

DESIGN DATA

SOIL

Soil Density= 140 pcf
 Soil Friction Angle (Phi)= 34 deg.
 Angle of wall friction (delta)= 22 deg.
 Back slope angle (beta)= 21 deg.
 Broken backslope angle (beta')= 21 deg.
 Slope - Back face of wall= 90 deg.
 Allowable Bearing Capacity= 4000 psf
 Ka= 0.3458
 KaH= 0.3206
 KaV= 0.1295
 EP= 48.41
 EP(H)= 44.88
 EP(V)= 18.13

WALL GEOMETRY

Stem Height hs= 10.50 ft
 Stem Thickness ts= 10.00 in
 Base Thickness tb= 18.00 in
 Toe Width lt= 1.00 ft
 Heel Width lh= 6.5 ft
 Surcharge hsc= 0 ft

Wall Height-H= 12.00 ft
 Total Base Width Lb= 8.33 ft
 Weight of Wall & Slab = 3188 lbs/ft
 Bar cover stem = 1.5 in
 Bar cover toe/heel = 1.5 in
 Height at back of soil wedge Ht = 14.50 ft

ACTIVE FORCES

Pq(H)= 0.00
 Pa(H)= 4715.31 lb/ft

RETAINING FORCES

Stem Wall - w1= 1312.50 lbs
 Base Slab - w2= 1875.00 lbs
 Soil above heel - w3= 9555.00 lbs
 Soil wedge - w4= 1135.28 lbs
 PaV= 1905.11 lb/ft
 Total W= 15782.89 lbs

Safety factor against overturning=

Moment Arm 7.25
 4.83 ft
 Overturning Mom., Mo= 22782.97 ft-lbs/ft

1.42 ft 1859.38 ft-lbs/ft
 4.17 ft 7812.50 ft-lbs/ft
 5.08 ft 48571.25 ft-lbs/ft
 6.17 ft 7000.88 ft-lbs/ft
 8.33 ft 15875.89 ft-lbs/ft
 Resisting Mom., Mr= 81119.90 ft-lbs/ft
 3.56 OK

RESULTANT OF WALL FORCES

Sum of vertical forces Rv= 15783 lbs
 Resultant location a = 3.70 ft
 Eccentricity e= 0.47 ft L/6= 1.39
 Pressure at toe of wall= Resultant in middle third
 p1 2535.47 psf OK
 p2 1252.42 psf

CHECK SLIDING

Sliding Coeff, = 0.45
 Safety Factor, Sliding = 1.51 OK

Project: County of Orleans V7105
 15' x 9' Culvert
 Client: Camp Precast
 Job Number: 2007.004.002
 File Name: Cantwall.xls
 Entered By: CJB / 5/26
 Checked By: KE
 Date: 5/24/2007
 Sheet: 9 of 11

Denotes input field

