

TABLE 7. WARM AIR CAPACITY, BTUH DELIVERED SECOND STORY REGISTERS

COMBINATION No.		ACTUAL LENGTH (BONNET TO BOOT) FEET	6	6½	7	7½	4	6	8	10	12	14	16	18	20
11 or 22	12 or 24	1	8,370	8,140	7,900	7,670	7,430	7,190	6,950	6,710	6,470	6,240	6,000		
14	15		10,040	9,760	9,470	9,190	8,900	8,620	8,330	8,050	7,770	7,480	7,200		
15	16		11,710	11,380	11,050	10,720	10,390	10,060	9,720	9,390	9,060	8,730	8,400		
11 or 22	12 or 24	2	16,200	15,750	15,300	14,840	14,380	13,920	13,460	13,000	12,550	12,100	11,640		
14	15		18,920	18,390	17,850	17,310	16,780	16,240	15,710	15,180	14,640	14,100	13,570		
11 or 22	12 or 24	3	7,940	7,720	7,500	7,280	7,050	6,830	6,600	6,370	6,150	5,930	5,700		
14	15		9,540	9,270	9,000	8,730	8,460	8,190	7,920	7,650	7,380	7,110	6,840		
15	16		11,120	10,810	10,500	10,180	9,870	9,550	9,230	8,920	8,610	8,290	7,980		
11 or 22	12 or 24	4	15,400	14,970	14,530	14,100	13,670	13,230	12,800	12,360	11,930	11,500	11,070		
14	15		17,980	17,470	16,960	16,450	15,950	15,430	14,930	14,420	13,910	13,400	12,890		
11 or 22	12 or 24	5	7,530	7,320	7,110	6,900	6,680	6,470	6,250	6,040	5,830	5,620	5,400		
14	15		9,030	8,780	8,520	8,270	8,010	7,750	7,500	7,240	6,990	6,730	6,470		
15	16		10,530	10,240	9,940	9,650	9,350	9,050	8,750	8,450	8,150	7,860	7,560		
11 or 22	12 or 24	6	14,580	14,180	13,780	13,370	12,950	12,530	12,120	11,710	11,300	10,890	10,480		
14	15		17,040	16,550	16,070	15,580	15,110	14,620	14,140	13,660	13,180	12,700	12,210		
11 or 22	12 or 24	7	7,120	6,920	6,720	6,520	6,310	6,110	5,900	5,700	5,500	5,300	5,100		
14	15		8,530	8,290	8,050	7,810	7,570	7,330	7,080	6,840	6,600	6,360	6,120		
15	16		9,950	9,670	9,390	9,110	8,830	8,550	8,260	7,980	7,700	7,420	7,140		
11 or 22	12 or 24	8	13,780	13,390	13,000	12,610	12,220	11,830	11,440	11,050	10,670	10,280	9,890		
14	15		16,080	15,620	15,170	14,710	14,260	13,810	13,350	12,900	12,440	11,980	11,530		
11 or 22	12 or 24	9	6,700	6,510	6,320	6,130	5,940	5,750	5,560	5,370	5,180	4,990	4,800		
14	15		8,040	7,810	7,580	7,350	7,130	6,900	6,670	6,440	6,220	5,990	5,760		
15	16		9,370	9,110	8,850	8,580	8,310	8,050	7,780	7,510	7,250	6,980	6,720		
11 or 22	12 or 24	10	12,970	12,600	12,240	11,870	11,500	11,140	10,770	10,400	10,040	9,680	9,310		
14	15		15,140	14,710	14,280	13,850	13,420	13,000	12,570	12,140	11,710	11,280	10,850		

Notes: When floor registers are used on second story rooms, include the equivalent elbow resistance for the cross-over connection as shown in Fig. 2.
Combination Numbers 21 and 23 as shown in Tables 2 and 3 are composed of narrow stacks for narrow stud spaces.

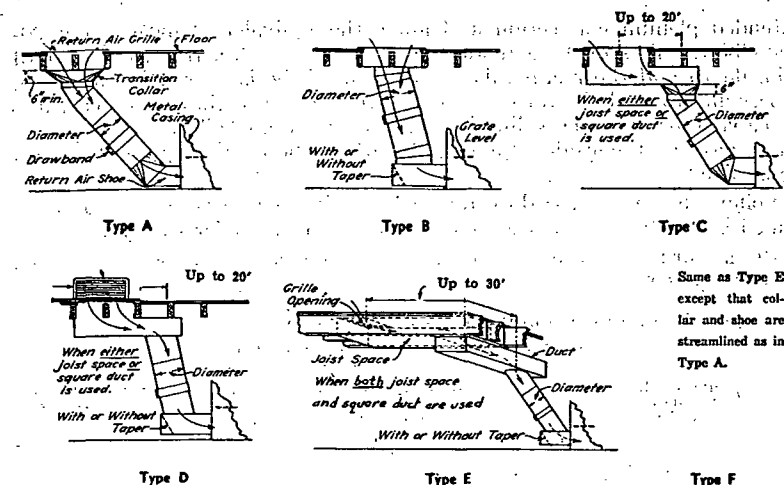
For Combination No. 21, the capacities are the Btuh deliveries shown for Combination Nos. 11 or 22 multiplied by 0.83.

For Combination No. 23, the capacities are the Btuh deliveries shown for Combination Nos. 12 or 24 multiplied by 0.83.

Standard work sheets to facilitate design according to the recommended procedure, are available from NWAH & ACA.

TABLE 8. RETURN AIR—CARRYING CAPACITY—BTUH SERVICED

RETURN AIR COMBINATION No.	DUCT DIAM. IN.	TYPE A BTUH	TYPE B AND C BTUH	TYPE D BTUH	TYPE E BTUH	TYPE F BTUH	RETURN AIR COMBINATION No.
31	10	11,300	9,500	7,800	5,000	7,800	31
32	12	16,300	13,700	11,300	7,200	11,300	32
33	14	22,200	18,700	15,300	9,800	15,300	33
34	16	29,000	24,400	20,000	12,800	20,000	34
35	18	36,700	30,800	25,300	16,200	25,300	35
36	20	45,300	38,000	31,300	20,000	31,300	36
37	22	54,800	46,000	37,800	24,100	37,800	37
38	24	65,200	54,800	45,000	28,700	45,000	38



Note: For Types C, D, E, and F return-air systems, reduce the carrying capacities shown in Table 8 by 1 percent for each 4 ft additional length in the horizontal run.

FIG. 5. TYPICAL ARRANGEMENTS OF RETURN-AIR DUCT SYSTEMS

Design of Extended Plenum Systems

The extended plenum system of gravity warm air heating employs horizontal ducts in the basement leading from an enlargement or extension of the customary plenum to the risers which distribute the conditioned air to the various rooms. Extended plenum gravity systems have been satisfactorily designed and installed in small compact houses where the heat losses do not exceed 65,000 Btuh. The dimension from the floor to the bottom of the joists should in every case be at least 7 ft. To design such a system the procedure is the same as for the conventional system already described in this chapter.

It is understood that the length of leader pipe is measured from the register to the furnace. For takeoffs, use standard fittings designed for

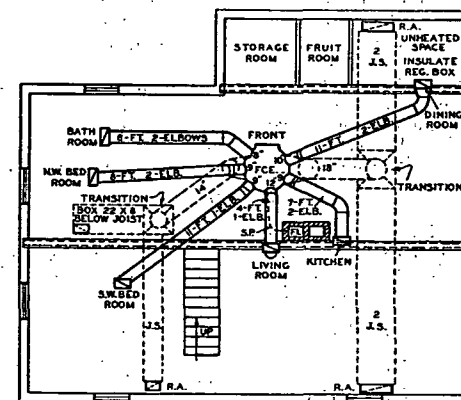


FIG. 6. TYPICAL BASEMENT LINE DRAWING