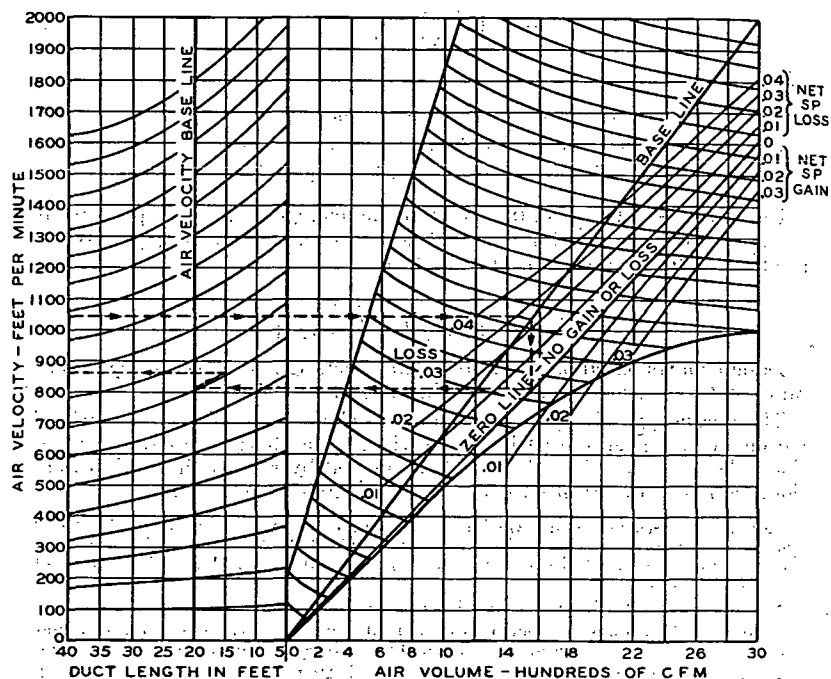




* Based on Equation 13.

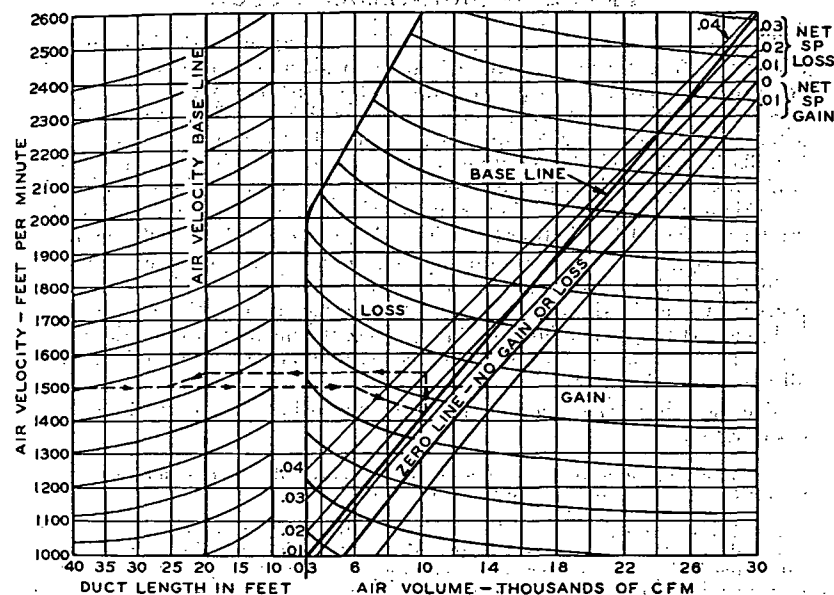
FIG. 14. STATIC REGAIN CHART*

For Determining Velocity in Ducts Carrying Q to 3000 cfm

4. Loss in Section F = $0.13 \times 0.225 = 0.03$ in. water.
5. Since the operating pressure of Outlet 1 is to be the same as that of Outlet 6, the loss in Section B must equal the loss in Section F. Using the Static Regain Chart, Fig. 15, size Section B for a net loss of 0.03 in. water.

The procedure for using these charts is indicated by arrow heads and dashed lines on Fig. 15. Proceed as follows:

- a. Locate the velocity of the preceding (upstream) duct section along the velocity scale on the left margin (1500 fpm).
- b. Proceed horizontally to the air volume abscissa (6000 cfm).
- c. Proceed parallel to the curved lines to intersect the diagonal base line.
- d. Go vertically to the net loss desired (0.03 net loss).
- e. Go horizontally to the air velocity base line.
- f. Proceed parallel to the curved lines to intersect ordinate for 25 ft duct length.
- g. Move horizontally to the air velocity scale and read the velocity in the downstream section of duct (1500 fpm).
6. This procedure is repeated for Section C except that the *no gain or loss* line is used in previous Step 5 d. Outlet No. 2 will then have the same static pressure behind it as Outlet No. 1, thus fulfilling the problem condition of the same operating pressure for all outlets.
7. At this point, the equivalent length of the elbow in Section D should be estimated. Its width will be somewhat less than that of Section C. Assume $W = 26$ in.; hence $H/W = 16/26 = 0.6$. With a typical radius ratio of 1.25, from Fig. 8,



* Based on Equation 13.

FIG. 15. STATIC REGAIN CHART*

For Determining Velocity in Ducts Carrying 3000 to 30,000 cfm

$L/W = 6$; therefore $L = 6 \times (26/12) = 13$ ft. Adding this to the actual length of Section D results in a total equivalent length of 26 ft.

8. Using the *no gain or loss* line in Fig. 14, size Sections D, E and G. Results are listed in Table 8.

9. The total pressure loss of the system is the sum of the losses in Sections A and B (or F) and the outlet operating pressure:

$$\begin{aligned} \text{Loss in Section A} &= 0.13 \times 0.40 = 0.05 \\ \text{Loss in Section B (or F)} &= 0.03 \\ \text{Outlet Operating Pressure} &= 0.12 \end{aligned}$$

$$\text{Total Pressure Loss} = 0.20 \text{ in.}$$

TABLE 8. TABULATION OF RESULTS (EXAMPLE 7)

SECTION	AIR VOLUME cfm	EQUIVALENT LENGTH ft	VELOCITY fpm	RECTANGULAR DUCT in.	DIAM. in.	FRICTION PER 100 FT in. H ₂ O	NET PRESSURE LOSS in. H ₂ O
A	8000	40	1500	48 x 16	29.2	0.13	.05
B	6000	25	1500	36 x 16	—	—	.03
C	4500	15	1300	31 x 16	—	—	0
D	3000	26*	1040	26 x 16	—	—	0
E	1500	15	860	16 x 16	—	—	0
F	2000	22.5	1200	15 x 16	17.	0.13	.03
G	1000	15	900	10 x 16	—	—	0

* Includes 13 equivalent ft for elbow (see Step 7 in Example 7).