ELIANTO VILLAGE

IN

Buckeye, Arizona

SITE WALL
STRUCTURAL CALCULATIONS

Registered Professional Engineer (Structural)
CERTIFICATE NO.
6627
DONN
WOOLDRIDGE
Date Signed 04-16-2008
ARIZONA, U.S.A.
EXPIRES 12.31.08

WOOLDRIDGE - WAIBEL Engineering, L.L.C.
14126 W. Bent Tree Circle North
Litchfield Park
Fax: 623-535-5781

Structural Engineers
623.935.6617
Arizona 85340

To specify your own special title block here use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV801 Dsgnr: dw Date: APR 6.20
Description:
GUARDRAIL over a 8'-0" SCOUR W...

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	8.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	0.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	2.17 ft
Heel Width	=	3.17
Total Footing Width	=	5.34
Footing Thickness	=	14.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	3.13	OK
Sliding	=	1.55	OK
Total Bearing Load	=	4,642 lbs	
...resultant ecc.	=	2.34 in	
Soil Pressure @ Toe	=	1,060 psf	OK
Soil Pressure @ Heel	=	679 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,106 psf	
ACI Factored @ Heel	=	708 psf	
Footing Shear @ Toe	=	8.7 psi	OK
Footing Shear @ Heel	=	29.1 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	1,643.1 lbs	
less 100% Passive Force	= -	231.4 lbs	
less 100% Friction Force	= -	2,321.2 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NGI	As < Min %	As < Min %
Design Height Above Ftg	ft =	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete
Thickness	=		8.00	12.00
Rebar Size	=		# 4	# 5
Rebar Spacing	=		32.00	16.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		No Good	0.979
Total Force @ Section	lbs =		560.9	2,020.1
Moment....Actual	ft-# =		1,076.8	5,914.4
Moment.....Allowable	ft-# =		1,325.1	6,038.3
Shear.....Actual	psi =		11.7	28.1
Shear.....Allowable	=		82.2	82.2
Wall Weight	psf =		100.0	150.0
Rebar Depth 'd'	in =		4.00	6.00
LAP SPLICE IF ABOVE	in =		12.00	12.00
LAP SPLICE IF BELOW	in =		12.00	
HOOK EMBED INTO FTG	in =			6.16

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Use Full Stresses	=	
Modular Ratio 'n'	=	
Short Term Factor	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	Medium Weight
Masonry Design Method	=	ASD

Concrete Data

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

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV801 Dsgnr: dw Date: APR 6,2008
Description....
GUARDRAIL over a 8'-0" SCOUR WALL

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,106	708 psf
Mu' : Upward	=	2,476	0 ft-#
Mu' : Downward	=	494	4,758 ft-#
Mu: Design	=	1,982	4,758 ft-#
Actual 1-Way Shear	=	8.71	29.13 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 5 @ 18.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 13.75 in, #5@ 21.25 in, #6@ 30.00 in, #7@ 41.00 in, #8@ 48.25 in, #9@ 4
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	1,596.5	3.06	4,878.3
Toe Active Pressure	=		0.39	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	10.92	508.2
Total	=	1,643.1	**O.T.M.** =	5,386.5

Resisting/Overturning Ratio = **3.13**

Vertical Loads used for Soil Pressure = 4,642.4 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	2,083.2	4.26	8,864.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	2.67	48.1
Soil Over Toe	=			
Surcharge Over Toe	=			
Stem Weight(s)	=	1,000.0	2.60	2,603.3
Earth @ Stem Transitions	=	160.0	3.00	480.5
Footing Weight	=	934.5	2.67	2,495.1
Key Weight	=			
Vert. Component	=	446.7	5.34	2,385.4
	Total =	4,642.4 lbs	**R.M.=**	16,876.5

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06

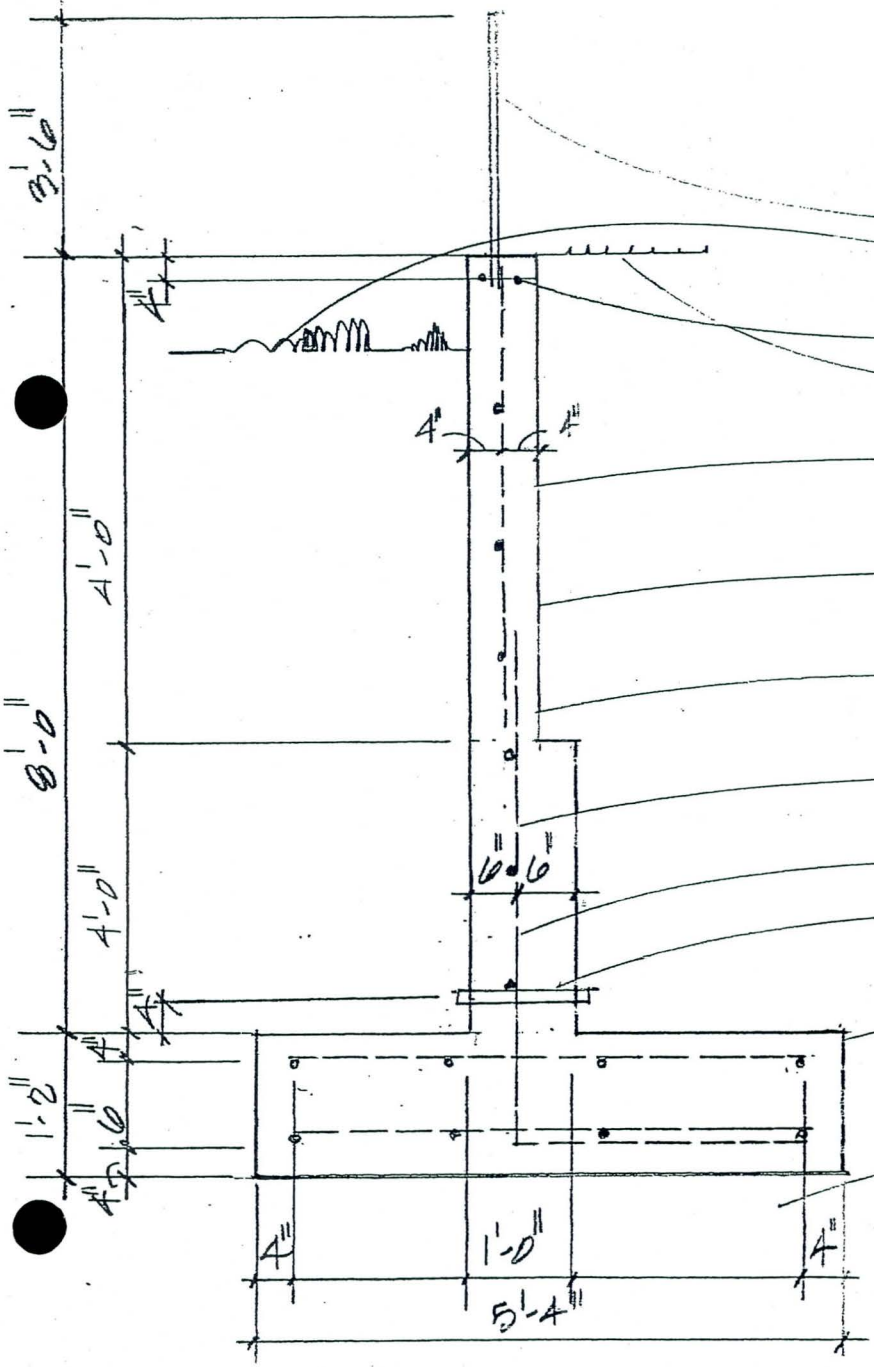
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf. Basic



GUARDRAIL IF REQUIRED

FINISH GRADE

2#3 BARS CONTINUOUS

SCOUR GRADE

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#5 LAPPED 12" VERTICALS CENTER IN WALL @16" O.C. and #6 HORIZONTAL @ 18" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

5' - 4" WIDE x 14" THICK CONCRETE FOOTING w/6#5 BARS CONTINUOUS, #6 x 58" @ 18" O.C. TRANSVERSE BOTTOM, #5 x 68" O.C. TRANSVERSE @ 18" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 1'-0" RETAINING WALL, over a 8'-0" SCOUR WALL

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV802 Dsgnr: Date: APR 6.2007
Descrptn:
GUARDRAIL over a 9'-0" SCOUR WALL

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	9.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	0.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	2.67 ft
Heel Width	=	3.67
Total Footing Width	=	6.34
Footing Thickness	=	16.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	3.47	OK
Sliding	=	1.60	OK
Total Bearing Load	=	6,037 lbs	
...resultant ecc.	=	0.95 in	
Soil Pressure @ Toe	=	1,023 psf	OK
Soil Pressure @ Heel	=	881 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,072 psf	
ACI Factored @ Heel	=	923 psf	
Footing Shear @ Toe	=	8.8 psi	OK
Footing Shear @ Heel	=	33.4 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	2,075.3 lbs	
less 100% Passive Force	= -	302.2 lbs	
less 100% Friction Force	= -	3,018.6 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	As < Min %	Stem OK
Design Height Above Ftg	ft =	9.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete
Thickness	=		8.00	12.00
Rebar Size	=		# 4	# 6
Rebar Spacing	=		18.00	16.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		**No Good**	**0.971**
Total Force @ Section	lbs =		834.5	2,536.9
Moment....Actual	ft-# =		1,769.4	8,187.9
Moment.....Allowable	ft-# =		2,321.3	8,428.1
Shear.....Actual	psi =		17.4	35.2
Shear.....Allowable	=		82.2	82.2
Wall Weight	psf =		100.0	150.0
Rebar Depth 'd'	in =		4.00	6.00
LAP SPLICE IF ABOVE	in =		12.00	24.90
LAP SPLICE IF BELOW	in =		12.00	
HOOK EMBED INTO FTG	in =			7.33
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Use Full Stresses	=			
Modular Ratio 'n'	=			
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =		3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV802 Dsgnr: Date: APR 6,2008
Description....
GUARDRAIL over a 9'-0" SCOUR WALL

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,072	923 psf
Mu' : Upward	=	3,746	0 ft-#
Mu' : Downward	=	855	7,900 ft-#
Mu: Design	=	2,891	7,900 ft-#
Actual 1-Way Shear	=	8.82	33.40 psi
Allow 1-Way Shear	=	75.00	75.00 psi

Toe Reinforcing = None Spec'd
Heel Reinforcing = # 5 @ 16.00 in
Key Reinforcing = None Spec'd

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 11.50 in, #5@ 17.75 in, #6@ 25.25 in, #7@ 34.50 in, #8@ 45.25 in, #9@ 4
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	2,028.8	3.44	6,988.0
Toe Active Pressure	=		0.44	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	12.08	562.5
Total	=	2,075.3	**O.T.M.** =	7,550.5

Resisting/Overturning Ratio = **3.47**

Vertical Loads used for Soil Pressure = 6,037.3 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	2,883.6	5.01	14,432.4
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	3.17	57.1
Soil Over Toe	=			
Surcharge Over Toe	=			
Stem Weight(s)	=	1,100.0	3.09	3,403.7
Earth @ Stem Transitions	=	200.0	3.50	700.7
Footing Weight	=	1,268.0	3.17	4,019.6
Key Weight	=			
Vert. Component	=	567.7	6.34	3,598.9
	Total =	6,037.3 lbs	**R.M.=**	26,212.3

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	

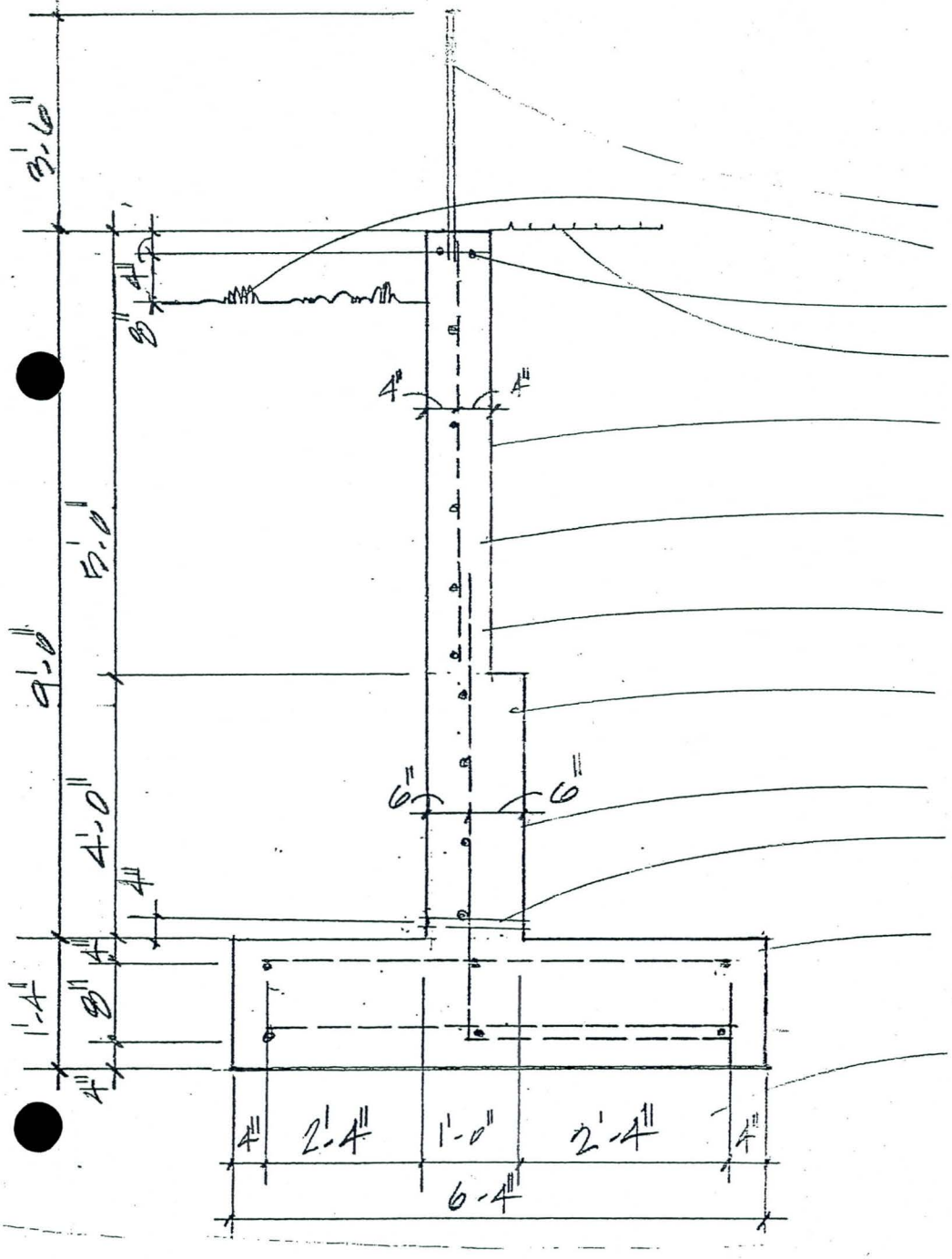
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
i = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-2

Fw = 13.03(0.85)(1.20) = **13.3** Psf. Basic



GUARDRAIL IF REQUIRED

FINISH GRADE

2#3 BARS CONTINUOUS

SCOUR GRADE

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#6 LAPPED 25" VERTICALS CENTER IN WALL @ 16" O.C. and #6 HORIZONTAL @ 18" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

6' - 4" WIDE x 16" THICK CONCRETE FOOTING w/6#5 BARS CONTINUOUS, #6 x 68" @ 18" O.C. TRANSVERSE BOTTOM, #5 x 68" O.C. TRANSVERSE @ 16" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 1'-0" RETAINING WALL, over a 9'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title · ELIANTO VILLAGE in Buckeye, AZ
Job # · EV803 Dsgnr: dw Date: APR 6.200
Description:
GUARDRAIL over a 10'-0" SCOUR WA...

This Wall in File: c:\program files\rp2007\elianto village in b

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www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	10.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	0.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	3.00 ft
Heel Width	=	4.00
Total Footing Width	=	7.00
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	3.45	OK
Sliding	=	1.59	OK
Total Bearing Load	=	7,356 lbs	
...resultant ecc.	=	0.98 in	
Soil Pressure @ Toe	=	1,125 psf	OK
Soil Pressure @ Heel	=	977 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,191 psf	
ACI Factored @ Heel	=	1,035 psf	
Footing Shear @ Toe	=	9.3 psi	OK
Footing Shear @ Heel	=	35.9 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	2,559.3 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	3,678.0 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK	Stem OK
Design Height Above Ftg	ft =	10.00	6.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete
Thickness	=		8.00	12.00
Rebar Size	=		# 4	# 7
Rebar Spacing	=		18.00	16.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		0.464	0.978
Total Force @ Section	lbs =		560.9	3,114.5
Moment....Actual	ft-# =		1,076.8	11,008.5
Moment.....Allowable	ft-# =		2,321.3	11,253.9
Shear.....Actual	psi =		11.7	43.3
Shear.....Allowable	=		82.2	82.2
Wall Weight	psf =		100.0	150.0
Rebar Depth 'd'	in =		4.00	6.00
LAP SPLICE IF ABOVE	in =		12.00	36.75
LAP SPLICE IF BELOW	in =		12.00	
HOOK EMBED INTO FTG	in =			8.61
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Use Full Stresses	=			
Modular Ratio 'n'	=			
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =		3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV803 Dsgnr: dw Date: APR 6,2008
Description:...
GUARDRAIL over a 10'-0" SCOUR WALL

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,191	1,035 psf
Mu' : Upward	=	5,260	0 ft-#
Mu' : Downward	=	1,215	0 ft-#
Mu: Design	=	4,045	11,008 ft-#
Actual 1-Way Shear	=	9.28	35.95 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 6 @ 18.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 10.00 in, #5@ 15.50 in, #6@ 21.75 in, #7@ 29.75 in, #8@ 39.00 in, #9@ 4
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	2,512.8	3.83	9,632.2
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	13.25	616.8
Total	=	2,559.3	**O.T.M.** =	10,249.0

Resisting/Overturning Ratio = **3.45**

Vertical Loads used for Soil Pressure = 7,356.1 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	3,600.0	5.50	19,800.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	3.50	63.0
Soil Over Toe	=			
Surcharge Over Toe	=			
Stem Weight(s)	=	1,300.0	3.45	4,483.3
Earth @ Stem Transitions	=	160.0	3.83	613.3
Footing Weight	=	1,575.0	3.50	5,512.5
Key Weight	=			
Vert. Component	=	703.1	7.00	4,921.5
Total	=	7,356.1 lbs	**R.M.=**	35,393.6

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

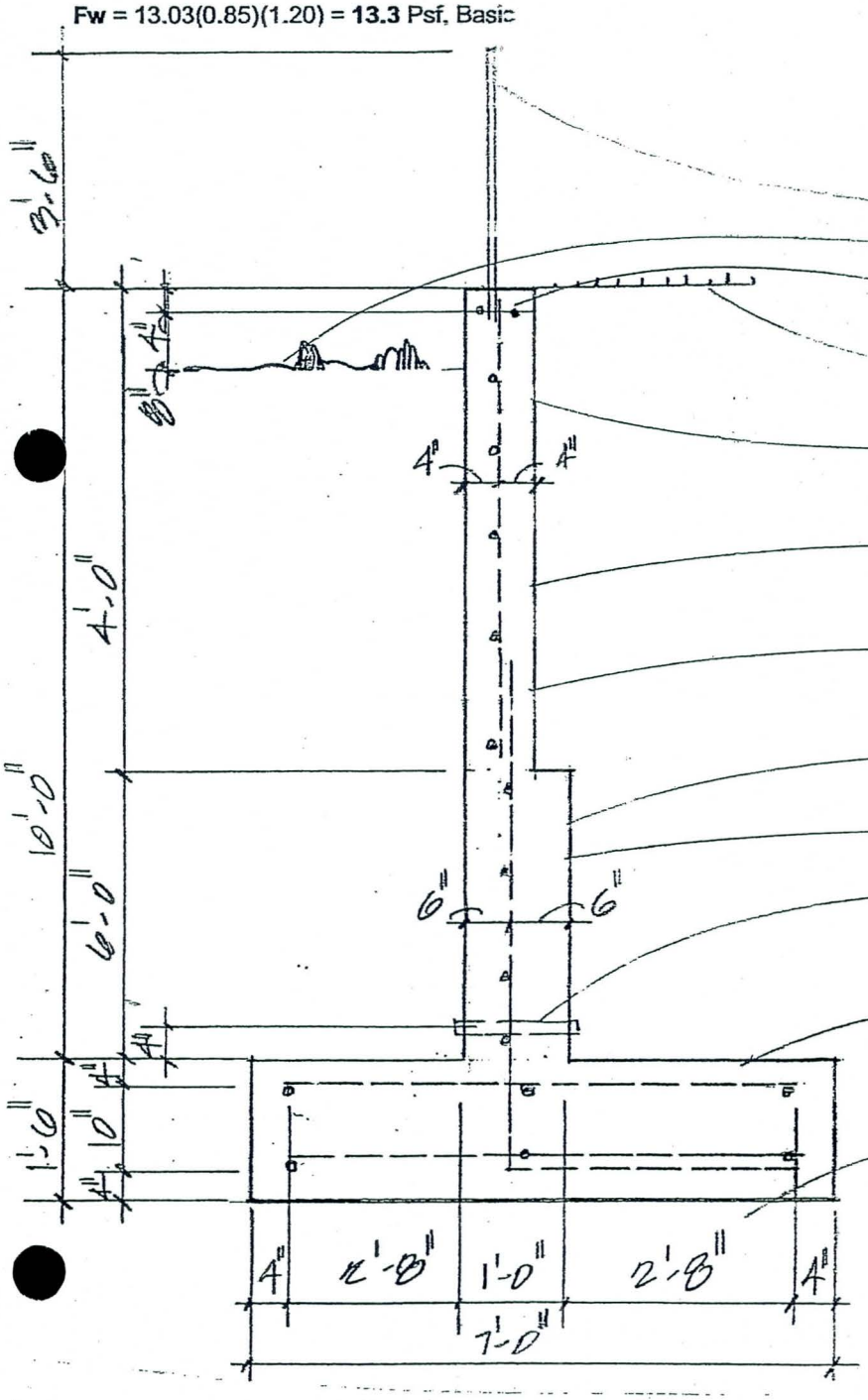
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



GUARDRAIL IF REQUIRED

FINISH GRADE

2#3 BARS CONTINUOUS

SCOUR GRADE

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#7 LAPPED 37" VERTICALS CENTER IN WALL @ 16" O.C. and #6 HORIZONTAL @ 18" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

7' - 0" WIDE x 18" THICK CONCRETE FOOTING w/6#5 BARS CONTINUOUS, #5 x 76" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 76" O.C. TRANSVERSE @ 18" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 1'-0" RETAINING WALL, over a 10'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV804 Dsgnr Date: APR 6.20
Descrip: GUARDRAIL over a 11'-0" SCOUR W

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	11.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	0.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	3.67 ft
Heel Width	=	4.67
Total Footing Width	=	8.34
Footing Thickness	=	20.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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	=	18.0 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

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

*Design Summary

Wall Stability Ratios

Overturning	=	3.99	OK
Sliding	=	1.67	OK
Total Bearing Load	=	9,400 lbs	
...resultant ecc.	=	1.67 in	
Soil Pressure @ Toe	=	1,014 psf	OK
Soil Pressure @ Heel	=	1,240 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,081 psf	
ACI Factored @ Heel	=	1,321 psf	
Footing Shear @ Toe	=	9.4 psi	OK
Footing Shear @ Heel	=	41.8 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	3,095.0 lbs	
less 100% Passive Force	= -	472.2 lbs	
less 100% Friction Force	= -	4,700.2 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NGI	As < Min %	Stem OK
Design Height Above Ftg	ft =	11.00	6.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete
Thickness	=		8.00	12.00
Rebar Size	=		# 4	# 8
Rebar Spacing	=		18.00	16.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		No Good	1.000
Total Force @ Section	lbs =		834.5	3,752.9
Moment....Actual	ft-# =		1,769.4	14,437.1
Moment.....Allowable	ft-# =		2,321.3	14,444.1
Shear.....Actual	psi =		17.4	52.1
Shear.....Allowable	=		82.2	82.2
Wall Weight	psf =		100.0	150.0
Rebar Depth 'd'	in =		4.00	6.00
LAP SPLICE IF ABOVE	in =		12.00	42.92
LAP SPLICE IF BELOW	in =		12.00	
HOOK EMBED INTO FTG	in =			10.07
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Use Full Stresses	=			
Modular Ratio 'n'	=			
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =		3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV804 Dsgnr: Date: APR 6,2008
Description....
GUARDRAIL over a 11'-0" SCOUR WALL

Page: _____

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,081	1,321 psf
Mu' : Upward	=	7,516	0 ft-#
Mu' : Downward	=	2,020	0 ft-#
Mu: Design	=	5,495	14,437 ft-#
Actual 1-Way Shear	=	9.43	41.81 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 6 @ 18.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 8.75 in, #5@ 13.50 in, #6@ 19.25 in, #7@ 26.00 in, #8@ 34.25 in, #9@ 43
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	3,048.4	4.22	12,871.2
Toe Active Pressure	=		0.56	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	14.42	671.1
Total	=	3,095.0	**O.T.M.** =	13,542.3

Resisting/Overturning Ratio = **3.99**

Vertical Loads used for Soil Pressure = 9,400.4 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	4,844.4	6.51	31,512.8
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	4.17	75.1
Soil Over Toe	=			
Surcharge Over Toe	=			
Stem Weight(s)	=	1,400.0	4.11	5,754.7
Earth @ Stem Transitions	=	200.0	4.50	900.7
Footing Weight	=	2,085.0	4.17	8,694.5
Key Weight	=			
Vert. Component	=	853.0	8.34	7,113.6
Total	=	9,400.4 lbs	**R.M.=**	54,051.3

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

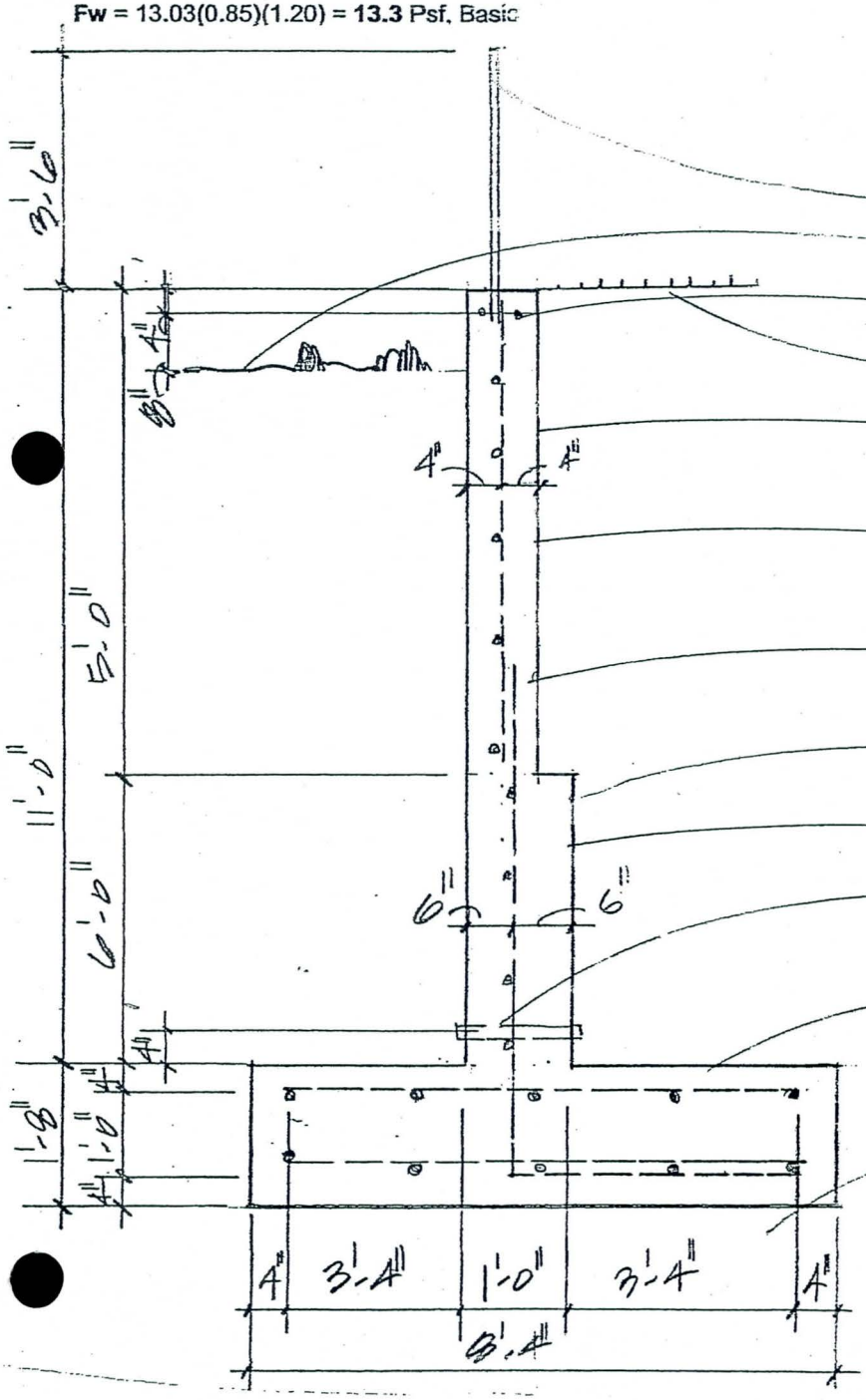
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50

CODE: I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06



GUARDRAIL IF REQUIRED

FINISH GRADE

2#3 BARS CONTINUOUS

SCOUR GRADE

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#8 LAPPED 43" VERTICALS CENTER IN WALL @ 16" O.C. and #6 HORIZONTAL @ 18" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

8' - 4" WIDE x 20" THICK CONCRETE FOOTING w/10#5 BARS CONTINUOUS, #5 x 92" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 92" O.C. TRANSVERSE @ 18" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 1'-0" RETAINING WALL, over a 11'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ /EV804

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV805 Dsgnr: dw
Description....
GUARDRAIL over a 12'-0" SCOUR WALL

Page: _____
Date: APR 6,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	12.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	0.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	3.67 ft
Heel Width	=	4.67
Total Footing Width	=	8.34
Footing Thickness	=	20.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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	=	18.0 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

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

*Design Summary

Wall Stability Ratios

Overturning	=	3.47	OK
Sliding	=	1.54	OK
Total Bearing Load	=	10,121 lbs	
...resultant ecc.	=	0.50 in	
Soil Pressure @ Toe	=	1,250 psf	OK
Soil Pressure @ Heel	=	1,177 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,317 psf	
ACI Factored @ Heel	=	1,240 psf	
Footing Shear @ Toe	=	11.7 psi	OK
Footing Shear @ Heel	=	45.6 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	3,595.3 lbs	
less 100% Passive Force	= -	472.2 lbs	
less 100% Friction Force	= -	5,060.4 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NGI	Stem OK	Stem OK
Design Height Above Ftg	ft =	12.00	6.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete
Thickness	=		8.00	12.00
Rebar Size	=		# 5	# 8
Rebar Spacing	=		18.00	12.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		0.783	0.998
Total Force @ Section	lbs =		1,168.9	4,452.1
Moment....Actual	ft-# =		2,766.0	18,534.5
Moment.....Allowable	ft-# =		3,531.0	18,568.4
Shear.....Actual	psi =		24.4	61.8
Shear.....Allowable	=		82.2	82.2
Wall Weight	psf =		100.0	150.0
Rebar Depth 'd'	in =		4.00	6.00
LAP SPLICE IF ABOVE	in =		16.73	42.86
LAP SPLICE IF BELOW	in =		16.73	
HOOK EMBED INTO FTG	in =			10.05
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Use Full Stresses	=			
Modular Ratio 'n'	=			
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =		3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV805 Dsgnr: dw
Description....
GUARDRAIL over a 12'-0" SCOUR WALL

Page: _____
Date: APR 6,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,317	1,240 psf
Mu' : Upward	=	8,795	0 ft-#
Mu' : Downward	=	2,020	0 ft-#
Mu: Design	=	6,775	18,535 ft-#
Actual 1-Way Shear	=	11.67	45.61 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 6 @ 14.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 7.25 in, #5@ 11.25 in, #6@ 15.75 in, #7@ 21.50 in, #8@ 28.25 in, #9@ 35
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	3,548.8	4.56	16,166.7
Toe Active Pressure	=		0.56	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	15.42	717.6
Total	=	3,595.3	**O.T.M.** =	16,884.3

Resisting/Overturning Ratio = **3.47**

Vertical Loads used for Soil Pressure = 10,120.7 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	5,284.8	6.51	34,377.6
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	4.17	75.1
Soil Over Toe	=			
Surcharge Over Toe	=			
Stem Weight(s)	=	1,500.0	4.10	6,155.0
Earth @ Stem Transitions	=	240.0	4.50	1,080.8
Footing Weight	=	2,085.0	4.17	8,694.5
Key Weight	=			
Vert. Component	=	992.9	8.34	8,281.2
Total	=	10,120.7 lbs	**R.M.=**	58,664.1

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC· Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

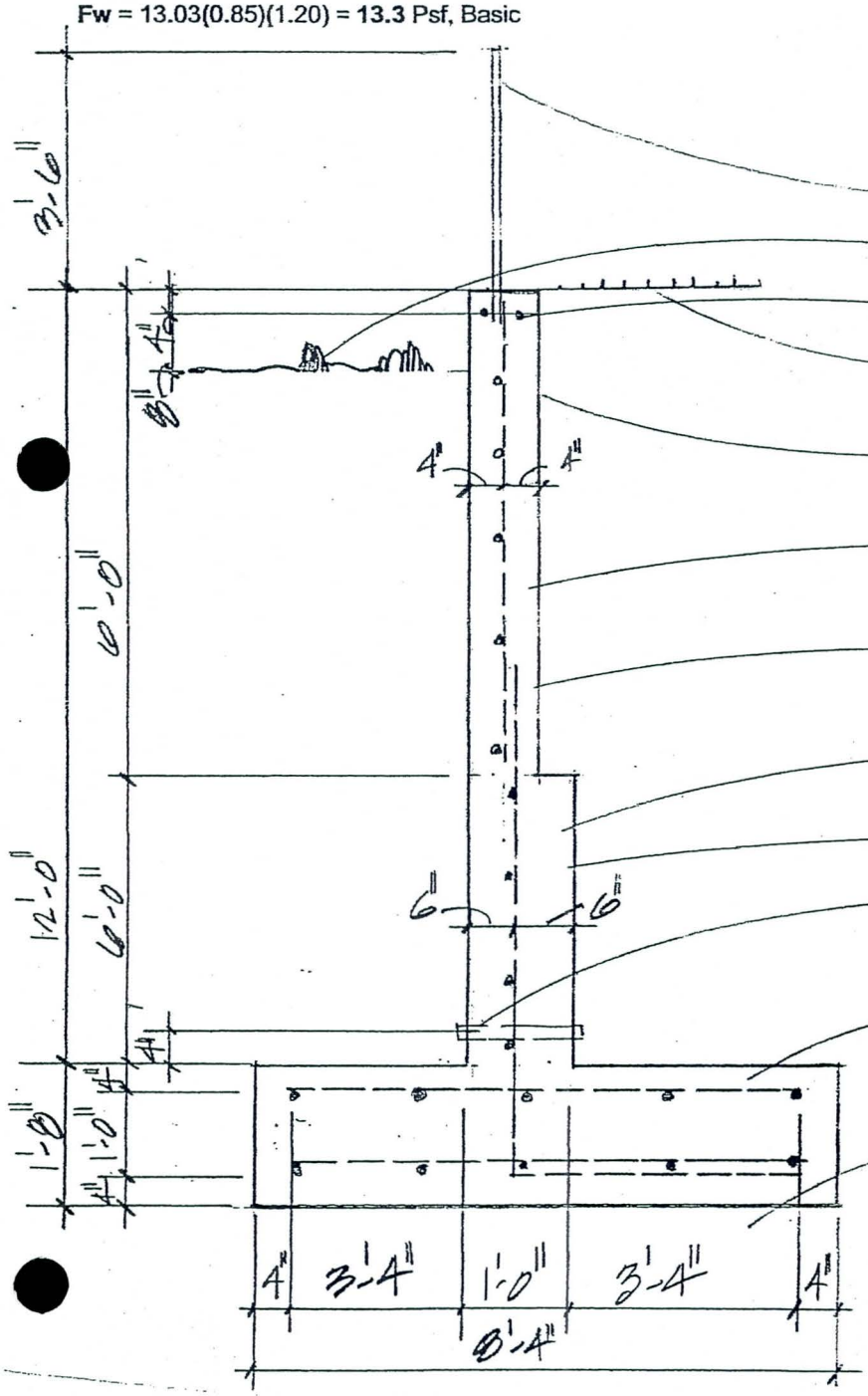
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



GUARDRAIL IF REQUIRED

FINISH GRADE

2#3 BARS CONTINUOUS

SCOUR GRADE

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#5 LAPPED 18" VERTICALS CENTER IN WALL @ 18" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#8 LAPPED 43" VERTICALS CENTER IN WALL @ 12" O.C. and #6 HORIZONTAL @ 18" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

8' - 4" WIDE x 20" THICK CONCRETE FOOTING w/10#5 BARS CONTINUOUS, #5 x 92" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 92" O.C. TRANSVERSE @ 14" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 1'-0" RETAINING WALL, over a 12'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ/FV805

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV820 Dsgnr: dw Date: MAR 31.200
Descrptn....
GUARDRAIL over a 2'-0" FLOOD WALL over a 1'-

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	12.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	120.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	4.67 ft
Heel Width	=	6.00
Total Footing Width	=	10.67
Footing Thickness	=	16.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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	=	18.0 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

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

*Design Summary

Wall Stability Ratios

Overturning	=	3.48 OK
Sliding	=	4.93 OK
Total Bearing Load	=	12,046 lbs
...resultant ecc.	=	0.69 in
Soil Pressure @ Toe	=	1,165 psf OK
Soil Pressure @ Heel	=	1,093 psf OK
Allowable	=	2,666 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	1,239 psf
ACI Factored @ Heel	=	1,162 psf
Footing Shear @ Toe	=	22.6 psi OK
Footing Shear @ Heel	=	70.8 psi OK
Allowable	=	75.0 psi

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	5,646.6 lbs
less 100% Passive Force	=	- 21,835.6 lbs
less 100% Friction Force	=	- 6,023.2 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NG!	Stem OK	As < Min %	Bar Lap/Emb
Design Height Above Ftg	ft =	12.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	16.00
Rebar Size	=		# 5	# 6	# 7
Rebar Spacing	=		18.00	18.00	12.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		**0.426**	**0.916**	**0.976**
Total Force @ Section	lbs =		880.9	3,300.1	7,332.1
Moment....Actual	ft-# =		1,503.5	9,327.8	30,054.5
Moment.....Allowable	ft-# =		3,531.0	10,179.3	30,807.0
Shear.....Actual	psi =		18.4	34.4	50.9
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	200.0
Rebar Depth 'd'	in =		4.00	8.00	12.00
LAP SPLICE IF ABOVE	in =		12.00	12.00	36.66
LAP SPLICE IF BELOW	in =		12.00	12.00	
HOOK EMBED INTO FTG	in =				8.59
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Pags
Job # : EV820 Dsgnr: dw Date: MAR 31,2008
Description....
GUARDRAIL ov er a 2'-0" FLOOD WALL over a 1'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,239	1,162 psf
Mu' : Upward	=	13,387	0 ft-#
Mu' : Downward	=	18,319	28,108 ft-#
Mu: Design	=	4,933	28,108 ft-#
Actual 1-Way Shear	=	22.60	70.77 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	# 6 @ 18.00 in	
Heel Reinforcing	=	# 7 @ 12.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: #4@ 11.50 in, #5@ 17.75 in, #6@ 25.25 in, #7@ 34.50 in, #8@ 45.25 in, #9@ 4
Heel: #4@ 4.75 in, #5@ 7.25 in, #6@ 10.25 in, #7@ 13.75 in, #8@ 18.25 in, #9@ 23.
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	5,600.0	4.44	24,888.9
Toe Active Pressure	=		3.78	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	15.08	702.1
Total	=	5,646.6	**O.T.M.** =	25,591.0

Resisting/Overturning Ratio = **3.48**

Vertical Loads used for Soil Pressure = 12,046.4 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	6,720.0	8.34	56,022.4
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	5.34	96.1
Soil Over Toe	=		2.34	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,800.0	5.21	9,372.7
Earth @ Stem Transitions	=	480.0	5.73	2,748.3
Footing Weight	=	2,134.0	5.34	11,384.9
Key Weight	=			
Vert. Component	=	894.4	10.67	9,543.3
	Total =	12,046.4 lbs	**R.M.=**	89,167.6

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	

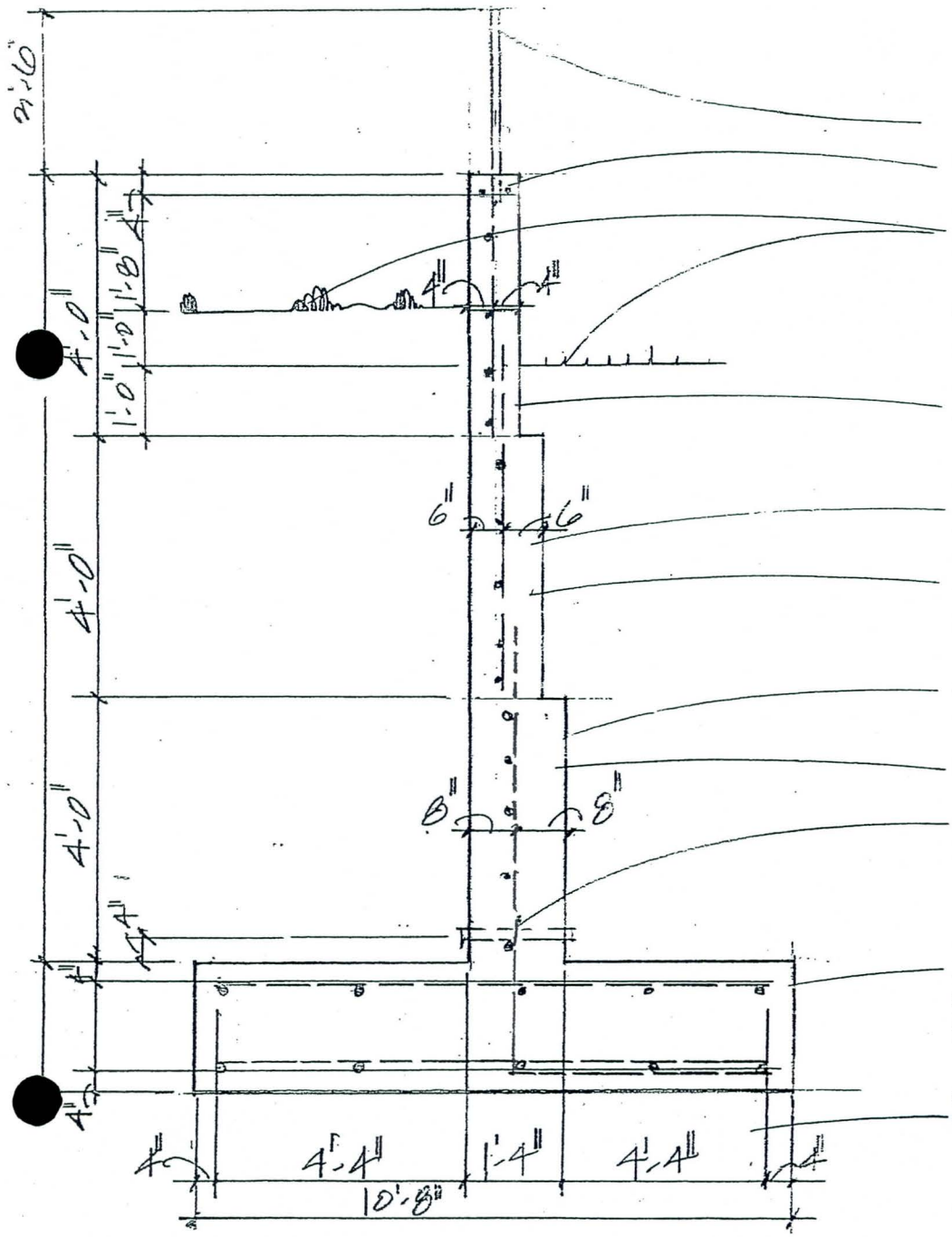
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf. Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#5 LAPPED 12" VERTICALS CENTER IN WALL @ 18" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#6 LAPPED 12" VERTICALS CENTER IN WALL @18" O.C. and #6 HORIZONTAL @ 18" OC.

16" CONCRETE WALL w/#7 LAPPED 38" VERTICALS CENTER IN WALL @ 12" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

10'-8" WIDE x 16" THICK CONCRETE FOOTING w/10#5 BARS CONTINUOUS, #6 x 120" @ 18" O.C. TRANSVERSE BOTTOM, #7 x 120" O.C. TRANSVERSE @ 12" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" FLOOD WALL, over a 1'-0" RETAINING WALL, over a 0'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page:
Job # : EV821 Dsgnr: dw Date: APR 1,200
Description:
GUARDRAIL over a 2'-0" FLOOD WALL over a 2'-0

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	13.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	132.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	5.67 ft
Heel Width	=	6.67
Total Footing Width	=	12.33
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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	=	18.0 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

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

*Design Summary

Wall Stability Ratios

Overturning	=	3.85	OK
Sliding	=	5.08	OK
Total Bearing Load	=	14,629 lbs	
...resultant ecc.	=	2.65 in	
Soil Pressure @ Toe	=	1,059 psf	OK
Soil Pressure @ Heel	=	1,314 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,130 psf	
ACI Factored @ Heel	=	1,402 psf	
Footing Shear @ Toe	=	30.8 psi	OK
Footing Shear @ Heel	=	75.4 psi	NG
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	6,669.4 lbs
less 100% Passive Force	=	- 26,562.5 lbs
less 100% Friction Force	=	- 7,314.7 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NG!	Stem OK	Stem OK	Bar Lap/Emb
Design Height Above Ftg	ft =	13.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	16.00
Rebar Size	=		# 5	# 6	# 8
Rebar Spacing	=		18.00	12.00	12.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		0.737	0.871	0.953
Total Force @ Section	lbs =		1,334.5	4,156.9	8,592.1
Moment....Actual	ft-# =		2,602.7	13,047.9	38,008.2
Moment.....Allowable	ft-# =		3,531.0	14,983.3	39,898.4
Shear.....Actual	psi =		27.8	43.3	59.7
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	200.0
Rebar Depth 'd'	in =		4.00	8.00	12.00
LAP SPLICE IF ABOVE	in =		15.75	22.32	40.91
LAP SPLICE IF BELOW	in =		15.75	22.32	
HOOK EMBED INTO FTG	in =				9.57
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV821 Dsgnr: dw Date: APR 1,2008
Description.....
GUARDRAIL over a 2'-0" FLOOD WALL over a 2'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,130	1,402 psf
Mu' : Upward	=	18,810	0 ft-#
Mu' : Downward	=	29,760	0 ft-#
Mu: Design	=	10,950	38,008 ft-#
Actual 1-Way Shear	=	30.81	75.37 psi
Allow 1-Way Shear	=	75.00	75.00 psi

Toe Reinforcing	=	# 6 @ 18.00 in
Heel Reinforcing	=	# 7 @ 12.00 in
Key Reinforcing	=	None Spec'd

Other Acceptable Sizes & Spacings

Toe: #4@ 10.00 in, #5@ 15.50 in, #6@ 21.75 in, #7@ 29.75 in, #8@ 39.00 in, #9@ 4
Heel: #4@ 4.00 in, #5@ 6.25 in, #6@ 8.75 in, #7@ 11.75 in, #8@ 15.50 in, #9@ 19.7
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	6,622.9	4.83	32,010.6
Toe Active Pressure	=		4.17	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	16.25	756.4
Total	=	6,669.4	**O.T.M.** =	32,767.0

Resisting/Overturning Ratio = **3.85**

Vertical Loads used for Soil Pressure = 14,629.4 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	8,319.0	9.67	80,408.3
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	6.33	114.0
Soil Over Toe	=		2.83	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,900.0	6.19	11,765.4
Earth @ Stem Transitions	=	560.0	6.71	3,759.6
Footing Weight	=	2,774.7	6.17	17,108.8
Key Weight	=			
Vert. Component	=	1,057.8	12.33	13,044.5
	Total =	14,629.4 lbs	**R.M.=**	126,200.6

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	

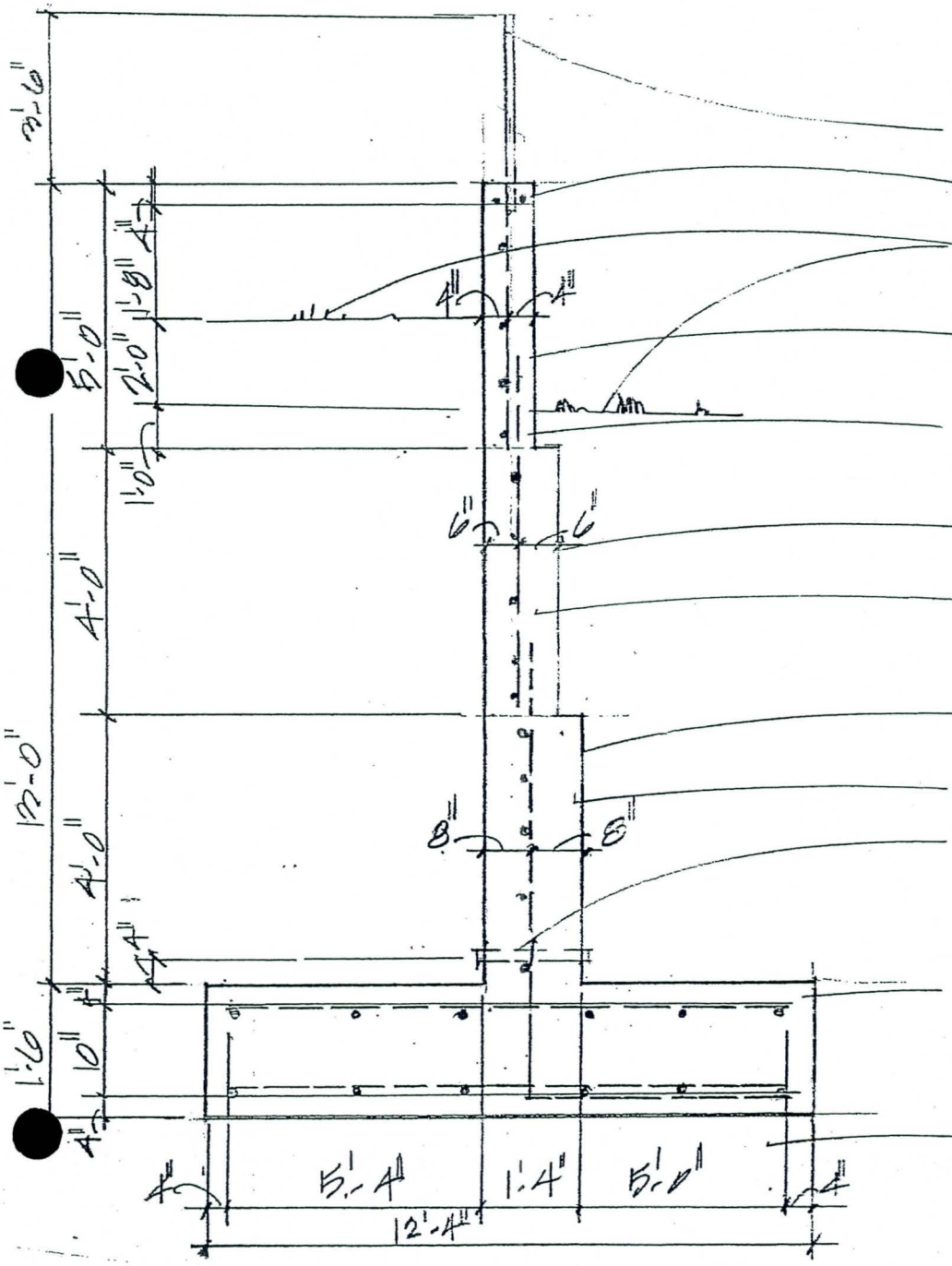
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf. Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#5 LAPPED 16" VERTICALS CENTER IN WALL @ 18" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#6 LAPPED 23" VERTICALS CENTER IN WALL @12" O.C. and #6 HORIZONTAL @ 18" OC.

16" CONCRETE WALL w/#8 LAPPED 41" VERTICALS CENTER IN WALL @ 12" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

12'-4" WIDE x 18" THICK CONCRETE FOOTING w/12#5 BARS CONTINUOUS, #6 x 140" @ 18" O.C. TRANSVERSE BOTTOM, #7 x 140" TRANSVERSE @ 12" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" FLOOD WALL, over a 2'-0" RETAINING WALL, over a 9'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen, and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV822 Dsgnr: dw Date: APR 1,2[illegible]
Descrn:
GUARDRAIL over a 2'-0" FLOOD WALL over a [illegible]

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	12.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	132.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	5.00 ft
Heel Width	=	6.33
Total Footing Width	=	11.33
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	3.82	OK
Sliding	=	5.71	OK
Total Bearing Load	=	12,959 lbs	
...resultant ecc.	=	1.29 in	
Soil Pressure @ Toe	=	1,079 psf	OK
Soil Pressure @ Heel	=	1,209 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,155 psf	
ACI Factored @ Heel	=	1,294 psf	
Footing Shear @ Toe	=	26.2 psi	OK
Footing Shear @ Heel	=	65.8 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	5,787.4 lbs	
less 100% Passive Force	=	- 26,562.5 lbs	
less 100% Friction Force	=	- 6,479.7 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NG!	Stem OK	As < Min %	Stem OK
Design Height Above Ftg	ft =	12.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	16.00
Rebar Size	=		# 5	# 5	# 7
Rebar Spacing	=		18.00	13.75	12.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		0.426	0.991	0.976
Total Force @ Section	lbs =		880.9	3,300.1	7,332.1
Moment....Actual	ft-# =		1,503.5	9,327.8	30,054.5
Moment.....Allowable	ft-# =		3,531.0	9,415.7	30,807.0
Shear.....Actual	psi =		18.4	34.4	50.9
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	200.0
Rebar Depth 'd'	in =		4.00	8.00	12.00
LAP SPLICE IF ABOVE	in =		12.00	12.00	36.66
LAP SPLICE IF BELOW	in =		12.00	12.00	
HOOK EMBED INTO FTG	in =				8.59
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV822 Dsgnr: dw
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 2'-0"

Page: _____
Date: APR 1,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,155	1,294 psf
Mu' : Upward	=	14,693	0 ft-#
Mu' : Downward	=	23,175	0 ft-#
Mu: Design	=	8,482	30,055 ft-#
Actual 1-Way Shear	=	26.23	65.81 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	# 6 @ 18.00 in	
Heel Reinforcing	=	# 7 @ 12.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: #4@ 10.00 in, #5@ 15.50 in, #6@ 21.75 in, #7@ 29.75 in, #8@ 39.00 in, #9@ 4
Heel: #4@ 4.25 in, #5@ 6.50 in, #6@ 9.25 in, #7@ 12.50 in, #8@ 16.50 in, #9@ 20.7
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	5,740.9	4.50	25,833.9
Toe Active Pressure	=		4.17	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	15.25	709.9
Total	=	5,787.4	**O.T.M.** =	26,543.8

Resisting/Overturning Ratio = **3.82**

Vertical Loads used for Soil Pressure = 12,959.4 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	7,195.2	8.83	63,545.6
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	5.67	102.0
Soil Over Toe	=		2.50	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,800.0	5.54	9,966.7
Earth @ Stem Transitions	=	480.0	6.06	2,906.7
Footing Weight	=	2,549.3	5.67	14,441.5
Key Weight	=			
Vert. Component	=	916.9	11.33	10,388.6
	Total =	12,959.4 lbs	**R.M.=**	101,351.0

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06

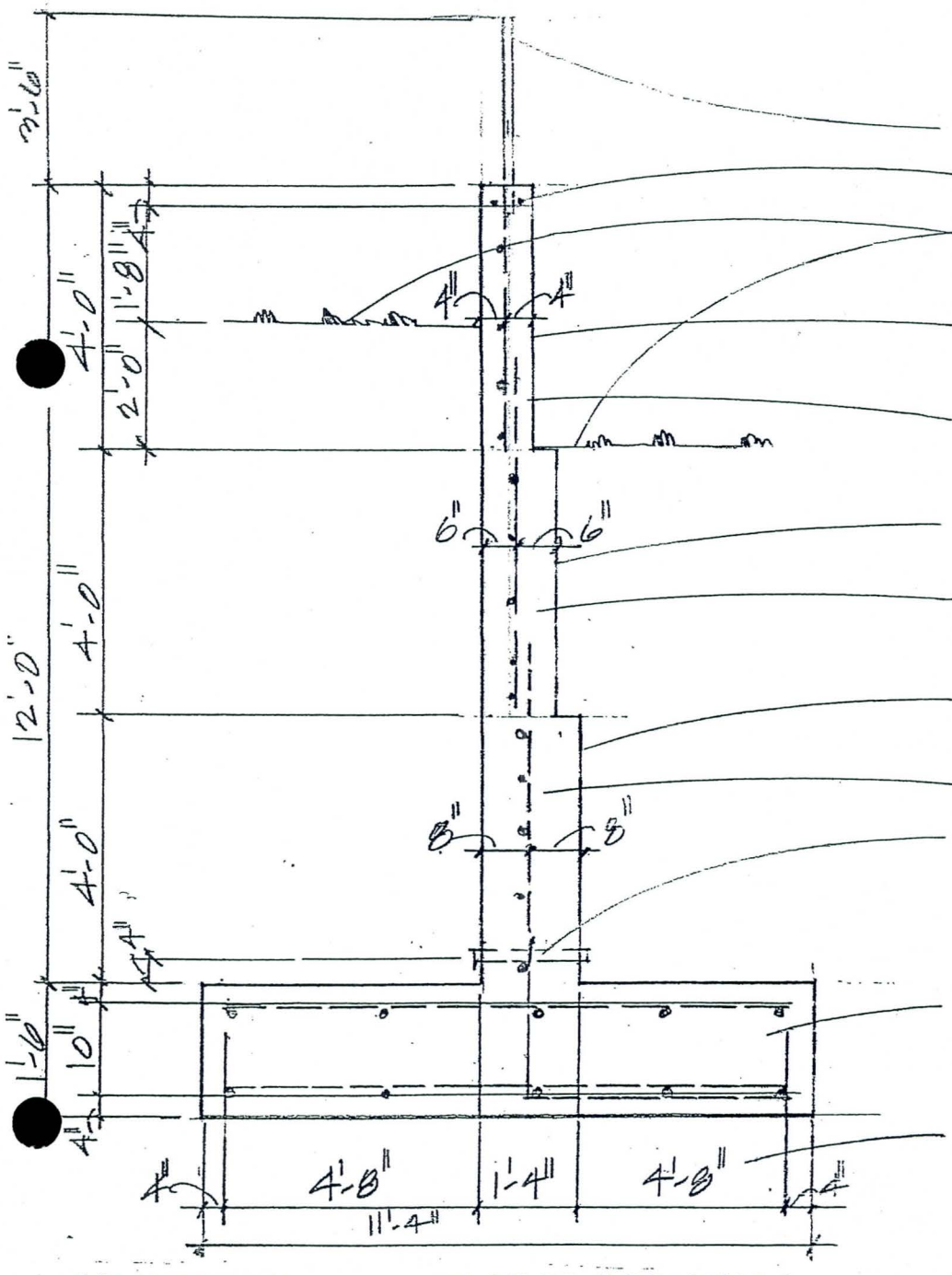
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-[illegible]
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf. Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#5 LAPPED 12" VERTICALS CENTER IN WALL @ 18" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#5 LAPPED 12" VERTICALS CENTER IN WALL @ 14" O.C. and #6 HORIZONTAL @ 18" OC.

16" CONCRETE WALL w/#7 LAPPED 37" VERTICALS CENTER IN WALL @ 12" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

11'-4" WIDE x 18" THICK CONCRETE FOOTING w/10#5 BARS CONTINUOUS, #6 x 128" @ 18" O.C. TRANSVERSE BOTTOM, #7 x 128" TRANSVERSE @ 12" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" FLOOD WALL, over a 2'-0" RETAINING WALL, over a 8'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV823 Dsgnr: dw Date: APR 2,20
Descrip.:
GUARDRAIL over a 2'-0" RETAINING WALL over a

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	9.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	132.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	3.67 ft
Heel Width	=	4.33
Total Footing Width	=	8.00
Footing Thickness	=	16.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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	=	18.0 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

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

*Design Summary

Wall Stability Ratios

Overturning	=	3.27 OK
Sliding	=	8.65 OK
Total Bearing Load	=	7,252 lbs
...resultant ecc.	=	2.31 in
Soil Pressure @ Toe	=	1,037 psf OK
Soil Pressure @ Heel	=	776 psf OK
Allowable	=	2,666 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	1,118 psf
ACI Factored @ Heel	=	836 psf
Footing Shear @ Toe	=	22.4 psi OK
Footing Shear @ Heel	=	39.8 psi OK
Allowable	=	75.0 psi

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	3,410.1 lbs
less 100% Passive Force	=	- 25,858.9 lbs
less 100% Friction Force	=	- 3,625.8 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NGI	Stem OK	Stem OK	Bar Lap/Emb
Design Height Above Ftg	ft =	11.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	8.00	12.00
Rebar Size	=		# 5	# 5	# 8
Rebar Spacing	=		16.00	16.00	16.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		0.056	0.660	0.903
Total Force @ Section	lbs =		124.9	1,334.5	4,156.9
Moment....Actual	ft-# =		221.6	2,602.7	13,047.9
Moment.....Allowable	ft-# =		3,945.8	3,945.8	14,444.1
Shear.....Actual	psi =		2.6	27.8	57.7
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	100.0	150.0
Rebar Depth 'd'	in =		4.00	4.00	6.00
LAP SPLICE IF ABOVE	in =		12.00	14.09	38.79
LAP SPLICE IF BELOW	in =		12.00	14.09	
HOOK EMBED INTO FTG	in =				9.00
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV823 Dsgnr: dw Date: APR 2,2008
Description.....
GUARDRAIL over a 2'-0" RETAINING WALL over a 9'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,118	836 psf
Mu' : Upward	=	7,239	0 ft-#
Mu' : Downward	=	12,284	11,378 ft-#
Mu: Design	=	5,045	11,378 ft-#
Actual 1-Way Shear	=	22.43	39.83 psi
Allow 1-Way Shear	=	75.00	75.00 psi

Toe Reinforcing = None Spec'd
Heel Reinforcing = # 5 @ 12.00 in
Key Reinforcing = None Spec'd

Other Acceptable Sizes & Spacings
Toe: #4@ 11.50 in, #5@ 17.75 in, #6@ 25.25 in, #7@ 34.50 in, #8@ 45.25 in, #9@ 4
Heel: #4@ 8.75 in, #5@ 13.75 in, #6@ 19.25 in, #7@ 26.25 in, #8@ 34.75 in, #9@ 43
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	3,363.5	3.44	11,585.4
Toe Active Pressure	=		4.11	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	12.08	562.5
Total	=	3,410.1	**O.T.M.** =	12,147.9

Resisting/Overturning Ratio = 3.27

Vertical Loads used for Soil Pressure = 7,251.6 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	3,596.4	6.34	22,783.2
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	4.17	75.1
Soil Over Toe	=		1.84	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,300.0	4.08	5,304.3
Earth @ Stem Transitions	=	200.0	4.50	900.7
Footing Weight	=	1,600.0	4.00	6,400.0
Key Weight	=			
Vert. Component	=	537.2	8.00	4,297.6
Total	=	7,251.6 lbs	**R.M.=**	39,760.9

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06

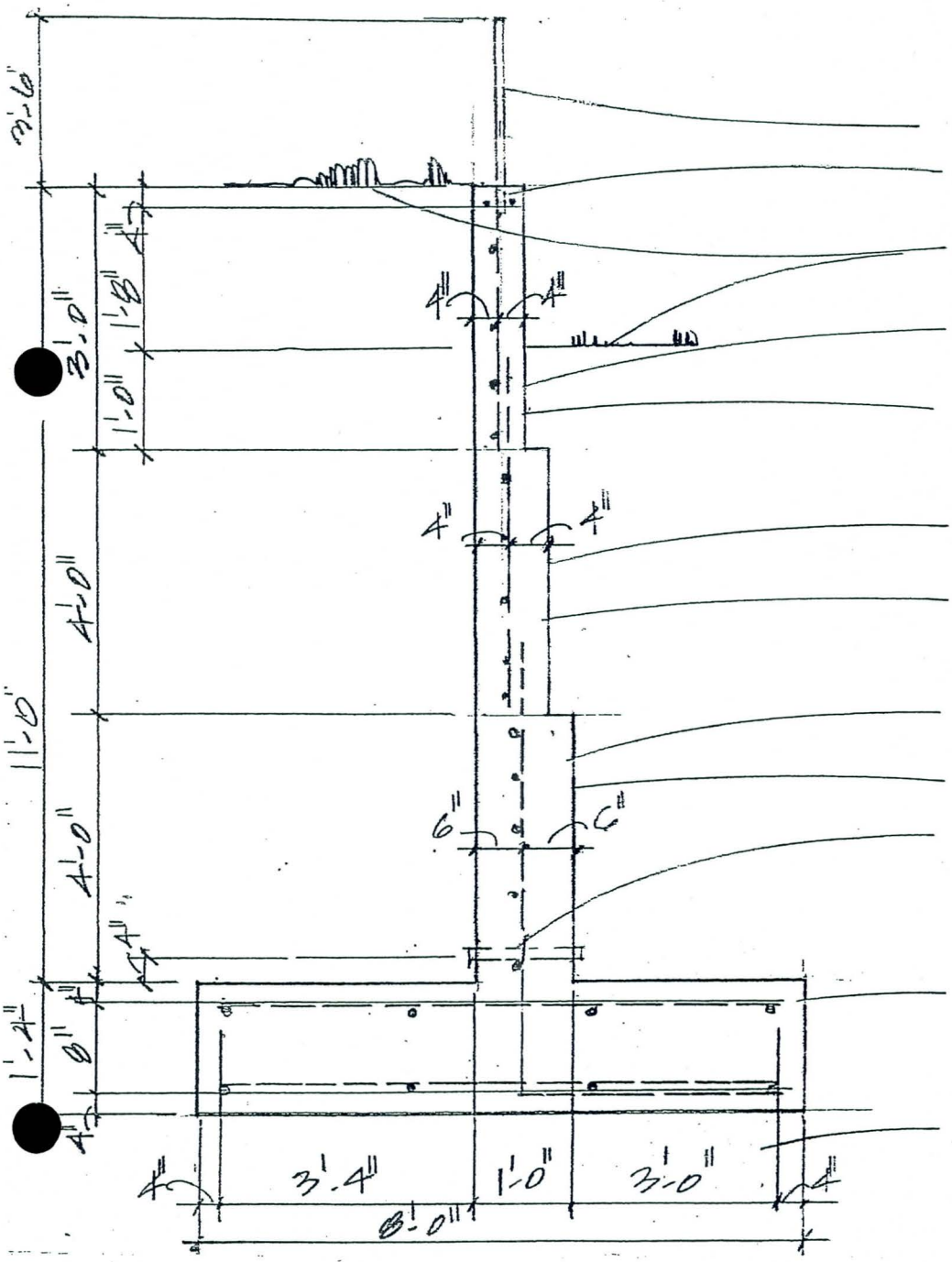
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#5 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

8" CONCRETE WALL w/#5 LAPPED 14" VERTICALS CENTER IN WALL @ 16" O.C. and #5 HORIZONTAL @ 18" OC.

12" CONCRETE WALL w/#8 LAPPED 39" VERTICALS CENTER IN WALL @ 16" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

8'-0" WIDE x 16" THICK CONCRETE FOOTING w/8#5 BARS CONTINUOUS, #6 x 88" @ 24" O.C. TRANSVERSE BOTTOM, #7 x 88" TRANSVERSE @ 24" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" RETAINING WALL, over a 9'-0" SCOUR WALL

at ELIANTO VILLAGE in Buckeye, AZ /EV823

To specify your own special title block here use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV824 Dsgnr: dw Date: APR 2.20
Description:
GUARDRAIL over a 2'-0" FLOOD WALL over a

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	11.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	108.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	4.00 ft
Heel Width	=	5.33
Total Footing Width	=	9.33
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	3.10 OK
Sliding	=	4.81 OK
Total Bearing Load	=	10,279 lbs
...resultant ecc.	=	4.05 in
Soil Pressure @ Toe	=	1,341 psf OK
Soil Pressure @ Heel	=	862 psf OK
Allowable	=	2,666 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	1,424 psf
ACI Factored @ Heel	=	915 psf
Footing Shear @ Toe	=	10.4 psi OK
Footing Shear @ Heel	=	49.8 psi OK
Allowable	=	75.0 psi

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	4,968.4 lbs
less 100% Passive Force	=	- 18,742.5 lbs
less 100% Friction Force	=	- 5,139.5 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NG!	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	ft =	11.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	16.00
Rebar Size	=		# 4	# 5	# 7
Rebar Spacing	=		16.00	14.00	10.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		0.310	0.935	0.987
Total Force @ Section	lbs =		528.1	2,544.1	6,172.9
Moment....Actual	ft-# =		807.4	6,414.1	23,310.4
Moment.....Allowable	ft-# =		2,600.4	6,861.9	23,626.1
Shear.....Actual	psi =		11.0	35.3	64.3
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	200.0
Rebar Depth 'd'	in =		4.00	6.00	8.00
LAP SPLICE IF ABOVE	in =		12.00	19.97	37.07
LAP SPLICE IF BELOW	in =		12.00	19.97	
HOOK EMBED INTO FTG	in =				8.69
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV824 Dsgnr: dw Date: APR 2.2008
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 1'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,424	915 psf
Mu' : Upward	=	10,808	0 ft-#
Mu' : Downward	=	12,528	19,834 ft-#
Mu: Design	=	1,720	19,834 ft-#
Actual 1-Way Shear	=	10.44	49.81 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	# 6 @ 18.00 in	
Heel Reinforcing	=	# 6 @ 12.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 6.00 in, #5@ 9.00 in, #6@ 12.75 in, #7@ 17.50 in, #8@ 23.00 in, #9@ 29.
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	4,921.9	4.17	20,507.8
Toe Active Pressure	=		3.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	14.25	663.3
Total	=	4,968.4	**O.T.M.** =	21,171.2

Resisting/Overturning Ratio = **3.10**

Vertical Loads used for Soil Pressure = 10,279.0 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	5,275.6	7.33	38,678.9
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	4.67	84.0
Soil Over Toe	=		2.00	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,700.0	4.55	7,733.3
Earth @ Stem Transitions	=	400.0	5.07	2,026.7
Footing Weight	=	2,099.3	4.67	9,793.0
Key Weight	=			
Vert. Component	=	786.1	9.33	7,334.3
Total	=	10,279.0 lbs	**R.M.=**	65,650.3

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	

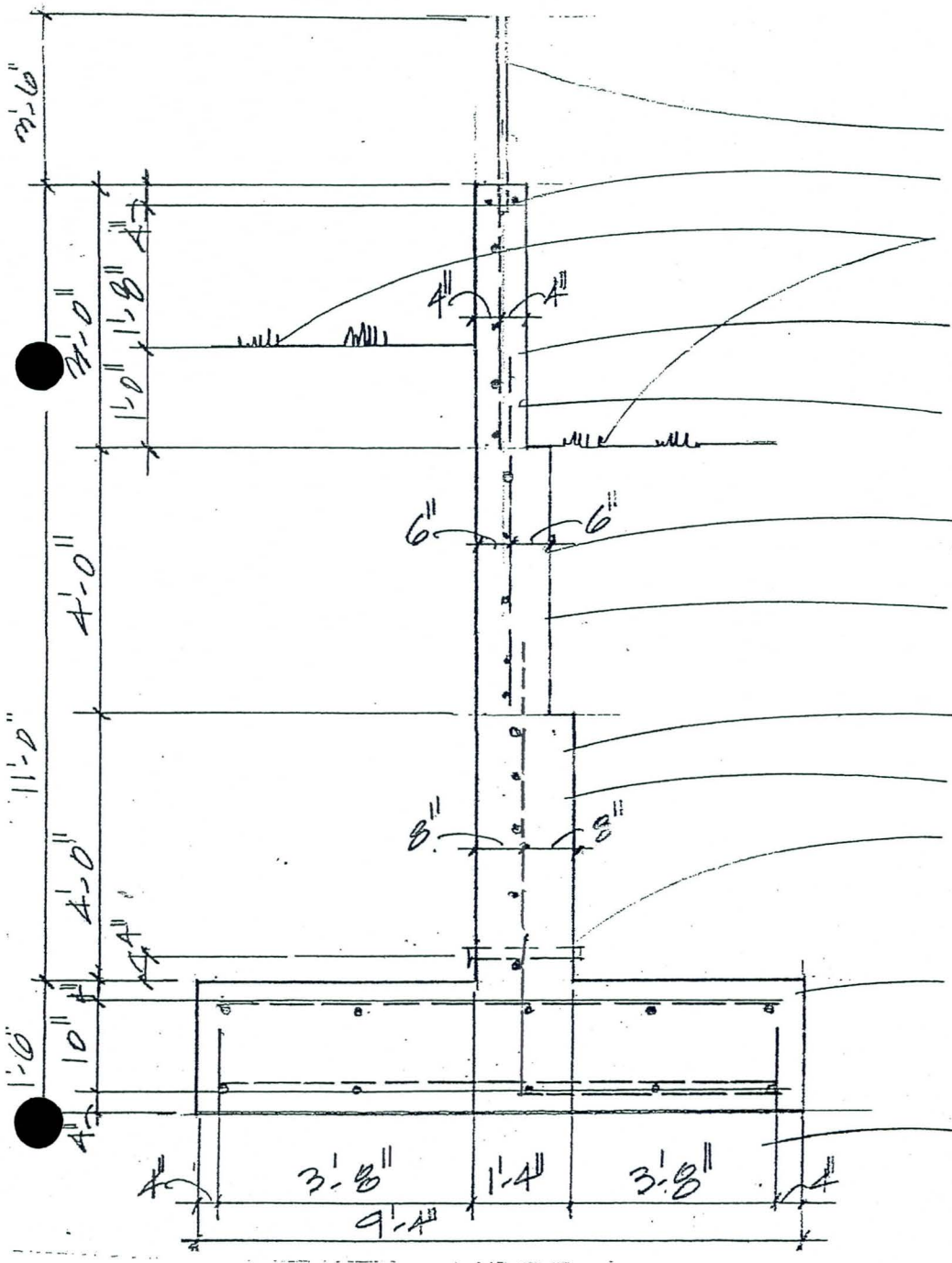
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf. Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 18" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#5 LAPPED 20" VERTICALS CENTER IN WALL @ 14" O.C. and #6 HORIZONTAL @ 18" OC.

16" CONCRETE WALL w/#7 LAPPED 37" VERTICALS CENTER IN WALL @ 10" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

9'-4" WIDE x 18" THICK CONCRETE FOOTING w/10#5 BARS CONTINUOUS, #6 x 104" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 104" TRANSVERSE @ 12" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" FLOOD WALL, over a 1'-0" RETAINING WALL, over a 8'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV825 Dsgnr: dw Date: APR 5.2
Descrip.
GUARDRAIL over a 2'-0" FLOOD WALL over a

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
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Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	13.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	132.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	3.67 ft
Heel Width	=	5.17
Total Footing Width	=	8.84
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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	=	18.0 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

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

*Design Summary

Wall Stability Ratios

Overturning	=	2.15	OK
Sliding	=	4.85	OK
Total Bearing Load	=	11,530 lbs	
...resultant ecc.	=	13.91 in	
Soil Pressure @ Toe	=	2,330 psf	OK
Soil Pressure @ Heel	=	278 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,360 psf	
ACI Factored @ Heel	=	282 psf	
Footing Shear @ Toe	=	4.4 psi	OK
Footing Shear @ Heel	=	54.9 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	6,669.4 lbs	
less 100% Passive Force	=	- 26,562.5 lbs	
less 100% Friction Force	=	- 5,765.0 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NG!	Ratio > 1.0	Stem OK	Bar Lap/Emb
Design Height Above Ftg	ft =	13.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	18.00
Rebar Size	=		# 4	# 7	# 9
Rebar Spacing	=		16.00	12.00	12.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		1.001	0.893	0.937
Total Force @ Section	lbs =		1,334.5	4,156.9	8,592.1
Moment....Actual	ft-# =		2,602.7	13,047.9	38,008.2
Moment.....Allowable	ft-# =		2,600.4	14,607.0	40,575.0
Shear.....Actual	psi =		27.8	57.7	71.6
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	225.0
Rebar Depth 'd'	in =		4.00	6.00	10.00
LAP SPLICE IF ABOVE	in =		12.00	33.56	45.25
LAP SPLICE IF BELOW	in =		12.00	33.56	
HOOK EMBED INTO FTG	in =				10.54
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page. _____
Job # : EV825 Dsgnr: dw Date: APR 5,2008
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 1'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
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Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,360	282 psf
Mu' : Upward	=	13,959	0 ft-#
Mu' : Downward	=	12,486	20,636 ft-#
Mu: Design	=	1,473	20,636 ft-#
Actual 1-Way Shear	=	4.40	54.91 psi
Allow 1-Way Shear	=	75.00	75.00 psi

Toe Reinforcing	=	None Spec'd
Heel Reinforcing	=	# 6 @ 12.00 in
Key Reinforcing	=	None Spec'd

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 5.75 in, #5@ 8.75 in, #6@ 12.25 in, #7@ 16.75 in, #8@ 22.00 in, #9@ 28.
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	6,622.9	4.83	32,010.6
Toe Active Pressure	=		4.17	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	16.25	756.4
Total	=	6,669.4	O.T.M. =	32,767.0

Resisting/Overturning Ratio = 2.15

Vertical Loads used for Soil Pressure = 11,530.0 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	5,725.2	7.01	40,105.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	4.42	79.6
Soil Over Toe	=		1.84	
Surcharge Over Toe	=			
Stem Weight(s)	=	2,000.0	4.24	8,481.7
Earth @ Stem Transitions	=	740.0	4.81	3,557.5
Footing Weight	=	1,989.0	4.42	8,791.4
Key Weight	=			
Vert. Component	=	1,057.8	8.84	9,350.8
Total	=	11,530.0 lbs	R.M.=	70,365.9

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	

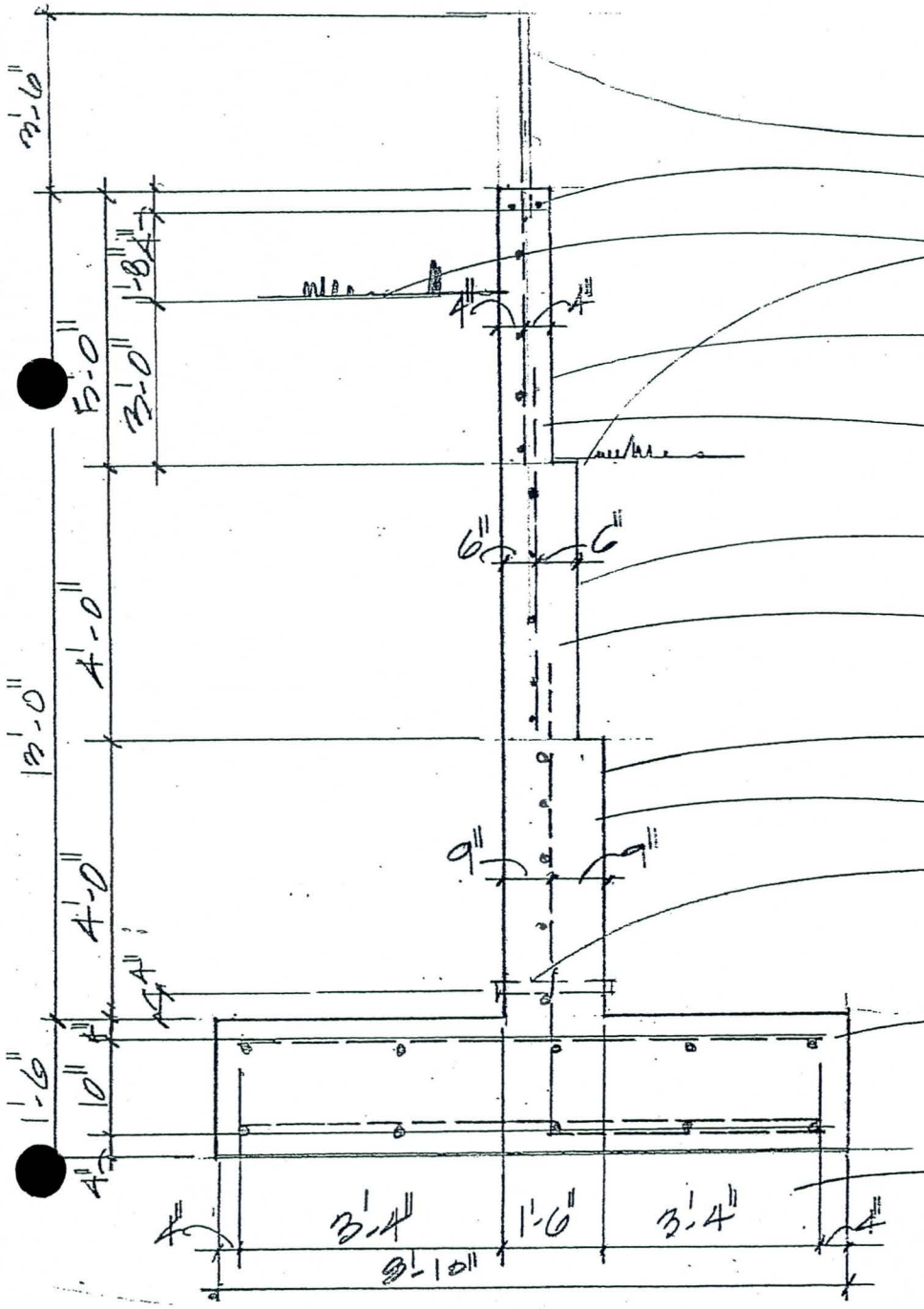
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#7 LAPPED 34" VERTICALS CENTER IN WALL @ 12" O.C. and #6 HORIZONTAL @ 18" OC.

18" CONCRETE WALL w/#9 LAPPED 46" VERTICALS CENTER IN WALL @ 12" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

8'-10" WIDE x 18" THICK CONCRETE FOOTING w/10#5 BARS CONTINUOUS, #6 x 98" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 98" TRANSVERSE @ 12" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" FLOOD WALL, over a 3'-0" RETAINING WALL, over a 8'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV826 Dsgnr: dw Date: APR 5,2008
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 5'-0"

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Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	15.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	156.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	4.67 ft
Heel Width	=	6.67
Total Footing Width	=	11.34
Footing Thickness	=	24.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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	=	18.0 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

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

*Design Summary

Wall Stability Ratios

Overturning	=	2.58 OK
Sliding	=	5.13 OK
Total Bearing Load	=	17,460 lbs
...resultant ecc.	=	11.23 in
Soil Pressure @ Toe	=	2,302 psf OK
Soil Pressure @ Heel	=	778 psf OK
Allowable	=	2,666 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,330 psf
ACI Factored @ Heel	=	787 psf
Footing Shear @ Toe	=	8.8 psi OK
Footing Shear @ Heel	=	57.3 psi OK
Allowable	=	82.2 psi

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	9,150.1 lbs
less 100% Passive Force	=	- 38,250.0 lbs
less 100% Friction Force	=	- 8,730.0 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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	4th	Bottom
		Shear NG!	Stem OK	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	ft =	15.00	12.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	16.00	24.00
Rebar Size	=		# 4	# 5	# 8	# 9
Rebar Spacing	=		16.00	14.00	12.00	10.00
Rebar Placed at	=		Edge	Edge	Edge	Edge
Design Data						
fb/FB + fa/Fa	=		0.310	0.935	0.908	0.992
Total Force @ Section	lbs =		528.1	2,544.1	6,172.9	11,414.5
Moment....Actual	ft-# =		807.4	6,414.1	23,310.4	57,947.5
Moment.....Allowable	ft-# =		2,600.4	6,861.9	25,678.4	58,428.0
Shear.....Actual	psi =		11.0	35.3	64.3	79.3
Shear.....Allowable	=		82.2	82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	200.0	300.0
Rebar Depth 'd'	in =		4.00	6.00	8.00	12.00
LAP SPLICE IF ABOVE	in =		12.00	19.97	38.98	47.91
LAP SPLICE IF BELOW	in =		12.00	19.97	38.98	
HOOK EMBED INTO FTG	in =					47.91
Masonry Data						
f'm	psi =					
Fs	psi =					
Solid Grouting	=					
Use Full Stresses	=					
Modular Ratio 'n'	=					
Short Term Factor	=					
Equiv. Solid Thick.	=					
Masonry Block Type	=					
Masonry Design Method	=	ASD				
Concrete Data						
f'c	psi =		3,000.0	3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV826 Dsgnr: dw Date: APR 5,2008
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 5'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,330	787 psf
Mu' : Upward	=	23,094	0 ft-#
Mu' : Downward	=	24,339	38,343 ft-#
Mu: Design	=	1,244	38,343 ft-#
Actual 1-Way Shear	=	8.76	57.30 psi
Allow 1-Way Shear	=	82.16	82.16 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 6 @ 12.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 4.50 in, #5@ 6.75 in, #6@ 9.50 in, #7@ 13.00 in, #8@ 17.00 in, #9@ 21.5
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	9,103.5	5.67	51,586.5
Toe Active Pressure	=		5.00	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	18.75	872.8
Total	=	9,150.1	**O.T.M.** =	52,459.3

Resisting/Overturning Ratio = **2.58**

Vertical Loads used for Soil Pressure = 17,460.0 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	8,406.0	9.01	75,696.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	5.67	102.1
Soil Over Toe	=		2.34	
Surcharge Over Toe	=			
Stem Weight(s)	=	2,900.0	5.41	15,676.3
Earth @ Stem Transitions	=	1,280.0	6.15	7,870.9
Footing Weight	=	3,402.0	5.67	19,289.3
Key Weight	=			
Vert. Component	=	1,454.0	11.34	16,488.1
	Total =	17,460.0 lbs	R.M.=	135,122.7

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06

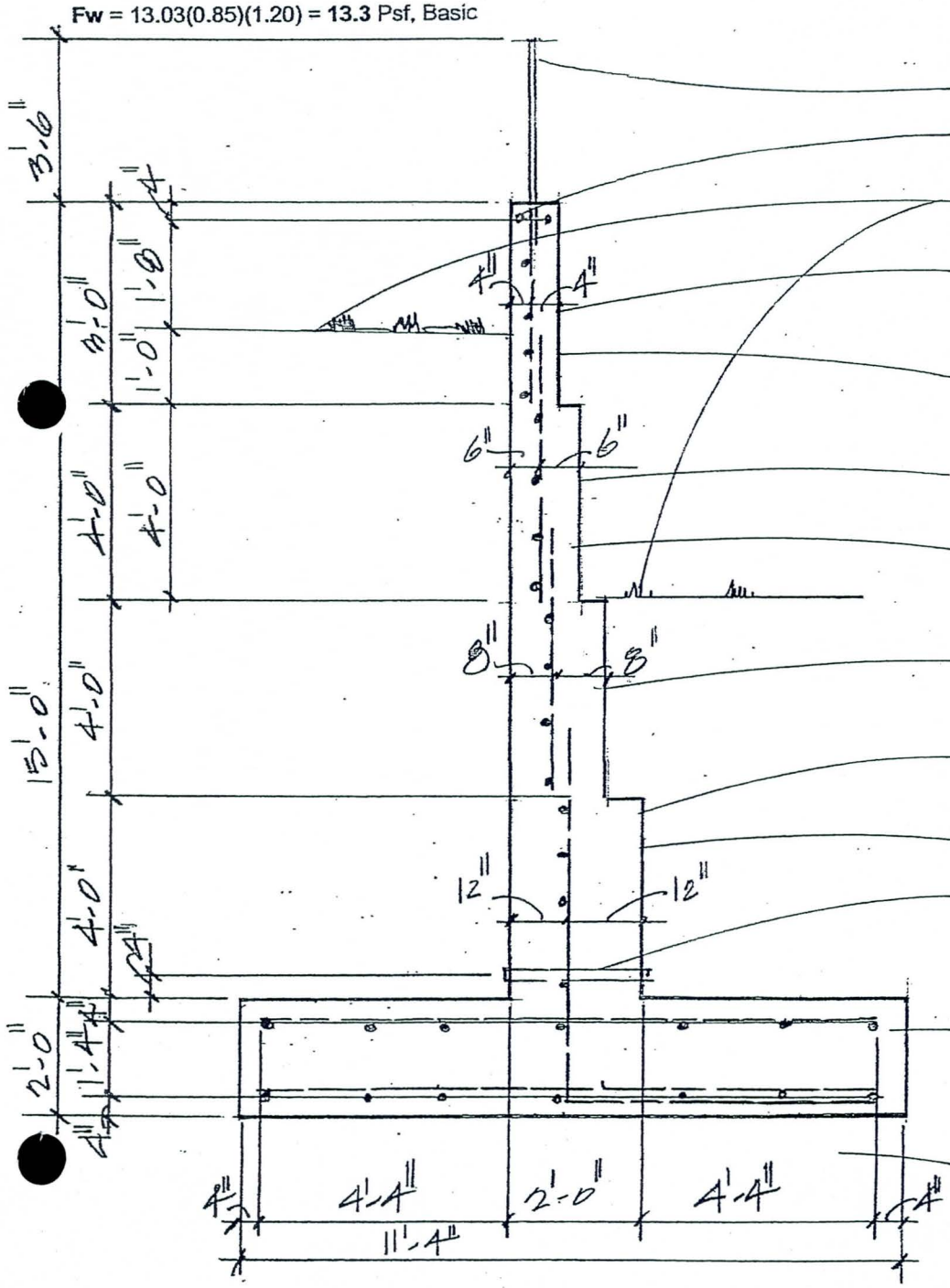
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#5 LAPPED 20" VERTICALS CENTER IN WALL @ 14" O.C. and #6 HORIZONTAL @ 18" OC.

16" CONCRETE WALL w/#8 LAPPED 40" VERTICALS CENTER IN WALL @ 12" O.C. and #6 HORIZONTAL @ 14" OC.

24" CONCRETE WALL w/#9 LAPPED 48" VERTICALS CENTER IN WALL @ 10" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

11'-4" WIDE x 24" THICK CONCRETE FOOTING w/14#5 BARS CONTINUOUS, #5 x 128" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 128" TRANSVERSE @ 12" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" FLOOD WALL, over a 5'-0" RETAINING WALL, over a 8'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV827 Dsgnr: dw Date: APR 5,2008
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 4'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	14.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	144.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	4.00 ft
Heel Width	=	6.00
Total Footing Width	=	10.00
Footing Thickness	=	24.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.30	OK
Sliding	=	5.03	OK
Total Bearing Load	=	14,906 lbs	
...resultant ecc.	=	13.98 in	
Soil Pressure @ Toe	=	2,533 psf	OK
Soil Pressure @ Heel	=	449 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,516 psf	
ACI Factored @ Heel	=	446 psf	
Footing Shear @ Toe	=	3.6 psi	OK
Footing Shear @ Heel	=	47.0 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	8,110.6 lbs	
less 100% Passive Force	=	- 33,320.0 lbs	
less 100% Friction Force	=	- 7,453.0 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NG!	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	ft =	14.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	16.00	24.00
Rebar Size	=		# 5	# 7	# 9
Rebar Spacing	=		14.00	14.00	12.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		0.941	0.899	0.954
Total Force @ Section	lbs =		1,888.9	5,114.5	9,952.9
Moment....Actual	ft-# =		4,206.0	17,675.1	47,272.3
Moment.....Allowable	ft-# =		4,470.4	19,658.2	49,575.0
Shear.....Actual	psi =		39.4	47.4	69.1
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	200.0	300.0
Rebar Depth 'd'	in =		4.00	9.00	12.00
LAP SPLICE IF ABOVE	in =		20.10	33.78	46.07
LAP SPLICE IF BELOW	in =		20.10	33.78	
HOOK EMBED INTO FTG	in =				10.35
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV827 Dsgnr: dw
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 4'-0"

Page: _____
Date: APR 5,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,516	446 psf
Mu' : Upward	=	17,917	0 ft-#
Mu' : Downward	=	16,704	27,251 ft-#
Mu: Design	=	1,213	27,251 ft-#
Actual 1-Way Shear	=	3.59	47.01 psi
Allow 1-Way Shear	=	82.16	82.16 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 6 @ 12.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 6.25 in, #5@ 9.50 in, #6@ 13.25 in, #7@ 18.25 in, #8@ 24.00 in, #9@ 30.
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	8,064.0	5.33	43,008.0
Toe Active Pressure	=		4.67	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	17.75	826.3
Total	=	8,110.6	**O.T.M.** =	43,834.3

Resisting/Overturning Ratio = **2.30**

Vertical Loads used for Soil Pressure = 14,905.9 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	6,720.0	8.00	53,760.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	5.00	90.0
Soil Over Toe	=		2.00	
Surcharge Over Toe	=			
Stem Weight(s)	=	2,600.0	4.74	12,333.3
Earth @ Stem Transitions	=	1,280.0	5.42	6,933.3
Footing Weight	=	3,000.0	5.00	15,000.0
Key Weight	=			
Vert. Component	=	1,287.9	10.00	12,879.5
	Total =	14,905.9 lbs	**R.M.=**	100,996.1

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06

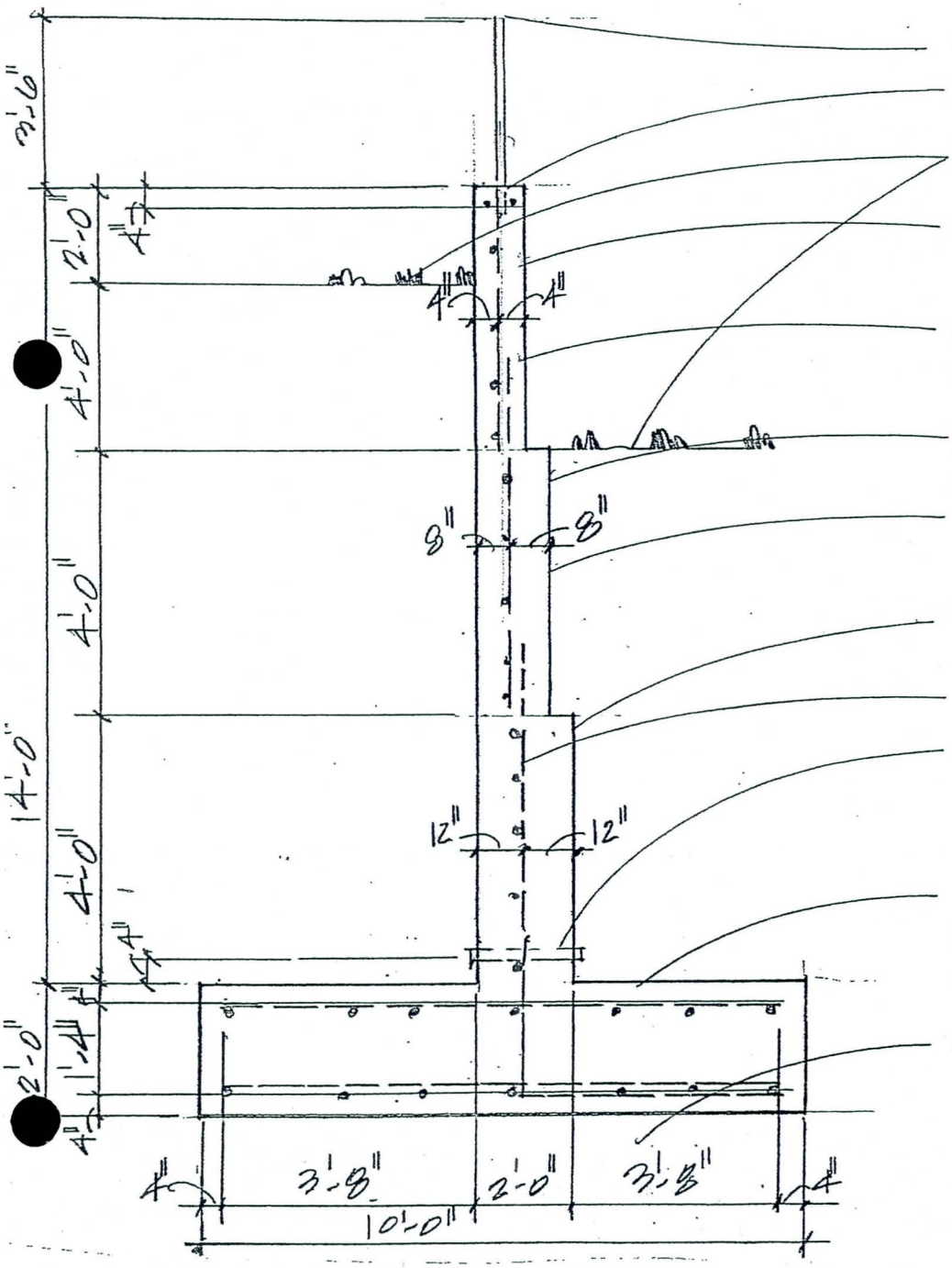
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#5 LAPPED 20" VERTICALS CENTER IN WALL @ 14" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

16" CONCRETE WALL w/#7 LAPPED 34" VERTICALS CENTER IN WALL @ 14" O.C. and #6 HORIZONTAL @ 18" OC.

24" CONCRETE WALL w/#9 LAPPED 46" VERTICALS CENTER IN WALL @ 12" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

10'-0" WIDE x 24" THICK CONCRETE FOOTING w/14#5 BARS CONTINUOUS, #5 x 112" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 112" TRANSVERSE @ 12" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" FLOOD WALL, over a 4'-0" RETAINING WALL, over a 8'-0" SCOUR WALL at FLANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV828 Dsgnr: dw
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 1'-0"

Page: _____
Date: APR 5,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	12.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	120.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	3.67 ft
Heel Width	=	5.00
Total Footing Width	=	8.67
Footing Thickness	=	20.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.31	OK
Sliding	=	4.80	OK
Total Bearing Load	=	10,685 lbs	
...resultant ecc.	=	11.55 in	
Soil Pressure @ Toe	=	2,053 psf	OK
Soil Pressure @ Heel	=	412 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,136 psf	
ACI Factored @ Heel	=	429 psf	
Footing Shear @ Toe	=	3.6 psi	OK
Footing Shear @ Heel	=	45.1 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	5,930.1 lbs	
less 100% Passive Force	=	- 23,138.9 lbs	
less 100% Friction Force	=	- 5,342.6 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NG!	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	ft =	12.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	16.00
Rebar Size	=		# 4	# 6	# 8
Rebar Spacing	=		14.00	14.00	10.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		0.509	0.976	0.997
Total Force @ Section	lbs =		880.9	3,300.1	7,332.1
Moment....Actual	ft-# =		1,503.5	9,327.8	30,054.5
Moment.....Allowable	ft-# =		2,955.7	9,553.5	30,151.2
Shear.....Actual	psi =		18.4	45.8	76.4
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	200.0
Rebar Depth 'd'	in =		4.00	6.00	8.00
LAP SPLICE IF ABOVE	in =		12.00	25.03	42.80
LAP SPLICE IF BELOW	in =		12.00	25.03	
HOOK EMBED INTO FTG	in =				9.20
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV828 Dsgnr: dw Date: APR 5,2008
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 1'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

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Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,136	429 psf
Mu' : Upward	=	12,764	0 ft-#
Mu' : Downward	=	11,718	19,146 ft-#
Mu: Design	=	1,046	19,146 ft-#
Actual 1-Way Shear	=	3.59	45.15 psi
Allow 1-Way Shear	=	82.16	82.16 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 6 @ 12.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 7.00 in, #5@ 10.75 in, #6@ 15.25 in, #7@ 20.75 in, #8@ 27.25 in, #9@ 34
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	5,883.5	4.56	26,802.6
Toe Active Pressure	=		3.89	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	15.42	717.6
Total	=	5,930.1	**O.T.M.** =	27,520.3

Resisting/Overturning Ratio = **2.31**

Vertical Loads used for Soil Pressure = 10,685.2 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	5,280.0	6.84	36,097.6
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	4.34	78.1
Soil Over Toe	=		1.84	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,800.0	4.21	7,572.7
Earth @ Stem Transitions	=	480.0	4.73	2,268.3
Footing Weight	=	2,167.5	4.34	9,396.1
Key Weight	=			
Vert. Component	=	939.7	8.67	8,147.1
	Total =	10,685.2 lbs	R.M.=	63,559.8

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	

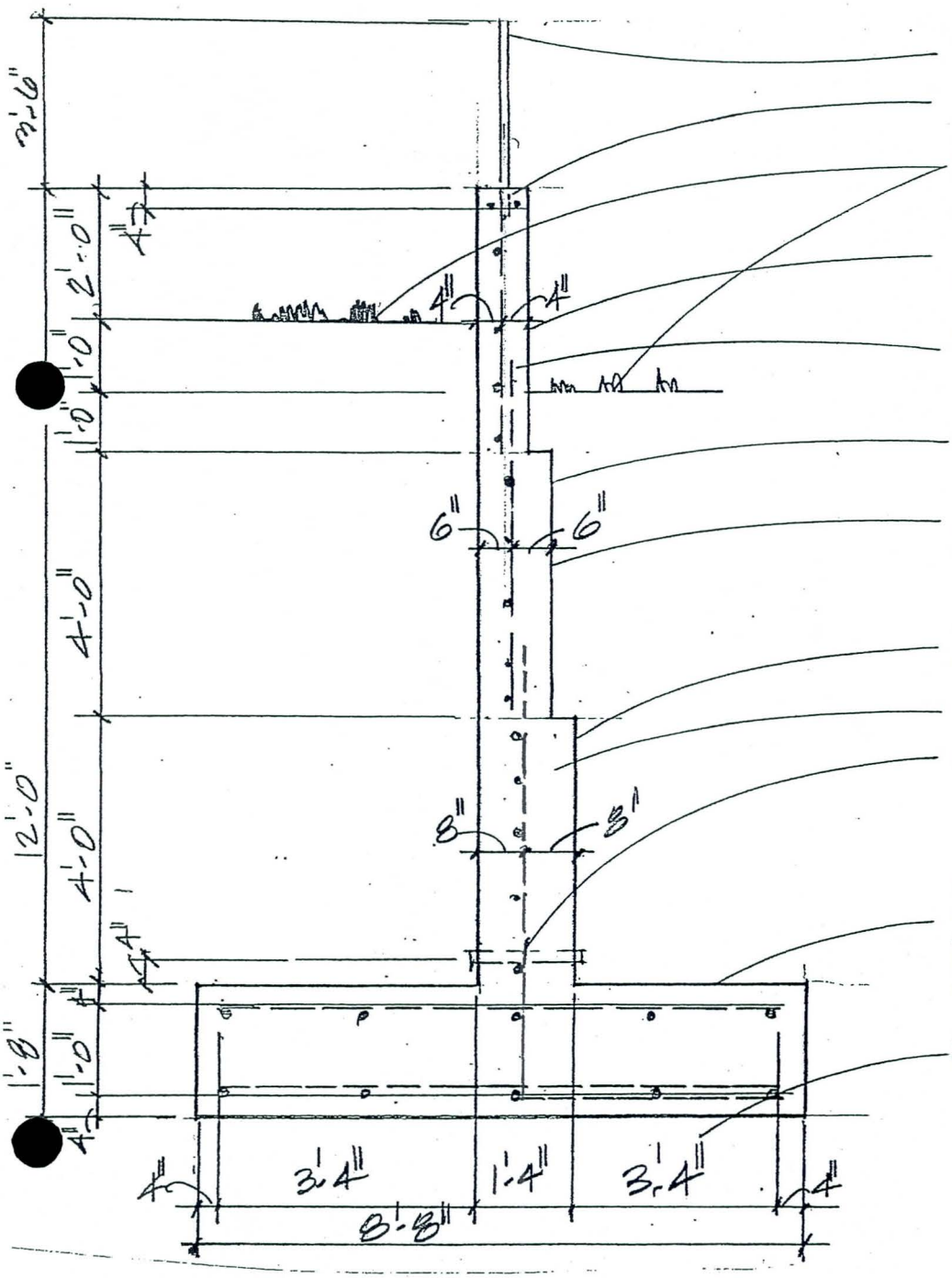
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 14" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#6 LAPPED 26" VERTICALS CENTER IN WALL @ 14" O.C. and #6 HORIZONTAL @ 18" OC.

16" CONCRETE WALL w/#8 LAPPED 43" VERTICALS CENTER IN WALL @ 10" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

8'-8" WIDE x 20" THICK CONCRETE FOOTING w/10#5 BARS CONTINUOUS, #5 x 96" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 96" TRANSVERSE @ 12" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" FLOOD WALL, over a 1'-0" RETAINING WALL, over a 9'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ/FV828

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV829 Dsgnr: dw
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 6'-0"

Page: _____
Date: APR 5,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	16.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	168.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	5.00 ft
Heel Width	=	7.33
Total Footing Width	=	12.33
Footing Thickness	=	28.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.64	OK
Sliding	=	5.24	OK
Total Bearing Load	=	20,758 lbs	
...resultant ecc.	=	11.71 in	
Soil Pressure @ Toe	=	2,483 psf	OK
Soil Pressure @ Heel	=	884 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,472 psf	
ACI Factored @ Heel	=	881 psf	
Footing Shear @ Toe	=	8.3 psi	OK
Footing Shear @ Heel	=	55.5 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	10,634.1 lbs
less 100% Passive Force	=	- 45,352.2 lbs
less 100% Friction Force	=	- 10,379.0 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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	4th	Bottom
		Shear NG!	Stem OK	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	ft =	16.00	12.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	18.00	28.00
Rebar Size	=		# 4	# 6	# 8	# 9
Rebar Spacing	=		16.00	14.00	12.00	10.00
Rebar Placed at	=		Edge	Edge	Edge	Edge
Design Data						
fb/FB + fa/Fa	=		0.578	0.976	0.917	0.940
Total Force @ Section	lbs =		880.9	3,300.1	7,332.1	12,976.9
Moment....Actual	ft-# =		1,503.5	9,327.8	30,054.5	70,134.8
Moment.....Allowable	ft-# =		2,600.4	9,553.5	32,788.4	74,628.0
Shear.....Actual	psi =		18.4	45.8	61.1	72.1
Shear.....Allowable	=		82.2	82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	225.0	350.0
Rebar Depth 'd'	in =		4.00	6.00	10.00	15.00
LAP SPLICE IF ABOVE	in =		12.00	25.03	39.36	45.40
LAP SPLICE IF BELOW	in =		12.00	25.03	39.36	
HOOK EMBED INTO FTG	in =					45.40
Masonry Data						
f'm	psi =					
Fs	psi =					
Solid Grouting	=					
Use Full Stresses	=					
Modular Ratio 'n'	=					
Short Term Factor	=					
Equiv. Solid Thick.	=					
Masonry Block Type	=					
Masonry Design Method	=	ASD				
Concrete Data						
f'c	psi =		3,000.0	3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV829 Dsgnr: dw Date: APR 5,2008
Description....
GUARDRAIL over a 2'-0" FLOOD WALL over a 6'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel	
Factored Pressure	=	2,472	881	psf
Mu' : Upward	=	28,216	0	ft-#
Mu' : Downward	=	30,450	47,524	ft-#
Mu: Design	=	2,234	47,524	ft-#
Actual 1-Way Shear	=	8.32	55.50	psi
Allow 1-Way Shear	=	82.16	82.16	psi
Toe Reinforcing	=	None Spec'd		
Heel Reinforcing	=	# 6 @ 12.00 in		
Key Reinforcing	=	None Spec'd		

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 4.25 in, #5@ 6.50 in, #6@ 9.25 in, #7@ 12.50 in, #8@ 16.25 in, #9@ 20.7
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	10,587.5	6.11	64,701.4
Toe Active Pressure	=		5.44	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	20.08	934.9
Total	=	10,634.1	**O.T.M.** =	65,636.3

Resisting/Overturning Ratio = **2.64**

Vertical Loads used for Soil Pressure = 20,758.1 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	9,593.6	9.83	94,321.1
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	6.17	111.0
Soil Over Toe	=		2.50	
Surcharge Over Toe	=			
Stem Weight(s)	=	3,300.0	5.83	19,241.7
Earth @ Stem Transitions	=	1,840.0	6.65	12,233.3
Footing Weight	=	4,315.5	6.17	26,605.1
Key Weight	=			
Vert. Component	=	1,691.0	12.33	20,849.9
	Total =	20,758.1 lbs	**R.M.=**	173,362.1

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	

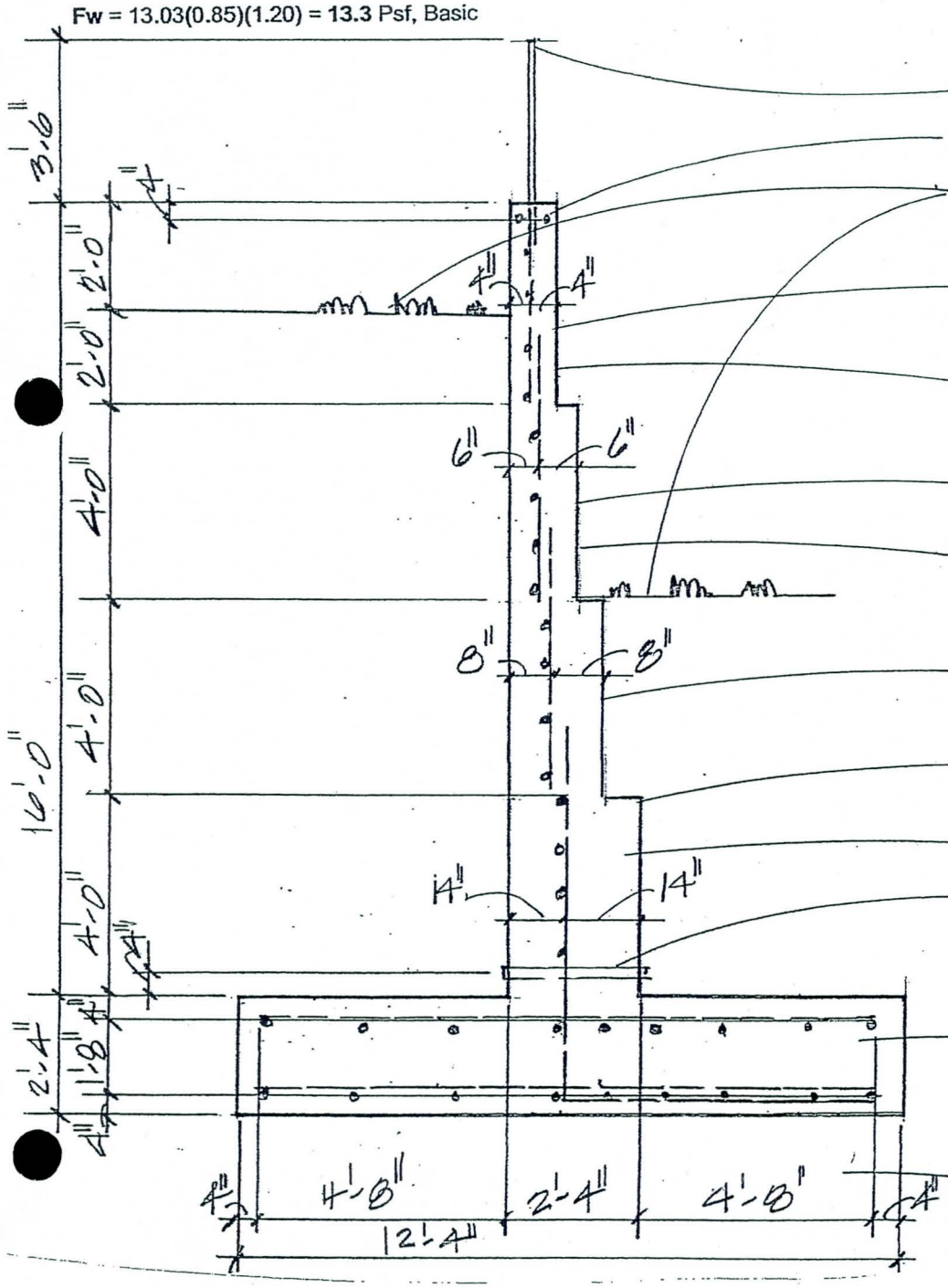
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#6 LAPPED 26" VERTICALS CENTER IN WALL @ 14" O.C. and #6 HORIZONTAL @ 18" OC.

16" CONCRETE WALL w/#7 LAPPED 40" VERTICALS CENTER IN WALL @ 12" O.C. and #6 HORIZONTAL @ 14" OC.

28" CONCRETE WALL w/#9 LAPPED 46" VERTICALS CENTER IN WALL @ 10" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

12'-4" WIDE x 28" THICK CONCRETE FOOTING w/18#5 BARS CONTINUOUS, #5 x 140" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 140" TRANSVERSE @ 12" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 2'-0" FLOOD WALL over a 6'-0" RETAINING WALL, over a 8'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV830 Dsgnr: dw
Description....
GUARDRAIL over a 3'-0" RETAINING WALL over a 8'-0"

Page: _____
Date: APR 5,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
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Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	11.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	132.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	3.00 ft
Heel Width	=	4.33
Total Footing Width	=	7.33
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.01 OK
Sliding	=	6.20 OK
Total Bearing Load	=	8,509 lbs
...resultant ecc.	=	13.76 in
Soil Pressure @ Toe	=	2,250 psf OK
Soil Pressure @ Heel	=	71 psf OK
Allowable	=	2,666 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,324 psf
ACI Factored @ Heel	=	74 psf
Footing Shear @ Toe	=	3.4 psi OK
Footing Shear @ Heel	=	39.2 psi OK
Allowable	=	75.0 psi

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	4,968.4 lbs
less 100% Passive Force	=	- 26,562.5 lbs
less 100% Friction Force	=	- 4,254.5 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NG!	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	ft =	11.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	16.00
Rebar Size	=		# 4	# 5	# 7
Rebar Spacing	=		16.00	14.00	10.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		0.310	0.935	0.987
Total Force @ Section	lbs =		528.1	2,544.1	6,172.9
Moment....Actual	ft-# =		807.4	6,414.1	23,310.4
Moment.....Allowable	ft-# =		2,600.4	6,861.9	23,626.1
Shear.....Actual	psi =		11.0	35.3	64.3
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	200.0
Rebar Depth 'd'	in =		4.00	6.00	8.00
LAP SPLICE IF ABOVE	in =		12.00	19.97	37.07
LAP SPLICE IF BELOW	in =		12.00	19.97	
HOOK EMBED INTO FTG	in =				8.69
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV830 Dsgnr: dw Date: APR 5,2008
Description....
GUARDRAIL over a 3'-0" RETAINING WALL over a 8'-0"

This Wall in File: c:\program files\rp2007\elianto village in t

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,324	74 psf
Mu' : Upward	=	9,076	0 ft-#
Mu' : Downward	=	8,343	12,094 ft-#
Mu: Design	=	733	12,094 ft-#
Actual 1-Way Shear	=	3.43	39.16 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 6 @ 18.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 9.75 in, #5@ 15.00 in, #6@ 21.25 in, #7@ 29.00 in, #8@ 38.00 in, #9@ 48
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	4,921.9	4.17	20,507.8
Toe Active Pressure	=		4.17	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	14.25	663.3
Total	=	4,968.4	O.T.M. =	21,171.2

Resisting/Overturning Ratio = 2.01

Vertical Loads used for Soil Pressure = 8,509.0 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	3,955.6	5.83	23,067.7
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	3.67	66.0
Soil Over Toe	=		1.50	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,700.0	3.55	6,033.3
Earth @ Stem Transitions	=	400.0	4.07	1,626.7
Footing Weight	=	1,649.3	3.67	6,044.5
Key Weight	=			
Vert. Component	=	786.1	7.33	5,762.1
	Total =	8,509.0 lbs	R.M.=	42,600.4

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

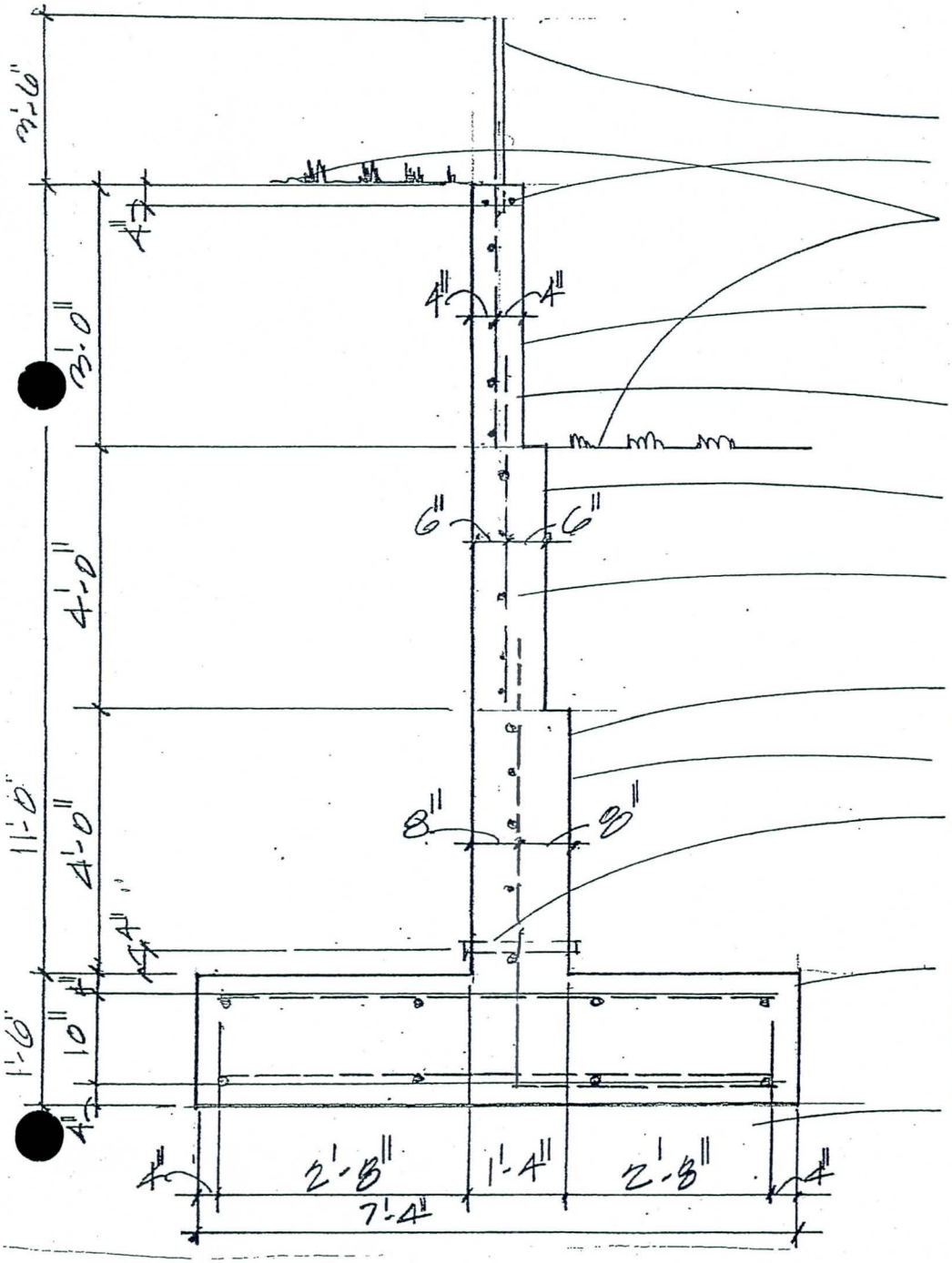
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#5 LAPPED 20" VERTICALS CENTER IN WALL @ 14" O.C. and #6 HORIZONTAL @ 18" OC.

16" CONCRETE WALL w/#7 LAPPED 38" VERTICALS CENTER IN WALL @ 10" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

7'-4" WIDE x 18" THICK CONCRETE FOOTING w/8#5 BARS CONTINUOUS, #5 x 80" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 80" TRANSVERSE @ 18" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 3'-0" RETAINING WALL, over a 8'-0" SCOUR WALL

at ELIANTO VILLAGE in Buckeye, AZ

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV831 Dsgnr: dw Date: APR 5,2008
Description....
GUARDRAIL over a 4'-0" RETAINING WALL over a 7'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	11.00 ft
Wall height above soil	=	3.50 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	132.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	63.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	3.00 ft
Heel Width	=	4.33
Total Footing Width	=	7.33
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	18.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.01	OK
Sliding	=	6.20	OK
Total Bearing Load	=	8,509 lbs	
...resultant ecc.	=	13.76 in	
Soil Pressure @ Toe	=	2,250 psf	OK
Soil Pressure @ Heel	=	71 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,324 psf	
ACI Factored @ Heel	=	74 psf	
Footing Shear @ Toe	=	3.4 psi	OK
Footing Shear @ Heel	=	39.2 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	4,968.4 lbs
less 100% Passive Force	=	- 26,562.5 lbs
less 100% Friction Force	=	- 4,254.5 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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	4th
		Shear NG!	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	ft =	11.00	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Concrete	Concrete	Concrete
Thickness	=		8.00	12.00	16.00
Rebar Size	=		# 4	# 5	# 7
Rebar Spacing	=		16.00	14.00	10.00
Rebar Placed at	=		Edge	Edge	Edge
Design Data					
fb/FB + fa/Fa	=		0.310	0.935	0.987
Total Force @ Section	lbs =		528.1	2,544.1	6,172.9
Moment....Actual	ft-# =		807.4	6,414.1	23,310.4
Moment.....Allowable	ft-# =		2,600.4	6,861.9	23,626.1
Shear.....Actual	psi =		11.0	35.3	64.3
Shear.....Allowable	=		82.2	82.2	82.2
Wall Weight	psf =		100.0	150.0	200.0
Rebar Depth 'd'	in =		4.00	6.00	8.00
LAP SPLICE IF ABOVE	in =		12.00	19.97	37.07
LAP SPLICE IF BELOW	in =		12.00	19.97	
HOOK EMBED INTO FTG	in =				8.69
Masonry Data					
f'm	psi =				
Fs	psi =				
Solid Grouting	=				
Use Full Stresses	=				
Modular Ratio 'n'	=				
Short Term Factor	=				
Equiv. Solid Thick.	=				
Masonry Block Type	=				
Masonry Design Method	=	ASD			
Concrete Data					
f'c	psi =		3,000.0	3,000.0	3,000.0
Fy	psi =		60,000.0	60,000.0	60,000.0

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV831 Dsgnr: dw Date: APR 5,2008
Description....
GUARDRAIL over a 4'-0" RETAINING WALL over a 7'-0"

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,324	74 psf
Mu' : Upward	=	9,076	0 ft-#
Mu' : Downward	=	8,343	12,094 ft-#
Mu: Design	=	733	12,094 ft-#
Actual 1-Way Shear	=	3.43	39.16 psi
Allow 1-Way Shear	=	75.00	75.00 psi

Toe Reinforcing = None Spec'd
Heel Reinforcing = # 6 @ 18.00 in
Key Reinforcing = None Spec'd

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 9.75 in, #5@ 15.00 in, #6@ 21.25 in, #7@ 29.00 in, #8@ 38.00 in, #9@ 48
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	4,921.9	4.17	20,507.8
Toe Active Pressure	=		4.17	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	46.6	14.25	663.3
Total	=	4,968.4	**O.T.M.** =	21,171.2

Resisting/Overturning Ratio = **2.01**

Vertical Loads used for Soil Pressure = 8,509.0 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	3,955.6	5.83	23,067.7
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	18.0	3.67	66.0
Soil Over Toe	=		1.50	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,700.0	3.55	6,033.3
Earth @ Stem Transitions	=	400.0	4.07	1,626.7
Footing Weight	=	1,649.3	3.67	6,044.5
Key Weight	=			
Vert. Component	=	786.1	7.33	5,762.1
Total	=	8,509.0 lbs	**R.M.**=	42,600.4

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE:	F'c = 3000 Psi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06

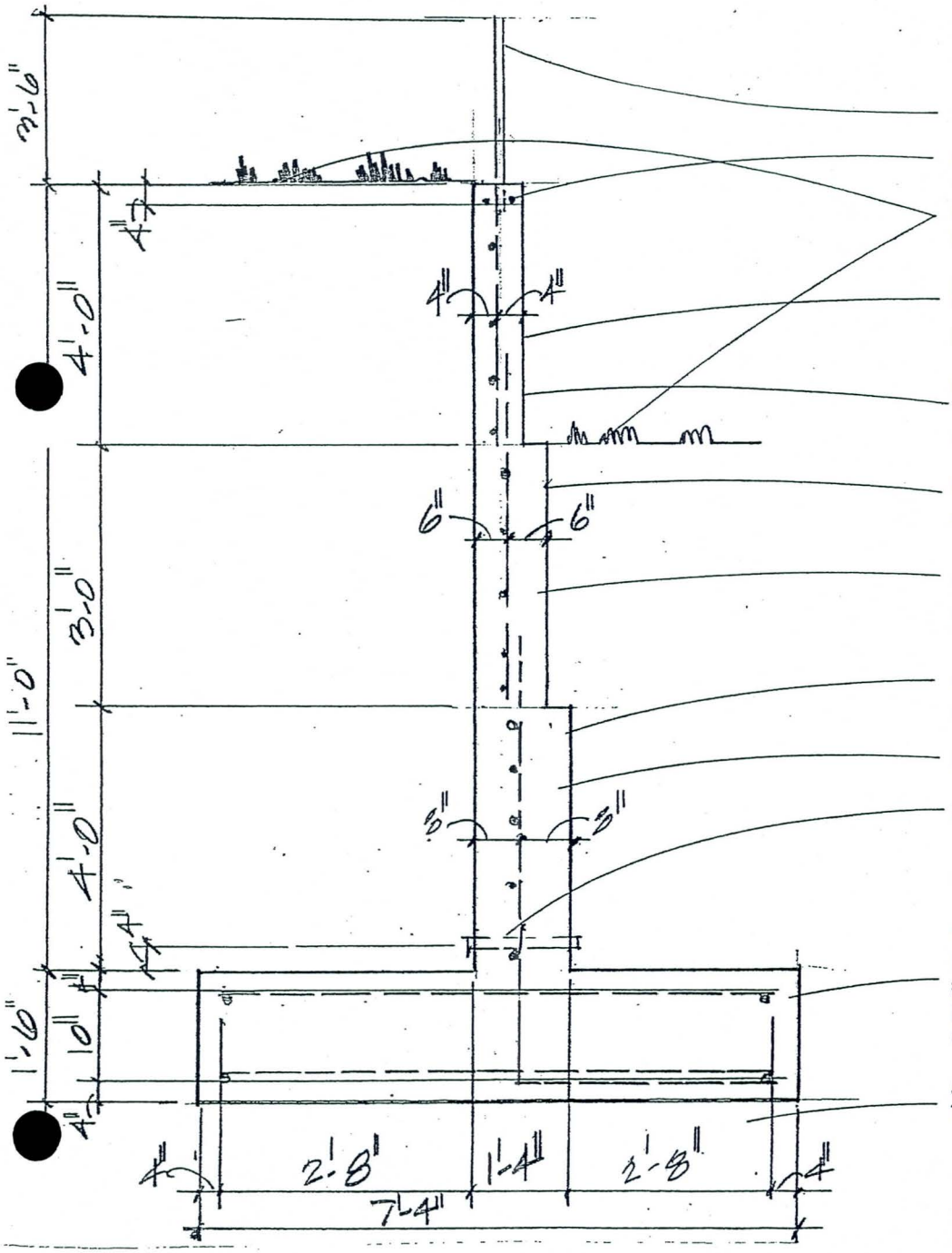
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)

Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic



GUARDRAIL IF REQUIRED

2#3 BARS CONTINUOUS

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

8" CONCRETE WALL w/#4 LAPPED 12" VERTICALS CENTER IN WALL @ 16" O.C. and #5 BARS HORIZONTAL @ 18" O.C.,

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

12" CONCRETE WALL w/#5 LAPPED 20" VERTICALS CENTER IN WALL @ 14" O.C. and #6 HORIZONTAL @ 18" OC.

16" CONCRETE WALL w/#7 LAPPED 38" VERTICALS CENTER IN WALL @ 10" O.C. and #6 HORIZONTAL @ 14" OC.

LAP BARS per ACI 318 in CONCRETE

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

7'-4" WIDE x 18" THICK CONCRETE FOOTING w/8#5 BARS CONTINUOUS, #5 x 80" @ 18" O.C. TRANSVERSE BOTTOM, #6 x 80" TRANSVERSE @ 18" O.C. TOP

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

GUARDRAIL over a 4'-0" RETAINING WALL, over a 7'-0" SCOUR WALL at ELIANTO VILLAGE in Buckeye, AZ/EV831

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV601 Dsgnr: dw
Description....
6'-0" MASONRY THEME WALL

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	0.50 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.50 ft
Heel Width	=	1.33
Total Footing Width	=	1.83
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

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	=	1.57	OK
Sliding	=	5.75	OK
Total Bearing Load	=	645 lbs	
...resultant ecc.	=	6.93 in	
Soil Pressure @ Toe	=	1,273 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,500 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	4.2 psi	OK
Footing Shear @ Heel	=	1.8 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	122.6 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	322.4 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

Top Stem

		Stem OK
Design Height Above Ftg	ft =	0.00
Wall Material Above "Ht"	=	Masonry
Thickness	=	8.00
Rebar Size	=	# 4
Rebar Spacing	=	48.00
Rebar Placed at	=	Edge

Design Data

fb/FB + fa/Fa	=	0.854
Total Force @ Section	lbs =	84.6
Moment....Actual	ft-# =	280.1
Moment.....Allowable	=	328.2
Shear.....Actual	psi =	2.9
Shear.....Allowable	psi =	19.4
Wall Weight	=	49.0
Rebar Depth 'd'	in =	3.82
LAP SPLICE IF ABOVE	in =	36.00
LAP SPLICE IF BELOW	in =	
HOOK EMBED INTO FTG	in =	6.59

Masonry Data

f'm	psi =	1,500
Fs	psi =	24,000
Solid Grouting	=	No
Use Full Stresses	=	No
Modular Ratio 'n'	=	21.48
Short Term Factor	=	1.000
Equiv. Solid Thick.	in =	4.60
Masonry Block Type	=	Medium Weight
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =
Fy	psi =

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV601 Dsgnr: dw
Description....
6'-0" MASONRY THEME WALL

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,500	0 psf
Mu' : Upward	=	260	0 ft-#
Mu' : Downward	=	56	99 ft-#
Mu: Design	=	204	99 ft-#
Actual 1-Way Shear	=	4.18	1.83 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	42.8	0.50	21.4
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	4.50	359.1
Total	=	122.6	**O.T.M.** =	380.5

Resisting/Overturning Ratio = **1.57**

Vertical Loads used for Soil Pressure = 644.8 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	39.8	1.50	59.6
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=		0.00	
Soil Over Toe	=		0.25	
Surcharge Over Toe	=			
Stem Weight(s)	=	318.5	0.83	265.4
Earth @ Stem Transitions	=			
Footing Weight	=	274.5	0.92	251.2
Key Weight	=			
Vert. Component	=	12.0	1.83	21.9
Total	=	644.8 lbs	**R.M.=**	598.1

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

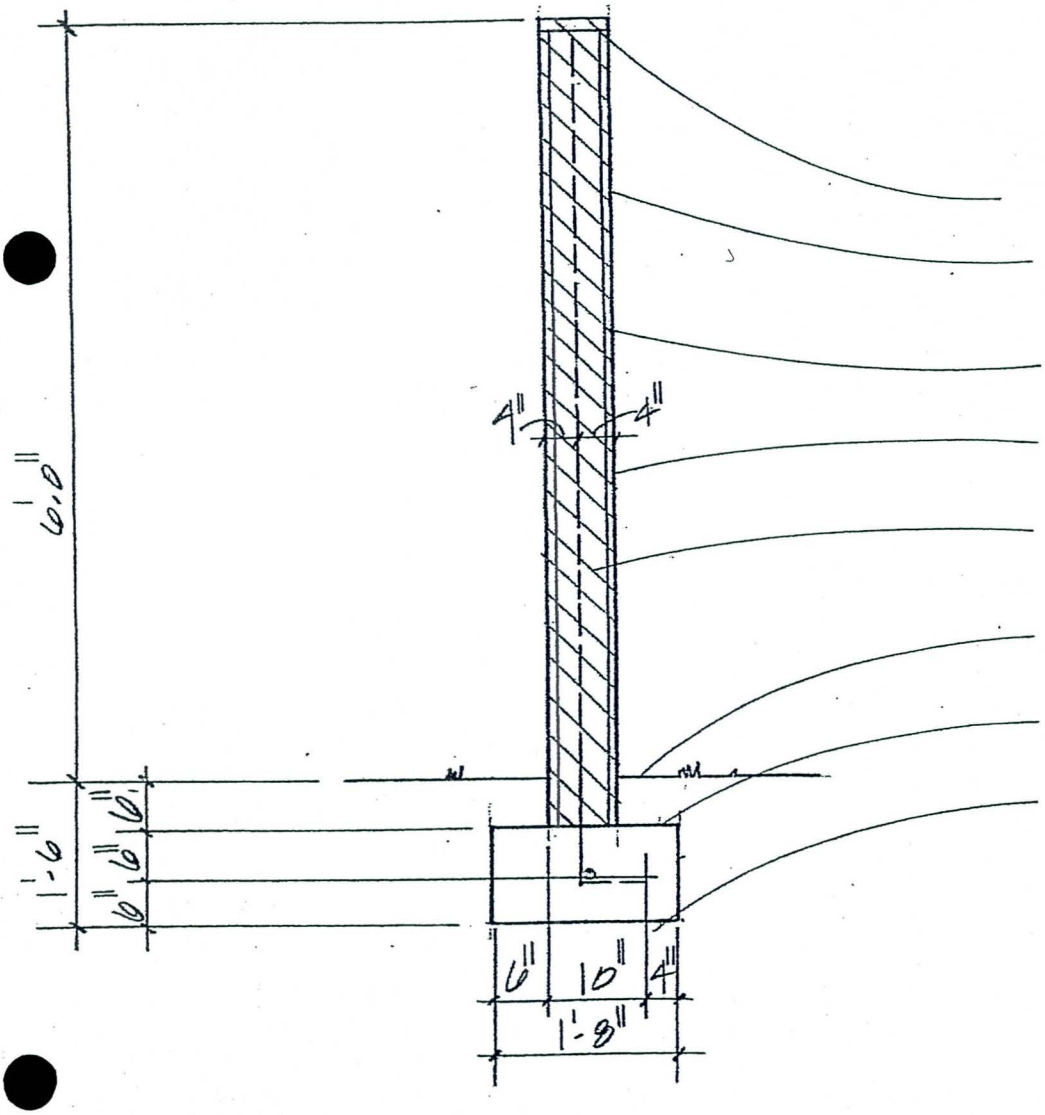
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



SOLID CAP BLOCK

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#4 HOOKED VERTICALS, LAP 24", @ 48" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT REBAR CELLS SOLID

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

20" WIDE x 12" THICK CONCRETE FOOTING w/1#5 BAR CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY THEME WALL at ELIANTO VILLAGE in Buckeye, AZ/EV601

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV602 Dsgnr:
Description....
4'-6" WROUGHT IRON OVER A 1'-6" MASONRY VIEW

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	0.50 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	3.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.50 ft
Heel Width	=	1.33
Total Footing Width	=	1.83
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	10.0 #/ft
...Height to Top	=	2.00 ft
...Height to Bottom	=	0.50 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	40.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	3.10	OK
Sliding	=	7.93	OK
Total Bearing Load	=	464 lbs	
...resultant ecc.	=	3.14 in	
Soil Pressure @ Toe	=	471 psf	OK
Soil Pressure @ Heel	=	36 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	551 psf	
ACI Factored @ Heel	=	42 psf	
Footing Shear @ Toe	=	1.0 psi	OK
Footing Shear @ Heel	=	1.8 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	77.6 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	232.1 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK
Design Height Above Ftg	ft =	2.00	0.00
Wall Material Above "Ht"	=	Fence	Masonry
Thickness	=		8.00
Rebar Size	=		# 4
Rebar Spacing	=		48.00
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		0.272
Total Force @ Section	lbs =		39.6
Moment....Actual	ft-# =		88.8
Moment.....Allowable	ft-# =		326.8
Shear.....Actual	psi =		1.3
Shear.....Allowable	=		19.4
Wall Weight	psf =		49.0
Rebar Depth 'd'	in =		3.81
LAP SPLICE IF ABOVE	in =		24.00
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		6.00
Masonry Data			
f'm	psi =		1,500
Fs	psi =		24,000
Solid Grouting	=		No
Use Full Stresses	=		No
Modular Ratio 'n'	=		21.48
Short Term Factor	=		1.000
Equiv. Solid Thick.	=		4.60
Masonry Block Type	=	Medium Weight	
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV602 Dsgnr:
Description....
4'-6" WROUGHT IRON OVER A 1'-6" MASONRY VIEW

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel	
Factored Pressure	=	551	42	psf
Mu' : Upward	=	109	0	ft-#
Mu' : Downward	=	56	99	ft-#
Mu: Design	=	53	99	ft-#
Actual 1-Way Shear	=	1.01	1.83	psi
Allow 1-Way Shear	=	75.00	75.00	psi
Toe Reinforcing	=	None Spec'd		
Heel Reinforcing	=	None Spec'd		
Key Reinforcing	=	None Spec'd		

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	42.8	0.50	21.4
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=	15.0	2.25	33.8
Load @ Stem Above Soil	=	19.8	4.50	89.1
Total	=	77.6	O.T.M. =	144.2

Resisting/Overturning Ratio = 3.10

Vertical Loads used for Soil Pressure = 464.3 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	39.8	1.50	59.6
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	40.0	0.83	33.3
Soil Over Toe	=		0.25	
Surcharge Over Toe	=			
Stem Weight(s)	=	98.0	0.83	81.7
Earth @ Stem Transitions	=			
Footing Weight	=	274.5	0.92	251.2
Key Weight	=			
Vert. Component	=	12.0	1.83	21.9
Total	=	464.3 lbs	R.M.=	447.7

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

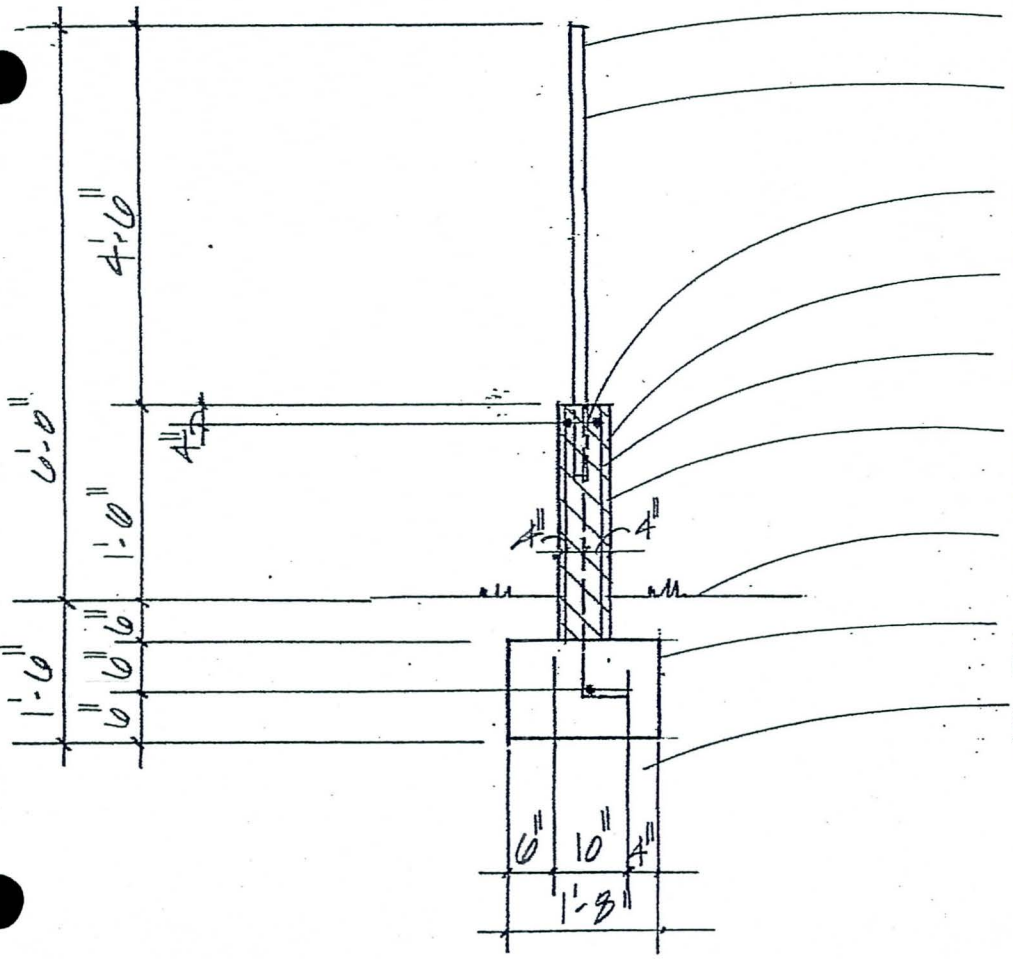
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
0.25 Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



STEEL VIEW FENCE

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

2#3 BARS CONTINUOUS, GROUT SOLID IN 8" x 8" BOND BEAM

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#4 HOOKED VERTICALS, LAP 24", @ 48" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT REBAR CELLS SOLID

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

20" WIDE x 12" THICK CONCRETE FOOTING w/1#5 BAR CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

4'-6" STEEL VIEW WALL over a 1'-6' MASONRY WALL at ELIANTO VILLAGE in Buckeye, AZ/EV602

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV603 Dsgnr: dw
Description....
24" SQUARE x 6'-8" TALL MASONRY THEME WALL

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	0.50 ft
Wall height above soil	=	6.67 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.50 ft
Heel Width	=	2.50
Total Footing Width	=	3.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

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	=	4.15	OK
Sliding	=	8.15	OK
Total Bearing Load	=	1,378 lbs	
...resultant ecc.	=	5.66 in	
Soil Pressure @ Toe	=	893 psf	OK
Soil Pressure @ Heel	=	26 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,062 psf	
ACI Factored @ Heel	=	31 psf	
Footing Shear @ Toe	=	3.4 psi	OK
Footing Shear @ Heel	=	3.1 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	131.5 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	689.0 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

Top Stem

		Stem OK
Design Height Above Ftg	ft =	0.00
Wall Material Above "Ht"	=	Masonry
Thickness	=	16.00
Rebar Size	=	# 4
Rebar Spacing	=	16.00
Rebar Placed at	=	Edge

Design Data

fb/FB + fa/Fa	=	0.107
Total Force @ Section	lbs =	93.5
Moment....Actual	ft-# =	341.0
Moment.....Allowable	=	3,176.9
Shear.....Actual	psi =	0.9
Shear.....Allowable	psi =	19.4
Wall Weight	=	118.0
Rebar Depth 'd'	in =	12.00
LAP SPLICE IF ABOVE	in =	24.00
LAP SPLICE IF BELOW	in =	
HOOK EMBED INTO FTG	in =	6.00

Masonry Data

f'm	psi =	1,500
Fs	psi =	24,000
Solid Grouting	=	No
Use Full Stresses	=	No
Modular Ratio 'n'	=	21.48
Short Term Factor	=	1.000
Equiv. Solid Thick.	in =	11.60
Masonry Block Type	=	Medium Weight
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	
Fy	psi =	

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV603 Dsgnr: dw Date: APR 9,2008
Description....
24" SQUARE x 6'-8" TALL MASONRY THEME WALL

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,062	31 psf
Mu' : Upward	=	336	0 ft-#
Mu' : Downward	=	88	306 ft-#
Mu: Design	=	248	306 ft-#
Actual 1-Way Shear	=	3.43	3.07 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	42.8	0.50	21.4
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	88.7	4.84	428.9
Total	=	131.5	**O.T.M.** =	450.3

Resisting/Overturning Ratio = **4.15**

Vertical Loads used for Soil Pressure = 1,378.0 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	70.0	2.42	169.2
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=		0.00	
Soil Over Toe	=		0.25	
Surcharge Over Toe	=			
Stem Weight(s)	=	846.1	1.17	987.1
Earth @ Stem Transitions	=			
Footing Weight	=	450.0	1.50	675.0
Key Weight	=			
Vert. Component	=	12.0	3.00	35.9
	Total =	1,378.0 lbs	**R.M.=**	1,867.1

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

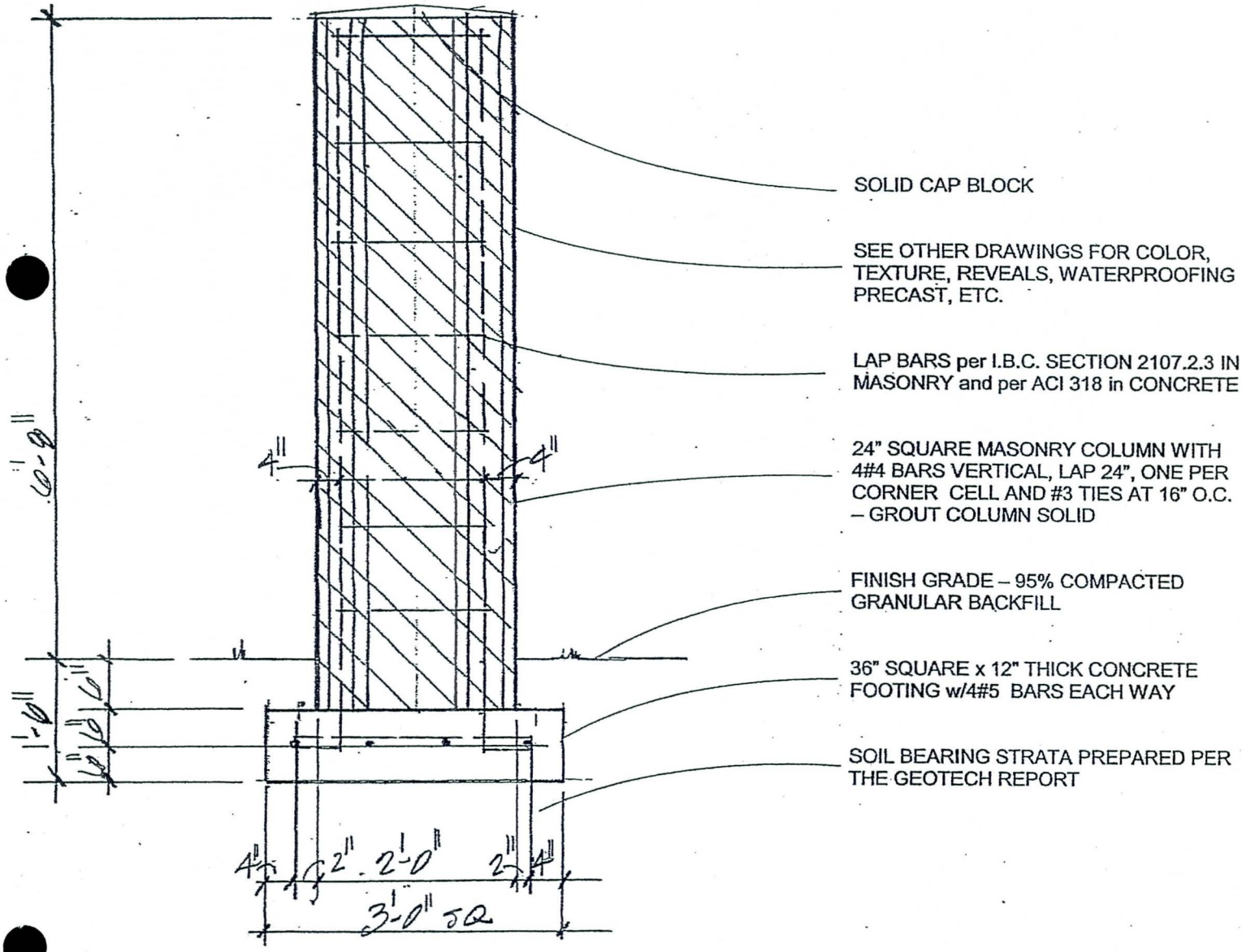
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3 Psf, Basic, No Increase**

ASCE 7-Q, OTM & SLIDING = 0.6DL = **1.67** F.S.

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	



24" SQUARE x 6'-8" TALL MASONRY THEME WALL COLUMN at ELIANTO VILLAGE in Buckeye, AZ/EV603

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV604 Dsgnr: dw
Description....
24" SQUARE x 6'-8" TALL MASONRY THEME WALL

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	0.50 ft
Wall height above soil	=	6.67 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.50 ft
Heel Width	=	2.50
Total Footing Width	=	3.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	320.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	4.98	OK
Sliding	=	9.37	OK
Total Bearing Load	=	1,698 lbs	
...resultant ecc.	=	5.35 in	
Soil Pressure @ Toe	=	1,071 psf	OK
Soil Pressure @ Heel	=	61 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,276 psf	
ACI Factored @ Heel	=	73 psf	
Footing Shear @ Toe	=	4.4 psi	OK
Footing Shear @ Heel	=	3.1 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	131.5 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	849.0 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

Top Stem

		Stem OK
Design Height Above Ftg	ft =	0.00
Wall Material Above "Ht"	=	Masonry
Thickness	=	16.00
Rebar Size	=	# 4
Rebar Spacing	=	16.00
Rebar Placed at	=	Edge

Design Data

fb/FB + fa/Fa	=	0.107
Total Force @ Section	lbs =	93.5
Moment....Actual	ft-# =	341.0
Moment.....Allowable	=	3,176.9
Shear.....Actual	psi =	0.9
Shear.....Allowable	psi =	19.4
Wall Weight	=	118.0
Rebar Depth 'd'	in =	12.00
LAP SPLICE IF ABOVE	in =	24.00
LAP SPLICE IF BELOW	in =	
HOOK EMBED INTO FTG	in =	6.00

Masonry Data

f'm	psi =	1,500
Fs	psi =	24,000
Solid Grouting	=	No
Use Full Stresses	=	No
Modular Ratio 'n'	=	21.48
Short Term Factor	=	1.000
Equiv. Solid Thick.	in =	11.60
Masonry Block Type	=	Medium Weight
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =
Fy	psi =

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV604 Dsgnr: dw Date: APR 9,2008
Description....
24" SQUARE x 6'-8" TALL MASONRY THEME WALL

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,276	73 psf
Mu' : Upward	=	404	0 ft-#
Mu' : Downward	=	88	306 ft-#
Mu: Design	=	317	306 ft-#
Actual 1-Way Shear	=	4.41	3.07 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	42.8	0.50	21.4
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	88.7	4.84	428.9
Total	=	131.5	**O.T.M.** =	450.3

Resisting/Overturning Ratio = **4.98**

Vertical Loads used for Soil Pressure = 1,698.0 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	70.0	2.42	169.2
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	320.0	1.17	373.3
Soil Over Toe	=		0.25	
Surcharge Over Toe	=			
Stem Weight(s)	=	846.1	1.17	987.1
Earth @ Stem Transitions	=			
Footing Weight	=	450.0	1.50	675.0
Key Weight	=			
Vert. Component	=	12.0	3.00	35.9
	Total =	1,698.0 lbs	**R.M.=**	2,240.5

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03 Psf**

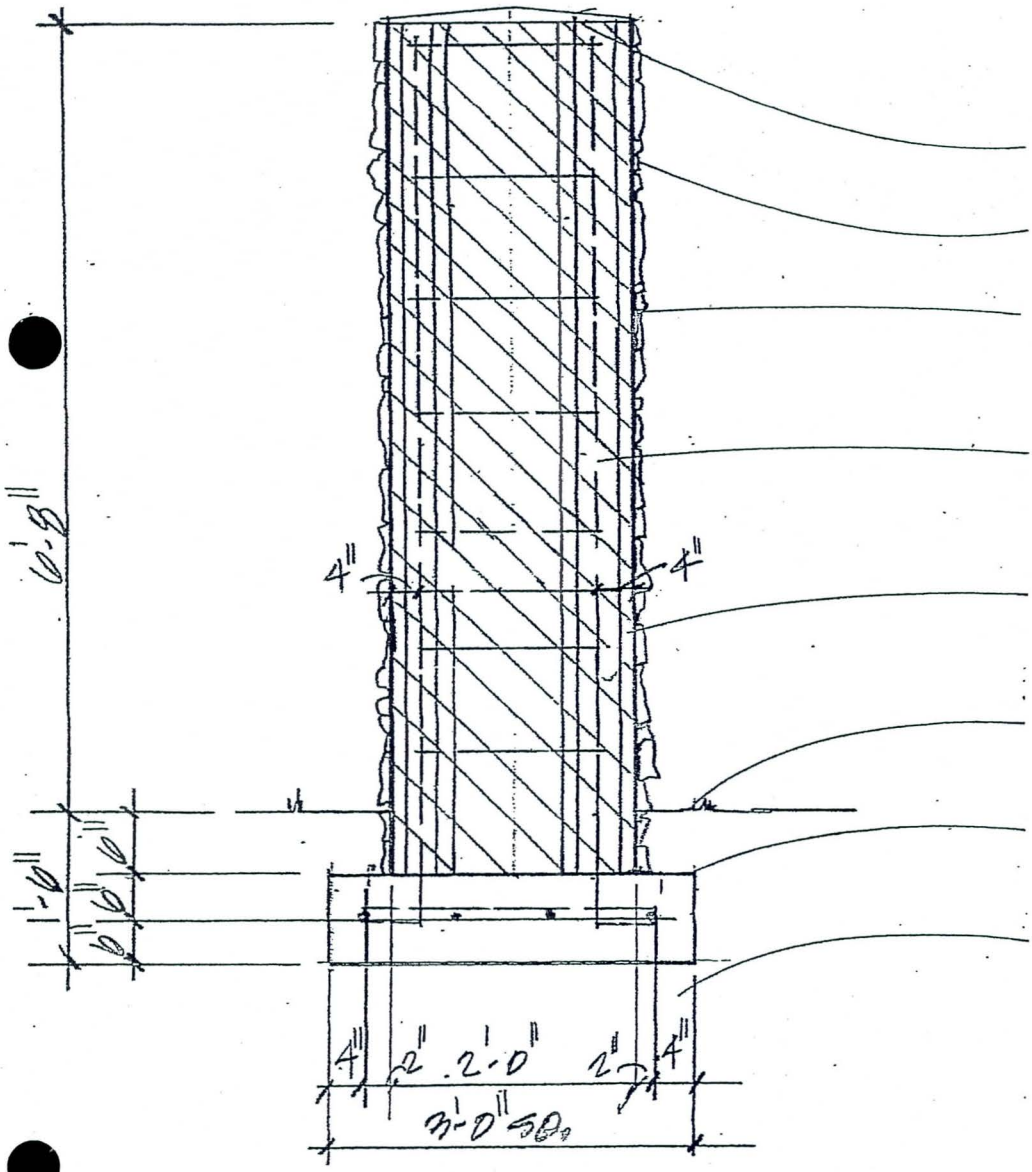
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3 Psf, Basic, No Increase**

ASCE 7-Q, OTM & SLIDING = 0.6DL = **1.67** F.S.

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	



SOLID CAP BLOCK

STONE VENEER

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

24" SQUARE MASONRY COLUMN WITH 4#4 BARS VERTICAL, LAP 24", ONE PER CORNER CELL AND #3 TIES AT 16" O.C. – GROUT COLUMN SOLID

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

36" SQUARE x 12" THICK CONCRETE FOOTING w/4#5 BARS EACH WAY

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

24" SQUARE x 6'-8" TALL MASONRY THEME WALL COLUMN with STONE VENEER at ELIANTO VILLAGE in Buckeye, AZ/EV604

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV605 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 1'-4" MASONRY RETAINING

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	1.33 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.33 ft
Heel Width	=	1.83
Total Footing Width	=	2.16
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	1.82	OK
Sliding	=	4.44	OK
Total Bearing Load	=	858 lbs	
...resultant ecc.	=	7.20 in	
Soil Pressure @ Toe	=	1,192 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,382 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	3.1 psi	OK
Footing Shear @ Heel	=	4.7 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	182.9 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	429.1 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK
Design Height Above Ftg	ft =	1.33	0.00
Wall Material Above "Ht"	=	Fence	Masonry
Thickness	=		8.00
Rebar Size	=		# 4
Rebar Spacing	=		48.00
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		0.677
Total Force @ Section	lbs =		113.4
Moment....Actual	ft-# =		360.4
Moment.....Allowable	ft-# =		532.4
Shear.....Actual	psi =		1.6
Shear.....Allowable	=		38.7
Wall Weight	psf =		78.0
Rebar Depth 'd'	in =		5.63
LAP SPLICE IF ABOVE	in =		24.00
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		6.00
Masonry Data			
f'm	psi =		1,500
Fs	psi =		24,000
Solid Grouting	=		Yes
Use Full Stresses	=		Yes
Modular Ratio 'n'	=		21.48
Short Term Factor	=		1.000
Equiv. Solid Thick.	=		7.60
Masonry Block Type	=	Medium Weight	
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV605 Dsgnr: dw Date: APR 9,2008
Description....
6'-0" MASONRY WALL over a 1'-4" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,382	0 psf
Mu' : Upward	=	151	0 ft-#
Mu' : Downward	=	31	382 ft-#
Mu: Design	=	120	382 ft-#
Actual 1-Way Shear	=	3.07	4.69 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings
Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	103.1	0.78	80.1
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	5.33	425.3
Total	=	182.9	**O.T.M.** =	505.4

Resisting/Overturning Ratio = **1.82**

Vertical Loads used for Soil Pressure = 858.3 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	185.7	1.58	293.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	0.66	143.3
Soil Over Toe	=		0.17	
Surcharge Over Toe	=			
Stem Weight(s)	=	103.7	0.66	68.8
Earth @ Stem Transitions	=			
Footing Weight	=	324.0	1.08	349.9
Key Weight	=			
Vert. Component	=	28.9	2.16	62.3
	Total =	858.3 lbs	**R.M.=**	917.4

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

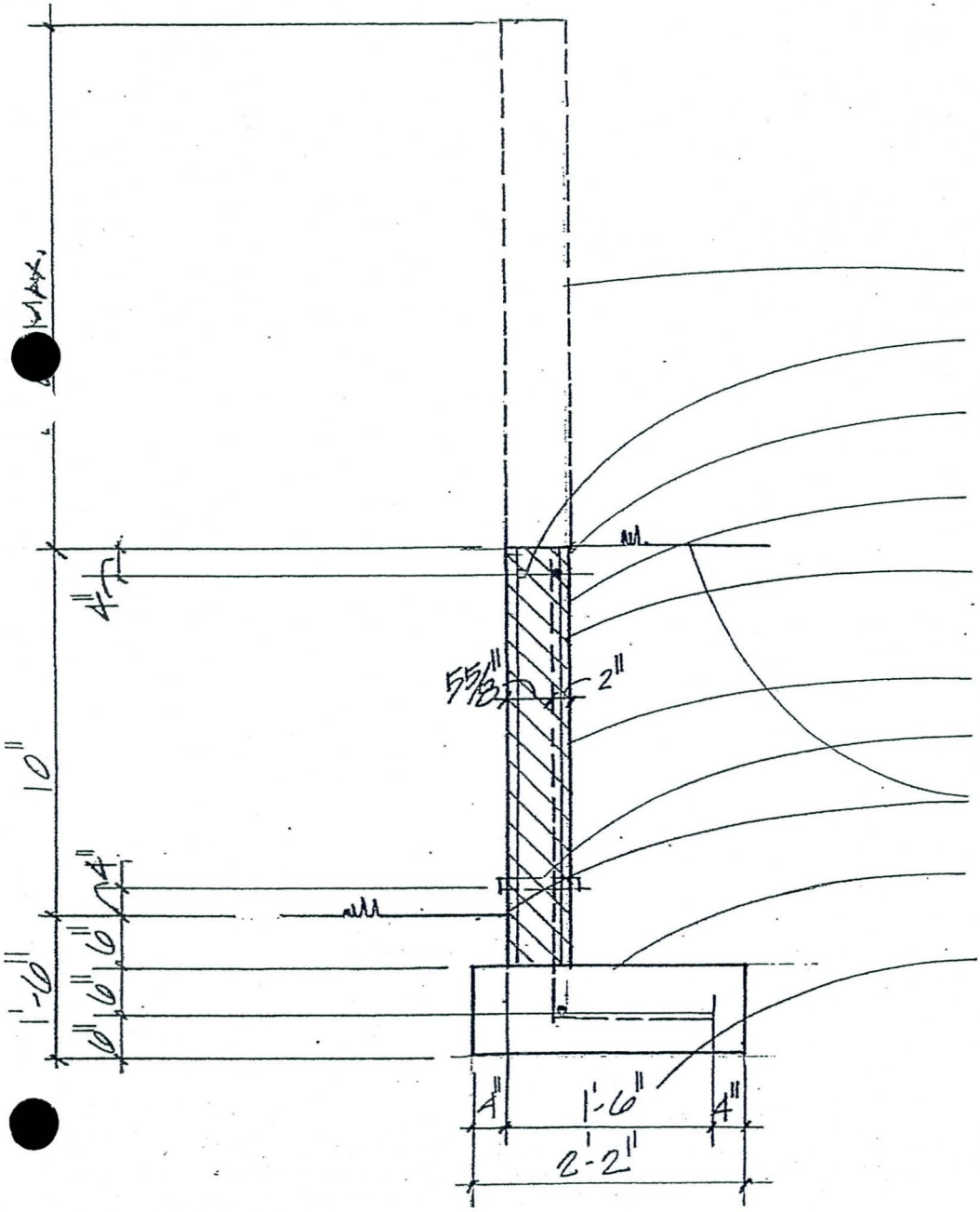
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G.= 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#4 HOOKED VERTICALS, LAP 24" @ 48" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

26" WIDE x 12" THICK CONCRETE FOOTING w/1#5 BAR CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 1'-4" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV605

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV606 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 2'-0" MASONRY RETAINING

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	2.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.33 ft
Heel Width	=	2.00
Total Footing Width	=	2.33
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.00	OK
Sliding	=	3.70	OK
Total Bearing Load	=	1,089 lbs	
...resultant ecc.	=	6.84 in	
Soil Pressure @ Toe	=	1,221 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,401 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	3.2 psi	OK
Footing Shear @ Heel	=	6.9 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	250.8 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	544.7 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NGI	Stem OK
Design Height Above Ftg	ft =	2.00	0.00
Wall Material Above "Ht"	=	Fence	Masonry
Thickness	=		8.00
Rebar Size	=		# 4
Rebar Spacing	=		48.00
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		0.845
Total Force @ Section	lbs =		155.8
Moment....Actual	ft-# =		449.7
Moment.....Allowable	ft-# =		532.4
Shear.....Actual	psi =		2.2
Shear.....Allowable	=		38.7
Wall Weight	psf =		78.0
Rebar Depth 'd'	in =		5.63
LAP SPLICE IF ABOVE	in =		36.00
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		7.09
Masonry Data			
f'm	psi =		1,500
Fs	psi =		24,000
Solid Grouting	=		Yes
Use Full Stresses	=		Yes
Modular Ratio 'n'	=		21.48
Short Term Factor	=		1.000
Equiv. Solid Thick.	=		7.60
Masonry Block Type	=	Medium Weight	
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV606 Dsgnr: dw Date: APR 9,2008
Description....
6'-0" MASONRY WALL over a 2'-0" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,401	0 psf
Mu' : Upward	=	157	0 ft-#
Mu' : Downward	=	31	629 ft-#
Mu: Design	=	126	629 ft-#
Actual 1-Way Shear	=	3.22	6.87 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings
Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	171.0	1.00	171.0
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	6.00	478.8
Total	=	250.8	**O.T.M.** =	649.8

Resisting/Overturning Ratio = **2.00**

Vertical Loads used for Soil Pressure = 1,089.3 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	320.0	1.66	532.3
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	0.66	143.3
Soil Over Toe	=		0.17	
Surcharge Over Toe	=			
Stem Weight(s)	=	156.0	0.66	103.5
Earth @ Stem Transitions	=			
Footing Weight	=	349.5	1.17	407.2
Key Weight	=			
Vert. Component	=	47.8	2.33	111.5
	Total =	1,089.3 lbs	**R.M.=**	1,297.7

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

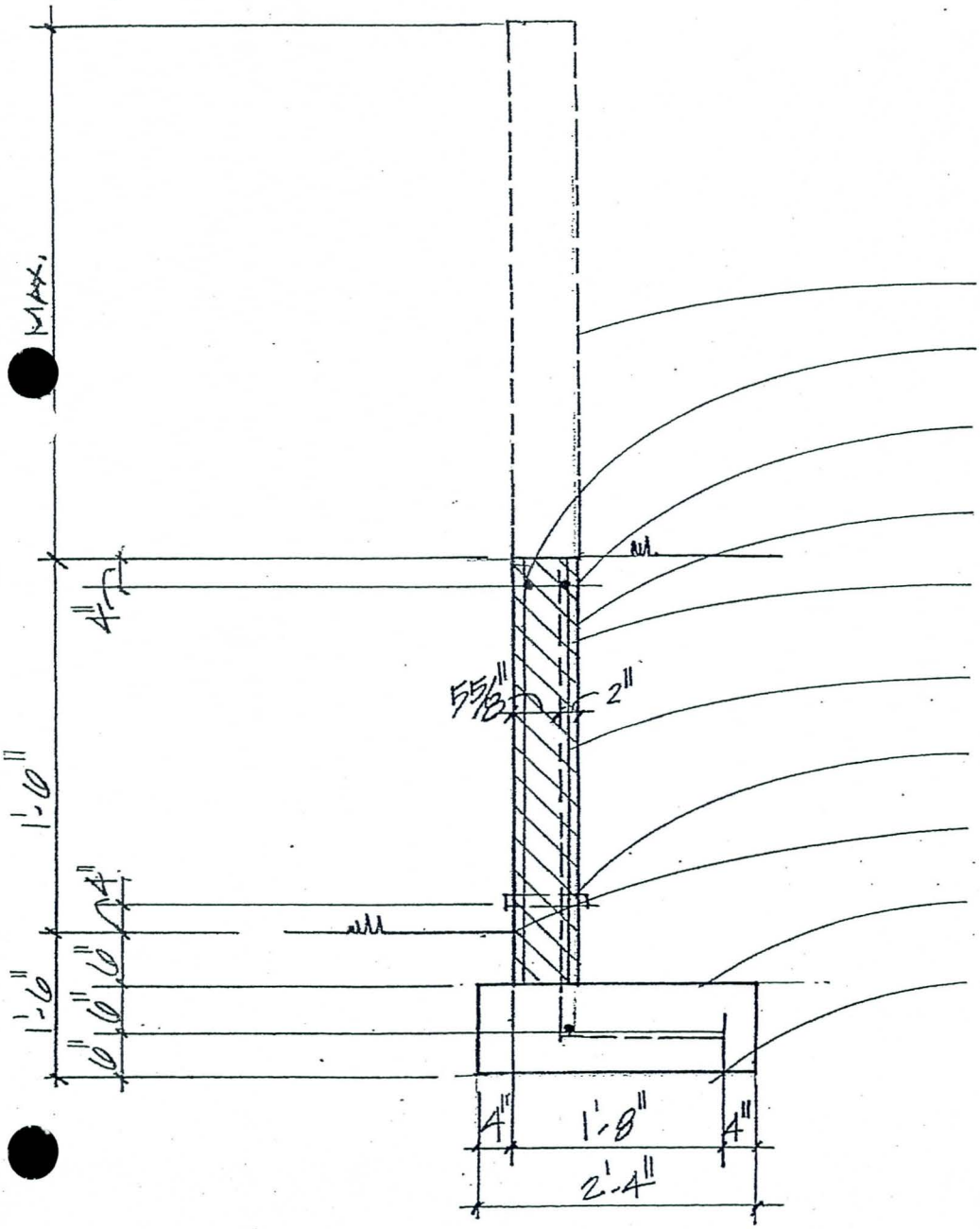
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = 13.3 Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#4 HOOKED VERTICALS, LAP36", @ 48" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

28" WIDE x 12" THICK CONCRETE FOOTING w/1#5 BAR CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 2'-0" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV606

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV607 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 2'-8" MASONRY RETAINING

Page: _____
Date: APR 10,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	2.67 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.33 ft
Heel Width	=	2.17
Total Footing Width	=	2.50
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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	=	216.0 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

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

*Design Summary

Wall Stability Ratios

Overturning	=	2.10 OK
Sliding	=	3.15 OK
Total Bearing Load	=	1,353 lbs
...resultant ecc.	=	6.78 in
Soil Pressure @ Toe	=	1,317 psf OK
Soil Pressure @ Heel	=	0 psf OK
Allowable	=	2,666 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	1,497 psf
ACI Factored @ Heel	=	0 psf
Footing Shear @ Toe	=	3.6 psi OK
Footing Shear @ Heel	=	9.4 psi OK
Allowable	=	75.0 psi

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	335.7 lbs
less 100% Passive Force	= -	382.5 lbs
less 100% Friction Force	= -	676.3 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK
Design Height Above Ftg	ft =	2.67	0.00
Wall Material Above "Ht"	=	Fence	Masonry
Thickness	=		8.00
Rebar Size	=		# 4
Rebar Spacing	=		40.00
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		0.901
Total Force @ Section	lbs =		215.2
Moment....Actual	ft-# =		573.0
Moment.....Allowable	ft-# =		635.7
Shear.....Actual	psi =		3.0
Shear.....Allowable	=		38.7
Wall Weight	psf =		78.0
Rebar Depth 'd'	in =		5.63
LAP SPLICE IF ABOVE	in =		36.00
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		7.57
Masonry Data			
f'm	psi =		1,500
Fs	psi =		24,000
Solid Grouting	=		Yes
Use Full Stresses	=		Yes
Modular Ratio 'n'	=		21.48
Short Term Factor	=		1.000
Equiv. Solid Thick.	=		7.60
Masonry Block Type	=	Medium Weight	
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV607 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 2'-8" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,497	0 psf
Mu' : Upward	=	170	0 ft-#
Mu' : Downward	=	31	0 ft-#
Mu: Design	=	139	917 ft-#
Actual 1-Way Shear	=	3.56	9.44 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	255.9	1.22	313.1
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=	-		
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	6.67	532.3
Total	=	335.7	**O.T.M.** =	845.3

Resisting/Overturning Ratio = 2.10

Vertical Loads used for Soil Pressure = 1,352.5 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	481.7	1.75	842.1
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	0.66	143.3
Soil Over Toe	=		0.17	
Surcharge Over Toe	=			
Stem Weight(s)	=	208.3	0.66	138.1
Earth @ Stem Transitions	=			
Footing Weight	=	375.0	1.25	468.8
Key Weight	=			
Vert. Component	=	71.6	2.50	179.0
	Total =	1,352.5 lbs	**R.M.=**	1,771.3

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

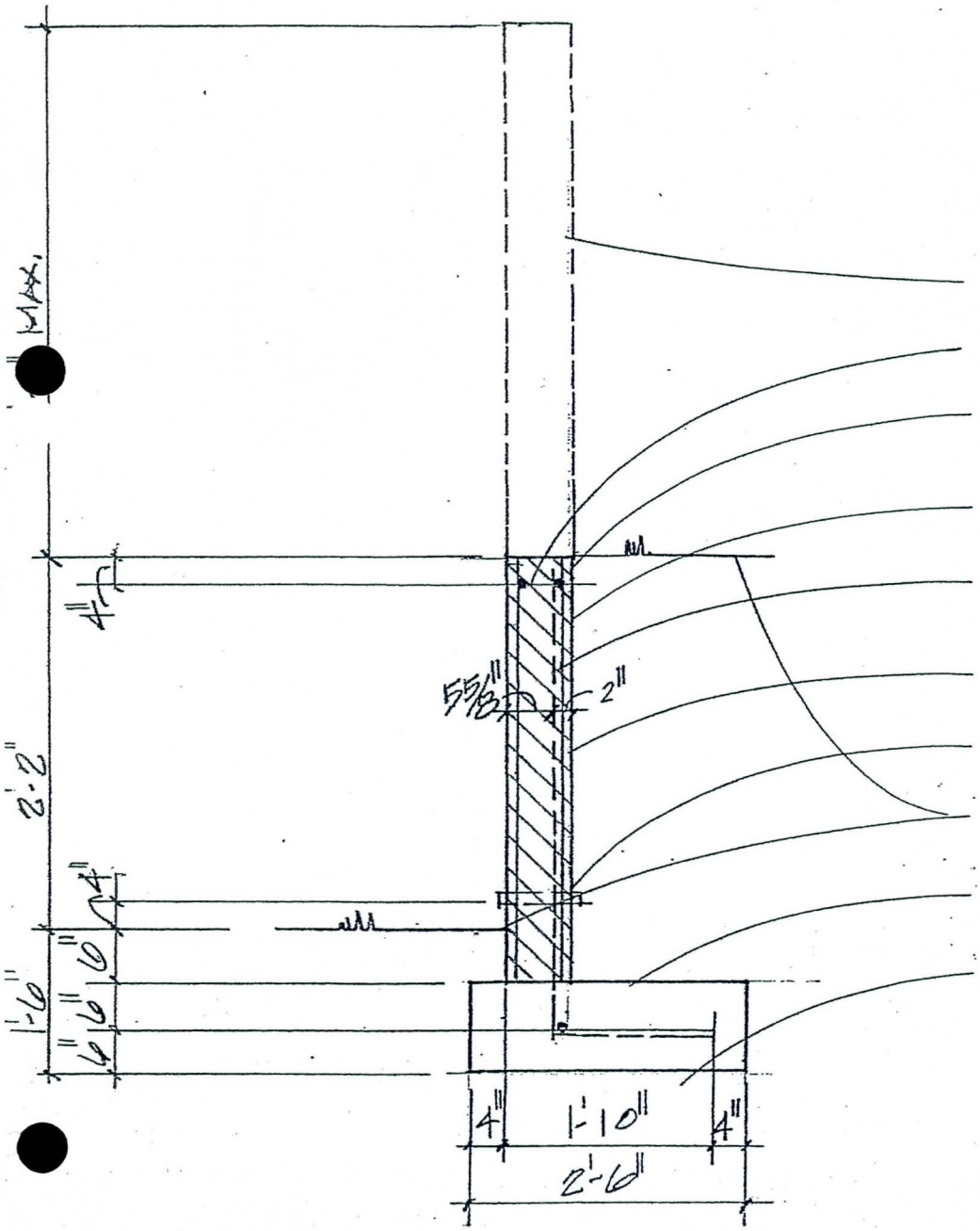
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#4 HOOKED VERTICALS, LAP 36", @ 40" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

30" WIDE x 12" THICK CONCRETE FOOTING w/1#5 BAR CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 2'-8" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV607

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV608 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 3'-4" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	3.33 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.33 ft
Heel Width	=	2.33
Total Footing Width	=	2.66
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.12	OK
Sliding	=	2.76	OK
Total Bearing Load	=	1,639 lbs	
...resultant ecc.	=	6.97 in	
Soil Pressure @ Toe	=	1,459 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,644 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	4.0 psi	OK
Footing Shear @ Heel	=	12.3 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	436.0 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	819.5 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK
Design Height Above Ftg	ft =	3.33	0.00
Wall Material Above "Ht"	=	Fence	Masonry
Thickness	=		8.00
Rebar Size	=		# 4
Rebar Spacing	=		32.00
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		0.936
Total Force @ Section	lbs =		290.5
Moment....Actual	ft-# =		739.0
Moment.....Allowable	ft-# =		789.4
Shear.....Actual	psi =		4.1
Shear.....Allowable	=		38.7
Wall Weight	psf =		78.0
Rebar Depth 'd'	in =		5.63
LAP SPLICE IF ABOVE	in =		36.00
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		7.86
Masonry Data			
f'm	psi =		1,500
Fs	psi =		24,000
Solid Grouting	=		Yes
Use Full Stresses	=		Yes
Modular Ratio 'n'	=		21.48
Short Term Factor	=		1.000
Equiv. Solid Thick.	=		7.60
Masonry Block Type	=	Medium Weight	
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV608 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 3'-4" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,644	0 psf
Mu' : Upward	=	188	0 ft-#
Mu' : Downward	=	31	0 ft-#
Mu: Design	=	157	1,182 ft-#
Actual 1-Way Shear	=	4.04	12.32 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings
Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	356.2	1.44	514.2
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	7.33	584.9
Total	=	436.0	**O.T.M.** =	1,099.1

Resisting/Overturning Ratio = **2.12**

Vertical Loads used for Soil Pressure = 1,639.1 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	664.7	1.83	1,215.2
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	0.66	143.3
Soil Over Toe	=		0.17	
Surcharge Over Toe	=			
Stem Weight(s)	=	259.7	0.66	172.3
Earth @ Stem Transitions	=			
Footing Weight	=	399.0	1.33	530.7
Key Weight	=			
Vert. Component	=	99.7	2.66	265.1
	Total =	1,639.1 lbs	**R.M.=**	2,326.6

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

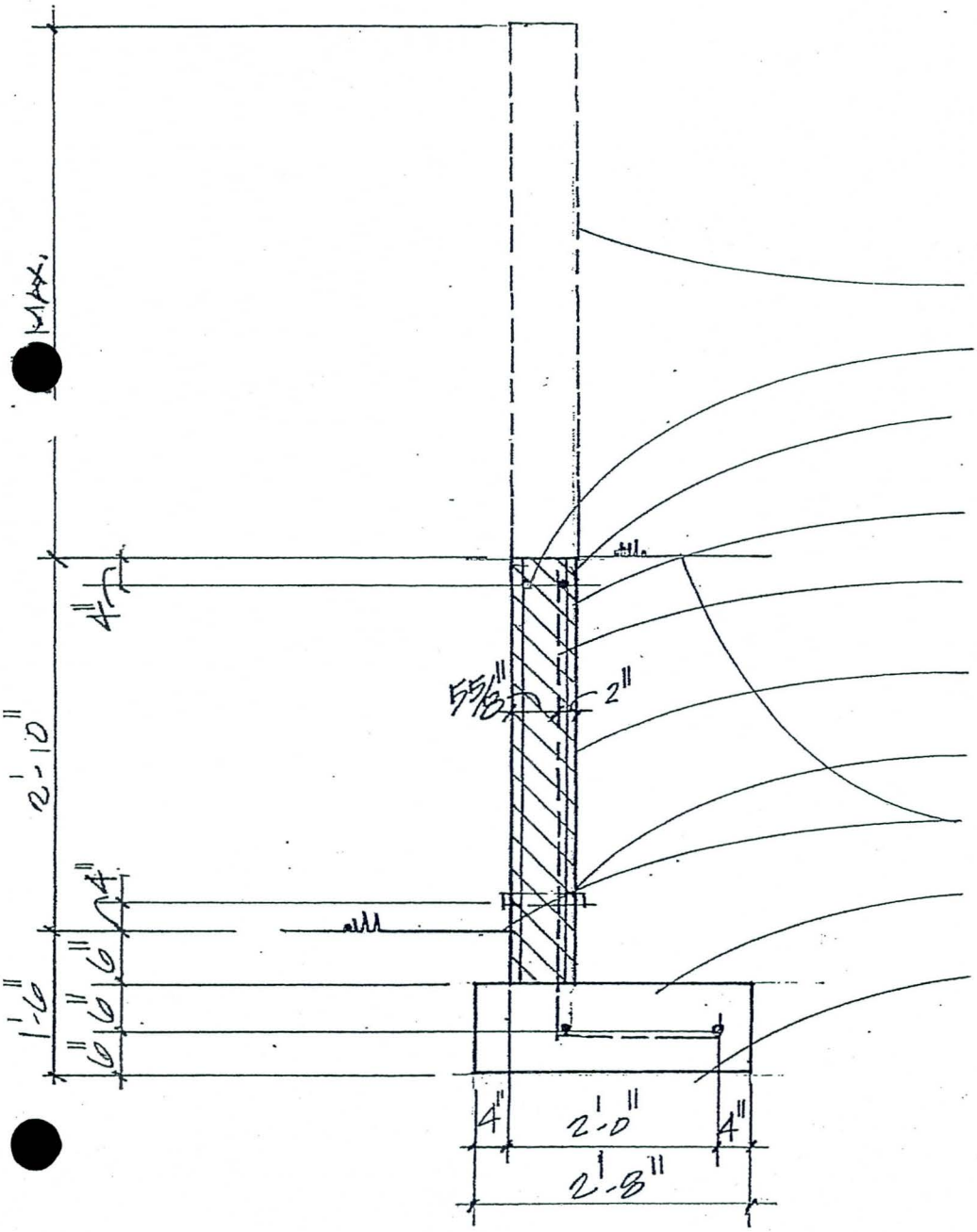
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#4 HOOKED VERTICALS, LAP 36" @ 32" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

32" WIDE x 12" THICK CONCRETE FOOTING w/2#5 BARS CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 3'-4" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV608

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO V ILLAGE in Buckeye, AZ Page: _____
Job # : EV609 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 4'-0" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	4.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.33 ft
Heel Width	=	2.50
Total Footing Width	=	2.83
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.11	OK
Sliding	=	2.46	OK
Total Bearing Load	=	1,965 lbs	
...resultant ecc.	=	7.33 in	
Soil Pressure @ Toe	=	1,629 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,823 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	4.6 psi	OK
Footing Shear @ Heel	=	15.7 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	554.8 lbs	
less 100% Passive Force	=	- 382.5 lbs	
less 100% Friction Force	=	- 982.7 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK
Design Height Above Ftg	ft =	4.00	0.00
Wall Material Above "Ht"	=	Fence	Masonry
Thickness	=		8.00
Rebar Size	=		# 4
Rebar Spacing	=		24.00
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		0.925
Total Force @ Section	lbs =		383.8
Moment....Actual	ft-# =		963.9
Moment.....Allowable	ft-# =		1,042.5
Shear.....Actual	psi =		5.5
Shear.....Allowable	=		38.7
Wall Weight	psf =		78.0
Rebar Depth 'd'	in =		5.63
LAP SPLICE IF ABOVE	in =		36.00
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		7.77
Masonry Data			
f'm	psi =		1,500
Fs	psi =		24,000
Solid Grouting	=		Yes
Use Full Stresses	=		Yes
Modular Ratio 'n'	=		21.48
Short Term Factor	=		1.000
Equiv. Solid Thick.	=		7.60
Masonry Block Type	=	Medium Weight	
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO V ILLAGE in Buckeye, AZ Page: _____
Job # : EV609 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 4'-0" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,823	0 psf
Mu' : Upward	=	209	0 ft-#
Mu' : Downward	=	31	0 ft-#
Mu: Design	=	178	1,542 ft-#
Actual 1-Way Shear	=	4.60	15.67 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings
Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	475.0	1.67	791.7
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	8.00	638.4
Total	=	554.8	**O.T.M.** =	1,430.1

Resisting/Overturning Ratio = **2.11**

Vertical Loads used for Soil Pressure = 1,965.4 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	880.0	1.91	1,683.7
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	0.66	143.3
Soil Over Toe	=		0.17	
Surcharge Over Toe	=			
Stem Weight(s)	=	312.0	0.66	207.0
Earth @ Stem Transitions	=			
Footing Weight	=	424.5	1.42	600.7
Key Weight	=			
Vert. Component	=	132.9	2.83	376.1
	Total =	1,965.4 lbs	**R.M.=**	3,010.8

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

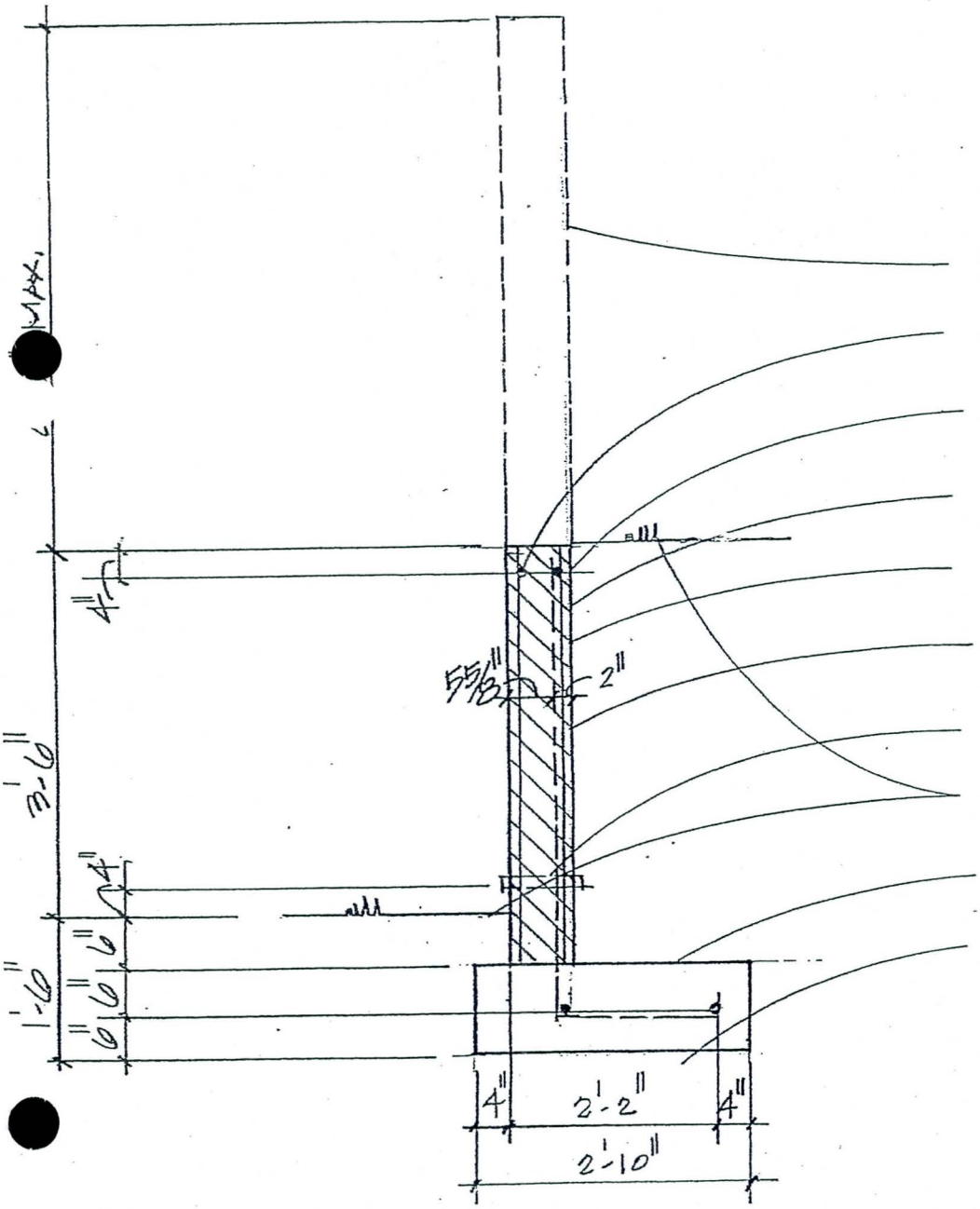
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#4 HOOKED VERTICALS, LAP 36", @ 24" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

34" WIDE x 12" THICK CONCRETE FOOTING w/2#5 BARS CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 4'-0" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV609

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV610 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 4'-8" MASONRY RETAINING

Page: _____
Date: APR 10,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	4.67 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.33 ft
Heel Width	=	2.67
Total Footing Width	=	3.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.07	OK
Sliding	=	2.24	OK
Total Bearing Load	=	2,324 lbs	
...resultant ecc.	=	7.83 in	
Soil Pressure @ Toe	=	1,828 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,032 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	5.3 psi	OK
Footing Shear @ Heel	=	19.4 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	690.6 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	1,161.9 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK
Design Height Above Ftg	ft =	4.67	0.00
Wall Material Above "Ht"	=	Fence	Masonry
Thickness	=		8.00
Rebar Size	=		# 5
Rebar Spacing	=		24.00
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		**0.791**
Total Force @ Section	lbs =		494.2
Moment....Actual	ft-# =		1,257.1
Moment.....Allowable	ft-# =		1,589.1
Shear.....Actual	psi =		7.2
Shear.....Allowable	=		38.7
Wall Weight	psf =		78.0
Rebar Depth 'd'	in =		5.63
LAP SPLICE IF ABOVE	in =		45.00
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		8.31
Masonry Data			
f'm	psi =		1,500
Fs	psi =		24,000
Solid Grouting	=		Yes
Use Full Stresses	=		Yes
Modular Ratio 'n'	=		21.48
Short Term Factor	=		1.000
Equiv. Solid Thick.	=		7.60
Masonry Block Type	=	Medium Weight	
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV610 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 4'-8" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,032	0 psf
Mu' : Upward	=	234	0 ft-#
Mu' : Downward	=	31	0 ft-#
Mu: Design	=	203	2,011 ft-#
Actual 1-Way Shear	=	5.25	19.42 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings
Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	610.8	1.89	1,154.5
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	8.67	691.9
Total	=	690.6	**O.T.M.** =	1,846.3

Resisting/Overturning Ratio = **2.07**

Vertical Loads used for Soil Pressure = 2,323.8 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	1,122.7	2.00	2,243.5
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	0.66	143.3
Soil Over Toe	=		0.17	
Surcharge Over Toe	=			
Stem Weight(s)	=	364.3	0.66	241.6
Earth @ Stem Transitions	=			
Footing Weight	=	450.0	1.50	675.0
Key Weight	=			
Vert. Component	=	170.9	3.00	512.7
Total	=	2,323.8 lbs	**R.M.=**	3,816.1

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

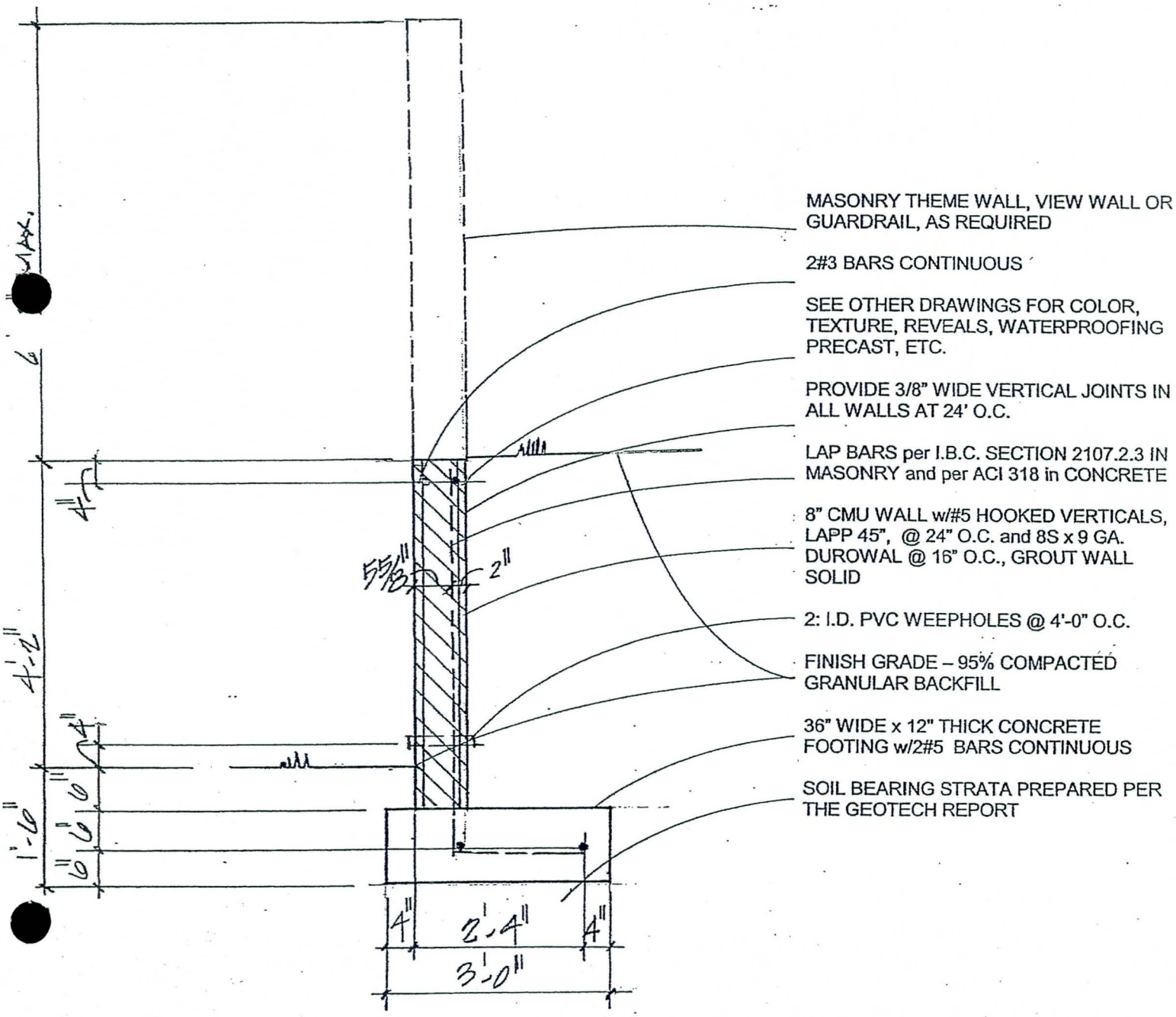
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



6'-0" MASONRY WALL over a 4'-8" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV610

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV611 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 5'-4" MASONRY RETAINING

Page: _____
Date: APR 10,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	5.33 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.33 ft
Heel Width	=	3.17
Total Footing Width	=	3.50
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.44	OK
Sliding	=	2.23	OK
Total Bearing Load	=	2,983 lbs	
...resultant ecc.	=	7.41 in	
Soil Pressure @ Toe	=	1,756 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,863 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	4.8 psi	OK
Footing Shear @ Heel	=	23.5 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	841.1 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	1,491.4 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK	Stem OK
Design Height Above Ftg	ft =	5.33	2.00	0.00
Wall Material Above "Ht"	=	Fence	Masonry	Masonry
Thickness	=		8.00	12.00
Rebar Size	=		# 5	# 5
Rebar Spacing	=		48.00	32.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		0.907	0.774
Total Force @ Section	lbs =		290.5	619.6
Moment....Actual	ft-# =		739.0	1,623.7
Moment.....Allowable	ft-# =		814.8	2,099.1
Shear.....Actual	psi =		4.1	5.1
Shear.....Allowable	=		38.7	38.7
Wall Weight	psf =		78.0	124.0
Rebar Depth 'd'	in =		5.63	9.63
LAP SPLICE IF ABOVE	in =		45.00	45.00
LAP SPLICE IF BELOW	in =		45.00	
HOOK EMBED INTO FTG	in =			8.12
Masonry Data				
f'm	psi =		1,500	1,500
Fs	psi =		24,000	24,000
Solid Grouting	=		Yes	Yes
Use Full Stresses	=		Yes	Yes
Modular Ratio 'n'	=		21.48	21.48
Short Term Factor	=		1.000	1.000
Equiv. Solid Thick.	=		7.60	11.60
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =			
Fy	psi =			

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV611 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 5'-4" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,863	0 psf
Mu' : Upward	=	295	0 ft-#
Mu' : Downward	=	42	0 ft-#
Mu: Design	=	253	2,598 ft-#
Actual 1-Way Shear	=	4.84	23.50 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings
Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	761.3	2.11	1,606.4
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	9.33	744.5
Total	=	841.1	O.T.M. =	2,350.9

Resisting/Overturning Ratio = 2.44

Vertical Loads used for Soil Pressure = 2,982.9 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	1,387.9	2.42	3,351.9
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	0.83	179.3
Soil Over Toe	=		0.17	
Surcharge Over Toe	=			
Stem Weight(s)	=	507.7	0.74	378.1
Earth @ Stem Transitions	=	133.2	1.16	155.0
Footing Weight	=	525.0	1.75	918.8
Key Weight	=			
Vert. Component	=	213.0	3.50	745.5
	Total =	2,982.9 lbs	R.M.=	5,728.5

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

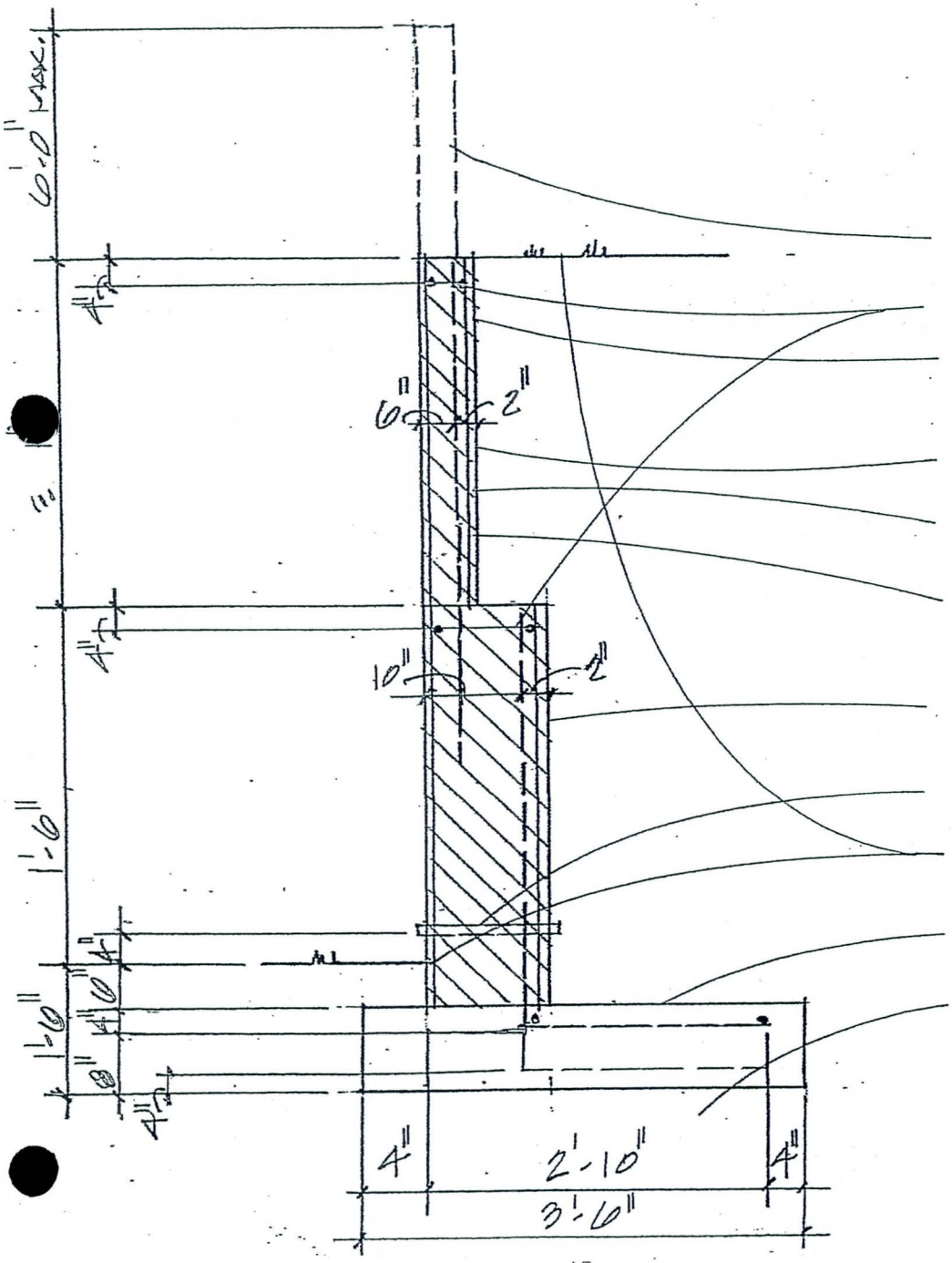
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED VERTICALS LAP 45" @ 48" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

12" CMU WALL w/#5 HOOKED VERTICALS, LAP 45", @ 32" O.C. and 12S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

42" WIDE x 12" THICK CONCRETE FOOTING w/2#5 BARS CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 5'-4" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV611

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV612 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 6'-0" MASONRY RETAINING

Page: _____
Date: APR 10,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007, 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	6.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.33 ft
Heel Width	=	3.50
Total Footing Width	=	3.83
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.53	OK
Sliding	=	2.14	OK
Total Bearing Load	=	3,571 lbs	
...resultant ecc.	=	7.69 in	
Soil Pressure @ Toe	=	1,869 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,978 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	5.2 psi	OK
Footing Shear @ Heel	=	29.7 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	1,010.8 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	1,785.5 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NGI	Stem OK	Bar Lap/Emb
Design Height Above Ftg	ft =	6.00	2.00	0.00
Wall Material Above "Ht"	=	Fence	Masonry	Masonry
Thickness	=		8.00	12.00
Rebar Size	=		# 5	# 5
Rebar Spacing	=		40.00	32.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		0.992	0.994
Total Force @ Section	lbs =		383.8	763.8
Moment....Actual	ft-# =		963.9	2,086.2
Moment.....Allowable	ft-# =		972.0	2,099.1
Shear.....Actual	psi =		5.5	6.3
Shear.....Allowable	=		38.7	38.7
Wall Weight	psf =		78.0	124.0
Rebar Depth 'd'	in =		5.63	9.63
LAP SPLICE IF ABOVE	in =		45.00	45.00
LAP SPLICE IF BELOW	in =		45.00	
HOOK EMBED INTO FTG	in =			10.44
Masonry Data				
f'm	psi =		1,500	1,500
Fs	psi =		24,000	24,000
Solid Grouting	=		Yes	Yes
Use Full Stresses	=		Yes	Yes
Modular Ratio 'n'	=		21.48	21.48
Short Term Factor	=		1.000	1.000
Equiv. Solid Thick.	=		7.60	11.60
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =			
Fy	psi =			

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV612 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 6'-0" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,978	0 psf
Mu' : Upward	=	316	0 ft-#
Mu' : Downward	=	42	0 ft-#
Mu: Design	=	274	3,338 ft-#
Actual 1-Way Shear	=	5.23	29.67 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 17.00 in, #5@ 26.25 in, #6@ 37.00 in, #7@ 48.25 in, #8@ 48.25 in, #9@ 4
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	931.0	2.33	2,172.3
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	10.00	798.0
Total	=	1,010.8	O.T.M. =	2,970.3

Resisting/Overturning Ratio = 2.53

Vertical Loads used for Soil Pressure = 3,571.0 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	1,800.0	2.58	4,644.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	0.83	179.3
Soil Over Toe	=		0.17	
Surcharge Over Toe	=			
Stem Weight(s)	=	560.0	0.74	412.8
Earth @ Stem Transitions	=	160.0	1.16	186.1
Footing Weight	=	574.5	1.92	1,100.2
Key Weight	=			
Vert. Component	=	260.5	3.83	997.7
Total	=	3,571.0 lbs	R.M.=	7,520.1

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

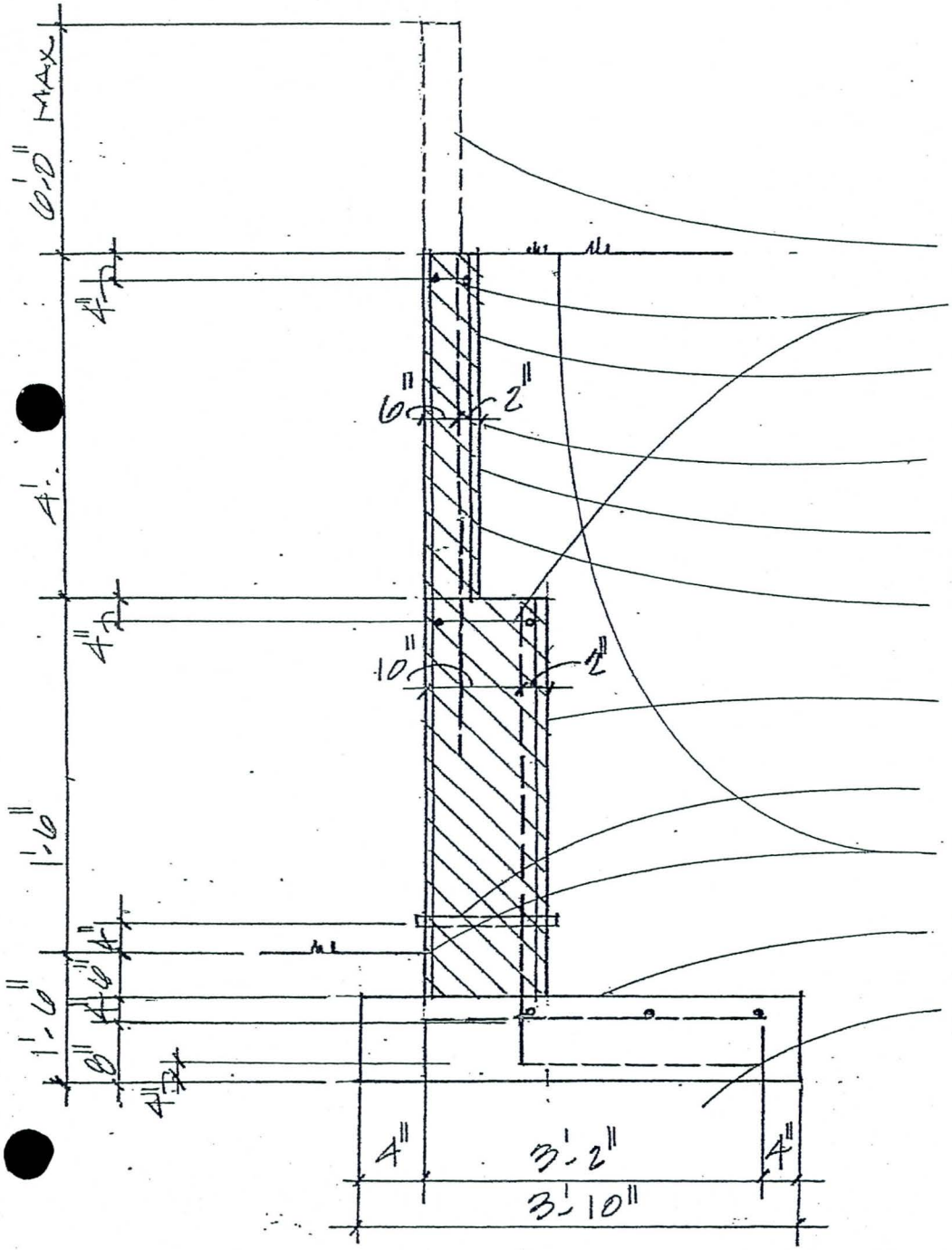
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED VERTICALS, LAP 45", @ 40" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

12" CMU WALL w/#5 HOOKED VERTICALS, LAP 45", @ 32" O.C. and 12S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

46" WIDE x 12" THICK CONCRETE FOOTING w/3#5 BARS CONTINUOUS AND #5 X 38" O.C. TRANSVERSE

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 6'-0" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV612

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV613 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 6'-8" MASONRY RETAINING

Page: _____
Date: APR 10,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
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Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	6.67 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.33 ft
Heel Width	=	4.00
Total Footing Width	=	4.33
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 4.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.81	OK
Sliding	=	2.15	OK
Total Bearing Load	=	4,382 lbs	
...resultant ecc.	=	7.65 in	
Soil Pressure @ Toe	=	1,906 psf	OK
Soil Pressure @ Heel	=	118 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,041 psf	
ACI Factored @ Heel	=	126 psf	
Footing Shear @ Toe	=	6.2 psi	OK
Footing Shear @ Heel	=	38.4 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	1,197.3 lbs
less 100% Passive Force	= -	382.5 lbs
less 100% Friction Force	= -	2,191.0 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	0.0 lbs OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK	Bar Lap/Emb
Design Height Above Ftg	ft =	6.67	2.67	0.00
Wall Material Above "Ht"	=	Fence	Masonry	Masonry
Thickness	=		8.00	12.00
Rebar Size	=		# 5	# 5
Rebar Spacing	=		40.00	24.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		0.991	0.956
Total Force @ Section	lbs =		383.6	924.8
Moment....Actual	ft-# =		963.5	2,650.1
Moment.....Allowable	ft-# =		972.0	2,773.4
Shear.....Actual	psi =		5.5	7.7
Shear.....Allowable	=		38.7	38.7
Wall Weight	psf =		78.0	124.0
Rebar Depth 'd'	in =		5.63	9.63
LAP SPLICE IF ABOVE	in =		45.00	45.00
LAP SPLICE IF BELOW	in =		45.00	
HOOK EMBED INTO FTG	in =			10.03
Masonry Data				
f'm	psi =		1,500	1,500
Fs	psi =		24,000	24,000
Solid Grouting	=		Yes	Yes
Use Full Stresses	=		Yes	Yes
Modular Ratio 'n'	=		21.48	21.48
Short Term Factor	=		1.000	1.000
Equiv. Solid Thick.	=		7.60	11.60
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =			
Fy	psi =			

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV613 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 6'-8" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in t

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,041	126 psf
Mu' : Upward	=	329	0 ft-#
Mu' : Downward	=	42	0 ft-#
Mu: Design	=	286	4,240 ft-#
Actual 1-Way Shear	=	6.20	38.44 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 5 @ 18.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 16.25 in, #5@ 25.00 in, #6@ 35.50 in, #7@ 48.25 in, #8@ 48.25 in, #9@ 4
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	1,117.5	2.56	2,856.6
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	10.67	851.4
Total	=	1,197.3	**O.T.M.** =	3,708.0

Resisting/Overturning Ratio = **2.81**

Vertical Loads used for Soil Pressure = 4,382.0 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	2,400.8	2.83	6,794.4
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	0.83	179.3
Soil Over Toe	=		0.17	
Surcharge Over Toe	=			
Stem Weight(s)	=	643.1	0.75	481.8
Earth @ Stem Transitions	=	160.0	1.16	186.1
Footing Weight	=	649.5	2.17	1,406.2
Key Weight	=			
Vert. Component	=	312.7	4.33	1,353.8
	Total =	4,382.0 lbs	**R.M.=**	10,401.5

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

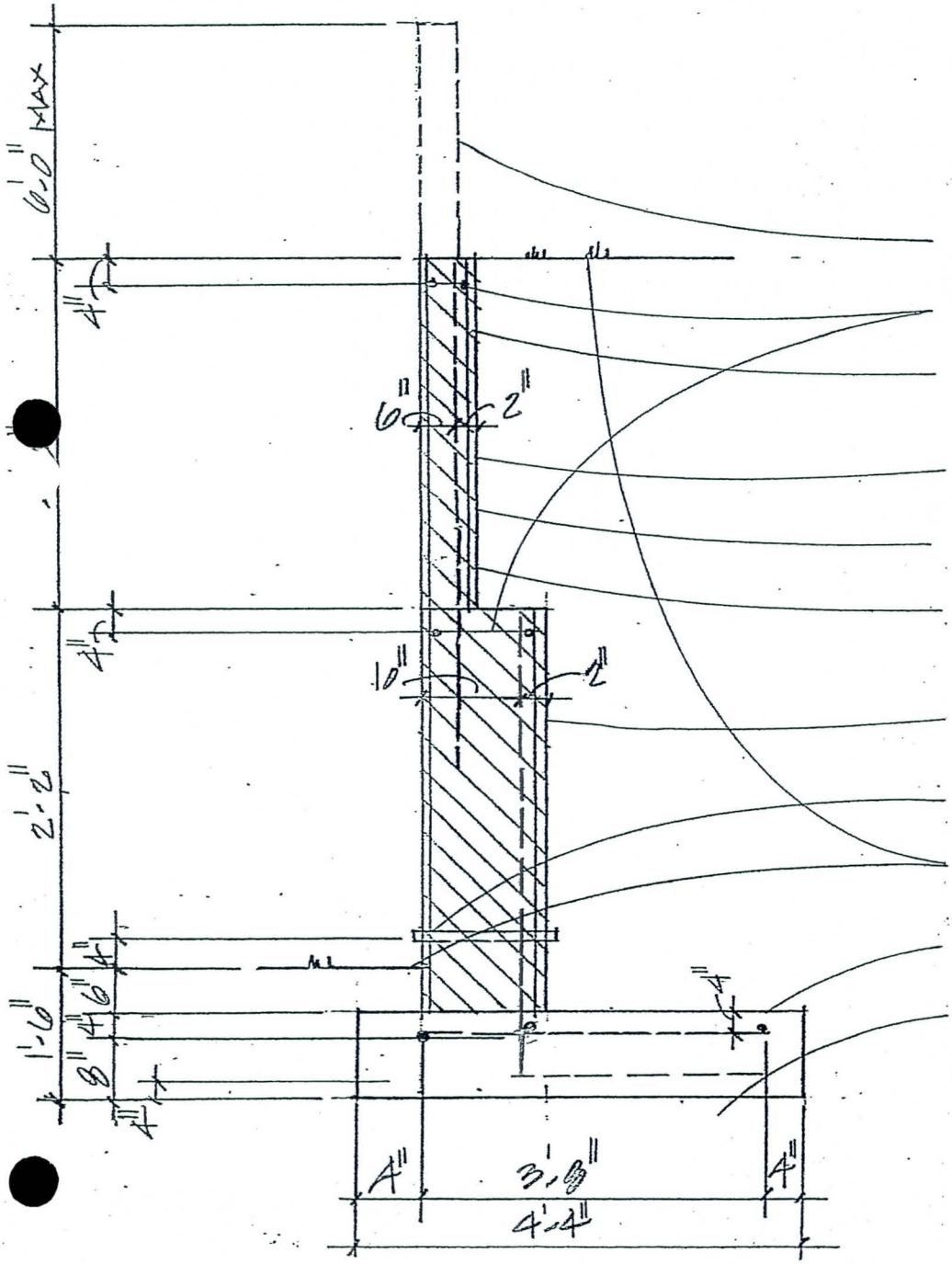
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED VERTICALS, LAP 45", @ 40" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

12" CMU WALL w/#5 HOOKED VERTICALS, LAP 45", @ 24" O.C. and 12S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

52" WIDE x 12" THICK CONCRETE FOOTING w/3#5 BARS CONTINUOUS AND #5 x 4" TRANSVERSE @ 24" O.C.

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 6'-8" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV613

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV614 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 8'-0" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	8.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.67 ft
Heel Width	=	4.50
Total Footing Width	=	5.17
Footing Thickness	=	14.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 4.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	3.00	OK
Sliding	=	2.04	OK
Total Bearing Load	=	5,895 lbs	
...resultant ecc.	=	7.25 in	
Soil Pressure @ Toe	=	1,940 psf	OK
Soil Pressure @ Heel	=	341 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,089 psf	
ACI Factored @ Heel	=	367 psf	
Footing Shear @ Toe	=	9.8 psi	OK
Footing Shear @ Heel	=	43.5 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	1,676.3 lbs	
less 100% Passive Force	= -	472.2 lbs	
less 100% Friction Force	= -	2,947.7 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK	Bar Lap/Emb
Design Height Above Ftg	ft =	8.00	4.00	0.00
Wall Material Above "Ht"	=	Fence	Masonry	Masonry
Thickness	=		8.00	12.00
Rebar Size	=		# 5	# 7
Rebar Spacing	=		40.00	24.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		0.992	0.787
Total Force @ Section	lbs =		383.8	1,295.8
Moment....Actual	ft-# =		963.9	4,120.5
Moment.....Allowable	ft-# =		972.0	5,233.3
Shear.....Actual	psi =		5.5	11.1
Shear.....Allowable	=		38.7	38.7
Wall Weight	psf =		78.0	124.0
Rebar Depth 'd'	in =		5.63	9.63
LAP SPLICE IF ABOVE	in =		45.00	63.00
LAP SPLICE IF BELOW	in =		45.00	
HOOK EMBED INTO FTG	in =			11.57
Masonry Data				
f'm	psi =		1,500	1,500
Fs	psi =		24,000	24,000
Solid Grouting	=		Yes	Yes
Use Full Stresses	=		Yes	Yes
Modular Ratio 'n'	=		21.48	21.48
Short Term Factor	=		1.000	1.000
Equiv. Solid Thick.	=		7.60	11.60
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =			
Fy	psi =			

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV614 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 8'-0" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,089	367 psf
Mu' : Upward	=	841	0 ft-#
Mu' : Downward	=	119	0 ft-#
Mu: Design	=	721	6,593 ft-#
Actual 1-Way Shear	=	9.82	43.51 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 7 @ 38.25 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 12.75 in, #5@ 19.75 in, #6@ 28.25 in, #7@ 38.25 in, #8@ 48.25 in, #9@ 4
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	1,596.5	3.06	4,878.3
Toe Active Pressure	=		0.56	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	12.17	970.9
Total	=	1,676.3	**O.T.M.** =	5,849.2

Resisting/Overturning Ratio = **3.00**

Vertical Loads used for Soil Pressure = 5,895.5 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	3,360.0	3.42	11,491.2
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	1.17	252.7
Soil Over Toe	=		0.34	
Surcharge Over Toe	=			
Stem Weight(s)	=	808.0	1.11	893.4
Earth @ Stem Transitions	=	160.0	1.50	240.5
Footing Weight	=	904.8	2.59	2,338.8
Key Weight	=			
Vert. Component	=	446.7	5.17	2,309.5
	Total =	5,895.5 lbs	**R.M.=**	17,526.1

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

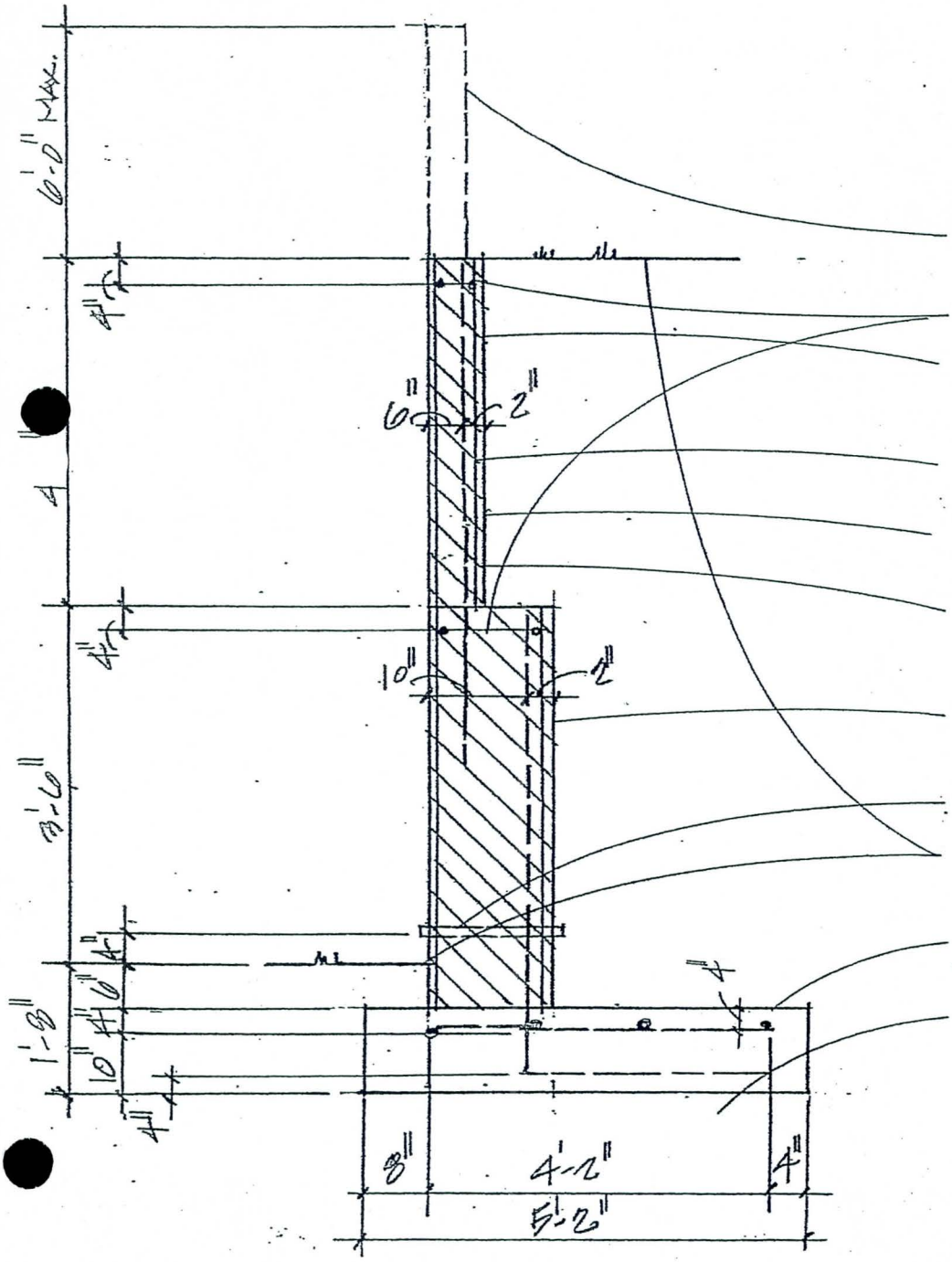
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = 13.3 Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED VERTICALS, LAP 45", @ 40" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

12" CMU WALL w/#7 HOOKED VERTICALS, LAP63", @ 24" O.C. and 12S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

62" WIDE x 14" THICK CONCRETE FOOTING w/4#5 BARS CONTINUOUS AND #5 BARS x 54" @ 18" O.C.

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 8'-0" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV614

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV615 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 9'-4" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	9.33 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	1.00 ft
Heel Width	=	5.67
Total Footing Width	=	6.67
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 4.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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

Axial Load Applied to Stem

Axial Dead Load	=	216.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	3.70	OK
Sliding	=	2.18	OK
Total Bearing Load	=	8,702 lbs	
...resultant ecc.	=	5.90 in	
Soil Pressure @ Toe	=	1,881 psf	OK
Soil Pressure @ Heel	=	728 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,013 psf	
ACI Factored @ Heel	=	779 psf	
Footing Shear @ Toe	=	9.6 psi	OK
Footing Shear @ Heel	=	45.9 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	2,308.3 lbs	
less 100% Passive Force	= -	680.0 lbs	
less 100% Friction Force	= -	4,350.9 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK	Stem OK
Design Height Above Ftg	ft =	9.33	5.33	0.00
Wall Material Above "Ht"	=	Fence	Masonry	Masonry
Thickness	=		8.00	16.00
Rebar Size	=		# 5	# 7
Rebar Spacing	=		40.00	24.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		0.992	0.883
Total Force @ Section	lbs =		383.8	1,733.7
Moment....Actual	ft-# =		963.9	6,127.7
Moment.....Allowable	ft-# =		972.0	6,941.0
Shear.....Actual	psi =		5.5	11.2
Shear.....Allowable	=		38.7	38.7
Wall Weight	psf =		78.0	164.0
Rebar Depth 'd'	in =		5.63	12.63
LAP SPLICE IF ABOVE	in =		45.00	63.00
LAP SPLICE IF BELOW	in =		45.00	
HOOK EMBED INTO FTG	in =			12.98
Masonry Data				
f'm	psi =		1,500	1,500
Fs	psi =		24,000	24,000
Solid Grouting	=		Yes	Yes
Use Full Stresses	=		Yes	Yes
Modular Ratio 'n'	=		21.48	21.48
Short Term Factor	=		1.000	1.000
Equiv. Solid Thick.	=		7.60	15.60
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =			
Fy	psi =			

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV615 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 9'-4" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,013	779 psf
Mu' : Upward	=	1,716	0 ft-#
Mu' : Downward	=	304	0 ft-#
Mu: Design	=	1,412	9,804 ft-#
Actual 1-Way Shear	=	9.59	45.95 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 7 @ 29.75 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 10.00 in, #5@ 15.50 in, #6@ 21.75 in, #7@ 29.75 in, #8@ 39.00 in, #9@ 4
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	2,228.5	3.61	8,044.8
Toe Active Pressure	=		0.67	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	13.83	1,103.6
Total	=	2,308.3	**O.T.M.** =	9,148.5

Resisting/Overturning Ratio = **3.70**

Vertical Loads used for Soil Pressure = 8,701.7 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	4,855.3	4.50	21,857.1
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	1.67	360.0
Soil Over Toe	=		0.50	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,186.1	1.58	1,872.9
Earth @ Stem Transitions	=	320.0	2.00	640.0
Footing Weight	=	1,500.8	3.34	5,005.0
Key Weight	=			
Vert. Component	=	623.5	6.67	4,158.9
	Total =	8,701.7 lbs	**R.M.=**	33,893.9

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

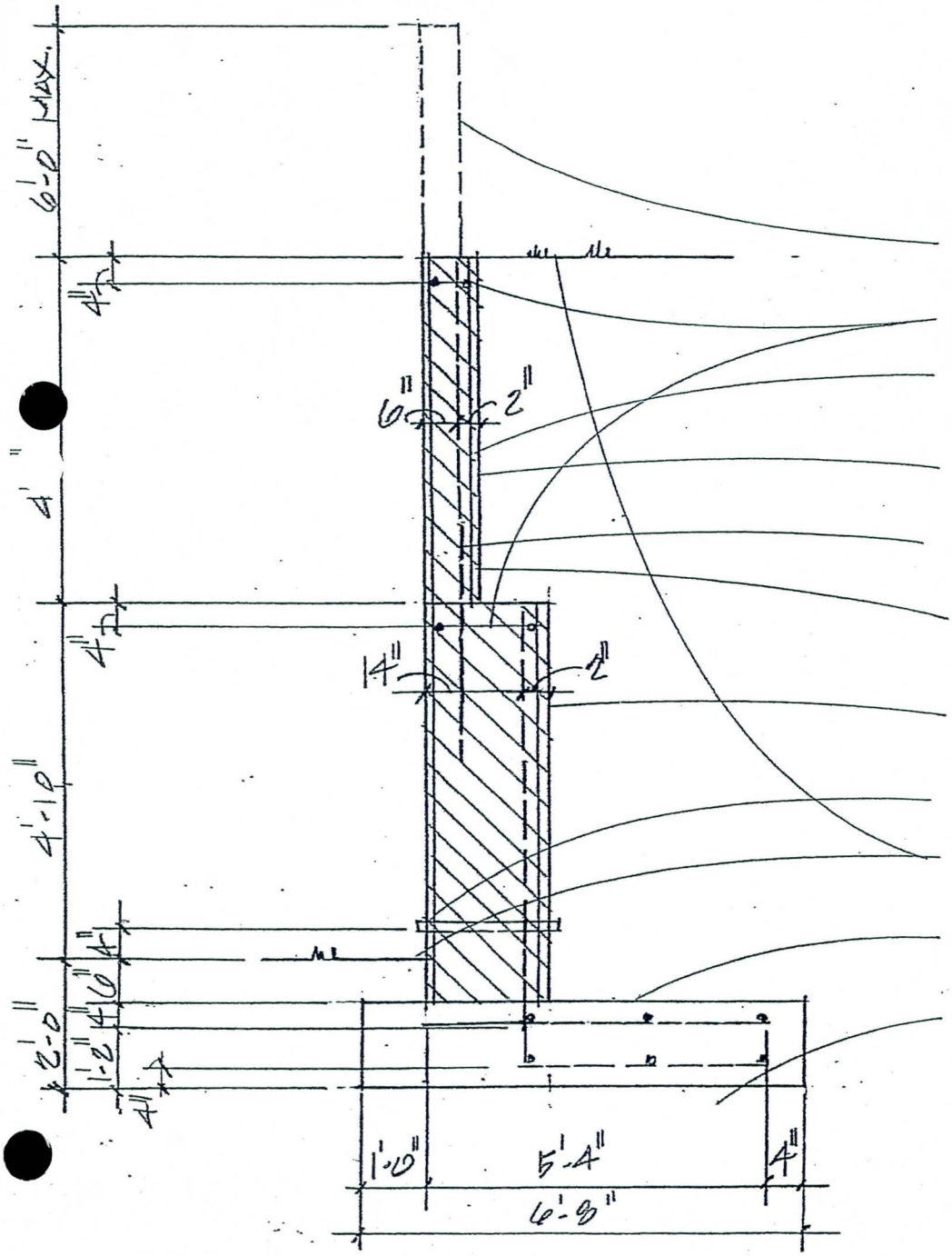
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED VERTICALS, LAP 45", @ 40" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

16" CMU WALL w/#7 HOOKED VERTICALS, LAP 63" @ 24" O.C. and 12S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

80" WIDE x 18" THICK CONCRETE FOOTING w/6#5 BARS CONTINUOUS AND #5 BARS x 72" @ 16" O.C.

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 9'-4" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV615

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV616 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 10'-8" MASONRY RETAINING

Page: _____
Date: APR 10,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	10.67 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	1.33 ft
Heel Width	=	6.33
Total Footing Width	=	7.66
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 4.00 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	=	216.0 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

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

*Design Summary

Wall Stability Ratios

Overturning	=	3.92	OK
Sliding	=	2.11	OK
Total Bearing Load	=	10,850 lbs	
...resultant ecc.	=	5.14 in	
Soil Pressure @ Toe	=	1,892 psf	OK
Soil Pressure @ Heel	=	941 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,039 psf	
ACI Factored @ Heel	=	1,014 psf	
Footing Shear @ Toe	=	13.0 psi	OK
Footing Shear @ Heel	=	59.1 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	2,893.9 lbs	
less 100% Passive Force	= -	680.0 lbs	
less 100% Friction Force	= -	5,425.2 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Shear NG!	Stem OK	Stem OK
Design Height Above Ftg	ft =	10.67	6.67	0.00
Wall Material Above "Ht"	=	Fence	Masonry	Masonry
Thickness	=		8.00	16.00
Rebar Size	=		# 5	# 7
Rebar Spacing	=		40.00	16.00
Rebar Placed at	=		Edge	Edge
Design Data				
fb/FB + fa/Fa	=		0.992	0.858
Total Force @ Section	lbs =		383.8	2,242.9
Moment....Actual	ft-# =		963.9	8,784.4
Moment.....Allowable	ft-# =		972.0	10,234.0
Shear.....Actual	psi =		5.5	14.7
Shear.....Allowable	=		38.7	38.7
Wall Weight	psf =		78.0	164.0
Rebar Depth 'd'	in =		5.63	12.63
LAP SPLICE IF ABOVE	in =		45.00	63.00
LAP SPLICE IF BELOW	in =		45.00	
HOOK EMBED INTO FTG	in =			12.62
Masonry Data				
f'm	psi =		1,500	1,500
Fs	psi =		24,000	24,000
Solid Grouting	=		Yes	Yes
Use Full Stresses	=		Yes	Yes
Modular Ratio 'n'	=		21.48	21.48
Short Term Factor	=		1.000	1.000
Equiv. Solid Thick.	=		7.60	15.60
Masonry Block Type	=	Medium Weight		
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =			
Fy	psi =			

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV616 Dsgnr: dw Date: APR 10,2008
Description....
6'-0" MASONRY WALL over a 10'-8" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	2,039	1,014 psf
Mu' : Upward	=	2,717	0 ft-#
Mu' : Downward	=	473	0 ft-#
Mu: Design	=	2,244	14,055 ft-#
Actual 1-Way Shear	=	13.00	59.12 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	# 7 @ 24.75 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr

Heel: #4@ 8.25 in, #5@ 13.00 in, #6@ 18.25 in, #7@ 24.75 in, #8@ 32.75 in, #9@ 41

Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	2,814.1	4.06	11,415.7
Toe Active Pressure	=		0.67	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	15.17	1,210.6
Total	=	2,893.9	**O.T.M.** =	12,626.3

Resisting/Overturning Ratio = **3.92**

Vertical Loads used for Soil Pressure = 10,850.5 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	6,397.7	5.16	33,023.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	216.0	2.00	431.3
Soil Over Toe	=		0.67	
Surcharge Over Toe	=			
Stem Weight(s)	=	1,405.9	1.92	2,703.1
Earth @ Stem Transitions	=	320.0	2.33	745.6
Footing Weight	=	1,723.5	3.83	6,601.0
Key Weight	=			
Vert. Component	=	787.4	7.66	6,031.3
Total	=	10,850.5 lbs	**R.M.=**	49,535.2

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

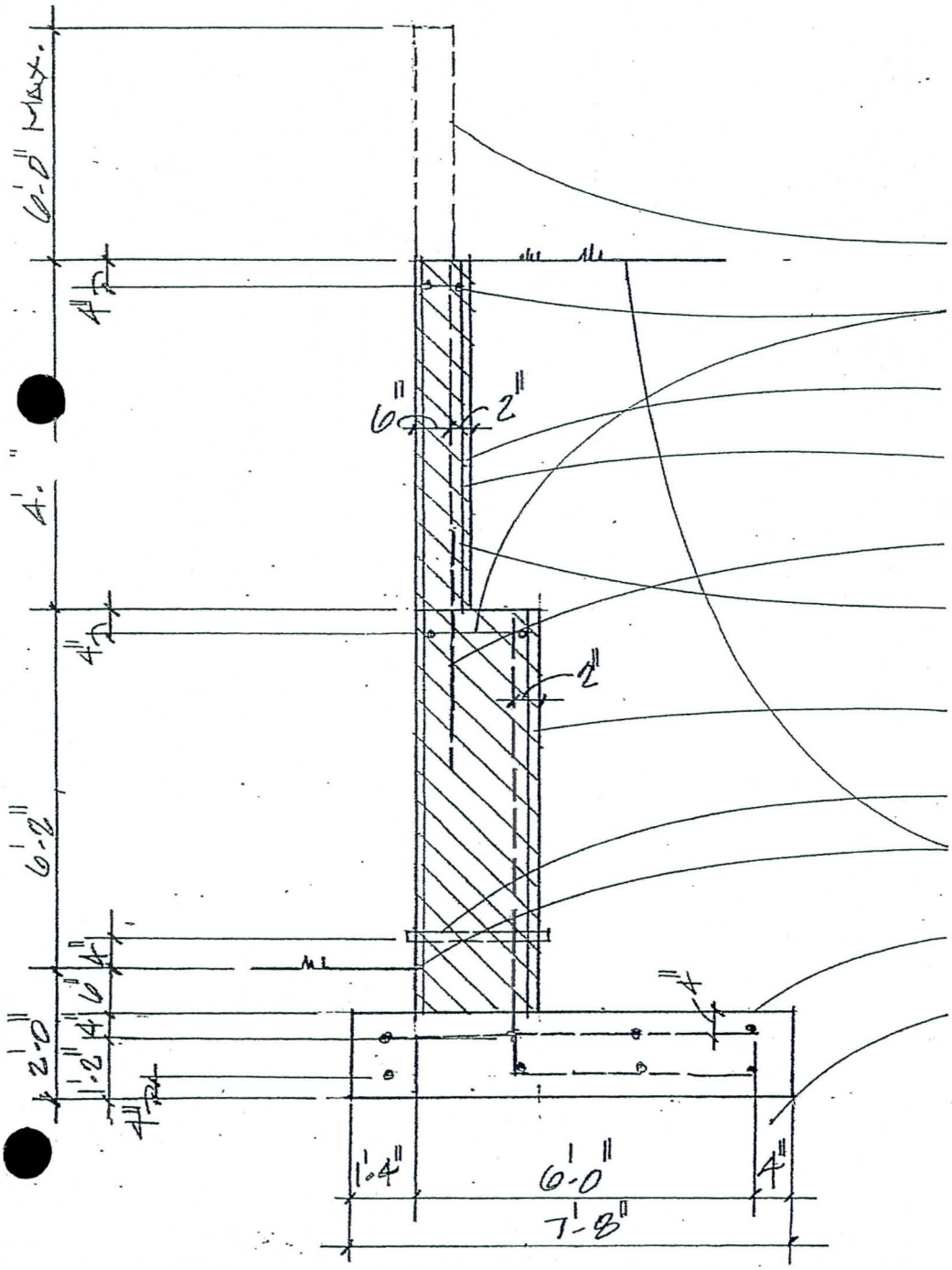
F = qzGCf (Eq. 6-25)
Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at-TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



MASONRY THEME WALL, VIEW WALL OR GUARDRAIL, AS REQUIRED

2#3 BARS CONTINUOUS

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED VERTICALS, LAP 45", @ 40" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

16" CMU WALL w/#7 HOOKED VERTICALS, LAP 63" @ 16" O.C. and 12S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2: I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 95% COMPACTED GRANULAR BACKFILL

92" WIDE x 18" THICK CONCRETE FOOTING w/8#5 BARS CONTINUOUS AND #6 BARS x 84" @ 18" O.C.

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 10'-8" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV616

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV0630 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 0'-6" MASONRY RETAINING

Page: ____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	1.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	:=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.67 ft
Heel Width	=	1.33
Total Footing Width	=	2.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

*Design Summary

Wall Stability Ratios

Overturning	=	1.94	OK
Sliding	=	5.11	OK
Total Bearing Load	=	827 lbs	
...resultant ecc.	=	5.85 in	
Soil Pressure @ Toe	=	1,075 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,257 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	4.6 psi	OK
Footing Shear @ Heel	=	2.4 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	155.8 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	413.4 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Stem OK	Stem OK
Design Height Above Ftg	ft =	1.00	0.00
Wall Material Above "Ht"	=	Masonry	Masonry
Thickness	=	6.00	8.00
Rebar Size	=	# 4	# 5
Rebar Spacing	=	48.00	48.00
Rebar Placed at	=	Center	Edge
Design Data			
fb/FB + fa/Fa	=	0.920	0.598
Total Force @ Section	lbs =	79.8	98.8
Moment....Actual	ft-# =	239.4	325.5
Moment.....Allowable	ft-# =	260.2	544.1
Shear.....Actual	psi =	2.3	2.1
Shear.....Allowable	psi =	38.7	38.7
Wall Weight	psf =	58.0	78.0
Rebar Depth 'd'	in =	2.81	3.81
LAP SPLICE IF ABOVE	in =	36.00	30.00
LAP SPLICE IF BELOW	in =	36.00	
HOOK EMBED INTO FTG	in =		6.28
Masonry Data			
f'm	psi =	1,500	1,500
Fs	psi =	24,000	24,000
Solid Grouting	=	Yes	Yes
Use Full Stresses	=	Yes	Yes
Modular Ratio 'n'	=	21.48	21.48
Short Term Factor	=	1.000	1.000
Equiv. Solid Thick.	in =	5.60	7.60
Masonry Block Type	=		
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV0630 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 0'-6" MASONRY RETAINING

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
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Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,257	0 psf
Mu' : Upward	=	360	0 ft-#
Mu' : Downward	=	88	134 ft-#
Mu: Design	=	272	134 ft-#
Actual 1-Way Shear	=	4.64	2.44 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings
Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	76.0	0.67	50.7
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	5.00	399.0
Total	=	155.8	**O.T.M.** =	449.7

Resisting/Overturning Ratio = **1.94**

Vertical Loads used for Soil Pressure = 826.9 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	79.6	1.67	132.8
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=		0.00	
Soil Over Toe	=		0.34	
Surcharge Over Toe	=			
Stem Weight(s)	=	426.0	0.94	398.4
Earth @ Stem Transitions	=			
Footing Weight	=	300.0	1.00	300.0
Key Weight	=			
Vert. Component	=	21.3	2.00	42.5
	Total =	826.9 lbs	R.M.=	873.7

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

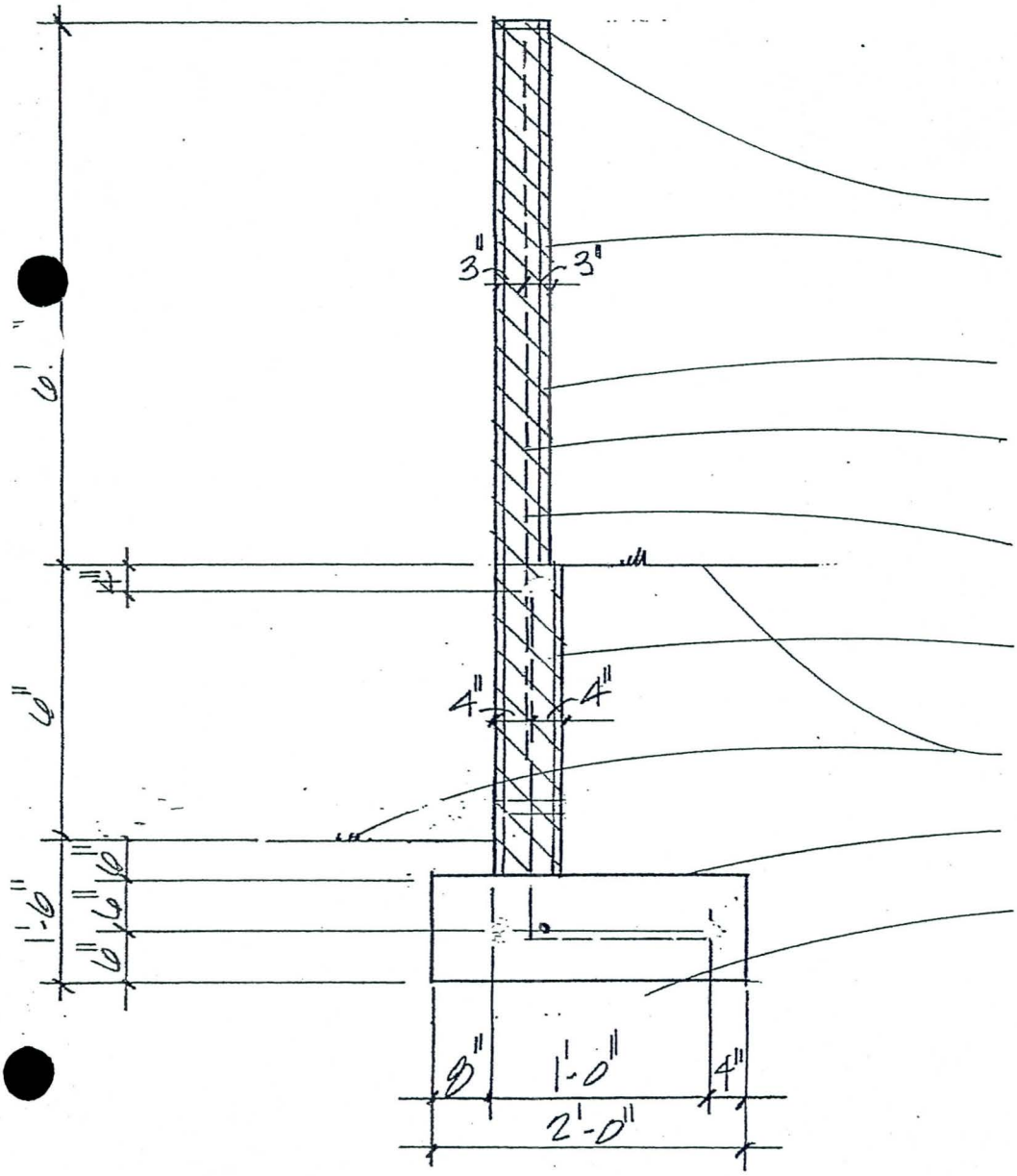
F = qzGCf (Eq. 6-25)
Psf/ft Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic, No Increase

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



SOLID CAP BLOCK

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

6" CMU WALL w/#4 VERTICALS, LAP 36", @ 48" O.C. and 6S x 9 GA. DUROWAL @ 16" O.C., GROUT REBAR CELLS SOLID

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED VERTICALS, LAP 30", @ 48" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2" I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

24" WIDE x 12" THICK CONCRETE FOOTING w/1#5 BAR CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 1'-0" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV0630

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV0631 Dsgnr: dw Date: APR 9,2008
Description....
6'-0" MASONRY WALL over a 2'-0" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	2.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.67 ft
Heel Width	=	1.50
Total Footing Width	=	2.17
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 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

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

*Design Summary

Wall Stability Ratios

Overturning	=	1.98	OK
Sliding	=	3.67	OK
Total Bearing Load	=	1,077 lbs	
...resultant ecc.	=	5.95 in	
Soil Pressure @ Toe	=	1,219 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,398 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	5.6 psi	OK
Footing Shear @ Heel	=	4.6 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	250.8 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	538.7 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Stem OK	Stem OK
Design Height Above Ftg	ft =	2.00	0.00
Wall Material Above "Ht"	=	Masonry	Masonry
Thickness	=	6.00	8.00
Rebar Size	=	# 4	# 5
Rebar Spacing	=	48.00	48.00
Rebar Placed at	=	Center	Edge
Design Data			
fb/FB + fa/Fa	=	0.920	0.826
Total Force @ Section	lbs =	79.8	155.8
Moment....Actual	ft-# =	239.4	449.7
Moment.....Allowable	ft-# =	260.2	544.1
Shear.....Actual	psi =	2.3	3.3
Shear.....Allowable	psi =	38.7	38.7
Wall Weight	psf =	58.0	78.0
Rebar Depth 'd'	in =	2.81	3.81
LAP SPLICE IF ABOVE	in =	36.00	45.00
LAP SPLICE IF BELOW	in =	36.00	
HOOK EMBED INTO FTG	in =		8.68
Masonry Data			
f'm	psi =	1,500	1,500
Fs	psi =	24,000	24,000
Solid Grouting	=	Yes	Yes
Use Full Stresses	=	Yes	Yes
Modular Ratio 'n'	=	21.48	21.48
Short Term Factor	=	1.000	1.000
Equiv. Solid Thick.	in =	5.60	7.60
Masonry Block Type	=		
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,398	0 psf
Mu' : Upward	=	412	0 ft-#
Mu' : Downward	=	88	298 ft-#
Mu: Design	=	324	298 ft-#
Actual 1-Way Shear	=	5.63	4.57 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	171.0	1.00	171.0
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	6.00	478.8
Total	=	250.8	**O.T.M.** =	649.8

Resisting/Overturning Ratio = **1.98**

Vertical Loads used for Soil Pressure = 1,077.3 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	200.0	1.75	350.7
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=		0.00	
Soil Over Toe	=		0.34	
Surcharge Over Toe	=			
Stem Weight(s)	=	504.0	0.95	476.7
Earth @ Stem Transitions	=			
Footing Weight	=	325.5	1.09	353.2
Key Weight	=			
Vert. Component	=	47.8	2.17	103.8
Total	=	1,077.3 lbs	**R.M.=**	1,284.3

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph

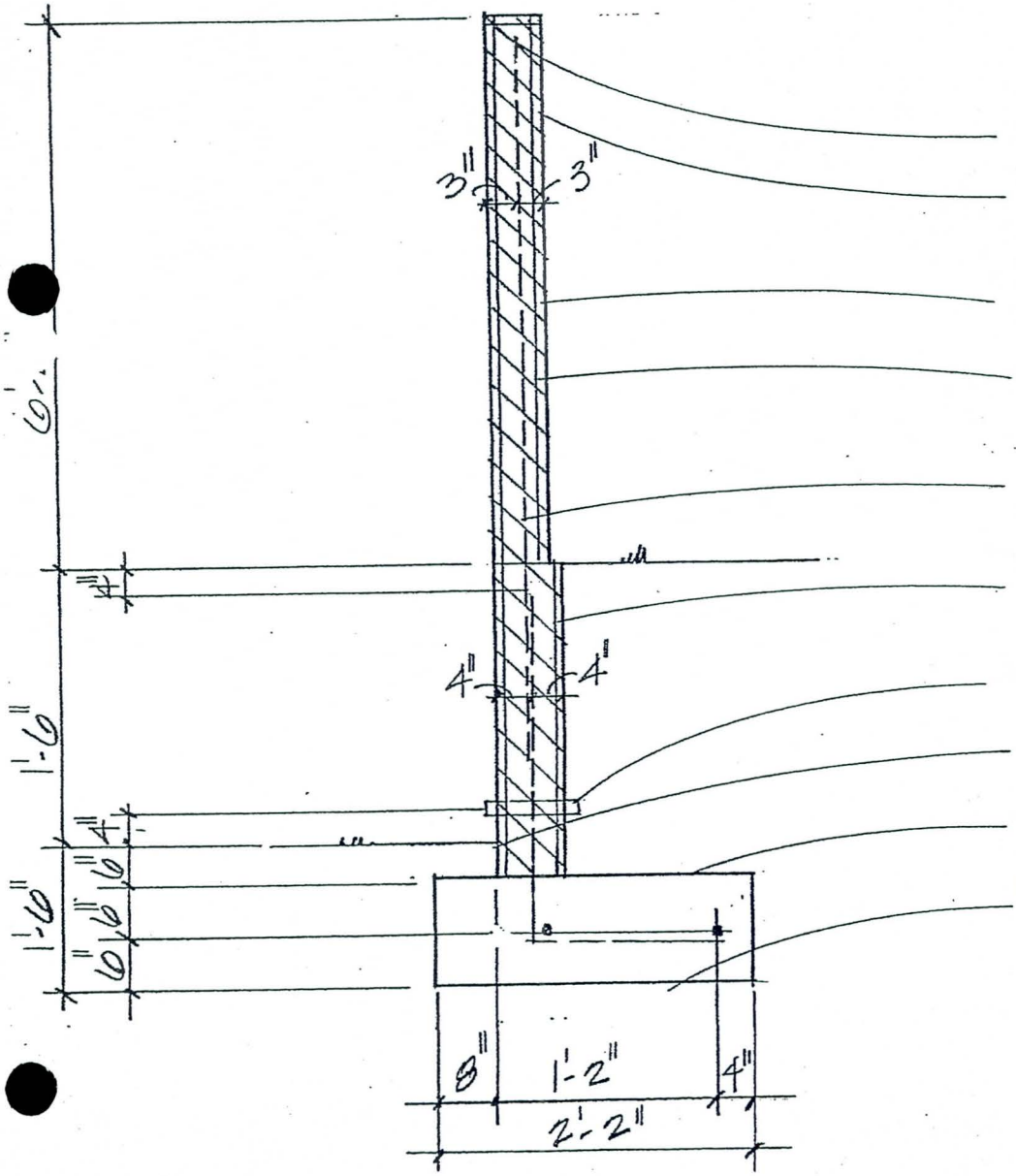
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Psf/ft Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic, No Increase

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	



SOLID CAP BLOCK

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

6" CMU WALL w/#4 VERTICALS, LAP 36", @ 48" O.C. and 6S x 9 GA. DUROWAL @ 16" O.C., GROUT REBAR CELLS SOLID

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED, LAP 45", VERTICALS @ 48" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2" I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

26" WIDE x 12" THICK CONCRETE FOOTING w/2#5 BARS CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 2'-0" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV0631

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV0632 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 3'-0" MASONRY RETAINING

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	3.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.67 ft
Heel Width	=	1.67
Total Footing Width	=	2.34
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

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	=	1.90	OK
Sliding	=	2.79	OK
Total Bearing Load	=	1,379 lbs	
...resultant ecc.	=	6.52 in	
Soil Pressure @ Toe	=	1,467 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,651 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	7.1 psi	OK
Footing Shear @ Heel	=	7.4 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	383.8 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	689.6 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
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
		Stem OK	Stem OK
Design Height Above Ftg	ft =	3.00	0.00
Wall Material Above "Ht"	=	Masonry	Masonry
Thickness	=	6.00	8.00
Rebar Size	=	# 4	# 5
Rebar Spacing	=	48.00	32.00
Rebar Placed at	=	Center	Edge
Design Data			
fb/FB + fa/Fa	=	0.920	0.809
Total Force @ Section	lbs =	79.8	250.8
Moment....Actual	ft-# =	239.4	649.8
Moment.....Allowable	ft-# =	260.2	803.0
Shear.....Actual	psi =	2.3	5.4
Shear.....Allowable	psi =	38.7	38.7
Wall Weight	psf =	58.0	78.0
Rebar Depth 'd'	in =	2.81	3.81
LAP SPLICE IF ABOVE	in =	36.00	45.00
LAP SPLICE IF BELOW	in =	36.00	
HOOK EMBED INTO FTG	in =		8.50
Masonry Data			
f'm	psi =	1,500	1,500
Fs	psi =	24,000	24,000
Solid Grouting	=	Yes	Yes
Use Full Stresses	=	Yes	Yes
Modular Ratio 'n'	=	21.48	21.48
Short Term Factor	=	1.000	1.000
Equiv. Solid Thick.	in =	5.60	7.60
Masonry Block Type	=		
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV0632 Dsgnr: dw Date: APR 9,2008
Description....
6'-0" MASONRY WALL over a 3'-0" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,651	0 psf
Mu' : Upward	=	492	0 ft-#
Mu' : Downward	=	88	555 ft-#
Mu: Design	=	404	555 ft-#
Actual 1-Way Shear	=	7.10	7.35 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	304.0	1.33	405.3
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	7.00	558.6
Total	=	383.8	**O.T.M.** =	963.9

Resisting/Overturning Ratio = **1.90**

Vertical Loads used for Soil Pressure = 1,379.3 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	361.2	1.84	664.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=		0.00	
Soil Over Toe	=		0.34	
Surcharge Over Toe	=			
Stem Weight(s)	=	582.0	0.95	554.9
Earth @ Stem Transitions	=			
Footing Weight	=	351.0	1.17	410.7
Key Weight	=			
Vert. Component	=	85.1	2.34	199.0
Total	=	1,379.3 lbs	**R.M.=**	1,828.7

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

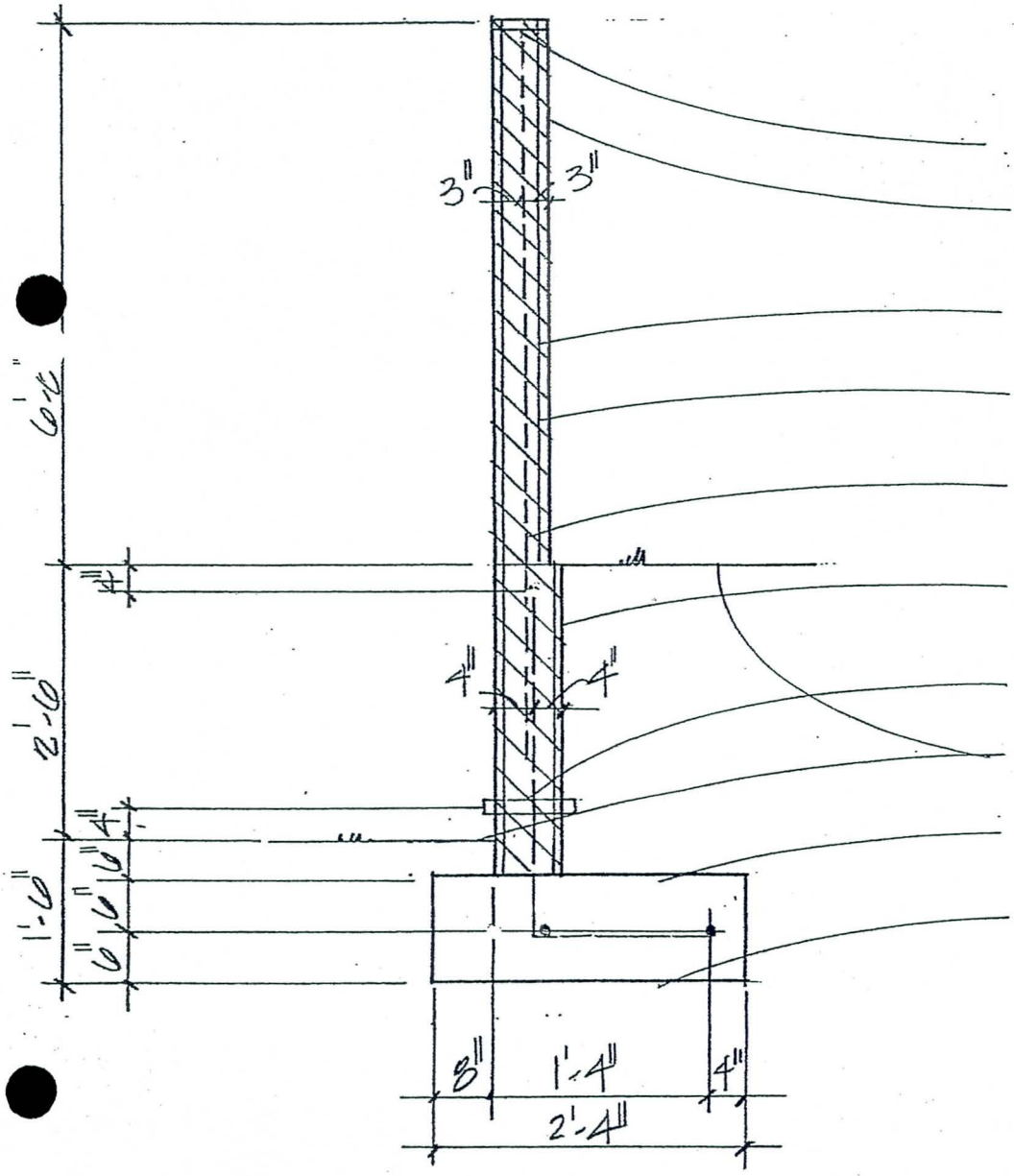
WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

F = qzGCf (Eq. 6-25)
Psf/ft Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic, No Increase

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended
SOIL per GeoTek Report 0889-PH3 of 04/25/06	



SOLID CAP BLOCK

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

6" CMU WALL w/#4 VERTICALS, LAP 36". @ 48" O.C. and 6S x 9 GA. DUROWAL @ 16" O.C., GROUT REBAR CELLS SOLID

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED VERTICALS, LAP45", @ 32" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2" I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

28" WIDE x 12" THICK CONCRETE FOOTING w/2#5 BARS CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 3'-0" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV0632

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ
Job # : EV0633 Dsgnr: dw
Description....
6'-0" MASONRY WALL over a 4'-0" MASONRY RETAINING

Page: _____
Date: APR 9,2008

This Wall in File: c:\program files\rp2007\elianto village in b

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Criteria

Retained Height	=	4.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	13.3 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	2,666.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	38.0 psf/ft
Toe Active Pressure	=	0.0 psf/ft
Passive Pressure	=	340.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe		0.00 pcf
Footing||Soil Friction	=	0.500
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	0.67 ft
Heel Width	=	2.00
Total Footing Width	=	2.67
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0014
Cover @ Top = 3.00 in @ Btm.= 3.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

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		
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	6.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	1.97	OK
Sliding	=	2.35	OK
Total Bearing Load	=	1,839 lbs	
...resultant ecc.	=	7.01 in	
Soil Pressure @ Toe	=	1,634 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	2,666 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,819 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	8.4 psi	OK
Footing Shear @ Heel	=	12.0 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs (Vertical Component Used)

Lateral Sliding Force	=	554.8 lbs	
less 100% Passive Force	= -	382.5 lbs	
less 100% Friction Force	= -	919.7 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 : 1 Stability	=	0.0 lbs	OK

Load Factors

Building Code	IBC 03 & 06
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

		Top Stem Stem OK	2nd Bar Lap/Emb
Design Height Above Ftg	ft =	4.00	0.00
Wall Material Above "Ht"	=	Masonry	Masonry
Thickness	=	6.00	8.00
Rebar Size	=	# 4	# 5
Rebar Spacing	=	48.00	24.00
Rebar Placed at	=	Center	Edge
Design Data			
fb/FB + fa/Fa	=	0.920	0.950
Total Force @ Section	lbs =	79.8	383.8
Moment....Actual	ft-# =	239.4	963.9
Moment.....Allowable	ft-# =	260.2	1,014.9
Shear.....Actual	psi =	2.3	8.4
Shear.....Allowable	psi =	38.7	38.7
Wall Weight	psf =	58.0	78.0
Rebar Depth 'd'	in =	2.81	3.81
LAP SPLICE IF ABOVE	in =	36.00	45.00
LAP SPLICE IF BELOW	in =	36.00	
HOOK EMBED INTO FTG	in =		9.58
Masonry Data			
f'm	psi =	1,500	1,500
Fs	psi =	24,000	24,000
Solid Grouting	=	Yes	Yes
Use Full Stresses	=	Yes	Yes
Modular Ratio 'n'	=	21.48	21.48
Short Term Factor	=	1.000	1.000
Equiv. Solid Thick.	in =	5.60	7.60
Masonry Block Type	=		
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =		
Fy	psi =		

To specify your own special title block here, use the "Settings" screen and enter your title block information.

Title : ELIANTO VILLAGE in Buckeye, AZ Page: _____
Job # : EV0633 Dsgnr: dw Date: APR 9,2008
Description....
6'-0" MASONRY WALL over a 4'-0" MASONRY RETAINING

This Wall in File: c:\program files\rp2007\elianto village in t

Retain Pro 2007 , 15-Mar-2008, (c) 1989-2008
www.retainpro.com/support for latest release
Registration # : RP-1153675 2007011

Cantilevered Retaining Wall Design

Code: IBC 03 & 06

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,819	0 psf
Mu' : Upward	=	558	0 ft-#
Mu' : Downward	=	88	1,134 ft-#
Mu: Design	=	469	1,134 ft-#
Actual 1-Way Shear	=	8.36	11.97 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings
Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	475.0	1.67	791.7
Toe Active Pressure	=		0.50	
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=	79.8	8.00	638.4
Total	=	554.8	**O.T.M.** =	1,430.1

Resisting/Overturning Ratio = **1.97**

Vertical Loads used for Soil Pressure = 1,839.4 lbs

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	640.0	2.00	1,282.1
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=	6.0	1.00	6.0
Soil Over Toe	=		0.34	
Surcharge Over Toe	=			
Stem Weight(s)	=	660.0	0.96	633.2
Earth @ Stem Transitions	=			
Footing Weight	=	400.5	1.34	534.7
Key Weight	=			
Vert. Component	=	132.9	2.67	354.9
	Total =	1,839.4 lbs	**R.M.=**	2,810.9

DESIGNER NOTES:

WOOLDRIDGE-WAIBEL ENGINEERING, LLC Structural
14126 W. Bent Tree Circle North 623-935-6617
Litchfield Park Fax: 623-535-5781 Arizona 85340-5068

WIND FORCE per ASCE 7-02 Exposure C Vw = 90 mph
Kz = 0.85 (Table 6-3)
Kzt = 1.0 (Topograhic Factor)
Kd = 0.85 (Table 6-4)
I = 0.87 (Table 6-1)
Qz = 0.00256(0.85)(1.0)(0.85)(90)(90)(0.870 = **13.03** Psf

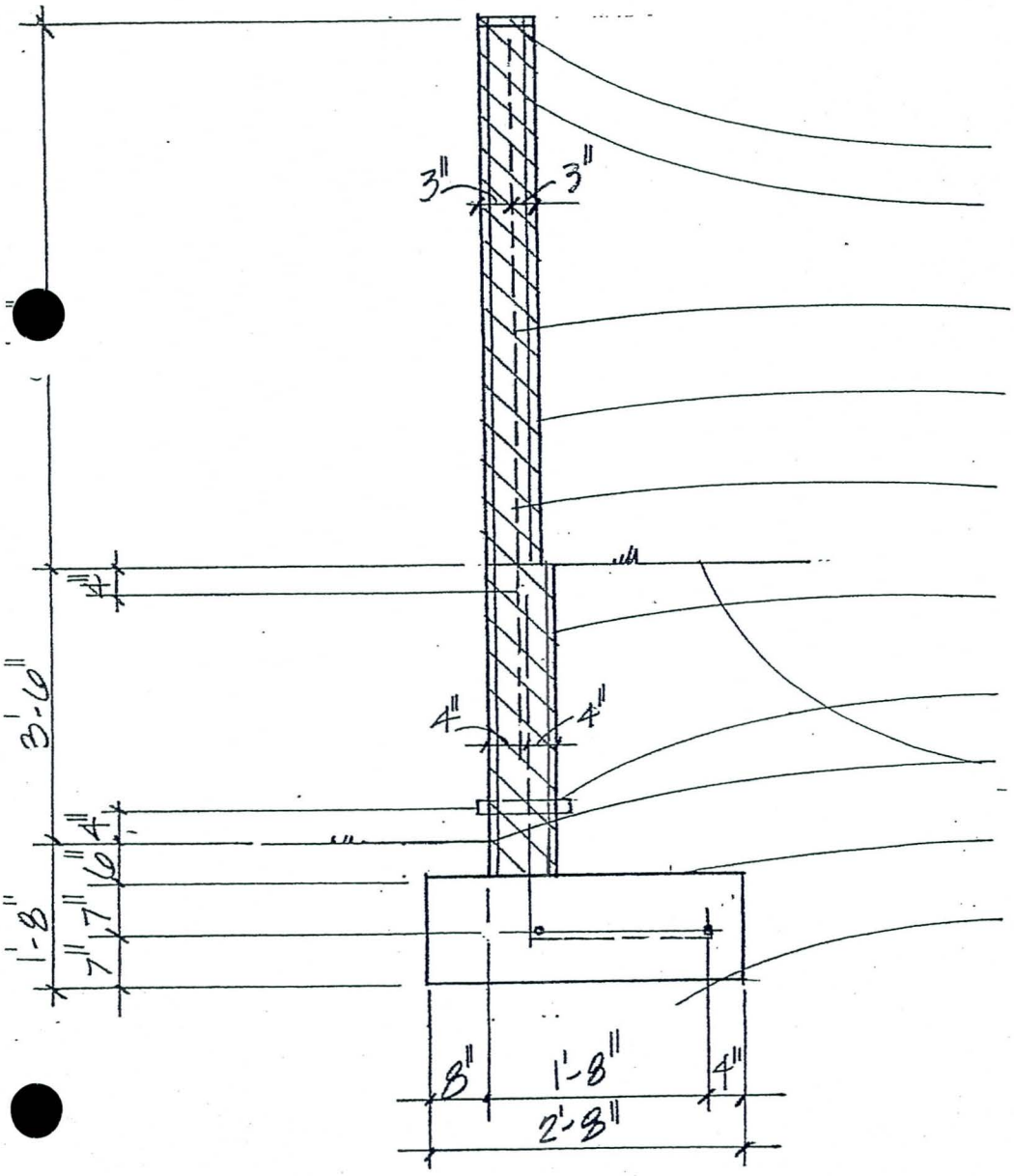
F = qzGCf (Eq. 6-25)
Psf/ft Qz = 13.03 (From above)
G = 0.85 (6.5.8.1)
Cf = 1.2 (Fig. 6-20)

Fw = 13.03(0.85)(1.20) = **13.3** Psf, Basic, No Increase

Structural Engineering Design Data

WIND FORCE:	13.3 Psf
CONCRETE MASONRY UNITS	F'm = 1500 Psi
MASONRY MORTAR:	F'm = 1800 Psi
MASONRY GROUT:	F'c = 2000 Psi
CONCRETE:	F'c = 2500 Psi
DUROWAL:	A182 Fy = 50 Ksi
REINFORCING:	A615-60 Fy = 60 Ksi
SOIL DENSITY:	110 Pcf
SOIL BEARING:	2000 Psf
SOIL BEARING w/WIND or at TOE:	2000 Psf
SOIL ACTIVE PRESSURE:	38 Psf/ft
SOIL PASSIVE PRESSURE:	340 Psf/ft
SOIL FRICTION FACTOR:	0.50
CODE:	I.B.C. 2006 Edition, as amended

SOIL per GeoTek Report 0889-PH3 of 04/25/06



SOLID CAP BLOCK

SEE OTHER DRAWINGS FOR COLOR, TEXTURE, REVEALS, WATERPROOFING PRECAST, ETC.

PROVIDE 3/8" WIDE VERTICAL JOINTS IN ALL WALLS AT 24' O.C.

6" CMU WALL w/#4 VERTICALS, LAP 36", @ 48" O.C. and 6S x 9 GA. DUROWAL @ 16" O.C., GROUT REBAR CELLS SOLID

LAP BARS per I.B.C. SECTION 2107.2.3 IN MASONRY and per ACI 318 in CONCRETE

8" CMU WALL w/#5 HOOKED VERTICALS, LAP 45" @ 24" O.C. and 8S x 9 GA. DUROWAL @ 16" O.C., GROUT WALL SOLID

2" I.D. PVC WEEPHOLES @ 4'-0" O.C.

FINISH GRADE – 90% COMPACTED GRANULAR BACKFILL

32" WIDE x 14" THICK CONCRETE FOOTING w/2#5 BARS CONTINUOUS

SOIL BEARING STRATA PREPARED PER THE GEOTECH REPORT

6'-0" MASONRY WALL over a 4'-0" MASONRY RETAINING WALL at ELIANTO VILLAGE in Buckeye, AZ/EV0633