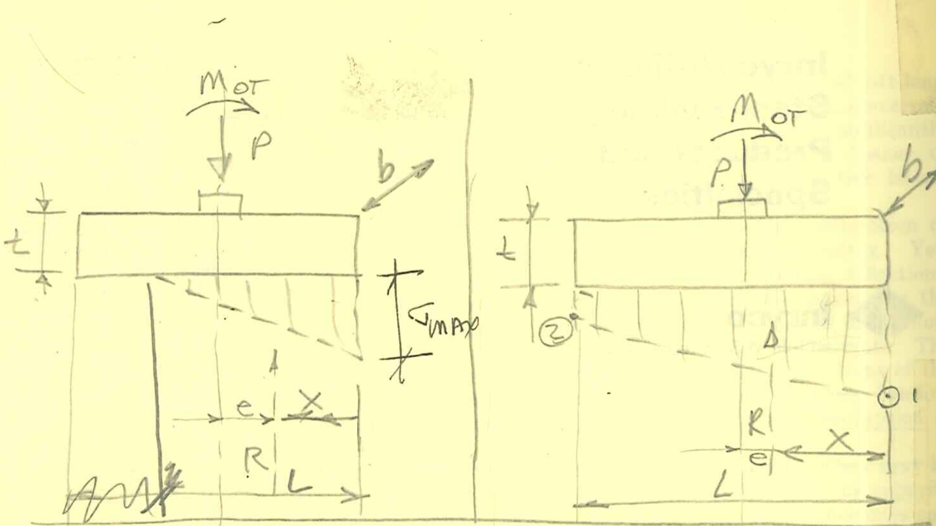

$M_{OT} =$

$M_{RESIST} =$

$\left.\right\}\ \dfrac{M_R}{M_{OT}} \geq 1.5 \text{ TO } 1.8$

$X = \dfrac{M_R - M_{OT}}{W_{TOTAL}}$ $(W_{TOT} \cong P)$

SOIL PRESS $= \dfrac{2W}{3(x)(b)}$

$\boxed{L = 3X}$

$W = \dfrac{\sigma_{MAX}}{2}(3x)(b)$

$\Rightarrow \sigma_{MAX} = \dfrac{2W}{3xb}$

SOIL PRESS?

$e = L/2 - x$

$p_1 = \dfrac{P}{bL}\left(1 + \dfrac{6e}{L}\right)$

$p_2 = \dfrac{P}{bL}\left(1 - \dfrac{6e}{L}\right)$

footing. In that case, the pressure diagram becomes triangular, as shown in Fig. 7-12*d*. The pressures extend over a distance of $3(b/2 - e)$. The maximum pressure is

$$p = \frac{2P}{3(b/2 - e)} \tag{7-18}$$

Treatment of a square or rectangular spread footing with overturning moment M about one principal axis is similar. For full bearing on the footing, the maximum and

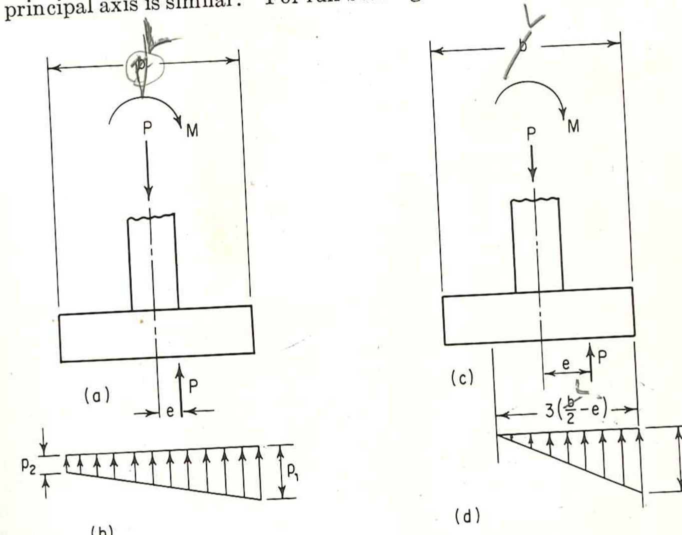

Fig. 7-12. Footings subjected to overturning.

minimum pressures are

$$p_1 = \frac{P}{bL}\left(1 + \frac{6e}{L}\right) \tag{7-19a}$$

$$p_2 = \frac{P}{bL}\left(1 - \frac{6e}{L}\right) \tag{7-19b}$$

where L = length of footing in the plane of overturning
b = length of the other side of the footing

When $e > L/6$, the resultant lies outside the middle third and full bearing does not exist. In that case, the pressure diagram is a triangular prism, and the maximum pressure is

$$p = \frac{2P}{3b\underbrace{(L/2 - e)}_{x}} \quad \frac{2W}{3bx} \tag{7-20}$$

For square or rectangular footings subjected to overturning about two principal axes and for unsymmetrical footings, the procedure is generally similar. Eccentricities of the loading, e_1 and e_2, are determined about the two principal axes. Then, for bearing over the entire footing, the maximum soil pressure is computed from

$$p = \frac{P}{A}\left(1 + \frac{e_1c_1}{r_1^2} + \frac{e_2c_2}{r_2^2}\right) \tag{7-21}$$