

Title Block Line 1
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 and then using the "Printing &
 Title Block" selection.
 Title Block Line 6

Project Title:
 Engineer:
 Project Descr:

Project ID:

Printed: 13 DEC 2013, 10:52AM

File = c:\Users\jbingham\DOCUME~1\ENERCA~1\EDGEWA~1.EC6
 ENERCALC, INC. 1983-2013, Build:6.13.8.31, Ver:6.13.8.31

Cantilevered Retaining Wall

Lic. #: KW-06010158

Licensee: REEVE & ASSOCIATES

Description: Edgewater 9' retaining wall

Calculations per ACI 318-05, ACI 530-05, IBC 2006,
 CBC 2007, ASCE 7-05

Criteria

Retained Height = 9.00 ft
 Wall height above soil = 0.00 ft
 Slope Behind Wall = 0.00 : 1
 Height of Soil over Toe = 12.00 in
 Water height over heel = 0.0 ft
 Vertical component of active
 Lateral soil pressure options:
 NOT USED for Soil Pressure.
 NOT USED for Sliding Resistance.
 NOT USED for Overturning Resistance.

Soil Data

Allow Soil Bearing = 2,000.0 psf
 Equivalent Fluid Pressure Method
 Heel Active Pressure = 43.0 psf/ft
 Toe Active Pressure = 30.0 psf/ft
 Passive Pressure = 389.0 psf/ft
 Soil Density, Heel = 110.00 pcf
 Soil Density, Toe = 110.00 pcf
 Friction Coeff btwn Ftg & Soil = 0.400
 Soil height to ignore
 for passive pressure = 12.00 in

Design Summary

Wall Stability Ratios

Overturning = 1.86 OK
 Sliding = 1.54 OK
 Total Bearing Load = 4,163 lbs
 ...resultant ecc. = 12.62 in
 Soil Pressure @ Toe = 1,889 psf OK
 Soil Pressure @ Heel = 0 psf OK
 Allowable = 2,000 psf
Soil Pressure Less Than Allowable
 ACI Factored @ Toe = 2,267 psf
 ACI Factored @ Heel = 0 psf
 Footing Shear @ Toe = 22.2 psi OK
 Footing Shear @ Heel = 26.3 psi OK
 Allowable = 82.2 psi
Sliding Calcs (Vertical Component NOT Used)
 Lateral Sliding Force = 2,090.0 lbs
 less 100% Passive Force = - 1,556.0 lbs
 less 100% Friction Force = - 1,666.0 lbs
 Added Force Req'd = 0.0 lbs OK
for 1.5 : 1 Stability = 0.0 lbs OK

Stem Construction

Design Height Above Ftg

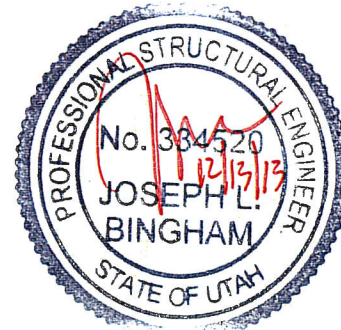
	Top Stem	2nd
Stem OK	Stem OK	Stem OK
Wall Material Above "Ht"	Concrete	Concrete
Thickness	8.00	8.00
Rebar Size	# 4	# 4
Rebar Spacing	16.50	6.00
Rebar Placed at	Edge	Edge

Design Data

fb/FB + fa/Fa	=	0.359	0.792
Total Force @ Section	lbs =	860.0	2,762.4
Moment....Actual	ft-l =	1,433.3	8,351.2
Moment....Allowable	ft-l =	3,997.3	10,542.0
Shear....Actual	psi =	11.5	36.8
Shear....Allowable	psi =	82.2	82.2
Wall Weight	psf =	100.0	100.0
Rebar Depth 'd'	in =	6.25	6.25
Lap splice if above	in =	17.09	17.09
Lap splice if below	in =	17.09	4.60
Hook embed into footing	in =	17.09	4.60

Concrete Data

f'c	psi =	3,000.0	3,000.0
Fy	psi =	60,000.0	60,000.0



Load Factors

Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

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Description: Edgewater 9' retaining wall

Footing Dimensions & Strengths

Toe Width	=	2.19 ft
Heel Width	=	2.85
Total Footing Width	=	5.04
Footing Thickness	=	12.00 in
Key Width	=	8.00 in
Key Depth	=	12.00 in
Key Distance from Toe	=	2.19 ft
f'c =	3,000 psi	Fy = 60,000 psi
Footing Concrete Density	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top	2.00	@ Btm. = 3.00 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,267	0 psf
Mu' : Upward	= 4,527	0 ft-lb
Mu' : Downward	= 747	3,274 ft-lb
Mu: Design	= 3,780	3,274 ft-lb
Actual 1-Way Shear	= 22.20	26.25 psi
Allow 1-Way Shear	= 82.16	82.16 psi
Toe Reinforcing	= # 4 @ 12.00 in	
Heel Reinforcing	= # 4 @ 16.00 in	
Key Reinforcing	= # 4 @ 22.25 in	

Other Acceptable Sizes & Spacings

Toe: #4@ 13.25 in, #5@ 20.50 in, #6@ 29.00 in, #7@ 39.25 in, #8@ 48.25 in, #9@ 4
 Heel: #4@ 11.75 in, #5@ 18.25 in, #6@ 25.75 in, #7@ 35.25 in, #8@ 46.25 in, #9@ 4
 Key: #4@ 22.25 in, #5@ 34.50 in, #6@ 48.25 in, #7@ 48.25 in,

Summary of Overturning & Resisting Forces & Moments

ItemOVERTURNING.....			RESISTING.....		
	Force lbs	Distance ft	Moment ft-lb		Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	= 2,150.0	3.33	7,166.7	Soil Over Heel	= 2,166.0	3.95	8,552.1
Surcharge over Heel	=			Sloped Soil Over Heel	=		
Toe Active Pressure	= -60.0	0.67	-40.0	Surcharge Over Heel	=		
Surcharge Over Toe	=			Adjacent Footing Load	=		
Adjacent Footing Load	=			Axial Dead Load on Stem	=		
Added Lateral Load	=			* Axial Live Load on Stem	=		
Load @ Stem Above Soil	=			Soil Over Toe	= 240.7	1.09	263.3
				Surcharge Over Toe	=		
				Stem Weight(s)	= 900.0	2.52	2,269.1
				Earth @ Stem Transitions	=		
Total	= 2,090.0	O.T.M.	= 7,126.7	Footing Weight	= 756.4	2.52	1,906.9
Resisting/Overturning Ratio		=	1.86	Key Weight	= 100.0	2.52	252.1
Vertical Loads used for Soil Pressure =			4,163.0 lbs	Vert. Component	=		
				Total =	4,163.0 lbs	R.M. =	13,243.4

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

