C. Y. GEOTECH, INC.

Engineering Geology and Geotechnical Engineering

9428 Eton Avenue, Unit M, Chatsworth, CA 91311
Tel: (818) 341-1899 Fax: (818) 341-1897 Email: cygeotech@sbcglobal.net

June 30, 2009 P. N. CYG-06-4503

Fico Construction
c/o Alber Mangoli
1250 S Los Angeles Street, # 205
Los Angeles, California 90015

Subject: Equivalent Fluid Pressure for Retaining Wall with Hydrostatic Pressure Condition, Proposed Single Family Residence with Basement, Lot 22, Block 28, Tract 7260, 1859 Benecia Avenue, Los Angeles, California

Dear Mr. Alber,

As requested, C. Y. Geotech (CYG), Inc. has prepared this addendum report to provide you with the recommendations for the design of an 8-foot high retaining wall with hydrostatic condition. It is our understanding that the south yard retaining wall will not be provided with a subdrain system and, therefore, will be designed for hydrostatic pressure condition.

Eight wedge slope stability analyses using Free Body Diagram method were performed to determine the critical equivalent fluid pressure for the design of the 8-foot high retaining wall with hydrostatic pressure. The ultimate shear strength parameters of alluvial soil were used in slope stability analysis. The results of the analyses are presented in Figure 1 through Figure 8. The analyses indicated that an equivalent fluid pressure of 65 psf/ft can be used in the design of the retaining wall (see Figure 7).

All other recommendations in the referenced CYG reports, unless superseded by this report, should be incorporated into the design of the retaining wall and implemented during construction.

We appreciate the opportunity for providing the professional service. If you have any questions regarding this report, please do not hesitate to contact us.

Very truly yours,
C. Y. Geotech, Inc.

REGISTERED PROFESSIONAL ENGINEER
TZE-TZONG TSAO
No. C 046886
Exp. 06-30-11
CIVIL
STATE OF CALIFORNIA

John T. Tsao
RCE 46886/CEG 1783

Encl: References

cc: (5) Addressee

REFERENCES

1. C. Y. Geotech, Inc., September 2, 2004, Geotechnical Engineering Investigation, Proposed Duplex, Lot 22, Block 28, Tract 7260, 1859 Benecia Avenue, Los Angeles, California.

2. City of Los Angeles Approval Letter Dated October 27, 2004 (Log# 45701).

3. C. Y. Geotech, Inc., April 28, 2006, Update Geotechnical Engineering Investigation, Proposed Two-Story Single Family Residence with Basement, Lot 22, Block 28, Tract 7260, 1859 Benecia Avenue, Los Angeles, California.

4. City of Los Angeles Approval Letter Dated June 14, 2006 (Log# 53827).

5. C. Y. Geotech, Inc., June 18, 2009, Recommendation for Property Line Block Wall, Proposed Two-Story Single Family Residence with Basement, Lot 22, Block 28, Tract 7260, 1859 Benecia Avenue, Los Angeles, California.

6. C. Y. Geotech, Inc., June 29, 2009, Additional Information, Proposed Two-Story Single Family Residence with Basement, Lot 22, Block 28, Tract 7260, 1859 Benecia Avenue, Los Angeles, California.

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Project Name : Fico / Benecia / 8 ft wall with hydrostatic pressure

Geometry of Critical Active Wedge:

Height of Retaining Wall	= 8 ft
Angle of Slope above Retaining Wall	= 0 degree
Dip Angle of Critical Wedge	= 52 degree
Depth of Tension Crack	= 0 ft
Length of Slip Surface	= 10.14 ft

Shear Strength Parameters of Earth Material:

Unit Weight (125 - 62.4 = 62.6 says 63)	= 63 pcf
Cohesion (C)	= 220 psf
Friction Angle (ϕ)	= 21 degree
Mobilized Cohesion (Cm)	= 146.7 psf
Mobilized Friction Angle (ϕm)	= 14.35 degree

Required Factor of Safety = 1.50

Seismic Coefficient = 0

Calculations:

Dip Angle of Critical Active = 52 degree

Total Weight of Critical Wedge = 1575 lbs

Frictional Resistance (Cm x L) = 146.7 x 10.14 = 1488 lbs

Unbalanced Lateral Force =

= [1575 - 1488 x Sin(52)] x Tan(52 - 14.35) - 1488 x Cos(52)

= - 606 lbs

EFP = 2 x (- 606) / 8^2 = - 18.9 says - 19 psf/ft

Figure 1

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Project Name : Fico / Benecia / 8 ft wall with hydrostatic pressure

Geometry of Critical Active Wedge:

Height of Retaining Wall	= 8 ft
Angle of Slope above Retaining Wall	= 0 degree
Dip Angle of Critical Wedge	= 52 degree
Depth of Tension Crack	= 1 ft
Length of Slip Surface	= 8.88 ft

Shear Strength Parameters of Earth Material:

Unit Weight (125 - 62.4 = 62.6 says 63)	= 63 pcf
Cohesion (C)	= 220 psf
Friction Angle (ϕ)	= 21 degree
Mobilized Cohesion (Cm)	= 146.7 psf
Mobilized Friction Angle (ϕm)	= 14.35 degree

Required Factor of Safety = 1.50

Seismic Coefficient = 0

Calculations:

Dip Angle of Critical Active = 52 degree

Total Weight of Critical Wedge = 1550 lbs

Frictional Resistance (Cm x L) = 146.7 x 8.88 = 1303 lbs

Unbalanced Lateral Force =

= [1550 - 1303 x Sin(52)] x Tan(52 - 14.35) - 1303 x Cos(52)

= - 399 lbs

EFP = 2 x (- 399) / 8^2 = - 12.4 says - 13 psf/ft

Figure 2

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Project Name : Fico / Benecia / 8 ft wall with hydrostatic pressure

Geometry of Critical Active Wedge:

Height of Retaining Wall	= 8 ft
Angle of Slope above Retaining Wall	= 0 degree
Dip Angle of Critical Wedge	= 52 degree
Depth of Tension Crack	= 2 ft
Length of Slip Surface	= 7.61 ft

Shear Strength Parameters of Earth Material:

Unit Weight (125 - 62.4 = 62.6 says 63)	= 63 pcf
Cohesion (C)	= 220 psf
Friction Angle (ϕ)	= 21 degree
Mobilized Cohesion (Cm)	= 146.7 psf
Mobilized Friction Angle (ϕm)	= 14.35 degree

Required Factor of Safety = 1.50

Seismic Coefficient = 0

Calculations:

Dip Angle of Critical Active = 52 degree

Total Weight of Critical Wedge = 1476 lbs

Frictional Resistance (Cm x L) = 146.7 x 7.61 = 1116 lbs

Unbalanced Lateral Force =

= [1476 - 1116 x Sin(52)] x Tan(52 - 14.35) - 1116 x Cos(52)

= - 227 lbs

EFP = 2 x (- 227) / 8^2 = - 7.1 says - 8 psf/ft

Figure 3

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Project Name : Fico / Benecia / 8 ft wall with hydrostatic pressure

Geometry of Critical Active Wedge:

Height of Retaining Wall	= 8 ft
Angle of Slope above Retaining Wall	= 0 degree
Dip Angle of Critical Wedge	= 52 degree
Depth of Tension Crack	= 3 ft
Length of Slip Surface	= 6.34 ft

Shear Strength Parameters of Earth Material:

Unit Weight (125 - 62.4 = 62.6 says 63)	= 63 pcf
Cohesion (C)	= 220 psf
Friction Angle (ϕ)	= 21 degree
Mobilized Cohesion (Cm)	= 146.7 psf
Mobilized Friction Angle (ϕm)	= 14.35 degree

Required Factor of Safety = 1.50

Seismic Coefficient = 0

Calculations:

Dip Angle of Critical Active = 52 degree

Total Weight of Critical Wedge = 1353 lbs

Frictional Resistance (Cm x L) = 146.7 x 6.34 = 930 lbs

Unbalanced Lateral Force =

= [1353 - 930 x Sin(52)] x Tan(52 - 14.35) - 930 x Cos(52)

= - 94 lbs

EFP = 2 x (- 94) / 8^2 = - 2.9 says - 3 psf/ft

Figure 4

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Project Name : Fico / Benecia / 8 ft wall with hydrostatic pressure

Geometry of Critical Active Wedge:

Height of Retaining Wall	= 8 ft
Angle of Slope above Retaining Wall	= 0 degree
Dip Angle of Critical Wedge	= 52 degree
Depth of Tension Crack	= 4 ft
Length of Slip Surface	= 5.07 ft

Shear Strength Parameters of Earth Material:

Unit Weight (125 - 62.4 = 62.6 says 63)	= 63 pcf
Cohesion (C)	= 220 psf
Friction Angle (ϕ)	= 21 degree
Mobilized Cohesion (Cm)	= 146.7 psf
Mobilized Friction Angle (ϕm)	= 14.35 degree

Required Factor of Safety = 1.50

Seismic Coefficient = 0

Calculations:

Dip Angle of Critical Active = 52 degree

Total Weight of Critical Wedge = 1181 lbs

Frictional Resistance (Cm x L) = 146.7 x 5.07 = 744 lbs

Unbalanced Lateral Force =

= [1181 - 744 x Sin(52)] x Tan(52 - 14.35) - 744 x Cos(52)

= 0.8 lbs

EFP = 2 x 0.8 / 8^2 = 0.025 says 0 psf/ft

Figure 5

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Project Name : Fico / Benecia / 8 ft wall with hydrostatic pressure

Geometry of Critical Active Wedge:

Height of Retaining Wall	= 8 ft
Angle of Slope above Retaining Wall	= 0 degree
Dip Angle of Critical Wedge	= 52 degree
Depth of Tension Crack	= 5 ft
Length of Slip Surface	= 3.80 ft

Shear Strength Parameters of Earth Material:

Unit Weight (125 - 62.4 = 62.6 says 63)	= 63 pcf
Cohesion (C)	= 220 psf
Friction Angle (ϕ)	= 21 degree
Mobilized Cohesion (Cm)	= 146.7 psf
Mobilized Friction Angle (ϕm)	= 14.35 degree

Required Factor of Safety = 1.50

Seismic Coefficient = 0

Calculations:

Dip Angle of Critical Active = 52 degree

Total Weight of Critical Wedge = 959 lbs

Frictional Resistance (Cm x L) = 146.7 x 3.80 = 557 lbs

Unbalanced Lateral Force =

= [959 - 557 x Sin(52)] x Tan(52 - 14.35) - 557 x Cos(52)

= 58.3 lbs

EFP = 2 x 58.3 / 8^2 = 1.8 says 2 psf/ft

Figure 6

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Project Name : Fico / Benecia / 8 ft wall with hydrostatic pressure

Geometry of Critical Active Wedge:

Height of Retaining Wall	= 8 ft
Angle of Slope above Retaining Wall	= 0 degree
Dip Angle of Critical Wedge	= 52 degree
Depth of Tension Crack	= 6 ft
Length of Slip Surface	= 2.54 ft

Shear Strength Parameters of Earth Material:

Unit Weight (125 - 62.4 = 62.6 says 63)	= 63 pcf
Cohesion (C)	= 220 psf
Friction Angle (ϕ)	= 21 degree
Mobilized Cohesion (Cm)	= 146.7 psf
Mobilized Friction Angle (ϕm)	= 14.35 degree

Required Factor of Safety = 1.50

Seismic Coefficient = 0

Calculations:

Dip Angle of Critical Active = 52 degree

Total Weight of Critical Wedge = 689 lbs

Frictional Resistance (Cm x L) = 146.7 x 2.54 = 373 lbs

Unbalanced Lateral Force =

= [689 - 373 x Sin(52)] x Tan(52 - 14.35) - 373 x Cos(52)

= 75.2 lbs

EFP = 2 x 75.2 / 8^2 = 2.35

Recommended EFP = 62.4 + 2.35 = 64.75 says 65 psf/ft

Figure 7

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Project Name : Fico / Benecia / 8 ft wall with hydrostatic pressure

Geometry of Critical Active Wedge:

Height of Retaining Wall	= 8 ft
Angle of Slope above Retaining Wall	= 0 degree
Dip Angle of Critical Wedge	= 52 degree
Depth of Tension Crack	= 7 ft
Length of Slip Surface	= 1.27 ft

Shear Strength Parameters of Earth Material:

Unit Weight (125 - 62.4 = 62.6 says 63)	= 63 pcf
Cohesion (C)	= 220 psf
Friction Angle (ϕ)	= 21 degree
Mobilized Cohesion (Cm)	= 146.7 psf
Mobilized Friction Angle (ϕm)	= 14.35 degree

Required Factor of Safety = 1.50

Seismic Coefficient = 0

Calculations:

Dip Angle of Critical Active = 52 degree

Total Weight of Critical Wedge = 369 lbs

Frictional Resistance (Cm x L) = 146.7 x 1.27 = 186 lbs

Unbalanced Lateral Force =

= [369 - 186 x Sin(52)] x Tan(52 - 14.35) - 186 x Cos(52)

= 57 lbs

EFP = 2 x 57 / 8^2 = 1.8 says 2 psf/ft

Figure 8