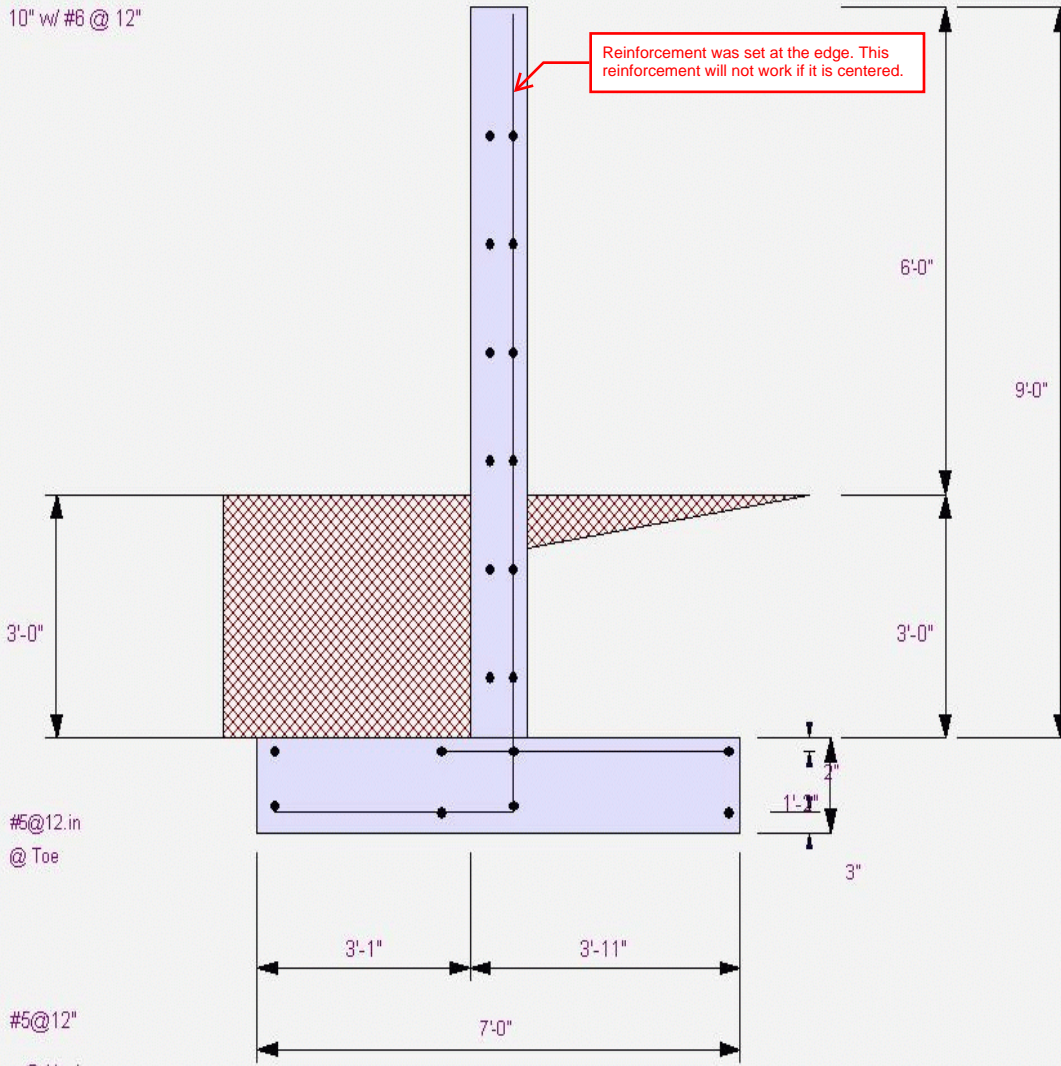


10" w/ #6 @ 12"

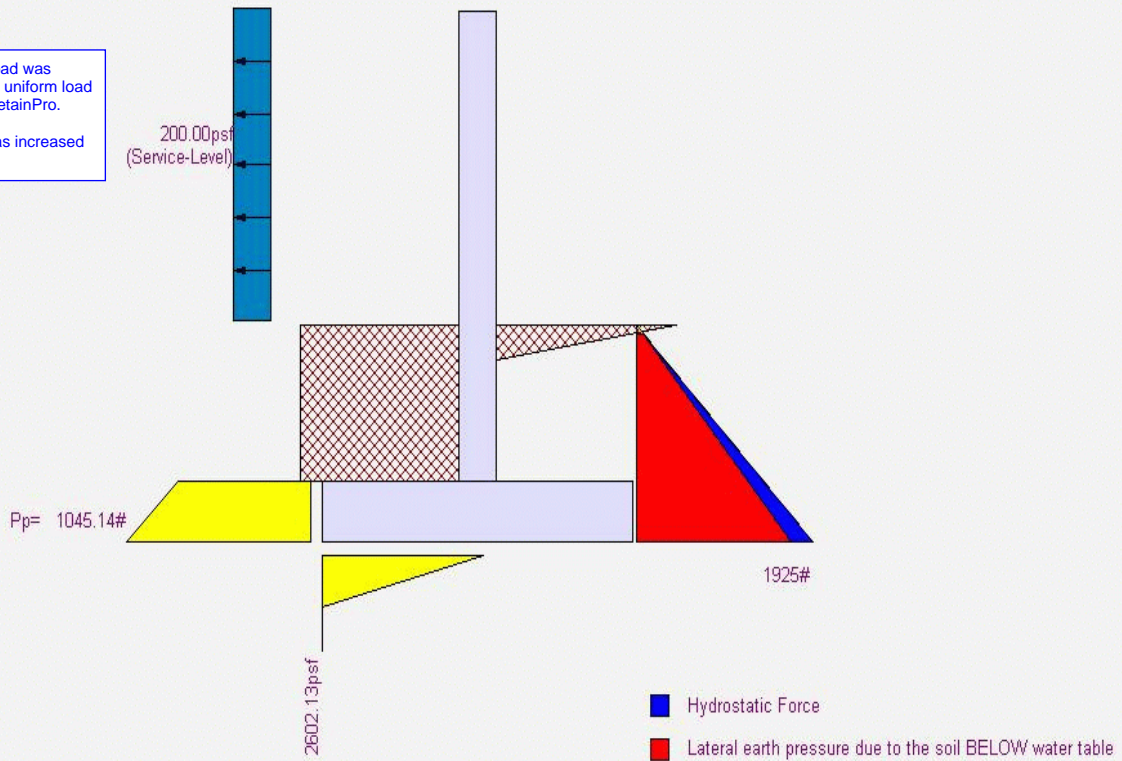


Reinforcement was set at the edge. This reinforcement will not work if it is centered.

#5@12.in
@ Toe

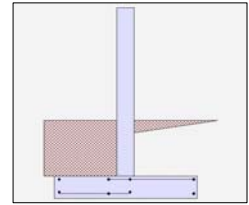
#5@12"
@ Heel

Triangular load was converted to uniform load to input in RetainPro.
187.2 psf was increased to 200 psf.



Criteria

Retained Height	=	3.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	36.00 in
Water height over heel	=	4.0 ft

**Load Factors**

Building Code	IBC 2012,ACI
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Soil Data and Lateral Earth Pressure

Allow Soil Bearing	=	4,000.0 psf	Soil Density, Heel	=	120.00 pcf
Equivalent Fluid Pressure Method			Soil Density, Toe	=	120.00 pcf
Active Heel Pressure	=	40.0 psf/ft	Footing Soil Friction	=	0.400
	=		Soil height to ignore for passive pressure	=	36.00 in
Passive Pressure	=	250.0 psf/ft			

Surcharge Loads

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

Axial Load Applied to Stem

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

Lateral Load Applied to Stem

Lateral Load	=	200.0 #/ft
...Height to Top	=	9.00 ft
...Height to Bottom	=	3.00 ft
Load Type	=	Live Load (L) (Service Level)

Wind on Exposed Stem

Wind on Exposed Stem (Service Level)	=	0.0 psf
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Adjacent Footing Load

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

Wall Design Summary**Stability Ratios**

Overturning	=	1.57 OK
Sliding	=	1.56 OK

Soil Bearing

Total Bearing Load	=	4,870 lbs
...resultant ecc.	=	27.50 in
Soil Pressure @ Toe	=	2,602 psf OK
Soil Pressure @ Heel	=	0 psf OK
Allowable	=	4,000 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	3,530 psf
ACI Factored @ Heel	=	0 psf
Footing Shear @ Toe	=	29.2 psi OK
Footing Shear @ Heel	=	16.1 psi OK
Allowable	=	75.0 psi

Sliding**Resisting Forces**

<u>Vertical Forces</u>	<u>Force</u>
Soil Over Heel (above water table, if any)	61.7 lbs
Soil Over Heel (below water table, if any)	650.0
Water Over Heel	545.1
Buoyant Force	-509.6
Sloped Soil Over Heel	0.0
Surcharge Over Heel	0.0
Adjacent Footing Load	0.0
Axial Dead Load on Stem	0.0
Axial Live Load on Stem *	Omit
Soil Over Toe	1,110.0
Surcharge Over Toe	0.0
Stem Weight(s)	1,125.0
Earth @ Stem Transitions	0.0
Footing Weight	1,225.0
Key Weight	0.0
Vert. Component **	153.5

Sliding Forces

<u>Lateral Forces</u>	<u>Force</u>
Heel Active Pressure (above water table, if any)	0.6 lbs
Heel Active Pressure (below water table, if any)	225.1
Hydrostatic Force	499.2
* Heel Active Pressure	902.5
Surcharge over Heel	0.0
Adjacent Footing	0.0
Surcharge Over Toe	0.0
Load @ Stem Above Soil	0.0
Added Lateral Load	1,200.0
Seismic Load	0.0
Seismic-Self-weight	0.0
Lateral on Key	0.0
Totals =	1,924.8 lbs

*Includes water table effect

Total Vertical Loads

4,360.6 lbs

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

Sliding Calcs

Lateral Sliding Force	=	1,924.8 lbs
less 100% Passive Force	=	- 1,045.1 lbs
less 100% Friction Force	=	- 1,948.1 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 Stability	=	0.0 lbs OK

Vertical component of active lateral soil pressure IS considered in the calculation of soil bearing pressures.

Overturning**Resisting Moments**

<u>Resisting Moments</u>	<u>Force</u>	<u>Distance</u>	<u>Moment</u>
Soil Over Heel (above water table, if any)	61.7 lbs	5.46 ft	336.6ft-#
Soil Over Heel (below water table, if any)	650.0	5.46	3,547.7
Water Table	545.1	5.46	3,547.7
Soil Over Heel	1,110.0	5.46	336.6
Sloped Soil Over Heel	0.0		
Surcharge Over Heel	0.0		
Adjacent Footing Load	0.0		
Axial Dead Load on Stem	0.0		
Axial Live Load on Stem *	0.0		
Soil Over Toe	1,110.0	1.54	1,711.3
Surcharge Over Toe	0.0		
Stem Weight(s)	1,125.0	3.50	3,937.5
Earth @ Stem Transitions	0.0		
Footing Weight	1,225.0	3.50	4,287.5
Key Weight	0.0		
Vert. Component	153.5	7.00	1,074.2
Total Vertical Loads	4,870.2 lbs		
	Resisting Moment		17,870.3 ft-#
	Eccentricity		-26.0 in

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

Overturning**Overturning Moments**

<u>Overturning Moments</u>	<u>Force</u>	<u>Distance</u>	<u>Moment</u>
Heel Active Pressure (above water table, if any)	0.6 lbs	4.06 ft	1,438.5 ft-#
Heel Active Pressure (below water table, if any)	225.1	1.41	317.9
Hydrostatic Force	499.2	1.33	
Buoyant Force	509.6	3.50	
Surcharge over Heel	0.0		
Adjacent Footing	0.0		
Surcharge Over Toe	0.0		
Load @ Stem Above Soil	0.0		
Added Lateral Load	1,200.0	7.17	8,600.0
Seismic Load	0.0		
Seismic-Self-weight	0.0		
Totals =	2,434.4 lbs		
	Overturning Moment		11,369.3 ft-#

Stem Design Summary

Bottom		
		Stem OK
Design Height Above Ftg	ft =	0.00
Wall Material Above "Ht"	=	Concrete
Design Method	=	LRFD
Thickness	=	10.00
Rebar Size	=	# 6
Rebar Spacing	=	12.00
Rebar Placed at	=	Edge
Design Data		
fb/FB + fa/Fa	=	0.897
Total Force @ Section		
Service Level	lbs =	
Strength Level	lbs =	2,827.5
Moment....Actual		
Service Level	ft-# =	
Strength Level	ft-# =	12,634.0
Moment.....Allowable	=	14,069.5
Shear.....Actual		
Service Level	psi =	
Strength Level	psi =	30.9
Shear.....Allowable	psi =	75.0
Anet	in ² =	
Rebar Depth 'd'	in =	7.63
Masonry Data		
f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Wall Weight	psf =	125.0
Short Term Factor	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	Medium Weight
Masonry Design Method	=	ASD
Concrete Data		
f'c	psi =	2,500.0
Fy	psi =	60,000.0

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.3843 in ² /ft		
(4/3) * As :	0.5124 in ² /ft	Min Stem T&S Reinf Area 2.160 in ²	
200bd/fy : 200(12)(7.625)/60000 :	0.305 in ² /ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in ² /ft	
0.0018bh : 0.0018(12)(10) :	0.216 in ² /ft	Horizontal Reinforcing Options :	
	=====	One layer of :	Two layers of :
Required Area :	0.3843 in ² /ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.44 in ² /ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.0329 in ² /ft	#6@ 22.00 in	#6@ 44.00 in

Footing Data

Toe Width	=	3.08 ft	f'c	=	2,500 psi
Heel Width	=	3.92	Fy	=	60,000 psi
Total Footing Width	=	7.00 ft	Footing Concrete Density	=	150.00 pcf
Footing Thickness	=	14.00 in	Min. As %	=	0.0018
Key Width	=	0.00 in	Rebar Cover @ Top	=	2.00 in
Key Depth	=	0.00 in	@ Bottom	=	3.00 in
Key Distance from Toe	=	0.00 ft			

Footing Design Results

	<u>Toe</u>	<u>Heel</u>
Factored Pressure	= 3,530	0 psf
Mu' : Upward	= 144,257	0 ft-#
Mu' : Downward	= 36,621	3,809 ft-#
Mu: Design	= 8,970	536 ft-#
Actual 1-Way Shear	= 29.24	16.12 psi
Allow 1-Way Shear	= 75.00	75.00 psi
Toe Reinforcing	= # 5 @ 12.00 in	
Heel Reinforcing	= # 5 @ 12.00 in	
Key Reinforcing	= None Spec'd	

Other Acceptable Sizes & Spacings

Toe: #4@ 7.93 in, #5@ 12.30 in, #6@ 17.46 in, #7@ 23.80 in, #8@ 31.34 in, #9@ 39

Heel: #4@ 7.93 in, #5@ 12.30 in, #6@ 17.46 in, #7@ 23.80 in, #8@ 31.34 in, #9@ 39

Key: No key defined

Min footing T&S reinf Area	2.12 in ²
Min footing T&S reinf Area per fo	0.30 in ² /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 7.94 in	#4@ 15.87 in
#5@ 12.30 in	#5@ 24.60 in
#6@ 17.46 in	#6@ 34.92 in

Footing Torsion, Tu	=	0.00 ft-lbs
Footing Allow. Torsion, phi Tu	=	0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

