

Figure 3-55. Loading diagram of base plate.

**Base plate with center web**

- Area.

$$A_b = AF$$

- Bearing pressure.

$$B_p = \frac{Q}{A_b}$$

- Base plate thickness.

$$\text{Now } M = \frac{QF}{8}$$

$$Z = \frac{At_b^2}{6}$$

$$\text{and } f_b = \frac{M}{Z} = \frac{3QF}{4At_b^2}$$

Therefore

$$t_b = \sqrt{\frac{3QF}{4AF_b}}$$

Assumes uniform load fixed in center.

**Base plate analysis for offset web (see Figure 3-56)**

- Overall length,  $\sum L$ .

$$\text{Web } I_w = A - 2d_1 - 2j$$

$$\text{ribs } L_r = n(G - t_w)$$

$$\sum L = I_w + L_r$$

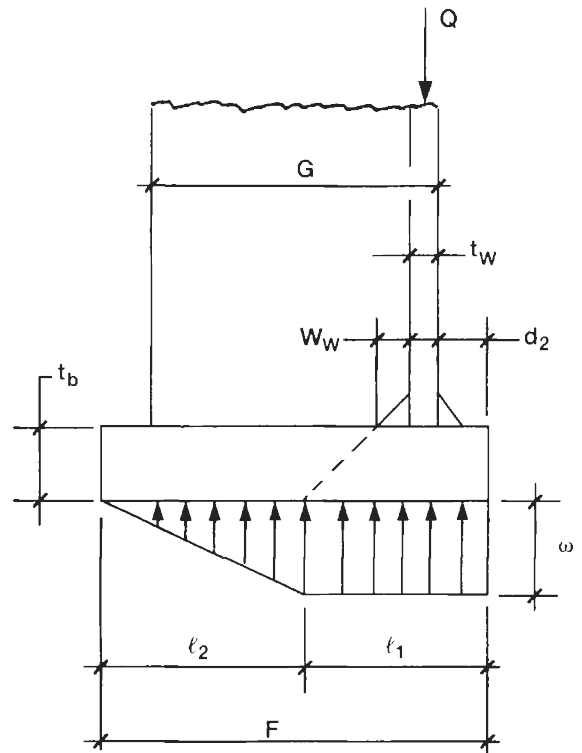


Figure 3-56. Load diagram and dimensions for base plate with an offset web.

- Unit linear load,  $f_u$ .

$$f_u = \frac{Q}{\sum L} \text{ lb/linear in.}$$

- Distances  $\ell_1$  and  $\ell_2$ .

$$\ell_1 = d_2 + t_w + W_w + t_b$$

$$\ell_2 = F - \ell_1$$

- Loads moment.

$$\omega = \frac{f_u}{\ell_1 + 0.5\ell_2}$$

$$M = \frac{\omega \ell_2^2}{6}$$

- Bending stress,  $f_b$ .

$$f_b = \frac{6M}{t_b^2}$$