Applied Earth Sciences
Geotechnical Engineers
Engineering Geologists
DSA Accepted Testing Laboratory
Special Inspection and Materials Testing

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November 12, 2014

Agoura Hills Center Properties, LLC
2985 E Hillcrest Drive #107
Thousand Oaks, CA 91362

Work Order: 2272-1-0-103

Attention: Mr. Steve Rice

Subject: **Geotechnical Response to City of Agoura Hills Review Sheet Dated September 91 2014, Senior Housing Community, Vesting Tentative Tract Number 71742 (APN# 2061-001-025), 30800 Agoura Road, Agoura Hills, California.**

1. INTRODUCTION

This report was prepared to provide geotechnical engineering responses to the September 91 2014 City of Agoura Hills - Geotechnical Review Sheet. The geotechnical review was of the referenced report by this firm dated July 29, 2014 which was provided to address comments in the review letter dated April 18, 2014. The current review letter is attached for reference.

2. RESPONSES TO GEODYNAMICS REVIEW LETTER DATED SEPTEMBER 91 2014

PLANNING/FEASIBILITY COMMENTS

COMMENT 1

The consultant provided static translational analyses for potential unfavorably oriented surfaces in the Calabasas Formation at the base of the proposed soil nail wall. Seismic analyses should be provided as per the County of Los Angeles Guidelines.

RESPONSE

The Los Angeles County Department of Public Works, Geotechnical and Materials Engineering Division (GMED) *Manual for Preparation of Geotechnical Reports* provides requirements for slope stability analyses and can be viewed at http://dpw.lacounty.gov/gmed/permits/docs/manual.pdf. Based the seismic analysis procedure outlined in the County guidelines, the requested analysis is presented in Appendix A, which resulted in a factor of safety above 1.1.

COMMENT 2

The contact between the Older Alluvium and the underlying Calabasas Formation is reported to be inclined northerly at an overall gradient of about 13 degrees, with variable material conditions. At some locations, the contact was found to be abrupt. Other locations encountered residual soil of gray clay (B-1), or plastic clay seams within the uppermost part of the Calabasas Formation inclined roughly parallel

to the contact (B-3). The consultant should discuss and evaluate as necessary the potential for translational deformation where this contact will be exposed in future cut-slopes or retaining wall back-cuts. Mitigation measures should be recommended as necessary.

Note: The consultant responded to this comment by referring to rotational stability analyses provided in the report. However, the rotational stability analyses provided do not address the potential for translational movement where the contact between the Older Alluvium and the underlying Calabasas Formation is inclined toward the back of the proposed wall at an angle of about 13 degrees. As noted in the earlier comment there are numerous indications that low strength materials are associated at least locally with this contact. These include "clay soft, "plastic deformation" and "plastic, possibly polished clay seams" noted near the contact in Borings B-1, B-2 and B-3, and indications of low-angle dips within the Calabasas Formation in Borings 4 and 6 (Boring 5 did not extend to the contact). The consultant describes a failure associated with the Qoal/Tc contact just northeast of the project. Inasmuch as construction of a soil nail wall tends to provide limited opportunity for evaluation during construction, it would appear prudent to provide sufficient subsurface exploration and analyses to better define the nature of this contact and the underlying bedrock prior to construction.

Second Note: The consultant responds by providing descriptions of the alluvium at each of the referenced contacts. With all respect to the consultant, while these descriptions are generally consistent with the logs provided, they do not convey the complete understanding provided by the log. The following provides the reviewer's understanding of these contacts as derived from the logs provided:

- *The contact is described as a residual soil of grayish brown clay with "some" coarse grains of sand and few gravel. At 41 feet (in the middle of the residual soil), the crowd was used to "get a bite". A residual clay soil with a moisture content of 26% would be unlikely to be so hard that a crowd would be needed to drill. The note on the log is more suggestive of a soft plastic clay where the drill bit is occluded with clay and the crowd was used to push the teeth deeper into the unit to engage a new cutting surface.*

- *The consultant accurately describes the older alluvium overlying the contact, but does not include the description of the underlying Calabasas Formation that is characterized as a claystone with plastic deformation.*

- *The consultant accurately describes the older alluvium overlying the contact, but does not include the description of the underlying Calabasas Formation that is characterized as massive claystone that is "very weathered" and "sheared" with rootlets along plastic clay seams oriented subparallel to the contact (which would be dipping out of slope in future retaining wall backcuts).*

- *The consultant accurately describes the older alluvium overlying the contact, but does not include the description of the underlying Calabasas Formation that is characterized as silty claystone with "bedding inclined 15 to 20 degrees". No dip direction is provided; however, if this dip is northward, the features would be adversely oriented in future retaining wall backcuts.*

- *The contact was not encountered.*

- *The consultant accurately describes the older alluvium overlying the contact, but does not include the description of the underlying Calabasas Formation that is characterized as clayey siltstone with "bedding inclined at 10 to 20 degrees".*

Based on these descriptions, the reviewer maintains that the contact between the Older Alluvium and the Calabasas Formation, while clearly variable, should be considered a potentially weak horizon that could contribute to translational failures. Although the soil nail wall backcut can be observed and mapped during construction, effective mitigation would be difficult at that point if low-strength conditions were found

to predominate. The consultant should characterize and evaluate this contact as part of the feasibility level study.

RESPONSE

As previously stated, the contact between the Older Alluvium and the Calabasas Formation is variable. The following boring by boring responses are provided to further clarify our interpretations of encountered conditions and discuss ramifications with respect to slope stability and the proposed development.

B-1 Residual clay zone @ 40-42 feet. This clay zone represents a weathered surface (Paleosol) at the top of the bedrock. Although laboratory testing indicated a high moisture content of 26% for the drive sample taken mid layer, a blow count of 7 blows for 12 inches utilizing the drill rig's 2050 pound inner kelly bar was recorded. This blow count for a clay along with the visual and tactile examination of the obtained sample clearly indicated the clay was hard and not soft.

B-2 Contact @ 20 feet with abundant cobbles within the brown clayey fine to coarse sand Older Alluvium from 19 to 20 feet. The contact was observed down hole and is described as irregular and undulatory but generally horizontal. The increase in cobbles likely represents a basal lag deposited within a scoured bedrock zone at the base of the Older Alluvium. Materials of this type would likely have a high friction angle.

The underlying bedrock consists of generally massive claystone with occasional thin sandstone interbeds and is fractured but with secondary iron oxide/manganese staining. The plastic deformation refers to observed polished surfaces within the claystone, a result of tectonic deformation during folding and uplift as opposed to mass wasting (landslide) features. The bedrock was reported to be consistently moist and hard with 4 to 7 blows recorded for the 3450 pound to 2050 pound full and inner kelly bar.

B-3 Contact @ 16.9 feet. From 15.3 to 16.9 feet, a silty fine to coarse sand and gravel layer at the base of the Older Alluvium sits on a basal contact described as clear, abrupt, and planar. This is clearly another scoured surface with lag deposit. Measured approximate attitude on contact / scoured surface at 16.9 feet recorded dip of 13º.

Within the upper 0.5 feet of bedrock below the contact, the bedrock is described as very weathered and sheared. Shearing likely again is tectonic in nature. Reported clay "seams" with rootlets subparallel to contact are translocated secondary infillings. Fracturing below the upper "sheared zone" becomes tight but secondary mineral deposits (calcium carbonate/limonite) further evidence of previous groundwater water presence.

The thin plastic clay bed @ 21 feet dips southwesterly into the hill with observed bedding (albeit generally poorly defined) becoming steeper with depth to near vertical and further evinces the complexly folded nature of the sedimentary bedrock in this area near the contact with the underlying Conejo Volcanics.

B-4 Contact @ 10.0 feet. The bedding inclinations of 15º-20º were based on observation of the drive samples. At this boring location and elevation (967±') the Older Alluvium/Calabasas Formation contact is at 10 feet (el. 957), well below proposed grades (both remedial undercut and finished) as shown on Cross Section F-F'. It is our opinion, the bedding is likely complexly folded/contorted, but even if it is dipping northward, the bedrock near this boring is too deep to be exposed.

B-5 No additional response.

B-6 Contact at 12 feet with abundant calcium carbonate @ 11-12 feet is in hard silty clay Older Alluvium. Similar to boring B-4 the bedding inclinations of 10º-20º were based on observation of the drive sample. Also like B-4, based on location and elevation of this boring, the observed basal contact of the Older Alluvium (el. 962º) is well below any proposed excavated grade (see Sections E-E' and F-F'. The recommended building undercuts shown on Section A-A' will also remove bedrock beyond the retaining walls under the building. Required in-grading geologic observation of removal and/or retaining wall backcut excavations will provide another opportunity to verify specific location conditions and expand removal limits if needed.

As is documented, the Older Alluvium/bedrock contact is variable. It can consist of a surface of weathering and soil development (Paleosol) as in boring B-1 to a scoured erosional bedrock surfaces as in B-2 and B-3 to an unconformity with no soil profile as in Borings B-4 and B-6. However, based on the acquired data, the contact is not a unique continuous layer nor is it a weak horizon where the base of the Older Alluvium is a clay or silt. While it is evident the base of the Older Alluvium does have an overall northwesterly inclination based on the elevations at which the contact was observed in our borings. However, the 13º abrupt planar nature of the scoured contact measured in boring B-3 contrasts with the irregular, undulatory, but generally horizontal contact in B-2, versus the residual soil (hard Paleosol) of the contact in B-1. High blow counts even where the soil is very moist and common presence of calcium carbonates where the soil is dry support the finding the basal materials of the Older Alluvium are hard/dense. As shown on Sections A-A' and F-F', the overall inclination of the contact appears to approximately 7º-10º. In addition, the variable nature of the contact in terms of material types and orientation along with the lack of observed weak materials in the exploratory borings support the opinion the Older Alluvium/bedrock contact is not a potentially weak horizon that could contribute to translational failure.

Note: The landslide mentioned in our previous overall report (Gorian 2000) along Agoura Road northeast of the site was a rotational failure, purported to occur within saturated Older Alluvium near the contact. All slopes and wall backcuts will be observed and mapped during construction to verify actual conditions.

COMMENT 3
The consultant provides earthquake parameters (peak ground acceleration and earthquake magnitude) based on a seismic event that has a 10% probability of exceedance in 50 years. The consultant should revise these parameters to comply with the 2013 edition of the California Building Code (and by adoption, the City of Agoura Hills Building Code). Mitigation measures should be recommended as necessary.

Note: As per the 2103 CBC, peak ground acceleration should be based on a seismic event that has a 2% probability of exceedance in 50 years (2475 years return period).

RESPONSE
Los Angeles County Department of Public Works, Geotechnical and Materials Engineering Division (GMED) document GS045.0 requires the potential for liquefaction be based on peak ground acceleration, utilizing a hazard level of 2 percent probability of exceedance over 50 years. The peak ground acceleration is determined using the United States Geological Survey (USGS) interactive web application, 2008 Interactive Deaggregations, http://geohazards.usgs.gov/deaggint/2008/.

Probabilistic seismic hazard analyses (PSHA) predict the peak horizontal ground acceleration will be on the order of 0.28g for an earthquake having a 2% chance of being exceeded in 50 years. The mean magnitude from this PSHA is 5.96 (Mw) with a mean distance of 18.4 km from the property and a modal magnitude of 5.2 (Mw) with a modal distance of 8.1 km from the property. The values are for the site

latitude 33.1442°N and longitude 118.7923°W assuming a shear wave velocity, V_s^{30} of 350 meters/second.

REPORT REVIEW COMMENTS AND PLAN-CHECK COMMENTS

The Report Review Comments 1 through 4 as well as the Plan Check Comments 1 through 9 are acknowledged and will be complied with at the appropriate design stage and by the appropriate design professional as the entitlement process moves forward.

Note that for Report Review Comment No. 4, infiltration testing was performed within the Older Alluvium in the area of the proposed infiltration basin west of the driveway for Building B. As was described in our last response (Gorian 2014b), an infiltration rate less than the minimum requirement of 0.3 inch/hour was obtained.

-o0o-

Please contact us if you have questions concerning this geotechnical report or require additional information.

Respectfully,
Gorian and Associates, Inc.

By: Jerome J. Blunck, GE151
Principal Geotechnical Engineer

William F. Cavan, Jr., CEG1161
Principal Engineering Geologist

Attachment: Review Letter of April 18, 2014
Appendix A: Slope Stability Analyses
Plate 1: Geotechnical Map
Plate 2: Geotechnical Cross Sections

REFERENCES

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Date: September 9, 2014
GDI #: 11.00103.0183

CITY OF AGOURA HILLS - GEOTECHNICAL REVIEW SHEET

To: Doug Hooper

Project Location: 30800 Agoura Road, Agoura Hills, California.

Building & Safety #: 08-CUP-001

Geotechnical Report: Gorian & Associates, Inc. (2014b), "Geotechnical Response to City of Agoura Hills Review Sheet Dated April 18, 2014, Senior Housing Community, Vesting Tentative Tract Number 71742 (APN# 2061-001-025), 30800 Agoura Road, Agoura Hills, California," Log Number: 2272-1-0-102, dated July 29, 2014.

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Previous Reviews: November 11, 2011 and April 18, 2014.

FINDINGS

Planning/Feasibility Issues	Geotechnical Report
☐ Acceptable as Presented	☐ Acceptable as Presented
☒ Response Required	☒ Response Required

REMARKS

Gorian and Associates, Inc. (GAI; consultant) provided a response to the City of Agoura Hills geotechnical review letter dated April 18, 2014 regarding the proposed development at the site located at 30800 Agoura Road in the City of Agoura Hills, California. The proposed development includes the construction of two residential buildings with subterranean parking, retaining walls with a maximum height of 27 ft, associated infrastructure improvements, and widening of Agoura Road. Other associated improvements include access and landscaping areas.

The City of Agoura Hills – Planning Department reviewed the referenced report from a geotechnical perspective for compliance with applicable codes, guidelines, and standards of practice. GeoDynamics, Inc. (GDI) performed the geotechnical review on behalf of the City. Based upon a review of the submitted reports, the consultant shall adequately respond to the following Planning/Feasibility comments prior to consideration by the Planning Commission of approval of Case # 08-CUP-001. The Consultant should respond to the following Report Review comments prior to Building Plan-Check Approval. Plan-Check comments should be addressed in Building & Safety Plan Check. A separate geotechnical submittal is not required for plan-check comments.

Notes to City:

1. *The grading plan shows proposed retaining walls higher than 6 ft. The City code limits the height of retaining walls to 6 ft or less. Variances for retaining wall heights may be required for approval of the grading plan. No justification for deviation from the code requirements were provided in the referenced reports.*

2. *The consultant has responded to a previous comment by indicating that some improvements shown on the current development plan (widening of Agoura Road) will be completed as a separate project by the City of Agoura Hills.*

Planning/Feasibility Comments

1. The consultant provided static translational analyses for potential unfavorably oriented surfaces in the Calabasas Formation at the base of the proposed soil nail wall. Seismic analyses should be provided as per the County of Los Angeles Guidelines.

2. The contact between the Older Alluvium and the underlying Calabasas Formation is reported to be inclined northerly at an overall gradient of about 13 degrees, with variable material conditions. At some locations the contact was found to be abrupt. Other locations encountered residual soil of gray clay (B-1), or plastic clay seams within the uppermost part of the Calabasas Formation inclined roughly parallel to the contact (B-3). The consultant should discuss and evaluate as necessary the potential for translational deformation where this contact will be exposed in future cut-slopes or retaining wall back-cuts. Mitigation measures should be recommended as necessary.

   Note: The consultant responded to this comment by referring to rotational stability analyses provided in the report. However, the rotational stability analyses provided do not address the potential for translational movement where the contact between the Older Alluvium and the underlying Calabasas Formation is inclined toward the back of the proposed wall at an angle of about 13 degrees. As noted in the earlier comment there are numerous indications that low strength materials are associated at least locally with this contact. These include "*clay soil*", "*plastic deformation*" and "*plastic, possibly polished clay seams*" noted near the contact in Borings B-1, B-2 and B-3, and indications of low-angle dips within the Calabasas Formation in Borings 4 and 6 (Boring 5 did not extend to the contact). The consultant describes a failure associated with the Qoal/Tc contact just northeast of the project. Inasmuch as construction of a soil nail wall tends to provide limited opportunity for evaluation during construction, it would appear prudent to provide sufficient subsurface exploration and analyses to better define the nature of this contact and the underlying bedrock prior to construction.

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   B-2 – The consultant accurately describes the older alluvium overlying the contact, but does not include the description of the underlying Calabasas Formation that is characterized as a claystone with plastic deformation.

B-3 – The consultant accurately describes the older alluvium overlying the contact, but does not include the description of the underlying Calabasas Formation that is characterized as massive claystone that is "very weathered" and "sheared" with rootlets along plastic clay seams oriented subparallel to the contact (which would be dipping out of slope in future retaining wall backcuts).

B-4 - The consultant accurately describes the older alluvium overlying the contact, but does not include the description of the underlying Calabasas Formation that is characterized as silty claystone with "bedding inclined 15 to 20 degrees". No dip direction is provided; however, if this dip is northward, the features would be adversely oriented in future retaining wall backcuts.

B-5 – The contact was not encountered.

B-6 — The consultant accurately describes the older alluvium overlying the contact, but does not include the description of the underlying Calabasas Formation that is characterized as clayey siltstone with "bedding inclined at 10 to 20 degrees".

Based on these descriptions, the reviewer maintains that the contact between the Older Alluvium and the Calabasas Formation, while clearly variable, should be considered a potentially weak horizon that could contribute to translational failures. Although the soil nail wall backcut can be observed and mapped during construction, effective mitigation would be difficult at that point if low-strength conditions were found to predominate. The consultant should characterize and evaluate this contact as part of the feasibility level study.

3. The consultant provides earthquake parameters (peak ground acceleration and earthquake magnitude) based on a seismic event that has a 10% probability of exceedance in 50 years. The consultant should revise these parameters to comply with the 2013 edition of the California Building Code (and by adoption, the City of Agoura Hills Building Code). Mitigation measures should be recommended as necessary.

   Note: As per the 2103 CBC, peak ground acceleration should be based on a seismic event that has a 2% probability of exceedance in 50 years (2475 years return period).

Report Review Comments

1. The consultant should review final development plans, including the grading plans when they become available. A copy of the grading plan should be used as a base map for an updated geotechnical map. Additional geotechnical recommendations should be provided as necessary to address the various aspects of the development/grading plans.
2. The consultant should evaluate the potential for interaction between retaining walls and adjacent foundations/structures. Mitigation measures should be recommended as necessary.
3. The consultant should review the final design of soil nail wall. Soil nailing design should be provided for review by the City prior to approval.
4. No on-site infiltration systems are proposed at the site. If any are to be proposed, the consultant should perform additional on-site infiltration testing as per the County of Los Angeles requirements (see "Low Impact Development Best Management Practice, Guidelines for Design, Investigation, and reporting").

Plan-Check Comments

1. The name, address, and phone number of the Consultant and a list of all the applicable geotechnical reports shall be included on the building/grading plans.
2. The following note must appear on the grading and foundation plans: *"All retaining wall excavations shall be reviewed by the project engineering geologist for the presence of adversely oriented joint surfaces. Adverse surfaces shall be evaluated and supported in accordance with recommendations of the project geotechnical engineer."*
3. The grading plan should include the limits and depths of overexcavation for the swimming pool, the road and flatwork areas as recommended by the Consultant.
4. The following note must appear on the grading and foundation plans: "*Excavations shall be made in compliance with CAL/OSHA Regulations.*"
5. The following note must appear on the foundation plans: "*All foundation excavations must be observed and approved, in writing, by the Project Geotechnical Consultant prior to placement of reinforcing steel.*"

6. Foundation plans and foundation details shall clearly depict the embedment material and minimum depth of embedment for the foundations.
7. Drainage plans depicting all surface and subsurface non-erosive drainage devices, flow lines, and catch basins shall be included on the building plans.
8. Final grading, drainage, and foundation plans shall be reviewed, signed, and wet stamped by the consultant.
9. Provide a note on the grading and foundation plans that states: "*An as-built report shall be submitted to the City for review. This report prepared by the Geotechnical Consultant must include the results of all compaction tests as well as a map depicting the limits of fill, locations of all density tests, outline and elevations of all removal bottoms, keyway locations and bottom elevations, locations of all subdrains and flow line elevations, and location and elevation of all retaining wall backdrains and outlets. Geologic conditions exposed during grading must be depicted on an as-built geologic map.*"

If you have any questions regarding this review letter, please contact GDI at (805) 496-1222.

Respectfully Submitted,
GeoDynamics, INC.

Ali Abdel-Haq
Geotechnical Engineering Reviewer
GE 2308 (exp. 12/31/15)

Christopher J. Sexton
Engineering Geologic Reviewer
CEG 1441 (exp. 11/30/14)

APPENDIX A

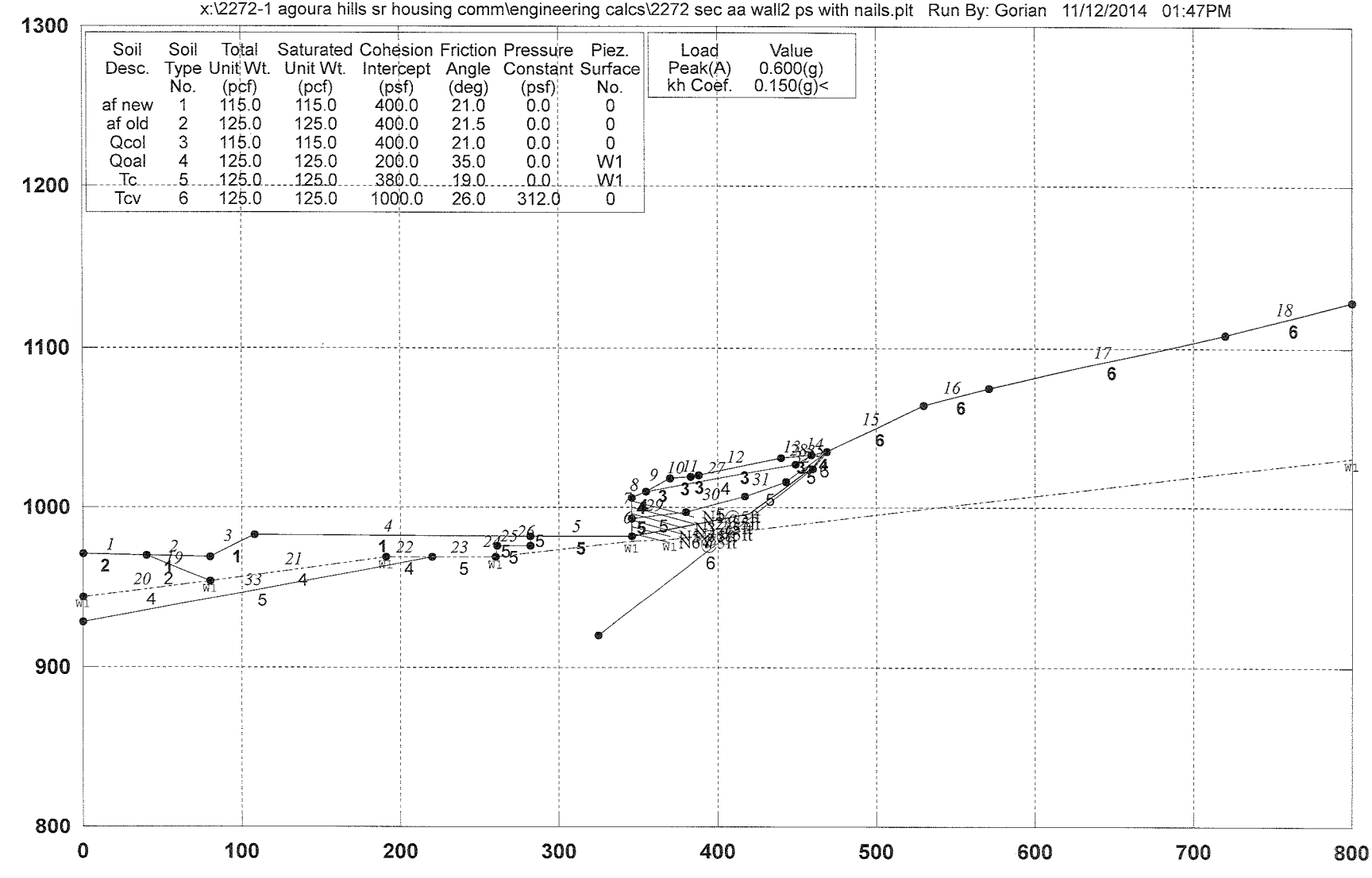
SLOPE STABILITY ANALYSES

WO 2272-1-0-101 with nails Section A-A' pseudo-static

x:\2272-1 agoura hills sr housing comm\engineering calcs\2272 sec aa wall2 ps with nails.plt Run By: Gorian 11/12/2014 01:47PM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pressure Constant (psf)	Piez. Surface No.
af new	1	115.0	115.0	400.0	21.0	0.0	0
af old	2	125.0	125.0	400.0	21.5	0.0	0
Qcol	3	115.0	115.0	400.0	21.0	0.0	0
Qoal	4	125.0	125.0	200.0	35.0	0.0	W1
Tc	5	125.0	125.0	380.0	19.0	0.0	W1
Tcv	6	125.0	125.0	1000.0	26.0	312.0	0

Load	Value
Peak(A)	0.600(g)
kh Coef.	0.150(g)<



GSTABL7 v.2 FSmin=1.11

Factor Of Safety Is Calculated By The Simplified Janbu Method

GSTABL7

*** GSTABL7 ***

** GSTABL7 by Garry H. Gregory, P.E. **

** Original Version 1.0, January 1996; Current Version 2.005, Sept. 2006 **

****

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 11/12/2014
Time of Run: 01:47PM
Run By: Gorian
Input Data Filename: X:\2272-1 Agoura Hills Sr Housing Comm\engineering calcs\2272 sec aa wall2 ps with nails.dat
Output Filename: X:\2272-1 Agoura Hills Sr Housing Comm\engineering calcs\2272 sec aa wall2 ps with nails.OUT
Unit System: English
Plotted Output Filename: X:\2272-1 Agoura Hills Sr Housing Comm\engineering calcs\2272 sec aa wall2 ps with nails.PLT
PROBLEM DESCRIPTION: WO 2272-1-0-101 with nails
Section A-A' pseudo-static

BOUNDARY COORDINATES
18 Top Boundaries
35 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	971.00	40.00	970.00	2
2	40.00	970.00	80.00	969.00	1
3	80.00	969.00	108.00	983.00	1
4	108.00	983.00	282.00	982.00	1
5	282.00	982.00	346.00	982.00	5
6	346.00	982.00	346.20	993.00	5
7	346.20	993.00	346.50	1006.00	4
8	346.50	1006.00	355.00	1010.00	4
9	355.00	1010.00	370.00	1018.00	3
10	370.00	1018.00	383.00	1019.00	3
11	383.00	1019.00	388.00	1020.00	3
12	388.00	1020.00	440.00	1031.00	3
13	440.00	1031.00	459.00	1033.00	3
14	459.00	1033.00	469.00	1035.00	4
15	469.00	1035.00	530.00	1064.00	6
16	530.00	1064.00	571.00	1075.00	6
17	571.00	1075.00	720.00	1108.00	6
18	720.00	1108.00	800.00	1128.00	6
19	40.00	970.00	80.00	954.00	2
20	0.00	944.00	80.00	954.00	4
21	80.00	954.00	191.00	969.00	4
22	191.00	969.00	220.00	969.00	4
23	220.00	969.00	260.00	969.00	5
24	260.00	969.00	261.00	976.00	5
25	261.00	976.00	281.90	976.00	5
26	281.90	976.00	282.00	982.00	5
27	355.00	1010.00	449.00	1027.00	4
28	449.00	1027.00	459.00	1033.00	4
29	346.20	993.00	380.00	997.00	5
30	380.00	997.00	417.00	1007.00	5
31	417.00	1007.00	443.00	1016.00	5
32	443.00	1016.00	469.00	1035.00	5
33	0.00	928.00	220.00	969.00	5
34	325.00	920.00	460.00	1024.00	6
35	460.00	1024.00	469.00	1035.00	6

User Specified Y-Origin = 800.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

6 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	115.0	115.0	400.0	21.0	0.00	0.0	0
2	125.0	125.0	400.0	21.5	0.00	0.0	0
3	115.0	115.0	400.0	21.0	0.00	0.0	0
4	125.0	125.0	200.0	35.0	0.00	0.0	1
5	125.0	125.0	380.0	19.0	0.00	0.0	1
6	125.0	125.0	1000.0	26.0	0.00	312.0	0

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)

Piezometric Surface No. 1 Specified by 7 Coordinate Points

Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	944.00
2	80.00	954.00
3	191.00	969.00
4	260.00	969.00
5	346.50	979.00
6	370.00	980.00
7	800.00	1031.00

Specified Peak Ground Acceleration Coefficient (A) = 0.600(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.150(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

SOIL NAIL LOAD(S)

6 SOIL NAIL LOAD(S) SPECIFIED

Nail No.	X-Pos (ft)	Y-Pos (ft)	Nail Dia (in)	Tendon Dia (in)	Spacing (ft)	Inclin. (deg)	Length (ft)
1	346.45	1004.00	6.0	1.0	5.00	15.00	40.00
2	346.36	1000.00	6.0	1.0	5.00	15.00	40.00
3	346.27	996.00	6.0	1.0	5.00	15.00	35.00
4	346.18	992.00	6.0	1.0	5.00	15.00	35.00
5	346.11	988.00	6.0	1.0	5.00	15.00	25.00
6	346.04	984.00	6.0	1.0	5.00	15.00	25.00

SOIL NAIL LOAD DATA

Soil Nail No. 1 4 Load Points Apply to This Nail

Load Diagram Type = 1

POINT NO.	X-COORD.(ft)	Y-COORD.(ft)	FORCE(lbs)
1	346.45	1004.00	1400.00
2	359.54	1000.61	5654.87
3	369.07	998.15	5654.87
4	385.09	993.65	0.00

Allowable Pullout Stress = 1000.0(psf)

Allowable Tendon Stress = 36000.0(psi)

Allowable Nail Head Load = 7000.0(lbs)

Soil Nail No. 2 4 Load Points Apply to This Nail

Load Diagram Type = 1

POINT NO.	X-COORD.(ft)	Y-COORD.(ft)	FORCE(lbs)
1	346.36	1000.00	1400.00
2	359.44	996.61	5654.87
3	368.97	994.15	5654.87
4	385.00	989.65	0.00

Allowable Pullout Stress = 1000.0(psf)

Allowable Tendon Stress = 36000.0(psi)

Allowable Nail Head Load = 7000.0(lbs)

Soil Nail No. 3 4 Load Points Apply to This Nail

Load Diagram Type = 1

POINT NO.	X-COORD.(ft)	Y-COORD.(ft)	FORCE(lbs)
1	346.27	996.00	1400.00
2	354.99	993.74	5654.87
3	369.68	989.94	5654.87
4	380.08	986.94	0.00

Allowable Pullout Stress = 1500.0(psf)

Allowable Tendon Stress = 36000.0(psi)
Allowable Nail Head Load = 7000.0(lbs)
Soil Nail No. 4 4 Load Points Apply to This Nail
Load Diagram Type = 1

POINT NO.	X-COORD.(ft)	Y-COORD.(ft)	FORCE(lbs)
1	346.18	992.00	1400.00
2	354.90	989.74	5654.87
3	369.59	985.94	5654.87
4	379.99	982.94	0.00

Allowable Pullout Stress = 1500.0(psf)
Allowable Tendon Stress = 36000.0(psi)
Allowable Nail Head Load = 7000.0(lbs)
Soil Nail No. 5 4 Load Points Apply to This Nail
Load Diagram Type = 1

POINT NO.	X-COORD.(ft)	Y-COORD.(ft)	FORCE(lbs)
1	346.11	988.00	1400.00
2	352.65	986.31	5654.87
3	362.42	983.78	5654.87
4	370.26	981.53	0.00

Allowable Pullout Stress = 2000.0(psf)
Allowable Tendon Stress = 36000.0(psi)
Allowable Nail Head Load = 7000.0(lbs)
Soil Nail No. 6 4 Load Points Apply to This Nail
Load Diagram Type = 1

POINT NO.	X-COORD.(ft)	Y-COORD.(ft)	FORCE(lbs)
1	346.04	984.00	1400.00
2	352.58	982.31	5654.87
3	362.34	979.78	5654.87
4	370.18	977.53	0.00

Allowable Pullout Stress = 2000.0(psf)
Allowable Tendon Stress = 36000.0(psi)
Allowable Nail Head Load = 7000.0(lbs)
NOTE - An Equivalent Line Load Is Calculated For Each Row Of Soil Nails
Assuming A Uniform Distribution Of Load Horizontally Between
Individual Nails.
Trial Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	346.000	982.000
2	420.000	996.400
3	460.000	1025.000
4	468.000	1034.800

* * Factor Of Safety Is Calculated By The Simplified Janbu Method * *
Sum of Soil Nail Forces on Failure Surface = 16606.99 (lbs)
Factor Of Safety For The Preceding Specified Surface = 1.112
The calculated factor of safety for the specified surface without piers/piles, reinforcement, soil nails, or applied forces = 1.010

Table 1 - Individual Data on the 16 Slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	0.2	137.0	0.0	0.0	0.0	0.0	20.6	0.0	0.0
2	0.3	653.7	0.0	0.0	0.0	0.0	98.1	0.0	0.0
3	8.5	26642.9	0.0	0.0	0.0	0.0	3996.4	0.0	0.0
4	15.0	53583.2	0.0	0.0	0.0	0.0	8037.5	0.0	0.0
5	10.0	37950.0	0.0	0.0	0.0	0.0	5692.5	0.0	0.0
6	3.0	11118.4	0.0	0.0	0.0	0.0	1667.8	0.0	0.0
7	5.0	18434.2	0.0	0.0	0.0	0.0	2765.1	0.0	0.0
8	29.0	107715.2	0.0	0.0	0.0	0.0	16157.3	0.0	0.0
9	3.0	11229.9	0.0	0.0	0.0	0.0	1684.5	0.0	0.0
10	20.0	62272.3	0.0	0.0	0.0	0.0	9340.8	0.0	0.0
11	3.0	7104.1	0.0	0.0	0.0	0.0	1065.6	0.0	0.0
12	6.0	12170.8	0.0	0.0	0.0	0.0	1825.6	0.0	0.0
13	10.0	14457.2	0.0	0.0	0.0	0.0	2168.6	0.0	0.0
14	1.0	1057.2	0.0	0.0	0.0	0.0	158.6	0.0	0.0
15	6.9	4026.1	0.0	0.0	0.0	0.0	603.9	0.0	0.0

16	1.1	73.9	0.0	0.0	0.0	0.0	11.1	0.0	0.0

Table 2 - Base Stress Data on the 16 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	11.01	346.10	0.20	647.80	231.72
2	11.01	346.35	0.31	1188.86	737.04
3	11.01	350.75	8.66	1534.91	1060.23
4	11.01	362.50	15.28	1693.45	1208.30
5	11.01	375.00	10.19	1774.14	1283.66
6	11.01	381.50	3.06	1741.95	1253.60
7	11.01	385.50	5.09	1734.96	1247.08
8	11.01	402.50	29.54	1744.92	1256.37
9	11.01	418.50	3.06	1755.41	1266.17
10	35.56	430.00	24.59	1580.18	2190.87
11	35.56	441.50	3.69	1300.81	1666.24
12	35.56	446.00	7.38	1173.57	1427.31
13	35.56	454.00	12.29	955.22	1017.26
14	35.56	459.50	1.23	809.64	743.88
15	50.77	463.46	10.95	712.52	505.45
16	50.77	467.46	1.70	233.66	59.82

NOTE: Pier/Pile, reinforcement, soil nail, and applied forces (if applicable) are included in the Available Shear values in Table 2 by uniform distribution on each slice base, based upon the converged factor of safety.
Sum of the Resisting Forces (including Pier/Pile, Tieback, Reinforcing Soil Nail, and Applied Forces if applicable) = 202151.03 (lbs)
Average Available Shear Strength (including Tieback, Pier/Pile, Reinforcing, Soil Nail, and Applied Forces if applicable) = 1473.28(psf)
Sum of the Driving Forces = 181762.52 (lbs)
Average Mobilized Shear Stress = 1324.69(psf)
Total length of the failure surface = 137.21(ft)

*** SEISMIC SLOPE DISPLACEMENT DATA ***
(Note: kv is set = zero for displacement calculations)
Seismic Yield Coefficient (ky) = 0.1993(g)
Calculated Newmark Seismic Displacement = 0.528(ft)
Non-Symmetrical Sliding Resistance Has Been Specified for Downhill Sliding.

**** END OF GSTABL7 OUTPUT ****

BENCHMARK

RIBM TAG IN CONC CB 42 FEET WEST OF CENTERLINE OF KANAN ROAD AND 64 FEET NORTH OF CENTERLINE OF AGOURA ROAD.

BM NO.: CY10004A ELEVATION: 961.97 ADJ.: 1988

FLOOD PLAIN NOTE

COUNTY: LOS ANGELES
ASSESSOR PARCEL #: 2061-001-025
FLOOD ZONE: X
COMMUNITY NAME: AGOURA HILLS
COMMUNITY #: 065032
COMMENTS: MINIMAL FLOOD HAZARD
MAP NUMBER: 06037C1243F
MAP DATE: SEPTEMBER 26, 2008

LEGAL DESCRIPTION

PARCEL 2 OF PARCEL MAP 15762, IN THE CITY OF AGOURA HILLS, AS PER MAP FILED IN BOOK 175 PAGES 6 AND 7 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN ALL OIL, GAS, MINERALS AND OTHER HYDROCARBON SUBSTANCES LYING BELOW THE SURFACE OF SAID LAND; BUT WITH NO RIGHT OF SURFACE ENTRY THERETO, AS PROVIDED IN THE DEED RECORDED DECEMBER 26, 1960 AS INSTRUMENT NO. 1450 IN BOOK D1076 PAGE 585, OFFICIAL RECORDS.

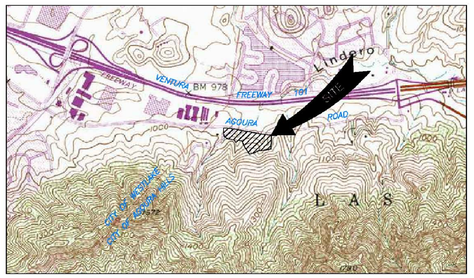
ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN ALL OIL, GAS, MINERALS AND OTHER HYDROCARBON SUBSTANCES LYING BELOW THE SURFACE OF SAID LAND; BUT WITH NO RIGHT OF SURFACE ENTRY THERETO, AS PROVIDED IN THE DEED RECORDED DECEMBER 29, 1960 AS INSTRUMENT NO. 1452 IN BOOK D1076 PAGE 568, OFFICIAL RECORDS.

ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN ALL OIL, GAS, MINERALS AND OTHER HYDROCARBON SUBSTANCES LYING BELOW THE SURFACE OF SAID LAND, BUT WITH NO RIGHT OF SURFACE ENTRY THERETO, AS PROVIDED IN THE DEED RECORDED MARCH 4, 1983 AS INSTRUMENT NO. 83-248390.

BASIS OF BEARINGS

THE BEARING SOUTH 75° 24' 45" EAST OF THE CENTERLINE OF AGOURA RD, AS SHOWN ON PARCEL MAP NO. 15762, AS FILED IN BOOK 175, PAGES 6 AND 7 OF PARCEL MAPS, RECORDS OF LOS ANGELES COUNTY, WAS TAKEN AS THE BASIS OF BEARINGS SHOWN ON THIS MAP.

VICINITY MAP



THOMAS GUIDE PAGE: 557 F-6

CONSTRUCTION NOTES:

1. CONSTRUCT 3 INCHES OF A.C. OVER 10 INCHES OF AGGREGATE BASE
2. CONSTRUCT 3 INCHES OF A.C. OVER 7 INCHES OF AGGREGATE BASE.
3. DECORATIVE CONCRETE, 7 INCHES WITH NO. 3 BARS AT 18 INCHES ON CENTER IN BOTH DIRECTIONS OVER 4 INCHES OF CLASS 2 AGGREGATE BASE. SEE SECTION HEREON.
4. FIRELANE PER L.A.C.F.D. REQUIREMENTS.
5. 6" CONC. CURB PER APWA STD. PLAN 120-1
6. 6" CONC. CURB AND 18" GUTTER PER APWA STD. PLAN 123-1
7. RETAINING WALLS BY SEPARATE PERMIT
8. HANDICAP RAMP PER APWA STD. 111-2
9. 6" ROLLED CURB PER APWA STD. PLAN 121-1

Geotechnical Map

Gorian & Associates, Inc.
Applied Earth Sciences

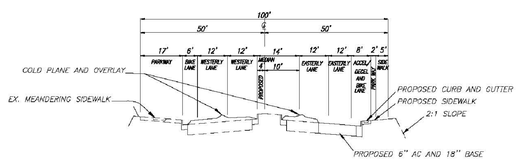
Job No: 2272-0-0-102		Date: Nov. 2014
Scale: 1" = 40'	Drawn by:	PLATE 1
	Approved by:	

EXPLANATION

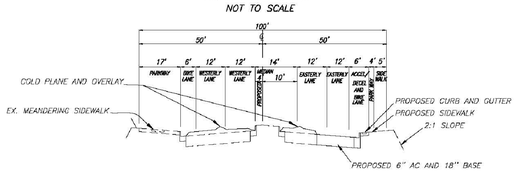
- **afc** — Certified Engineered Fill
- **Qal** — Alluvium
- **Qoal** — Older Alluvium
- **Tc** — Calabasas Formation
- **Tcvag** — Conejo Volcanics (Agglomerate)
- Approximate Contact Between Geologic Units
- T-4 — Approximate Location of Exploratory Backhoe Pit
- IP-4 — Approximate Location of Stormwater Infiltration Test Pit
- B-6 — Approximate Location of 24" Diameter Exploratory Boring
- Strike and Dip of Bedding
- Groundwater
- BT-3 — Approximate Location of Seismic Traverse
- A — A' — Geotechnical Cross Section

SECTION A-A
EXISTING STREET SECTION
NOT TO SCALE

SECTION B-B
PROPOSED STREET SECTION
NOT TO SCALE



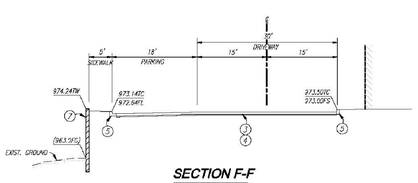
SECTION C-C
PROPOSED STREET SECTION
NOT TO SCALE



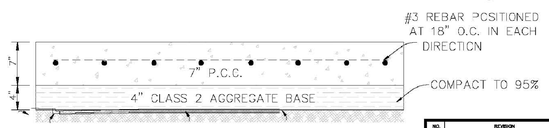
SECTION D-D
PROPOSED STREET SECTION
NOT TO SCALE

BIOSWALE DETAIL
NOT TO SCALE

SECTION E-E
NOT TO SCALE



SECTION F-F
NOT TO SCALE



DECORATIVE CONCRETE PAVEMENT SECTION
NOT TO SCALE

LEGEND

SYMBOLS
- EXIST. SEWER MANHOLE
- PROP. SEWER MANHOLE
- PROP. SEWER CLEANOUT
- EXIST. WATER VALVE
- PROP. WATER VALVE
- EXIST. FIRE HYDRANT
- PROP. FIRE HYDRANT
- EXIST. AREA DRAIN
- PROP. AREA DRAIN
- EXIST. STORM MANHOLE
- PROP. STORM MANHOLE
- EXIST. CATCH BASIN
- PROP. CATCH BASIN
- EXIST. ELECTRICAL OR TELEPHONE VAULT
- EXIST. LIGHT POLE
- EXIST. OVERHEAD LIGHT POLE
- EXIST. SIGN
- EXIST. TREE TO REMAIN, PROTECT IN PLACE
- EXIST. TREE TO BE BOXED AND TRANSPLANTED
- EXIST. TREE TO BE REMOVED FOR PROPOSED ROAD WIDENING

LINETYPES
- EXIST. SEWER
- PROP. SEWER
- EXIST. WATER
- PROP. WATER
- EXIST. STORM DRAIN
- PROP. STORM DRAIN
- EXIST. GAS LINE
- GR — PROP. GRADE BREAK
- EXIST. CONCRETE CURB
- PROP. CONCRETE CURB
- PROP. RETAINING WALL
- DAYLITE

ABBREVIATIONS
FS = FINISHED SURFACE
FG = FINISHED GRADE
FH = FIRE HYDRANT
FL = FLOWLINE
TC = TOP OF CURB
TG = TOP OF GRATE
TW = TOP OF WALL
HP = HIGH POINT
INV = INVERT
PAD = BLDG. PAD
FF = BLDG. FINISHED FLOOR
GFF = GARAGE FINISHED FLOOR
CO = SEWER CLEANOUT
SF = SQUARE FOOTAGE
AC = ACREAGE
R/W = RIGHT-OF-WAY
RET = RETAINING WALL
DY. LT = DAY LIGHT LINE

PUBLIC UTILITIES / SERVICES

WATER: LAS VIRGENES MUNICIPAL WATER DIST. 4232 LAS VIRGENES ROAD CALABASAS, CA 91302 (818) 880-4110

ELECTRICAL: SOUTHERN CALIFORNIA EDISON 3585 YOSEMITE DRIVE THOUSAND OAKS, CA 91361 (805) 494-7016

TELEPHONE: SBC (PAC BELL) 15701 RAMMER STREET, #115 VAN NUYS, CA 91406 (818) 373-9889

GAS: SOUTHERN CALIFORNIA GAS 9400 OAKDALE AVENUE CHATSWORTH, CA 91313 (818) 701-3324

SEWER: LA COUNTY, DEPT. OF PUBLIC WORKS SEWER MAINTENANCE DIVISION 1000 S. FREMONT AVENUE, BLDG A9 EAST ALHAMBRA, CA 91803 (626) 300-3308

CABLE: TIME WARNER CABLE 2323 TELLER ROAD NEWBERRY PARK, CA 91320 (805) 375-5213

CABLE: CHARTER COMMUNICATIONS 3506 CROSSCREEK ROAD MALIBU, CA 90265 (310) 456-9619

CALTRANS: CALTRANS 5465 MESSA BOULEVARD YUCAIPA, CA 9356 (805) 388-1496

UTILITY NOTE

UTILITY INFORMATION SHOWN HEREON WAS COMPILED FROM PUBLIC RECORDS. NO LIABILITY IS ASSUMED OR INFERRED BY HMK ENGINEERING AS TO THE ACCURACY OF SAID INFORMATION.

BOUNDARY DATUM

ESTABLISHED FROM THE LOCAL CITY OR COUNTY ENGINEERING BUREAU'S BOUNDING MONUMENTED CENTERLINES OR FROM MONS OF RECORD AS SHOWN. 'n' ELEVATIONS ARE SHOWN, THEY ARE FOR INFORMATION ONLY AND ARE NOT FOR CONSTRUCTION OF GRADE, DRAINAGE OR ANY OTHER ITEM WHICH MAY BE CONNECTED TO VERTICAL DATUM.

SCALE: 1"=40'
40' 30' 20' 10' 0 40'

NO.	REVISION	REVISED BY	APPROVED BY	DATE
1	ADDED CITY'S WIDENING PER KIMLEY HORN'S PLANS	GB/1/3/2013	MARK D HARDY	1/3/2013

HMK ENGINEERING INC.
CIVIL ENGINEERS · LAND SURVEYORS · LAND PLANNERS
1552 EIGHTEENTH STREET
SANTA MONICA, CA 90404 PHONE (310) 449-5511

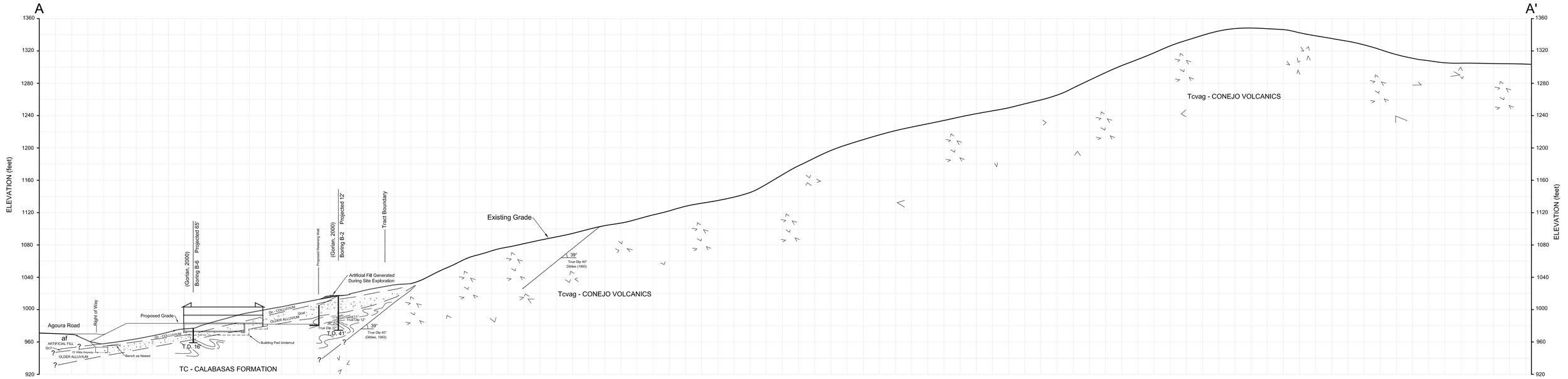
No. 36536 EXP. JUNE 30, 2014

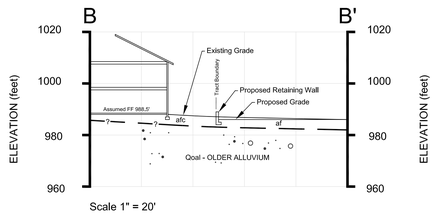
(OWNER& DEVELOPER)
AGOURA HILLS CENTER PROPERTIES, LLC
2385 E. HILLCREST DRIVE #107
THOUSAND OAKS, CA 91362
(818) 886-4200 CONTACT: STEVE RICE

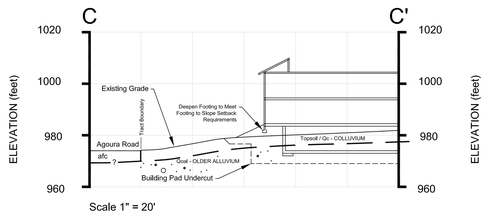
VESTING TENTATIVE TRACT MAP NUMBER 71742

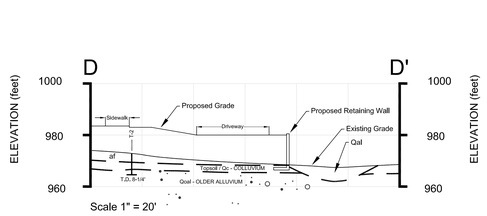
LOCATED IN A CORPORATED TERRITORY OF
THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA
SEPTEMBER 2012

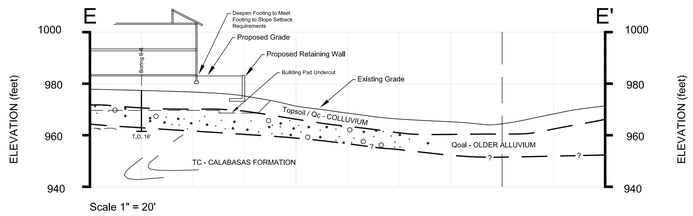
SHEET 1 OF 1

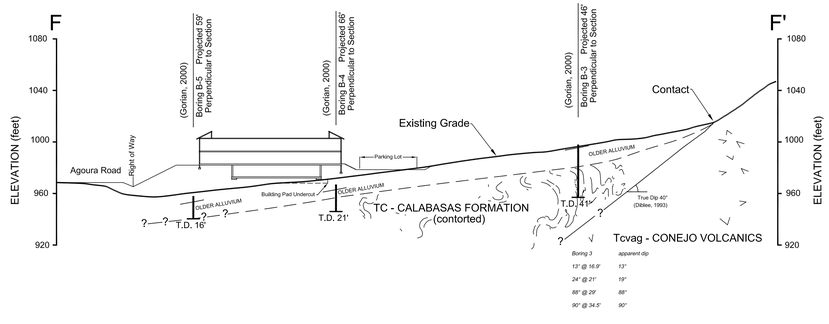












GEOTECHNICAL CROSS SECTIONS

Gorian & Associates, Inc. *Applied Earth Sciences*		
Job No: 2272-0-0-103		Date: Nov. 2014
Scale: 1" = 40'	Drawn by:	PLATE 2
	Approved by:	