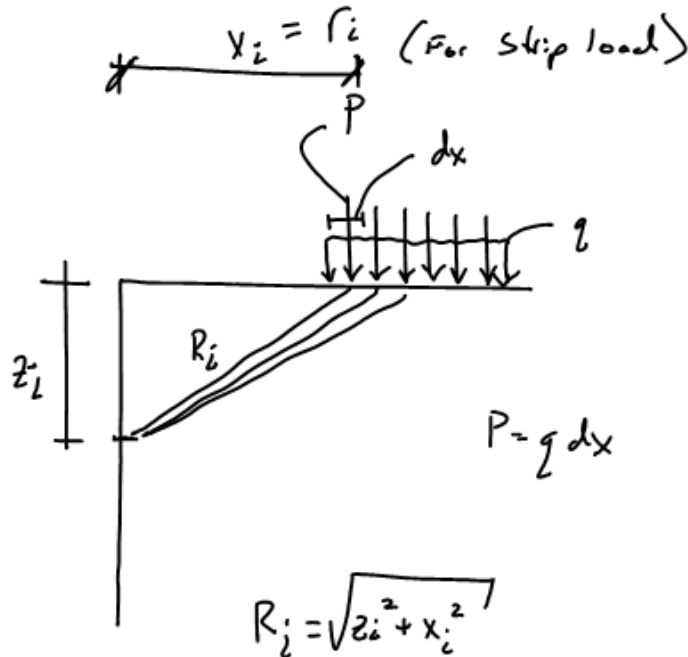


HOW TO ENGINEER	Project				Job Ref.	
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Integrated Vs Discretized				1		
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### BOUSSINESQ NOTES



$$\sigma_x = \sigma_r = -\frac{P}{2\pi R^2} \left[ \frac{-3r^2 z}{R^3} + \frac{(1-2\nu)R}{R+z} \right]$$

( $r_i = x_i$ )

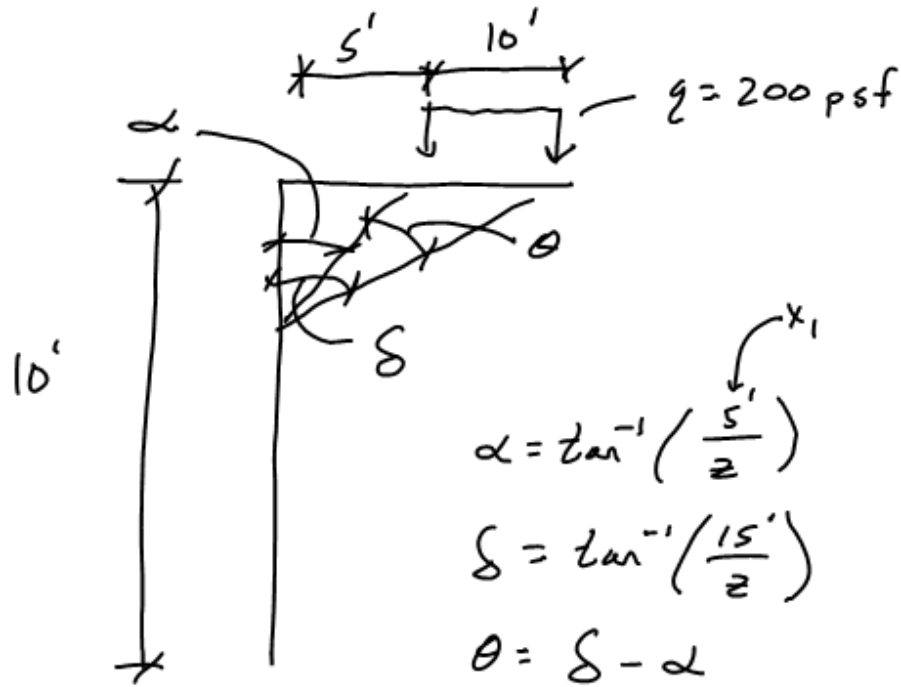
$$= \frac{P}{2\pi} \left[ \frac{3r^2 z}{R^3} - \frac{1-2\nu}{R(R+z)} \right]$$

$$= \frac{P}{2\pi z^2} \left[ 3 \sin^2 \theta \cos^3 \theta - \frac{(1-2\nu) \cos^2 \theta}{1 + \cos \theta} \right]$$

(See Bowles 3rd Ed.)



HOW TO ENGINEER	Project				Job Ref.	
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$z$	$\alpha$	$\delta$	$\theta$	$\sigma_H$	Force
0					
2	$68.2^\circ$	$82.4^\circ$	$14.2^\circ$	29.2	29.2
4	$51.34^\circ$	$76.1^\circ$	$23.73$	41.57	76.8
6	39.81	68.2	28.39	40.9	82.47
8	32	61.93	29.2	35.42	76.32
10	$26.6^\circ$	$56.3^\circ$	29.75	29.13	64.6

$\frac{\sigma_{z+1} + \sigma_z}{2} \times (z_{i+1} - z_i)$   
 Not close!!  $\rightarrow$  324 lb