

SUBJECT: Independant Conc. Wall Analysis w/o Mirafi

$$K_a = \frac{1 - \sin \phi}{1 + \sin \phi} \quad \phi = 0.38 \quad \boxed{K_a = 0.238}$$

$$\gamma_{equiv} = K_a \gamma = (0.238)(100) \quad \boxed{\gamma_{equiv} = 23.8 \text{ lb/ft}^3}$$

Height = 7 blocks tall @ 30" = 17.5 vt  
 less 48" top "fence" = <4 vt>  
 less 1.5 blocks buried = <3.75 vt>  
 Equiv. H = 9.75 vt of soil on wall

$$\begin{aligned} \text{Reaction on wall} &= \left(\frac{1}{2}\right)(K_a)(\gamma)(H^2) \\ &= (0.5)(0.238)(100)(9.75^2) \\ \boxed{R_a} &= \boxed{1,131 \text{ lb/ft}} \end{aligned}$$

Moment at lowest block

$$\begin{aligned} M &= (R_a)\left(\frac{H}{3}\right) \\ &= (1,131)\left(\frac{9.75}{3}\right) \\ \boxed{M_p} &= \boxed{3,676 \text{ kip}\cdot\text{ft/ft}} \end{aligned}$$

versus concrete wall

WEIGHT OF WALL = W

$$\begin{aligned} W &= (2.5'w)(17.5 \text{ vt} - 1 \text{ buried joint}) \gamma_{\text{concrete}} \\ &= (2.5)(15)(150) \end{aligned}$$

$$\boxed{W} = \boxed{5,625 \text{ lb/ft}}$$