

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

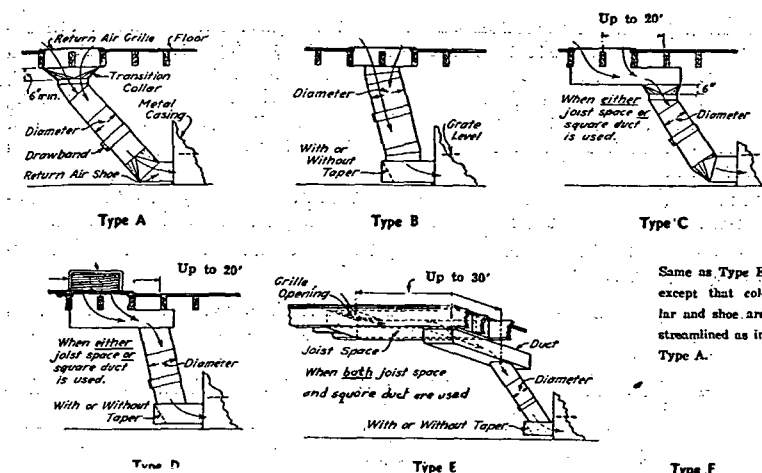
COMBINATION NO.		Height from basement floor to bottom of joists—Feet—	ACTUAL LENGTH (BONNET TO BOOT) FEET															
			6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
			6½	8½	10½	12½	14½	16½	18½	20½	22½	24½	26½	28½	30½	32½	34½	36½
			7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37
11 or 22	1	11	8,370	8,140	7,900	7,670	7,430	7,190	6,950	6,710	6,470	6,240	6,000	5,760	5,520	5,280	5,040	4,800
12 or 24	2	12	10,040	9,780	9,470	9,190	8,900	8,620	8,330	8,060	7,770	7,480	7,200	6,910	6,620	6,330	6,040	5,750
14	3	14	11,710	11,390	11,050	10,720	10,390	10,060	9,720	9,390	9,060	8,730	8,400	8,070	7,740	7,410	7,080	6,750
15	4	15	16,200	15,750	15,300	14,840	14,380	13,920	13,460	13,000	12,550	12,100	11,640	11,190	10,740	10,290	9,840	9,390
16	5	16	18,920	18,390	17,850	17,310	16,780	16,240	15,710	15,180	14,640	14,100	13,570	13,040	12,510	11,980	11,450	10,920
11 or 22	2	11	7,940	7,720	7,500	7,280	7,050	6,830	6,600	6,370	6,150	5,930	5,700	5,480	5,260	5,040	4,820	4,600
12 or 24	3	12	9,540	9,270	9,000	8,730	8,460	8,190	7,920	7,650	7,380	7,110	6,840	6,570	6,300	6,030	5,760	5,490
14	4	14	11,120	10,810	10,500	10,190	9,870	9,560	9,250	8,940	8,630	8,320	8,010	7,700	7,390	7,080	6,770	6,460
15	5	15	15,400	14,970	14,530	14,100	13,670	13,240	12,810	12,380	11,950	11,520	11,090	10,660	10,230	9,800	9,370	8,940
16	6	16	17,980	17,470	16,960	16,450	15,950	15,430	14,930	14,420	13,910	13,400	12,890	12,380	11,870	11,360	10,850	10,340
11 or 22	3	11	7,530	7,320	7,110	6,900	6,680	6,470	6,250	6,040	5,830	5,620	5,400	5,190	4,980	4,770	4,560	4,350
12 or 24	4	12	9,030	8,790	8,520	8,270	8,010	7,750	7,500	7,240	6,990	6,730	6,470	6,210	5,950	5,690	5,430	5,170
14	5	14	10,530	10,240	9,940	9,650	9,350	9,050	8,750	8,450	8,150	7,850	7,550	7,250	6,950	6,650	6,350	6,050
15	6	15	14,580	14,180	13,780	13,370	12,950	12,530	12,120	11,710	11,300	10,890	10,480	10,070	9,660	9,250	8,840	8,430
16	7	16	17,040	16,550	16,070	15,580	15,110	14,620	14,140	13,660	13,180	12,700	12,210	11,730	11,250	10,770	10,290	9,810
11 or 22	4	11	7,120	6,920	6,720	6,520	6,310	6,110	5,900	5,700	5,500	5,300	5,100	4,900	4,700	4,500	4,300	4,100
12 or 24	5	12	8,530	8,290	8,050	7,810	7,570	7,330	7,090	6,840	6,600	6,360	6,120	5,880	5,640	5,400	5,160	4,920
14	6	14	9,950	9,670	9,390	9,110	8,830	8,550	8,260	7,980	7,700	7,420	7,140	6,860	6,580	6,300	6,020	5,740
15	7	15	13,780	13,390	13,000	12,610	12,220	11,830	11,440	11,050	10,660	10,270	9,880	9,490	9,100	8,710	8,320	7,930
16	8	16	16,080	15,620	15,170	14,710	14,260	13,810	13,350	12,900	12,440	11,980	11,530	11,070	10,620	10,160	9,710	9,250
11 or 22	5	11	6,700	6,510	6,320	6,130	5,940	5,750	5,560	5,370	5,180	4,990	4,800	4,610	4,420	4,230	4,040	3,850
12 or 24	6	12	8,040	7,810	7,580	7,350	7,130	6,900	6,670	6,440	6,220	5,990	5,760	5,530	5,300	5,070	4,840	4,610
14	7	14	9,370	9,110	8,850	8,590	8,330	8,070	7,810	7,550	7,290	7,030	6,770	6,510	6,250	5,990	5,730	5,470
15	8	15	12,970	12,600	12,240	11,870	11,500	11,140	10,770	10,400	10,040	9,680	9,320	8,960	8,600	8,240	7,880	7,520
16	9	16	15,140	14,710	14,280	13,850	13,420	13,000	12,570	12,140	11,710	11,280	10,850	10,420	9,990	9,560	9,130	8,700

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

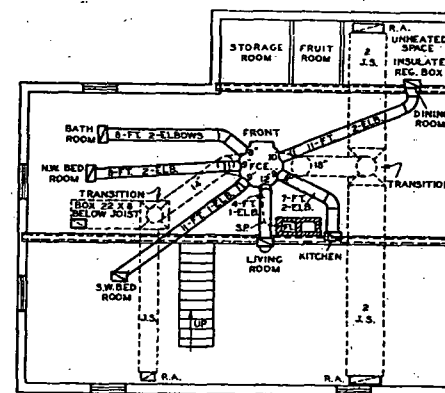


FIG. 6. TYPICAL BASEMENT LINE DRAWING