

Cantilevered Retaining Wall

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ENERCALC, INC. 1983-2015, Build:6.15.10.6, Ver:6.15.10.6

Lic. #: KW-06010584

Licensee: Aedifica Case Engineering

Description: Retaining Wall - 6'-8" Tall

Calculations per ACI 318-08, ACI 530-08, IBC 2009, CBC 2010, ASCE 7-05

Criteria

Retained Height	=	6.67 ft
Wall height above soil	=	4.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	20.00 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	=	35.0 psf/ft
Toe Active Pressure	=	30.0 psf/ft
Passive Pressure	=	250.0 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

Surcharge Loads

Surcharge Over Heel	=	100.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0 psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Design Summary

Wall Stability Ratios		
Overturning	=	2.79 OK
Sliding	=	1.96 OK
<i>Slab Resists All Sliding!</i>		
Total Bearing Load	=	3,989 lbs
...resultant ecc.	=	8.35 in
Soil Pressure @ Toe	=	1,709 psf OK
Soil Pressure @ Heel	=	64 psf OK
Allowable	=	2,000 psf
<i>Soil Pressure Less Than Allowable</i>		
ACI Factored @ Toe	=	2,050 psf
ACI Factored @ Heel	=	77 psf
Footing Shear @ Toe	=	2.6 psi OK
Footing Shear @ Heel	=	41.8 psi OK
Allowable	=	94.9 psi
Sliding Calcs	<i>Slab Resists All Sliding!</i>	
Lateral Sliding Force	=	1,149.9 lbs
less 100% Passive Force	= -	656.3 lbs
less 100% Friction Force	= -	1,598.0 lbs
Added Force Req'd	=	0.0 lbs OK
...for 1.5 : 1 Stability	=	0.0 lbs OK

Lateral Load Applied to Stem

Lateral Load	=	0.0 plf
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

Wind on Exposed Stem = 5.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Stem Construction

	Top Stem	2nd
Design Height Above Ftg	ft = 6.67	Stem OK 0.00
Wall Material Above "H"	= Fence	Concrete
Thickness	in = 0.00	8.00
Rebar Size	= # 5	# 5
Rebar Spacing	in = 12.00	12.00
Rebar Placed at	= Edge	Edge
Design Data		
fb/FB + fa/Fa	=	0.498
Total Force @ Section	lbs = 20.0	1,550.2
Moment....Actual	ft-l = 40.0	4,140.8
Moment.....Allowable	ft-l = 0.0	8,312.6
Shear.....Actual	psi = 0.0	20.9
Shear.....Allowable	psi = 0.0	94.9
Wall Weight	psf = 0.0	100.0
Rebar Depth 'd'	in = 0.00	6.19
Lap splice if above	in = 0.00	18.50
Lap splice if below	in = 0.00	3.60
Hook embed into footing	in = 0.00	3.60
Concrete Data		
f'c	psi = 4,000.0	4,000.0
Fy	psi = 20,000.0	20,000.0

Load Factors

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