



Condition	Cohesive Soil (Non-Expansive Clay)			Cohesionless Soil (Granular - Sand)				
	Assumed Backfill Characteristics							
Approx Total Density	140 pcf				140 pcf			
Approximate Friction Angle	15° - 20°	15	<i>Ka, Ko, Kp Averages</i>	20	30° - 35°	30	<i>Ka, Ko, Kp Averages</i>	35
Active Pressure Coefficient, $K_a = (1 - \sin\phi) / (1 + \sin\phi) = 1/K_p$	0.54	0.59	0.54	0.49	0.30	0.33	0.30	0.27
At-Rest Pressure Coefficient, $K_o = (1 - \sin\phi)$	0.70	0.74	0.70	0.66	0.46	0.50	0.46	0.43
Passive Pressure Coefficient, $K_p = (1 + \sin\phi) / (1 - \sin\phi) = 1/K_a$	1.87	1.70	1.87	2.04	3.35	3.00	3.35	3.69
Estimated Lateral Earth Pressures (Equivalent Fluid Pressures)								
Active	Active Drained	76 pcf	$K_a(\gamma) = 0.54(140) = 76$ pcf		42 pcf	$K_a(\gamma) = 0.3(140) = 42$ pcf		
	Active Undrained	104 pcf	$K_a(\gamma - \gamma_w) + \gamma_w = 0.54(140 - 62.4) + 62.4 = 104$ pcf		86 pcf	$K_a(\gamma - \gamma_w) + \gamma_w = 0.3(140 - 62.4) + 62.4 = 86$ pcf		
At-Rest	At-Rest Drained	98 pcf	$K_o(\gamma) = 0.7(140) = 98$ pcf		65 pcf	$K_o(\gamma) = 0.46(140) = 65$ pcf		
	At Rest Undrained	117 pcf	$K_o(\gamma - \gamma_w) + \gamma_w = 0.7(140 - 62.4) + 62.4 = 117$ pcf		98 pcf	$K_o(\gamma - \gamma_w) + \gamma_w = 0.46(140 - 62.4) + 62.4 = 98$ pcf		
Passive	Passive Drained	262 pcf	$K_p(\gamma) = 1.87(140) = 262$ pcf		468 pcf	$K_p(\gamma) = 3.35(140) = 468$ pcf		
	Passive Undrained	145 pcf	$K_p(\gamma - \gamma_w) = 1.87(140 - 62.4) = 145$ pcf		260 pcf	$K_p(\gamma - \gamma_w) = 3.35(140 - 62.4) = 260$ pcf		

$$R = (0.5)(K_o)(\gamma)(H^2) = (0.5)(EFP)(H^2) = \text{psf} / \text{lineal foot of wall length}$$

Condition	Cohesive Soil (Non-Expansive Clay)			Cohesionless Soil (Granular - Sand)				
	Assumed Backfill Characteristics							
Approx Total Density	110 pcf				110 pcf			
Approximate Friction Angle	15° - 20°	15	<i>Ka, Ko, Kp Averages</i>	20	30° - 35°	30	<i>Ka, Ko, Kp Averages</i>	35
Active Pressure Coefficient, $K_a = (1 - \sin\phi) / (1 + \sin\phi) = 1/K_p$	0.54	0.59	0.54	0.49	0.30	0.33	0.30	0.27
At-Rest Pressure Coefficient, $K_o = (1 - \sin\phi)$	0.70	0.74	0.70	0.66	0.46	0.50	0.46	0.43
Passive Pressure Coefficient, $K_p = (1 + \sin\phi) / (1 - \sin\phi) = 1/K_a$	1.87	1.70	1.87	2.04	3.35	3.00	3.35	3.69
Estimated Lateral Earth Pressures (Equivalent Fluid Pressures)								
Active	Active Drained	59 pcf	$K_a(\gamma) = 0.54(110) = 59$ pcf		33 pcf	$K_a(\gamma) = 0.3(110) = 33$ pcf		
	Active Undrained	88 pcf	$K_a(\gamma - \gamma_w) + \gamma_w = 0.54(110 - 62.4) + 62.4 = 88$ pcf		77 pcf	$K_a(\gamma - \gamma_w) + \gamma_w = 0.3(110 - 62.4) + 62.4 = 77$ pcf		
At-Rest	At-Rest Drained	77 pcf	$K_o(\gamma) = 0.7(110) = 77$ pcf		51 pcf	$K_o(\gamma) = 0.46(110) = 51$ pcf		
	At Rest Undrained	96 pcf	$K_o(\gamma - \gamma_w) + \gamma_w = 0.7(110 - 62.4) + 62.4 = 96$ pcf		84 pcf	$K_o(\gamma - \gamma_w) + \gamma_w = 0.46(110 - 62.4) + 62.4 = 84$ pcf		
Passive	Passive Drained	206 pcf	$K_p(\gamma) = 1.87(110) = 206$ pcf		368 pcf	$K_p(\gamma) = 3.35(110) = 368$ pcf		
	Passive Undrained	89 pcf	$K_p(\gamma - \gamma_w) = 1.87(110 - 62.4) = 89$ pcf		159 pcf	$K_p(\gamma - \gamma_w) = 3.35(110 - 62.4) = 159$ pcf		

