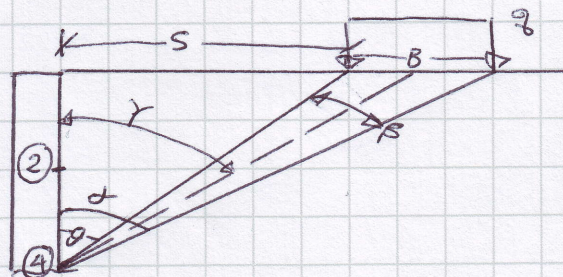
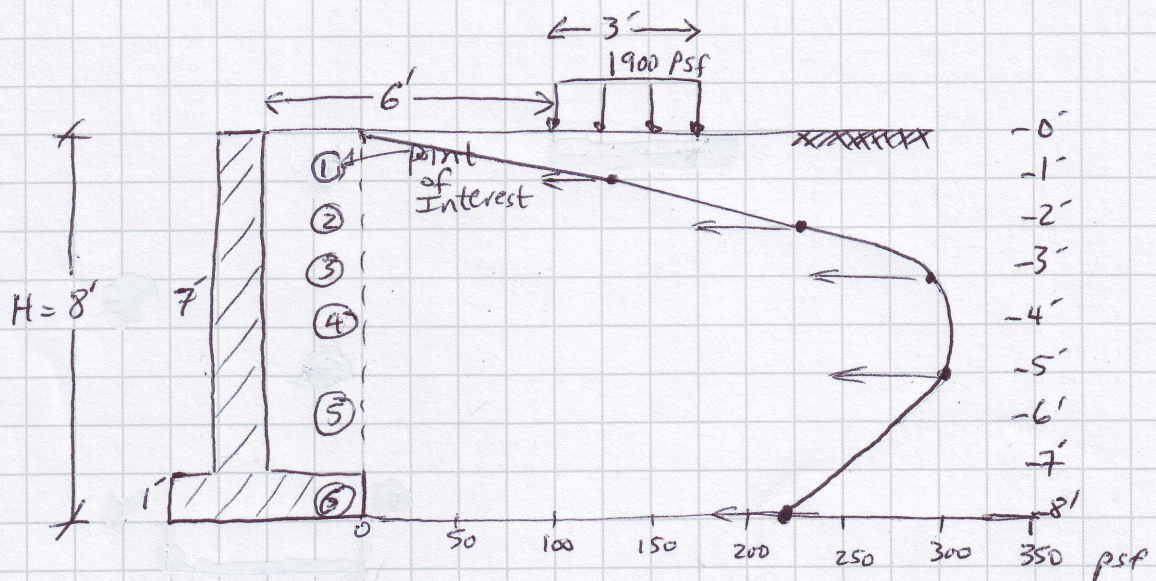


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Project: Strip Load Surcharge Computation Designed by: LAA

Design example:



$$[1 \text{ Rad} = \frac{180}{\pi} = 57.2956^\circ]$$

At (4),  $\Delta H = 4'$

$$\alpha = \tan^{-1} \left( \frac{S+B}{\Delta H} \right) \text{ Rad} = \left[ \tan^{-1} \left( \frac{6'+3'}{4'} \right) \right] = 1.153 \text{ Rad} = 66.04^\circ$$

$$\theta = \tan^{-1} \left( \frac{S}{\Delta H} \right) \text{ Rad} = \left[ \tan^{-1} \left( \frac{6'}{4'} \right) \right] = 0.983 \text{ Rad} = 56.31^\circ$$

$$\beta = \alpha - \theta = 66.04^\circ - 56.31^\circ = 9.73^\circ = 0.17 \text{ Rad}$$

$$\sigma_1 = \frac{q}{\pi} (\beta + \sin \beta) = \frac{1900}{3.1416} (0.17 + \sin 0.17) = 204.9 \text{ psf}$$

$$\sigma_2 = \frac{q}{\pi} (\beta - \sin \beta) = \frac{1900}{3.1416} (0.17 - \sin 0.17) = 0.5 \text{ psf} \quad \text{In Radians.}$$

$$\gamma = \frac{\alpha + \theta}{2} = \frac{1.153 + 0.983}{2} = 1.068 \text{ Rad} = 61.18^\circ$$



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Lateral stress @ -4 ft =  $P_{\text{sur.}}$

$$\begin{aligned} P_{\text{sur}} &= 2 \left( \sigma_1 \sin^2(\gamma) + \sigma_2 \cos^2(\gamma) \right) \\ &= 2 \left( 204.9 \sin^2(\underbrace{1.068}_{\text{radians}}) + 0.5 \cos^2(\underbrace{1.068}_{\text{radians}}) \right) \\ &= 314.7 \text{ psf } (4) \end{aligned}$$

So if we did this for 1', 2', 3', 4', 5' and 8', we get the following:

<u>Depth, ft</u>	<u>Lateral Stress, psf</u>
1'	129.3
2'	231.4
3'	292.6
4'	314.7
5'	308.0
8'	222.3

Contrary to some practice, there will be lateral stresses on the retaining structure, even if strip load is at a distance greater than  $1.0 H$ .