

# DESIGN EXAMPLE 1

# Report Printout

Hugh Brooks, PE, SE  
 Retain Pro Software  
 PO Box 826 Corona del Mar, CA 92625  
 hbrooks@retainpro.com  
 949-721-4099

Title : EX-2  
 Job # : 702  
 Description...

Page: \_\_\_\_\_  
 Date: JUL 11, 2009

This Wall in File: c:\program files\up2007\examples.rp5

Retain Pro 9.0 1989 - 2009 Ver: 9.00 8056  
 Registration #: RP-11101 5 RP9.00  
 Licensed to: [The company name goes here]

## Cantilevered Retaining Wall Design

Code: IBC 2006

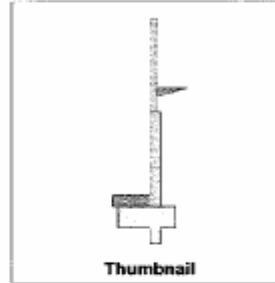
### Criteria

Retained Height = 10.00 ft  
 Wall height above soil = 6.00 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 = 4,000.0 psf  
 Equivalent Fluid Pressure Method  
 Heel Active Pressure = 30.0 psf/ft  
 Toe Active Pressure = 30.0 psf/ft  
 Passive Pressure = 300.0 psf/ft  
 Soil Density, Heel = 110.00 pcf  
 Soil Density, Toe = 110.00 pcf  
 Footing/Soil Friction = 0.400  
 Soil height to ignore for passive pressure = 12.00 in



### Surcharge Loads

Surcharge Over Heel = 0.0 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

### Lateral Load Applied to Stem

Lateral Load = 0.0 #/ft  
 ...Height to Top = 0.00 ft  
 ...Height to Bottom = 0.00 ft  
 Wind on Stem = 15.0 psf

### Adjacent Footing Load

Adjacent Footing Load = 1,500.0 lbs  
 Footing Width = 3.00 ft  
 Eccentricity = 0.00 in  
 Wall to Ftg CL Dist = 4.50 ft  
 Footing Type = Line Load  
 Base Above/Below Soil at Back of Wall = -1.0 ft  
 Poisson's Ratio = 0.500

### Design Summary

**Wall Stability Ratios**  
 Overturning = 1.39 Ratio < 1.5!  
 Sliding = 1.61 OK

**Total Bearing Load**  
 = 5,549 lbs  
 ...resultant ecc. = 20.87 in

**Soil Pressure @ Toe** = 3,658 psf OK  
**Soil Pressure @ Heel** = 0 psf OK  
 Allowable = 4,000 psf  
 Soil Pressure Less Than Allowable

**ACI Factored @ Toe** = 4,375 psf  
**ACI Factored @ Heel** = 0 psf

**Footing Shear @ Toe** = 23.1 psi OK  
**Footing Shear @ Heel** = 10.8 psi OK  
 Allowable = 67.1 psi

**Sliding Calc (Vertical Component NOT Used)**  
 Lateral Sliding Force = 2,990.7 lbs  
 less 100% Passive Force = - 2,454.2 lbs  
 less 100% Friction Force = - 2,219.4 lbs  
 Added Force Req'd = 0.0 lbs OK  
 ...for 1.5 : 1 Stability = 0.0 lbs OK

**Load Factors**  
 Building Code = IBC 2006  
 Dead Load = 1.200  
 Live Load = 1.600  
 Earth, H = 1.600  
 Wind, W = 1.600  
 Seismic, E = 1.000

### Stem Construction

	Top Stem	2nd	3rd
Design Height Above Ftg ft =	Stem OK 8.00	Stem OK 3.33	Ratio > 1.0 0.00
Wall Material Above "H" =	Masonry	Masonry	Masonry
Thickness =	8.00	12.00	12.00
Rebar Size =	# 4	# 5	# 8
Rebar Spacing =	32.00	16.00	8.00
Rebar Placed at =	Center	Edge	Edge
<b>Design Data</b>			
fb/Fb + fs/Fs =	0.991	0.996	1.145
Total Force @ Section lbs =	162.1	1,261.5	2,325.9
Moment...Actual ft-# =	493.1	3,451.5	9,410.0
Moment...Allowable ft-# =	518.6	3,820.4	8,221.7
Shear...Actual psi =	3.5	11.5	23.1
Shear...Allowable psi =	38.7	38.7	38.7
Wall Weight psf =	78.0	124.0	124.0
Rebar Depth 'd' in =	3.75	9.00	9.00
LAP SPLICE IF ABOVE in =	36.00	45.00	72.00
LAP SPLICE IF BELOW in =	36.00	45.00	
HOOK EMBED INTO FTG in =			18.78
<b>Masonry Data</b>			
fm psi =	1,500	1,500	1,500
Fs psi =	24,000	24,000	24,000
Solid Grouting =	Yes	Yes	Yes
<b>Concrete Data</b>			
Modular Ratio 'M' =	21.48	21.48	21.48
Short Term Factor =	1,000	1,000	1,000
Equiv. Solid Thick. in =	7.50	11.60	11.50
Masonry Block Type =	Medium Weight		
Masonry Design Method =	ASD		
fc psi =			
Fy psi =			