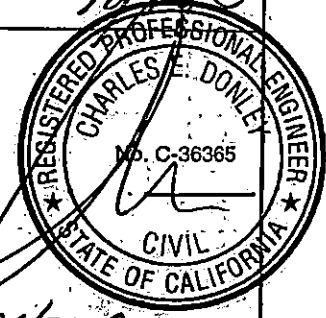


C. DONLEY

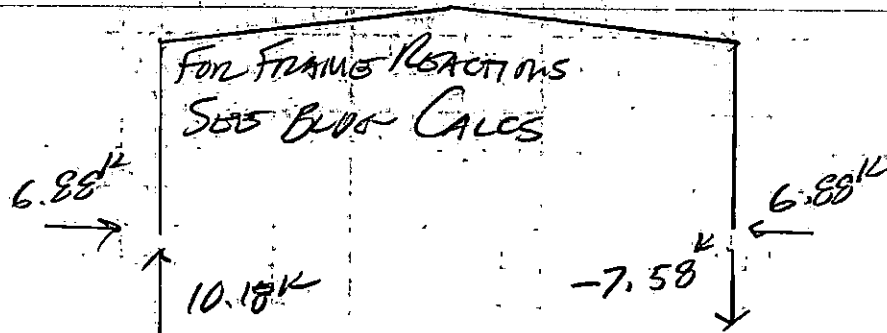
CORMIS BUILDINGS

Page 13



60' x 90' METAL BUILDING
 FOR TWO ROCKS V.F.D.
 7418 VALLEY FORD RD
 PETALUMA CA

GEOTECH REPORT #9215.01 BY PJC & ASSOC 4/24/2019



FOOTING REQS $\frac{10.18k}{2500psf} = 4.07'$ USE 4'-0" ϕ x 2'-0" DP
 w/ #4 @ 8" C EA WAY

UPLIFT 7.58k DL RESIST FTG - $4' \times 4' \times 2' \times 150 \times .6 = 2880 \#$
 SLAB $\frac{5}{12} \times 4' \times 20' \times 150 \times .6 = 3000 \#$
 GRN $1' \times 1' \times 20' \times 150 \times .6 = 1800 \#$

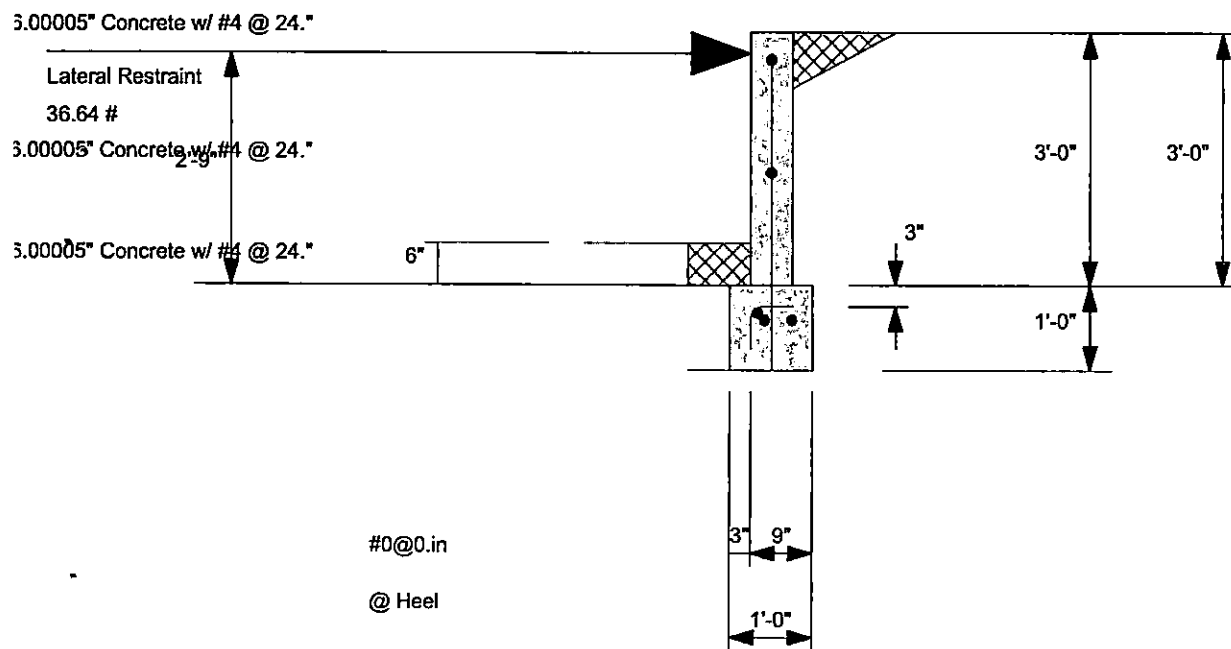
@ 3' WALL SIDE
 FTG - $4' \times 4' \times 2' \times 150 \times .6 = 2880 \#$
 WALL $.5' \times 3' \times 20' \times 150 \times .6 = 2700 \#$
 WALL FTG $1' \times 1' \times 20' \times 150 \times .6 = 1800 \#$
 PIER $1' \times 1' \times 3' \times 150 \times .6 = 270 \#$
 SLAB $\frac{5}{12} \times 4' \times 20' \times 150 \times .6 = 3000 \#$
 F.S. = $\frac{7680}{7580} = 1.01$ OK
 10650 # OK

HORIZ TENSILE 6.88k TAKE IN #2 HAIRPIN

$T_g = 2' \times 20' \times 40 \times .75 = 12.0k > 6.88k$ OK

END WALL FTGS

USE 2'-0" ϕ x 2'-0" DP w/ #4 @ 8" C EA WAY



Donley Engineering
5150 Salmon Falls rd
Pilot Hill, Ca. 95664
530-401-3189
FAX 530-885-5255

Title :
Dsgnr:
Description :

Job #
Date:

Scope :

Rev: 560100
 User: KW-0804123, Ver 5.6.1, 25-Oct-2002
 (c)1983-2002 ENERCALC Engineering Software

Restrained Retaining Wall Design

Page 1

Description Conc Retaining Wall at perimeter of VFD Bldg.

Criteria		Soil Data		Footing Strengths & Dimensions	
Retained Height	= 3.00 ft	Allow Soil Bearing	= 2,500.0 psf	f_c = 2,500 psi	F_y = 60,000 psi
Wall height above soil	= 0.00 ft	Equivalent Fluid Pressure Method		Min. As %	= 0.0014
Total Wall Height	= 3.00 ft	Heel Active Pressure	= 35.0	Toe Width	= 0.25 ft
		Toe Active Pressure	= 0.0	Heel Width	= 0.75
Top Support Height	= 2.75 ft	Passive Pressure	= 300.0	Total Footing Width	= 1.00
Slope Behind Wall	= 0.00 : 1	Water height over heel	= 0.0 ft	Footing Thickness	= 12.00 in
Height of Soil over Toe	= 6.00 in	Footing Soil Friction	= 0.300	Key Width	= 0.00 in
Soil Density	= 110.00 pcf	Soil height to ignore for passive pressure	= 0.00 in	Key Depth	= 0.00 in
				Key Distance from Toe	= 0.00 ft
Wind on Stem	= 0.0 psf			Cover @ Top = 3.00 in	@ Btm.= 3.00 in

Design Summary

Total Bearing Load	= 459 lbs
...resultant ecc.	= 0.81 in
Soil Pressure @ Toe	= 645 psf OK
Soil Pressure @ Heel	= 273 psf OK
Allowable	= 2,500 psf
Soil Pressure Less Than Allowable	
ACI Factored @ Toe	= 902 psf
ACI Factored @ Heel	= 382 psf
Footing Shear @ Toe	= 1.3 psi OK
Footing Shear @ Heel	= 1.6 psi OK
Allowable	= 85.0 psi
Reaction at Top	= 36.6 lbs
Reaction at Bottom	= 243.4 lbs
Sliding Stability Ratio	= 1.95 OK
Sliding Calcs	
Lateral Sliding Force	= 243.4 lbs
less 100% Passive Force	= 337.5 lbs
less 100% Friction Force	= 137.6 lbs
Added Force Req'd	= 0.0 lbs OK
....for 1.5 : 1 Stability	= 0.0 lbs OK

Footing Design Results

	Toe	Heel
Factored Pressure	= 902	382 psf
μ : Upward	= 27	0 ft-#
μ : Downward	= 9	21 ft-#
μ : Design	= 18	21 ft-#
Actual 1-Way Shear	= 1.35	1.65 psi
Allow 1-Way Shear	= 85.00	85.00 psi

Concrete Stem Construction

Thickness	= 6.00 in	F_y = 60,000 psi
Wall Weight	= 72.5 pcf	f_c = 2,500 psi
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
Design height	= 2.75 ft	Stem OK	Stem OK
Rebar Size	= # 4	1.56 ft	0.00 ft
Rebar Spacing	= 24.00 in	# 4	# 4
Rebar Placed at	= Center	24.00 in	24.00 in
Rebar Depth 'd'	= 3.00 in	Center	Center
Design Data		3.00 in	3.00 in
fb/FB + fa/Fa	= 0.000	0.034	0.074
μActual	= 0.2 ft-#	44.5 ft-#	96.5 ft-#
$M_n * \Phi$Allowable	= 1,296.9 ft-#	1,296.9 ft-#	1,296.9 ft-#
Shear Force @ this height	= 0.0 lbs		205.5 lbs
Shear.....Actual	= 0.00 psi		5.71 psi
Shear.....Allowable	= 85.00 psi		85.00 psi
Rebar Lap Required	= 18.72 in	18.72 in	
Rebar embedment into footing	=		6.00 in

Other Acceptable Sizes & Spacings:

Toe: None Spec'd	-or-	Not req'd, $\mu < S * Fr$
Heel: None Spec'd	-or-	Not req'd, $\mu < S * Fr$
Key: No key defined	-or-	No key defined

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	= -120.9 lbs
Heel Active Pressure	= -122.5

Sliding Force = 243.4 lbs

Net Moment Used For Soil Pressure Calculations
 31.0 ft-#

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-56.8 ft-#
Surcharge Over Heel	=	lbs ft ft-#
Axial Dead Load on Stem	=	lbs ft ft-#
Soil Over Toe	=	13.8 lbs 0.13 ft 1.7 ft-#
Surcharge Over Toe	=	lbs ft ft-#
Stem Weight	=	217.5 lbs 0.50 ft 108.8 ft-#
Soil Over Heel	=	82.5 lbs 0.88 ft 72.2 ft-#
Footing Weight	=	145.0 lbs 0.50 ft 72.5 ft-#
Total Vertical Force	=	458.8 lbs Base Moment = 198.4 ft-#