal furnaces, the

FIG. 4. TYPICAL BASEMENT LINE DRAWING