CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

March 30, 2019 Project No. 5750

9712 Oak Pass Road LLC
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SUBJECT: UPDATE GEOTECHNICAL ENGINEERING INVESTIGATION REPORT, PROPOSED MULTI-STRUCTURE LUXURY HOTEL COMPLEX AND CUSTOM SINGLE FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-9, VESTING TENTATIVE TRACT MAP NO. 74908, 9712 OAK PASS ROAD (AKA 9750 & 9800 WANDA PARK DRIVE), BEL AIR AREA, CITY OF LOS ANGELES, CALIFORNIA.

REFERENCE: REPORT OF ENGINEERING GEOLOGIC STUDY, PROPOSED MULTI-STRUCTURE LUXURY HOTEL AND CUSTOM SINGLE FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-9, VESTING TRACT 74908, 9712 OAK PASS ROAD, LOS ANGELES, CALIFORNIA, PREPARED BY LAND PHASES, INC., PROJECT NO. LP 1197, MARCH 30, 2019.

ADDITIONAL REFERENCES ARE LISTED IN THE REFERENCE SECTION OF THIS REPORT AND IN THE ABOVE REFERENCED REPORT PREPARED BY LAND PHASES, INC.

Oak Pass Road LLC,

Calwest Geotechnical Inc. is pleased to submit this report summarizing the findings of our update geotechnical engineering investigation and analyses performed for the proposed project consisting of a multi-structure luxury hotel complex and custom single family residential development, Lots 1-9, Vesting Tentative Tract Map No. 74908, Bel Air area, City of Los Angele, California. This report addresses the pertinent project design issues from a geotechnical engineering perspective.

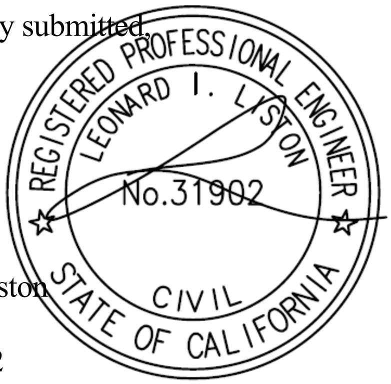
This report summarizes our geotechnical engineering investigation of the subject site, including descriptions of the various geotechnical engineering laboratory testing performed, discussion of the test results, geotechnical engineering analyses, and preliminary geotechnical engineering recommendations pertaining to the proposed project.

Based on our investigation as described in this report, it is the opinion of this office the proposed project is considered feasible from a geotechnical engineering standpoint, provided the recommendations presented herein and those of the project engineering geologist Land Phases, Inc., are incorporated into the project plans and are implemented during construction.

We appreciate the opportunity to provide you with geotechnical engineering services for the proposed project. Please note that certain assumptions were made during the course of our investigation and analysis presented in this report. Further, there are certain limitations that are normally understood to be associated with geotechnical engineering investigations, which are discussed in this report.

During review of this report, if there are items that require additional information and/or clarification, please do not hesitate to the call the undersigned at this office.

Respectfully submitted,



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Distribution: (1) Addressee (1 pdf. copy on CD for City submittal and 4 printed copies).
(2) Land phases, Inc. (1 electronic copy).

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INTRODUCTION

This Update Geotechnical Engineering Investigation report presents the results of our geotechnical engineering investigation and analysis for the proposed project consisting of a multi-structure luxury hotel complex and custom single family residential development, Lots 1-9, Vesting Tentative Tract 74908, 9712 Oak Pass Road, (aka 9750 and 9800 Wanda Park Drive) Bel Air area, City of Los Angeles, California. The Location Map included in Appendix A shows the approximate location of the subject site and surrounding vicinity.

The purpose of this report is to provide geotechnical engineering recommendations pertinent to the proposed project. The recommendations presented herein are based on our current and previous investigation of the subject site relative to the current proposed project. The following report describes our scope of work and presents our professional opinions regarding the proposed project in the form of findings, conclusions, and geotechnical recommendations

SCOPE OF WORK

Our update geotechnical engineering investigation has been directed at the identification and evaluation of the geotechnical conditions at the subject site that may influence the proposed project. Our current study was conducted between October and November of 2018, and included, but may not have been limited to, the following tasks:

- Consultation with the client, 9712 Oak Pass Road, LLC, the project Engineering Geologist, Land Phases, Inc. (LP), the project Architect, Harrison Design, and the project Civil Engineer, LC Engineer Group, Inc. (LCE), during our geotechnical engineering investigation and analysis of the subject site.

- Review of the referenced plans, reports, and City correspondence.

- Review of available published geotechnical information, relevant to the subject site and surrounding areas, available in our files.

- Review of available pertinent records on file at the City of Los Angeles Department of Building and Safety.

- Perform a site reconnaissance to access the visual surficial conditions at the subject site.

- Excavation and logging of 12 borings (Borings # 5-16) and 18 test pits (Test Pits # 8-25) within the subject site. The borings were excavated with a bucket auger drill rig and a track mounted drill rig. The test pits were excavated with hand labor. When completed with our examination and logging of the exploratory excavations, the excavations were backfilled to grade with the spoils generated from the excavation process. While significant care was taken by our excavation subcontractor during the backfilling process in an attempt to minimize future settlement, the backfilling of the exploratory excavations did not involve certified compaction. The detailed logs of the exploratory test borings and test pits, prepared by LP, are included in Appendix C.

- Preparation of an Update Geotechnical Map and Cross-sections, utilizing as a basis, the Update Geologic Map and Cross-sections prepared by LP. The Update Geotechnical Map and Cross-sections are included in Appendix B. We make no representation regarding the accuracy of the supplied Update Geologic Map and Cross-sections provided by LP.

- Review of the logs of the exploratory test borings and test pits prepared by LP and other previous Consultants. The Logs of the exploratory test and borings and test pits are included in Appendix C.

- Review of the laboratory test results of selected samples. A description of the laboratory test procedures and the results of the laboratory tests are included in Appendix D.

- Preparation of geotechnical engineering analysis, slope stability analysis, site-specific seismic analyses, site grading recommendations, foundation design recommendations, and retaining wall design recommendations. The slope stability, geotechnical engineering analysis, and calculations are included in Appendix E.

- Preparation of this formal report presenting our professional opinions regarding the proposed project in the form of findings, conclusions and geotechnical recommendations.

PROPOSED PROJECT

Information concerning the proposed project was provided by the Client, the project consultants, and from the Vesting Tentative Tract Map No. 74908, prepared by LCE. Based on the provided information and the Vesting Tentative Tract Map No. 74908, it is our understanding the proposed project will include the following:

- The recording of the Vesting Tentative Tract Map No. 74908 subdividing the subject site.

- Improvement of Private streets extending from Hutton Drive, Oak Pass Road, and Wanda Park Drive to service the proposed luxury hotel, associated condominiums, cottages, bungalows, and the custom single family residences.

- Public utilities; water, sewer, gas, electrical, and communications to be located in the Private Streets to service the proposed luxury hotel, associated condominiums, cottages, bungalows. And the custom single family residences.

- A multi-story (5-level) luxury hotel complex to the north-east of the subject site.

- Several condominiums, cottages and bungalows associated with the hotel located to the south of the hotel.
- Two (2) multi-level parking structures (P1) and (S), located to the south of the hotel.
- Swimming pool/spas, retaining walls, cart paths, decks, and ancillary structures associated with the hotel.
- Eight (8) custom single-family residences located to the south, south-west, and middle portion of the subject site. The residences will include partial subterranean areas and basements, and will include swimming pools/spas.

The proposed project will include the demolition and removal of all existing structures at the subject site. Grading will include conventional cutting and filling to develop the various building pads and private street grades. Grading may also include, in areas, the removal and recompaction of the near surface soils to a certified fill condition. Excavations extending into the site bedrock will be required for the proposed luxury hotel complex, parking structures, custom single family residences, swimming pool/spas, retaining walls, and for temporary shoring. Temporary shoring may include steel soldier beams, lagging, and possibly ground anchors, such as soil nails or tie-backs.

The foundations for the proposed multi-story luxury hotel complex, parking structures, custom single family residences, and associated basement and retaining walls may consist of conventional and deepened pile foundations extending into the site bedrock or the future certified compacted fill. All foundations adjacent to descending slopes shall comply with the code required foundation setback from descending slopes.

Retaining and basement walls will be required the luxury hotel, complex parking structures, single family residences, and Private Streets. The foundations for retaining and basement walls will extend into the site bedrock or future certified compacted fill. Conventional cantilever retaining walls will be utilized for most locations, however, in some locations, other forms of retaining systems, such as soil nail walls may be utilized.

SITE DESCRIPTION

The subject site is located on the south flank of the Santa Monica Mountains in the Benedict Canyon area of Bel Air, City of Los Angeles, California. Current access to the subject site is via Oak Pass Road and Wanda Park Drive.

Specifically, the subject site consists of a large, partially graded, hillside property which is situated on the east wall of Benedict Canyon. West to southwest trending ridges and canyons are the dominant topographic features within the site. Total physical relief within the site is on the order of 225 feet, with overall slope gradients that vary from nearly horizontal to as steep as 2:1 (H:V), however, slopes reach gradients of 1.5:1 (H:V) to near vertical on various portions of the uphill cut slopes along the existing roadway extending from Wanda Park Drive.

Past grading on the site consisted of cutting and filling associated with the construction of the existing building pad areas and private driveways that traverse the site. The existing topographic conditions of the subject site are shown on the Update Geotechnical Map and Cross-sections, included in Appendix B.

Area drainage systems are present for portions of the existing building pad areas. However, for the majority of the subject site, drainage is by sheet flow runoff directed towards the northwest, west, southwest, and offsite via the existing contours.

Vegetation on the subject site consists of domestic lawns, shrubs, and trees in the yard areas surrounding the existing structures. Natural grasses, shrubs, and trees are present on the undeveloped portions of the site.

EXISTING IMPROVEMENTS

Various residential structures, sports courts, swimming pools, decks, out buildings, and a variety of retaining walls are present on the subject site. The locations of these existing structures are shown on the Update Geotechnical Map and Cross-sections, included in Appendix B. It is to be noted that some of the existing retaining walls do not appear on the underlying survey. However, all existing structures will be demolished and removed from the site as part of the proposed project.

PREVIOUS GEOTECHNICAL STUDIES

The subject site has been the focus of several previous geotechnical studies. Accordingly, relevant geotechnical information on the subject site was reviewed and incorporated in this report as deemed appropriate. The references utilized as part of this report are listed in the References section of this report and in the Report of Engineering Geologic Study, prepared by Land Phase, Inc., dated March 30, 2019.

The most pertinent studies to our update geotechnical engineering investigation of the subject site are the studies completed in 2011-2013 by this office and Mountain geology, Inc (MGI). The studies were related to the previously proposed project consisting of the removal of a fire damaged residence, grading, and construction of retaining walls in construct suitable building pad areas for two future residences and ancillary site structures. In addition, the previously proposed project included improving portions of the existing onsite private driveways.

The studies included the excavation, logging, and sampling of four (4) exploratory test borings and seven (7) exploratory test pits within the approximate southern half of the subject site. The location of these exploratory test borings and test pits are shown on the Update Geotechnical Map and Cross-sections, included in Appendix B. The logs of the exploratory test borings and test pits, prepared by MGI, are included in Appendix C. The studies included recommendations for slope stability, site-specific seismic evaluation, grading recommendations, conventional and deepened foundation recommendations, retaining wall design recommendations, and recommendations for appurtenant structures.

To briefly summarize, it was concluded that the subject site was suitable for the previously proposed project provided the presented recommendations were implemented during design and construction. The detailed findings, conclusions, and recommendations of these studies are included in the referenced reports on file at the LABDS. The referenced reports were reviewed and approved by LADBS as stated in the referenced Department Approval Letters, dated January 22, 2013 and April 16, 2013.

SUBSURFACE CONDITIONS

Subsurface condition beneath the subject site has been interpreted and characterized based on the exploratory test borings and test pits excavated as part of the current and previous studies at the subject site, studies by other Consultants, and available published reports and geologic maps.

As stated by LP, regional geologic mapping by Dibblee (1991) indicates the subject site is underlain by sedimentary, metamorphic, and igneous bedrock. Specifically, Dibblee's mapping indicates that the south/southeast half (approximate) of the subject site is underlain by sedimentary bedrock units of the Monterey Formation (**Tmu**) of Miocene age. The north/northwest half (approximate) of the subject site is underlain by sedimentary bedrock units of the Topanga Formation (**Ttsi**) of middle Miocene age, and intrusive and extrusive igneous volcanic bedrock (**Tvb**), which is related to the Conejo Volcanics, also of middle Miocene age.

Further, based on research by LP, regional geologic mapping by the City of Los Angeles and the Association of Engineering Geologists (1960-70) indicates that the subject site is underlain by sedimentary, metamorphic, and igneous bedrock. Specifically, the mapping suggests that the south/southeast half (approximate) of the subject site is underlain by sedimentary bedrock units of the Modelo Formation (**Mml sh,ss**) of Miocene age. Santa Monica Slate (**Jsm**) of Jurassic age is mapped beneath the Monterey Formation bedrock in this area of the site. The City of Los Angeles and AEG's mapping indicates that the north/northwest half (approximate) of the subject site is underlain by sedimentary units of the Topanga Formation (**Mt sh,ss**) of middle Miocene age and intrusive and extrusive igneous volcanic bedrock (**Mmi**), which is also mapped by the City of LA/AEG as part of the middle Topanga Formation of middle Miocene age.

The exploratory test borings and test pits indicate that the geologic units underlying the subject site include uncertified artificial fill (af), certified compacted fill (afc), soil (Qs), and sedimentary, metamorphic and igneous bedrock (Tm, Tt, Tvb). The geologic units and their distribution in relation to the proposed project are shown on the Update Geotechnical Map and Cross-sections, included in Appendix B.

Uncertified Artificial Fill (af)

A minor to moderate amount of artificial fill, which was most likely generated during grading of the existing building pad areas and various portions of the existing private driveways, is present within the subject site. The artificial fill consists of an admixture of soil and bedrock and is described as a clayey sand, silty sand, and sandy clay with gravel, which is mottled dark yellowish brown and moderate yellowish brown, dry to moist, and medium dense to dense. The gravel component consists of angular, pebble to cobble size clasts of sandstone, siltstone, asphalt, and construction aggregate. The uncertified artificial fill is not considered suitable for foundation support or the support of any future concrete slabs-on-grade or hardscape.

Certified Compacted Fill (afc)

A moderate amount of fill, reported as certified compacted fill by Kovacs-Byer and Associates (1986b), underlies the northeast portion of the subject site. Localized areas of certified compacted fill are also reported by other consultants. In addition, certified compacted fill was placed in a keyway excavation in 2015 under the observation and approval of LP and CalWest Geotechnical (2015).

Based on the previous field investigations and reports, the certified compacted fill within the subject site consists of an admixture of soil and bedrock and is described as a sandy clay and clayey sand with gravel, which is mottled dark yellowish orange, dark gray, and dark yellowish brown, moist, and firm/dense. The gravel component consists of angular, pebble to cobble size clasts of sandstone and siltstone.

Soil (Qs)

A relatively thin layer of natural residual soil, up to five (5) feet in thickness, overlies the bedrock over the majority of the subject site. The natural soil is described by LP as a clayey sand and sandy clay with gravel, which is mostly brownish gray, slightly moist, and loose to dense. The sandy clay is moderate yellowish brown, slightly moist to moist, and firm. The gravel component present within the soil consists of angular, pebble size clasts of sandstone and siltstone. Basalt clasts make up the gravel fraction of the soil which overlies the basalt bedrock of the Conejo Volcanics.

Bedrock(Tm, Tt, Tvb)

As determined by LP, bedrock under the subject site consists of sedimentary units of the Modelo Formation (**Tm**) of Miocene age, sedimentary units of the Topanga Formation (**Tt**) of middle Miocene age, and intrusive and extrusive igneous bedrock (**Tvb**), related to the Conejo Volcanics of the Middle Miocene age.

Tm – The modelo formation consists of siltstone and shale with occasional sandstone interbeds. The siltstone and shale are thinly laminated to thinly bedded, somewhat friable to non-friable, moderately hard, and is typically slightly to moderately weathered with depth. The occasional sandstone interbeds are fine to coarse grained, thin to medium bedded, somewhat friable, moderately hard, and is typically slightly to moderately weathered/weathered with depth. The upper, thin, near surface profile consists of very weathered bedrock.

Tt - The bedrock mapped as part of the Topanga Formation consists of interbedded sandstone and claystone which are thinly laminated to medium bedded, somewhat friable to moderately strong, moderately hard to hard, moderately fractured, and slightly to moderately weathered with depth.

Tvb – The bedrock mapped as part of the Conejo Volcanics consists of basalt and basalt breccia which is massive, somewhat friable to moderately strong, moderately hard to hard, moderately fractured, and slightly to moderately weathered with depth.

Bedding planes mapped within the underlying sedimentary bedrock primarily strike east-west and dip towards the north. Therefore, north, north-west and north-east facing slopes and excavations, may be adverse in relation to bedding. Bedding observed within the underlying sedimentary bedrock located within the Benedict Canyon Fault Zone strike towards the north and northeast and dip towards the east.

Significant joint planes, sets, or systems were not identified within the underlying bedrock units. Shear planes mapped within the underlying bedrock generally strike north-south and dip towards the west.

GROUNDWATER

As determined by LP, the underlying groundwater level was not encountered within the southern half of the subject site to the maximum explored depth of approximately 55 feet below the existing grade. However, groundwater was encountered in exploratory test boring B-8, which is located along the northern half of the site, in the vicinity of the proposed luxury hotel. Groundwater was encountered at a depth of 39 feet below the existing grade. Further, water seepage was observed at a depth of 24 feet below the existing grade, within the same boring. A summary of the observed groundwater and seepage is provided below.

TABLE 1. GROUNDWATER OBSERVATION DATA

Excavation No.	Observation Type	Date of Observation	Surface El. ft. AMSL	Depth of Observation (ft)	Observation Elevation (ft) AMSL
B-8	Groundwater	10/12/2018	965	39	926
B-8	Seepage	10/12/2018	965	24	941

LP have attributed the observed seepage to the natural percolation of water downward through the unsaturated zone. It is not interpreted to be the underlying groundwater level. Because of the observation of groundwater within the same boring at a deeper elevation, it is considered a localized perched groundwater condition, within the Benedict Canyon Fault zone.

Groundwater was not encountered in any of the other exploratory test borings and test pits excavated at the subject site. Evidence of a historically high groundwater level, including seeps, springs, or perched water, was not observed within the subject site to the maximum depth explored (MGI, 2011-2012). In addition, the Seismic Hazard Evaluation Report for the Beverly Hills Quadrangle does not indicate the presence of a historically high groundwater level within the subsurface of the subject site (DOC DMG), now referred to as the California Geological Survey - CGS, 1998.

Due to the encountered nature of the groundwater and seepage condition in the northern portion of the subject site, LP has assumed the presence of groundwater within the areas located downslope of exploratory test boring B-8. LP's interpretation of the underlying groundwater is shown on the Cross-sections, included in Appendix B.

LABORATORY TESTING AND ANALYSIS

Laboratory tests were performed on bulk and relatively undisturbed ring samples considered representative of the earth materials encountered during our subsurface exploration. These tests were performed to measure the pertinent index and engineering properties of the underlying earth materials. After a visual classification in the field, samples were returned to the laboratory where a testing program was established.

In-situ moisture content and dry weight for samples were developed in accordance with ASTM D-2937. Consolidation tests were performed in accordance with the specification of ASTM D2435. Direct shear testing of obtained bedrock and/or soil samples were performed in accordance with the specifications of ASTM D-3080. Maximum density-optimum moisture content testing of materials was performed in accordance with the specifications of ASTM D-1557. An explanation of the laboratory testing procedures along with the laboratory test results are included in Appendix C.

SEISMIC CONSIDERATIONS

The subject site, as all of the Southern California area, is located in a seismically active region and will be subject to moderate to strong ground shaking should any of the active Southern California faults produce an earthquake. Potential hazards from earthquakes in the vicinity of the site, aside from strong ground shaking, may include fault rupture, landslides, liquefaction, and seismically induced settlement.

California Building Code 2016 Seismic Parameters

Section 1613 of the California Building Code 2016 provides load specifications for seismic design and related parameters for every structure, including non-structural components that are permanently attached to the structure. CBC 2016 seismic load design parameters are shown in tabulated format below:

TABLE 2. CBC 2016 SEISMIC DESIGN PARAMETERS

Parameter	Value	Reference
Site Latitude	34.1153^0	-
Site Longitude	-118.4309^0	-
Short term mapped acceleration parameter (0.2 second)	$S_S = 2.357g$	USGS
Long term mapped acceleration parameter (1-second)	$S_1 = 0.831g$	USGS
Site Classification	C	ASCE 7 Table 20.3-1
Site Coefficient value (short term)	Fa = 1.0	CBC 2016 Table 1613.3.3.(1)
Site Coefficient value (long term)	Fv = 1.3	CBC 2016 Table 1613.3.3.(2)
Adjusted maximum considered earthquake spectral response acceleration parameter (short term)	$S_{MS} = 2.357g$	Eq. 16-37 CBC 2016
Adjusted maximum considered earthquake spectral response acceleration parameter (long term)	$S_{M1} = 1.081g$	Eq. 16-38 CBC 2016

Parameter	Value	Reference
Design spectral response acceleration parameter (short term)	S_{DS}=1.571g	Eq. 16-39 CBC 2016
Design spectral response acceleration parameter (long term)	S_{D1}=0.721g	Eq. 16-40 CBC 2016
Mapped MCEG Peak Ground Acceleration	PGA = 0.8835	
Mapped MCEG Peak Ground Acceleration Adjusted for Site Class Effects	PGA_M=0.8835	

Probabilistic Seismic Hazard Analysis - PSHA

A probabilistic seismic hazard analysis (PSHA) was completed for the subject site. Seismic analysis was undertaken using the Unified Hazard Tool of the United States Geological Survey (USGS) website (https://earthquake.usgs.gov/hazards/interactive/). Based on the analysis, the following seismic parameters have been determined for the site.

TABLE 3. SITE SPECIFIC SEISMIC HAZARD ANALYSIS

Spectral Period	Return Period	Site Class	Radian, r (Mean)	Magnitude, m (Mean)
Peak Ground Acceleration	475 years	C	11.48km (7.55 miles)	6.77

Faulting and Fault Rupture

A fault is a discontinuity in the lithology of earth's crust. Occasionally, faults are sources of earthquakes due to movement along the defined fault plane resulting in sudden release of energy. Sites near seismically active faults can experience vigorous shaking due to sudden release of seismic energy. Fault movement can also propagate to the surface, resulting in fault surface rupture.

As determined by LP, the subject site is not located within a State designated Earthquake Fault Zone and no known potentially active or active faults cross the site. However, regional geologic mapping by Dibblee (1991) and the City of Los Angeles (1960-70) indicate that the Benedict Canyon Fault Zone traverses the subject site. In addition, older east/west-trending fault contacts have also been mapped by the City of Los Angeles within the site. The mapped faults of the site, as determined by LP, are shown on the Update Geotechnical Map and Cross-sections, included in Appendix D.

Potential adverse effects due to fault surface rupture is considered to be low to nil for the proposed project as the mapped faults at the site are not interpreted to be active tectonic features. Surface manifestations of any fault rupture are unlikely to impact the proposed project.

Earthquake Induced Landslides

The subject site is located within an area where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

A quantitative determination of seismically induced landslide potential within the project area of the subject site has been completed and the results of the analysis are discussed in the Slope Stability section of this report.

Liquefaction Potential & Seismic Settlement

Liquefaction is a seismic hazard that can result in sudden and total loss of shear strength of soil, resulting in large and potentially catastrophic settlements and instability of structures above. Many factors influence a soil's potential for liquefaction during an earthquake. These factors include magnitude and proximity of the earthquake and earthquake source, duration of shaking, soil type, grain size distribution and clay fraction content, soil density, effective overburden, location of groundwater table, and soils transmissivity among others.

The subject site is located outside areas where historical occurrences of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resource Code Section 2693(c) would be required. The Seismic Hazard Map is included in Appendix A.

It is the opinion of this office that liquefaction and liquefaction related settlement potential at the site is low to nil. This conclusion is based on the groundwater conditions observed during our field investigation, expected historic high groundwater elevation discussed in Groundwater section above, and the subsurface material types and conditions.

SLOPE STABILITY

Slope stability analysis was performed on Cross-sections A-A', C-C', E-E', G-G', I-I' and N-N'. These Cross-sections were considered the most critical in terms of the proposed project, slope gradient, underlying geology, and groundwater conditions.

The slope stability analyses were performed using Slide™ version 6.0, a software package from the RocScience Corporation. Slide utilizes limit equilibrium methods for slope stability evaluation. Both long term static and pseudo-static (seismic) conditions have been analyzed. The slope stability analyses printouts are included in Appendix E.

Representative shear strength parameters of the materials encountered were selected based on laboratory test results, published values by other consultants in the vicinity, and our previous work experience in the area. Selected shear strength parameters are indicated in the Table below. To model the varying shear strength of sedimentary bedrock, along-bedded vs. cross-bedded shear strength, the anisotropic function available in Slide was utilized. Peak shear strength parameters were used for pseudo-static analyses.

The groundwater elevations, as determined by LP and indicated on the Cross-sections, have been incorporated in the model for the slope stability analyses.

TABLE 4. SHEAR STRENGTH PARAMETERS USED IN SLOPE STABILITY ASSESSMENT

Material Type	Unit weight (γ) Pcf	Friction angle (ϕ) degree	Cohesion, (C') psf	Note
Sedimentary bedrock (Tm) – Cross bedded	130	36^0	770psf	Ultimate shear strength
Sedimentary bedrock (Tm) – Along bedded	130	27^0	330psf	Ultimate shear strength
Slate Bedrock (Jsm) – Cross bedded	130	36^0	770psf	Ultimate shear strength
Slate Bedrock (Jsm) – Along bedded	130	27^0	330psf	Ultimate shear strength
Sedimentary bedrock (Tm) – Cross bedded	130	43^0	900psf	Peak shear strength
Sedimentary bedrock (Tm) – Along bedded	130	32^0	400psf	Peak shear strength
Slate Bedrock (Jsm) – Cross bedded	130	43^0	900psf	Peak shear strength
Slate Bedrock (Jsm) – Along bedded	130	32^0	400psf	Peak shear strength
Landslide Debris (Qls)	110	37^0	250psf	
Sedimentary Bedrock (Tt) – Cross bedded	130	37^0	660psf	Ultimate shear strength
Sedimentary Bedrock (Tt) – Along bedded	130	35^0	300psf	Ultimate shear strength
Site Bedrock (Tvb)	130	38^0	910psf	Ultimate shear strength

Slope Stability Analysis Summary: As shown on the slope stability analyses printouts, included in Appendix E, Code compliant factors of safety were determined for all Cross-sections analyzed, for both long term static and pseudo-static conditions. Critical surfaces determined from the analyses are indicated on the Cross-sections, included in Appendix B. A summary of the slope stability analyses is presented on the following Table.

TABLE 5. SLOPE STABILITY ANALYSIS RESULTS

Section	Analysis Type	Factor of Safety	Target FoS
Section A-A' North Facing Slope	Static	2.387	≥1.5 (OK)
	Seismic Lower	1.003	≥1.0 (OK)
	Seismic Upper	1.281	≥1.0 (OK)
Section A-A' South Facing Slope	Static	1.502	≥1.5 (OK)
	Seismic	1.164	≥1.0 (OK)
Section C-C	Static	1.557	≥1.5 (OK)
	Seismic	1.032	≥1.0 (OK)
Section E-E	Static	2.36	≥1.5 (OK)
	Seismic	1.43	≥1.0 (OK)
Section G-G	Static	1.95	≥1.5 (OK)
	Seismic	1.24	≥1.0 (OK)
Section G-G	Static	1.67	≥1.5 (OK)
	Seismic	1.00	≥1.0 (OK)
Section N-N	Static	1.51	≥1.5 (OK)
	Seismic	1.02	≥1.0 (OK)

In analyzing Cross-section C-C', in addition to the recommended soil nail wall along the proposed driveway, two rows of soldier piles were modeled to obtain Code compliant factors of safety. The soldier piles are proposed upslope of the soil nail wall. The lateral extent of the proposed soldier piles and soil nail wall are indicated on the Geotechnical Map and Cross-sections, included in Appendix B. The proposed soil nail wall and soldier pile capacities required for the Code compliant factors of safety are indicated on the slope stability printouts, included in Appendix E. For convenience, these capacities are shown in the following Tables.

TABLE 6. SLOPE STABILITY ANALYSIS: CROSS-SECTION C-C'

Cross-section C-C': Soil Nail Wall Design Parameters			
Reinforcement Type	Soil Nail Spacing	Soil Nail Tensile Capacity	Soil Nail Bond to Ground
Soil Nail	4 feet in both horizontal and vertical directions	52.9 kip	6786 lb/ft
Reinforcement Type	Soil Nail Spacing	Soil Nail Tensile Capacity	Soil Nail Bond to Ground

Cross-section C-C': Soldier Pile Design Parameters					
Reinforcement Type	Spacing	Pile Elevation		Shear Capacity	
		Row 1	Row 2	Row 1	Row 2
Soldier Pile	10 feet Center to center	932 ft. AMSL	888 ft. AMSL	200kip	200kip

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

CalWest geotechnical has prepared this Update Geotechnical Engineering Investigation Report for the proposed project consisting of a multi-structure luxury hotel complex and custom single family residential development, Lots 1-9 Vesting Tentative Tract 74908, 9712 Oak Pass Road, (aka 9750 and 9800 Wanda Park Drive), City of Los Angeles, California.

Based upon our geotechnical engineering investigation and analysis, information from our previous investigation of the subject site, and experience with the subject site and similar projects, it is the opinion of this office, the proposed project is considered feasible from a geotechnical engineering perspective, provided our recommendations and those of Land Phases, Inc. are made part of the project plans and are implemented during construction.

Information concerning the proposed project was provided by the Client, the project consultants, and from the Vesting Tentative Tract Map No. 74908, prepared by LCE. Based on the provided information and the Vesting Tentative Tract Map No. 74908, it is our understanding the proposed project will include the following:

- The recording of the Vesting Tentative Tract Map No. 74908 subdividing the subject site.
- Improvement of Private streets extending from Hutton Drive, Oak Pass Road, and Wanda Park Drive to service the proposed luxury hotel, associated condominiums, cottages, bungalows, and the custom single family residences.

- Public utilities; water, sewer, gas, electrical, and communications to be located in the Private Streets to service the proposed luxury hotel, associated condominiums, cottages, bungalows. And the custom single family residences.

- A multi-story (5-level) luxury hotel complex to the north-east of the subject site.

- Several condominiums, cottages and bungalows associated with the hotel located to the south of the hotel.

- Two (2) multi-level parking structures (P1) and (S), located to the south of the hotel.

- Swimming pool/spas, retaining walls, cart paths, decks, and ancillary structures associated with the hotel.

- Eight (8) custom single-family residences located to the south, south-west, and middle portion of the subject site. The residences will include partial subterranean areas and basements, and will include swimming pools/spas.

The proposed project will include the demolition and removal of all existing structures at the subject site. Grading will include conventional cutting and filling to develop the various building pads and private street grades. Grading may also include, in areas, the removal and recompaction of the near surface soils to a certified fill condition. Excavations extending into the site bedrock will be required for the proposed luxury hotel, complex parking structures, custom single family residences, swimming pool/spas, retaining walls, and for temporary shoring. Temporary shoring may include steel soldier beams, lagging, and possibly ground anchors, such as soil nails or tie-backs.

The foundations for the proposed multi-story luxury hotel complex, parking structures, custom single family residences, and associated basement and retaining walls may consist of conventional and deepened pile foundations extending into the site bedrock or the future certified compacted fill. All foundations adjacent to descending slopes shall comply with the code required foundation setback from descending slopes.

Retaining and basement walls will be required the luxury hotel, complex parking structures, single family residences, and Private Streets. The foundations for retaining and basement walls will extend into the site bedrock or future certified compacted fill. Conventional cantilever retaining walls will be utilized for most locations, however, in some locations, other forms of retaining systems, such as soil nail walls, may be utilized.

The recommendations which follow are presented as guidelines for the proposed project. It is understood that Cal West Geotechnical will be given the opportunity to review the project plans prior to construction, and will observe, test and advise during site grading and foundation construction. Prior to construction, it is recommended that a preconstruction meeting be held with the project engineering consultants, owner and general contractor to review the plans and specifications, and to discuss scheduling of the project.

GRADING

Site preparation and grading should be performed in compliance with all applicable grading codes and the minimum specifications outlined below. In-grading observation and testing will be necessary during all phases of project construction to allow CalWest Geotechnical to provide certification of the finished project.

Site Preparation and Excavation

A. Any trees or shrubs designated for removal should be cut down and all stumps and roots should be removed. All major vegetation and debris material shall be stripped and wasted from the site.

B. All existing structures present at the subject site should be removed in their entirety, including foundations, slabs and subterranean structures.

C. All abandoned utility lines designated for removal should be excavated and removed from the site. Unreinforced concrete irrigation lines may be crushed to a size acceptable to the geotechnical consultants and distributed in the future compacted fill. Abandoned cesspools and seepage pits encountered during grading should be excavated under the observation of a representative of this office and backfilled with pea-gravel, or where possible, with certified compacted fill.

D. The exposed surface exposed by stripping and excavation activities should be scarified to a minimum depth of eight inches, moisture conditioned to produce a soil-water content of about two percent above optimum moisture content and compacted to a minimum of 90 percent relative compaction, based on ASTM Test D1557.

Temporary Excavations

A. For preliminary planning purposes, all excavations that exceed five (5) feet in vertical height into the residual soil and fill, or ten (10) feet in vertical height into the site bedrock (favorably oriented), should have the upper portion trimmed to a 1:1 (H:V) gradient.

B. Excavations in adversely bedded rock should be trimmed to a gradient not exceeding 3:1 (H:V). For preliminary planning purposes, it should be assumed that excavations facing north, north-east and north-west orientations are likely to expose adversely orientated bedrock.

C. All excavations greater than five (5) feet in height may be supported using a temporary shoring system.

D. Temporary shoring may consist of steel shoring beams and timber lagging. The steel beams are placed in drilled holes which are filled with concrete to the subgrade (excavation) level, and filled with slurry mix to the top of beam.

E. Timber lagging should be placed between the steel beams to prevent localized sloughing.

F. Cantilever shoring piles may be designed utilizing a triangular pressure distribution (Equivalent fluid pressure, EFP). If shoring piles are braced, for example, with tiebacks or rakers, then a trapezoidal pressure distribution should be utilized. See the following Table for shoring pressure diagrams for excavations with a level backfill and 2:1 backfill.

G. The pressure recommendations assume unsurcharged conditions. Excavations that are subject to additional surcharge load, such as construction vehicular load, should be designed for the appropriate surcharge.

H. The embedded portion of the soldier pile will provide lateral (passive) capacity for support. The allowable passive pressure may be considered an equivalent fluid pressure (E.F.P.) of 600 pcf, to a maximum pressure of 9,000 psf/ft in bedrock. The passive pressure may be doubled for soldier piles that are spaced a minimum of three times the pile diameter. Pile fixity should be considered at 1.5B below excavation level, where B is the pile diameter.

I. Due to soil arching, the pressure on the timber lagging will be less. The timber lagging may be designed using a uniform pressure of 400 pounds per square feet (psf).

J. Temporary ground anchors, if used as bracing, should not extend beyond property lines unless appropriate permission have been obtained from the adjacent property owner.

K. Post-grouted temporary ground anchors that extend into the site bedrock may be designed utilizing an allowable side friction of 25 pounds per square inch (psi).

L. The unbonded length of the temporary ground anchor should be a minimum of 10 feet (15 feet for strand anchors), or to a 60-degree surface drawn upward from the bottom of the sub-grade, whichever is greater. The project civil/structural engineer should determine the bonded and unbonded lengths of the anchors.

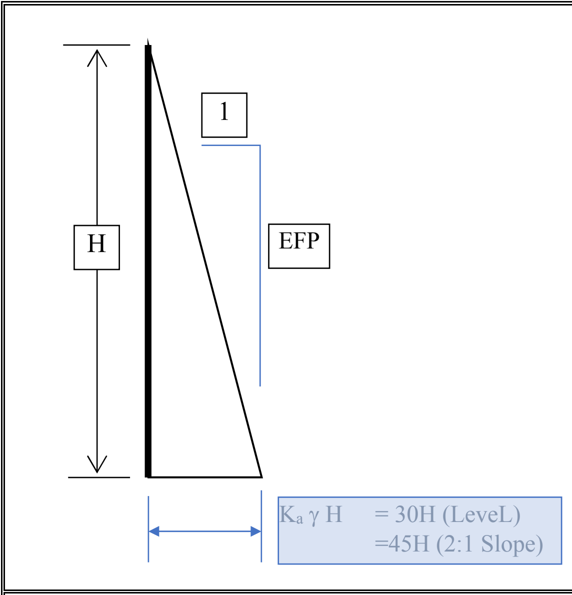


Figure 1. Temporary Shoring Cantilever Pressure Distribution

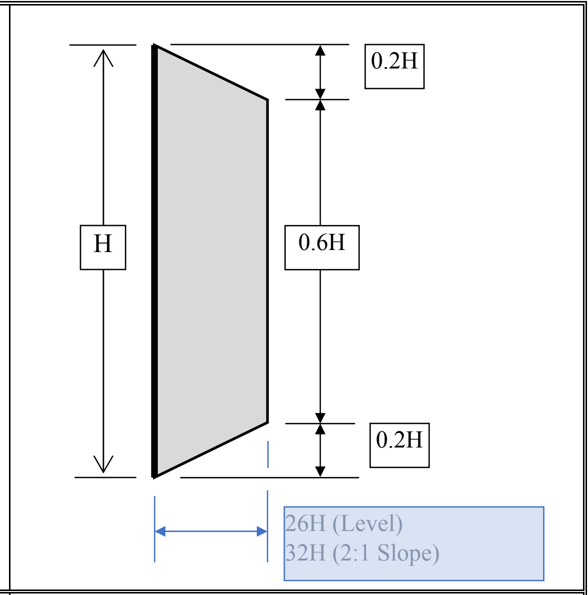


Figure 2. Temporary Shoring Braced Pressure Distribution

M. Proof testing for capacity is required for each ground anchor. Normally, proof-testing is performed at 150 percent of the calculated design load (DL). The proof-test load (1.5 x DL) is applied to the ground anchor in load cycles; at each load cycle, the extension of the anchor is measured, with a measured total extension at test completion which meet City criteria.

N. In addition, verification testing may also be required to verify the assumed bond stress, and to confirm adequacy of the construction procedure. The project civil/structural engineer will specify the ground anchor testing requirements, including load magnitude at each load cycle, and allowable deflection.

O. The steel shoring beams and/or ground anchors may be removed after the excavation has been stabilized.

P. All excavations should be stabilized within 30 days of initial excavation. Water should not be allowed to pond on top of the excavations, or to flow towards it. No vehicular surcharge should be allowed within five feet of the top of the cut.

Fill Placement

A. At the completion of scarification, certified compacted fill may be placed to design grades using onsite inorganic soils or approved import.

B. Soil proposed for use as compacted fill should be inorganic, free from deleterious materials, have an expansion index of 20 or less (EI ≤ 20) and contain no more than 15 percent by weight of rocks larger than four (4) inches (largest dimension) in the upper three feet, and six (6) inches below that to extent of removal and recompaction.

C. We expect that materials excavated onsite will be suitable for use as certified compacted fill provided they are not expansive (EI ≥ 20) and do not contain appreciable quantities of organic debris and large sized rock.

D. Where in place moisture content exceeds optimum values, the materials may need to be spread and dried, or mixed with dryer materials. Final determination will be provided in the field by the project geotechnical consultants at the time excavations take place.

E. Excavated material containing excessive organic debris will not be suitable for use in the certified compacted fill. Materials deemed unsuitable should be wasted offsite or as designated by the project architect or geotechnical consultant.

F. The approved material should be placed in layers, each not exceeding six (6) inches in thickness (before compaction), water conditions to about two percent above optimum moisture content and compacted to a minimum 90 percent relative compaction based on ASTM Test D1557.

G. Fill compaction tests should be performed during placement of the future fills to verify acceptable compaction and moisture content. At a minimum, one test should be performed within each 12 to 24 inches (vertical depth) or 500 cubic yards of fill (whichever is less). More frequent testing may be required by the geotechnical consultant.

H. Graded slopes should be constructed at a maximum gradient of 2:1 (H:V). Fill slopes should be constructed by overfilling and cutting back to the compacted core. Cut slopes should be observed and approved by the project geotechnical consultants.

I. If construction takes place during the winter months or unseasonable rainy periods, additional winterizing and erosion-control recommendations may be necessary.

Keys, Benching, and Subdrains

A. All fill placed on slopes exceeding a 5:1 (H:V) gradient should be provided with a keyway at the toe of the fill slope. The keyway should have a width of 15 feet and expose a minimum of two (2) feet of the site bedrock on the downhill side of the key. The bottom of the key should be inclined into the slope at a minimum gradient of two (2) percent.

B. Fill placed above the level of the keyway should be placed above horizontal benches excavated into the site bedrock. Benches should have a minimum width of four (4) feet. A minimum 12" of bedrock must be visible above the fill level at all times.

C. Subdrains should be placed below all canyon fills and in all fill slope keyways. Subdrains should consist of perforated SDR-35 PVC pipe placed with the perforations downward in a blanket of ¾-inch durable aggregate such that the subdrain pipe is surrounded by a minimum 12 inches of gravel on all sides. The gravel blanket should be wrapped with a geosynthetic filter such as Mirafi 140 or suitable equivalent. Fabric joints should be overlapped a minimum of three (3) feet. Minimum specifications for pipe diameter, aggregate volume and fabric width are provided as follows:

TABLE 7. SUBDRAIN PARAMETERS

Run Length (ft)	Pipe Diameter (in)	Aggregate Volume (ft)	Fabric Width (ft)
0 – 200	4"	4.5	10.5'
200 – 400	6"	5.0	11.0'
400 – 600	8"	5.6	11.5'

The project geotechnical consultants should observe and approve all subdrain installations prior to placing compacted fill.

Utility Trench Backfill

Contractors should strictly adhere to specifications set forth in the State of California Construction Safety Orders for "Excavations, Trenches, Earthwork". For the purposes of this section of the report, bedding is defined as material placed in a trench up to two (2) feet above a utility pipe, and backfill is defined as all material placed in a trench above the bedding.

A. Unless concrete bedding is required around utility pipes, free-draining sand should be used as bedding. Sand proposed for use in bedding should be tested in our laboratory to verify its suitability and to measure its compaction characteristics. Sand bedding should be compacted to achieve at least 90 percent relative density based on ASTM Test D1557.

B. Ponding and jetting compaction methods are not permitted.

C. Until the total backfill above the top of the pipe exceeds two (2) feet, machine-placed backfill material should not be allowed to *freefall* more than two (2) feet.

D. Approved, onsite, inorganic soil or imported materials may be used above the base as utility trench backfill. If imported material is proposed for this use, a sample should be tested and approved by the project geotechnical engineer before any is delivered to the site.

E. Proper compaction of trench backfill will be necessary under and adjacent to certified compacted fill, building foundations, concrete slabs and vehicle pavements. In these areas, backfill should be conditioned with water to produce a soil-water content of about two percent above optimum content, and placed in horizontal layers not exceeding six (6) inches in thickness (before compaction).

F. Each layer should be compacted to at least 90 percent relative compaction based on ASTM Test D1557. The upper 12 inches of trench backfill under vehicle pavements should be compacted to at least 95 percent relative compaction.

G. Where any trench crosses the perimeter foundation line of any building, the trench should be completely plugged and sealed with compacted clay soil for a horizontal distance of two feet on either side of the foundation.

FOUNDATIONS

Conventional and deepened pile foundations may be utilized for support of the proposed structures. Conventional foundations, both continuous and isolated pads, may derive support from the future certified compacted fill or the site bedrock. Deepened pile foundations should penetrate any surficial soils and extend entirely into the site bedrock.

Conventional Foundations: Conventional continuous or pad foundations should be founded entirely into certified compacted fill or entirely into the site bedrock. Foundations adjacent to descending slopes should meet all foundation setback requirements as stated in the following section of this report, and as required by the City of Los Angeles Building Code. Reinforcement for conventional foundations should be specified by the project civil/structural engineer.

Footings may be sized utilizing the following design parameters:

TABLE 8. FOUNDATIONS BEARING INTO FUTURE CERTIFIED COMPACTED FILL

Foundation Type	Minimum Width (in)	Maximum Vertical Bearing (psf)	Allowable Coefficient of Friction	Allowable Passive Earth Pressure (psf/ft depth)	Maximum Passive Earth Pressure (psf)	Minimum Embedment Depth (in)
Continuous	12	1800	0.30	350	3500	18
Pad	24	2200	0.30	350	3500	18

TABLE 9. FOUNDATIONS BEARING INTO SITE BEDROCK

Foundation Type	Minimum Width (in)	Maximum Vertical Bearing (psf)	Allowable Coefficient of Friction	Allowable Passive Earth Pressure (psf/ft depth)	Maximum Passive Earth Pressure (psf)	Minimum Embedment Depth (in)
Continuous	12	3500	0.35	500	7500	18
Pad	24	4200	0.35	500	7500	18

The bearing values presented above are net bearing values; the weight of concrete below grade may be neglected. Embedment depths should be measured from the lowest adjacent grade.

Friction Piles: Deepened friction pile foundations may be utilized to support the proposed structures. The friction piles should be a minimum of 24 inches in diameter and tied together with structural grade beams near the ground surface. Pile foundations should meet all slope setback requirement, as stated in the following section of this report, and as required by the City of Los Angeles Building Code. Size and reinforcement for friction piles should be specified by the project civil/structural engineer.

Footings may be sized utilizing the following design parameters:

TABLE 10. DEEPENED FRICTION PILE FOUNDATIONS BEARING INTO SITE BEDROCK

Foundation Type	Minimum Diameter (in)	**Allowable Skin Friction (psf)**	**Allowable Passive Earth Pressure (psf)**	**Maximum Passive Earth Pressure (psf)**	**Minimum Embedment Depth* (ft)**	**Allowable Coefficient of Friction**
Friction Pile	24	1,000	900	9,000	15	0.35
**into competent site bedrock (to be verified during construction)*						

The bearing values presented above are net bearing values; the weight of concrete below grade may be neglected. Embedment depths should be measured from the lowest adjacent grade.

During foundation construction, care should be taken to minimize evaporation of water from foundation and floor subgrades. Scheduling the construction sequence to minimize the time intervals between foundation excavation and concrete placement is important. Concrete should be placed only on foundation excavations that have been kept moist and free from drying cracks and that contain no loose debris or soil.

Foundation Setback

In accordance with LADBS Information Bulletin P/BC 2017-001, foundations adjacent to descending slopes with a gradient of 5:1 (H:V) or more should be set back from the slope face a minimum of H/3 or 40 feet maximum, where H is the vertical height measured from the top of the footing to the bottom of the slope.

Lateral Design

Lateral loads may be resisted by friction at the base of foundations and by passive capacity of the surrounding material. The allowable coefficient of friction and passive capacity are indicated in the Tables above. The passive capacity may be increased by a factor of one-third for short duration loading, such as the effects of wind and seismic forces. When combining passive capacity and friction for lateral resistance, the passive component should be reduced by a factor of one-third.

When designing soldier/friction piles, the allowable passive earth pressure may be increased by 100 percent for piles that are considered isolated. Piles are considered isolated when spaced laterally (i.e. perpendicular to the lateral thrust) more than 3 diameters center to center. For design purposes, it may be considered that piles commence to accrue passive resistance 1.5B into the bearing material, this is to say either future certified compacted fill or site bedrock, where B is the pile diameter.

Foundation Settlement

Conventional foundations bearing entirely into the future certified compacted fill or entirely into the site bedrock are expected to experience settlement of less than ½ inch. Differential settlement is expected to be ¼ inch or less. Deepened pile foundations extending into the site bedrock are expected to have total settlement of ½ inch or less.

Chemical Testing

Chemicals may be present in foundation bearing material that can adversely impact foundation concrete and reinforcement. The following table includes criteria of assessment of ground corrosion potential:

TABLE 11. CRITERIA FOR GROUND CORROSION POTENTIAL EVALUATION

Test	Units	Strong Corrosion Potential	Mild to no Potential	ASTM
pH	-	<4.5, >10	5.5<pH<10	G51
Resistivity	ohm-cm	<2,000	Greater than 5,000	G57
Sulfates	ppm1	> 200	Less than 200	D516
Chlorides	ppm	> 100	Less than 100	D512

To assess presence of such chemicals, selected samples was collected and tested. Based on the test results, the future certified compacted fill and site bedrock has a minimal corrosion potential.

Expansive Soils

Expansion tests performed in accordance with ASTM Standard 4829 "Expansion Index Test" indicate the on-site soil has an expansion index of E.I. equal to 65. Accordingly, foundations for the proposed improvement should be designed for a moderate expansion soil condition, with an expansion index range of 51-90.

Expansive soils are typically a problem in arid climates, as the variation in moisture content will cause a volume change in the soil. Expansive soil tends to be active near the ground surface, where greater moisture variations can easily occur, however, the actual depth varies with the specific soil and environmental differences. During inclement weather or excessive landscaping, moisture will infiltrate the soil and cause the soil to expand. When drying occurs, the loss of moisture content will cause soil to shrink, and extreme dryness may cause shrinkage (desiccation) cracks to develop, thus promoting moisture variations at greater depths.

Expansion and contraction of soils can cause pavement, concrete slabs-on-grade, and other structures to crack. To reduce the effect of expansive soil on surface structures, foundation systems are typically deepened and/or additional reinforcement is utilized. Slabs-on-grade and foundations are reinforced to increase their resistance to differential movement. It is recommended that when planning for site improvements, the landscape theme should take into consideration maintaining uniform moisture conditions around isolated structures and concrete slabs-on-grade. Optimally, the soil should be kept on the moist side, minimizing variation in moisture contents.

RETAINING WALL DESIGN

The proposed project will likely require retaining structures such as standard cantilever retaining walls, basement walls, soil nail walls, and possibly rock bolted walls. General recommendations for these various types of retaining walls are presented below.

Standard Cantilevered Retaining Walls: Standard cantilevered retaining walls may be designed utilizing the following parameters. Retaining wall foundations should be designed in accordance with the recommendations presented in the Foundation section of this report. The design parameters presented below incorporate the active soil pressures, backfill gradient and expansive potential of the backfill material.

A. The average bulk density of material placed on the backfill side of the wall will be approximately 125 pcf.

B. Standard cantilever retaining walls, may be designed for the following equivalent fluid weights (adapted from Terzaghi and Peck, 1967; soil type: in-house regression, based on expansion index):

- 45 pcf/ft for level backfill behind the retaining wall
- 60 pcf/ft for 2:1 (H:V) slope behind the retaining wall

C. An increase in these pressures may be necessary if vehicular traffic or any building structures are to be located adjacent to the retaining wall. Nonetheless, construction traffic and compaction equipment of substantial mass should be kept a minimum of half the retaining wall height away from the retaining wall unless these surcharges are accounted for in the design.

D. The above recommendations are for walls that are six (6) feet or less in height, and do not include seismic loads. Seismic loads are to be considered for walls that are greater than six (6) feet in height, and can be provided during the detailed design stage.

E. Subdrains should be placed behind all retaining walls. Subdrains should consist of perforated SDR-35 PVC pipe placed with the perforations downward in a blanket of $^3/_4$" durable aggregate such that the subdrain pipe is surrounded by a minimum of 12" of gravel on all side. A curtain gravel drain, at least 12 inch thick, should extend from the subdrain pipe upwards to a height of two (2) feet below surface grade. Additionally, the gravel blanket should be wrapped with a geosynthetic filter fabric such as Mirafi 140 or a suitable equivalent. Fabric joints should be overlapped a minimum of three feet. Minimum specifications for pipe diameter, aggregate volume and fabric width are provided as follows:

TABLE 12. SUBDRAIN SPECIFICATIONS

Run Length (ft)	**Pipe Diameter (in)**	**Aggregate Volume (ft^3)**	**Fabric Width (ft)**
0 - 200'	4"	4.5	10.5'
200 - 400'	6"	5.0	11.0'
400 - 600'	8"	5.6	11.5'

The project geotechnical consultants should observe and approve all subdrain installations prior to placing compacted fill.

F. Wall backfill areas not occupied by specified drainage materials should be backfilled with structural fill placed as specified above under "Site Preparation, Grading, Compaction and Utility Trench Backfill".

G. Preferably, the backfill should be capped with hardscape (i.e. sidewalk or drainage swale), or with clayey compacted fill in the upper two (2) feet.

Basement Walls: Basement walls will be required as part of the hotel construction. Additionally, the proposed custom single family residences may also incorporate basement walls in their design. General basement wall recommendations are provided below:

A. The average bulk density of material placed on the backfill side of the wall will be approximately 125 pcf.

B. Standard cantilever retaining wall, may be designed for the following equivalent fluid weights (adapted from Terzaghi and Peck, 1967; soil type: in-house regression, based on expansion index):

- 70 pcf/ft for level backfill behind the retaining wall
- 95 pcf/ft for 2:1 (H:V) slope behind the retaining wall

C. The above recommendations are for walls that are six (6) feet or less in height, and do not include seismic loads. Seismic loads are to be considered for walls that are greater than six (6) feet in height, and can be provided during the detailed design stage.

D. Drainage recommendations for standard cantilevered walls also apply to the construction of the basement walls that are not restrained.

Soil nail/rock bolt Walls: It is proposed to use permanent soil nail/rock bolt walls as part of the onsite private street and driveway construction. Other areas of the project may also incorporate these wall types.

Soil nail wall construction uses the drop-down construction method. The excavation is made from the top to bottom of the wall in lifts (i.e. layers); as the excavation progresses, steel tendons (nails) are placed in drilled holes in rows. These holes are normally inclined 15 to 20 degrees from the horizontal. Once the nails are inserted, the drilled holes are grouted along the entire length, using a tremie pipe. Shotcrete (mixture of sand, cement, aggregate and water) is placed to cover the excavation face using pressurized nozzles. The shotcrete facing provides support to the nail head that is locked off to a steel plate. For permanent soil nail walls, a permanent shotcrete facing is placed for durability.

For nails extending into the site soils, allowable grout-ground bond stress of five (5) psi can be utilized. For post-grouted nail extending into the site soils, the allowable bond stress can be increased to ten (10) psi. For nails/bolts extending into the site bedrock, an allowable grout-ground bond stress of 25psi can be used. Verification testing is undertaken at the beginning of the wall construction to verify the assumed grout-ground bond stress. Verification testing is normally completed using 2 or 3 sacrificial nails, installed at locations selected by the project geotechnical consultant, in coordination with the project civil/structural engineer and contractor. Verification testing is also used to check the adequacy of the proposed construction method.

Effective surface and subsurface drainage are critical for adequate performance of soil nail walls. Surface drainage may include a concrete V-drain, placed behind the wall with a minimum 2% gradient to allow runoff to a suitable discharge location. Subsurface drains may include drainage panels (such as Mirafi G200N), placed against the exposed ground between adjacent soil nail columns. These drainage panels normally drain to a rock pocket at the wall base, connected to weep holes or PVC pipes that outlet to a suitable discharge location. Detailed design of drainage structures will be undertaken by project civil/structural engineer.

For soil nail walls, an adequate number of soil nails are proof tested as part of the quality control. For the current project, five (5) percent of the total nails should be proof tested. The soils nails subjected to proof testing should be located along each nail row, and should consider factors such as increase/decrease of wall height, variation in nail length, change in ground condition (from rock to soil and vice versa) etc. The project geotechnical consultant should select the locations of the soil nails subjected to proof testing, in consultation with the soil nail wall engineer and general contractor.

Soil nail proof testing load (normally 150% of design load) should be applied incrementally to the nail head, using a hydraulic jack. The extension of the nail head measured at the test load must satisfy the requirement set forth in the Soil Nail plan for test completion. At proof test load, the stress in the nail bar should not exceed 90% of the yield stress of the steel.

Monitoring of the soil nail wall should be in accordance with the soil nail plans and City of Los Angeles requirements. Monitoring is required during construction and after completion of wall. Monitoring will normally be performed utilizing surveying methods. Other methods of monitoring may involve installation of inclinometers behind walls for longer monitoring periods.

SWIMMING POOL/SPA

The following criteria are provided as guidelines for any swimming pool/spa construction.

A. Swimming pool/spas should be designed for an equivalent fluid pressure of 77 pcf, which includes the expected soil load and hydrostatic pressure, considering the pool concrete shell is cast against compacted soil, and no gap exists between the two.

B. The swimming pool/spa foundation should maintain a minimum horizontal setback from descending slopes equal to 1/6 the overall height of the slope, with a maximum setback of 20 feet.

C. The swimming pool/spa should be provided with a subdrain system or a hydrostatic pressure relief valve. If the subdrain system is opted, it should consist of a four (4) inch diameter SDR-35 perforated pipe encased in two (2) cubic feet per lineal foot of gravel, running the longitudinal length of the pool. Where the subdrain exits the pool, a non-perforated pipe should extend to an outlet discharge location designed by the project civil engineer.

D. The swimming pool/spa decking should be cast free of the swimming pool/spa bond beam via an expansion joint. Water stops should be provided between the bond beam and the pool deck.

E. The swimming pool/spa foundation should be founded entirely into the future certified compacted fill or entirely into the site bedrock per the foundation recommendations presented herein. Where the spa is connected to the swimming pool, the spa should be bottomed to an equivalent depth into the same material as the adjacent pool shell.

F. Portions of the swimming pool/spa shell within close proximity of the existing structures should be designed considering the potential surcharge of the existing footings.

G. Standard swimming pool detail sheets may be utilized provided they are in compliance with our recommendations presented herein. It is recommended that a civil/structural engineer be retained to verify or provide specific structural design and detail for the swimming pool/spa and decking, based on the recommendations presented in this report. We further recommend that the project civil/structural engineer review steel placement prior to placing gunite and that the gunite be placed under deputy inspection.

H. The swimming pool/spa excavation should be observed and approved by the project geotechnical consultants prior to the placement of reinforcing steel and gunite.

I. Surface drainage around the swimming pool/spa must be maintained to prevent water from ponding or from concentrating and flowing over natural or constructed slopes in an uncontrolled fashion. All surface water should be collected and conducted to appropriate discharge facilities via non-erodible devices.

J. Leakage from swimming pool/spas and appurtenant plumbing can create artificial groundwater conditions that may adversely affect the pool, spa and adjacent structures or slopes. Therefore, the necessary precautions should be taken to ensure that the pool and plumbing are absolutely leak free.

K. The swimming pool/spa decking should be constructed in accordance with the slab-on-grade recommendations included in this report.

CONCRETE SLABS-ON-GRADE

For the proposed project, both concrete slabs-on-grade, or structural slabs may be utilized, depending on the final design and finished floor elevations. Reinforced concrete slabs-on-grade should be a minimum of four (4) inches thick and should be reinforced with a minimum of #4 bars spaced at 16 inches on center in each direction. Concrete should be cast over a minimum four (4) inch thickness of ½ inch clean aggregate base, constructed over the future certified compacted fill placed in accordance with the preceding sections of this report, or the site bedrock

To minimize floor dampness, a 10 mil visqueen moisture barrier should be placed over the aggregate base, to ultimately be in direct contact with the concrete.

Non-supported edges should be provided with a thickened slab edge, which has nominal dimensions of eight (8) inches in width and 12 inches in depth. The thickened slab edge should be reinforced with a minimum of one #4 bar placed near the top and bottom of the thickened slab edge.

Recommendations presented in the American Concrete Institute should be complied with for all concrete placement and curing operations. Improper curing techniques or excessive slump (water-cement ratio) could cause excessive shrinkage, cracking or curling. Concrete slabs should be allowed to cure adequately before placing vinyl or other moisture-sensitive floor coverings.

AC PAVEMENT

Asphalt cement pavement construction should comply with the requirements of the City of Los Angeles Standard Specifications, latest edition, except that compaction requirements for pavement subgrades should be based on ASTM Tests D1557, as described in the preceding sections of this report. A minimum pavement section of 3 inches of AC over 6 inches of Class II Base is recommended where traffic is limited to automobiles and occasional light commercial vehicles. Pavement sections for other conditions should be based on the R value of the pavement subgrade and traffic index based upon the anticipated usage.

DRAINAGE AND MOISTURE PROTECTION

The site should be fine graded to direct drainage away from any structures. Drainage should not be allowed to pond anywhere on the pad, against foundations or pavements, and should be directed toward suitable collection discharge facilities. Where possible, the grade should slope away from buildings (i.e. foundations) at a minimum 5% grade for at least ten (10) feet.

To promote the rapid drainage of surface water from pavements and to minimize the risk of water ponding on pavements, we recommend that pavements be designed with surface gradients of at least one percent along principal directions of drainage. Water seepage or the spread of extensive root systems into the soil subgrades of foundations, slabs or pavements could cause differential movements and consequent distress in these structural elements. This potential risk should be given consideration in the landscape design.

ADDITIONAL SERVICES

It is recommended that this office be provided an opportunity for a general review of the final design plans and supporting documents for overall compliance with the recommendations presented in this report. Additionally, this office should be retained to provide services during grading, foundation excavation and overall construction phases of the project.

Observation of foundation excavations should be performed prior to the placement of concrete and reinforcing steel to confirm that the foundations are founded in the recommended bearing materials. Field and laboratory testing of compacted fill should be performed to verify compliance with recommendations presented herein.

Observation of soil nail/rock bolt testing should be performed under the continuous supervision of the project geotechnical engineer.

PLAN REVIEW

CalWest Geotechnical should review all final design plans and supporting documents. This will allow us to perform a general review for compliance with the recommendations presented in this report.

SITE OBSERVATIONS

Prior to the start of construction, we recommend that a pre-construction meeting be held with the contractor to discuss the project and that a representative of CalWest Geotechnical be present at that meeting. We further recommend that CalWest Geotechnical should perform the following tasks prior to, and/or during, construction of the project:

1. Review all final project plans and supporting documents;
2. Observe and advise during clearing and stripping of the site, including removal of all existing structures;
3. Observe, test and advise during all excavations, installation of subdrainage systems and all grading and placement of certified, compacted fill;
4. Observe foundation excavations and slab subgrades;
5. Observe installation of retaining wall subdrains and backfill;
6. Observe and test during placement of utility trench backfill.

ACKNOWLEDGEMENTS

The design of drainage control devices is based on rainfall records and the requirements of the authoritative building department agencies. Even so, the capacity of drainage devices are often exceeded, which results in considerable damage. Slopes associated with hillside developments, which have performed satisfactorily over a long period of time, in a majority of cases, could fail as a result, even though such slopes have been designed to the minimum standards set forth by the California Building Code or other authoritative codes.

As for the design of earthquake forces, the records on which engineering design is based have been accumulated over a relatively short time frame. Every earthquake provides new information and data as to the cause and effect of large earthquakes. As an example, the January 17, 1994 Northridge earthquake recorded ground accelerations that exceeded all previous earthquake records. In addition, the engineering industry has learned that there are many blind-thrust faults present in Southern California. Thus, it should be understood that there is significant unpredictability associated with earthquake magnitude assessments.

It should also be understood that residential and commercial structures are constructed to the minimum standards as set forth by the California Building Code and other authoritative codes. Higher standards are utilized for hospitals, schools, and other critical structures, that must remain serviceable in the event of a disaster. Generally, Building Code requirements provide minimum standards to prevent catastrophic failure. Accordingly, it is believed that site structures are not likely to collapse, although considerable damage may occur.

PROPERTY OWNER'S RESPONSIBILITY

The property owner should care for drainage around the site structures and all graded slopes. To maintain the continued effectiveness of on-site drainage devices, there are important procedures which must be undertaken by the property owner on a regular basis. These procedures are specifically for drainage and debris protection, and therefore, the procedures should be performed prior to each rainy season, with sufficient time to allow for thorough maintenance.

In addition to maintenance of drainage devices, an inspection should be made for rodent activity. Small, burrowing rodents, such as ground squirrels and gophers, create avenues for infiltration of surface water, which could create surficial slope failures. Evidence of rodent infestation should result in the employment of a licensed exterminator. It should be emphasized that these procedures may require periodic performance if re-infestation occurs.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report is prepared for use by 9712 Oak Pass Road, LLC and their authorized agents, and should not be considered transferable. Prior to use by others, the subject site and this report should be reviewed by CalWest Geotechnical to determine if any additional work is required to update this report.

The findings presented in this report are valid as of this date and may be invalidated wholly or partially by changes outside our control. Therefore, this report should be subject to review and should not be relied upon after a period of one year or if any significant changes are made.

It is the intent of this report to aid in the design and construction of the described project. Implementation of the advice presented in the "Conclusions and Recommendations" sections of this report is intended to reduce risk associated with construction projects. The professional opinions and geotechnical advice contained in this report are not intended to imply total performance of the project or guarantee that unusual conditions will not be discovered during or after construction.

The conclusions and recommendations contained within this report are based on field observations of the site conditions. Recommendations are based on the assumption that the subsurface conditions do not deviate appreciably from those indicated by the individual test pits placed on the subject site. If conditions encountered during construction appear to differ from those described in this report, this office should be notified so we may determine if any modifications are necessary. In this way, any required supplemental recommendations can be made with a minimum delay to the project.

The recommendations are based on preliminary information provided to us at the start of the investigation. Any changes of this information may require additional work. This report has been prepared in accordance with generally accepted engineering practices and makes no warranties, either express or implied, as to the professional advice provided in this report.

Respectfully submitted,

Leonard Liston
President
RCE 31902

Robi Khan, PE
Project Engineer
RCE 70510

REFERENCES

CITY OF LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY, NOT APPROVED- CORRECTION NOTICE, 9800 W WANDA PARK, PERMIT NO. 11030-30000-02128, PREPARED BY JEFFERY DURAN, GRADING INSPECTOR, DATED AUGUST 21, 2015.

SUPPLEMENTAL GEOTECHNICAL ENGINEERING LETTER, COMMENTS ON ONSITE INFILTRATION SUITABILITY, 9712 OAK PASS ROAD (A.K.A. 9750 & 9800 WANDA PARK DRIVE), CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY CALWEST GEOTECHNICAL, PROJECT NO. 5277, DATED MARCH 23, 2013.

GEOLOGY AND SOILS APPROVAL LETTER, TRACT: SEC 2 T1S R15W (L S 19-24) // 4311/4311, BLOCK // 4 / 4, LOTS: 4 (arb-39) // LT 74 (arb-1) / LT 74 (arb-3), 9712 W. OAK PASS ROAD // 9750 / 9800 WANDA PARK DRIVE, PREPARED BY CITY OF LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY, LOG# 73947-01, DATED JANUARY 22, 2013.

SUPPLEMENTAL GEOTECHNICAL ENGINEERING LETTER TO OUR ADDENDUM GEOTECHNICAL ENGINEERING REPORT, DATED JULY 13, 2012, ADDITIONAL EXPLORATION, LABOTORY TESTING FOR RESIDUAL SHEAR STRENGTH RESISTANCE FOR SHALE-LIKE MATERIALS AND ADDITIONAL SLOPE STABILITY ANALYSES, 9712 OAK PASS ROAD (aka 9750 & 9800 WANDA PARK DRIVE), CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY CALWEST GEOTECHNICAL, PROJECT NO. 5277, DATED NOVEMBER 19, 2012.

ENGINEERING GEOLOGIC REPORT # 1 DATED JULY 13, 2012, ADDITIONAL EXPLORATION AND REVISION TO GEOLOGIC SECTION B-B', 9712 OAK PASS ROAD (aka 9750 and 9800 WANDA PARK DRIVE), CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY MOUNTAIN GEOLOGY, INC., PROJECT NO. JH7950, DATED NOVEMBER 16, 2012.

REQUEST FOR MODIFICATION OF BUILDING ORDINANCES, PERMIT APP. #11030-30001-02130; 30000-02128; 11020-30000-00935, 9800 W. WANDA PARK DRIVE, (A.K.A. 9712 W. OAK PASS ROAD), PREPARED BY LC ENGINEERING GROUP, INC., DATED OCTOBER 18, 2012.

REQUEST FOR MODIFICATION OF BUILDING ORDINANCES, PERMIT APP. #11030-30000-02128 & 11020-30000-00935, 9750 W. WANDA PARK DRIVE, (A.K.A. 9712 W. OAK PASS ROAD), PREPARED BY LC ENGINEERING GROUP, INC., DATED SEPTEMBER 4, 2012.

GRADING PRE-INSPECTION REPORT, 9800 W. WANDA PARK DRIVE, PERMIT APPLICATION 11030-30000-02130, PREPARED BY CITY OF LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY, INSEPCTION DATED MAY 10, 2011.

ADDENDUM GEOTECHNICAL ENGINEERING REPORT, RESPONSE TO THE CITY OF LOS ANGELES, GEOLOGY AND SOILS REPORT CORRECTION LETTER, LOG # 73947, DATED JUNE 8, 2011, PROPOSED SITE GRADING AND ASSOCIATED RETAINING WALLS TO CONSTRUCT A BUILDING PAD FOR A FUTURE RESIDENCE AND ANCILLARY STRUCTURES, AND IMPROVEMENT OF THE EXISTING PRIVATE DRIVEWAY, 9712 OAK PASS ROAD (AKA 9750 & 9800 WANDA PARK DRIVE), CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY CALWEST GEOTECHNICAL, PROJECT NO. 5277, DATED JULY 13, 2012

CALIFORNIA DEPARTMENT OF MINES AND GEOLOGY (CDMG), SEISMIC HAZARD ZONE MAP OF THE BEVERLY HILLS QUADRANGLE, 1997.

ADDITIONAL REFERENCES ARE DISCUSSED/LISTED IN THE REPORT OF ENGINEERING GEOLOGIC STUDY, PREPARED BY LAND PHASES, INC., PROJECT NO. LP1197, DATED MARCH 30, 2018

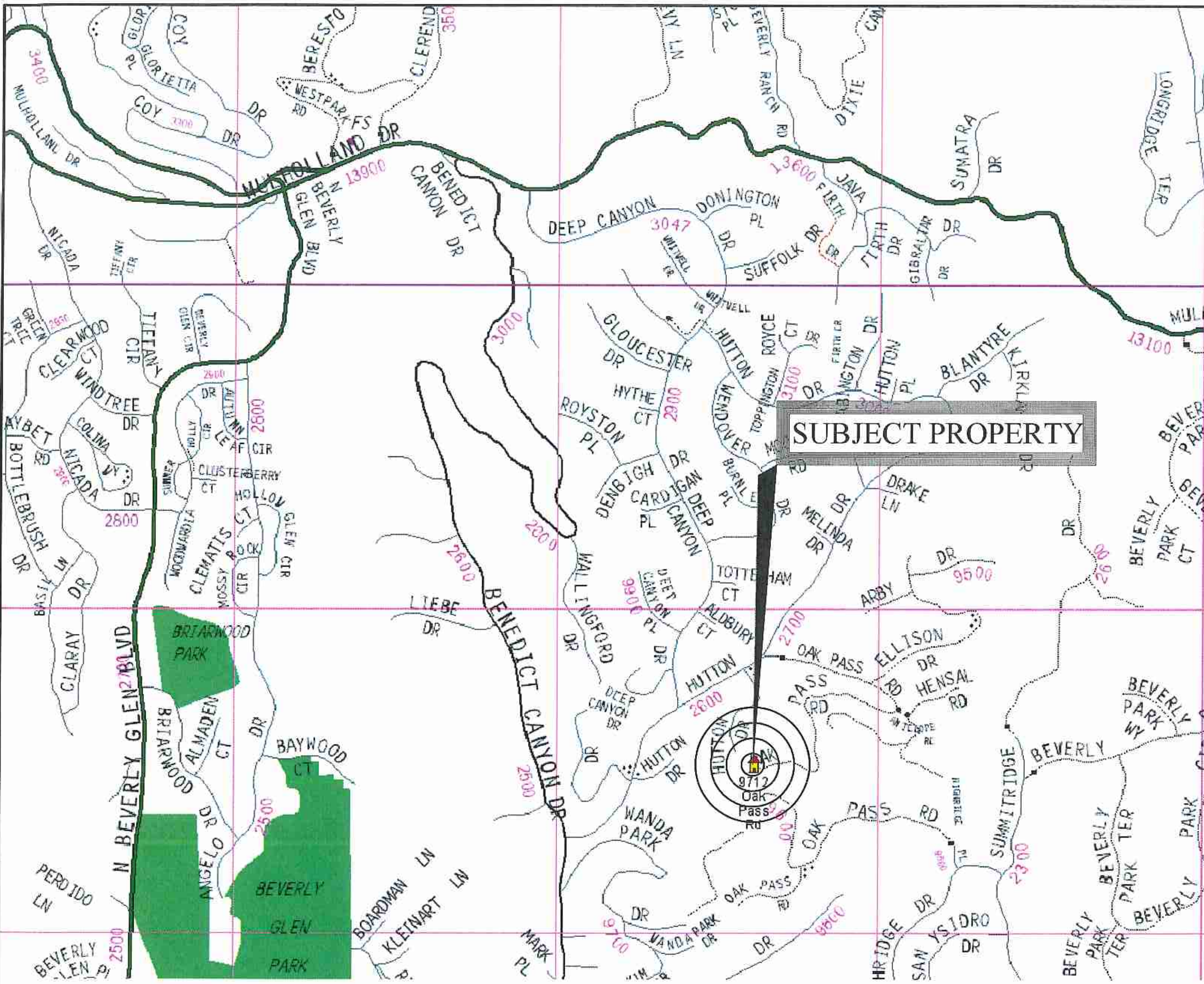
APPENDIX A

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS
A DIVISION OF LC ENGINEERING, INC.
889 PIERCE COURT, SUITE 101
THOUSAND OAKS, CA. 91360
(818)991-7148
(805)497-1244

PROJECT:	Oak Pass LLC
ADDRESS:	9712 Oak Pass Road, Los Angeles, CA
DRAWN:	RD
REF.:	592 C2
DATE:	March, 2019
JOB #:	G 5750

VICINITY MAP

SHEET TITLE



GRIDLINES ARE OFFSET BY APPROXIMATELLY 0.5 MILES.

N
NORTH

REFERENCE: THOMAS BROTHERS MAP GUIDE, PAGE: 592

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

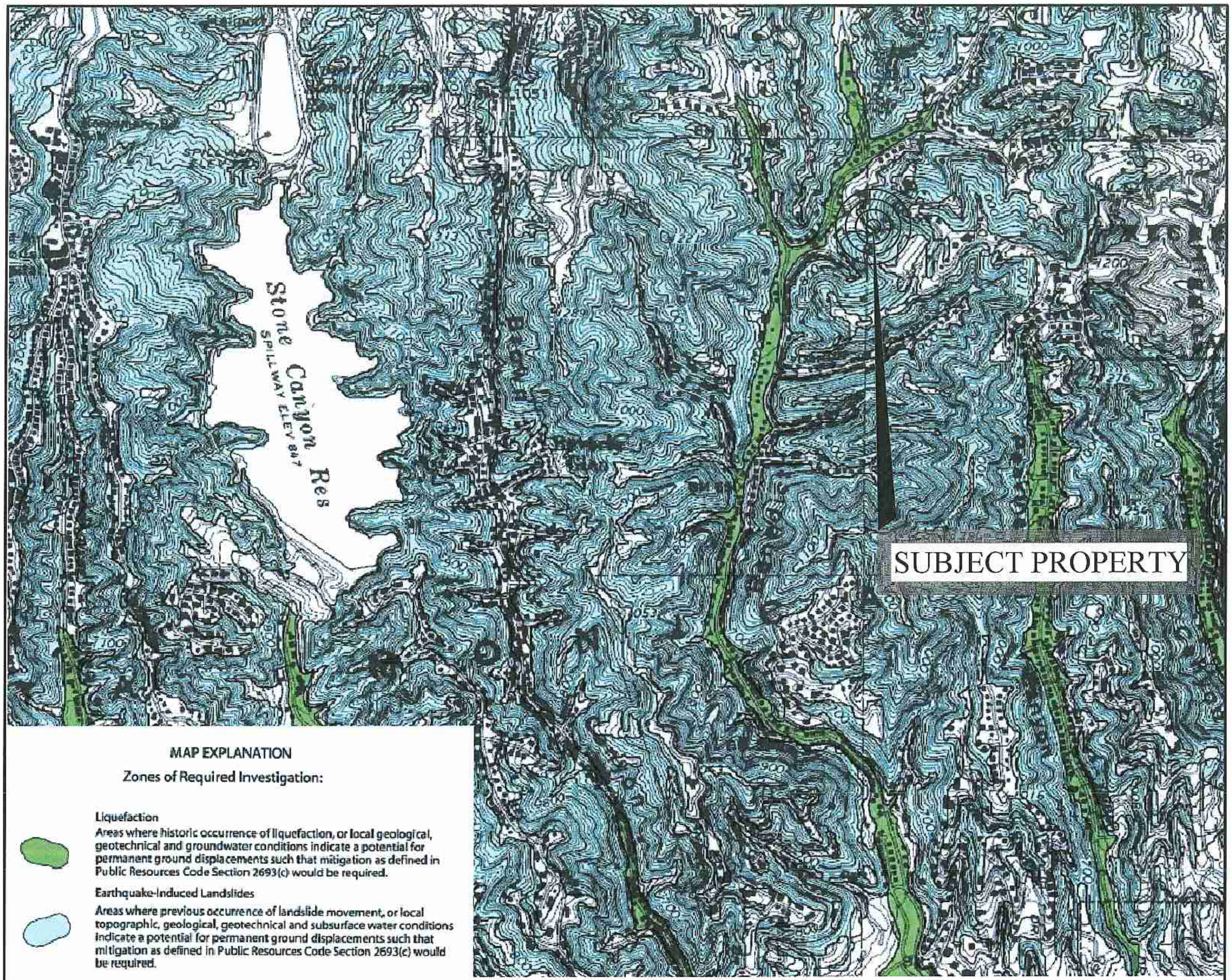
A DIVISION OF LC ENGINEERING, INC.

889 PIERCE COURT, SUITE 101 (818)991-7148
THOUSAND OAKS, CA. 91360 (805)497-1244

PROJECT: Oak Pass LLC	JOB #: G 5750
ADDRESS: 9712 Oak Pass Road, Los Angeles, CA	
DRAWN: RD	DATE: March, 2019

SEISMIC HAZARD MAP

SHEET TITLE



N
NORTH

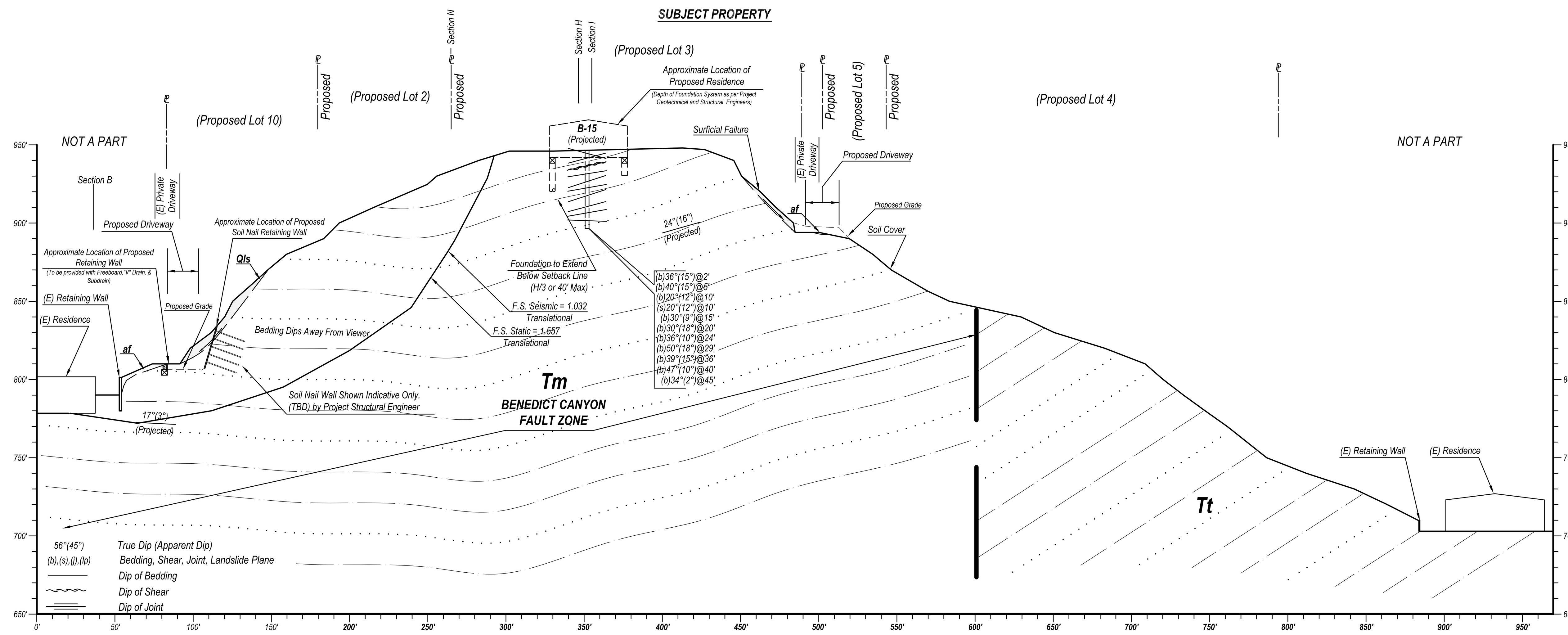
REFERENCE: SEISMIC HAZARD ZONE, BEVERLY HILLS QUADRANGLE, 1999

APPENDIX B

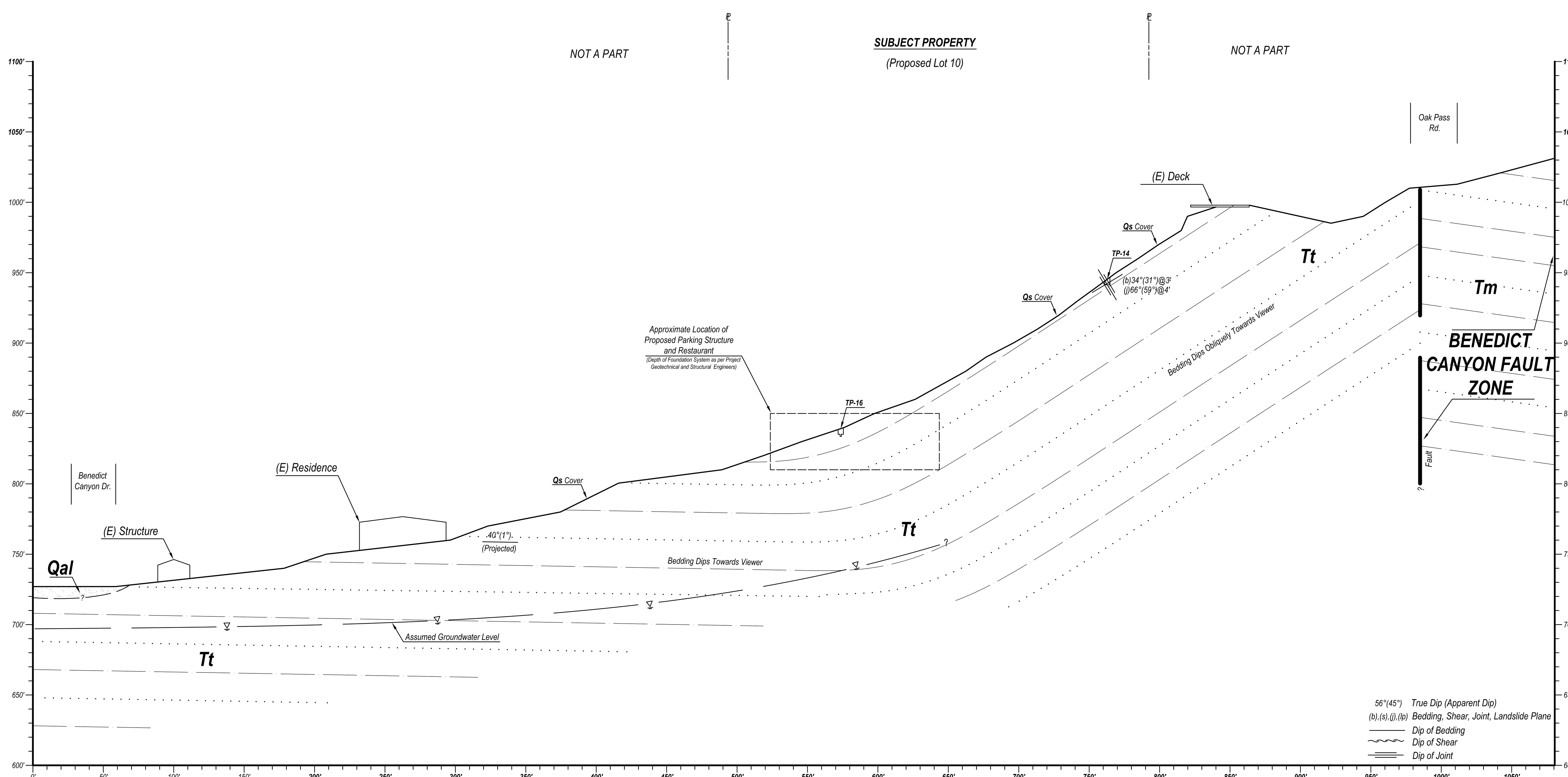
GEOTECHNICAL SECTIONS C & D

PROPOSED HOTEL AND RESIDENTIAL DEVELOPMENT

OAK PASS ROAD, BEVERLY HILLS AREA, CITY OF LOS ANGELES, CA



Geotechnical Section C-C'
Scale: 1" Equals 50'



Geotechnical Section D-D'
Scale: 1" Equals 50'

GEOLOGIC UNITS

Surficial Sediments:

af	Uncertified Artificial Fill
afc2	Certified Compacted Fill - CalWest Geotechnical, 2015
afc	Certified Compacted Fill - Kovacs-Byer and Assoc., Inc., 1986, 1988
Qs	Soil
Qal	Alluvium
Qls	Landslide Debris

Bedrock:

Tm	Modelo Formation
Tvb	Conejo Volcanics
Tt	Topanga Formation

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5158 COCHRAN ST.,
SIMI VALLEY, CA., 93063
www.landphases.com

(805) 522-5174
(805) 582-1228 (FAX)

JOB NAME:	JOB NUMBER:	DATE:	DRAFTED BY:	PLATE 3
9712 Oak Pass Rd., LLC	LP 1197	Feb., 2017	BAS	

No:	DATE:	REVISION DESCRIPTION:
1	Dec., 2018	Utilize Current Site Plan, Add Additional Geologic Borings, Test Pits, And Sections
2	Feb., 2019	Utilize Current Site Plan
3	March, 2019	Utilize Current Site Plan

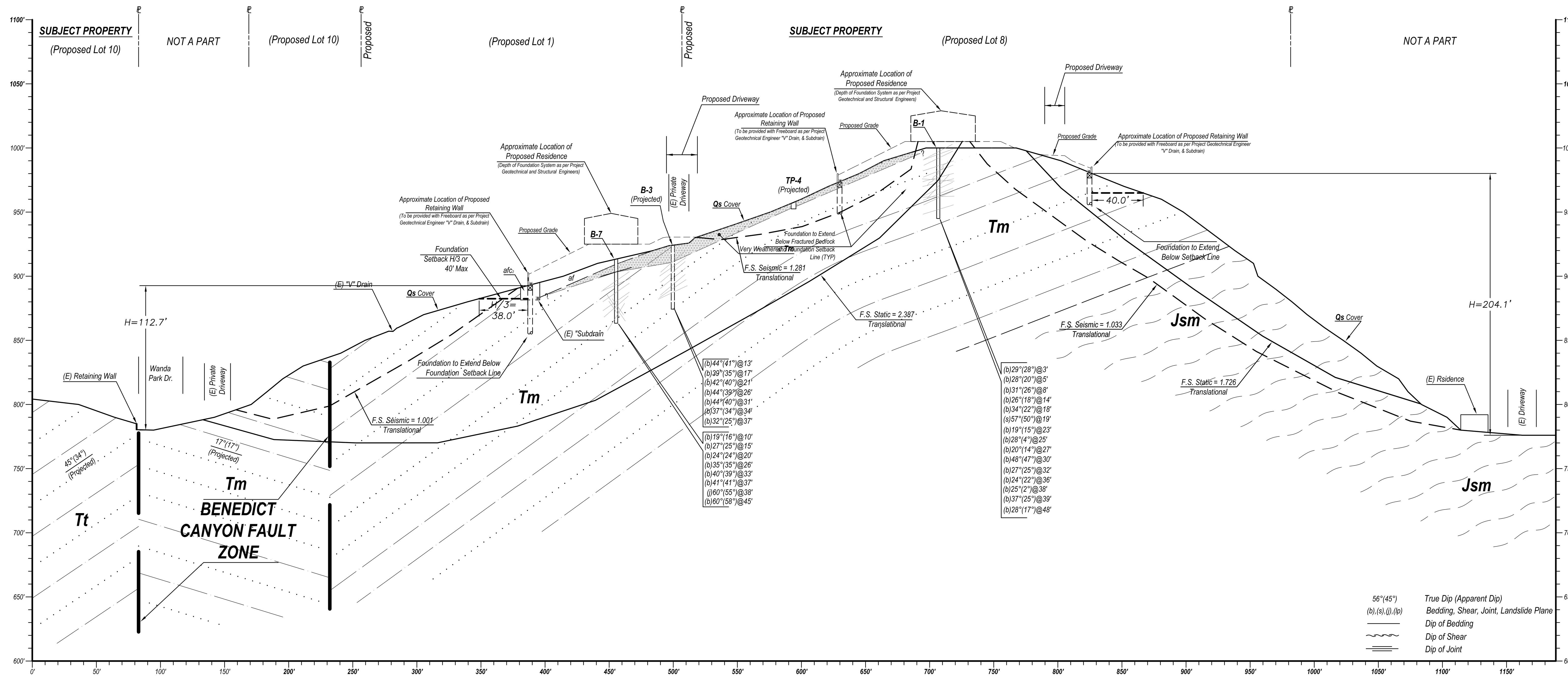
CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

A DIVISION OF LC ENGINEERING, INC.
889 PIERCE COURT, SUITE 101 (818)991-7148
THOUSAND OAKS, CA. 91360 (805)497-1244

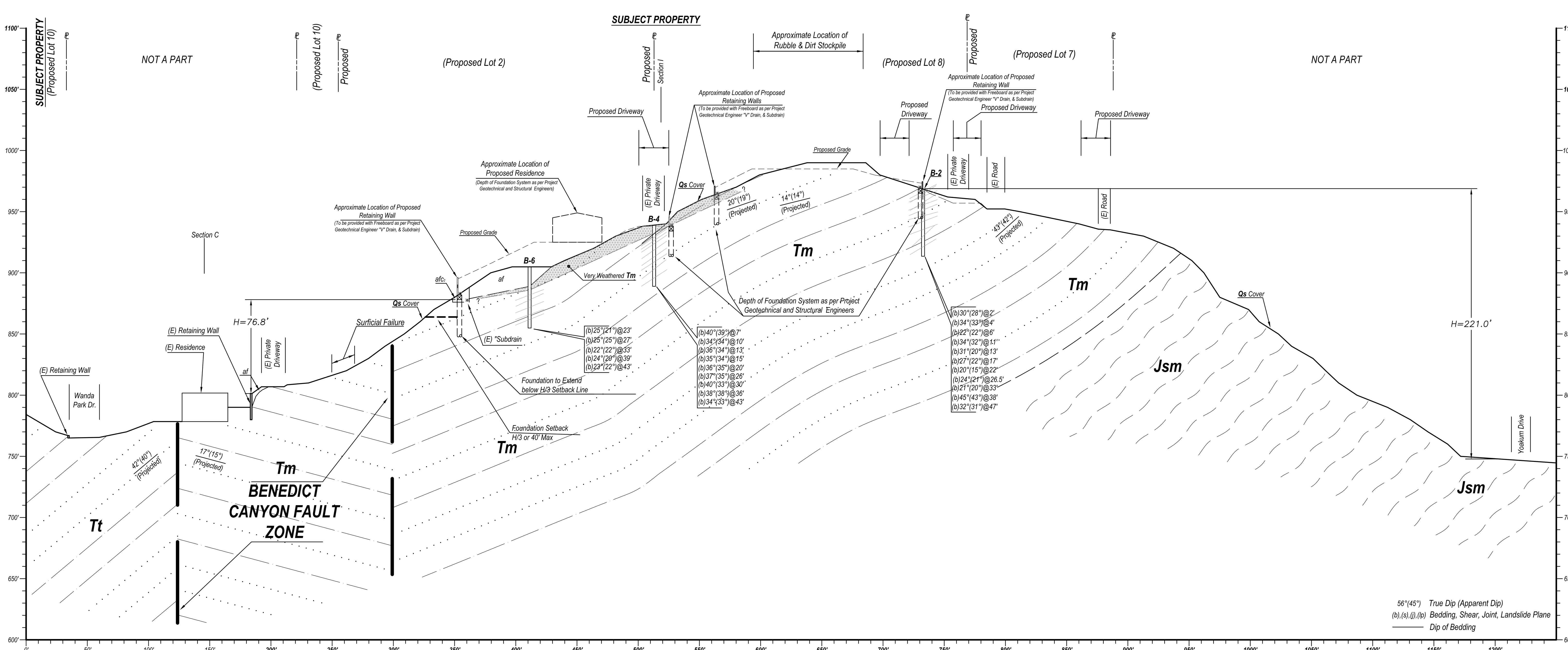
CLIENT: Oak Pass Rd LLC — JOB #: 5750-II
LOCATION: 9712 Oak Pass Road — SCALE: 1" = 50'
DATE: March, 2019 — DRAWN BY: RK

PLATE: 3

GEOTECHNICAL SECTIONS A & B
PROPOSED HOTEL AND RESIDENTIAL DEVELOPMENT
OAK PASS ROAD, BEVERLY HILLS AREA, CITY OF LOS ANGELES, CA



Geotechnical Section A-A'
Scale: 1" Equals 50'



Geotechnical Section B-B'
Scale: 1" Equals 50'

GEOLOGIC UNITS

Surficial Sediments:

af	Uncertified Artificial Fill
afc2	Certified Compacted Fill - CalWest Geotechnical, 2015
afc	Certified Compacted Fill - Kovacs-Byer and Assoc., Inc., 1986, 1988
Qs	Soil
Qal	Alluvium
Qls	Landslide Debris

Bedrock:

Tm	Modelo Formation
Tvb	Conejo Volcanics
Tt	Topanga Formation

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SIMI VALLEY, CA., 93063
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(805) 522-5174
(805) 582-1228 (FAX)

JOB NAME:	JOB NUMBER:	DATE:	DRAFTED BY:	
9712 Oak Pass Rd, LLC	LP 1197	Feb., 2017	BAS	PLATE 2

No	DATE	REVISION DESCRIPTION
1	Dec., 2018	Utilize Current Site Plan, Add Additional Geologic Borings, Test Pits, And Sections
2	Feb., 2019	Utilize Current Site Plan
3	March, 2019	Utilize Current Site Plan

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

A DIVISION OF LC ENGINEERING, INC.
889 PIERCE COURT, SUITE 101
THOUSAND OAKS, CA. 91360
(818)991-7148
(805)497-1244

CLIENT: Oak Pass Rd LLC	JOB #: 5750-H
LOCATION: 9712 Oak Pass Road	SCALE: 1" = 50'
DATE: March, 2019	DRAWN BY: RK

PLATE: 2

GEOLOGIC MAP

Structural Geologic Data From **Tvb** Cut-Slope

1. Bedding - N 80 W, 55 NE; Daylighted by cut-slope
2. Joint Set - NS 42 E; 6-inch to 1-foot spacing, rough, tight
3. Joint Set - N 57 W, 85 SW; 1- to 3-inch spacing, rough, tight
4. Bedding - N 60 W, 53 NE; Daylighted by cut-slope
5. Massive basalt bedrock with spheroidal weathering structures, 6-inch to 3-foot in diameter
6. Joint Set - N 16 E, 67 SE; 4- to 8-inch spacing, rough, tight
7. Bedding - N 60 W, 50 NE; Daylighted bedding plane which is also the failure surface of a prior bedrock pop-out
8. Joint Set - N 30 W, 90; 6-inch to 1-foot spacing, slight bedrock dilation at face of cut-slope producing ¼- to ½-wide joints
9. Joint - N 80 E, 54 SE; rough, tight
10. Joint Set - N 40 E, 70 SE; 1-inch to 2-foot spacing, rough, tight

*Overall, the exposed **Tvb** (basalt) of the cut-slope is hard to very hard with moderate degree of fracturing and a weathered "rind" which ranges from 3-inches to 3-feet thick from the face of the cut-slope. The basalt is generally massive but does possess an occasional medium to thick bedding fabric which appears to be extrusive igneous flow bedding. The bedding fabric is daylighted by the existing cut-slope.

EXPLANATION

GEOLOGIC SYMBOLS

- Geologic Contact - approximately located, queried where uncertain, dotted where concealed
- Fault Contact - Approximately located, queried where uncertain, dotted where concealed, arrow indicates dip of fault plane
- B-15 Location of boring - Mountain Geology, Inc., 2011, 2012 & Land Phases, Inc., 2018
- TP-25 Location of test pit - Mountain Geology, Inc., 2011 & Land Phases, Inc., 2018
- JBB-1-91 Location of boring - The J. Byer Group, Inc., 1991
- SEB-1 Location of boring - Smith-Emery Company, 1986
- KBTP-3-88 Location of test pit - Kovacs-Byer and Associates, Inc., 1988 (Shaded where buried or removed by grading)
- JBTP-4-84 Location of test pit - The J. Byer Group, Inc., 1984
- Strike and dip of bedding
- Strike and dip of foliation
- Strike and dip of shearing
- Strike and dip joint
- Strike of vertical joint
- Strike and dip joint set
- Strike of vertical joint set
- Arrows within mapped landslide and surficial failures show interpreted failure direction, barbed contacts denote interpreted limits of headscarp
- BE ~200' Approximate bottom elevation (feet)

GEOLOGIC UNITS

Surficial Sediments:

af	Uncertified Artificial Fill
afc2	Certified Compacted Fill - CalWest Geotechnical, 2015
afc	Certified Compacted Fill - Kovacs-Byer and Assoc., Inc., 1986, 1988
Qs	Soil
Qal	Alluvium
Qls	Landslide Debris

Bedrock:

Tm	Modelo Formation
Tvb	Conejo Volcanics
Tt	Topanga Formation

GEOLOGIC SHEET INDEX

Plate 1	GEOLOGIC MAP
Plate 2	GEOLOGIC SECTIONS A & B
Plate 3	GEOLOGIC SECTIONS C & D
Plate 4	GEOLOGIC SECTIONS E, F & G
Plate 5	GEOLOGIC SECTIONS H, I, J, K, L, M, & N

0 25 50 75 100 150 feet
Graphic Scale: 1" equals 50'

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(805) 522-5174
(805) 582-1228 (FAX)

JOB NAME:	JOB NUMBER:	DATE:	DRAFTED BY:	PLATE 1
9712 Oak Pass Rd., LLC	LP 1197	Feb., 2017	BAS	

No:	DATE:	REVISION DESCRIPTION:
1	Dec., 2018	Utilize Current Site Plan, Add Additional Geologic Borings, Test Pits, And Sections
2	Feb., 2019	Utilize Current Site Plan
3	March, 2019	Utilize Current Site Plan

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CONSULTING ENGINEERS
A DIVISION OF LC ENGINEERING, INC.
889 PIERCE COURT, SUITE 101 (818)991-7148
THOUSAND OAKS, CA. 91360 (805)497-1244

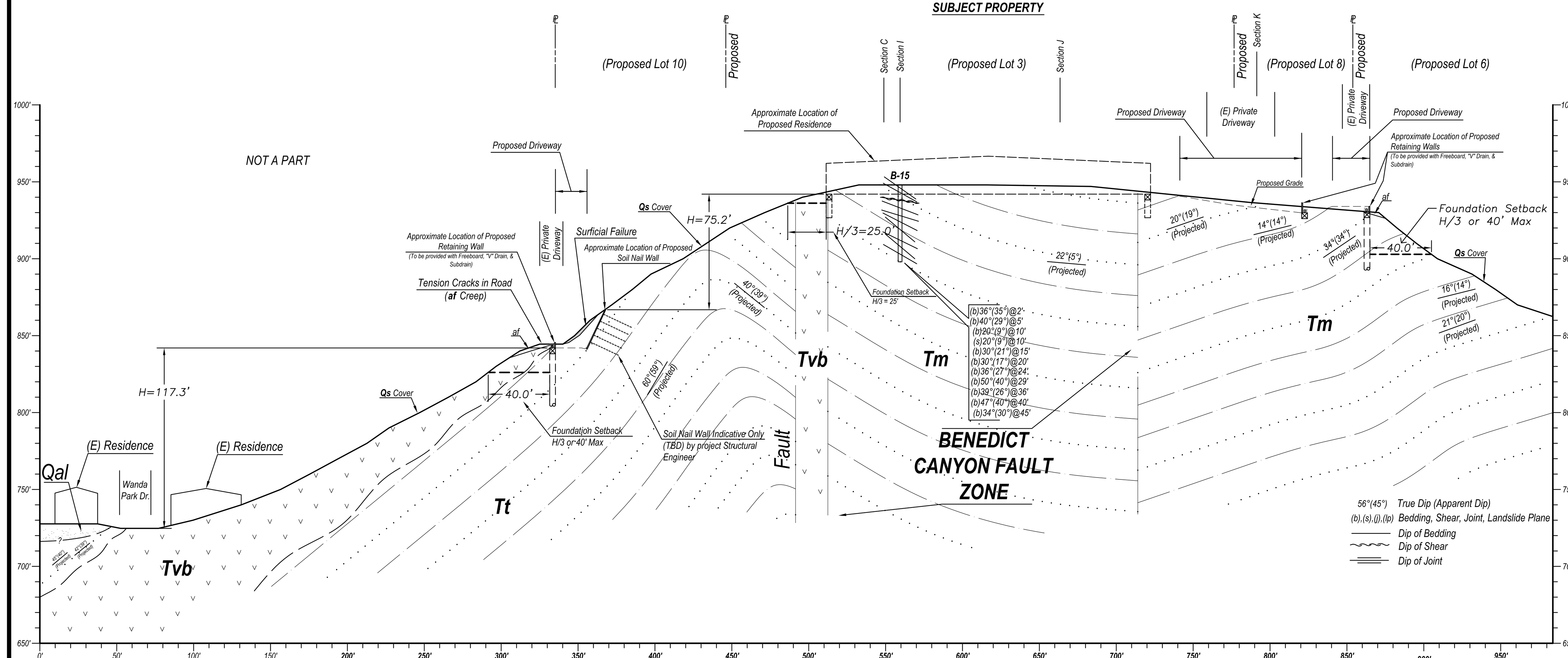
CLIENT: Oak Pass Rd LLC — JOB #: 5750-II
LOCATION: 9712 Oak Pass Road — SCALE: 1" = 50'
DATE: March, 2019 — DRAWN BY: RK

PLATE: 1

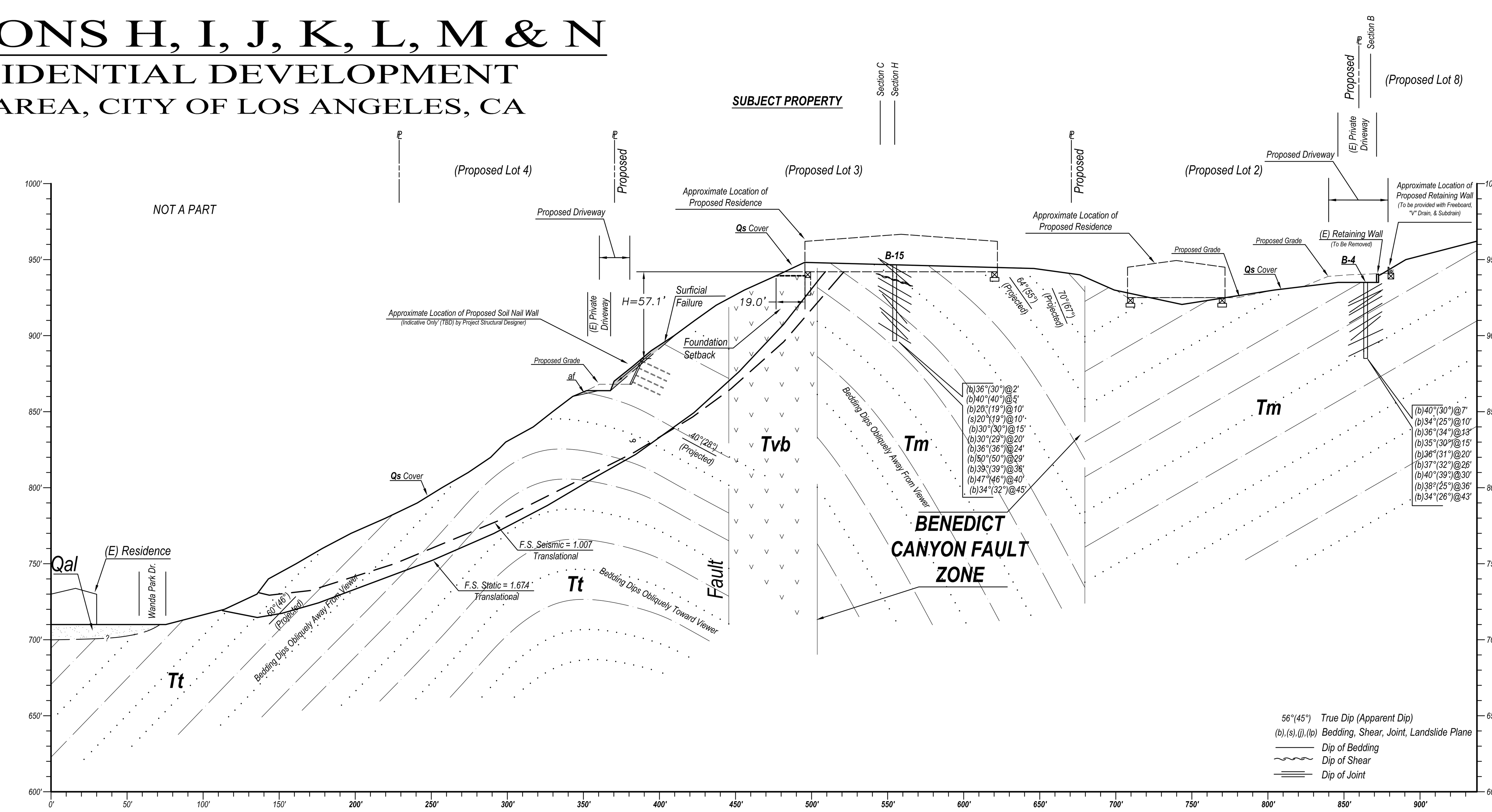
GEOTECHNICAL SECTIONS H, I, J, K, L, M & N

PROPOSED HOTEL AND RESIDENTIAL DEVELOPMENT

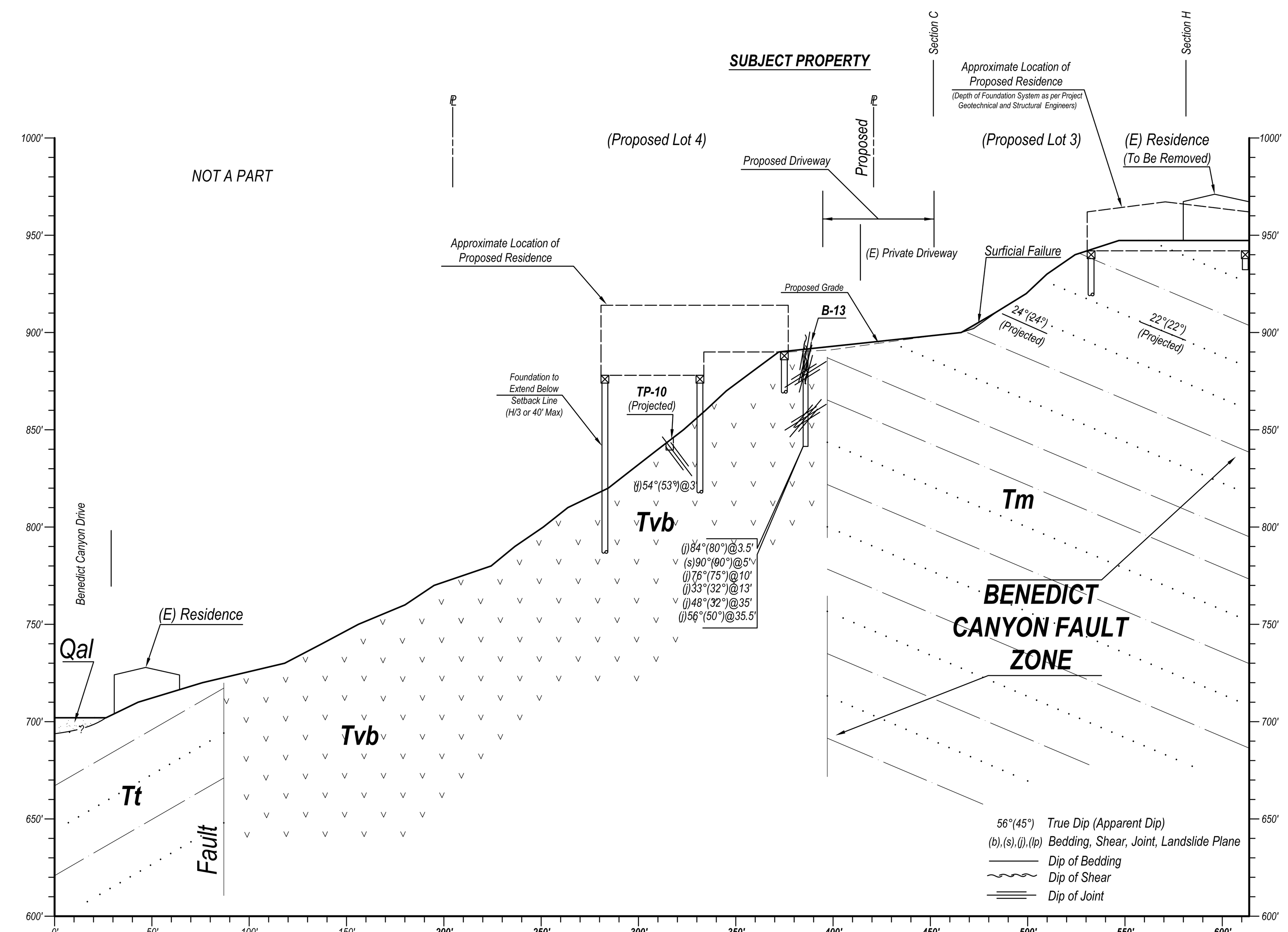
OAK PASS ROAD, BEVERLY HILLS AREA, CITY OF LOS ANGELES, CA



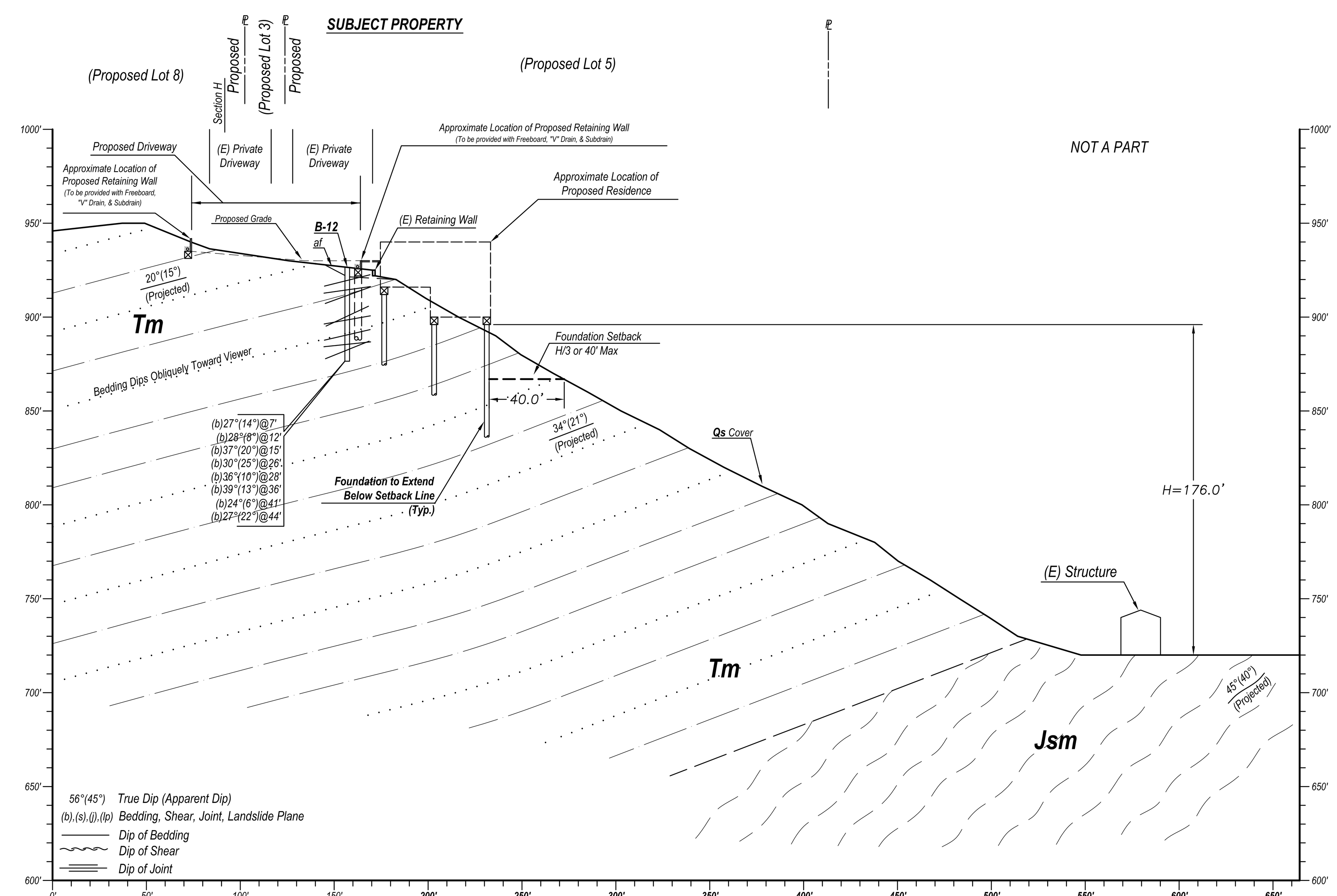
Geotechnical Section H-H'
Scale: 1" Equals 50'



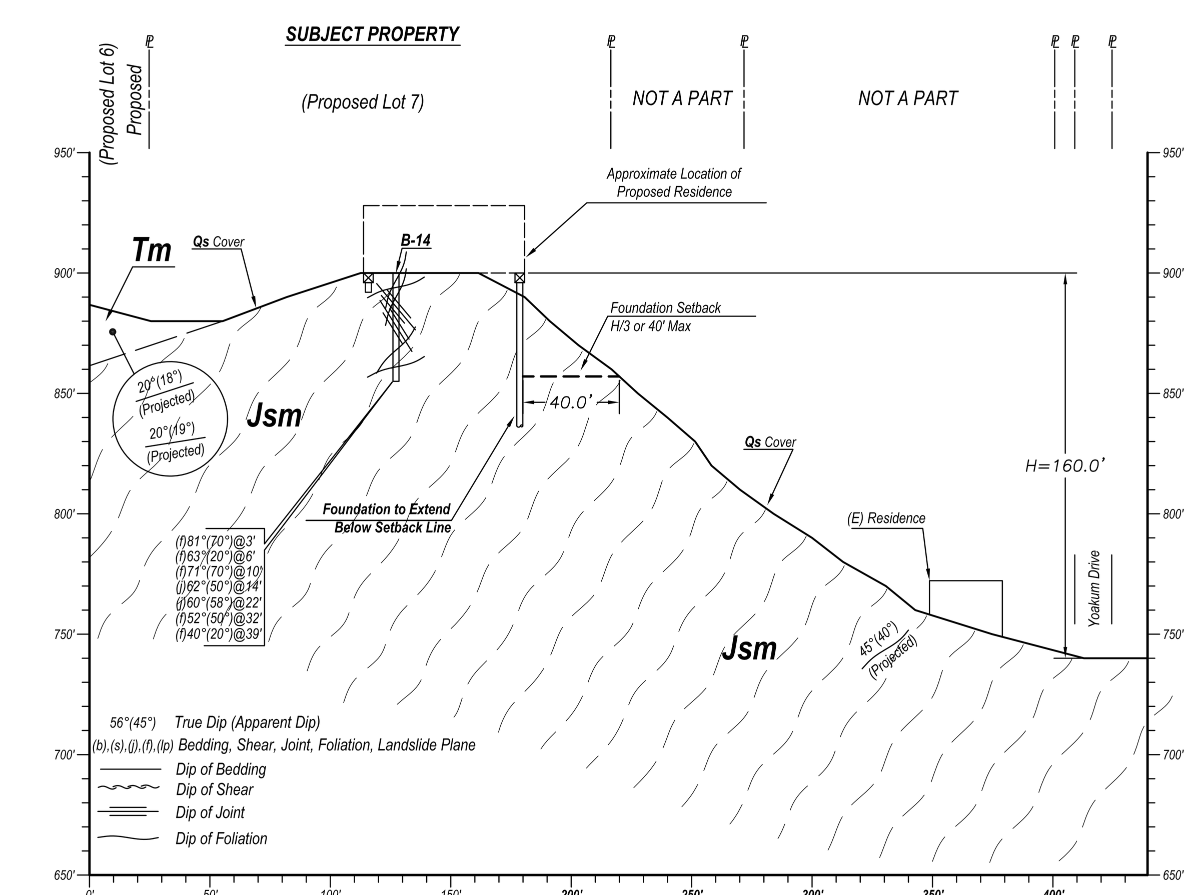
Geotechnical Section I-I'
Scale: 1" Equals 50'



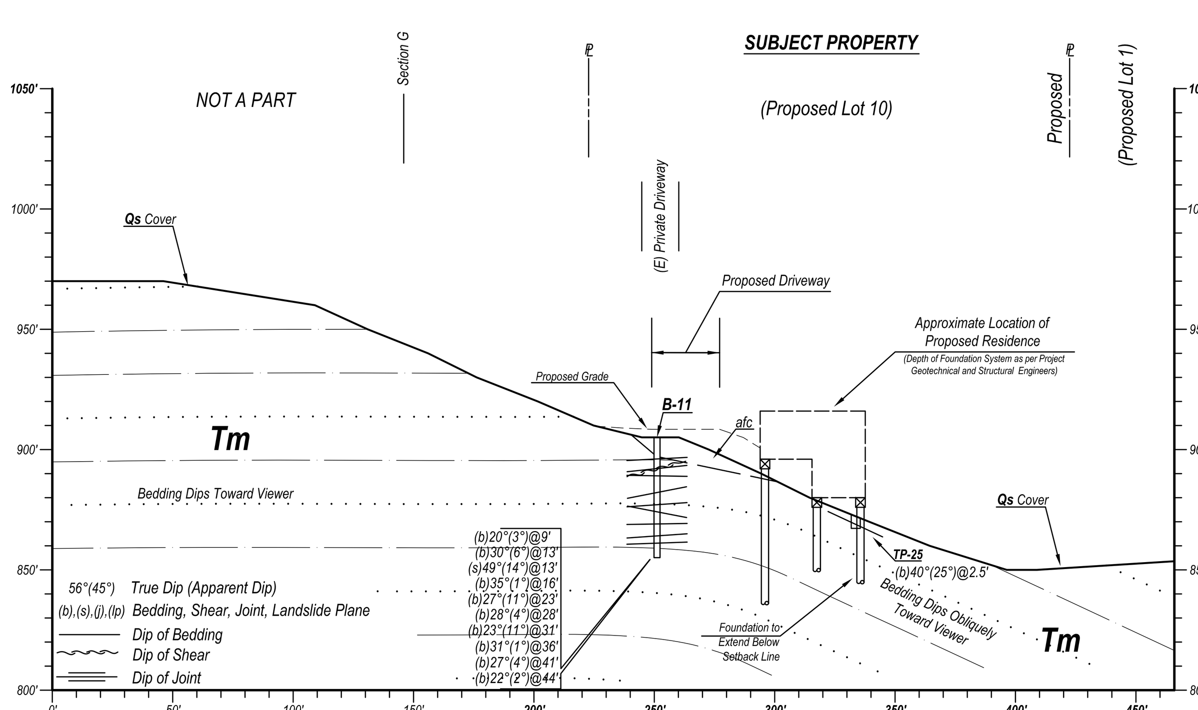
Geotechnical Section J-J'
Scale: 1" Equals 50'



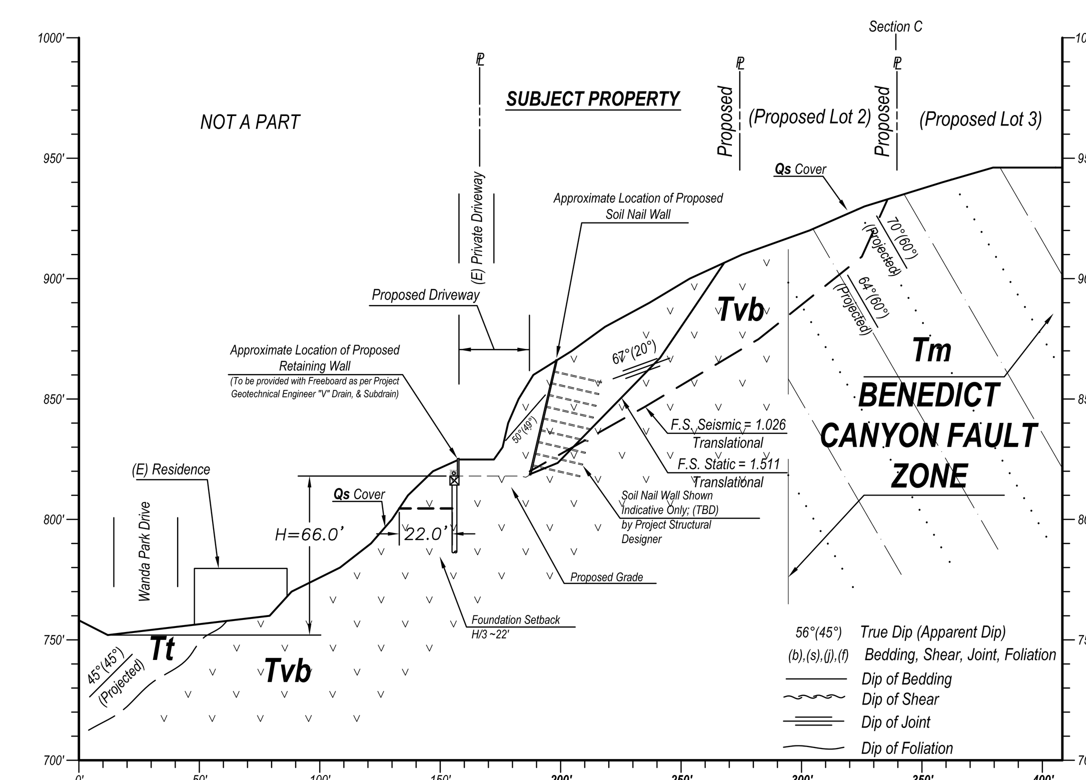
Geotechnical Section K-K'
Scale: 1" Equals 50'



Geotechnical Section M-M'
Scale: 1" Equals 50'



Geotechnical Section L-L'
Scale: 1" Equals 50'



Geotechnical Section N-N'
Scale: 1" Equals 50'

GEOLOGIC UNITS

Surficial Sediments:

af	Uncertified Artificial Fill
afc2	Certified Compacted Fill - CalWest Geotechnical, 2015
afc	Certified Compacted Fill - Kovacs-Byer and Assoc., Inc., 1986, 1988
Qs	Soil
Qal	Alluvium
Qls	Landslide Debris

Bedrock:

Tm	Modelo Formation
Tvb	Conejo Volcanics
Tt	Topanga Formation

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5158 COCHRAN ST.
SIMI VALLEY, CA., 93063
www.landphases.com

(805) 522-5174
(805) 582-1228 (FAX)

JOB NAME: 9712 Oak Pass Rd, LLC	JOB NUMBER: LP 1197	DATE: Dec., 2018	DRAFTED BY: BAS	PLATE 5
No.	DATE	REVISION DESCRIPTION		
1	Feb., 2019	Utilize Current Site Plan		

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

A DIVISION OF LC ENGINEERING, INC.
889 PIERCE COURT, SUITE 101 (818)991-7148
THOUSAND OAKS, CA. 91360 (805)497-1244

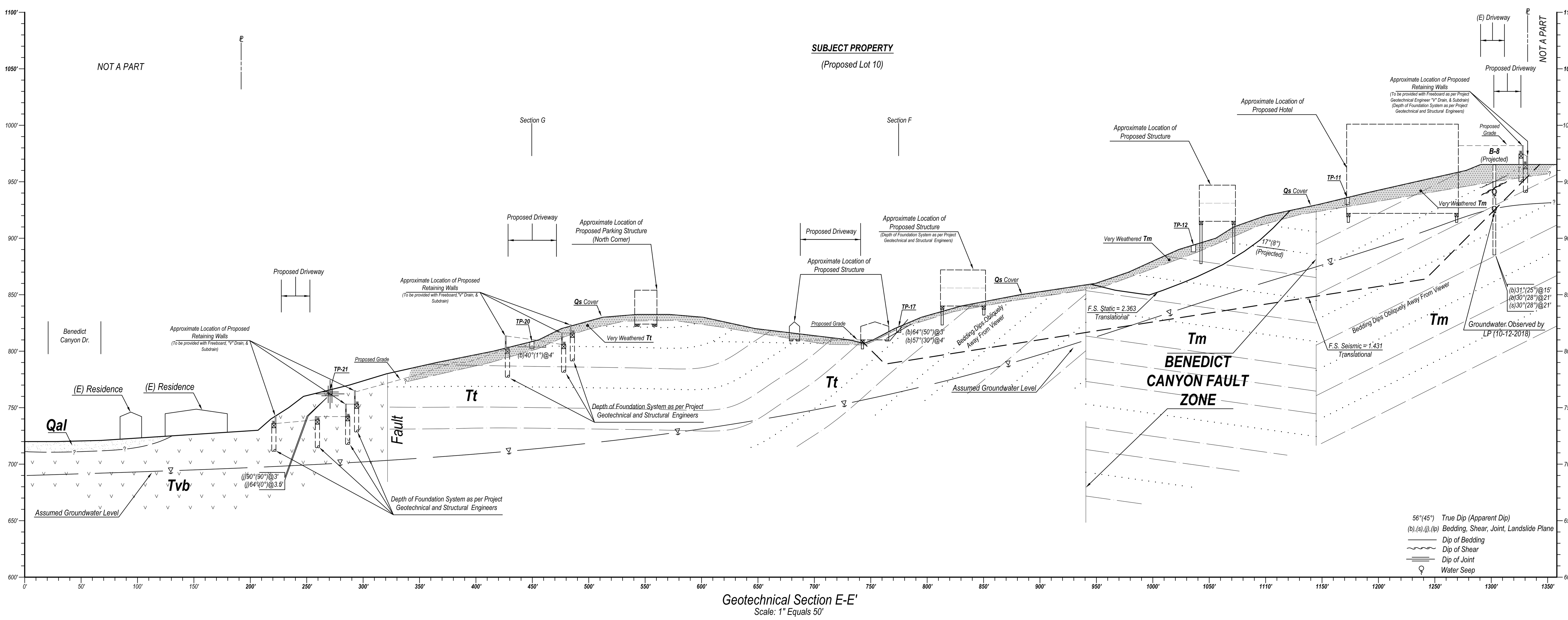
CLIENT: Oak Pass Rd LLC	JOB #: 5250-H
LOCATION: 9712 Oak Pass Road	SCALE: 1" = 50'
DATE: March, 2019	DRAWN BY: RK

PLATE: 5

GEOTECHNICAL SECTIONS E, F & G

PROPOSED HOTEL AND RESIDENTIAL DEVELOPMENT

OAK PASS ROAD, BEVERLY HILLS AREA, CITY OF LOS ANGELES, CA



Geotechnical Section E-E'

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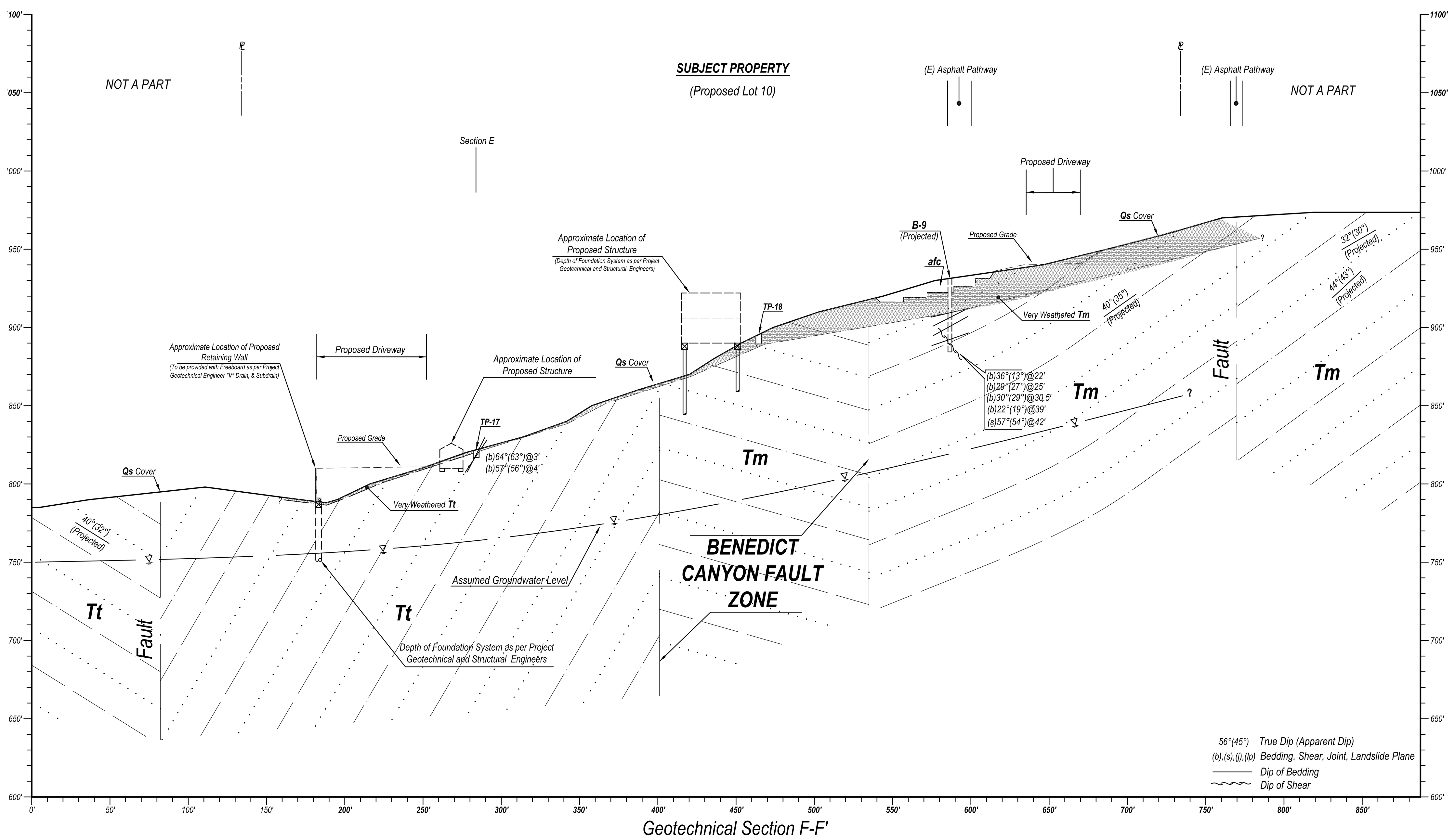

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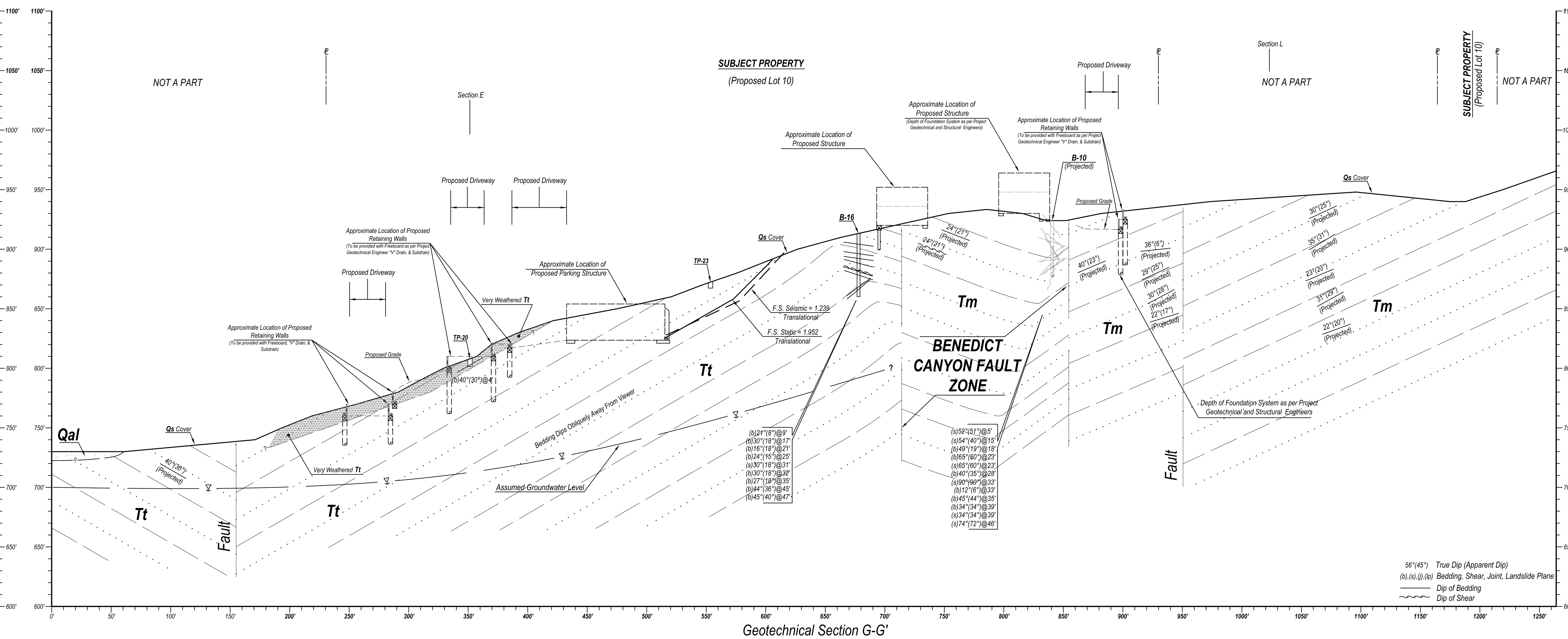

Geotechnical Section G-G'

Scale: 1" Equals 50'

GEOLOGIC UNITS

Surficial Sediments:

af	Uncertified Artificial Fill
afc2	Certified Compacted Fill - CalWest Geotechnical, 2015
afc	Certified Compacted Fill - Kovacs-Byer and Assoc., Inc., 1986, 1988
Qs	Soil
Qal	Alluvium
Qls	Landslide Debris

Bedrock:

Tm	Modelo Formation
Tvb	Conejo Volcanics
Tt	Topanga Formation

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5158 COCHRAN ST.,
SIMI VALLEY, CA., 93063
www.landphases.com

(805) 522-5174
(805) 582-1228 (FAX)

JOB NAME: 9712 Oak Pass Rd., LLC	JOB NUMBER: LP 1197	DATE: Feb., 2017	DRAFTED BY: BAS	PLATE 4

No:	DATE:	REVISION DESCRIPTION:
1	Dec., 2018	Utilize Current Site Plan, Add Additional Geologic Borings, Test Pits, And Sections
2	Feb., 2019	Utilize Current Site Plan

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

A DIVISION OF LC ENGINEERING, INC.
889 PIERCE COURT, SUITE 101 (818)991-7148
THOUSAND OAKS, CA. 91360 (805)497-1244

CLIENT: Oak Pass Rd LLC	JOB #: 5750-II
LOCATION: 9712 Oak Pass Road	SCALE: 1" = 50'
DATE: March, 2019	DRAWN BY: RK

PLATE: 4

APPENDIX C

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 5 (B-5)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/9/18	Weather Conditions	: Partly cloudy, warm
Date Logged	: 10/9/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition	Sampler Type
Remoulded	SS Split Spoon
Undisturbed	ST Shelby Tube
Lost, No Recovery	PS Piston Sampler
Bulk	DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 965	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	965	SM							0-1' ARTIFICIAL FILL (af) SILTY SAND with GRAVEL; mottled grayish orange and pale yellowish brown, dry, medium dense, gravel component consists of angular, pebble-size clasts of sandstone and siltstone		Bedding @4', N 81 W, 37 NE
5	960				SS		111.8	15.2	1'-50' BEDROCK (Modelo Formation - Tm) SILTSTONE and SHALE with occasional SANDSTONE interbeds; siltstone and shale are pale yellowish brown to moderate yellowish brown with iron-oxide staining, thin to medium bedded, somewhat friable, moderately hard, moderately fractured to fractured, moderately weathered to weathered; occasionally diatomaceous; sandstone is grayish orange with iron-oxide staining, fine- to medium-grained, thin to medium bedded		Bedding @9', N 74 W, 25 NE
10	955				SS		108.6	16.3			
15	950				SS		111.7	16.5	@4', Bedrock is thinly bedded, moderately fractured, moderately weathered @5', Bedrock is well bedded, tight, calcium-carbonate stringers common along bedding planes		Bedding @16', N 60 W, 28 NE
20	945				SS		116.3	15.4	@12', SANDSTONE interbeds becoming more common, thin to medium bedded @15', SILTSTONE color grading to primarily pale yellowish brown with iron-oxide staining		
25	940	SL-SH			SS		115.8	8.7	@25', SANDSTONE interbed; yellowish gray, 1.5 feet thick, fine- to medium-grained		Bedding @26.5', N 71 W, 25 NE
30	935										
									@33', SANDSTONE interbed; grayish orange, 3 feet thick, thinly laminated, fine- to medium-grained		Bedding @33', N 74 W, 27 NE
35	930				SS		115.4	13.8			Bedding @36', N 77 E, 24 NW
									@39', SANDSTONE interbed; yellowish gray, 1.5 feet thick, medium- to coarse-grained		
40	925										Bedding @40.5', N 85 E, 24 NW
45	920				SS		114.8	12.7	@45', Dolomitic SILTSTONE bed, 4-inches thick very hard, fractured		
50											

Total Depth: 50 feet
No groundwater
No caving
1 foot of fill

Surface Conditions: Gently sloping ridge area.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 6 (B-6)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/9 and 10/10/18	Weather Conditions	: Partly cloudy, warm
Date Logged	: 10/10/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 905	USCS	Sample Depth / Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	905	CL					0-16' ARTIFICIAL FILL (af) SANDY CLAY with GRAVEL; mottled moderate yellowish brown and dark yellowish brown, dry to slightly moist, upper 1.5 is loose, stiff below, gravel component consists of angular, pebble- to cobble-size clasts of sandstone and siltstone		
5	900		SS		100	19.7			
10	895		SS		104	19.0	@12', PVC fragments		
15	890		SS		98.6	19.6			
		ML					16'-19' VERY WEATHERED BEDROCK SANDY SILT with GRAVEL; mottled pale yellowish brown and moderate yellowish brown with iron-oxide staining, massive, slightly moist, stiff, gravel component consists of angular, pebble- to cobble-size clasts of siltstone and sandstone		
20	885	SL-SH	SS		103.3	18.2	19'-50' BEDROCK (Modelo Formation - Tm) SILTSTONE and SHALE with occasional SANDSTONE interbeds; siltstone and shale are pale yellowish brown to moderate yellowish brown with iron-oxide staining, thin to medium bedded, somewhat friable, moderately hard, moderately fractured to fractured, moderately weathered; occasionally diatomaceous; sandstone is grayish orange and yellowish gray with iron-oxide staining, fine- to medium-grained, thin to medium bedded @20', Somewhat undulatory bedding @23', Primarily SILTSTONE with occasional SANDSTONE interbeds, better rock quality, well bedded, slightly fractured, slightly to moderately weathered @27', Occasional calcium-carbonate stringers @33', Bedrock is well bedded and tight, occasional cemented SANDSTONE and dolomitic SILTSTONE beds which are hard, typically thin		Bedding @23', N 60 E, 25 NW
25	880		SS		112.4	14.9			Bedding @27', N 82 E, 25 NW
30	875		SS		111	19.6			Bedding @33', EW, 22 N
35	870								
40	865		SS		112.6	15.2			Bedding @39', N 60 E, 24 NW Bedding @43', N 80 E, 23 NW
45	860						@45', SILTSTONE color grading to pale yellowish brown and brownish gray with iron-oxide staining, hard, very tight, thin calcium-carbonate stringers along bedding planes		
50			SS		110.7	14.1			

Total Depth: 50 feet
No groundwater
No caving
16 feet of fill

Surface Conditions: Gently sloping access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 7 (B-7)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/10/18	Weather Conditions	: Partly cloudy, warm
Date Logged	: 10/10/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition	Sampler Type
Remoulded	SS Split Spoon
Undisturbed	ST Shelby Tube
Lost, No Recovery	PS Piston Sampler
Bulk	DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 915	USCS	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	Depth to Groundwater	Structure/Comments
0	915							
		CL						
5	910	ML	SS		101.5	18.7		
		ML						
10	905		SS		102.2	20.1		Bedding @10', N 85 W, 19 NE
15	900		SS		107.0	18.1		Bedding @15', N 85 W, 27 NE
20	895		SS		110.6	15.4		Bedding @20', N 70 E, 24 NW
25	890							Bedding @26', N 75 E, 35 NW
30	885	SL-SH	SS		117.4	11.9		
								Bedding @33', N 57 E, 40 NW
35	880							
								Bedding @37', N 70 E, 41 NW Joint Set @38', N 40 E, 60 SE
40	875		SS		108.8	14.8		
45	870							Bedding @45', N 47 E, 60 NW
50								

MATERIAL DESCRIPTIONS

0-4' ARTIFICIAL FILL (af)

SANDY CLAY with abundant GRAVEL; mottled moderate yellowish brown and dark yellowish brown, dry to slightly moist, stiff, gravel component consists of angular, pebble- to cobble-size clasts of sandstone

4'-6' SOIL (Qs)

SANDY SILT; dark yellowish brown, slightly moist, stiff

6'-10' VERY WEATHERED BEDROCK

SANDY SILT with GRAVEL; mottled pale yellowish brown and moderate yellowish brown with iron-oxide staining, massive, slightly moist, stiff, gravel component consists of angular, pebble- to cobble-size clasts of siltstone and sandstone, calcium-carbonate stringers, roots, gradational basal contact

10'-50' BEDROCK (Modelo Formation - Tm)

SILTSTONE and SHALE with occasioanal SANDSTONE interbeds; siltstone and shale are pale yellowish brown to moderate yellowish brown with iron-oxide staining, thinly laminated to thinly bedded, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered; occasionally diatomaceous; sandstone is grayish orange with iron-oxide staining, fine- to medium-grained, thin to medium bedded; bedrock is well bedded and tight

- @21', SANDSTONE interbed, grayish orange, 3 feet thick
- @26', Primarily SILTSTONE, color grading darker, trace gypsum stringers along bedding and fracture planes
- @27', SANDSTONE interbed, grayish orange, 6 feet thick, massive, medium- to coarse-grained
- @33', SILTSTONE; brownish gray with iron-oxide staining, thin to medium bedded, non-friable, moderately hard, slightly to moderately fractured, slightly weathered, calcium-carbonate stringers common along bedding and fracture planes
- @37', Dolomitic SILTSTONE, hard, moderately fractured
- @38'-40', Joint set, 1- to 3-inch spacing, tight, calcium-carbonate and gypsum coating

Total Depth: 50 feet
No groundwater
No caving
4 feet of fill

Surface Conditions: Gently sloping access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 8 (B-8)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/11/18	Weather Conditions	: Clear, warm
Date Logged	: 10/11/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 965	USCS	Sample Type	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)
0	965	SC					
5	960		Undisturbed	SS		97.3	23.7
10	955	SS	Undisturbed	SS		107.7	16.4
15	950		Undisturbed	SS		109.6	14.5
20	945		Undisturbed	SS		111.8	15.4
25	940		Undisturbed	SS		105.6	20.3
30	935	SS	Undisturbed	SS		107.4	19 1
35	930		Undisturbed	SS		106.2	18.0
40	925		Undisturbed	SS		111.7	18.2
45	920						
50							

MATERIAL DESCRIPTIONS

0-4' COMPACTED FILL (afc)

CONCRETE SLAB, 6-inches thick over 6-inches of base material

@1', CLAYEY SAND with GRAVEL; mottled moderate yellowish brown and dark yellowish brown, slightly moist, dense, gravel component consists of angular, pebble- to cobble-size clasts of sandstone and siltstone

4'-15' VERY WEATHERED BEDROCK

SANDSTONE; dark yellowish orange with iron-oxide staining, massive, friable, moist, weathered, rootlets common

@8', Grades to SILTY SANDSTONE; dark yellowish brown with iron-oxide staining, massive, friable, moist, weathered, rootlets common

@15', Gradational basal contact with competent bedrock

15'-80' BEDROCK (Modelo Formation - Tm)

SANDSTONE with occasional SILTSTONE interbeds; SANDSTONE is grayish orange and yellowish gray with iron-oxide staining, massive, fine- to medium-grained, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered; SILTSTONE is pale yellowish brown with iron-oxide staining, thinly bedded

@21', SILTSTONE interbed, 3-inches thick, somewhat sheared parallel to bedding

@22', SANDSTONE is occasionally deformed with slight to moderate shearing fabric

@24', Heavy water seepage from all sides of boring, slight caving at point of water seepage, unable to downhole log to a deeper depth due to water and caving hazard, remainder of boring logged by observation of samples and drilling spoils

@25', SANDSTONE; yellowish gray with iron-oxide staining, medium-grained, somewhat friable, moderately hard, moderately weathered

@35', SANDSTONE; grayish orange with iron-oxide staining, fine-grained, somewhat friable, moderately hard, moderately weathered

@39', Groundwater level at 700am on 10/12/18

@40', SANDSTONE; yellowish gray, medium-grained, somewhat friable, moderately hard, moderately weathered

Structure/Comments

Bedding @15', N 41 E, 31 NW

Bedding @21', N 25 E, 30 NW
Shearing @21', N 25 E, 30 NW

Depth to Groundwater: ▼ 39 feet

Total Depth: 80 feet
Water seepage at 24 feet
Groundwater level at 39 feet after 18 hours
Slight caving at 24 feet
4 feet of fill

Surface Conditions: Gently sloping access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers on 10/12/18 after final groundwater observation, asphalt patch placed at surface grade.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 8 (B-8)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/11/18	Weather Conditions	: Clear, warm
Date Logged	: 10/11/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 965	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
50	915				SS		105.8	16.7			
55	910										
60	905				SS		107	17.1	@60', SANDSTONE; medium gray, fine- to medium-grained, somewhat friable, moderately hard, slightly weathered; occasional dark gray SILTSTONE interbeds		
65	900	SS									
70	895				SS		108.4	17.7			
									@73', Rising groundwater level in boring 2 hours after completion of drilling	▽	
75	890										
80	885										
85	880										
90	875										
95	870										
100											

Total Depth: 80 feet
Water seepage at 24 feet
Groundwater level at 39 feet after 18 hours
Slight caving at 24 feet
4 feet of fill

Surface Conditions: Gently sloping access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers on 10/12/18 after final groundwater observation, asphalt patch placed at surface grade.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 9 (B-9)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/12/18	Weather Conditions	: Clear, warm
Date Logged	: 10/12/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 931	USCS	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	931							0-9' COMPACTED FILL (afc) ASPHALT, 4-inches thick over 8-inches of base material @1', SANDY CLAY with GRAVEL; mottled moderate yellowish brown and dark yellowish brown, dry, stiff, gravel component consists of angular, pebble- to cobble-size clasts of sandstone and siltstone		
5	926	CL	5	SS		105.6	11.6			
10	921	SC	10	SS		103.8	8.8	9'-15' SOIL (Qs) CLAYEY SAND with trace GRAVEL; moderate yellowish brown, dry, dense, gravel component consists of angular, pebble- to small cobble-size clasts of sandstone, occasional roots, gradational basal contact		
15	916	SS	15	SS		100.3	9.1	15'-22' VERY WEATHERED BEDROCK SANDSTONE; grayish orange with iron-oxide staining, massive, friable to somewhat friable, weak to moderately hard, weathered, occasional roots		
20	911		20	SS		102.5	6.4	@22', Gradational basal contact with competent bedrock		Bedding @22', N 60 W, 36 NE
25	906	SS	25	SS		116	5.3	22'-47' BEDROCK (Modelo Formation - Tm) SANDSTONE with occasional SILTSTONE interbeds; SANDSTONE is grayish orange with iron-oxide staining, thinly bedded, fine- to medium-grained, somewhat friable to non-friable, moderately hard, slightly fractured, slightly weathered; SILTSTONE is moderate yellowish brown with iron-oxide staining, thinly bedded; bedrock is well bedded and tight @26', SANDSTONE is massive, medium- to coarse-grained with depth		Bedding @25', N 72 E, 29 NW
30	901		30	SS		107.4	5.8	@30.5', Bedding marked by thin fine-grained SANDSTONE interbeds; Below SANDSTONE is massive, medium- to coarse-grained wth occasional thin fine-grained interbeds		Bedding @30.5', N 67 E, 30 NW
35	896									
40	891		40	SS		108.2	9.5	@39', SILTSTONE interbed, 1/2-inch thick @42', SHEAR; CLAY, light gray with iron-oxide staining, 1/8-inch thick, slightly moist, firm		Bedding @39', N 82 E, 22 NW Shear @42', N 22 E, 57 SE
45	886							@47', SANDSTONE is cemented, very hard, use of core bucket would be required to advance, drilling aborted		
50										

Total Depth: 47 feet
No groundwater
No caving
9 feet of fill

Surface Conditions: Gently sloping access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging, asphalt patch placed at surface grade.

Land Phases, Inc. Consulting Engineering Geologist	LOG OF BORING # 10 (B-10) (Page 1 of 2)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/15/18	Weather Conditions	: Clear, windy, warm
Date Logged	: 10/15/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 925	USCS	Sampler Type	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	925					0-2' ARTIFICIAL FILL (af)		
		SC				ASPHALT, 4-inches thick over 8-inches of base material		
						@1', CLAYEY SAND with GRAVEL; mottled moderate yellowish brown and dark yellowish brown, dry, dense, gravel component consists of angular, pebble- to cobble-size clasts of sandstone and concrete		
5	920		SS	102	5.8	2'-50' BENEDICT CANYON FAULT ZONE / BEDROCK (Modelo Formation - Tm)		Fault/Shear @5', N 30 E, 52 SE
		SS				SANDSTONE; yellowish gray with iron-oxide staining, massive, medium- to coarse-grained, somewhat friable, moderately hard, moderately fractured, moderately weathered		
						@5', SILTSTONE interbeds, moderate yellowish brown, 4-inches thick, thinly bedded, offset by thin micro-fault		
10	915		SS	105.2	8.4	MICRO-FAULT/SHEAR; CLAY, light gray with iron-oxide staining, 1/8-inch thick, reverse separation across fault		
15	910		SS	101	17.6	@15', FAULT/SHEARED contact, very thin and somewhat undulatory, below fault/shear is SILTSTONE; light olive gray with iron-oxide staining, thinly bedded, somewhat friable, moderately hard, moderately fractured, moderately sheared, moderately weathered; occasional thin SANDSTONE interbeds, bedrock is deformed, folded, and moderately sheared		Fault/Shear @15', N 10 W, 54 SE Bedding @18', N 30 W, 46 NE
		SL						
20	905		SS	112.2	6.5			
						@23', SHEAR ZONE; Highly sheared SILTSTONE, dark yellowish brown with iron-oxide staining, polished surfaces, deformed bedding which is parallel to shear zone, SANDSTONE below		Bedding @23', NS, 65 E Shearing @23', NS, 65 E
25	900	SS	SS	106.3	10.8	@23', SANDSTONE with occasional SILTSTONE interbeds; SANDSTONE is yellowish gray with iron-oxide staining, thinly bedded to massive, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered, bedding often truncated by very thin, east-dipping shears/faults		Bedding @28', N 72 E, 40 NW
30								

Total Depth: 50 feet
No groundwater
No caving
2 feet of fill

Surface Conditions: Gently sloping access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging, asphalt patch placed at surface grade.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 10 (B-10)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/15/18	Weather Conditions	: Clear, windy, warm
Date Logged	: 10/15/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 925	USCS	Sampler Type	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
30	895	SS	SS	107.2	7.2	@30', Cemented SANDSTONE concretion on south wall of boring, very hard, abundant iron-oxide staining		
		SL				@33', MICRO-FAULT/SHEAR, 1-foot separation of sandstone/siltstone contact, north side down		Fault/Shear @33', N 65 E, 90
						@33', SILTSTONE; dark yellowish brown with iron-oxide staining, thinly bedded, moderately sheared, moderately weathered		Bedding @33', N 80 W, 12 NE
35	890	SS				@35', SANDSTONE; yellowish gray with iron-oxide staining, massive, coarse-grained, non-friable, moderately hard, moderately fractured, moderately weathered		Bedding @35', N 60 E, 45 NW
						@39', SILTSTONE interbed, 3-inches thick, somewhat deformed and sheared		Bedding @39', N 32 E, 34 NW Shearing @39', N 32 E, 34 NW
40	885	SS-SL	SS	108.8	11.6	@40', Interbedded SANDSTONE and SILTSTONE; thinly bedded		
45	880							
		SS				@46', MICRO-FAULT/SHEAR; CLAY, pale olive, 1/8-inch thick, perfectly planar, 1 foot normal separation of siltstone/sandstone contact, below is SANDSTONE; yellowish gray, massive, coarse-grained, non-friable, moderately hard, moderately fractured, slightly to moderately weathered		Fault/Shear @46', N 65 E, 74 NW
			SS	106.6	9.3			
50	875							
55	870							
60								

Total Depth: 50 feet
No groundwater
No caving
2 feet of fill

Surface Conditions: Gently sloping access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging, asphalt patch placed at surface grade.

Land Phases, Inc. Consulting Engineering Geologist	LOG OF BORING # 11 (B-11) (Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC Project Location: 9712 Oak Pass Road Los Angeles, CA Project No.: LP1197	Date Excavated : 10/15 and 10/16/18 Date Logged : 10/16/18 Drilling Company : Roy Bros. Drilling Drilling Method : Bucket Auger Drill-Rig Auger Diameter : 24-inches Weather Conditions : Clear, windy, warm Elevation Datum : From Survey Logged By : Jake Holt, CEG Checked By : Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 905	USCS	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)
0	905						
5	900	SM	■	SS		106.3	7.9
10	895		■	SS		108.4	6.7
		SS-SL					
15	890		■	SS		112.2	12.3
20	865	SS	■	SS		110.7	10.8
25	880	SS-SL					
30	875		■	SS		111.6	9.6
35	870	SS					
40	865		■	SS		108.8	11.3
45	860	SS-SL					
50			■	SS		117	10.2

MATERIAL DESCRIPTIONS

0-8' COMPACTED FILL (afc)

ASPHALT, 4-inches thick over 8-inches of base material

@1', SILTY SAND with GRAVEL; mottled grayish orange and moderate yellowish brown, dry, dense, gravel component consists of angular, pebble-size clasts of sandstone and siltstone, trace roots

8'-50' BEDROCK (Modelo Formation - Tm)

Interbedded SANDSTONE and SILTSTONE; SANDSTONE is grayish orange with iron-oxide staining, thin to medium bedded, medium- to coarse-grained, non-friable, moderately hard to hard, slightly fractured, slightly weathered; SILTSTONE is pale yellowish brown to moderate yellowish brown with iron-oxide staining, thinly bedded, non-friable, moderately hard to hard, slightly fractured, slightly weathered

@13', MICRO-FAULT/SHEAR; Thin and sharp calcium-carbonate lined contact, 10-inches of normal separation of beds across fault, roots

Increase percentage of SILTSTONE, bedrock is well bedded and tight

@17', SANDSTONE; yellowish gray with iron-oxide staining, massive, coarse-grained, non-friable, moderately hard, slightly fractured, slightly weathered

@23', Interbedded SANDSTONE and SILTSTONE; SANDSTONE is grayish orange with iron-oxide staining, thinly bedded, fine- to medium-grained, non-friable, moderately hard, slightly fractured, slightly weathered; SILTSTONE is moderate yellowish brown with iron-oxide staining, thinly bedded, non-friable, moderately hard, slightly fractured, slightly weathered, tight

@28', SANDSTONE; yellowish gray with iron-oxide staining, massive, medium- to coarse-grained, occasional thin SILTSTONE interbeds

@31', SILTSTONE interbed; 4-inches thick, bedrock is well bedded and tight; below SANDSTONE is grayish orange with iron-oxide staining, massive, fine- to coarse-grained with depth

@36', SILTSTONE interbed; medium gray, 6-inches thick

@36.5', SANDSTONE; light bluish gray, massive, fine- to medium-grained, non-friable, moderately hard to hard, slightly fractured, slightly weathered, tight, occasional cemented beds that are very hard

@41', SILTSTONE interbed; medium gray, 2-inches thick

@43', Interbedded light bluish gray SANDSTONE and medium gray SILTSTONE; thinly bedded, tight

Depth to Groundwater

Structure/Comments

- Bedding @9', N 76 E, 20 NW
- Bedding @13', N 80 E, 30 NW
- Fault/Shear @13', N 55 E, 49 SE
- Bedding @16', N 70 E, 35 NW
- Bedding @23', EW, 27 N
- Bedding @28', N 75 E, 28 NW
- Bedding @31', N 40 E, 23 NW
- Bedding @36', N 71 E, 31 NW
- Bedding @41', N 77 E, 27 NW
- Bedding @44', N 73 E, 22 NW

Total Depth: 50 feet
No groundwater
No caving
8 feet of fill

Surface Conditions: Gently sloping access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging, asphalt patch placed at surface grade.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 12 (B-12)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/16/18	Weather Conditions	: Clear, warm
Date Logged	: 10/16/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 925	USCS	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	Structure/Comments
0	925	SC						
5	920		Undisturbed	SS		102.6	14.1	Bedding @7', N 77 E, 27 NW
10	915		Undisturbed	SS		107.3	15.2	Bedding @12', N 65 E, 28 NW
15	910		Undisturbed	SS		115.5	13.2	Bedding @15', N 80 E, 37 NW
20	905							
25	900	SL-SH	Undisturbed	SS		108.4	13.2	Bedding @26', N 82 W, 30 NE; Bedding @28', N 65 E, 36 NW
30	895							
35	890		Undisturbed	SS		109.6	16.4	Bedding @36', N 66 E, 39 NW
40	885							Bedding @41', N 64 E, 24 NW; Bedding @44', N 75 W, 27 NE
45	880		Lost, No Recovery					
50								

MATERIAL DESCRIPTIONS

0-5' ARTIFICIAL FILL (af)

ASPHALT, 6-inches thick over CLAYEY SAND with GRAVEL; mottled moderate yellowish brown and dark yellowish brown, dry to slightly moist, dense, gravel component consists of angular, pebble- to cobble-size clasts of sandstone, siltstone, shale, and concrete, scattered roots

@2', Abundant asphalt fragments, 4-inches thick

5'-50' BEDROCK (Modelo Formation - Tm)

SILTSTONE and SHALE with occasional SANDSTONE interbeds; SILTSTONE and SHALE are pale yellowish brown to moderate yellowish brown with iron-oxide staining, thinly laminated to thinly bedded, shale is fissile, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered; occasionally diatomaceous; sandstone is grayish orange with iron-oxide staining, fine- to medium-grained, thinly bedded

@7', Bedrock is tight and well bedded, calcium-carbonate common along bedding planes

@13', SANDSTONE interbed; grayish orange, 2-feet thick, medium-grained

@20', SANDSTONE interbeds are medium to thick bedded (1- to 2-feet thick)

@24'-28', Zone of fractured bedrock, numerous steeply-dipping micro-faults, randomely oriented, minor offsets of beds

@28', Bedrock is tight and well bedded

@36', Occasional thin to medium bedded dolomitic SILTSTONE beds, hard to very hard, fractured

Total Depth: 50 feet
No groundwater
No caving
5 feet of fill

Surface Conditions: Gently sloping access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging, asphalt patch placed at surface grade.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 13 (B-13)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 10/17/18	Weather Conditions	: Clear, warm
Date Logged	: 10/17/18	Elevation Datum	: From Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Brett Scott, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 890	USCS	Sample Type	Dry Density (pcf)	Moisture Content (%)
0	890	SM			
5	885				
10	880		SS	115.7	10.3
15	875				
20	870		SS	118.2	10.8
25	865	VL			
30	860		SS	118.5	7.9
35	855				
40	850				
45	845				
50					

MATERIAL DESCRIPTIONS

0-3' ARTIFICIAL FILL (af)

SILTY SAND with GRAVEL; moderate yellowish brown, dry, dense, gravel component consists of angular to subrounded, pebble-size clasts of basalt and sandstone, minor rooting

3'-50' BEDROCK (Conejo Volcanics - Tvb)

BASALT; dark yellowish brown and moderate brown with iron-oxide staining, massive, non-friable, moderately hard to hard, slightly to moderately fractured, moderately weathered
- @5', SHEAR; CLAY with caclium-carbonate, 1/4-inch thick, minor roots
- @10', Bedrock is very tight with occasional random pockets of fractured rock; Open joint, 1/4-inch wide
- @13', Well defined joint, closed

@19', Bedrock is very tight and hard, difficult to excavate from boring sidewalls with hand tools

@34'-36', Zone of very oxidized BASALT, abundant iron-oxide staining
- @35', Gypsum-filled joint, 1/2-inch thick, tight
- @35.5', Gypsum-filled joint, 1/2-inch thick, tight
- @36', Less oxidized zones of light bluish gray BASALT common for remainder of boring, very hard, slightly fractured, slightly weathered, very tight

Depth to Groundwater

Structure/Comments

Joint @3.5', N 65 E, 84 NW
Shear @5', N 65 E, 90
Joint @10', N 30 E, 76 NW
Joint @13', N 20 E, 33 SE
Joint @35', N 42 W, 48 SW
Joint @35.5', N 25 W, 56 SW

Total Depth: 50 feet
No groundwater
No caving
3 feet of fill

Surface Conditions: Planter area located adjacent to access road.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging, asphalt patch placed at surface grade.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 14 (B-14)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/14/18	Weather Conditions	: Clear, warm
Date Logged	: 11/14/18	Elevation Datum	: From Survey
Drilling Company	: RC Drilling, Inc.	Logged By	: Brett Scott, CEG
Drilling Method	: Lo-Drill Flight-Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 903	USCS	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	903	SM, CL						0-1' ARTIFICIAL FILL (af) 4-inches of ASPHALT over SILTY SAND with GRAVEL; pale yellowish brown to moderate yellowish brown, medium- to coarse-grained, dry, moderately dense, gravel component consists of subrounded, pebble-size clasts		Foliation @3', N 10 E, 81 NW
5	898		5	SS		112	6.0	1'-2' SOIL (Qs) SANDY CLAY with GRAVEL; moderate brown, fine- to coarse-grained, dry to slightly moist, stiff, gravel component consists of subangular to subrounded clasts of slate, roots @1'-2', Krotovinas present		Foliation @6', N 25 W, 63 NE
10	893		10	SS		116.4	5.1	2'-45' BEDROCK (Santa Monica Slate - Jsm)		Foliation @10', N 47 E, 71 NW
15	888		15	SS		117	5.3	SLATE; medium bluish gray to brownish gray, thinly foliated to massive, non-friable, hard, slightly to moderately fractured, slightly weathered @4'-7', Zone of very oxidized SLATE, abundant iron-oxide staining @11'-12', SLATE is moderately fractured, thicker foliation, blocky, easily picked from side walls with hand-tools @14', Quartzite vein, not continuous around boring, 1-inch thick		Joint @ 14', N 24 E, 62 SE
20	883	ME						@22', SLATE is very hard and tight, difficult to excavate from boring sidewalls with hand-tools		Joint @22', N 85 W, 60 SW
25	878		25	SS		119.5	3.2			
30	873							@32', SLATE is modeately fractured, thicker foliation, blocky, continues to total depth		Foliation @32', N 85 W, 52 NE
35	868		35 (Lost, No Recovery)							
40	863									Foliation @39', N 10 E, 40 NW
45	858									
50										

Total Depth: 45 feet
No groundwater
No caving
1 foot of fill

Surface Conditions: Moderately level driveway area.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging, asphalt patch placed at surface grade.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 15 (B-15)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/14/18	Weather Conditions	: Clear, warm
Date Logged	: 11/14/18	Elevation Datum	: From Survey
Drilling Company	: RC Drilling, Inc.	Logged By	: Jake Holt, CEG
Drilling Method	: LAR, Flight Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 948	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	948	CL							0-0.5' ARTIFICIAL FILL (af) SANDY CLAY; grayish brown, moist, firm, roots		Bedding @2', N 75 E, 36 SE
5	943				SS		105.7	18.3	0.5'-50' BENEDICT CANYON FAULT ZONE / BEDROCK (Modelo Formation - Tm) SILTSTONE with occasional SANDSTONE interbeds; SILTSTONE is pale yellowish brown with iron- and manganese-oxide staining, massive, friable, fractured, weathered, SANDSTONE interbeds are grayish orange, fine- to medium-gradined, thinly bedded		Bedding @5', N 35 E, 40 SE
10	938				SS		114.4	14.1	@2', Bedrock is thinly bedded, somewhat friable, moderately hard, moderately fractured to fractured, moderately weathered @4', Bedrock is well bedded, occasional thin diatomaceous SHALE interbeds		Bedding @10', N 20 E, 34 SE Shearing @10', N 20 E, 34 SE
15	933				SS		110.3	16.2	@10', Occasional shearing fabric parallel to bedding, undulatory bedding; SANDSTONE interbeds are thin to medium bedded @15', Bedrock is well bedded, moderately fractured, moderately weathered		Bedding @15', N 40 E, 30 SE
20	928				SS		109.4	16.6	@20', Iron- and manganese-oxide staining diminishing, bedrock is slightly weathered @21', SANDSTONE interbed, 3 feet thick @24', Bedrock is slightly fractured, tight		Bedding @20', N 20 E, 30 SE Bedding @24', N 40 E, 36 SE
25	923	SL			SS		110.2	15.8	@26', SANDSTONE interbed, 2 feet thick, moderately fractured, randomly oriented and steeply-dipping micro-faults with minor offsets, bedding is undulatory @29', Siliceous SILTSTONE and diatomaceous SHALE interbeds common		Bedding @29', N 39 E, 50 SE
30	918										
35	913				SS		111.7	15.2	@36', Increased degree of fracturing and weathering @37', SILTSTONE color grading to medium gray with abundant iron-oxide staining		Bedding @36', N 36 E, 39 SE
40	908								@40', Bedrock is well bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered @41', SILTSTONE color grades back to pale yellowish brown with iron-oxide staining		Bedding @40', N 45 E, 47 SE
45	903				SS		111.3	15.5			Bedding @45', N 57 E, 34 SE
50											

Total Depth: 50 feet
No groundwater
No caving
0.5 feet of fill

Surface Conditions: Level lawn area.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF BORING # 16 (B-16)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/15/18	Weather Conditions	: Clear, warm
Date Logged	: 11/15/18	Elevation Datum	: From Survey
Drilling Company	: RC Drilling, Inc.	Logged By	: Jake Holt, CEG
Drilling Method	: LoDrill Flight Auger Drill-Rig	Checked By	: Jake Holt, CEG
Auger Diameter	: 24-inches		

Sample Condition	Sampler Type
Remoulded	SS Split Spoon
Undisturbed	ST Shelby Tube
Lost, No Recovery	PS Piston Sampler
Bulk	DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 912	USCS	Sampler Type	Dry Density (pcf)	Moisture Content (%)
0	912	SC			
5	907	SS	SS	104.1	10.2
10	902	SL	SS	108.3	9.6
15	897				
20	892		SS	109.7	7.8
25	887				
30	882	SS	SS	110.4	11.0
35	877				
40	872		SS	112.2	9.3
45	867				
50	862	SS-SL			
55					

MATERIAL DESCRIPTIONS

0-2' SOIL (Qs)

CLAYEY SAND with GRAVEL; grayish brown, dry, medium dense, gravel component consists of angular, pebble-size clasts of sandstone

2'-53' BEDROCK (Topanga Formation - Tt)

SANDSTONE; grayish orange with iron-oxide staining, massive, medium- to coarse-grained, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered; occasional thin SILTSTONE interbeds which are light olive gray with iron-oxide staining, 1/2- to 1.5-inches thick

@7', Root-lined fractures and calcium-carbonate coating

@9', SILTSTONE; light olive gray, thinly bedded, non-friable, moderately hard, moderately fractured, moderately weathered; occasional SANDSTONE interbeds

@10', Bedding is somewhat undulatory but tight

@15', Primarily SANDSTONE; thin to thickly bedded, fine- to coarse-grained

@21', Vertical micro-fault, 1/2- to 2-inch offset of beds; Occasional thin SILTSTONE interbeds below

@25', SANDSTONE color is yellowish gray with iron-oxide staining, occasional SILTSTONE interbeds are dark yellowish brown with iron- and manganese-oxide staining

@27', Cemented SANDSTONE bed, 2 feet thick, very hard, coring required to advance

@31', Moderate shearing fabric in SILTSTONE interbeds, parallel to bedding

@35', Occasional gypsum crystals along SILTSTONE beds

@42', Gradational transition to medium dark gray SANDSTONE and dark gray SILTSTONE, tightly folded, sheared, gypsum crystals, numerous steeply-dipping micro-faults with minor offsets, no dominant or organized structural pattern, bedding rotates to more northerly dip

@47', Bedrock is thin to medium bedded, moderately hard, well bedded, tight, slightly weathered

Structure/Comments

Bedding @9', N 30 W, 21 NE

Bedding @17', N 15 W, 30 NE

Bedding @21', N 10 W, 26 NE

Bedding @25', N 6 W, 24 NE

Shearing @31', N 15 W, 30 NE
Bedding @32', N 15 W, 30 NE

Bedding @35', N 10 W, 27 NE

Bedding @45', N 80 E, 44 NW

Bedding @47', N 70 E, 45 NW

Total Depth: 53 feet
No groundwater
No caving
No fill

Surface Conditions: Crest of ridge.

Notes: Boring backfilled with spoils and tamped to grade by drillers after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 8 (TP-8)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/8/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/8/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; R Ring Samples

Depth in Feet	Surf. Elev. 832	USCS	Sampler Type	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	832					0-2' SOIL (Qs) CLAYEY SAND with GRAVEL; moderate brown, fine- to coarse-grained, dry, medium dense, granular texture, gravel component consists of angular, pebble-size clasts of siltstone and sandstone, roots		
1	831	SC						
~2			R	102.8	12.6			
2	830					2'-6' BEDROCK (Modelo Formation - Tm) DIATOMACEOUS SILTSTONE and SHALE; pale orangish brown and pale yellowish brown to moderate yellowish brown with iron-oxide staining, laminated to thinly bedded, shale is fissile, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered		
3	829							
~4			R	95.1	24.6			
4	828	SL/SH						Bedding @4', N 75 W, 20 NE
5	827							Bedding @5', N 85 W, 20 NE
6	826							
7	825							
8	824							
9	823							
10								

Total Depth: 6 feet
No groundwater
No caving
No fill

Surface Conditions: Southwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc. Consulting Engineering Geologist	LOG OF TEST PIT # 9 (TP-9) (Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/8/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/8/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 908	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	908	SM							0-0.5' ARTIFICIAL FILL (af) SILTY SAND with GRAVEL; moderate brown and light brown to dark yellowish orange, dry to slightly moist, loose, gravel component consists of angular to subangular, pebble- to cobble-size clasts of siltstone and sandstone, surficial trash debris		
1	907	SC							0.5'-1.5' SOIL (Qs) CLAYEY SAND with GRAVEL; moderate brown, fine- to coarse-grained, dry, medium dense, granular texture, gravel component consists of angular, pebble-size clasts of siltstone and sandstone, roots		
2	906								1.5'-6' BEDROCK (Modelo Formation - Tm) SILTSTONE and SHALE with occasional SANDSTONE interbeds; siltstone and shale are moderate yellowish brown with iron-oxide staining, thinly laminated to thinly bedded, somewhat friable to non-friable, moderately hard, moderately fractured, very weathered to moderately weathered with depth; sandstone is moderate yellowish brown to dark yellowish orange with iron-oxide staining, fine- to medium-grained, thinly bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered		
3	905				R		102.7	17.5			
4	904	SL/SH									Bedding @4', N 65 E, 16 NW
5	903										Bedding @5', N 75 W, 21 NW
6	902										
7	901										
8	900										
9	899										
10											

Total Depth: 6 feet
No groundwater
No caving
0.5 feet of fill

Surface Conditions: Southwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 10 (TP-10)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/8/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/8/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 845	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	845	SM							0-1' SOIL (Qs) SILTY SAND with GRAVEL; moderate brown to moderate yellowish brown, fine- to coarse-grained, dry to slightly moist, loose, gravel component consists of angular, pebble-size clasts of siltstone and basalt, roots		
1	844								1'-5' BEDROCK (Conejo Volcanics - Tvb) BASALT; dark yellowish brown and moderate brown with iron-oxide staining, massive, non-friable, moderately hard to hard, slightly to moderately fractured, moderately weathered, slightly vesicular		
2	843										Joint @2', N 10 E, 54 SE
3	842	VL									
4	841										
5	840										
6	839										
7	838										
8	837										
9	836										
10											

Total Depth: 5 feet
No groundwater
No caving
No fill

Surface Conditions: West-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 11 (TP-11)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/8/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/9/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 935	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	935								0-2' SOIL (Qs) SANDY CLAY with GRAVEL; dark yellowish brown to dusky yellowish brown, sand fraction is fine- to coarse-grained, dry, stiff, gravel component consists of subangular to subrounded, pebble- to cobble-size clasts of sandstone which is more common at basal contact		
1	934	CL			R		93.5	13.7			
2	933								2'-6' VERY WEATHERED BEDROCK (Modelo Formation - Tm) SANDSTONE; dark yellowish orange with iron-oxide staining, massive, medium-grained, friable, soft to moderately hard, moist, weathered		
3	932										
4	931	SS									
5	930										
					R		106.3	15.5			
6	929										
7	928										
8	927										
9	926										
10											

Total Depth: 6 feet
No groundwater
No caving
No fill

Surface Conditions: West-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc. Consulting Engineering Geologist	LOG OF TEST PIT # 12 (TP-12) (Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/8/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/9/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition	Sampler Type
Remoulded	SS Split Spoon
Undisturbed	ST Shelby Tube
Lost, No Recovery	PS Piston Sampler
Bulk	DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 895	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	895	CL							0-1' SOIL (Qs) SANDY CLAY with GRAVEL; dark yellowish brown to dusky yellowish brown, sand fraction is fine- to coarse-grained, dry, stiff, gravel component consists of subangular to subrounded, pebble- to cobble-size clasts of sandstone which is more common at basal contact		
1	894	SS							1'-6' BENEDICT CANYON FAULT ZONE / BEDROCK (Modelo Formation - Tm) SANDSTONE; dark yellowish orange and yellowish gray with iron-oxide staining, massive, medium-grained, friable, soft to moderately hard, moist, weathered		
2	893										
3	892										
4	891										
4.75					R		104.8	14.5			
5	890										
6	889										
7	888										
8	887										
9	886										
10											

Total Depth: 6 feet
No groundwater
No caving
No fill

Surface Conditions: Northwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 13 (TP-13)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/9/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/9/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition	Sampler Type
Remoulded	SS Split Spoon
Undisturbed	ST Shelby Tube
Lost, No Recovery	PS Piston Sampler
Bulk	DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 970	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	970	SC							0-1' SOIL (Qs) CLAYEY SAND with GRAVEL; moderate brown, fine- to coarse-grained, granular texture, dry to slightly moist, loose to medium dense, gravel component consists of angular to subrounded, pebble- to coblle-size clasts of sandstone, abundant rootlets, surficial trash debris		
1	969	SS							1'-6' BENEDICT CANYON FAULT ZONE / BEDROCK (Modelo Formation - Tm) SANDSTONE; pale brown, fine- to medium-grained, thickly bedded, slightly friable, moderately hard, slightly fractured, slightly to moderately weathered		
2	968										
3	967	SL							@3', SILTSTONE; moderate yellowish brown, laminated to thinly bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered		Bedding @3', N 5 E, 46 NW
4	966										Bedding @4', NS, 60 W
5	965				R		105.9	11.2			
6	964										
7	963										
8	962										
9	961										
10											

Total Depth: 6 feet
No groundwater
No caving
No fill

Surface Conditions: Southwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc. Consulting Engineering Geologist	LOG OF TEST PIT # 14 (TP-14) (Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/9/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/9/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 945	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	945	SC							0-1' SOIL (Qs) CLAYEY SAND with GRAVEL; moderate brown, fine- to coarse-grained, granular texture, dry to slightly moist, loose to medium dense, gravel component consists of angular to subrounded, pebble- to coblle-size clasts of sandstone, abundant rootlets, surfical trash debris		
1	944	SS							1'-4' BEDROCK (Topanga Formation - Tt) SANDSTONE; light gray with iron-oxide staining along fracture planes, thin to thickly bedded, blocky, somewhat friable to slightly friable, moderately hard, moderately fractured, slightly weathered, difficult to advance test pit with hand-tools		
2	943										
3	942										Bedding @3', N 25 W, 34 SW Joint @4', N 45 W, 66 NE
4	941										
5											

Total Depth: 4 feet
No groundwater
No caving
No fill

Surface Conditions: West-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 15 (TP-15)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/9 & 11/13/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/13/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 857	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	857	CL							0-2' SOIL (Qs) SANDY CLAY with GRAVEL; moderate brown, sand fraction is fine- to medium-grained, dry to slightly moist, stiff, gravel component consists subangular to subrounded, pebble- to cobble-size clasts of sandstone, rootlets		
1	856										
2	855	SL-SS			R		106.6	4.6	2'-3' BEDROCK (Topanga Formation - Tt) Interbedded SILTSTONE and SANDSTONE; SILTSTONE is pale yellowish brown and light olive gray with iron-oxide staining, laminated to thinly bedded, slightly friable, moderately hard, slightly fractured, slightly weathered; SANDSTONE is dark yellowish orange, very thinly bedded, medium-grained, slightly friable, moderately hard, slightly fractured, slightly weathered, minor calcium-carbonate accumalation along bedding planes, occasional root and krotovina, difficult to advance test pit with hand-tools		Bedding @2.5', N 80 E, 52 NW Bedding @2.75', N 58 E, 48 NW
3	854										
4	853										
5											

Total Depth: 3 feet
No groundwater
No caving
No fill

Surface Conditions: West-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 16 (TP-16)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/9 & 11/13/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/13/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 840	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	840								0-4.5' SOIL (Qs)		
									SANDY CLAY with minor GRAVEL; moderate brown, sand fraction is fine- to medium-grained, dry to slightly moist, very stiff, gravel component consists subangular to subrounded, pebble-size clasts of sandstone, open desiccation cracks upto 1/2-inch wide with 6- to 8-inch wide spacing, roolets		
1	839										
2	838	CL									
					R		98.5	19.7			
3	837										
4	836								@4', Switch to hand-auger to advance test pit		
		SL-SS							4.5'-5' BEDROCK (Topanga Formation - Tt)		
									Interbedded SILTSTONE and SANDSTONE; SILTSTONE is pale yellowish brown and light olive gray, SANDSTONE is dark yellowish orange, medium-grained		
5	835										
6	834										
7	833										
8	832										
9	831										
10											

Total Depth: 5 feet
No groundwater
No caving
No fill

Surface Conditions: West-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 17 (TP-17)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/13/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/13/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition
- Remoulded
- Undisturbed
- Lost, No Recovery
- Bulk

Sampler Type
- SS Split Spoon
- ST Shelby Tube
- PS Piston Sampler
- DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 822	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	822	CL							0-1' SOIL (Qs) SANDY CLAY; brownish black, sand fraction is fine- to coarse-grained, granular texture, slightly moist, stiff, minor desiccation cracks, rootlets		
1	821	SL-SS							1'-4' BEDROCK (Topanga Formation - Tt) Interbedded SILTSTONE and SANDSTONE; SILTSTONE is pale yellowish brown and light olive gray with iron-oxide staining, laminated to thinly bedded, slightly friable, moderately hard, slightly fractured; SANDSTONE is dark yellowish orange, very thinly bedded, medium-grained, slightly friable, moderately hard, slightly fractured, minor calcium-carbonate stringers; upper 1.5 feet of bedrock is weathered, slightly weathered below		
2	820										
3	819				R		105.7	12.5			Bedding @3', N 52 E, 64 NW
											Bedding @4', N 62 E, 57 NW
4	818										
5											

Total Depth: 4 feet
No groundwater
No caving
No fill

Surface Conditions: Northwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc. Consulting Engineering Geologist	LOG OF TEST PIT # 18 (TP-18) (Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/13/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/13/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition	Sampler Type
Remoulded	SS Split Spoon
Undisturbed	ST Shelby Tube
Lost, No Recovery	PS Piston Sampler
Bulk	DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 895	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	895	CL							0-1' SOIL (Qs) SANDY CLAY with GRAVEL; dark yellowish brown to dusky yellowish brown, sand fraction is fine- to coarse-grained, granular texture, dry, loose to medium stiff, abundant organic debris, gravel component consists of subangular to subrounded, pebble- to cobble-size clasts of sandstone which is more common at basal contact		
1	894	SS							1'-6' BENEDICT CANYON FAULT ZONE / BEDROCK (Modelo Formation - Tm) SANDSTONE; dark yellowish orange with iron-oxide staining, massive, medium-grained, friable, soft to moderately hard, moist, weathered		
2	893										
3	892				R		105.3	12.7			
4	891										
5	890										
6	889										
7	888										
8	887										
9	886										
10											

Total Depth: 6 feet
No groundwater
No caving
No fill

Surface Conditions: Northwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 19 (TP-19)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/13/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/13/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 795	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	795								0-2' SOIL (Qs)		
									SANDY CLAY with minor GRAVEL; brownish black, sand fraction is fine- to coarse-grained, upper 6-inches has granular texture, dry to slightly moist, very stiff, open desiccation cracks up to 1/2-inch wide with 6- to 8-inch spacing, gravel component consists of subangular to subrounded, pebble-size clasts of sandstone, rootlets		
1	794	CL									
2	793								2'-6' VERY WEATHERED BEDROCK (Topanga Formation - Tt)		
									SANDSTONE with SILTSTONE interbeds; SANDSTONE is dark yellowish orange with iron-oxide staining, massive, medium-grained, friable, soft to moderately hard, tight, moist weathered; SILTSTONE is pale yellowish orange to light olive gray, massive, friable, moderately hard, tight, weathered		
3	792										
					R		106.8	13.2			
4	791	SS-SL									
5	790										
6	789										
7	788										
8	787										
9	786										
10											

Total Depth: 6 feet
No groundwater
No caving
No fill

Surface Conditions: Northwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 20 (TP-20)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/13/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/13/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 808	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	808								0-2' SOIL (Qs)		
									SANDY CLAY with minor GRAVEL; brownish black, sand fraction is fine- to coarse-grained, upper 6-inches has granular texture, dry to slightly moist, very stiff, open desiccation cracks upto 1/2-inch wide with 6- to 8-inch spacing, gravel component consists of subangular to subrounded, pebble-size clasts of sandstone, rootlets		
1	807	CL									
2	806								2'-6' VERY WEATHERED BEDROCK (Topanga Formation - Tt)		
									SANDSTONE with SILTSTONE interbeds; SANDSTONE is dark yellowish orange with iron-oxide staining, massive, medium-grained, riable, soft to moderately hard, tight, moist weathered; SILTSTONE is pale yellowish orange to light olive gray, massive, friable, moderately hard, tight, weathered		
3	805										
4	804	SS-SL			R		103.3	13.9	@4', Faint bedding		Bedding @4', EW, 40 N
5	803										
6	802										
7	801										
8	800										
9	799										
10											

Total Depth: 6 feet
No groundwater
No caving
No fill

Surface Conditions: Northwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc. Consulting Engineering Geologist	LOG OF TEST PIT # 21 (TP-21) (Page 1 of 1)
Project Name: 9712 Oak Pass Road, LLC Project Location: 9712 Oak Pass Road Los Angeles, CA Project No.: LP1197	Date Excavated : 11/13 & 11/14/18 Date Logged : 11/14/18 Digging Company : GeoWorks Digging Method : Hand Labor Weather Conditions : Sunny, warm Elevation Datum : From Survey Logged By : Brett Scott, CEG Checked By : Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 767	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	767	SC							0-1' SOIL (Qs) CLAYEY SAND with GRAVEL; moderate brown, fine-coarse-grained, dry to slightly moist, loose to medium dense, gravel component consists of subangular to subrounded, pebble-size clasts of sandstone and basalt, rootlets		
1	766	VL							1'-4' BEDROCK (Conejo Volcanics - Tvb) BASALT; pale brown with iron-oxide and manganese staining on fracture planes, massive, somewhat friable to non-friable, moderately hard to hard, moderatly fractured, slightly to moderately weathered, abundant calcium-carbonate accumalation, difficult to advance test pit with hand-tools		
2	765										
3	764										Joint @3', N 30 E, 90
											Joint @3.5', EW, 64 N
					R		109.4	6.4			
4	763										
5											

Total Depth: 4 feet
No groundwater
No caving
No fill

Surface Conditions: Northwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 22 (TP-22)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/13 & 11/14/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/14/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 830	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	830	SM							0-1' SOIL (Qs) SILTY SAND with GRAVEL; dark yelowish brown, fine- to coarse-grained, dry, loose, gravel component consists of angular to subrounded, pebble-size clasts of sandstone and basalt, abundant rootlets		
1	829	VL							1'-3.5' BEDROCK (Conejo Volcanics - Tvb) BASALT; pale brown with iron-oxide and manganese staining on fracture planes, massive, somewhat friable to non-friable, moderately hard to hard, moderately fractured, slightly weathered, occasionally vesicular, difficult to advance test pit with hand-tools		
2	828										
3	827										Joint @3', N 35 W, 82 NE
4	826										
5											

Total Depth: 3.5 feet
No groundwater
No caving
No fill

Surface Conditions: Southwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 23 (TP-23)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/14/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/14/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 872	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	872								0-2' SOIL (Qs)		
1	871	CL							SANDY CLAY with minor GRAVEL; moderate brown brownish gray, sand fraction is fine- to coarse-grained, dry to slightly moist, very stiff, gravel component consists of subangular to subrounded, pebble-size clasts of sandstone, roots up to 1-inch diameter		
					R		97.4	13.5			
2	870								2'-5' BEDROCK (Topanga Formation - Tt)		
3	869								Interbedded SILTSTONE and SANDSTONE; SILTSTONE is medium gray to olive gray with iron-oxide staining along fracture planes, laminated to massive, somewhat friable, moderately hard, slightly fractured, moderately sheared, moderately weathered; SANDSTONE is dark yellowish orange to moderately yellowish brown with minor iron-oxide staining, medium- to coarse-grained, massive, somewhat friable to non-friable, moderately hard to hard, moderately fractured, moderately weathered		
		SL-SS			R		106.9	10.2			
4	868										
5	867										
6	866										
7	865										
8	864										
9	863										
10											

Total Depth: 5 feet
No groundwater
No caving
No fill

Surface Conditions: Northwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 24 (TP-24)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/14/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/14/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 894	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	894	SM							0-1' SOIL (Qs) SILTY SAND with GRAVEL; moderate brown to light brown, fine- to medium-grained, dry to slightly moist, medium dense, gravel component consists of subangular to subrounded, pebble- to cobble-size clasts of sandstone		
1	893	SS-SL							1'-5' BENEDICT CANYON FAULT ZONE / BEDROCK (Modelo Formation - Tm) Interbedded SANDSTONE and SILTSTONE; SANDSTONE is dark yellowish orange to moderately yellowish brown with minor iron-oxide staining, medium- to coarse-grained, massive, somewhat friable to non-friable, moderately hard to hard, moderately fractured, moderately weathered; SILTSTONE is pale yellowish brown to moderate yellowish brown with iron-oxide staining along fracture planes, laminated to massive, somewhat friable, moderately hard, moderately fractured, shearing along bedding planes, moderately weathered		Bedding @3', N 15 E, 24 SE Shearing @3', N 15 E, 24 SE
2	892										
3	891										
4	890										
5	889										
6	888										
7	887										
8	886										
9	885										
10											

Total Depth: 5 feet
No groundwater
No caving
No fill

Surface Conditions: Southwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

Land Phases, Inc.
Consulting Engineering Geologist

LOG OF TEST PIT # 25 (TP-25)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
Los Angeles, CA

Project No.: LP1197

Date Excavated	: 11/14/18	Weather Conditions	: Sunny, warm
Date Logged	: 11/14/18	Elevation Datum	: From Survey
Digging Company	: GeoWorks	Logged By	: Brett Scott, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; R Ring Samples

Depth in Feet	Surf. Elev. 872	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	872	SM							0-1' SOIL (Qs) SILTY SAND with GRAVEL; moderate brown to light brown, fine- to medium-grained, dry to slightly moist, medium dense, gravel component consists of subangular to subrounded, pebble- to cobble-size clasts of sandstone		
1	871								1'-5' BEDROCK (Modelo Formation - Tm) Interbedded SANDSTONE and SILTSTONE; SANDSTONE is grayish orange with iron-oxide staining, thin to medium bedded, medium- to coarse-grained, non-friable, moderately hard to hard, slightly fractured, slightly weathered; SILTSTONE is pale yellowish brown to moderate yellowish brown with iron-oxide staining, thinly bedded, non-friable, moderately hard to hard, slightly fractured, slightly weathered		
2	870				R		105.2	12.3			Bedding @2.5', N 35 E, 40 NW
3	869	SS-SL							@3', Bedrock is very fractured, blocky, slight caving		
4	868										
5	867										
6	866										
7	865										
8	864										
9	863										
10											

Total Depth: 5 feet
No groundwater
Caving as noted
No fill

Surface Conditions: Southwest-facing slope.

Notes: Test pit backfilled with spoils to grade by excavation crew after downhole logging.

BORING LOGS
MOUNTAIN
GEOLOGY
9712 OAK PASS
ROAD
2011

Mountain Geology, Inc.
CONSULTING ENGINEERING GEOLOGISTS • SIMI VALLEY, CA • (805) 522-5174

LOG OF BORING # 1 (B-1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Drilled	: 3-28-2011	Weather Conditions	: Clear, cool
Date Logged	: 3-28-2011	Elevation Datum	: Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition	Sampler Type
Remoulded	SS Split Spoon
Undisturbed	ST Shelby Tube
Lost, No Recovery	PS Piston Sampler
Bulk	DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 1001	USCS	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)
0	1001	SC					
5	996		5	SS	4	103.6	17.5
10	991		10	SS	11	111.8	10.5
15	986	SL	15	SS	12	113.5	14.4
20	981		20	SS	11	114.3	14.2
25	976		25	SS	9	96.5	24.6
30							

MATERIAL DESCRIPTIONS

0-1' FILL (af)

CLAYEY SAND with GRAVEL; mottled dark yellowish brown and moderate yellowish brown, moist, medium dense, gravel component consists of angular, pebble-size clasts of sandstone, siltstone, and construction aggregate

1'-55' BEDROCK (Modelo Formation - Tm)

SILTSTONE and SHALE with occasional SANDSTONE interbeds; siltstone and shale are moderate yellowish brown with iron-oxide staining, thinly laminated to thinly bedded, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered, occasional diatomaceous and dolomitic beds; sandstone is moderate yellowish brown to dark yellowish orange with iron-oxide staining, fine- to medium-grained, thin to medium bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered

- @3', SANDSTONE interbed, yellowish gray, coarse-grained, 2 feet thick
- @6.5', SANDSTONE interbed, dark yellowish orange, 1.5 feet thick
- @11', Dolomitic SILTSTONE bed, 6 inches thick, hard
- @12', SANDSTONE interbed, yellowish gray, coarse-grained, 2 feet thick

SHEAR @19', SANDY CLAY; dark yellowish brown, 1/4- 1/2-inch thick, slightly moist, firm, calcium carbonate accumulation

- @20', SILTSTONE and SHALE grading to dark yellowish brown, less oxidation
- @21', SANDSTONE interbed, yellowish gray, medium- to coarse-grained, 2 feet thick

@25', SILTSTONE, SHALE, and occasional SANDTONE are harder, non-friable, increasing percentage of dolomitic SILTSTONE interbeds which are hard

Depth to Groundwater

Structure/Comments

- Bedding @3' (N 84 W, 29 NE)
- Bedding @5' (N 60 W, 28 NE)
- Bedding @8' (N 76 W, 31 NE)
- Bedding @14' (N 62 W, 26 NE)
- Bedding @18' (N 56 W, 34 NE)
- Shear @19' (N 30 E, 57 NW)
- Bedding @23' (N 65 W, 19 NE)
- Bedding @25' (N 11 W, 28 NE)
- Bedding @27' (N 60 W, 20 NE)

Total Depth: 55 feet
No groundwater or evidence of historic groundwater
No caving
1 foot of fill

Surface Conditions: Moderately level lawn area on existing building pad

Notes: Boring backfilled with spoils by drillers after downhole logging

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Mountain Geology, Inc.

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LOG OF BORING # 1 (B-1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Drilled	: 3-28-2011	Weather Conditions	: Clear, cool
Date Logged	: 3-28-2011	Elevation Datum	: Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 1001	USCS	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
30	971		SS	10	99.7	21.8			Bedding @30' (N 55 E, 48 NW)
									Bedding @32' (N 80 W, 27 NE)
35	966		SS	10	101.2	20.7	@36', SILTSTONE and SHALE is occasionally medium gray with iron-oxide staining, small-scale cross-bedding within bedrock		Bedding @36' (N 76 W, 24 NE)
									Bedding @38' (N 25 W, 25 NE)
							@39', Dolomitic SILTSTONE interbeds; grayish orange with iron- and manganese-oxide staining, hard, moderately fractured, continue to 44 feet		Bedding @39' (N 60 W, 37 NE)
40	961								
		SL							
45	956		SS	9	97.7	22.4			
									Bedding @48' (N 54 W, 28 NE)
50	951						@50', Dolomitic SILTSTONE interbed; grayish orange with iron- and manganese-oxide staining, 1.5 feet thick, hard		
			SS	10	100.2	21.3			
55	946								
60									

Total Depth: 55 feet
No groundwater or evidence of historic groundwater
No caving
1 foot of fill

Surface Conditions: Moderately level lawn area on existing building pad

Notes: Boring backfilled with spoils by drillers after downhole logging

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LOG OF BORING # 2 (B-2)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Drilled	: 3-28 and 3-29-2011	Weather Conditions	: Clear, cool
Date Logged	: 3-29-2011	Elevation Datum	: Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition	Sampler Type
Remoulded	SS Split Spoon
Undisturbed	ST Shelby Tube
Lost, No Recovery	PS Piston Sampler
Bulk	DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 968	USCS	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)
0	968	SM					
5	963		Undisturbed	SS	8	111.7	11.4
10	958		Undisturbed	SS	15	119.2	7.2
15	953	SL	Undisturbed	SS	12	114.4	10.7
20	948		Undisturbed	SS	11	104.1	16.6
25	943		Undisturbed	SS	11	103.9	17.2
30							

MATERIAL DESCRIPTIONS

0-1' FILL (af)

ASPHALT, 3-inches thick over SILTY SAND with GRAVEL; moderate yellowish brown, dry, dense, gravel component consists of angular, pebble-size clasts of sandstone, siltstone, and construction aggregate

1'-55' BEDROCK (Modelo Formation - Tm)

SILTSTONE and SHALE with occasional SANDSTONE interbeds; siltstone and shale are moderate yellowish brown with iron-oxide staining, thinly laminated to thinly bedded, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered, occasional diatomaceous and dolomitic beds; sandstone is moderate yellowish brown to dark yellowish orange with iron-oxide staining, fine- to medium-grained, thinly bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered

@5', Dolomitic SILTSTONE and SHALE interbeds; grayish orange with iron- and manganese-oxide staining, hard, calcium carbonate accumulation on fracture planes, beds continue to 10 feet

@11', SILTSTONE and SHALE grade to pale yellowish brown with iron- and manganese-oxide staining, rock is well bedded and tight

@14', Dolomitic SILTSTONE and SHALE interbeds; grayish orange with iron- and manganese-oxide staining, hard, beds continue to 19 feet

@19', SILTSTONE and SHALE grade to medium dark gray with iron-oxide staining

@26.5', Dolomitic SILTSTONE and SHALE interbeds; grayish orange with iron- and manganese-oxide staining, very hard, beds continue to 29 feet

@29', SILTSTONE and SHALE grade to dark yellowish brown with iron-oxide staining, increased percentage of SANDSTONE interbeds which are yellowish gray with iron-oxide staining

Depth to Groundwater

Structure/Comments

- Bedding @2' (N 70 W, 30 NE)
- Bedding @4' (N 75 E, 34 NW)
- Bedding @6' (N 80 E, 22 NW)
- Bedding @11' (N 60 E, 34 NW)
- Bedding @13' (N 35 E, 31 NW)
- Bedding @17' (N 52 E, 27 NW)
- Bedding @22' (N 50 E, 20 NW)
- Bedding @26.5' (N 61 E, 24 NW)

Total Depth: 55 feet
No groundwater or evidence of historic groundwater
No caving
1 foot of fill

Surface Conditions: Center of existing access drive

Notes: Boring backfilled with spoils by drillers after downhole logging

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LOG OF BORING # 2 (B-2)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Drilled	: 3-28 and 3-29-2011	Weather Conditions	: Clear, cool
Date Logged	: 3-29-2011	Elevation Datum	: Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 968	USCS	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
30	938								
							@32.5', Dolomitic SILTSTONE and SHALE interbeds; hard, moderately fractured, beds continue to 34 feet		Bedding @33' (N 82 E, 21 NW)
35	933		SS	10	99.4	22.7			
							@38', Dolomitic SILTSTONE interbed; grayish orange with iron- and manganese-oxide staining, 1 foot thick, very hard		Bedding @38' (N 66 E, 45 NW)
40	928								
		SL					@43', Dolomitic SILTSTONE interbed; grayish orange with iron- and manganese-oxide staining, 3 feet thick, hard, moderately fractured to fractured, slight ravelling from boring sidewalls		
			SS	17	100.2	21.1			
45	923								
							@47', Increasing percentage of dolomitic siltstone/shale beds with depth		Bedding @47' (N 77 E, 32 NW)
50	918						@50', Primarily Dolomitic SILTSTONE and SHALE, hard		
			SS	14	102.7	19.5			
55	913								
60									

Total Depth: 55 feet
No groundwater or evidence of historic groundwater
No caving
1 foot of fill

Surface Conditions: Center of existing access drive

Notes: Boring backfilled with spoils by drillers after downhole logging

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LOG OF BORING # 3 (B-3)

(Page 1 of 2)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Drilled	: 3-29-2011	Weather Conditions	: Clear, warm (pm)
Date Logged	: 3-29-2011	Elevation Datum	: Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 925	USCS	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)
0	925	SM					
		CL					
5	920		5	SS	4	98.5	16.3
10	915	ML	10	SS	5	95.2	20.2
15	910		15	SS	7	97.7	16.8
20	905	SL	20	SS	10	107.1	17.4
25	900		25	SS	12	112.6	14.8
30							

MATERIAL DESCRIPTIONS

0-6' FILL (af)

ASPHALT, 3-inches thick over SILTY SAND with GRAVEL (base material); moderate yellowish brown and dark yellowish brown, slightly moist, dense, gravel component consists of angular, pebble-size clasts of construction aggregate

@0.5', SANDY CLAY with GRAVEL; mottled moderate yellowish brown and dark yellowish brown, slightly moist, firm to stiff, gravel component consists of angular, pebble- to cobble-size clasts of sandstone and asphalt

@5', Increased percentage of GRAVEL in fill

6'-13' VERY WEATHERED BEDROCK

SANDY SILT with GRAVEL; dark yellowish orange, massive, slightly moist, stiff, gravel component consists of pebble- to cobble-size sandstone clasts that are randomly oriented, no identifable relict structure

@11', Some pale gray mottling, occasional fragments of intact sandstone and siltstone

@13', Gradational transition to competent bedrock, no evidence of shearing at contact

0.5'-50' BEDROCK (Modelo Formation - Tm)

SILTSTONE and SHALE with occasional SANDSTONE interbeds; siltstone and shale are dark yellowish brown and moderate yellowish brown with iron-oxide staining, thinly laminated to thinly bedded, somewhat friable to non-friable, moderately hard, slightly fractured, slightly weathered; sandstone is grayish orange, fine- to medium-grained, thinly bedded, somewhat friable, moderately hard, slightly fractured, slightly weathered

@17', Bedrock is tight and well bedded

@21', Occasional calcium carbonate stringers, SANDSTONE interbeds are dark yellowish brown and grayish orange

Depth to Groundwater

Structure/Comments

Bedding @13' (N 42 E, 44 NW)

Bedding @17' (N 42 E, 39 NW)

Bedding @21' (N 45 E, 42 NW)

Bedding @26' (N 35 E, 44 NW)

Total Depth: 50 feet
No groundwater or evidence of historic groundwater
No caving
6 feet of fill

Surface Conditions: Center of existing access road

Notes: Boring backfilled with spoils by drillers after downhole logging

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Mountain Geology, Inc.

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LOG OF BORING # 3 (B-3)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Drilled	: 3-29-2011	Weather Conditions	: Clear, warm (pm)
Date Logged	: 3-29-2011	Elevation Datum	: Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 925	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
30	895										Bedding @31' (N 35 E, 44 NW)
									@33', SILTSTONE and SHALE grading to darker color		
									@34', SANDSTONE interbed; grayish orange, 3 feet thick		Bedding @34' (N 42 E, 37 NW)
35	890			Undisturbed	SS	15	101.3	15.0			
									@37', SILTSTONE and SHALE are dusky yellowish brown, thinly bedded, non-friable, hard, slightly fractured, slightly weathered, tight, occasional gypsum stringers		Bedding @37' (N 25 E, 32 NW)
40	885	SL									
				Undisturbed	SS	11	100.4	19.3			
45	880								@45', Bedrock grades to black color, somewhat cherty, hard		
				Undisturbed	SS	11	105.1	15.9			
50	875										
55	870										
60											

Total Depth: 50 feet
No groundwater or evidence of historic groundwater
No caving
6 feet of fill

Surface Conditions: Center of existing access road

Notes: Boring backfilled with spoils by drillers after downhole logging

Mountain Geology, Inc.
Consulting Engineering Geologist, Simi Valley, CA

LOG OF BORING # 4 (B-4)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Drilled	: 11-15-2012	Weather Conditions	: Cloudy, cool
Date Logged	: 11-15-2012	Elevation Datum	: Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 939	USCS	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	939	SC						0-1.5' FILL (af) ASPHALT, 4- to 8-inches thick over CLAYEY SAND with GRAVEL; mottled dark yellowish orange and grayish orange, dry to slightly moist, dense, gravel component consists of angular, pebble-size clasts of sandstone and siltstone, asphalt is thicker on north wall of boring, fill thickens to north		
		CL								
5	934	ML		SS		98.7	17.6	1.5'-3' SOIL SANDY CLAY with GRAVEL; dusky yellowish brown, slightly moist, very stiff, gravel component consists of angular, pebble- to cobble-size clasts of sandstone and siltstone, gradational basal contact		Bedding @7' (N 82 E, 40 NW)
10	929			SS		115.5	8.7	3'-6.5' VERY WEATHERED BEDROCK SANDY SILT with GRAVEL; dark yellowish orange, massive, slightly moist, stiff, gravel component consists of pebble- to cobble-size sandstone and siltstone clasts that are randomly oriented, no identifable relict structure @6.5', Gradational transition to competent bedrock, no evidence of shearing at contact		Bedding @10' (N 85 E, 34 NW)
		SL-SH								Bedding @13' (N 65 E, 36 NW)
15	924			SS		116	9.1	6.5'-50' BEDROCK (Modelo Formation - Tm) SILTSTONE and SHALE with occasional SANDSTONE interbeds; siltstone and shale are grayish orange to dark yellowish orange with iron- and manganese-oxide staining, thinly laminated to thinly bedded, shale is fissile, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered; sandstone is very pale orange, fine- to medium-grained, thinly bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered		Bedding @15' (N 69 E, 35 NW)
20	919			SS		117.6	8.8	@7', Bedrock is tight and well bedded @10', Bedrock is slightly weathered @13', Bedrock is very tight, hard @14', SILTSTONE and SHALE grading to dark yellowish brown, decreasing percentage of SHALE		Bedding @20' (N 70 E, 36 NW)
		SL-SS						@18', Interbedded SILTSTONE and SANDSTONE; bedrock is moderately strong, hard, slightly fractured, slightly weathered, tight, well bedded, SANDSTONE is thinly bedded to medium bedded		
25	914			SS		118.2	12.3	@22', Cemented SANDSTONE bed, 5-inches thick, hard		Bedding @26' (N 70 E, 37 NW)
30				SS		104.2	18.8			

Total Depth: 50 feet
No groundwater or evidence of historic groundwater
No caving
1.5 feet of fill

Surface Conditions: Center of existing access road

Notes: Boring backfilled with spoils to grade by drillers after downhole logging. Asphalt patch placed at surface grade

Mountain Geology, Inc.
Consulting Engineering Geologist, Simi Valley, CA

LOG OF BORING # 4 (B-4)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Drilled	: 11-15-2012	Weather Conditions	: Cloudy, cool
Date Logged	: 11-15-2012	Elevation Datum	: Survey
Drilling Company	: Roy Bros. Drilling	Logged By	: Jake Holt, CEG
Drilling Method	: Bucket Auger Drill-Rig	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 939	USCS	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
30	909	SL-SS	SS		104.2	18.8			Bedding @30' (N 50 E, 40 NW)
							@32', Small-scale cross-bedding, occasional steeply-dipping micro-faults with minor offsets (<2 inches)		
		SS					@33', Primarily SANDSTONE with occasional SILTSTONE interbeds		
35	904		SS		107.6	17.2			Bedding @36' (N 89 W, 38 NE)
40	899		SS		111.3	11.7	@40', Increasing percentage of SILTSTONE		Bedding @43' (N 80 W, 34 NE)
45	894		SS		115.1	14.4			
		SL-SS					@46', Interbedded SILTSTONE and SANDSTONE; SILTSTONE and SANDSTONE color grading to dark gray, bedrock is hard to very hard		
			SS		109.6	11.6			
50	889								
55	884								
60									

Total Depth: 50 feet
No groundwater or evidence of historic groundwater
No caving
1.5 feet of fill

Surface Conditions: Center of existing access road

Notes: Boring backfilled with spoils to grade by drillers after downhole logging. Asphalt patch placed at surface grade

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TEST PIT LOGS
MOUNTAIN
GEOLOGY
9712 OAK PASS
ROAD
2011

Mountain Geology, Inc.

CONSULTING ENGINEERING GEOLOGISTS • SIMI VALLEY, CA • (805) 522-5174

LOG OF TEST PIT # 1 (TP-1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Excavated	: 3-28-2011	Weather Conditions	: Sunny, warm
Date Logged	: 3-28-2011	Elevation Datum	: Survey
Digging Company	: CalWest Geotechnical	Logged By	: Jake Holt, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition
- Remoulded
- Undisturbed
- Lost, No Recovery
- Bulk

Sampler Type
- SS Split Spoon
- ST Shelby Tube
- PS Piston Sampler
- DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 963	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	963								0-2' FILL (af) CLAYEY SAND with GRAVEL; mottled dark yellowish brown and moderate yellowish brown, slightly moist, dense, gravel component consists of angular, pebble-size clasts of siltstone and sandstone		
1	962	SC									
2	961								2'-4' SOIL CLAYEY SAND with GRAVEL; brownish gray, slightly moist, dense, gravel component consists of angular, pebble-size clasts of siltstone and sandstone, roots		
							96.4	16.6			
3	960	SC									
4	959								4'-6.5' BEDROCK (Modelo Formation - Tm) SILTSTONE and SHALE with occasional SANDSTONE interbeds; siltstone and shale are moderate yellowish brown with iron-oxide staining, thinly laminated to thinly bedded, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered; sandstone is moderate yellowish brown to dark yellowish orange with iron-oxide staining, fine- to medium-grained, thinly bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered		
							94.8	23.3			
5	958	SL									
6	957										
7	956										
8	955										
9	954										
10											

Total Depth: 6.5 feet
No groundwater or evidence of historic groundwater
No caving
2 feet of fill

Surface Conditions: Gently sloping lawn area to west of existing beach vollyball court

Notes: Test pit backfilled with spoils after downhole logging

Mountain Geology, Inc.
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LOG OF TEST PIT # 2 (TP-2)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Excavated	: 3-28-2011	Weather Conditions	: Sunny, warm
Date Logged	: 3-28-2011	Elevation Datum	: Survey
Digging Company	: CalWest Geotechnical	Logged By	: Jake Holt, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 912	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	912	CL							0-1' SOIL SANDY CLAY with GRAVEL; moderate yellowish brown, slightly moist to moist, firm, gravel component consists of angular, pebble-size clasts of siltstone and sandstone, roots		
1	911	ML							1'-3' VERY WEATHERED BEDROCK SANDY SILT with GRAVEL; dark yellowish orange, massive, slightly moist, stiff, gravel component consists of pebble-size clasts of sandstone and siltstone, faint relict structure		
2	910										
3	909	SL							3'-6' BEDROCK (Modelo Formation - Tm) SILTSTONE and SHALE with occasional SANDSTONE interbeds; siltstone and shale are moderate yellowish brown with iron-oxide staining, thinly laminated to thinly bedded, somewhat friable to non-friable, moderately hard, moderately fractured, moderately weathered; sandstone is moderate yellowish brown to dark yellowish orange with iron-oxide staining, fine- to medium-grained, thinly bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered		
3.5-4				Undisturbed			92.4	27.2			
4	908										Bedding @4' (N 85 E, 34 NW)
5	907										
6	906										
7	905										
8	904										
9	903										
10											

Total Depth: 6 feet
No groundwater or evidence of historic groundwater
No caving
No fill

Surface Conditions: West-facing slope

Notes: Test pit backfilled with spoils after downhole logging

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LOG OF TEST PIT # 3 (TP-3)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Excavated	: 3-28-2011
Date Logged	: 3-28-2011
Digging Company	: CalWest Geotechnical
Digging Method	: Hand Labor
Sampled by	: CalWest Geotechnical
Weather Conditions	: Sunny, warm
Elevation Datum	: Survey
Logged By	: Jake Holt, CEG
Checked By	: Jake Holt, CEG

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 870	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	870								0-3' SOIL CLAYEY SAND with GRAVEL; moderate yellowish brown, slightly moist to moist, loose to medium dense, gravel component consists of angular, pebble- to cobble-size clasts of basalt, roots		
1	869										
		SC					97.2	16.4			
2	868										
3	867								3'-6' BEDROCK (Conejo Vocanics - Tvb) BASALT; moderate olive brown with iron- and manganese-oxide staining, massive, somewhat friable to non-friable, moderately hard to hard, moderately fractured, moderately weathered		
							111.7	12.2			
4	866										
		VL									
5	865										
6	864										
7	863										
8	862										
9	861										
10											

Total Depth: 6 feet
No groundwater or evidence of historic groundwater
No caving
No fill

Surface Conditions: West-facing slope

Notes: Test pit backfilled with spoils after downhole logging

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LOG OF TEST PIT # 4 (TP-4)

(Page 1 of 1)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Excavated	: 3-28-2011	Weather Conditions	: Sunny, warm
Date Logged	: 3-29-2011	Elevation Datum	: Survey
Digging Company	: CalWest Geotechnical	Logged By	: Jake Holt, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 958	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	958	CL							0-2.5' SOIL SANDY CLAY; dusky yellowish brown, moist, firm, roots		
1	957										
2	956						90.6	23.8			
3	955	ML							2.5'-4' VERY WEATHERED BEDROCK SANDY SILT; dark yellowish orange, massive, slightly moist, firm, gradational basal contact		
4	954	SS					102.8	16.3	4'-5' BEDROCK (Modelo Formation - Tm) SANDSTONE; grayish orange, massive, medium- to coarse-grained, somewhat friable, moderately hard, moderately fractured, moderately weathered		
5	953										
6	952										
7	951										
8	950										
9	949										
10											

Total Depth: 5 feet
No groundwater or evidence of historic groundwater
No caving
No fill

Surface Conditions: North-facing slope

Notes: Test pit backfilled with spoils after downhole logging

04-26-2011 X:\CALWEST\JOBS\5200\5277 Oak Pass LLC\4-11\geo\logs\jh7950 tp4.bor

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LOG OF TEST PIT # 5 (TP-5)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Excavated	: 3-28-2011	Weather Conditions	: Sunny, warm
Date Logged	: 3-29-2011	Elevation Datum	: Survey
Digging Company	: CalWest Geotechnical	Logged By	: Jake Holt, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 902	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	902								0-5' SOIL SANDY CLAY; dusky yellowish brown, moist, firm, gradational basal contact		
1	901										
2	900	CL									
3	899			Undisturbed			95.4	26.2			
4	898										
5	897	SL		Undisturbed			96.2	23.5	5'-6' BEDROCK (Modelo Formation - Tm) SILTSTONE and SHALE; dark yellowish orange with iron- and manganese-oxide staining, thinly laminated to thinly bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered		
6	896										
7	895										
8	894										
9	893										
10											

Total Depth: 6 feet
No groundwater or evidence of historic groundwater
No caving
No fill

Surface Conditions: Gently sloping lawn area

Notes: Test pit backfilled with spoils after downhole logging

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LOG OF TEST PIT # 6 (TP-6)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Excavated	: 3-28-2011	Weather Conditions	: Sunny, warm
Date Logged	: 3-29-2011	Elevation Datum	: Survey
Digging Company	: CalWest Geotechnical	Logged By	: Jake Holt, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 898	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	898								0-5' COMPACTED FILL (afc) SANDY CLAY and CLAYEY SAND; mottled dark yellowish orange, dark yellowish brown, and dark gray, moist, firm, roots		
1	897										
2	896	CL-SC					103.2	17.7			
3	895										
4	894										
5	893	ML					102.0	20.9	5'-6' VERY WEATHERED BEDROCK SANDY SILT; dark yellowish orange, massive, slightly moist, firm, gradational basal contact		
6	892	SL							6'-6.5' BEDROCK (Modelo Formation - Tm) SILTSTONE and SHALE; moderate yellowish brown and pale brown with iron- and manganese-oxide staining, thinly bedded, somewhat friable, moderately hard, moderately fractured, moderately weathered		
7	891										
8	890										
9	889										
10											

Total Depth: 6.5 feet
No groundwater or evidence of historic groundwater
No caving
5 feet of fill

Surface Conditions: Canyon area

Notes: Test pit backfilled with spoils after downhole logging

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LOG OF TEST PIT # 7 (TP-7)

Project Name: 9712 Oak Pass Road, LLC
Project Location: 9712 Oak Pass Road
City of Los Angeles, CA

MGI Project No.: JH7950

Date Excavated	: 3-29-2011	Weather Conditions	: Sunny, warm
Date Logged	: 3-29-2011	Elevation Datum	: Survey
Digging Company	: CalWest Geotechnical	Logged By	: Jake Holt, CEG
Digging Method	: Hand Labor	Checked By	: Jake Holt, CEG
Sampled by	: CalWest Geotechnical		

Sample Condition: Remoulded; Undisturbed; Lost, No Recovery; Bulk

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 898	USCS	Graphic	Sample Depth	Sampler Type	Blow Count	Dry Density (pcf)	Moisture Content (%)	MATERIAL DESCRIPTIONS	Depth to Groundwater	Structure/Comments
0	898								0-9' COMPACTED FILL (afc) SANDY CLAY and CLAYEY SAND with GRAVEL; mottled dark yellowish orange and dark yellowish brown, moist, firm/dense, gravel component consists of angular, pebble- to cobble-size clasts of sandstone and siltstone, roots		
1	897										
2	896										
3	895										
4	894			Undisturbed			106.2	20.1			
		CL-SC							@4.5', Color change to mottled dark gray and dark yellowish brown, increased percentage of gravel		
5	893										
6	892										
7	891			Undisturbed			104.8	17.8			
8	890										
9	889										
10											

Total Depth: 9 feet
No groundwater or evidence of historic groundwater
No caving
9 feet of fill

Surface Conditions: West-facing slope

Notes: Test pit backfilled with spoils after downhole logging

Summary of Boring and Test pits Logs, 9800 Wonda Park Dr., Prepared by Kovac Byer & Associates, KB8274G, August, 1984.

August 17, 1984
KB 8274-G

TABLE I

LOG OF TEST PITS

Pit Number	Depth (Feet)	Description
1	0 - 2	SOIL: Sandy and Silty Clay, dark brown, dry, slightly porous, hard
	2 - 3½	WEATHERED BEDROCK: Sandy Clay, dark orange-brown, slightly moist, stiff
	3½ - 5	BEDROCK: Fine to medium-grained Sandstone, with Shale interbeds, moist, moderately hard, thinly to thickly bedded, moderately to very weathered
	5 - 9	moderately weathered
	9 - 10	increase in amount of Shale interbeds
		End at 10 feet; No Water; No Caving; No Fill BEDDING: N45E; 10NW N24E; 11NW
2	0 - 3	SOIL: Silty Sand, dark brown, slightly moist, dense, porous, rootlets
	3 - 5	WEATHERED BEDROCK: Sandy Clay, dark reddish-brown, moist, firm to stiff, rootlets
	5 - 7½	BEDROCK: Sandstone, fine to medium-grained, tan to light gray, massive
		End at 7½ feet; No Water; No Caving; No Fill BEDDING: N65E; 30NW

(Continued)

TABLE I - LOG OF TEST PITS (Continued)

Pit Number	Depth (Feet)	Description
3	0 - 2½	SOIL: Silty Sand with Clay Binder, dark brown, slightly moist, porous, roots, rootlets, Sandstone fragments
	2½ - 5½	WEATHERED BEDROCK: Silty Sand, tan to light gray, slightly moist to moist, dense, rootlets, roots; discontinuous Bentonite layers, white, with black soil pockets
	5½ - 7	BEDROCK: Sandstone, tan, massive, hard
		End at 7 feet; No Water; No Caving; No Fill SHEAR: N50E; 73NW BEDDING: N70E; 15NW
4	0 - 3½	SOIL: Silty and Clayey Sand, dark brown, moist, medium dense, porous
	3½ - 5	WEATHERED BEDROCK: Sandy Clay, dark reddish-brown, slightly moist to moist, firm, rootlets
	5 - 9½	BEDROCK: Sandstone, tan, massive, hard, thin Shale interbeds; Shale is highly weathered, iron-stained
		End at 9½ feet; No Water; No Caving; No Fill BEDDING: N60W; 15SW
5	0 - 3	SOIL: Silty Sand, dark brown, dry, medium dense to dense, porous, roots
	3 - 8	WEATHERED BEDROCK: Shale, mottled gray, greenish-gray, and orange-brown, moist
	8 - 11	layer of dark gray, Clayey Sand, very moist, dipping moderately toward the southwest
	11 - 13½	Sandstone, orange, moist, massive, moderately to very weathered
	13½ - 14	gray, very moist, very weathered
		End at 14 feet; No Water; No Caving; No Fill

(Continued)

TABLE I - LOG OF TEST PITS (Continued)

Pit Number	Depth (Feet)	Description
6	0 - 2½	SOIL: Silty Sand, dark brown, slightly moist to dry, medium dense, Clay Binder, porous
	2½ - 5	WEATHERED BEDROCK: Sandstone with Shaley interbeds, medium dense to dense, slightly moist
	5 - 10	discontinuous weathered Shale inclusions, iron staining along bedding planes, folded, contorted
		End at 10 feet; No Water; No Caving; No Fill BEDDING: N10E; 5SE E-W; 20N at 5 feet
7	0 - 2	SOIL: Sandy Clay, dark brown, slightly moist, firm, slightly porous, roots
	2 - 6	WEATHERED BEDROCK: Sandy Clay, dark reddish-brown, slightly moist, firm, roots
	6 - 8½	becomes less weathered, Sandstone with Shale interbeds, tan to light gray, thickly bedded to massive, hard, iron staining, weathered
		End at 8½ feet; No Water; No Caving; No Fill BEDDING: N10W; 15SW
8	0 - 3½	SOIL: Silty Sand with Clay Binder, dark brown, dry, medium dense to dense, porous, rootlets
	3½ - 7	WEATHERED BEDROCK: Sandy Clay, dark brown, slightly moist, firm, Sandstone inclusions
	7 - 9	BEDROCK: Sandstone with Shale interbeds, tan to light gray, iron staining, thickly bedded, weathered, hard
		End at 9 feet; No Water; No Caving; No Fill

(Continued)

TABLE I - LOG OF TEST PITS (Continued)

Pit Number	Depth (Feet)	Description
9	0 - 1	SOIL: Silty Sand with Clay Binder, brown, dry, dense, porous
	1 - 2½	WEATHERED BEDROCK: Silty Sand, brown, dry, dense, Sandstone and Shale fragments, roots
	2½ - 5	BEDROCK: Shale and interbedded Sandstone; tan, thinly bedded Shale with thickly bedded Sandstone
		End at 5 feet; No Water; No Caving; No Fill BEDDING: N70E; 32NW N55E; 33NW
10	0 - 3	SOIL: Silty Sand, dark brown, dry, medium dense, slightly porous, roots, Sandstone fragments
	3 - 5	WEATHERED BEDROCK: Sandy Clay, medium brown, slightly moist, firm
	5 - 8	BEDROCK: Shale, tan, light gray and brown, thinly bedded, moderately hard, weathered, folded, contorted, fractured
	8 - 10	becomes denser, less weathered
		End at 10 feet; No Water; No Caving; No Fill BEDDING: N65W; 12NE

(Continued)

TABLE I - LOG OF TEST PITS (Continued)

Pit Number	Depth (Feet)	Description
11	0 - 3½	SOIL/ALLUVIUM: Silty Sand, brown, slightly moist, medium dense, roots, slightly porous, Sandstone gravel and fragments
	3½ - 8½	WEATHERED BEDROCK: Sandy Clay, tan to brown, moist, firm, highly weathered, Shaley bedding
	8½ - 9	BEDROCK: Shale, brown, gray, tan, and orange, thinly bedded, moderately hard to soft, weathered
	9 - 10	orange Shale, cemented, hard, intensely fractured, bedding is contorted, generally dipping to north
		End at 10 feet; Seepage as noted; No Caving; No Fill SHEAR: N35E; 50SE at 9 feet BEDDING: N70E; 36NW Note: Seepage occurs primarily within and along contacts of orange Shale
12	0 - 2½	SOIL: Silty Sand, brown, dry, medium dense, porous, roots
	2½ - 5½	WEATHERED BEDROCK: Sandy Clay, brown, slightly moist, firm, Diatomaceous inclusions, faint remnant bedding, contorted, roots
	5½ - 8	BEDROCK: Shale, brown to gray, thinly bedded, moderately hard, fractured, weathered
		End at 8 feet; No Water; No Caving; No Fill BEDDING: N78W; 13NE N85E; 14NW N83E; 16NW

(Continued)

TABLE I - LOG OF TEST PITS (Continued)

Pit Number	Depth (Feet)	Description
13	0 - 2½	SOIL: Silty Sand, brown, dry, slightly firm, porous, roots, Sandstone fragments
	2½ - 5	WEATHERED BEDROCK: Gravelly to Silty Clay, brown, blocky, Diatomaceous staining
	5 - 10	BEDROCK: Shale, gray, tan, light gray, yellow to rust, iron staining, thinly bedded, weathered, fractured, contorted, folded bedding, rootlets, moderately hard, sheared, Carbonate staining
		End at 10 feet; No Water; No Caving; No Fill BEDDING: N87E; 62NW N83E; Vertical
14	0 - ½	SOIL: Silty Sand, brown, dry, medium dense, rootlets
	½ - 1½	WEATHERED BEDROCK: Silty Sand, tan, dry, dense
	1½ - 3	BEDROCK: Sandstone, tan, massive, hard
		End at 3 feet; No Water; No Caving; No Fill
15	0 - 2	SOIL: Gravelly Clay, black, slightly moist, slightly firm, roots, Basalt fragments
	2 - 7½	BEDROCK: Basalt, yellow-brown to brown, massive, fractured, weathered, moderately hard; occasional Shale lenses, moist, roots
		End at 7½ feet; No Water; No Caving; No Fill BEDDING: N20E; 36SE within Shale lense JOINT: N18W; 68NE

(Continued)

TABLE I - LOG OF TEST PITS (Continued)

Pit Number	Depth (Feet)	Description
23	0 - 1	SOIL: Sandy Clay, dark brown, dry, firm, roots
	1 - 12	WEATHERED BEDROCK: Shale and Sandstone, thinly bedded, moderately hard, contorted bedding, roots, highly weathered; apparent bedding dips 30 degrees to the south
		End at 12 feet; No Water; No Caving; No Fill BEDDING: N27W; 11SW
24	0 - 12½	FILL: Gravelly to Cobbly Sand, tan, dry, slightly dense, occasional Sandstone boulders
	12½ - 13½	SOIL: Silty Sand, brown, dry, medium dense, Sandstone pieces
	13½ - 15	BEDROCK: Sandstone, tan, massive, hard
		End at 15 feet; No Water; No Caving; Fill to 12½ feet
25	0 - 6½	FILL: Gravelly to Cobbly Sand, tan, dry, slightly dense to dense, occasional Boulders; contact dips with slope; abundant Cobbles at contact
	6½ - 7½	SOIL: Silty Sand, brown, dry, medium dense
	7½ - 9½	BEDROCK: Shale, gray to brown, thinly bedded, fractured, weathered
		End at 9½ feet; No Water; Sloughing to 6½ feet; Fill to 6½ feet BEDDING: N48E; 32NW

(Continued)

1 5 9 0 1 7 7 0 2 4 5

TABLE I - LOG OF TEST PITS (Continued)

Pit Number	Depth (Feet)	Description
27	0 - 4½	SOIL: Silty to Sandy Clay, medium brown, moist, very stiff, roots
	4½ - 6	WEATHERED BEDROCK: Silty Clay, mottled brown and tan, remnant bedding
	6 - 7½	BEDROCK: Sandstone and Shale, olive-gray and brown, moderately hard, very weathered, fractured, slicked surfaces, contorted bedding, very fractured
		End at 7½ feet; No Water; No Caving; No Fill BEDDING: N72E; 32NW
28	0 - 3	SOIL: Silty to Sandy Clay, medium brown, moist, very stiff, roots
	3 - 5	BEDROCK: Sandstone and Shale; Sandstone is buff, fine to medium-grained, thinly bedded, hard, moderately weathered; Shale is tan and weathers white, thinly bedded, poorly bedded, highly weathered, fractured, moderately hard
		End at 5 feet; No Water; No Caving; No Fill BEDDING: N60E; 31NW
29	0 - 2½	SOIL: Silty Clay, dark brown, slightly moist to moist, very stiff, roots, rootlets, shale cobbles at contact
	2½ - 4	WEATHERED BEDROCK: Silty to Gravelly Clay, medium brown, slightly moist, very firm
	4 - 5½	BEDROCK: Sandstone and Shale, tan, poorly bedded, moderately hard, very weathered
		End at 5½ feet; No Water; No Caving; No Fill BEDDING: N12E; 51NW

(Continued)

TABLE I - LOG OF TEST PITS (Continued)

Pit Number	Depth (Feet)	Description
30	0 - 5	SOIL: Silty Clay, dark brown, moist, very stiff, roots
	5 - 6½	WEATHERED BEDROCK: Silty Clay, mottled brown and tan, moist, very firm, remnant bedding
	6½ - 8	BEDROCK: Sandstone and Shale; Sandstone is light gray with rust staining, fine to medium-grained, thickly bedded, moderately hard, weathered, fractured; Shale is lenticular, very weathered, very fractured, gray
		End at 8 feet; No Water; No Caving; No Fill BEDDING: N57E; 46NW N58E; 33NW
31	0 - ½	FILL: Silty Clay, gray-brown, dry, firm
	½ - 7½	SOIL: Silty Clay, dark brown, moist, very stiff, roots, occasional pieces of Shale
	7½ - 8	BEDROCK: Sandstone and Shale, tan, moderately hard to hard, very weathered
		End at 8 feet; No Water; No Caving; Fill to ½ foot

NOTE: The stratification depths represent the approximate boundary between earth types; the transition may be gradual.

BORING LOG NUMBER 1

Drilling Date 8/14/84 Elevation

Project KB 8274-G TOPA THRIFT

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description Surface Conditions: Ridge crest, natural chaparral and oak tree cover
				1		BEDROCK: Sandstone, tan, slightly moist, massive, very hard, fine to medium-grained, cemented use 24-inch coring bucket
				5		End at 4½ feet; No Water; No Caving; No Fill NOTE - PLATES A-1 THROUGH A-8: Stratification lines represent the approximate boundary between earth types; the transition may be gradual. *2400# Kelly, 12" Drop **1600# 1st Inner Kelly *** 800# 2nd Inner Kelly
				10		
				15		
				20		
				25		

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KOVACS-BYER and ASSOCIATES INC. PLATE A-1

BORING LOG NUMBER 2

Drilling Date 8/14/84 Elevation

Project KB 8274-G TOPA THRIFT

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description Surface Conditions : Grac·ed area, nose of ridge
				1		SOIL: Clayey Sand, dark brown, slightly moist, porous, medium dense
						WEATHERED BEDROCK: Sandstone, tan, slightly moist, massive, moderately hard
5	* 4	---	---	5		sample wasted Shale interbed
10	6	15.3	106.5	10		BEDROCK: Shale, mottled brown, contorted, thickly bedded, hard, weathered, interlayered with Basalt BEDDING: N30E; 37SE piece of hard, cemented Sandstone in tip of sampler; contact dips moderately to southeast Basalt, mottled red-brown and dark brown, fractured, massive, moderately hard, moderately to very weathered
15	5	14.5	108.8	15		
20	12	18.1	107.0	20		
25	** 10	20.4	105.6	25		Siltstone, blue-gray with iron staining, thickly bedded, very moist, moderately hard BEDDING: N55E; 79SE (Continued)

1 6 9 0 1 9 7 0 2 4 9

BORING LOG NUMBER 2 (Continued)

Drilling Date ______________ Elevation ______________

Project KB 8271-G TOPA THRIFT

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description Surface Conditions
				26		BEDROCK continues Basalt
30	11	25.6	98.8	30		
35	12	17.3	108.6	35		
40	26	5.9	115.3	40		very hard, cemented, difficult to drill
				45		
				50		End at 50 feet; No Water; No Caving; No Fill

KOVACS-BYER and ASSOCIATES INC.

PLATE A-1

BORING LOG NUMBER 3

Drilling Date 8/14/84 Elevation

Project KB 8274-G TOPA THRIFT

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
						Surface Conditions: Grac[illegible]d road on gently sloping area
				1		SOIL: Clayey Sand, dark brown, dry, porous, medium dense
2	* 5	10.0	108.2			
5	5	14.6	102.1	5		BEDROCK: Sandstone, tan, massive, slightly moist, moderately hard, moderately to very weathered
10	4	7.8	109.7	10		
15	4	9.1	110.8	15		
						Shale interbed: BEDDING: N75E; 10NW BEDDING: N26E; 38NW
20	10/10"	10.5	114.1	20		
						Sandstone, tan, massive, slightly moist, moderately hard, moderately to very weathered
						Shale interbed with thin Sandstone layer, gray, orange and tan, thinly bedded, with pieces of charcoal
						BEDDING: N82E; 9NW
						Sandstone, tan to light gray, massive, very hard
25	** 5	16.5	106.4	25		
						BEDDING: N75E; 8NW

(Continued)

KOVACS-BYER and ASSOCIATES INC.

PLATE A-4

BORING LOG NUMBER 3 (Continued)

Drilling Date ____________ Elevation ____________

Project KB 8274-G TOPA THRIFT

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description Surface Conditions
				26		BEDROCK continues
						caving, wet, soft
						perched groundwater
30	3	20.6	107.7	30		level of standing water after ½ hour
						Shale, dark brown, thinly bedded, moderately hard
						Sandstone, wet, soft
35	30/11"	14.1	117.8	35		
						Sandstone, tan, hard, slightly moist, massive
						Shale, dark brown, thinly bedded, very hard; hard drilling, used coring bucket
				40		End at 37½ feet; Perched Groundwater at 29 feet; Caving from 27½ feet to total depth; No Fill
				45		
				50		

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APPENDIX D

EXPLORATION AND LABORATORY TESTING PROCEDURES

Exploration

Field exploration is performed utilizing a variety of equipment, such as; a truck-mounted rotary drill rig, a truck-mounted bucket auger drill rig, a track-mounted backhoe, a rubber-tire backhoe and hand labor. The earth materials encountered are continuously logged by our field engineer and/or geologist and classified by visual examination in accordance with the Unified Soil Classification System.

The locations of test pits are determined by field measurements utilizing the plans furnished by the client. The location of the test pits should be considered accurate only to the degree implied by the method used.

Undisturbed samples of soils encountered are obtained at frequent intervals. Samples are obtained from hand samplers. The soil is retained in brass rings of 2.50 inches inside diameter and 1.00 inches in height. The central portion of the sample is retained in close-fitting, waterproof containers.

Classification

The field classification is verified in the laboratory, also in accordance with the Unified Soil Classification System. Laboratory classification may include visual examination, Atterberg Limit Tests per (ASTM D4318) and grain size distribution per (ASTM D-6913). The final classification is shown on the enclosed Log of Test Pits and Laboratory Plates.

Moisture-Density (ASTM D-558)

The field moisture content and dry unit weight are determined for each of the undisturbed soil samples. The information is useful in providing a gross picture of the soil consistency between test pits and any local variations. The dry unit weight is determined in pounds per cubic foot and shown on the enclosed Laboratory Plates. The field density and moisture content are determined as a percentage of the dry unit weight and are shown on the Log of Test Pits.

Shear Tests (ASTM D-3080)

Shear tests are performed in the Soil Test Direct Shear Machine, which is of the strain control type. Each sample is sheared under axial loads varying from 900 to 4000-lbs/sq. ft. in order to determine the Coulomb shear strength parameters, cohesion and angle of internal friction. Samples are generally tested in an artificially saturated condition. Depending upon the sample location and future site conditions, samples may be tested at field moisture content. The results are attached as graphic summaries on the enclosed Laboratory Plates.

Consolidation (ASTM D-2435)

Settlement predictions of the soil's behavior under load are made on the basis of the consolidation tests. The consolidation apparatus is designed to receive one of the one-inch high rings. The samples are tested under axial loads of up to 5500 lbs./sq. ft. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. Samples are generally tested at increased moisture content to determine the effect of water contacting the bearing soil. The normal load at which the water is added is noted on the drawing. Results are attached as graphic summaries on the enclosed Laboratory Plates.

Expansion Tests (ASTM D-4829)

In order to test the expansiveness of soil, a soil sample is compacted into a mold at near 50 percent saturation. A vertical confining pressure of 1-lbf/in is applied to the specimen and the sample is inundated with water. The deformation of the sample is measured over a 24-hour period or the rate of deformation becomes less than .0002 in./hr. whichever comes first. Results are shown on the enclosed Laboratory Plates.

Remolded Tests

Compaction tests are performed in accordance with ASTM D 1557. Remolded samples for shear, swell and consolidation are then prepared at densities corresponding to approximately 90/95 percent of maximum density. Results are shown on the enclosed Laboratory Plates.

Summary of shear strength parameters

Client: Oak Pass LLC 9712 Oak Pass Rd. 5750 II

SAMPLE	CONSULTANT	SHEAR VALUE	SOIL TYPE	COHESION (c) (PSF)	PHI (Ø) (DEG.)
B-7 @ 10'	CalWest Geotechnical(2018)	Ultimate	Very Weatherd Brx	280 psf	25°
B-7 @ 15'	CalWest Geotechnical(2018)	Ultimate	Bedrock (Tm)	640 psf	34°
B-7 @ 15'	CalWest Geotechnical(2018)	Peak	Bedrock (Tm)	840 psf	34°
B-7 @ 15'	CalWest Geotechnical(2018)	Residual	Bedrock (Tm)	340 psf	25°
B- 8 @ 10'	CalWest Geotechnical(2018)	Ultimate	Weathered Brx	310 psf	35°
B- 8 @ 10'	CalWest Geotechnical(2018)	Peak	Weathered Brx	440 psf	35°
B- 8@ 35'	CalWest Geotechnical(2018)	Ultimate	Sandstone Brx (Tm)	550 psf	36°
B- 8@ 35'	CalWest Geotechnical(2018)	Peak	Sandstone Brx (Tm)	775 psf	36°
B-9 @ 15'	CalWest Geotechnical(2018)	Ultimate	Weathered Brx	310 psf	39°
B-10 @ 15'	CalWest Geotechnical(2018)	Ultimate	Fault Zone Brx (Tm)	480 psf	34°
B-10 @ 15'	CalWest Geotechnical(2018)	Residual	Fault Zone Brx (Tm)	250 psf	26°
B-10 @ 25'	CalWest Geotechnical(2018)	Ultimate	Fault Zone Brx (Tm)	550 psf	34°
B-10 @ 25'	CalWest Geotechnical(2018)	Peak	Fault Zone Brx (Tm)	700 psf	34°
B-13 @ 10'	CalWest Geotechnical(2018)	Ultimate	Bedrock (Tvb)	990 psf	38°
B-13 @ 10'	CalWest Geotechnical(2018)	Peak	Bedrock (Tvb)	1330 psf	38°
B-14 @ 10'	CalWest Geotechnical(2018)	Ultimate	Bedrock (Jsm)	1200 psf	39°
B-14 @ 10'	CalWest Geotechnical(2018)	Peak	Bedrock (Jsm)	1470 psf	40°
B-14 @ 10'	CalWest Geotechnical(2018)	Residual	Bedrock (Jsm)	350 psf	33°
B-15 @ 20'	CalWest Geotechnical(2018)	Ultimate	Fault Zone Brx (Tm)	750 psf	34°
B-15 @ 20'	CalWest Geotechnical(2018)	Peak	Bedrock (Jsm)	960 psf	35°

B-15 @ 35'	CalWest Geotechnical(2018)	Ultimate	Fault Zone Brx (Tm)	620 psf	35°
B-15 @ 35'	CalWest Geotechnical(2018)	Peak	Fault Zone Brx (Tm)	800 psf	36°
B-16 @ 20'	CalWest Geotechnical(2018)	Ultimate	Bedrock (Tt)	700 psf	37°
B-16 @ 20'	CalWest Geotechnical(2018)	Peak	Bedrock (Tt)	925 psf	37°
B-16 @ 20'	CalWest Geotechnical(2018)	Residual	Bedrock (Tt)	310 psf	30°
B-16 @ 30'	CalWest Geotechnical(2018)	Ultimate	Bedrock (Tt)	660 psf	37°
B-16 @ 30'	CalWest Geotechnical(2018)	Peak	Bedrock (Tt)	885 psf	37°
TP-8 @ 4'	CalWest Geotechnical(2018)	Ultimate	Bedrock (Tm)	500 psf	34°
TP-8 @ 4'	CalWest Geotechnical(2018)	Peak	Bedrock (Tm)	650 psf	34°
TP-11 @ 1.5'	CalWest Geotechnical(2018)	Ultimate	Sandy Clay	410 psf	26°
TP-18 @ 3.5'	CalWest Geotechnical(2018)	Ultimate	Fault Zone Brx (Tm)	470 psf	35°
TP-18 @ 3.5'	CalWest Geotechnical(2018)	Peak	Fault Zone Brx (Tm)	660 psf	35°
TP-20 @ 4'	CalWest Geotechnical(2018)	Ultimate	Weathered Brx (Tt)	370 psf	32°
TP-20 @ 4'	CalWest Geotechnical(2018)	Peak	Weathered Brx (Tt)	475 psf	32°

Summary of shear strength parameters

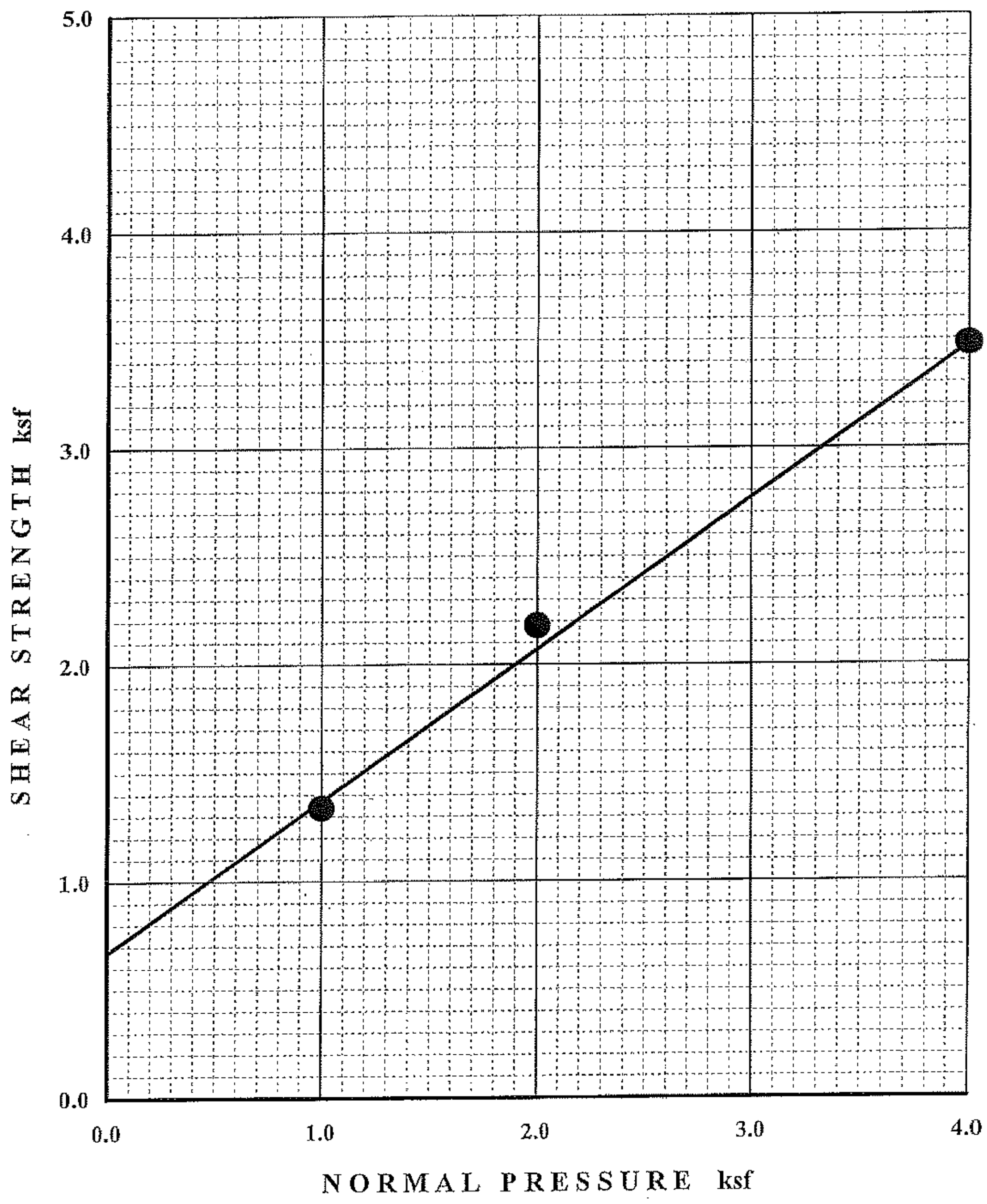
Client: Oak Pass Rd. LLC **9712 Oak Pass Rd.,** **Project No.5277 (2011-2012)**

SAMPLE	CONSULTANT	SHEAR VALUE	SOIL TYPE	COHESION (c) (PSF)	PHI (Ø) (DEG.)
B-1 @ 10'	**Cal West Geotech. April, 2011**	Ultimate	Siltstone and Shale Brx	670 psf	35°
B-1 @ 25'	**Cal West Geotech. April, 2011**	Ultimate	Siltstone and Shale Brx	550 psf	34°
B-1 @ 25'	**Cal West Geotech. April, 2011**	Re-Shear	Siltstone and Shale Brx	330 psf	27°
B-1 @ 45'	**Cal West Geotech. April, 2011**	Ultimate	Siltstone Brx	770 psf	36°
B-2 @ 20'	**Cal West Geotech. April, 2011**	Ultimate	Siltstone and Shale Brx	580 psf	34°
B-3 @ 15'	**Cal West Geotech. April, 2011**	Ultimate	Siltstone and Shale Brx	630 psf	34°
B-3 @ 35'	**Cal West Geotech. April, 2011**	Ultimate	Sandstone Brx	690 psf	37°
B-3 @ 45'	**Cal West Geotech. April, 2011**	Ultimate	Siltstone Brx	570 psf	37°
TP-1 @ 2.5'	**Cal West Geotech. April, 2011**	Ultimate	Clayey Sand	320 psf	28°
TP-3 @ 4'	**Cal West Geotech. April, 2011**	Ultimate	Basalt Brx	910 psf	38°
TP-5 @ 3'	**Cal West Geotech. April, 2011**	Ultimate	Sandy Clay	440 psf	27°
TP-6 @ 2.5'	**Cal West Geotech. April, 2011**	Ultimate	FILL	370 psf	32°
Bulk	**Cal West Geotech. April, 2011**	Ultimate	Remolded Soil to 90%	390 psf	32°
B-4 @ 30'	**Cal West Geotech. Nov., 2012**	Ultimate	Siltstone and Shale Brx	580 psf	35°
B-4 @ 30'	**Cal West Geotech. Nov., 2012**	Re-Shear	Siltstone and Shale Brx	300 psf	25°
B-4 @ 40'	**Cal West Geotech. Nov., 2012**	Ultimate	Siltstone and Shale Brx	660 psf	35°
B-4 @ 40'	**Cal West Geotech. Nov., 2012**	Re-Shear	Siltstone and Shale Brx	330 psf	25°

SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC NUMBER: G5277

SAMPLE: B-1 @ 10' (Siltstone and Shale Brx-Tm) DATE: April, 2011



STRAIN RATE -0.005 in/min Initial moisture content = 10.5 %

SAMPLE SATURATION - 24 hrs Final moisture content = 17.4 %

DRY DENSITY & WATER CONTENT - 112 pcf @ 17 %

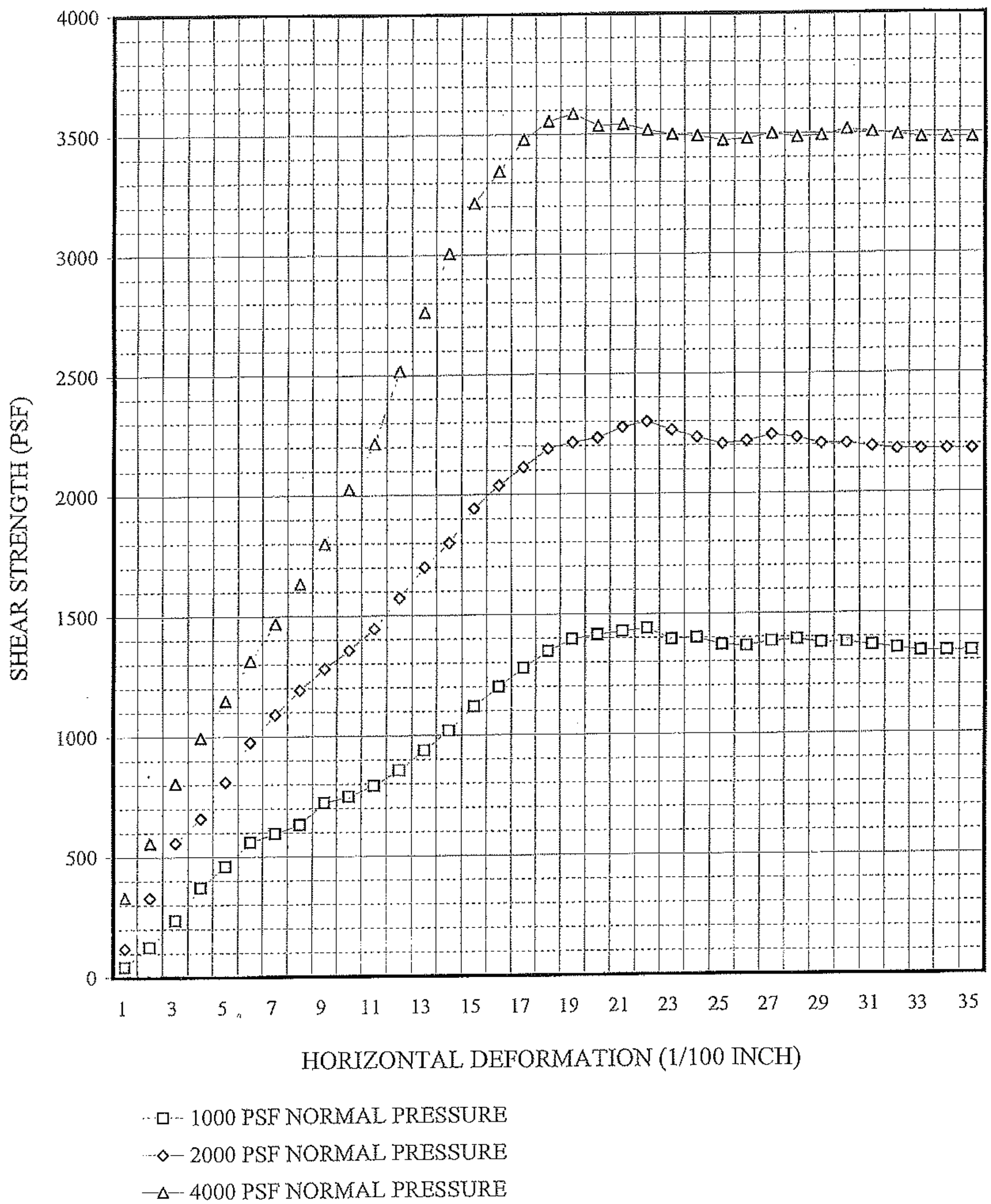
Ultimate Shear Resistance

COHESION = 670 psf

PHI = 35 °

DIRECT SHEAR TEST

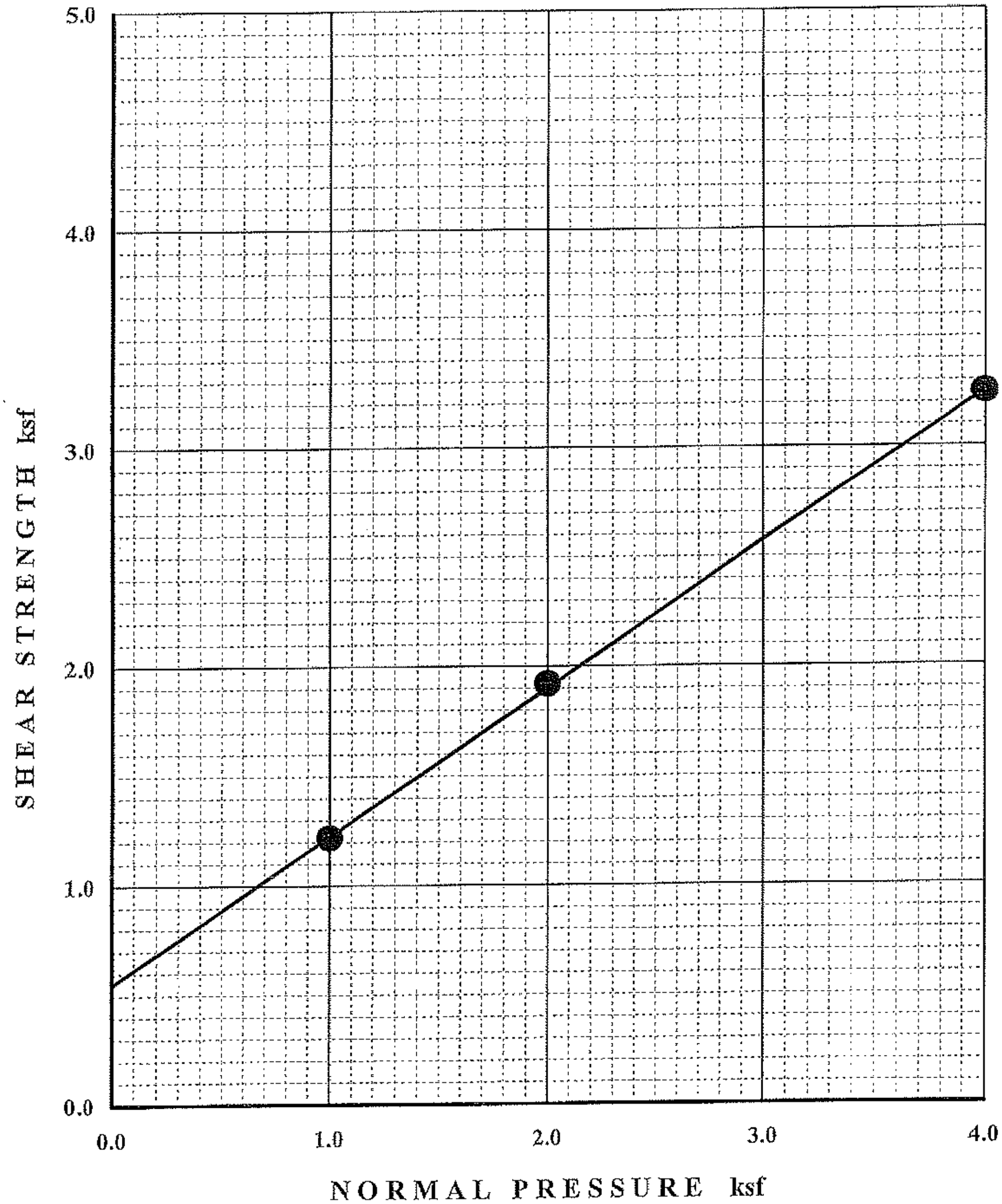
SAMPLE: **B-1 @ 10' (Siltstone and Shale Brx-Tm)** **first run**



SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC **NUMBER:** G5277

SAMPLE: B-1 @ 25' (Siltstone Shale Brx- Tm) **DATE:** April, 2011



STRAIN RATE -0.005 in/min Initial moisture content = 24.6 %

SAMPLE SATURATION - 24 hrs Final moisture content = 26.2 %

DRY DENSITY & WATER CONTENT - 96.5 pcf @ 26 %

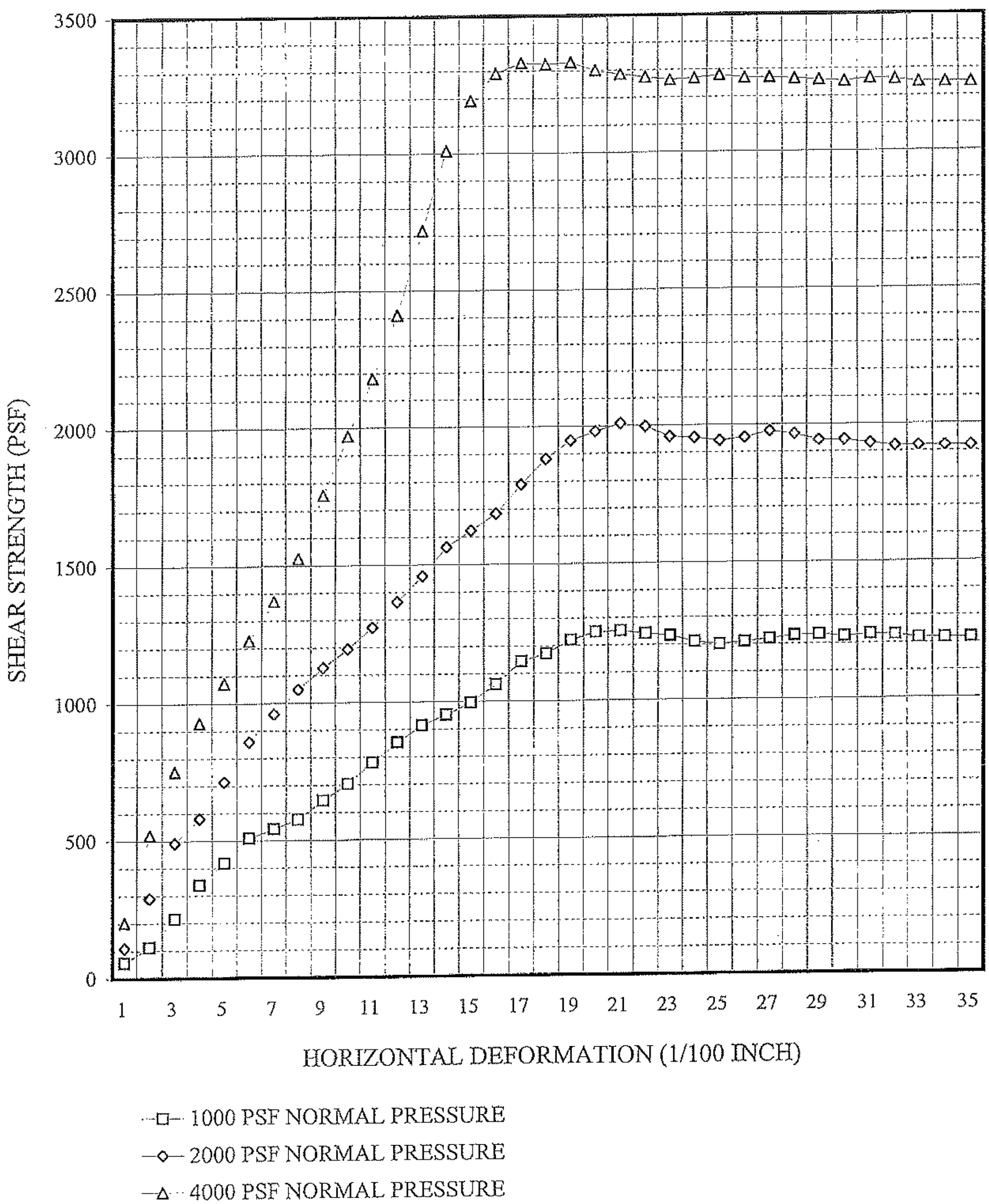
Ultimate Shear Resistance

COHESION = 550 psf

PHI = 34 °

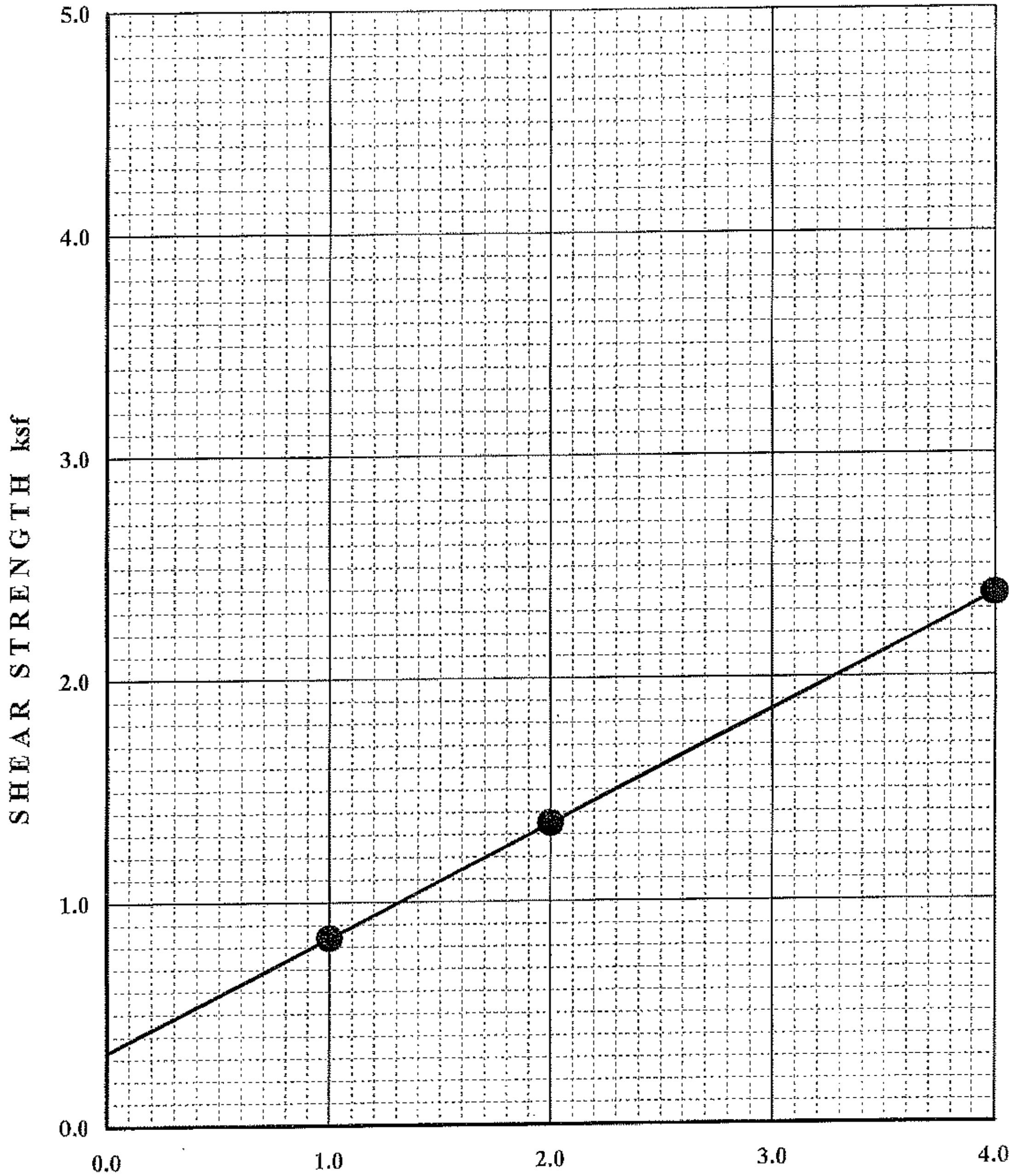
DIRECT SHEAR TEST

SAMPLE: B-1 @ 25' (Siltstone Shale Brx- Tm) first run



SHEAR TEST DIAGRAM

PROJECT:	Oak Pass Road, LLC	NUMBER:	G5277
SAMPLE:	B-1 @ 25' (Siltstone Shale Brx- Tm)	DATE:	April, 2011



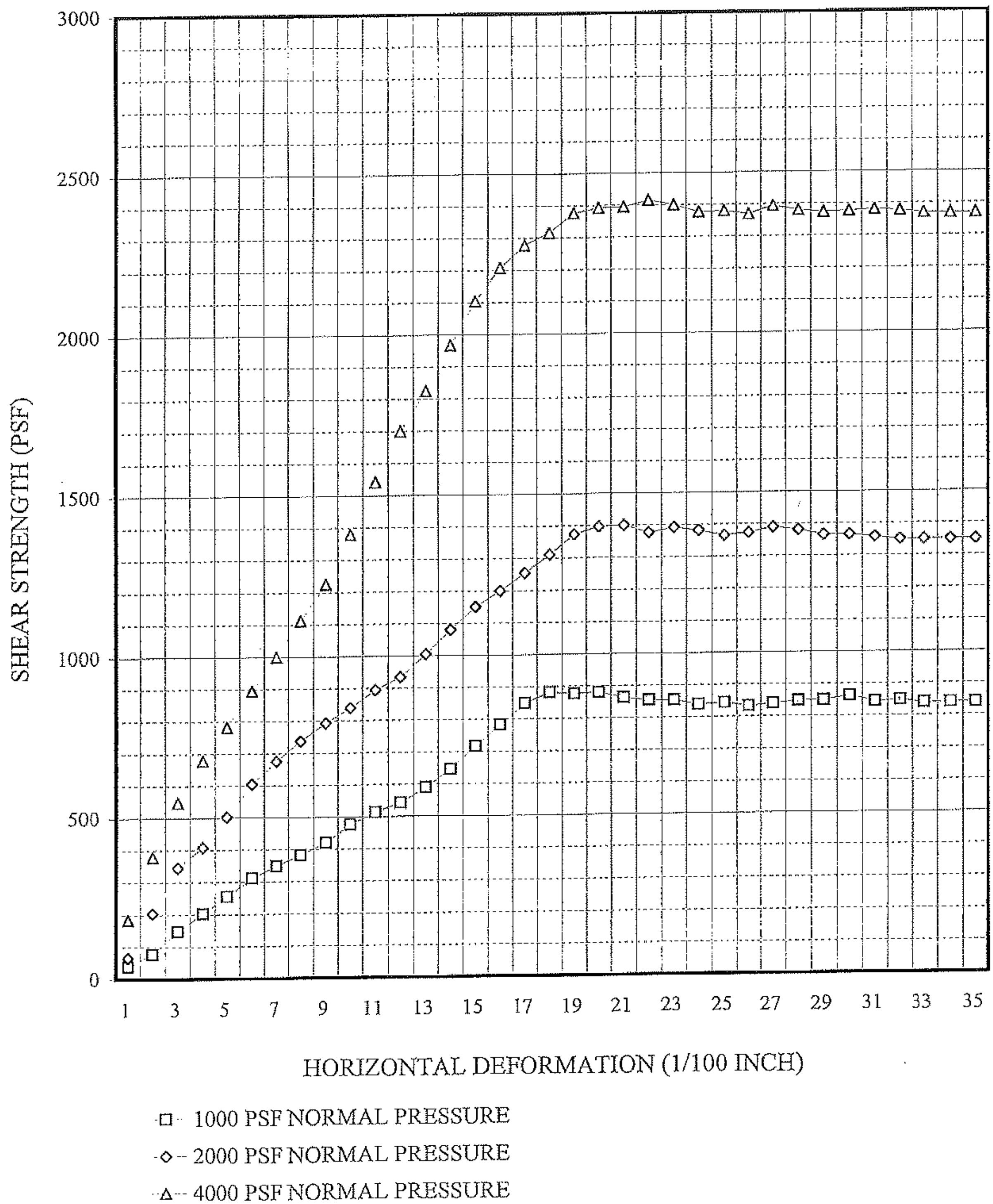
STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs
DRY DENSITY & WATER CONTENT - 96.5 pcf @ 26 %

Initial moisture content = 24.6 %
Final moisture content = 26.2 %

Re- Shear Resistance
COHESION = 330 psf
PHI = 27 °

DIRECT SHEAR TEST

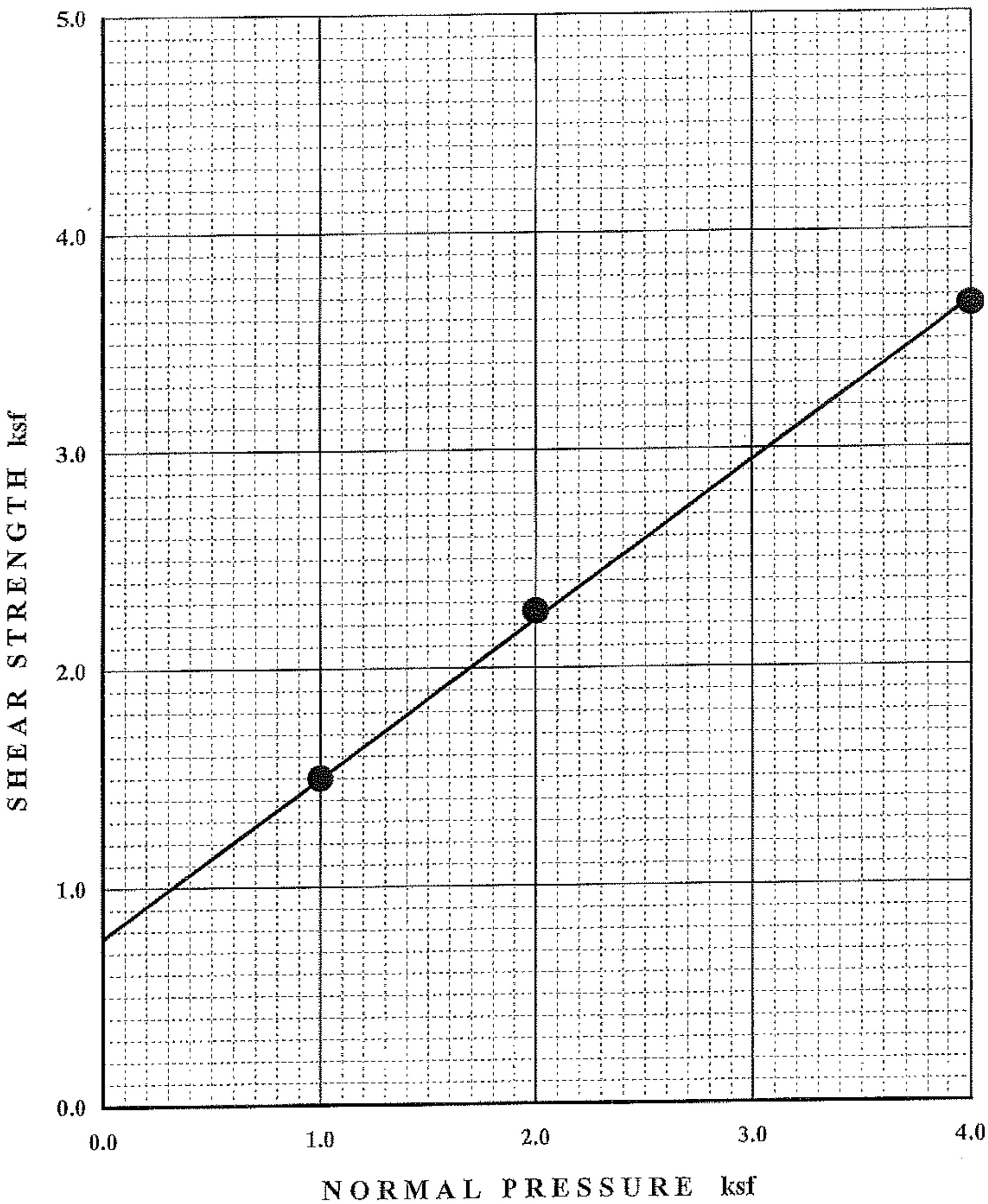
SAMPLE: B-1 @ 25' (Siltstone Shale Brx- Tm) second run



SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC NUMBER: G5277

SAMPLE: B-1 @ 45' (Siltstone Bedrock- Tm) DATE: April, 2011



STRAIN RATE -0.005 in/min Initial moisture content = 22.4 %

SAMPLE SATURATION - 24 hrs Final moisture content = 25.7 %

DRY DENSITY & WATER CONTENT - 98 pcf @ 26 %

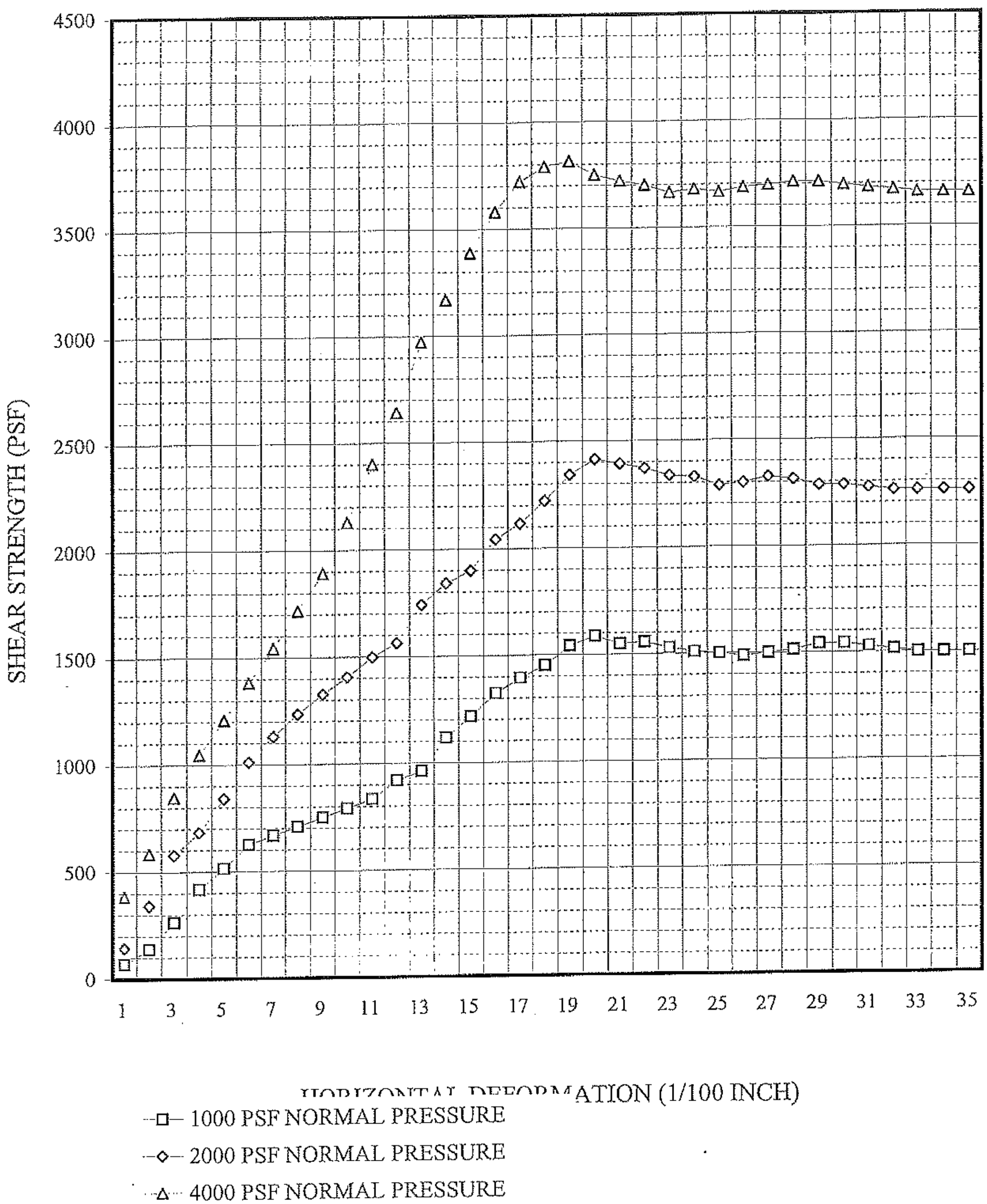
Ultimate Shear Resistance

COHESION = 770 psf

PHI = 36 °

DIRECT SHEAR TEST

SAMPLE: B-1 @ 45' (Siltstone Bedrock- Tm) first run



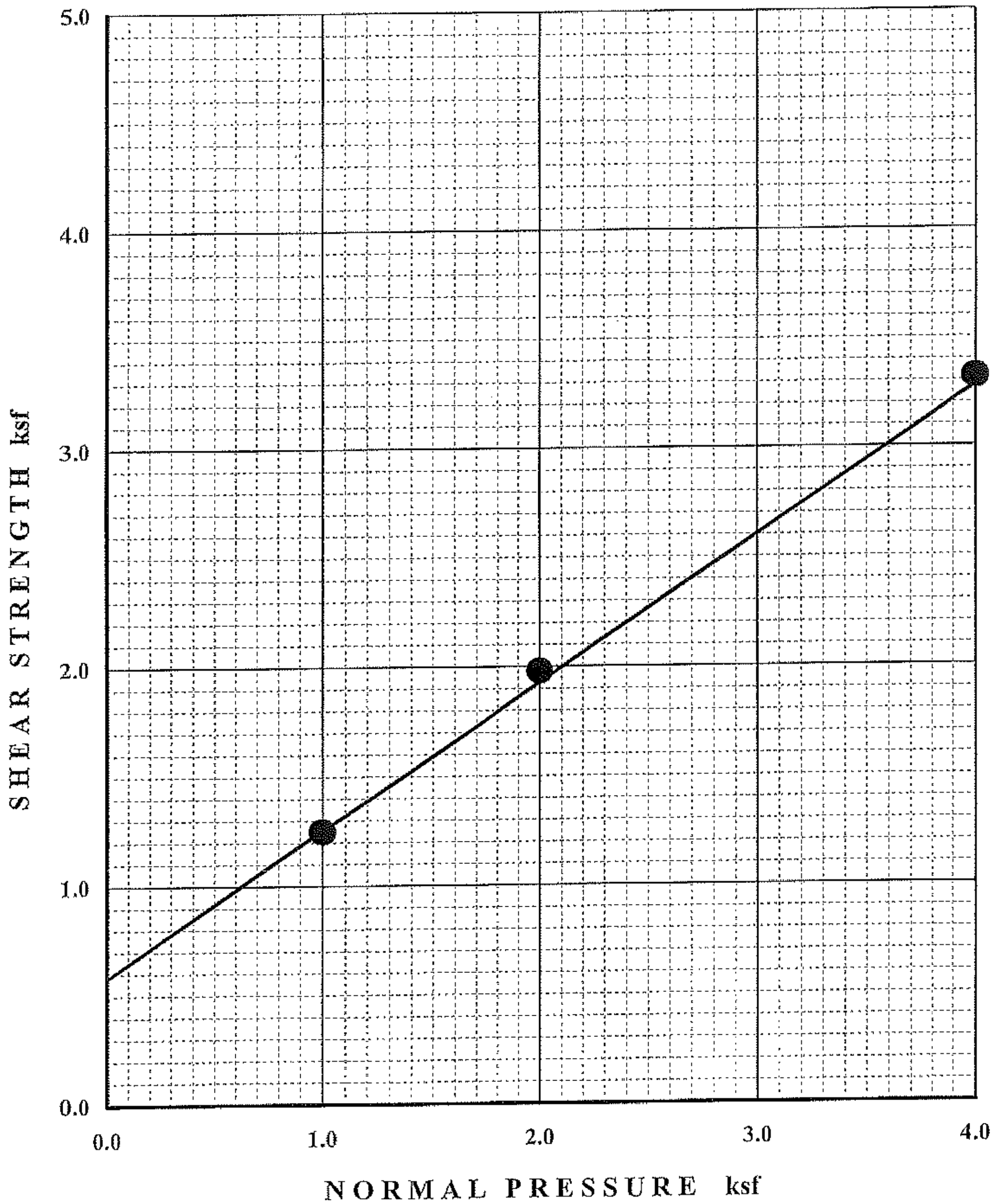
SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC

NUMBER: G5277

SAMPLE: B-2 @ 20' (Siltstone and Shale- Tm)

DATE: April, 2011



STRAIN RATE -0.005 in/min

SAMPLE SATURATION - 24 hrs

Initial moisture content = 16.6 %

Final moisture content = 22.2 %

DRY DENSITY & WATER CONTENT - 104 pcf @ 22 %

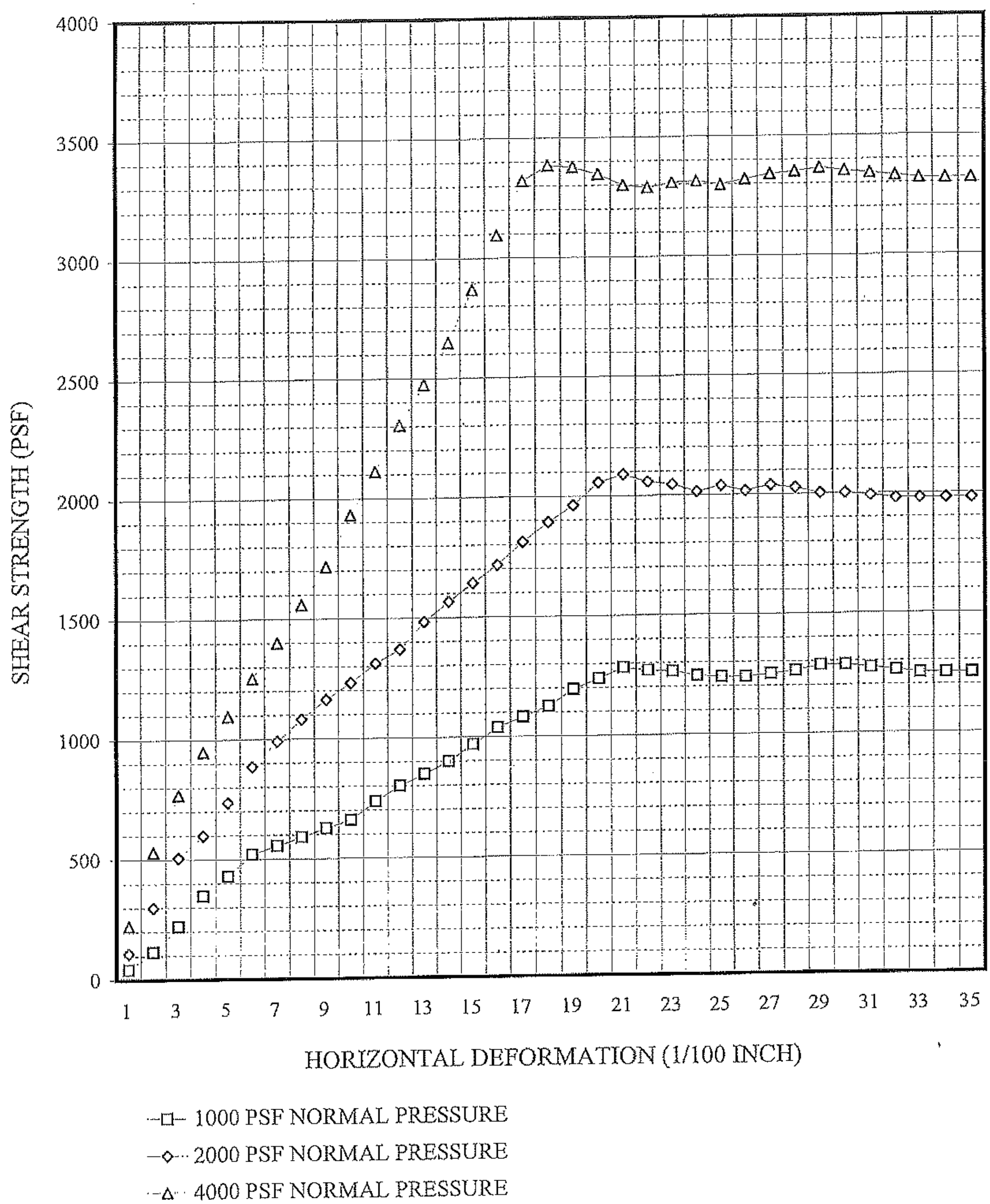
Ultimate Shear Resistance

COHESION = 580 psf

PHI = 34 °

DIRECT SHEAR TEST

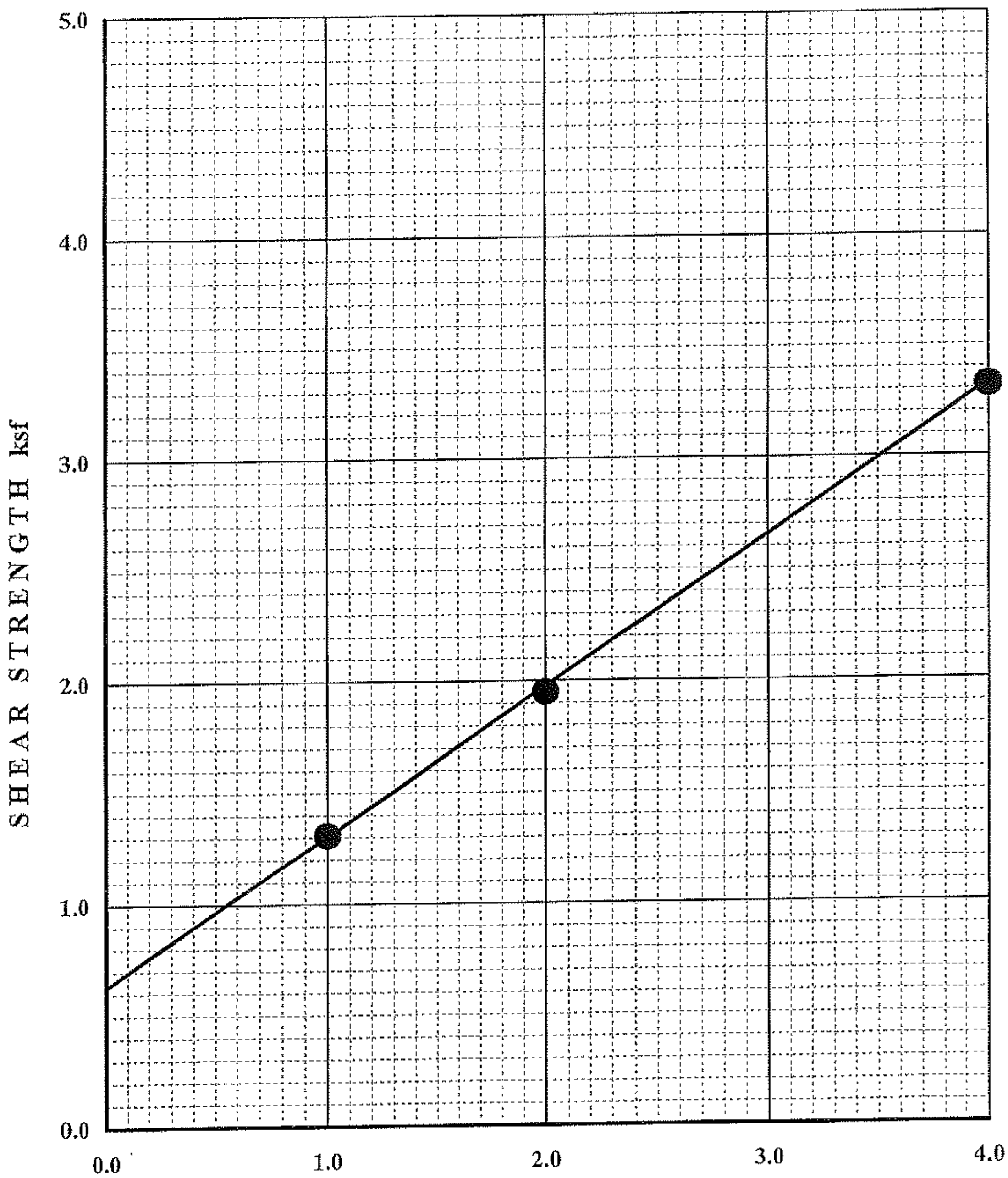
SAMPLE: B-2 @ 20' (Siltstone and Shale- Tm) **first run**



SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC **NUMBER:** G5277

SAMPLE: B-3 @ 15' (Siltstone and Shale Brx- Tm) **DATE:** April, 2011



STRAIN RATE -0.005 in/min Initial moisture content = 16.8 %

SAMPLE SATURATION - 24 hrs Final moisture content = 25.8 %

DRY DENSITY & WATER CONTENT - 97.7 pcf @ 26 %

Ultimate Shear Resistance

COHESION = 630 psf

PHI = 34 °

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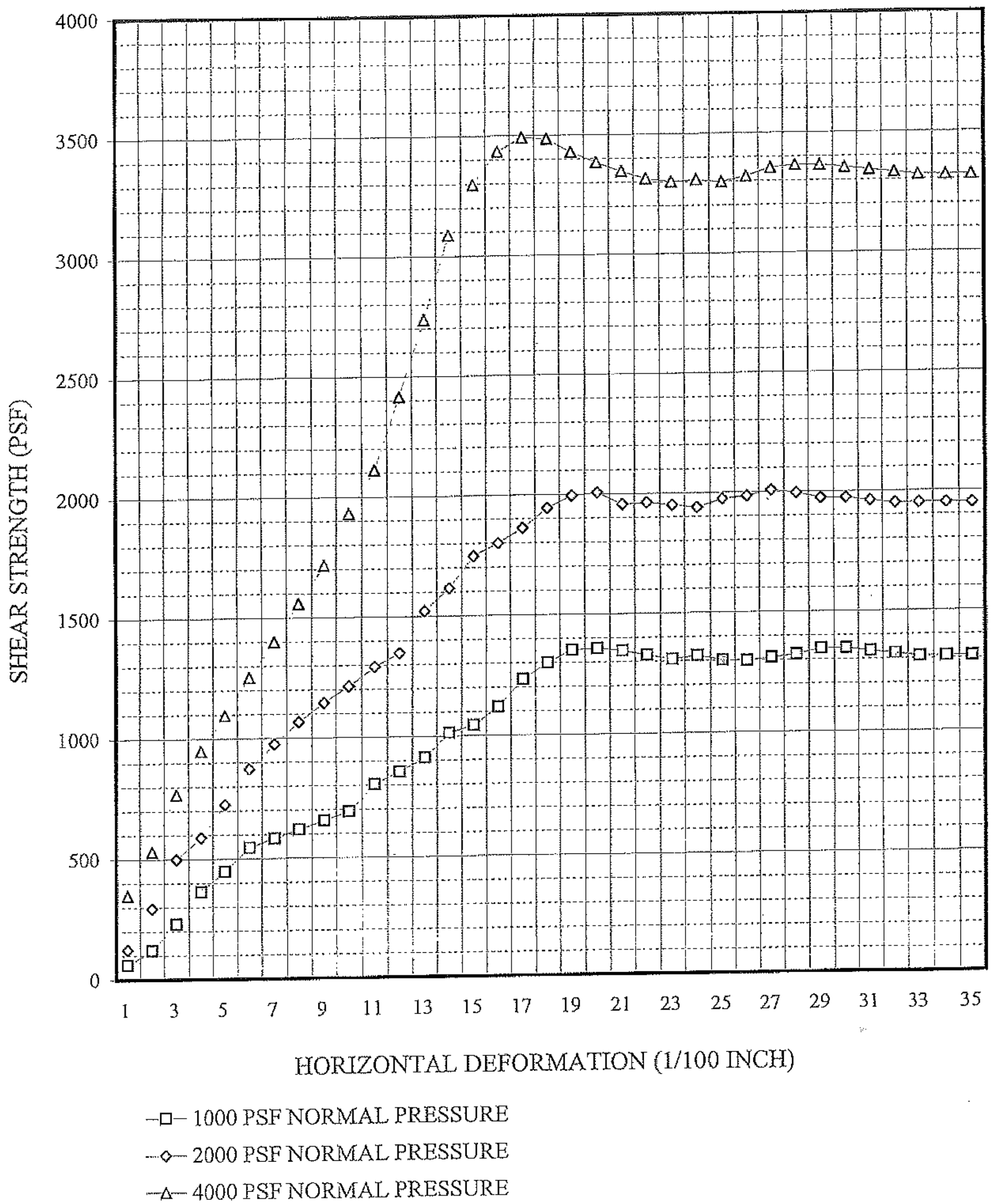
DIRECT SHEAR TEST

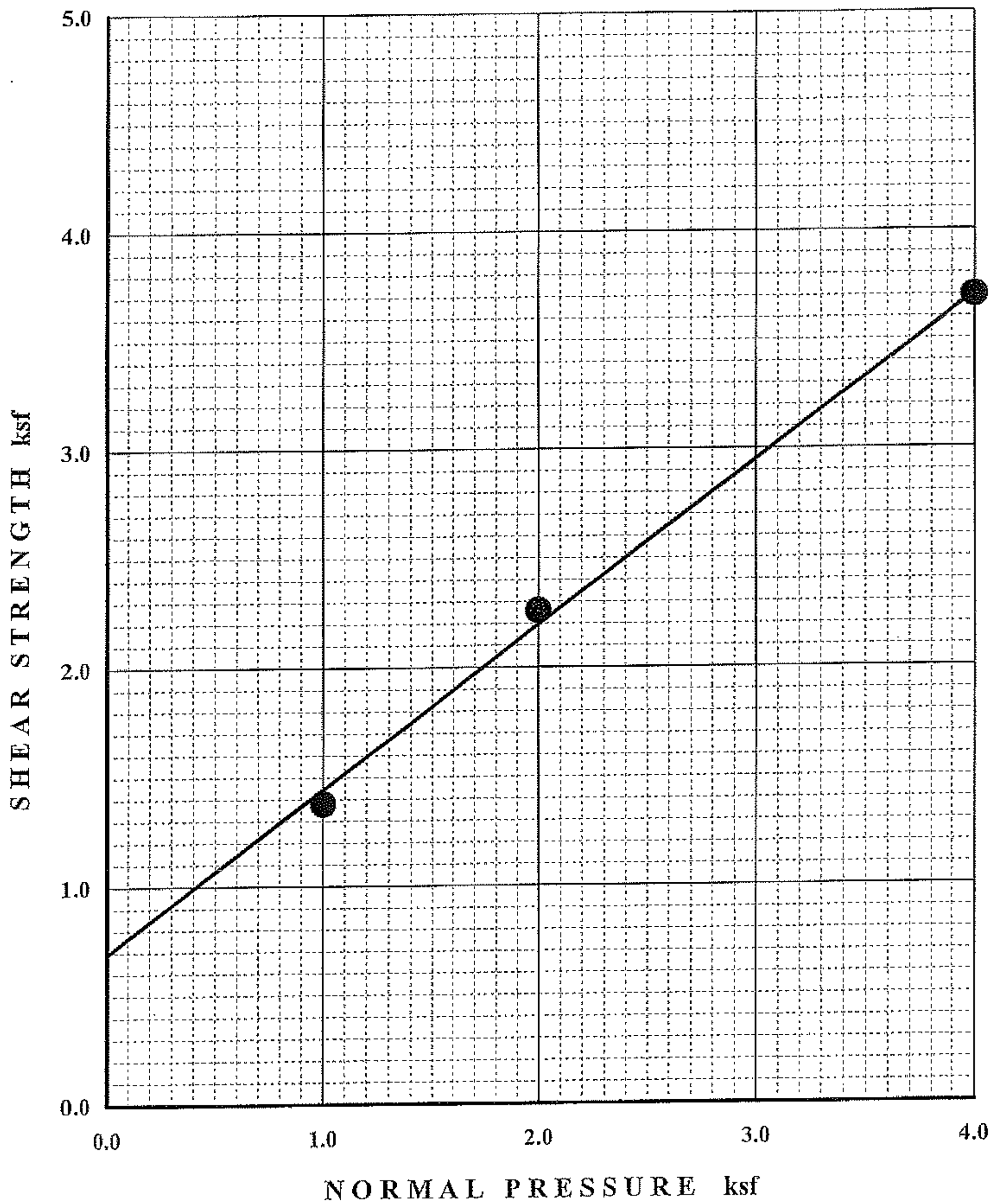
SAMPLE: B-3 @ 15' (Siltstone and Shale Brx- Tm) **first run**



SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC NUMBER: G5277

SAMPLE: B-3 @ 35' (Sandstone Bedrock) DATE: April, 2011



STRAIN RATE -0.005 in/min Initial moistur content = 15.0 %

SAMPLE SATURATION - 24 hrs Final moisture content = 23.6 %

DRY DENSITY & WATER CONTENT - 101.3 pcf @ 24 %

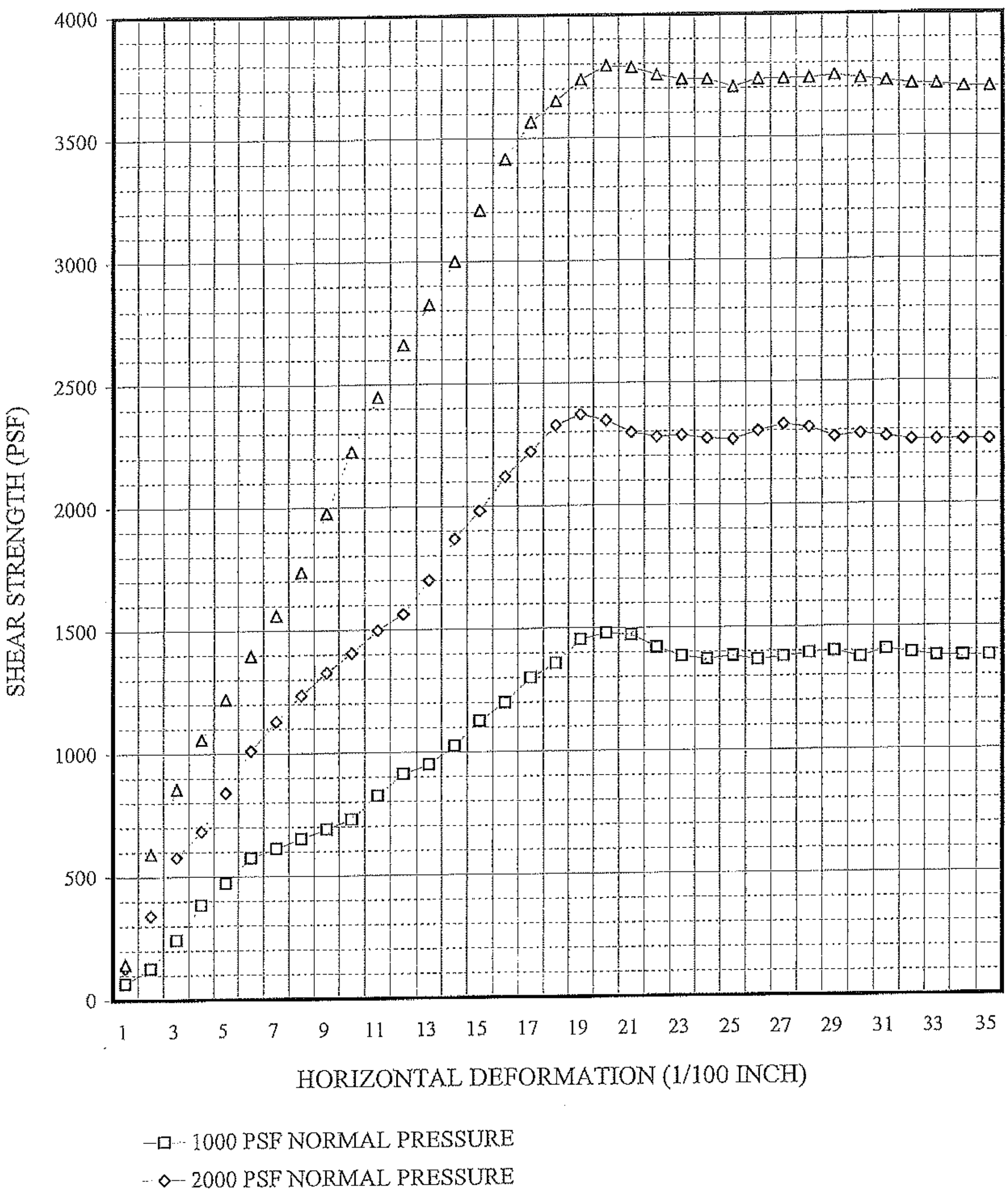
Ultimate Shear Resistance

COHESION = 690 psf

PHI = 37 °

DIRECT SHEAR TEST

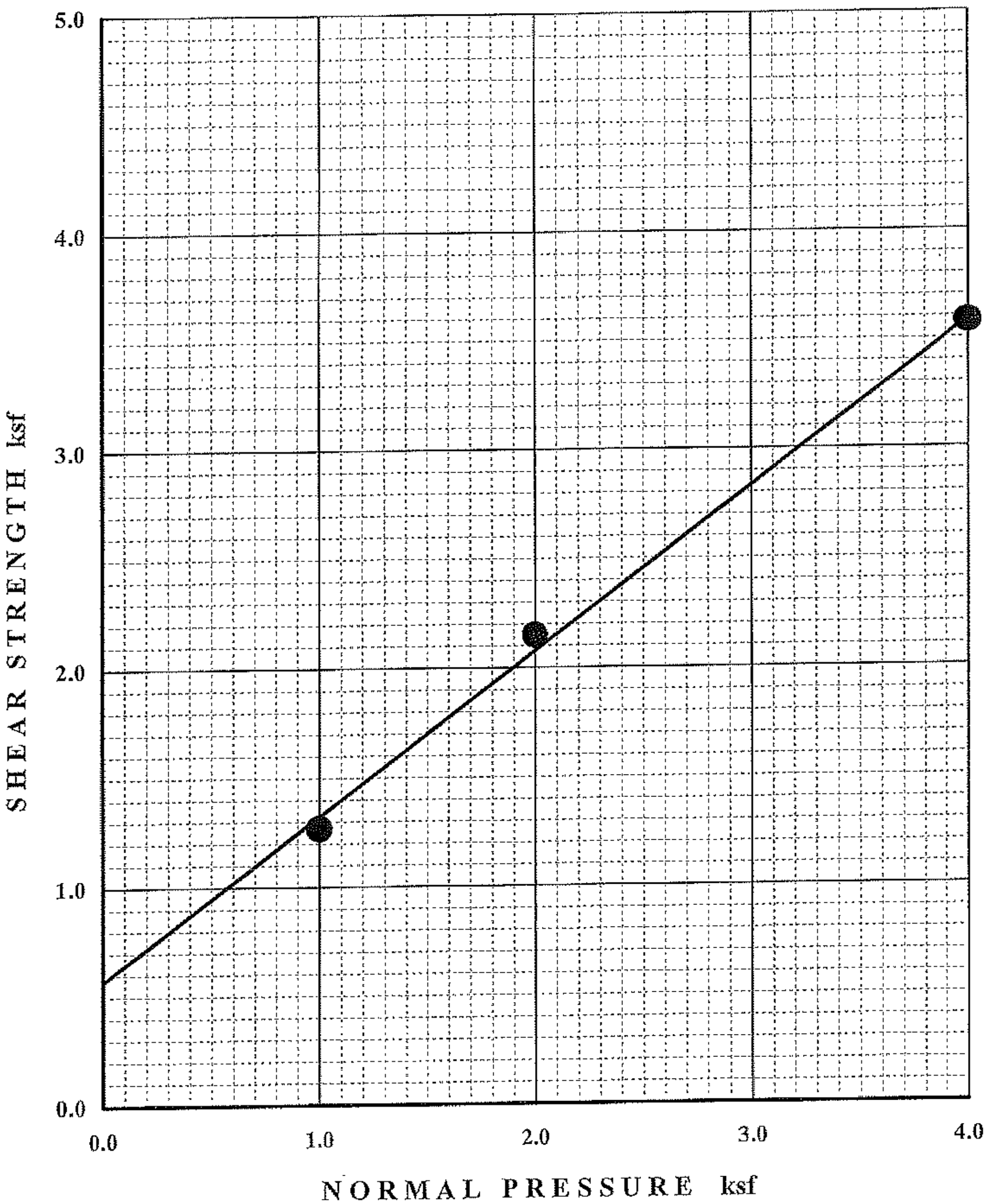
SAMPLE: B-3 @ 35' (Sandstone Bedrock) — first run



SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC NUMBER: G5277

SAMPLE: B-3 @ 45' (Siltstone Bedrock) DATE: April, 2011



STRAIN RATE -0.005 in/min Initial moisture content = 19.3 %

SAMPLE SATURATION - 24 hrs Final moisture content = 24.2 %

DRY DENSITY & WATER CONTENT - 100.4 pcf @ 24 %

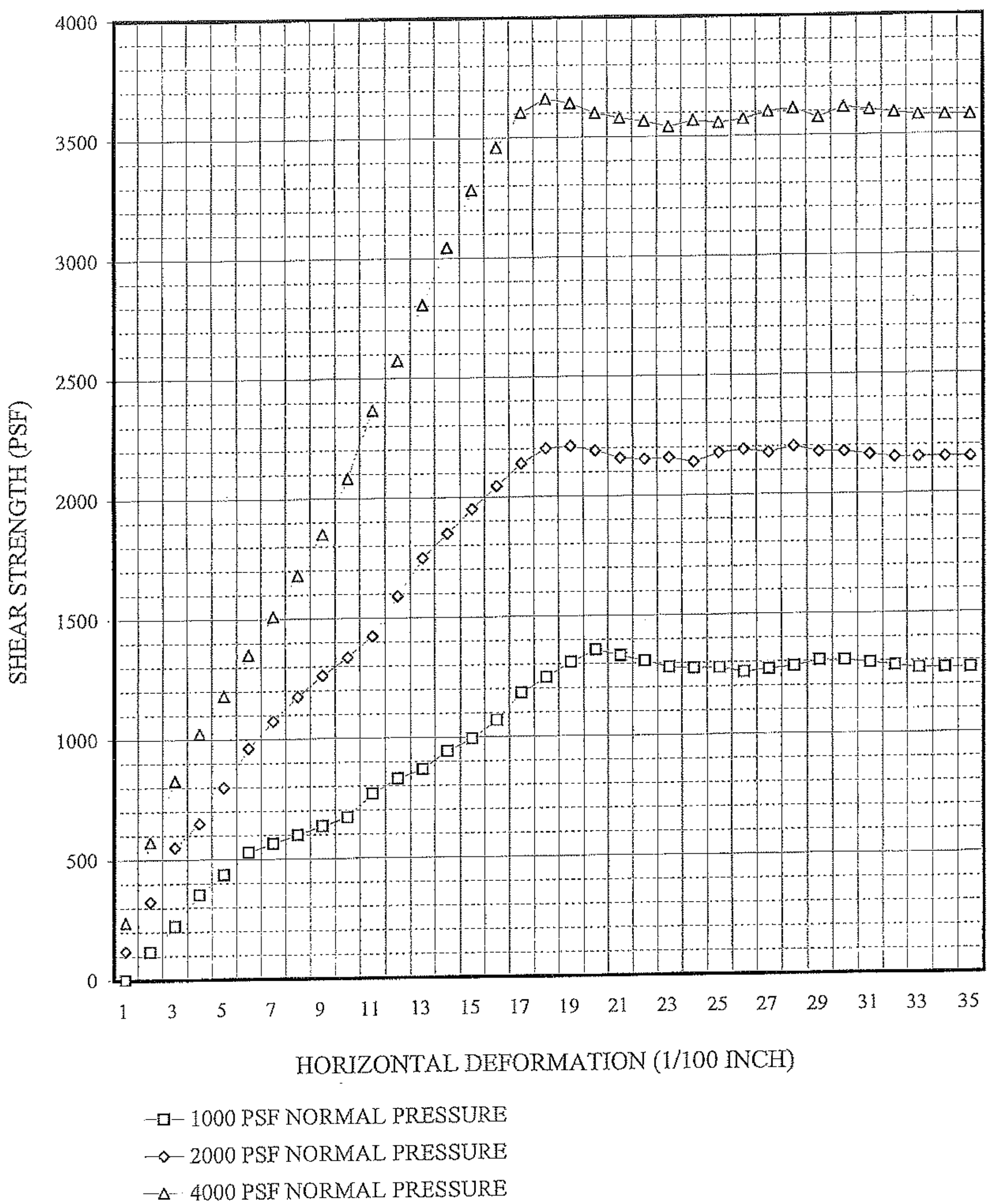
Ultimate Shear Resistance

COHESION = 570 psf

PHI = 37 °

DIRECT SHEAR TEST

SAMPLE: B-3 @ 45' (Siltstone Bedrock) first run



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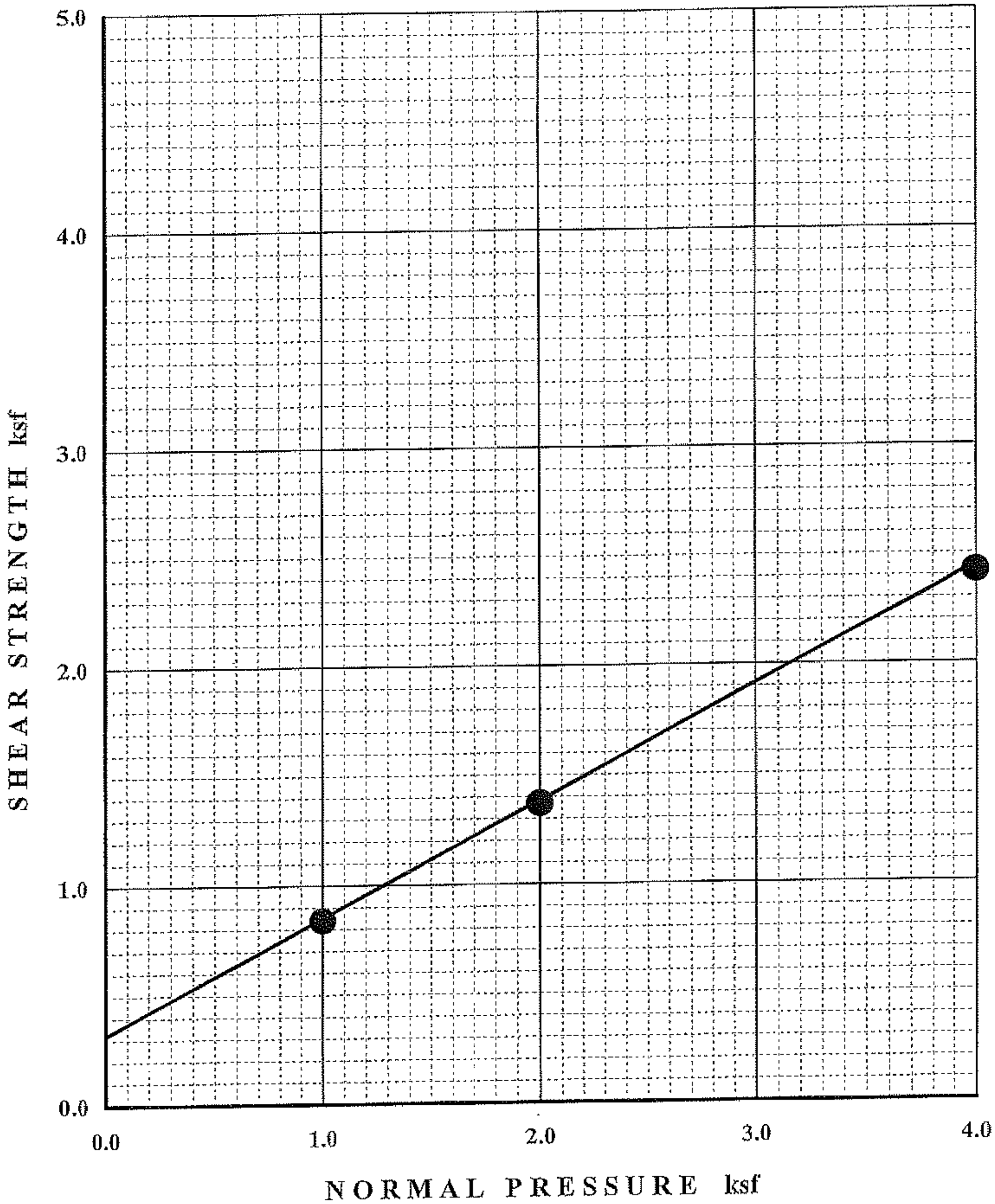
SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC
NUMBER: G5277

SAMPLE: TP-1 @2.5' (CLayey Sand)
DATE: April, 2011



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs
DRY DENSITY & WATER CONTENT - 96.4 pcf @ 27 %

Initial moisture content = 16.6 %
Final moisture content = 27.1 %

Ultimate Shear Resistance
COHESION = 320 psf
PHI = 28 °

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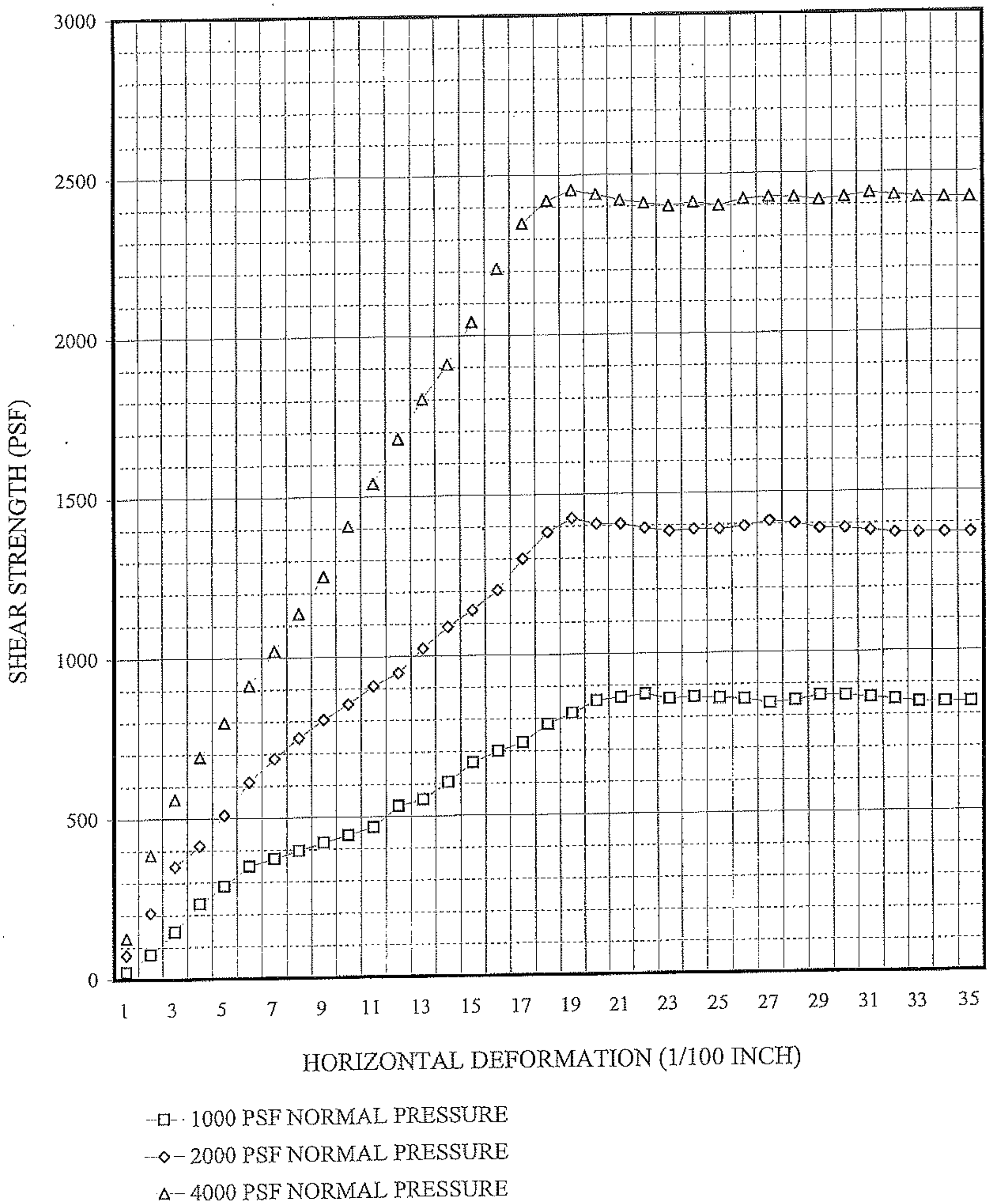
DIRECT SHEAR TEST

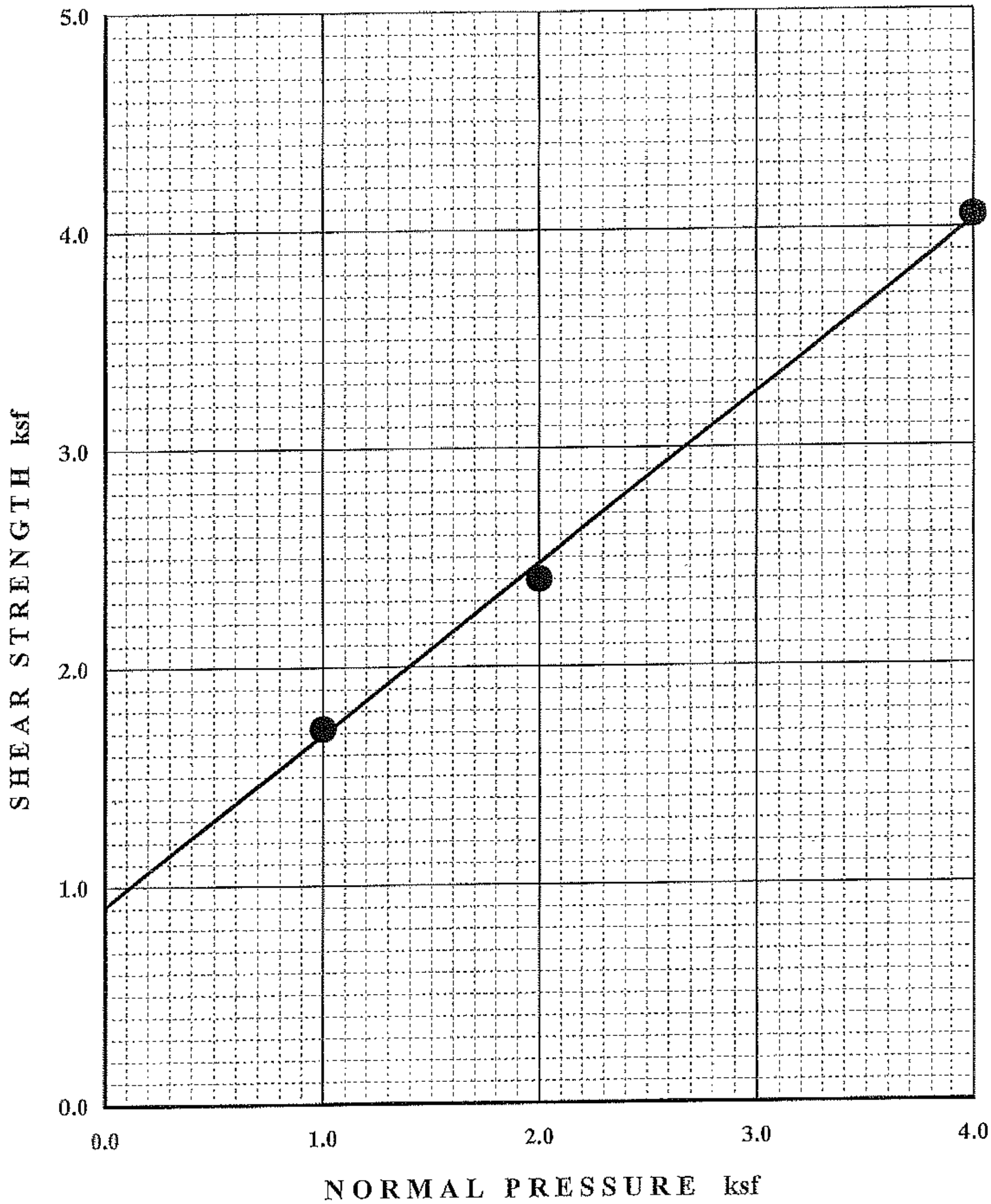
SAMPLE: TP-1 @2.5' (CLayey Sand) first run



SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC | NUMBER: G5277

SAMPLE: TP-3 @ 4' (Basalt Bedrock- Tvb) | DATE: April, 2011



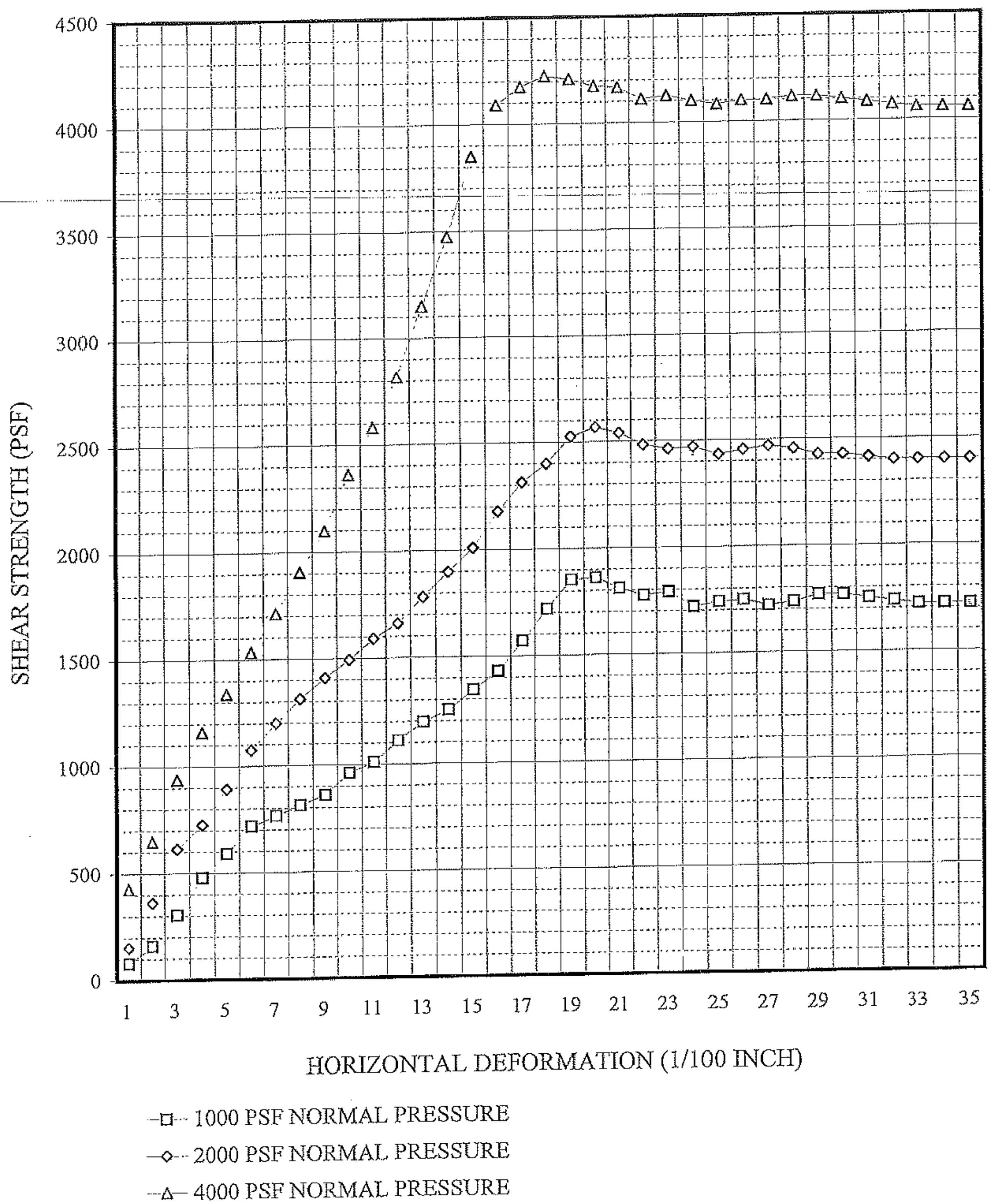
STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs
DRY DENSITY & WATER CONTENT - 112 pcf @ 18 %

Initial moisture content = 12.2 %
Final moisture content = 17.5 %

Ultimate Shear Resistance
COHESION = 910 psf
PHI = 38 °

DIRECT SHEAR TEST

SAMPLE: **TP-3 @ 4' (Basalt Bedrock- Tvb)** **first run**



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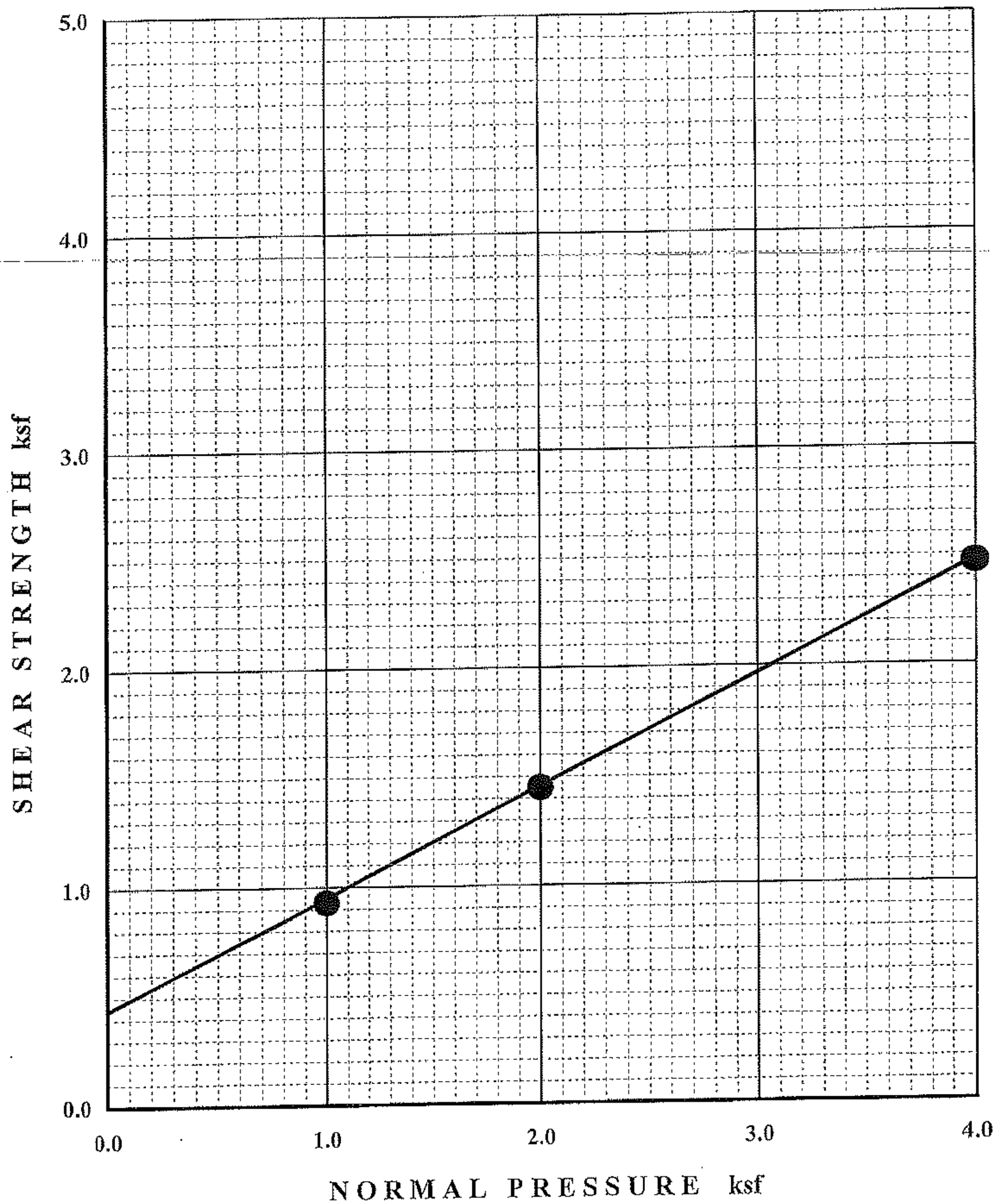
SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC — NUMBER: G5277

SAMPLE: TP-5 @ 3' (Sandy Clay) — DATE: April, 2011



STRAIN RATE -0.005 in/min

SAMPLE SATURATION - 24 hrs

Initial moisture content = 26.2 %

Final moisture content = 27.1 %

DRY DENSITY & WATER CONTENT - 95.4 pcf @ 27 %

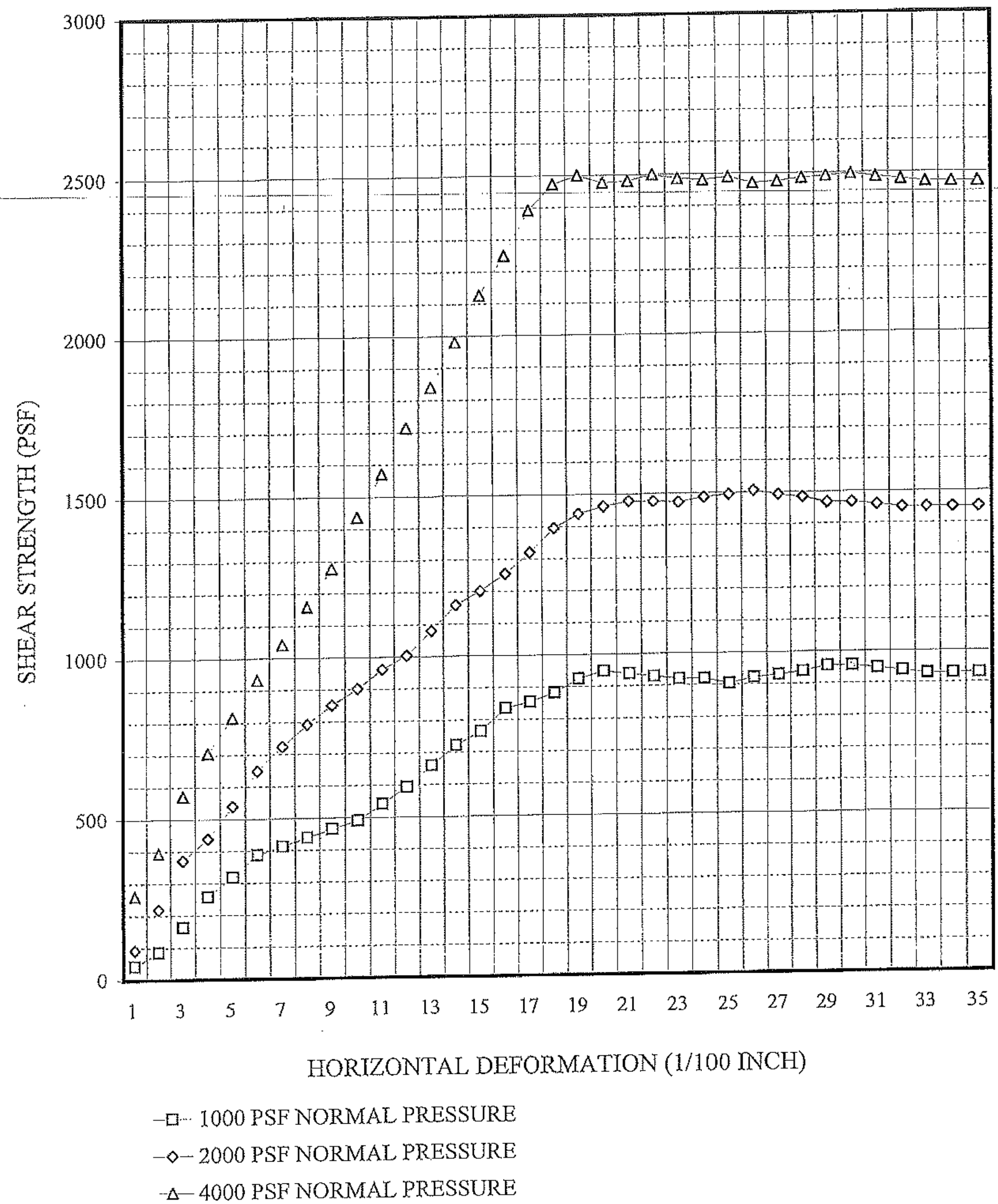
Ultimate Shear Resistance

COHESION = 440 psf

PHI = 27 °

DIRECT SHEAR TEST

SAMPLE: TP-5 @ 3' (Sandy Clay) first run



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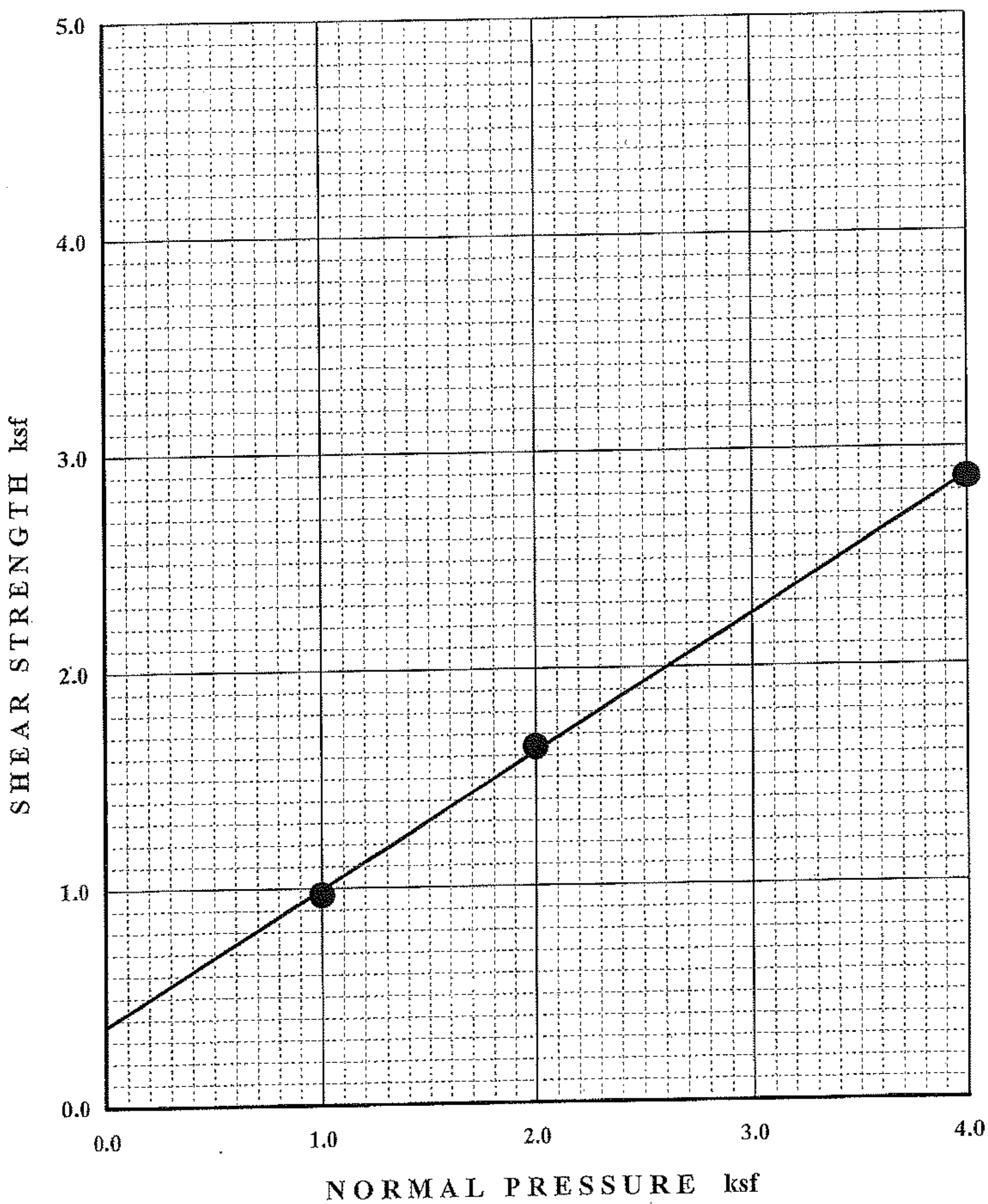
SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC **NUMBER:** G5277

SAMPLE: TP-6 @ 2.5'(FILL) **DATE:** April, 2011



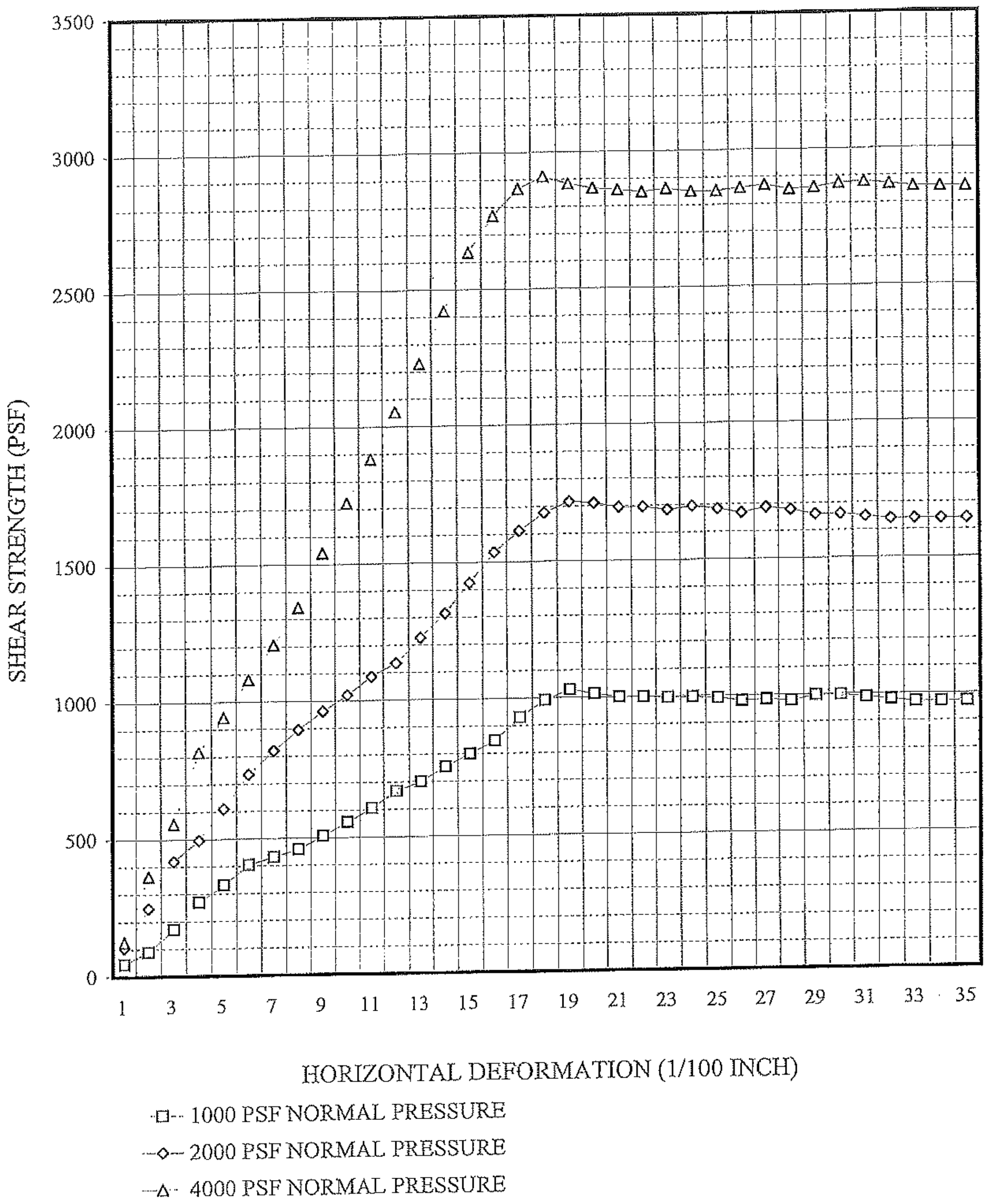
STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs
DRY DENSITY & WATER CONTENT - 103.2 pcf @ 22 %

Initial moisture content = 17.7 %
Final moisture content = 22.2 %

Ultimate Shear Resistance
COHESION = 370 psf
PHI = 32 °

DIRECT SHEAR TEST

SAMPLE: TP-6 @ 2.5'(FILL) **first run**



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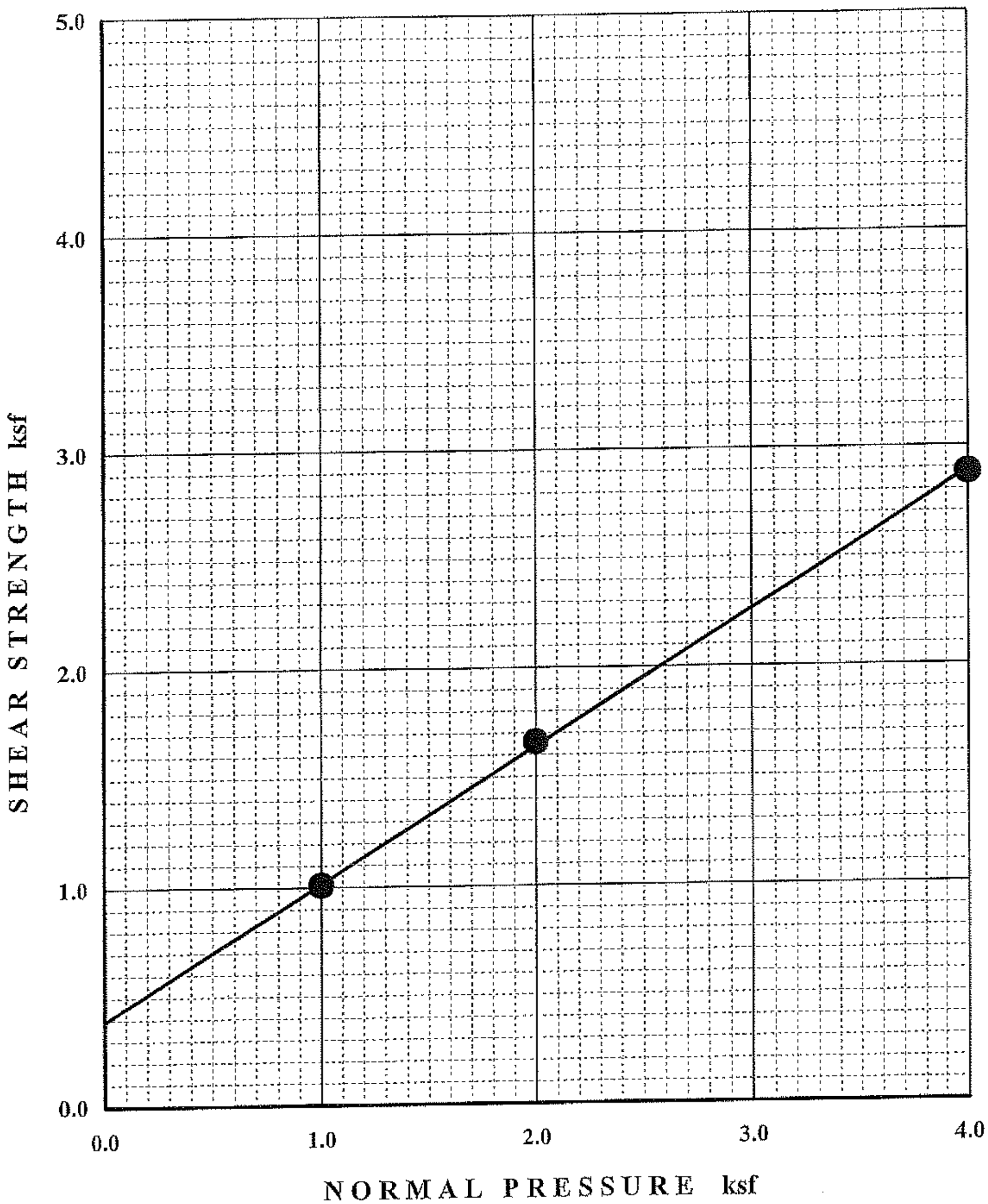
SHEAR TEST DIAGRAM

PROJECT:	Oak Pass Road, LLC	NUMBER:	G5277
SAMPLE:	Remolded Soil To 90%	DATE:	April, 2011



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs
DRY DENSITY & WATER CONTENT -

Initial moisture content = 18.0 %
Final moisture content = 28.2 %
94 pcf @ 28 %

Ultimate Shear Resistance
COHESION = 390 psf
PHI = 32 °

CALWEST GEOTECHNICAL

818-991-7148
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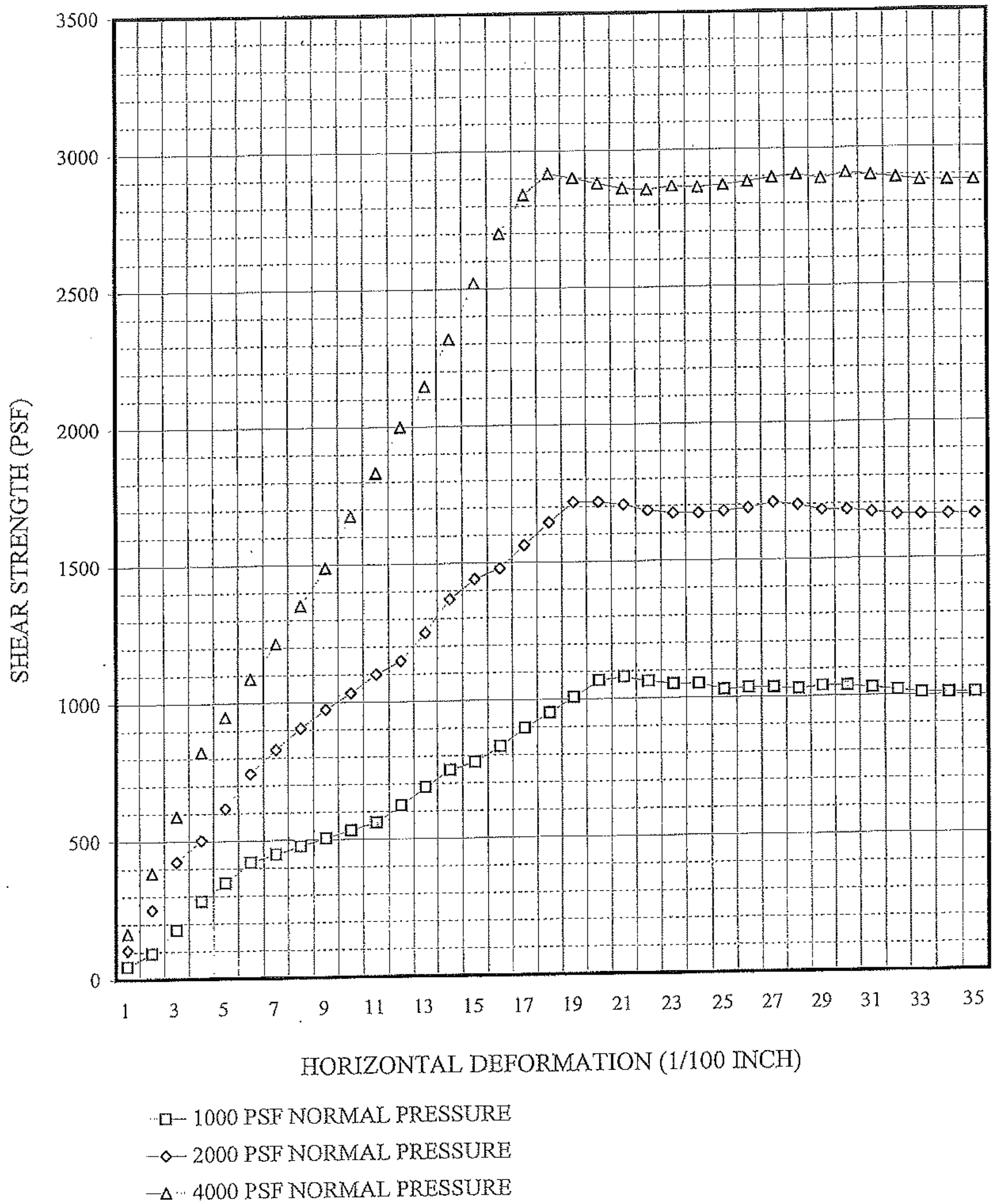
DIRECT SHEAR TEST

SAMPLE: **Remolded Soil To 90%** **first run**



CALWEST GEOTECHNICAL

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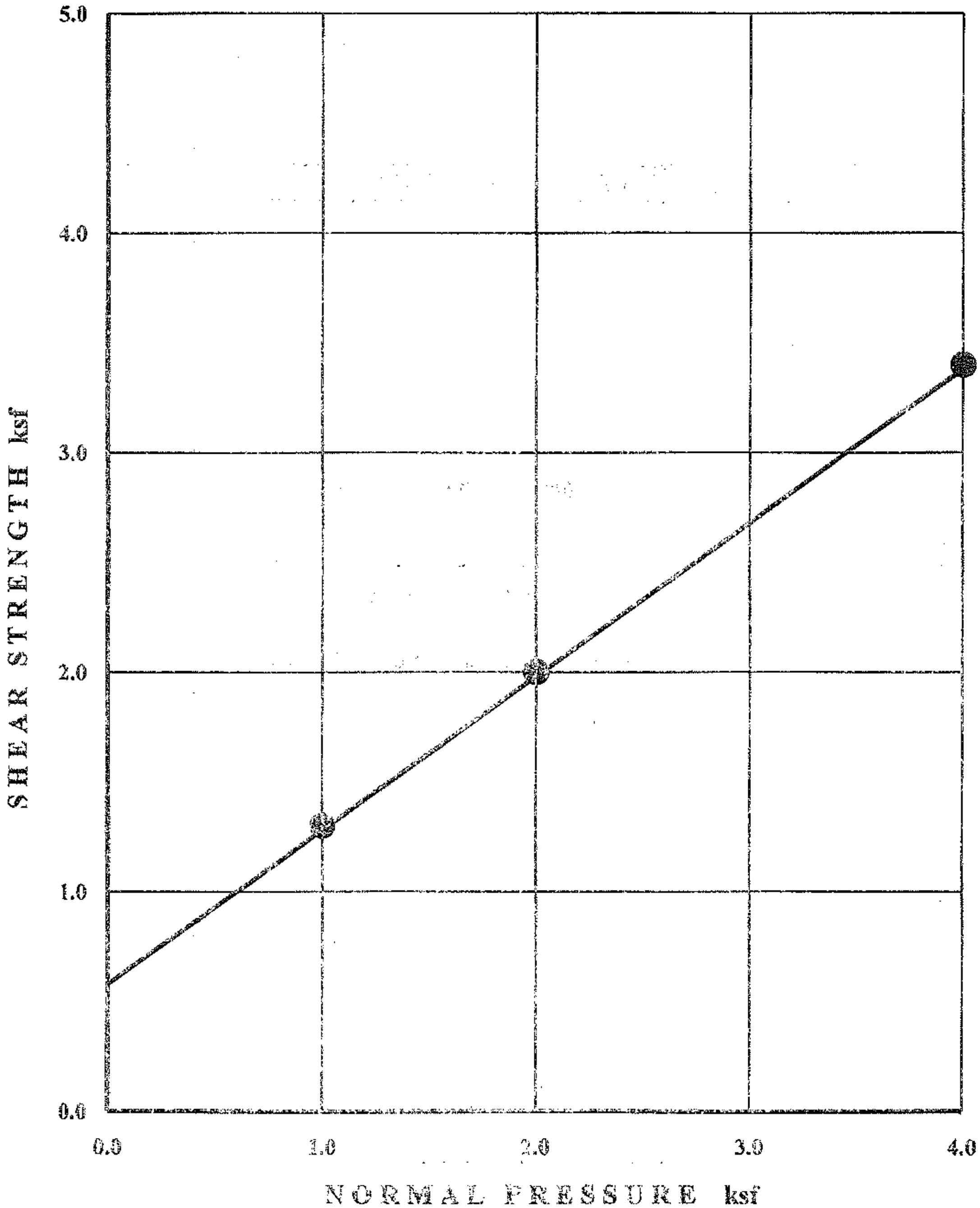
805-497-1244

SHEAR TEST DIAGRAM

PROJECT:	Oak Pass LLC	**NUMBER:**	G5277
SAMPLE:	B-4 @ 30' (Siltstone Shale Brx- Tm)	**DATE:**	Nov-12



STRAIN RATE -0.005 in/min — Initial moisture content = 18.8 %

SAMPLE SATURATION - 24 hrs — Final moisture content = 22.1 %

DRY DENSITY & WATER CONTENT - 104 pcf @ 22 %

ULTIMATE SHEAR RESISTANCE

COHESION = 580 psf

PHI = 35 °

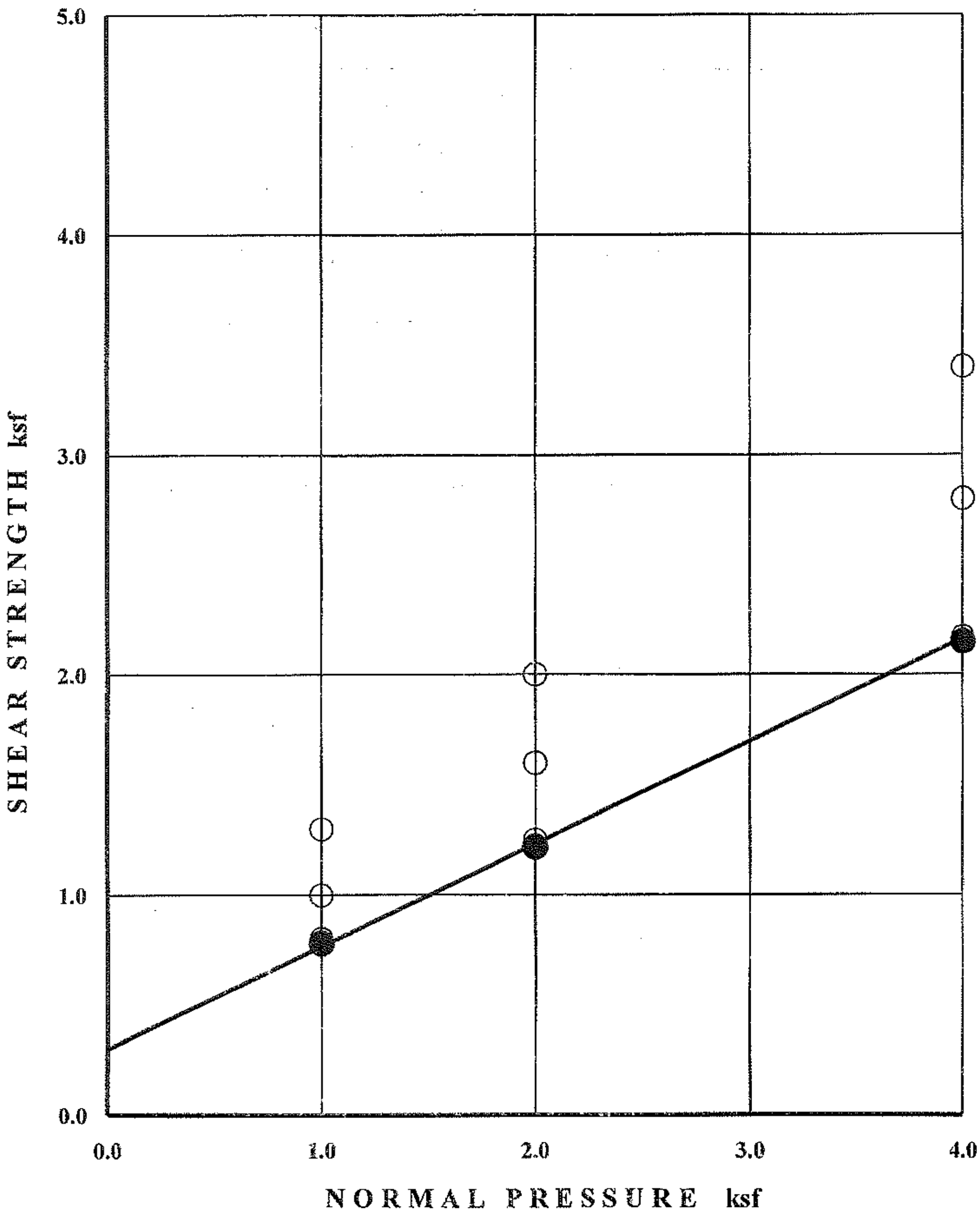
CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC NUMBER: G5277

SAMPLE: B-4 @ 30' (Siltstone Shale Brx- Tm) DATE: Nov-12



STRAIN RATE -0.010 in/min Initial moisture content = 18.8 %

SAMPLE SATURATION - 24 hrs Final moisture content = 22.1 %

DRY DENSITY & WATER CONTENT - 104 pcf @ 22 %

RESIDUAL SHEAR RESISTANCE

COHESION = 300 psf

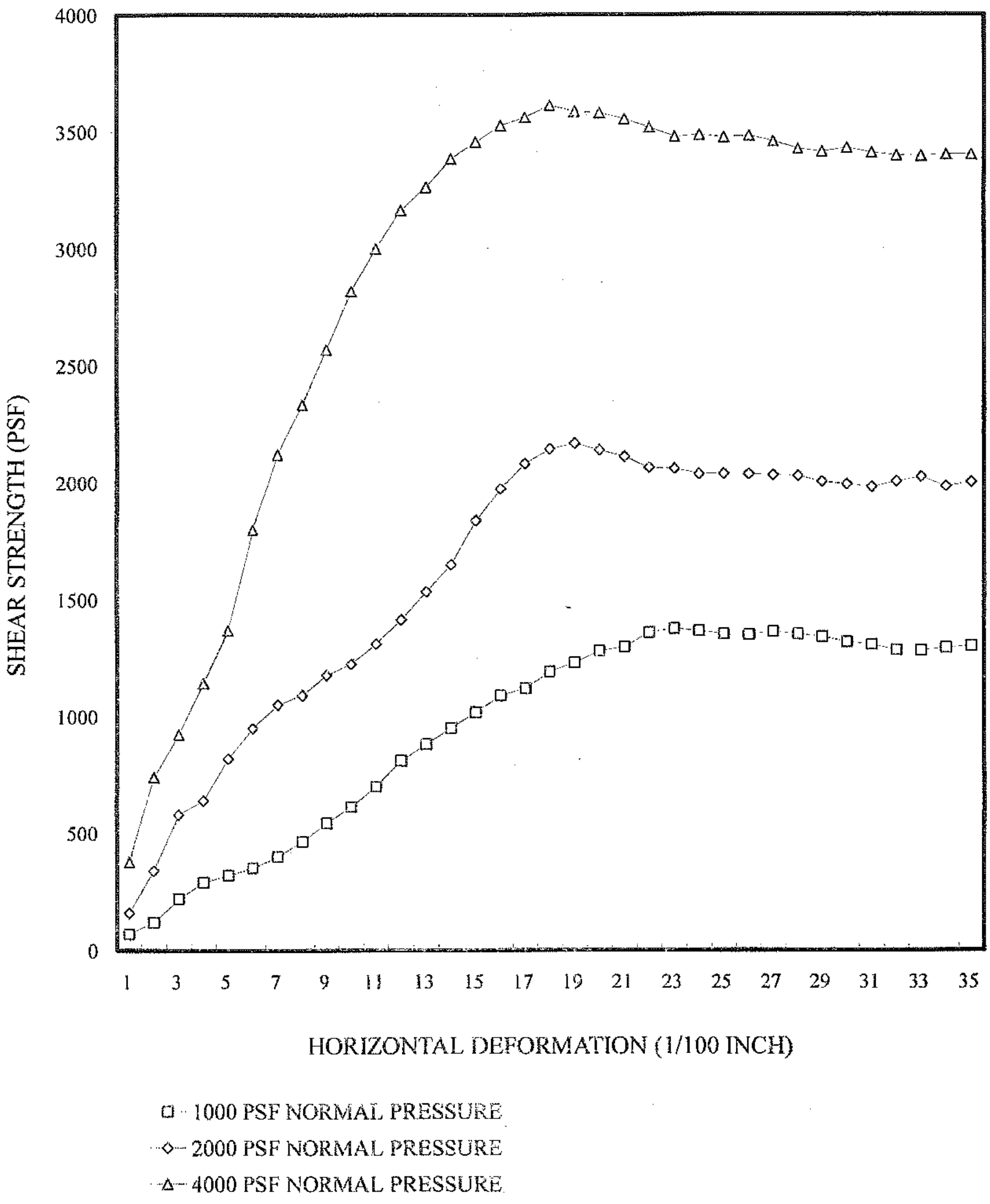
PHI = 25 °

CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

DIRECT SHEAR TEST

SAMPLE: **B-4 @ 30' (Siltstone Shale Brx- Tm)** **first run**

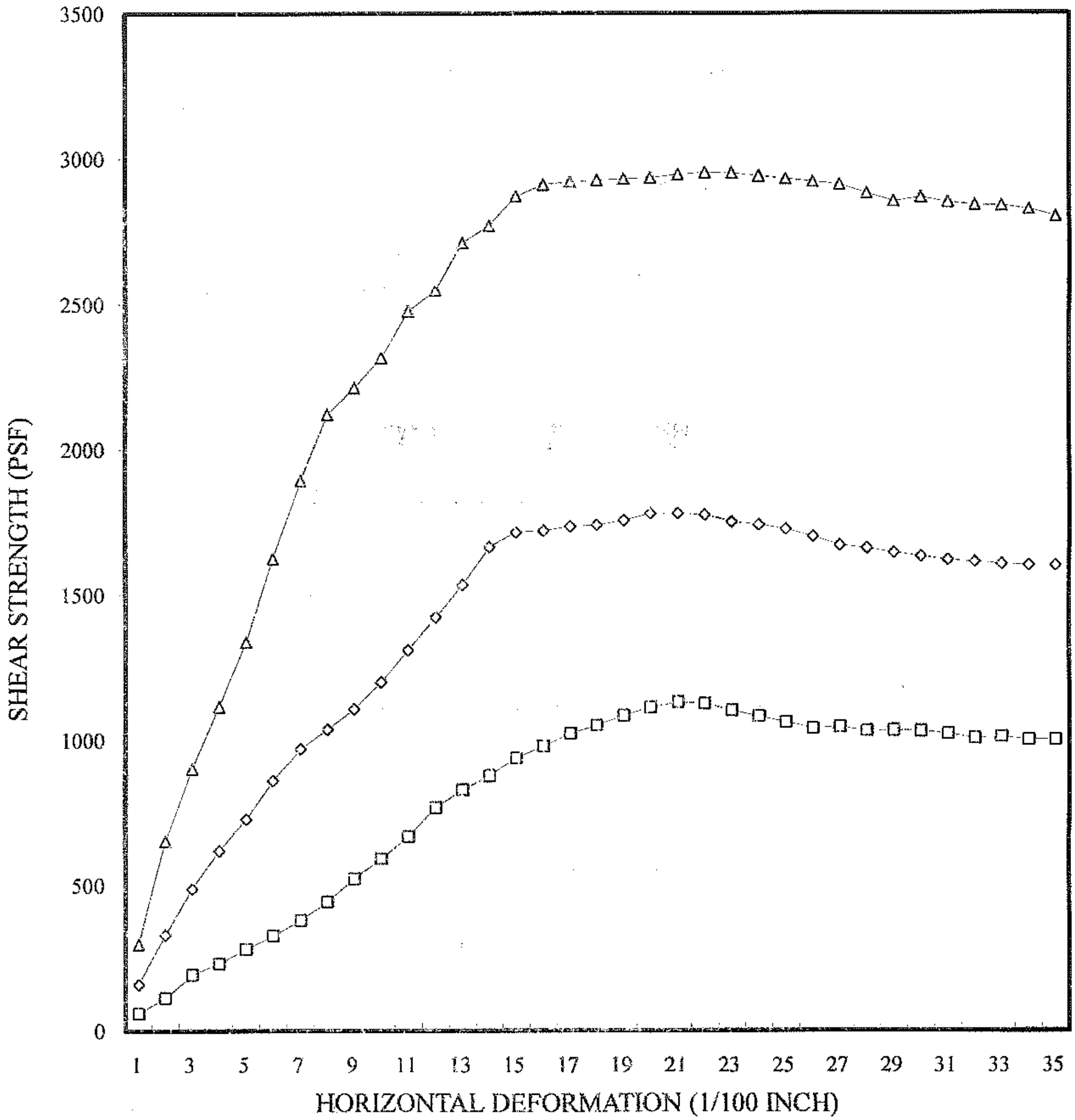


CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

DIRECT SHEAR TEST

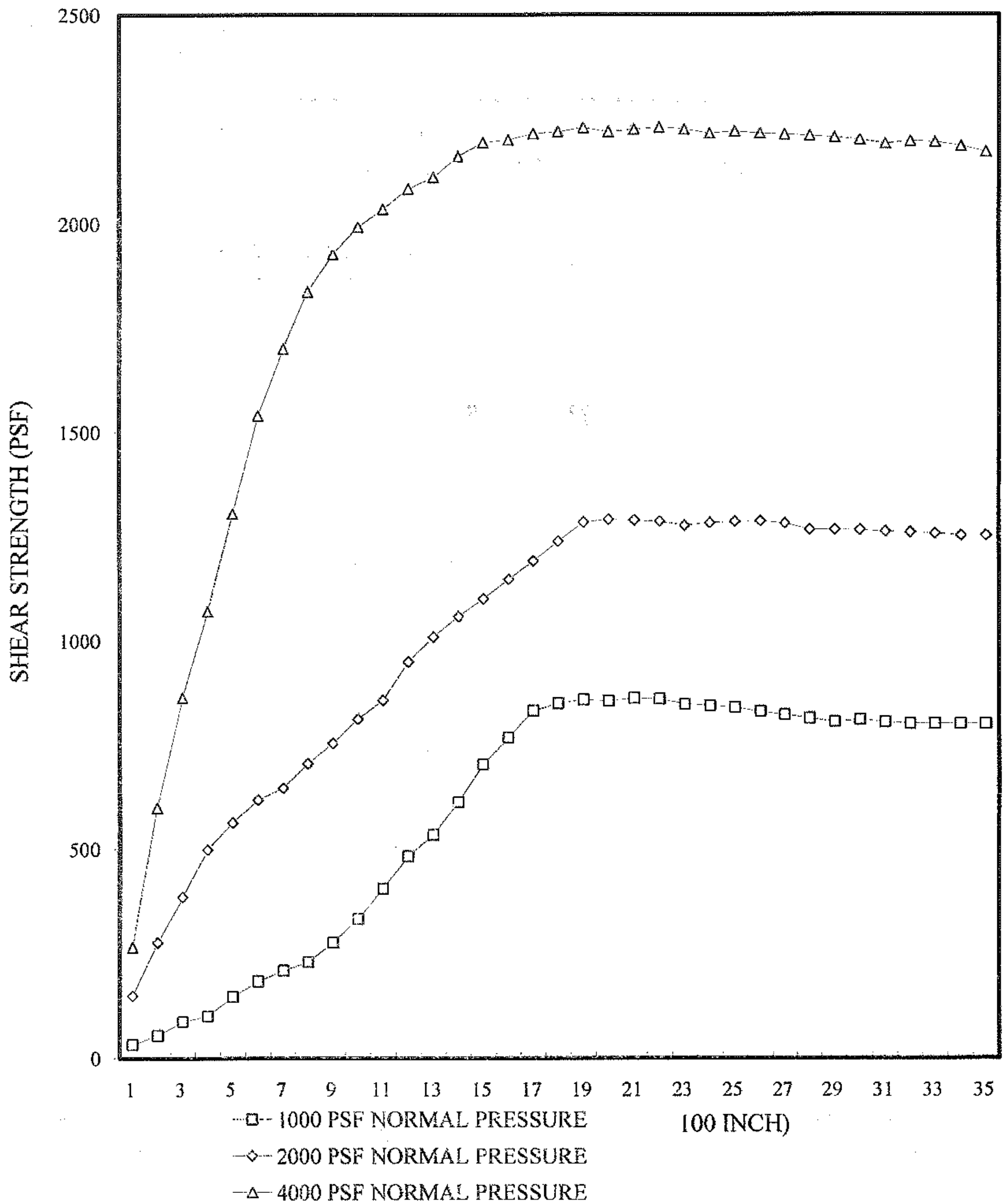
SAMPLE: **B-4 @ 30' (Siltstone Shale Brx- Tm)** **second run**



□ 1000 PSF NORMAL PRESSURE
◇ 2000 PSF NORMAL PRESSURE
△ 4000 PSF NORMAL PRESSURE

DIRECT SHEAR TEST

SAMPLE: **B-4 @ 30' (Siltstone Shale Brx- Tm)** **third run**



CALWEST GEOTECHNICAL

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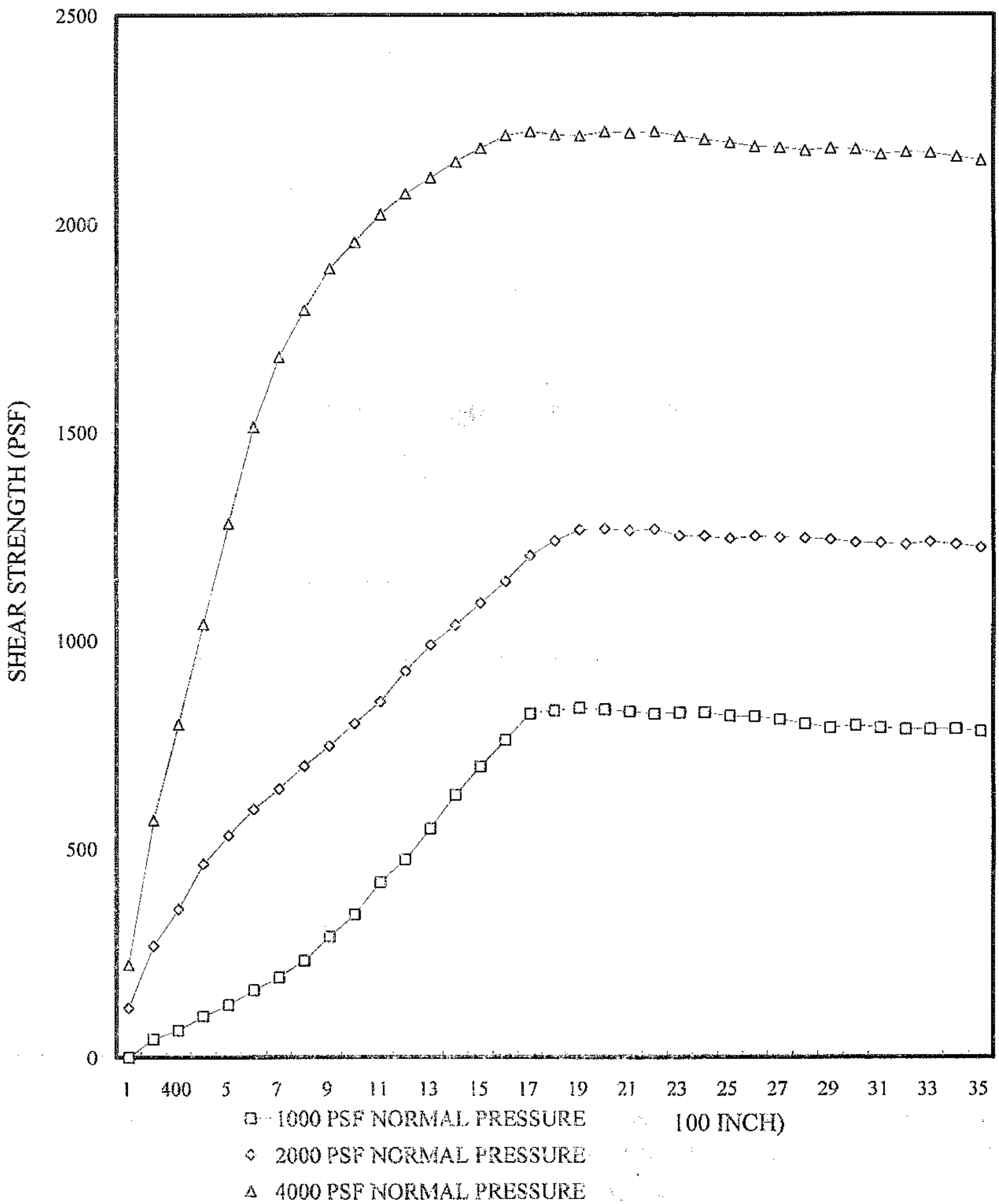
805-497-1244

DIRECT SHEAR TEST

SAMPLE: **B-4 @ 30' (Siltstone Shale Brx- Tm)** **fourth run**



CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

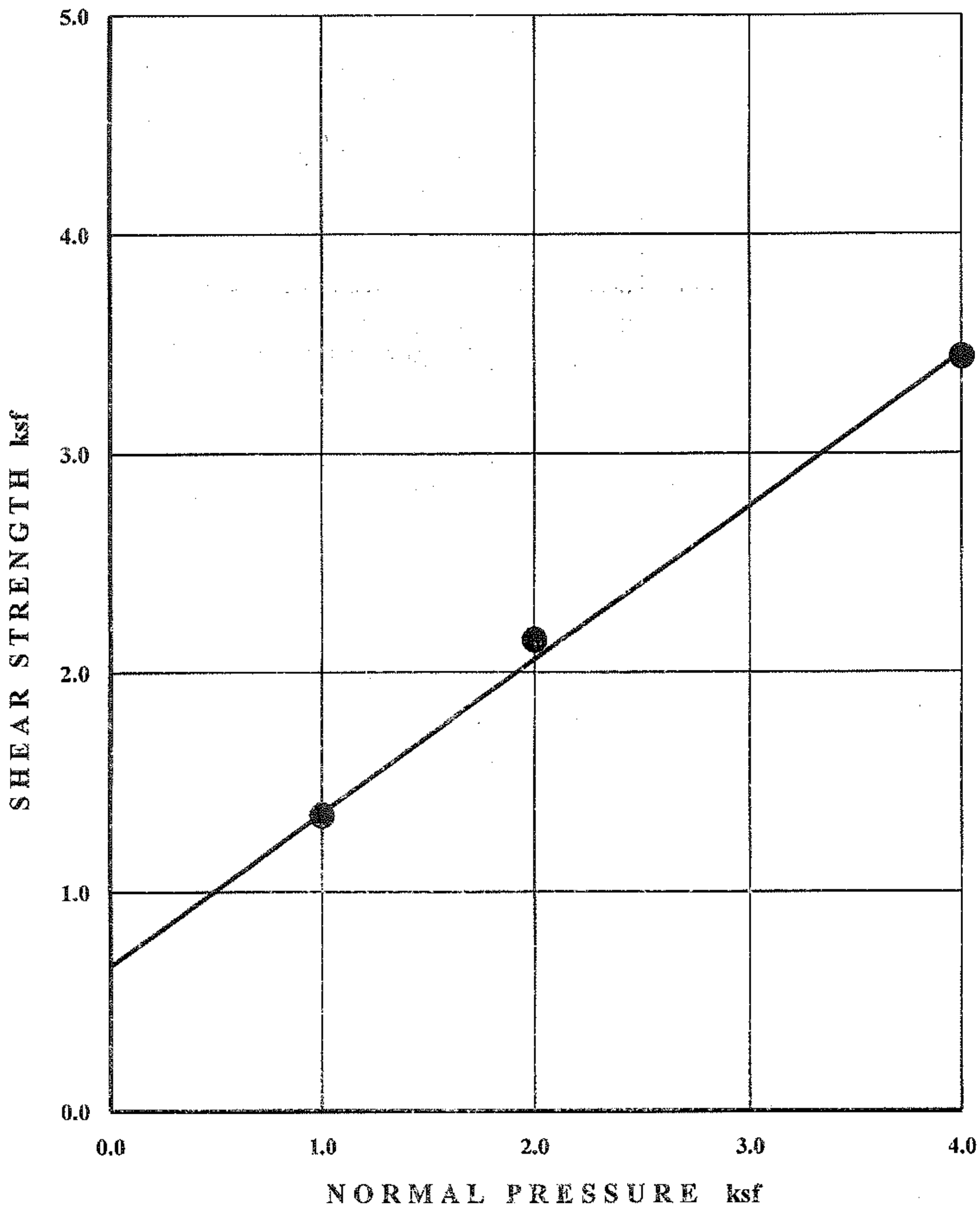
SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC

NUMBER: G5277

SAMPLE: B-4 @ 40' (Siltstone Shale Brx- Tm)

DATE: Nov-12



STRAIN RATE -0.005 in/min

SAMPLE SATURATION - 24 hrs

Initial moisture content = 11.7 %

Final moisture content = 18.3 %

DRY DENSITY & WATER CONTENT - 111.3 pcf @ 18 %

ULTIMATE SHEAR RESISTANCE

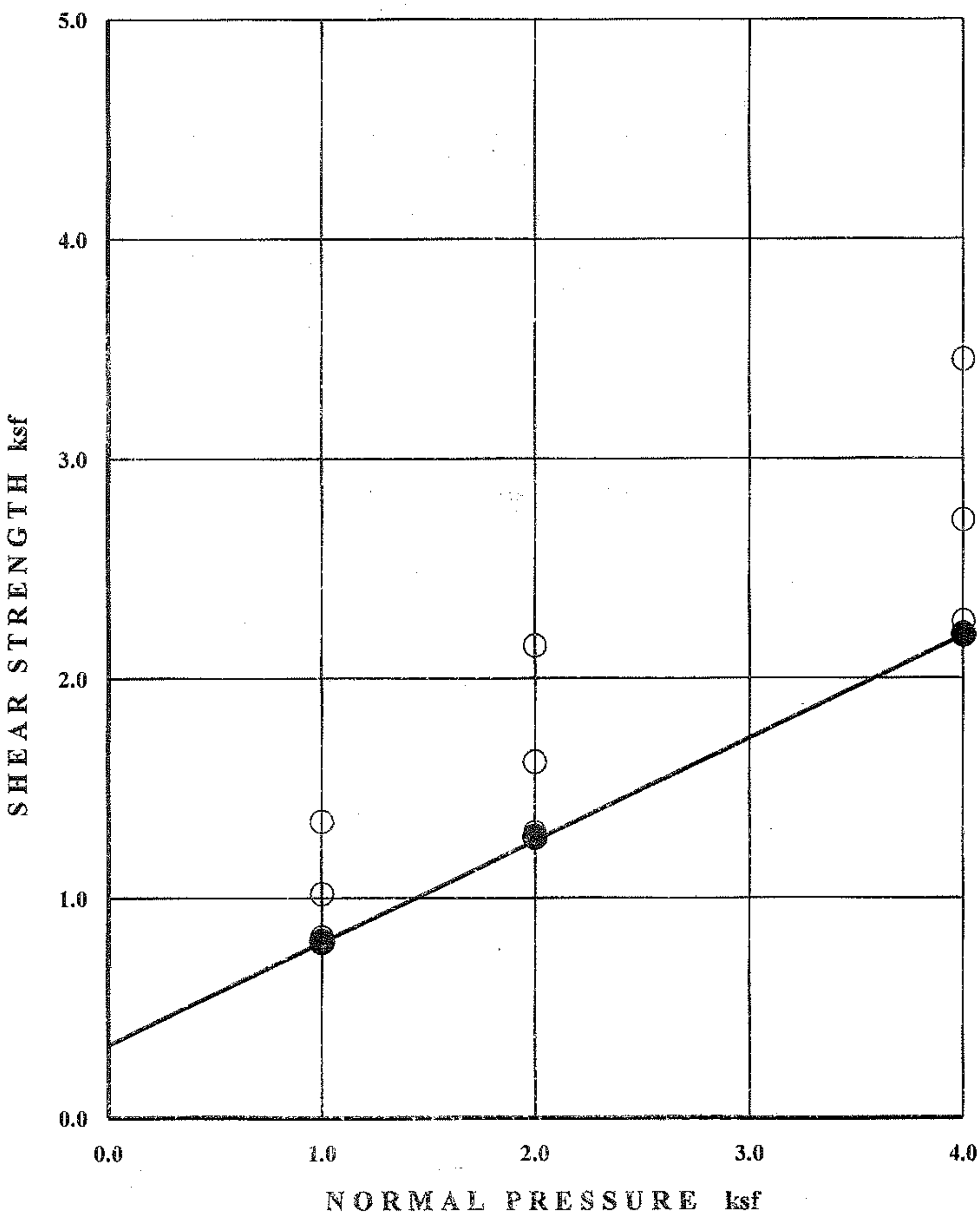
COHESION = 660 psf

PHI = 35 °

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC NUMBER: G5277

SAMPLE: B-4 @ 40' (Siltstone Shale- Tm) DATE: Nov-12



STRAIN RATE -0.010 in/min Initial moisture content = 11.7 %

SAMPLE SATURATION - 24 hrs Final moisture content = 18.3 %

DRY DENSITY & WATER CONTENT - 111.3 pcf @ 18 %

RESIDUAL SHEAR RESISTANCE

COHESION = 330 psf

PHI = 25 °

CALWEST GEOTECHNICAL

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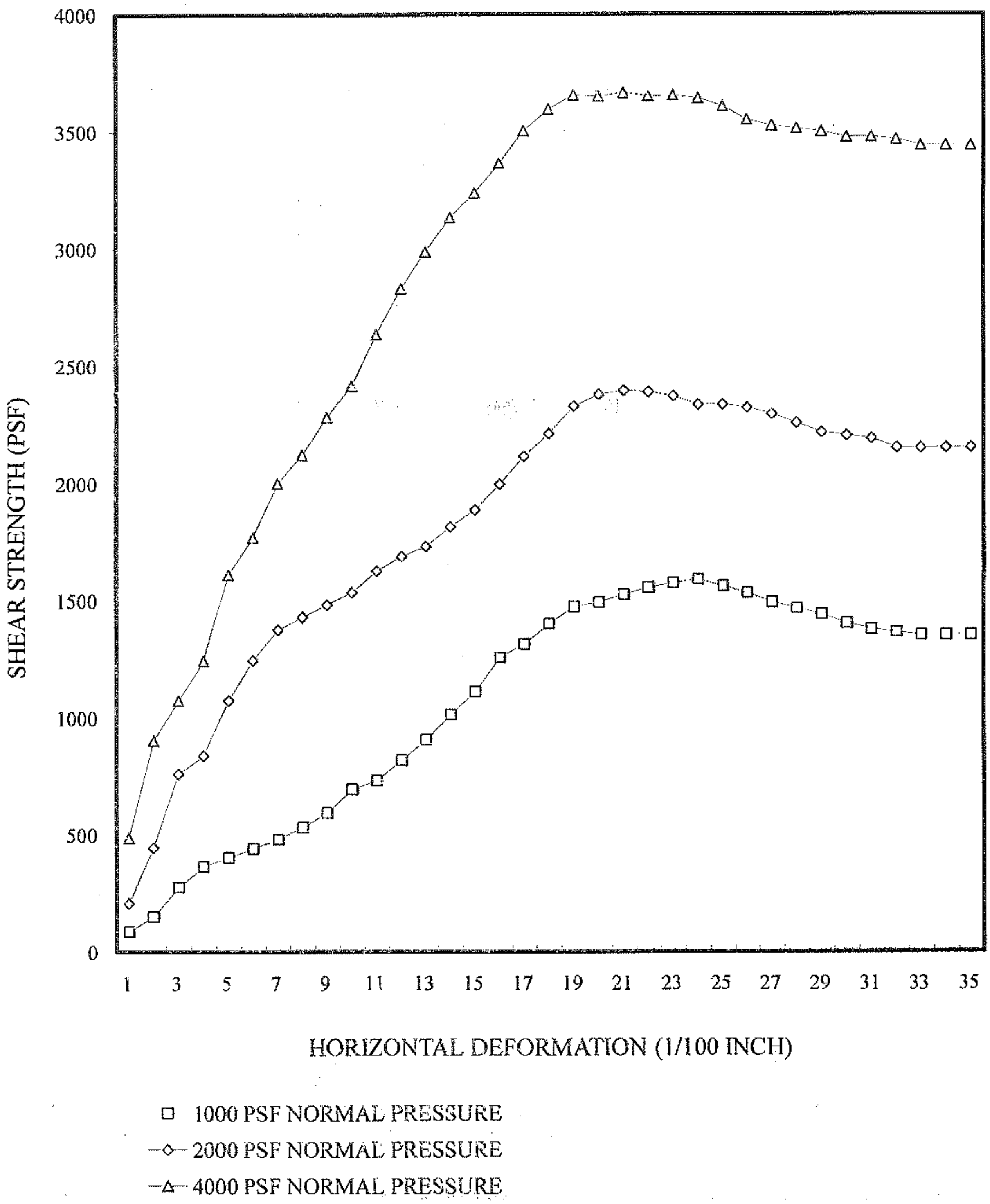
805-497-1244

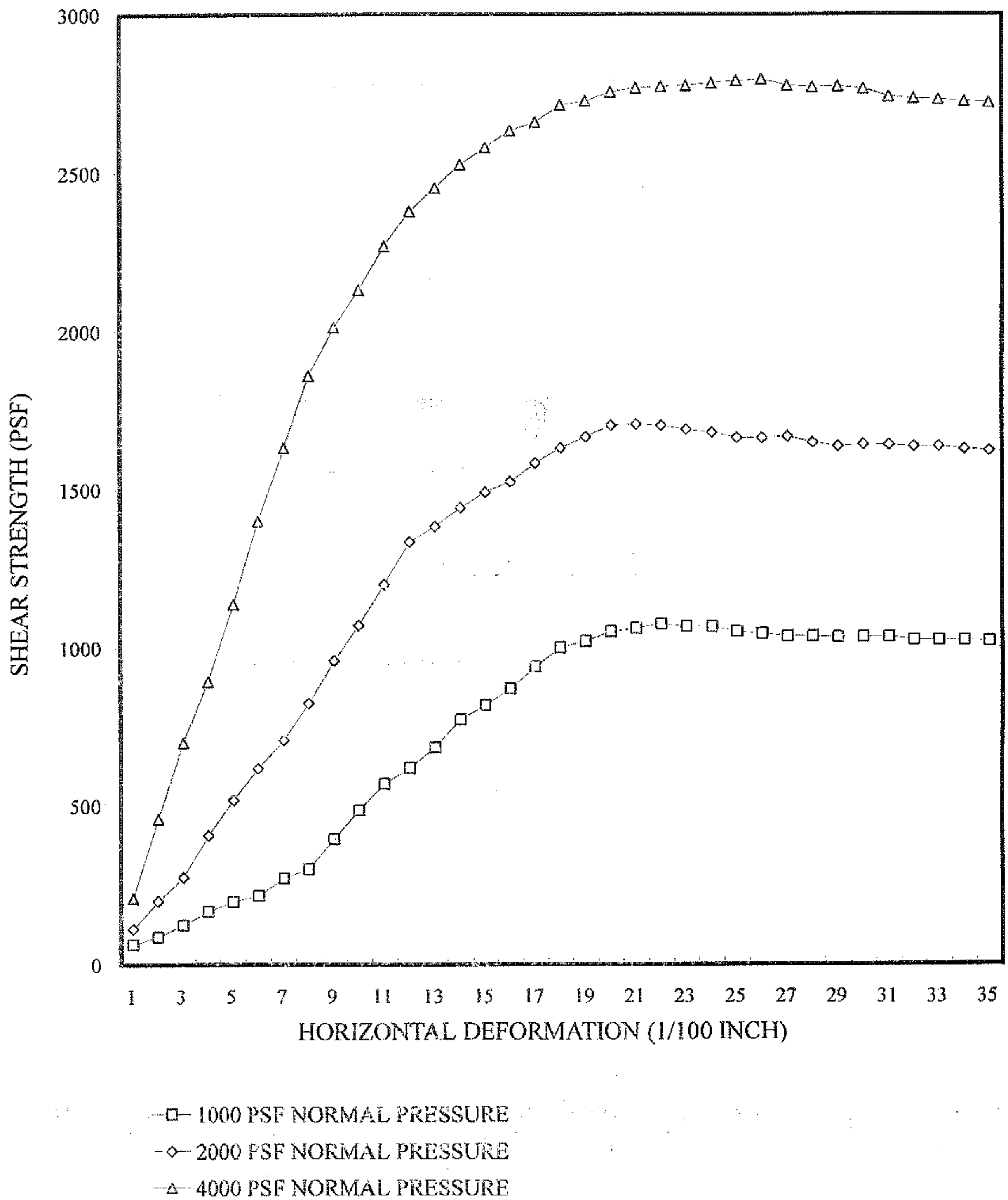
DIRECT SHEAR TEST

SAMPLE: **B-4 @ 40' (Siltstone Shale- Tm)** **first run**



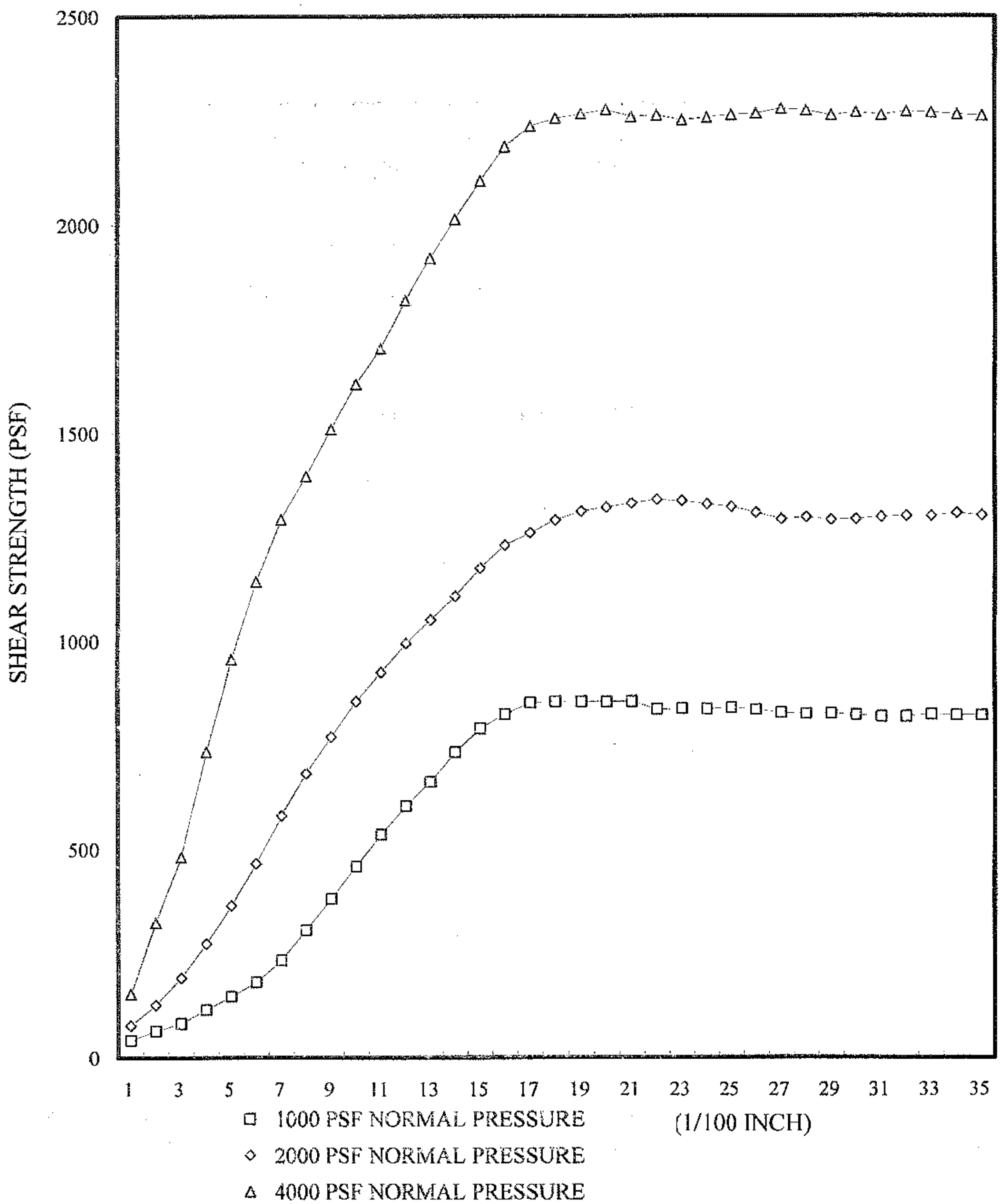
DIRECT SHEAR TEST

SAMPLE: **B-4 @ 40' (Siltstone Shale- Tm)** **second run**



DIRECT SHEAR TEST

SAMPLE: **B-4 @ 40' (Siltstone Shale- Tm)** **third run**



CALWEST GEOTECHNICAL

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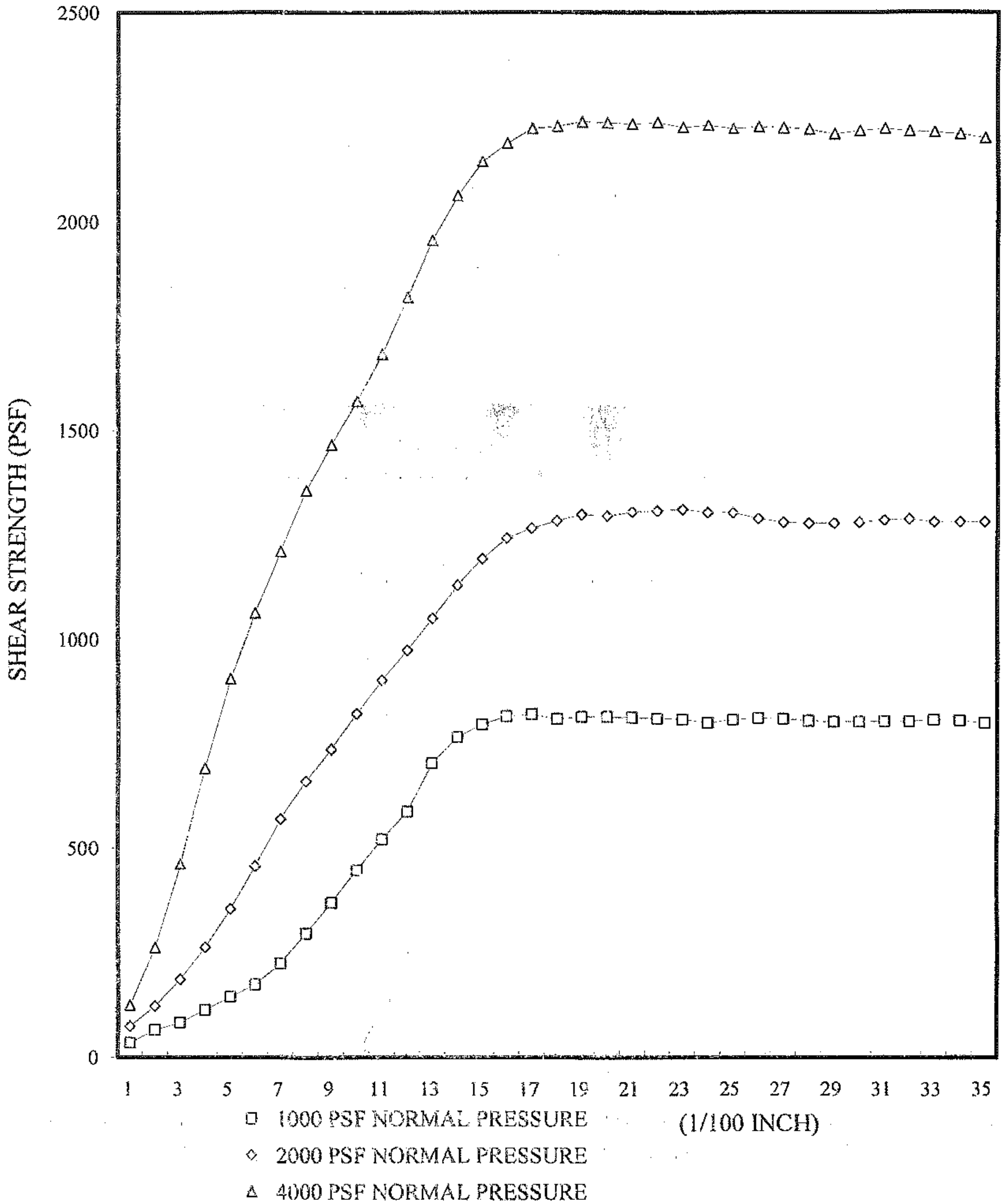
DIRECT SHEAR TEST

SAMPLE: **B-4 @ 40' (Siltstone Shale- Tm)** **fourth run**



CALWEST GEOTECHNICAL

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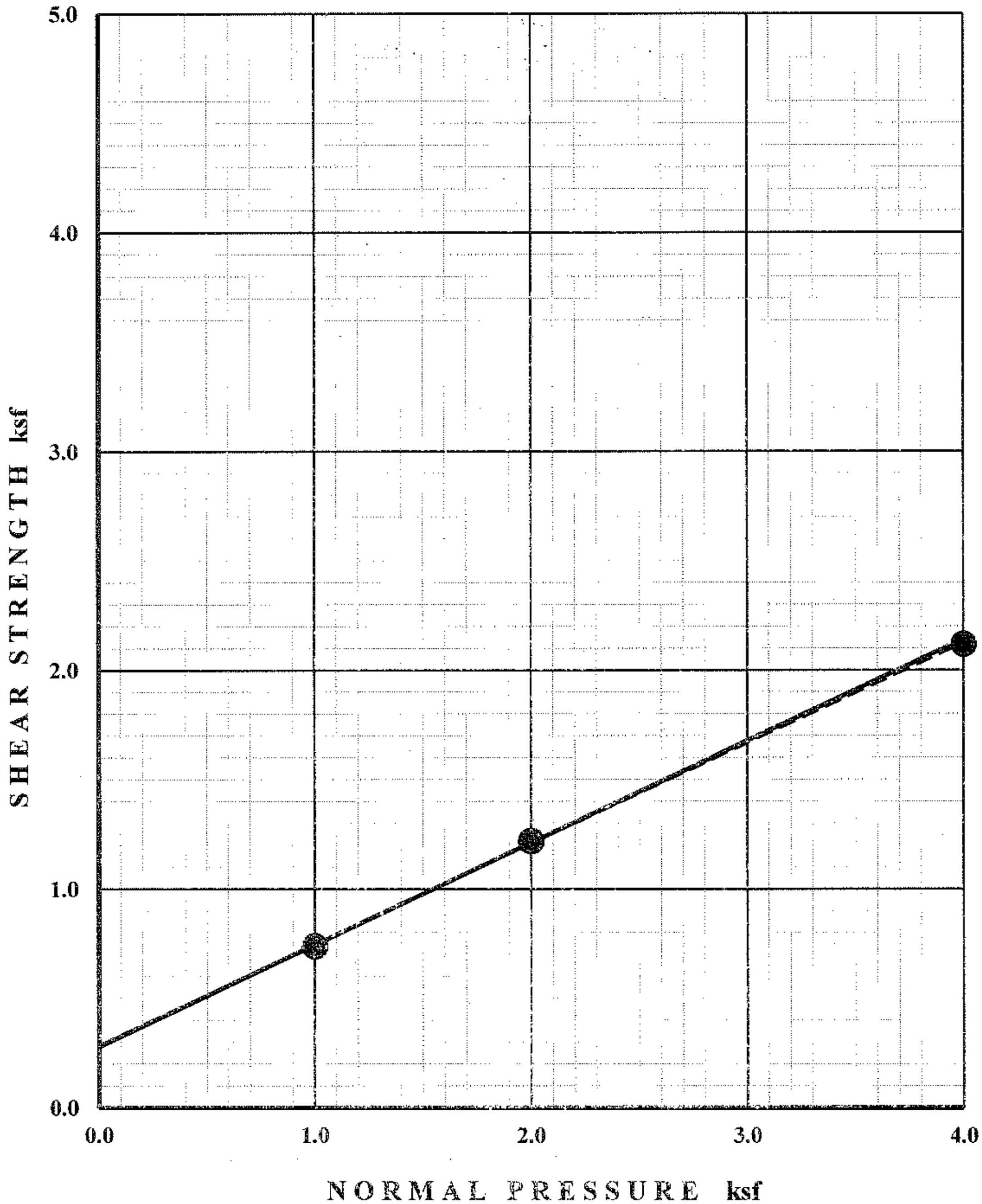
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-7 @ 10'(Very Weathered Brx) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 20.1 %
Final moisture content = 23.2 %

ULTIMATE SHEAR RESISTANCE
COHESION = 280 psf
PHI = 25 °

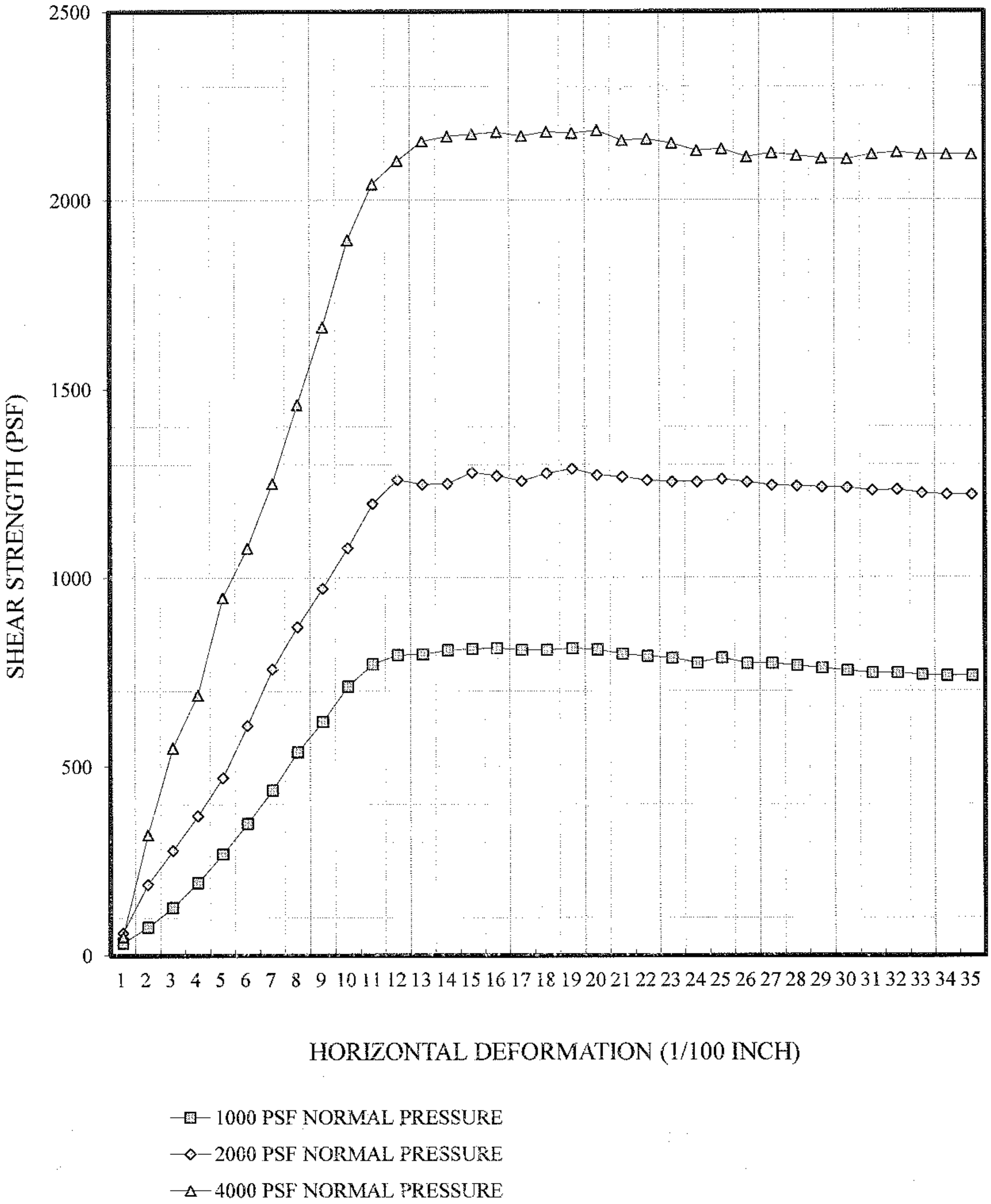
DRY DENSITY & WATER CONTENT - 102 pcf @ 23 %

CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

DIRECT SHEAR TEST

SAMPLE: **B-7 @ 10'(Very Weathered Brx)** **first run**



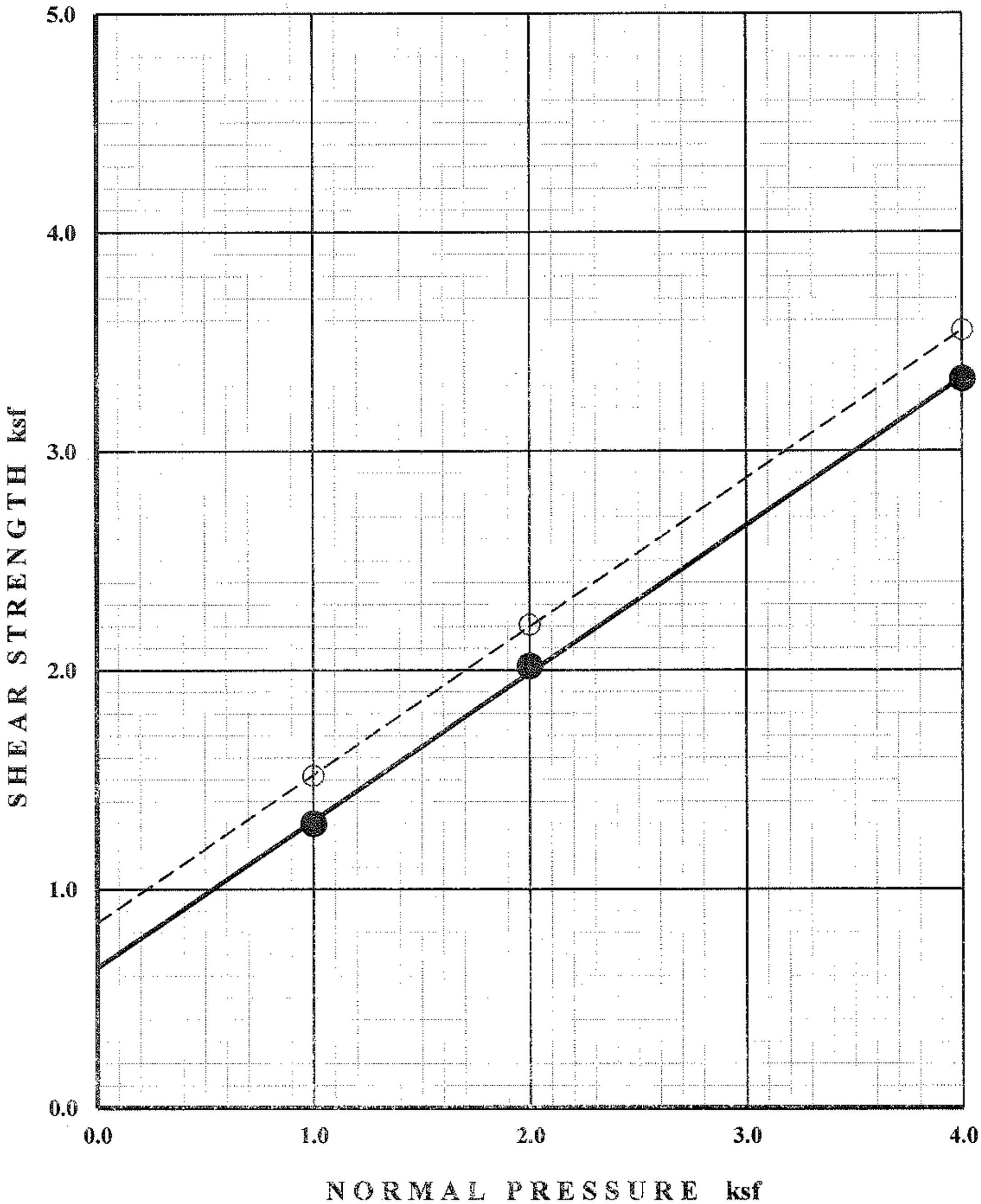
CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-7 @ 15' (Siltstone & Shale Brx- Tm) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 18.1 %
Final moisture content = 20.3 %

ULTIMATE SHEAR RESISTANCE
COHESION = 640 psf
PHI = 34 °

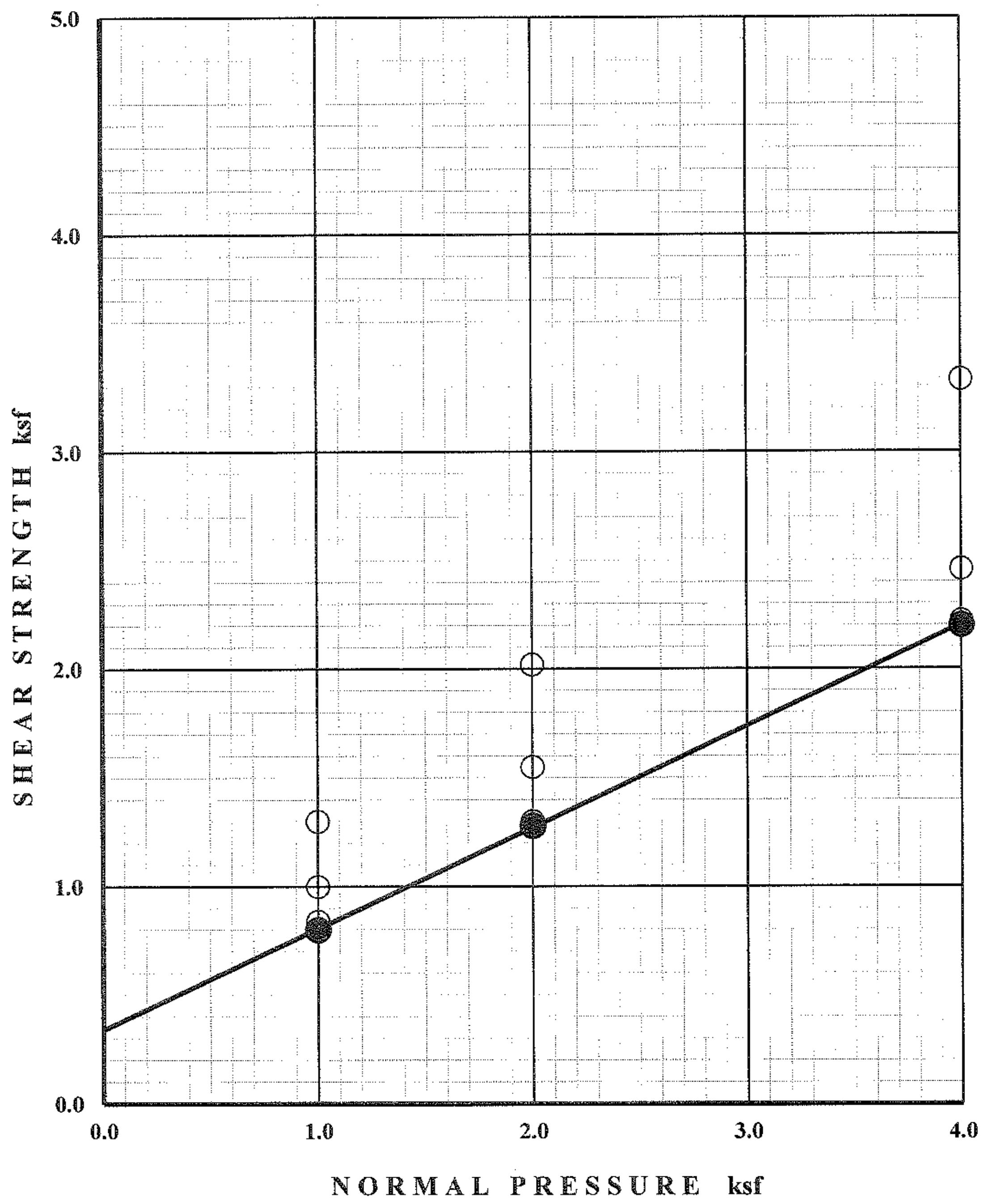
DRY DENSITY & WATER CONTENT - 107.2 pcf @ 20 %

PEAK SHEAR RESISTANCE
COHESION = 846 psf
PHI = 34 °

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-7 @ 15' (Siltstone & Shale Brx- Tm) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min

SAMPLE SATURATION - 24 hrs

Initial moisture content = 18.1 %

Final moisture content = 20.3 %

Residual Re- Shear Resistance

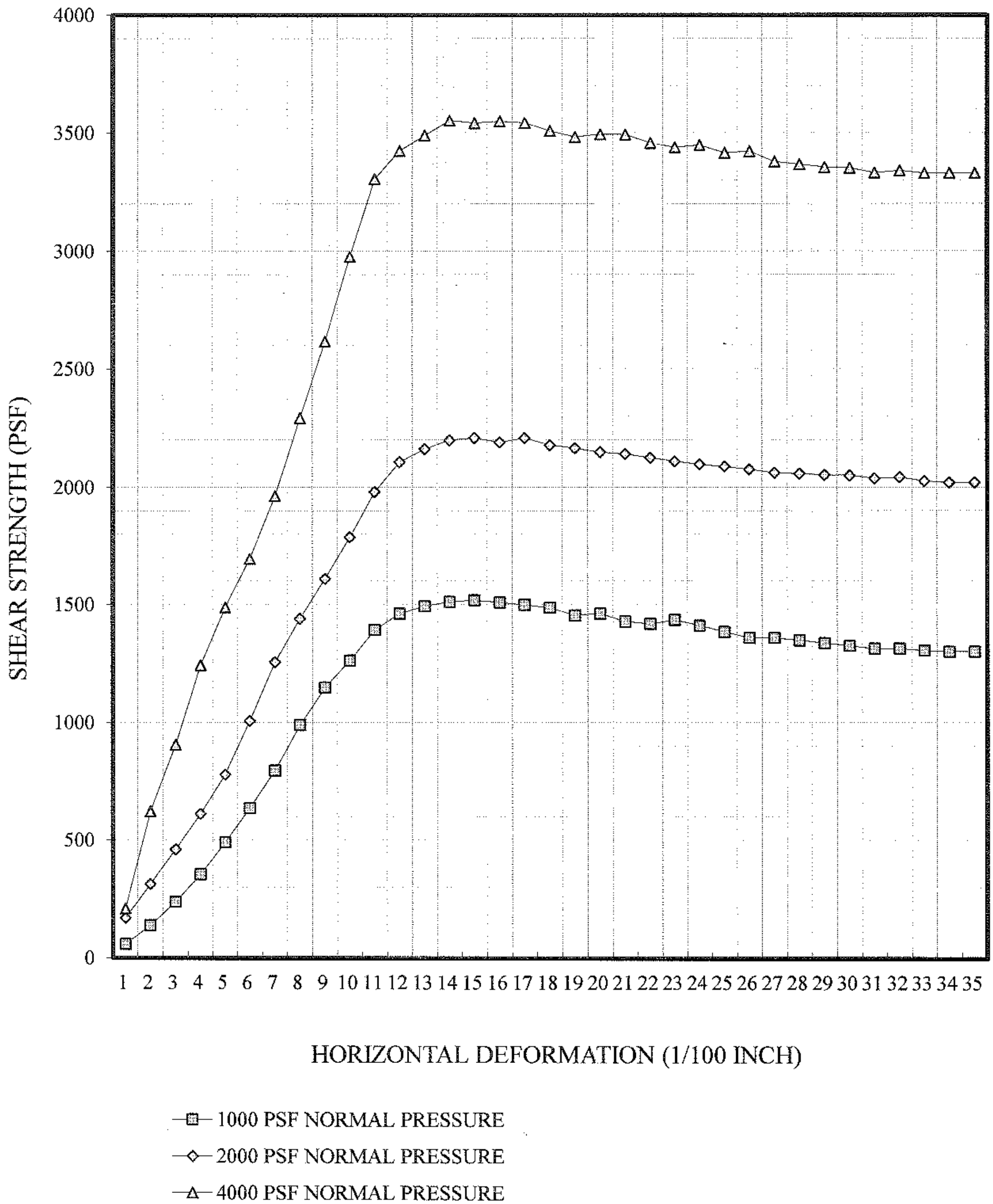
COHESION = 340 psf

PHI = 25 °

DRY DENSITY & WATER CONTENT - 107 pcf @ 20 %

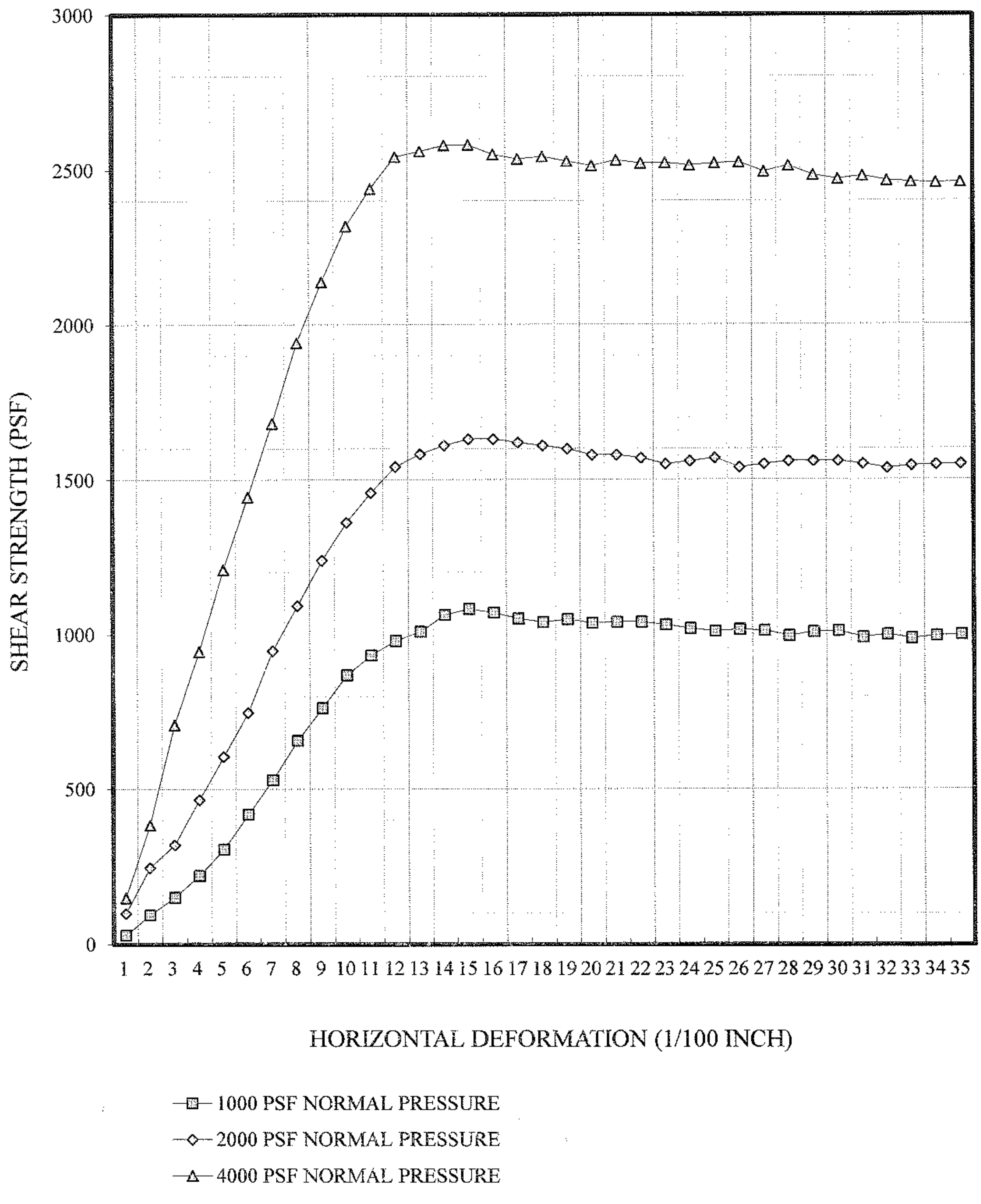
DIRECT SHEAR TEST

SAMPLE: **B-7 @ 15' (Siltstone & Shale Brx- Tm)** **1st run**



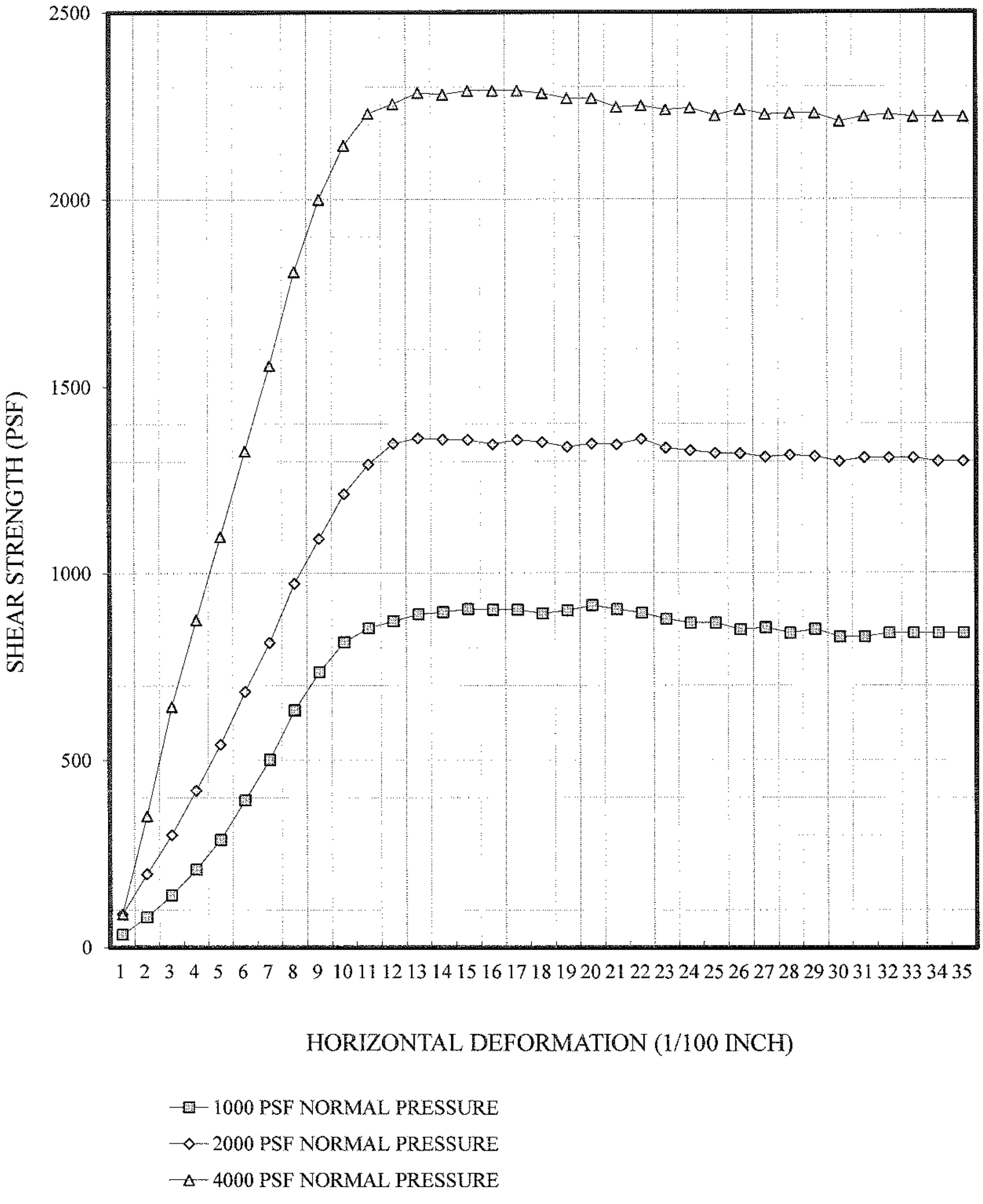
DIRECT SHEAR TEST

SAMPLE: **B-7 @ 15' (Siltstone & Shale Brx- Tm)** **2nd run**



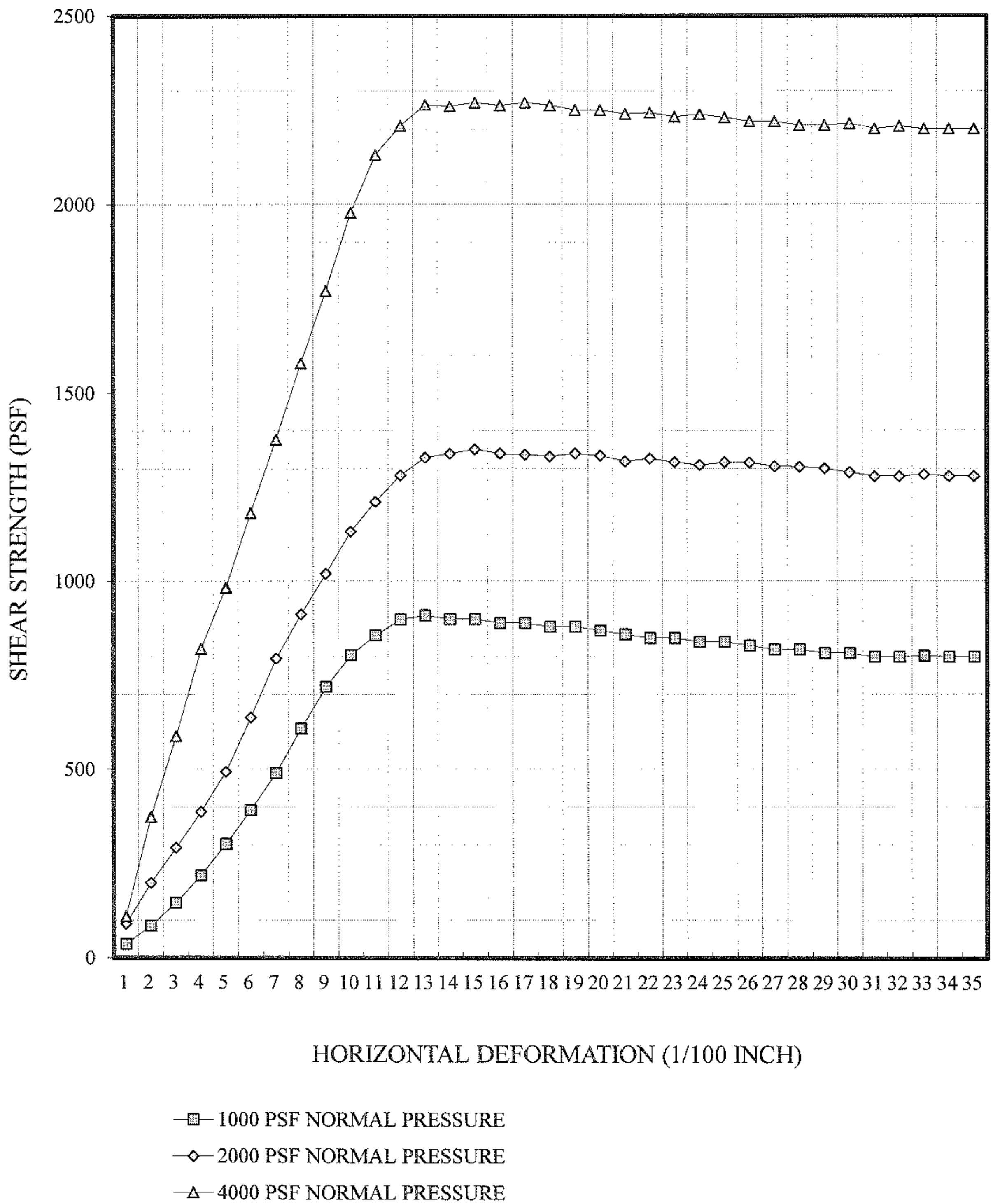
DIRECT SHEAR TEST

SAMPLE: **B-7 @ 15' (Siltstone & Shale Brx- Tm)** **3rd run**



DIRECT SHEAR TEST

SAMPLE: **B-7 @ 15' (Siltstone & Shale Brx- Tm)** **4th run**



CALWEST GEOTECHNICAL

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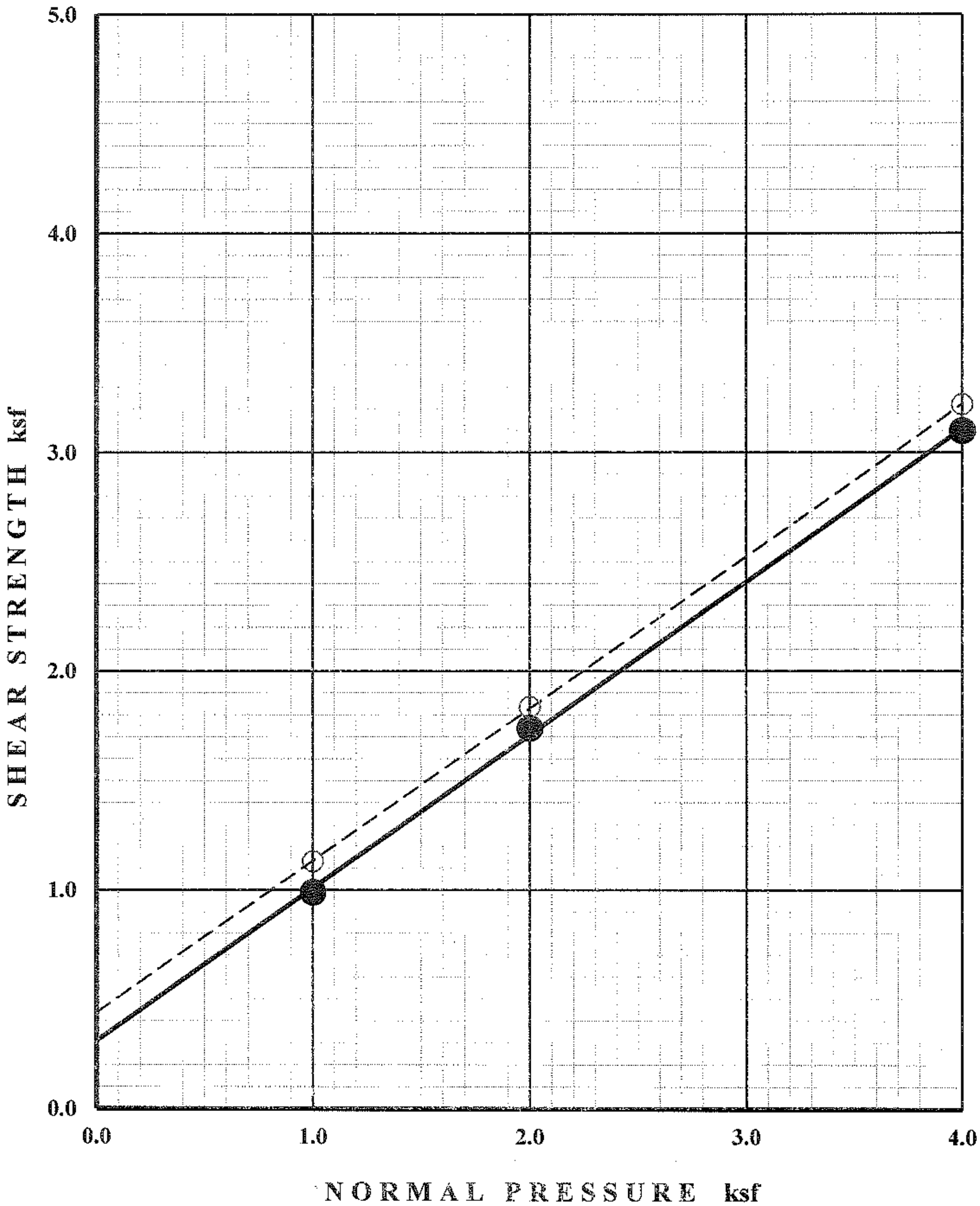
SHEAR TEST DIAGRAM

PROJECT:	**Oak Pass LLC**	**NUMBER:**	**5750II**
SAMPLE:	**B-8 @ 10' (Weathered Sandstone Brx)**	**DATE:**	**Dec., 2018**



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 16.4 %
Final moisture content = 20.0 %

ULTIMATE SHEAR RESISTANCE
COHESION = 310 psf
PHI = 35 °

DRY DENSITY & WATER CONTENT - 107.7 pcf @ 20 %

PEAK SHEAR RESISTANCE
COHESION = 440 psf
PHI = 35 °

CALWEST GEOTECHNICAL

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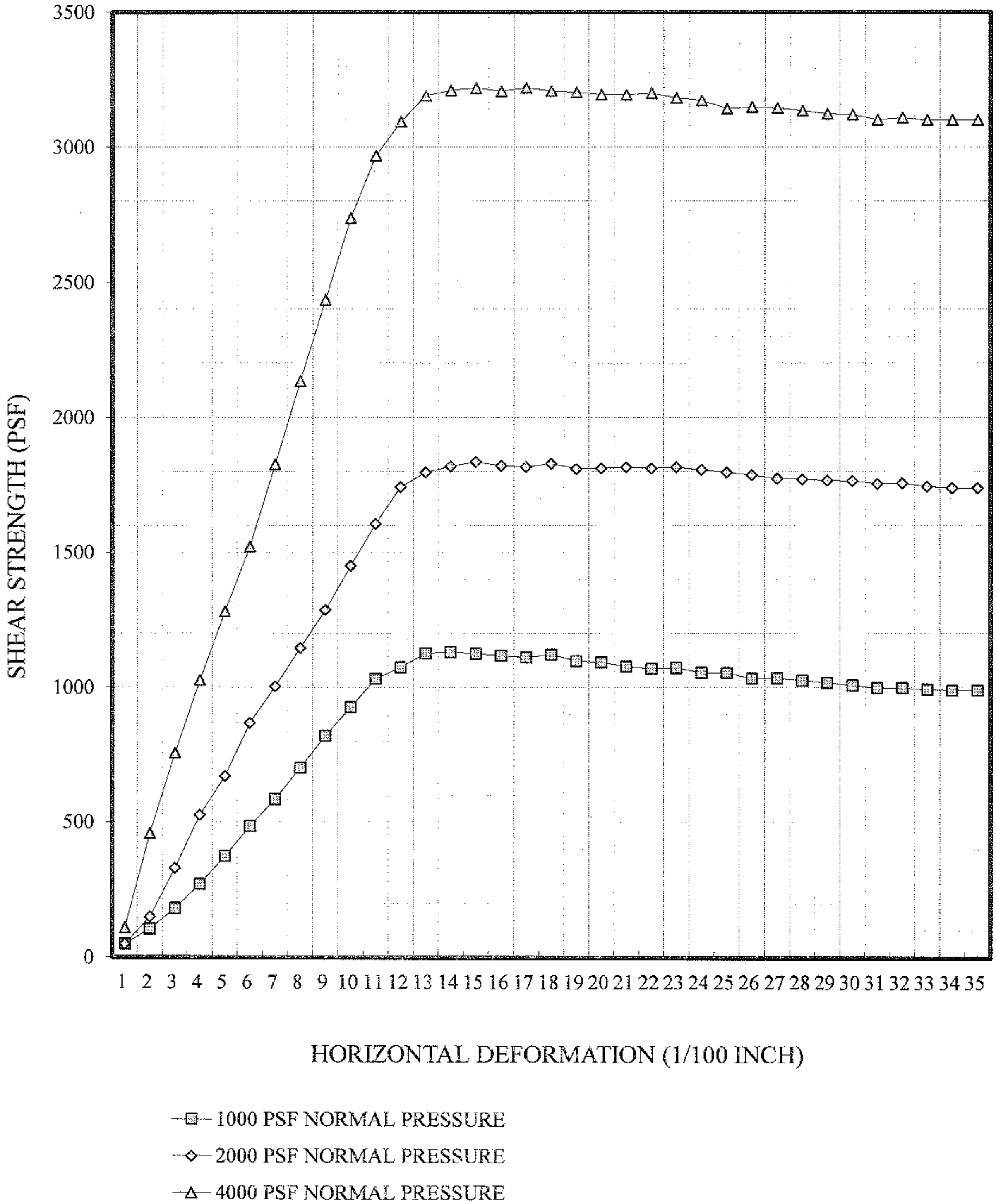
805-497-1244

DIRECT SHEAR TEST

SAMPLE: **B-8 @ 10' (Weathered Sandstone Brx)** **first run**



CALWEST GEOTECHNICAL

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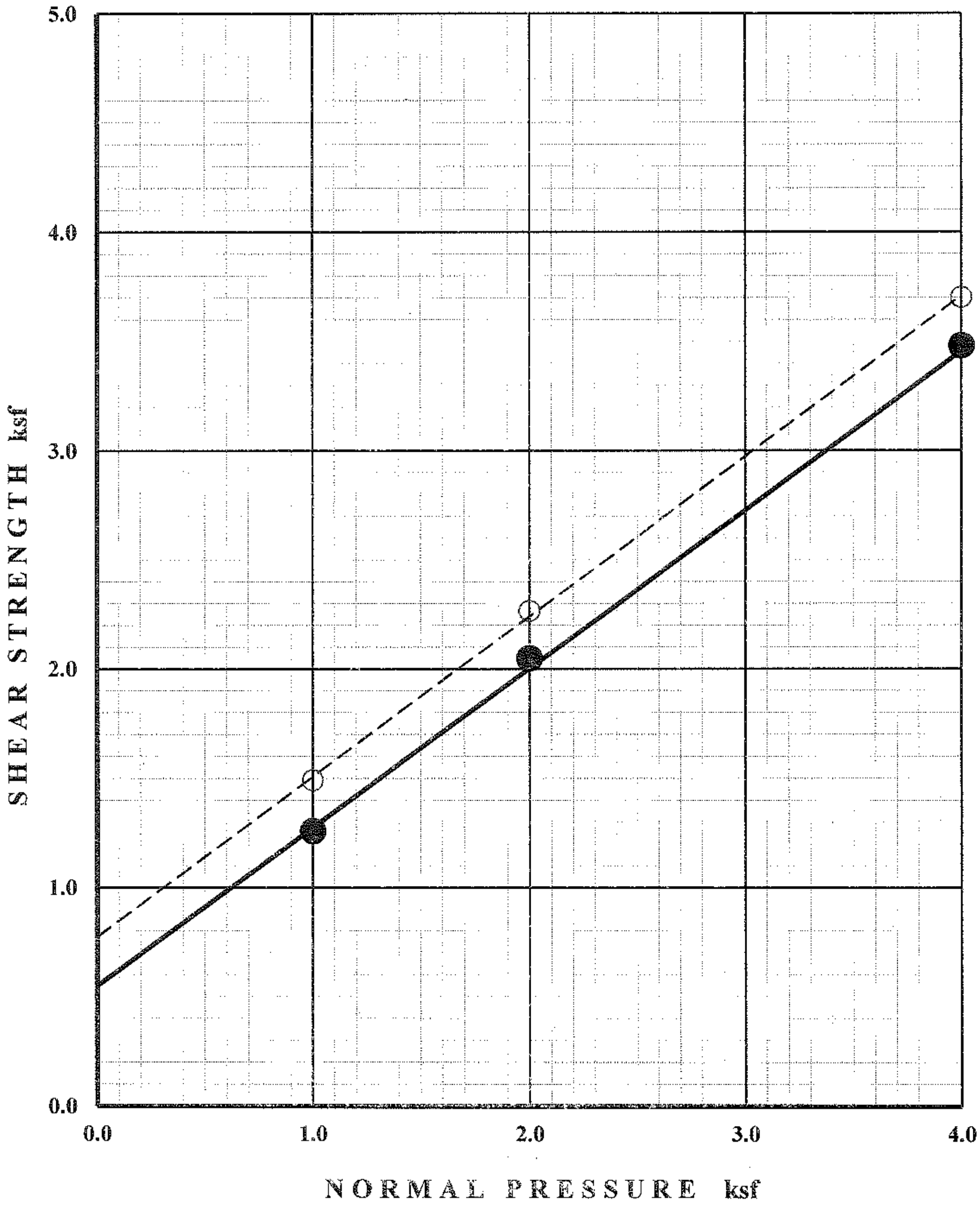
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-8 @ 35' (Bedrock- Tm) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 18.0 %
Final moisture content = 21.0 %

ULTIMATE SHEAR RESISTANCE
COHESION = 550 psf
PHI = 36 °

DRY DENSITY & WATER CONTENT - 106 pcf @ 21 %

PEAK SHEAR RESISTANCE
COHESION = 775 psf
PHI = 36 °

CALWEST GEOTECHNICAL

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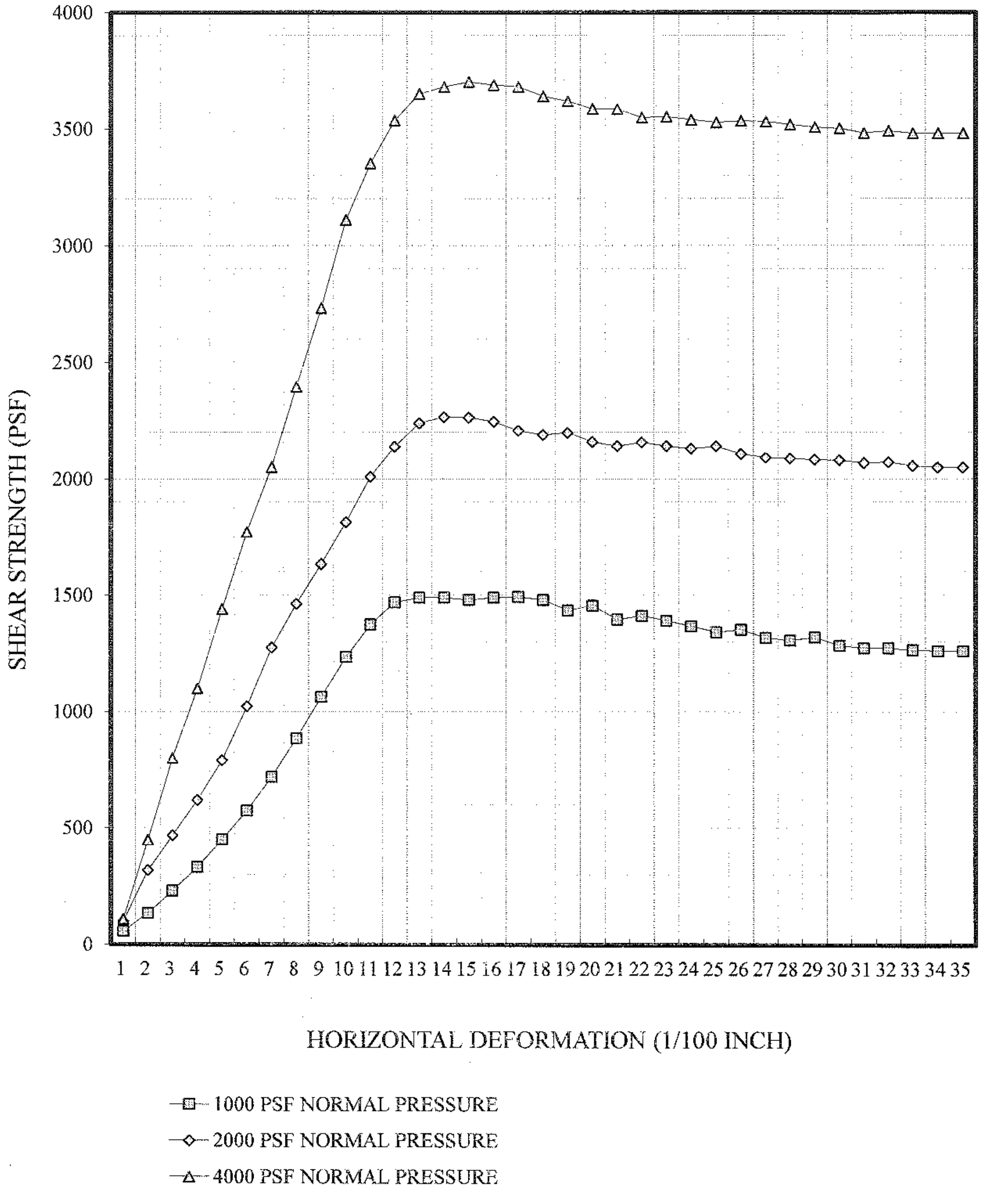
805-497-1244

DIRECT SHEAR TEST

SAMPLE: **B-8 @ 35' (Bedrock- Tm)** **first run**

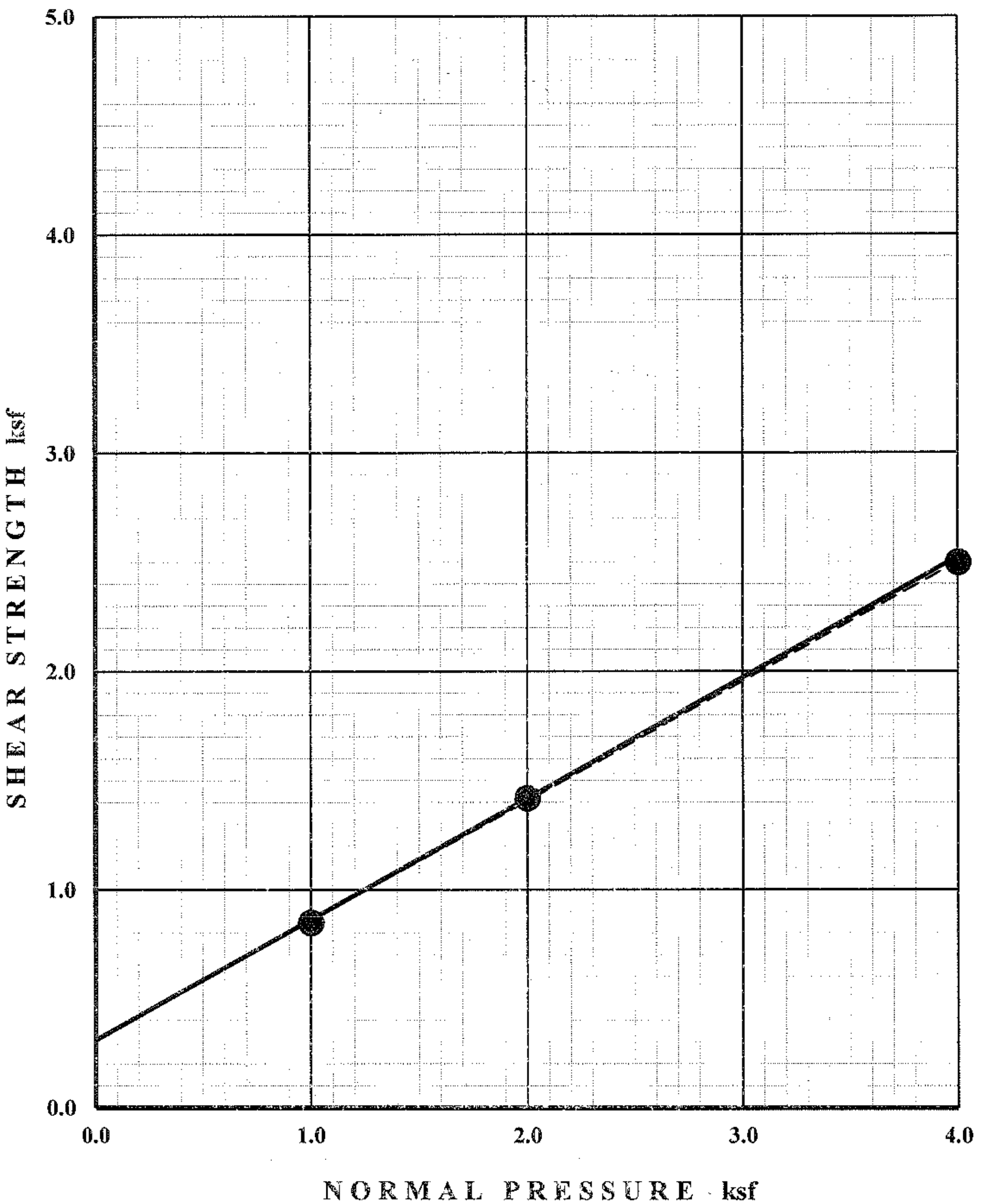


CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

SHEAR TEST DIAGRAM

PROJECT:	**Oak Pass LLC**	**NUMBER:**	**5750II**
SAMPLE:	**B-9 @ @ 15'(Very Weathered Brx)**	**DATE:**	**Dec., 2018**



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 9.1 %
Final moisture content = 23.8 %

ULTIMATE SHEAR RESISTANCE
COHESION = 310 psf
PHI = 29 °

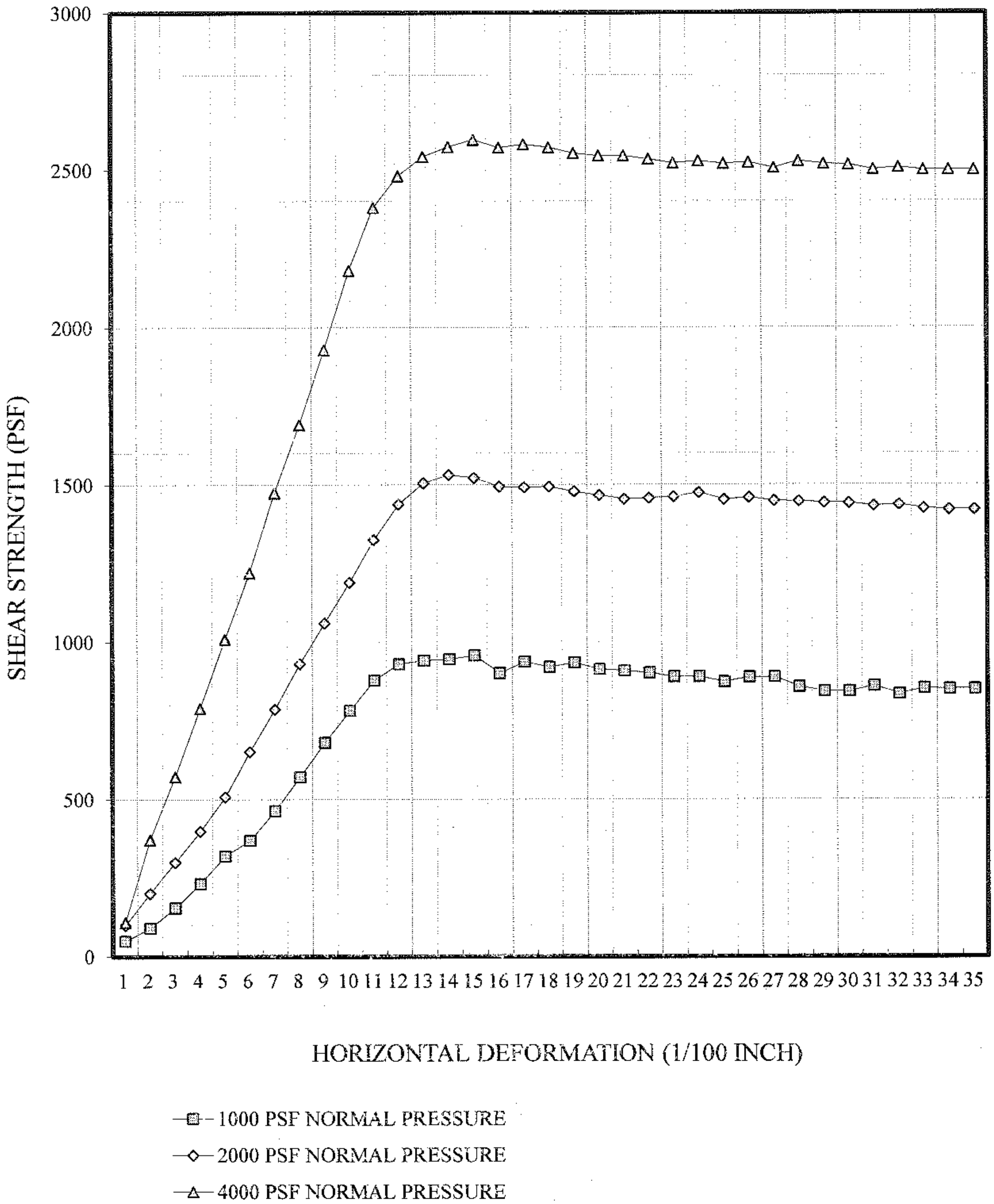
DRY DENSITY & WATER CONTENT - 100.3 pcf @ 24 %

CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

DIRECT SHEAR TEST

SAMPLE: **B-9 @ @ 15'(Very Weathered Brx)** **first run**



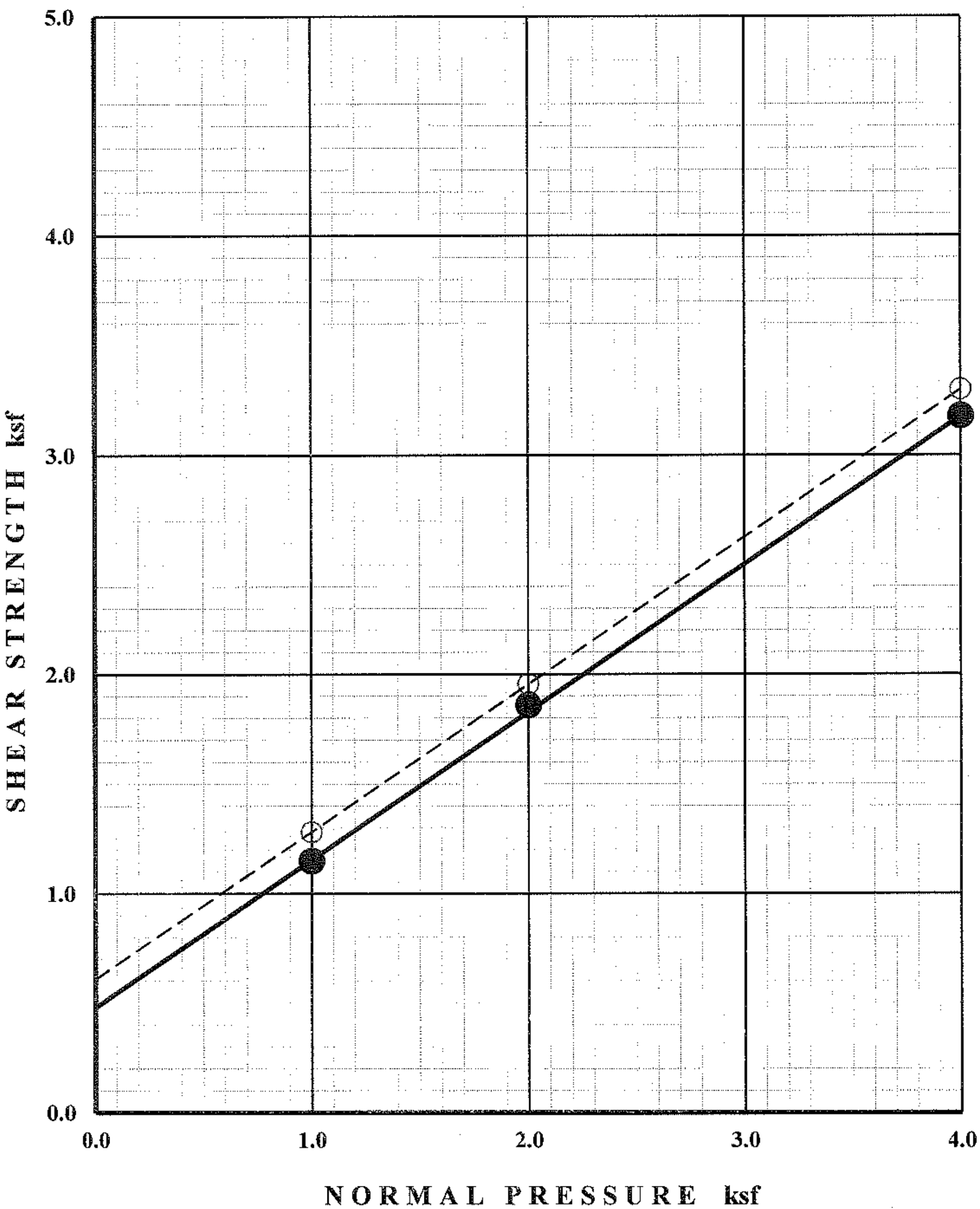
CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-10 @ 15' (Fault Zone Brx- Tm) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 17.6 %
Final moisture content = 23.6 %

ULTIMATE SHEAR RESISTANCE
COHESION = 480 psf
PHI = 34 °

DRY DENSITY & WATER CONTENT - 101 pcf @ 24 %

PEAK SHEAR RESISTANCE
COHESION = 610 psf
PHI = 34 °

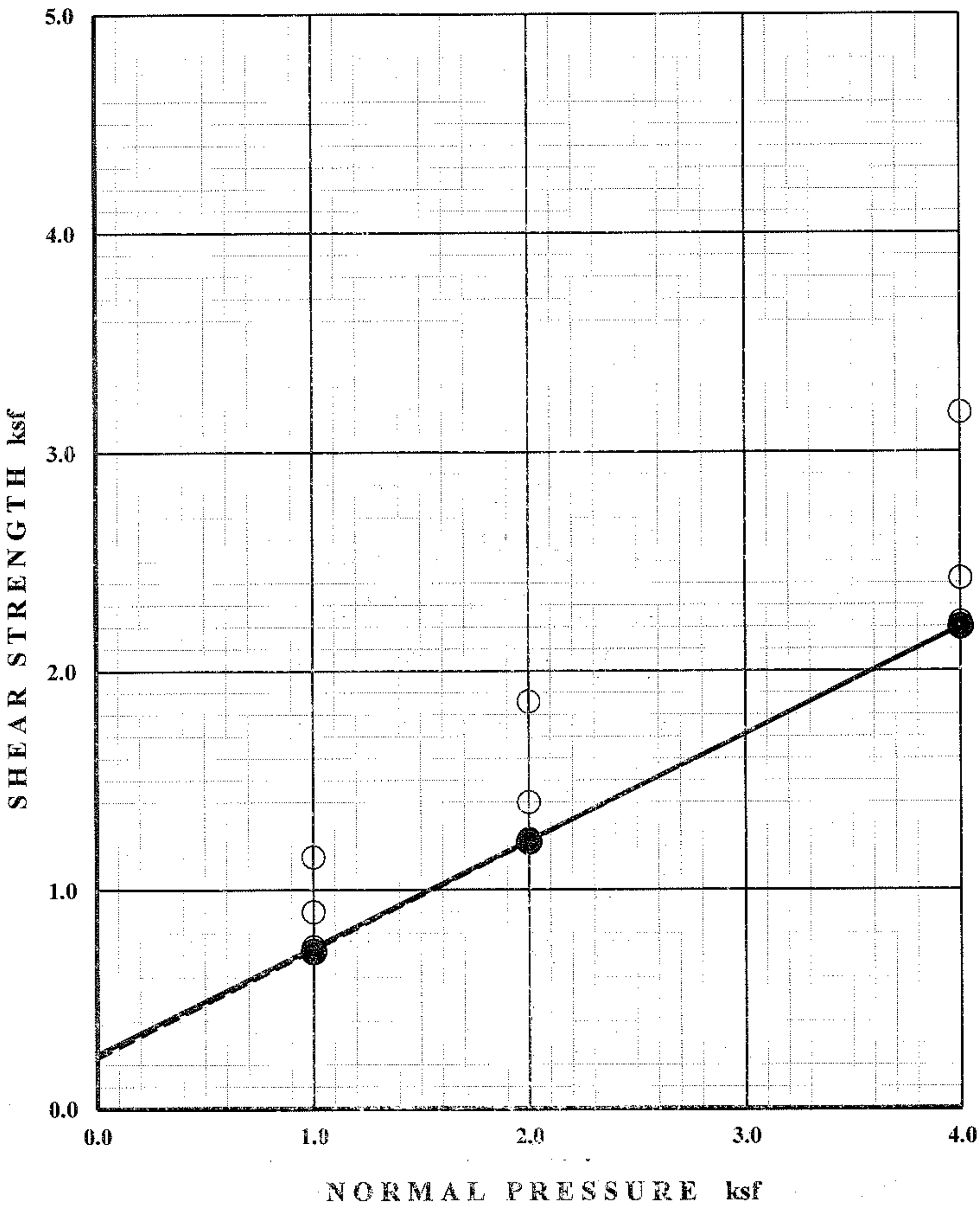
CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-10@15' (Fault Zone Brx- Tm) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

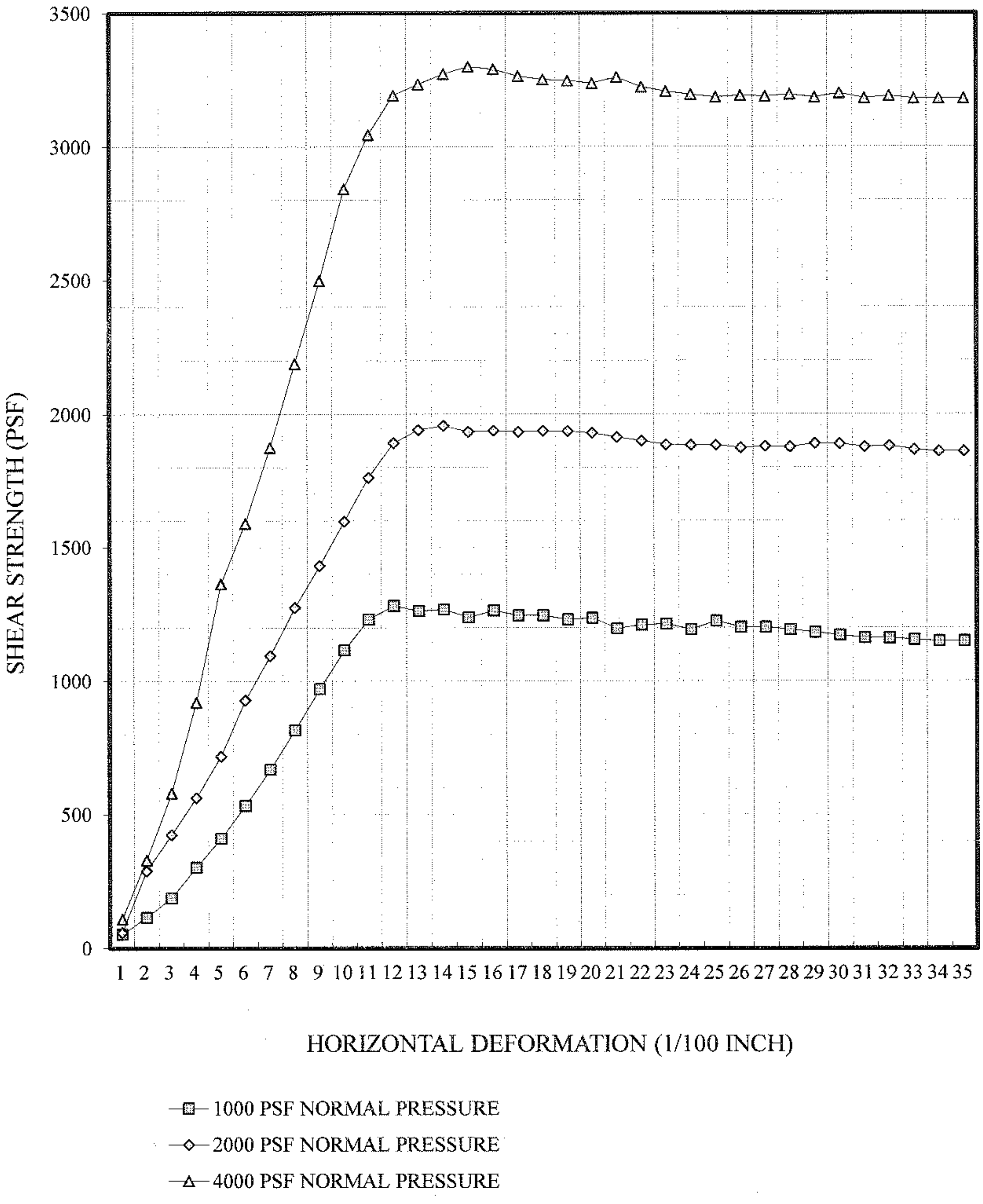
Initial moisture content = 17.6 %
Final moisture content = 23.6 %

Residual Re-Shear Resistance
COHESION = 250 psf
PHI = 26 °

DRY DENSITY & WATER CONTENT - 101 pcf @ 24 %

DIRECT SHEAR TEST

SAMPLE: **B-10 @ 15' (Fault Zone Brx- Tm)** **first run**



CALWEST GEOTECHNICAL

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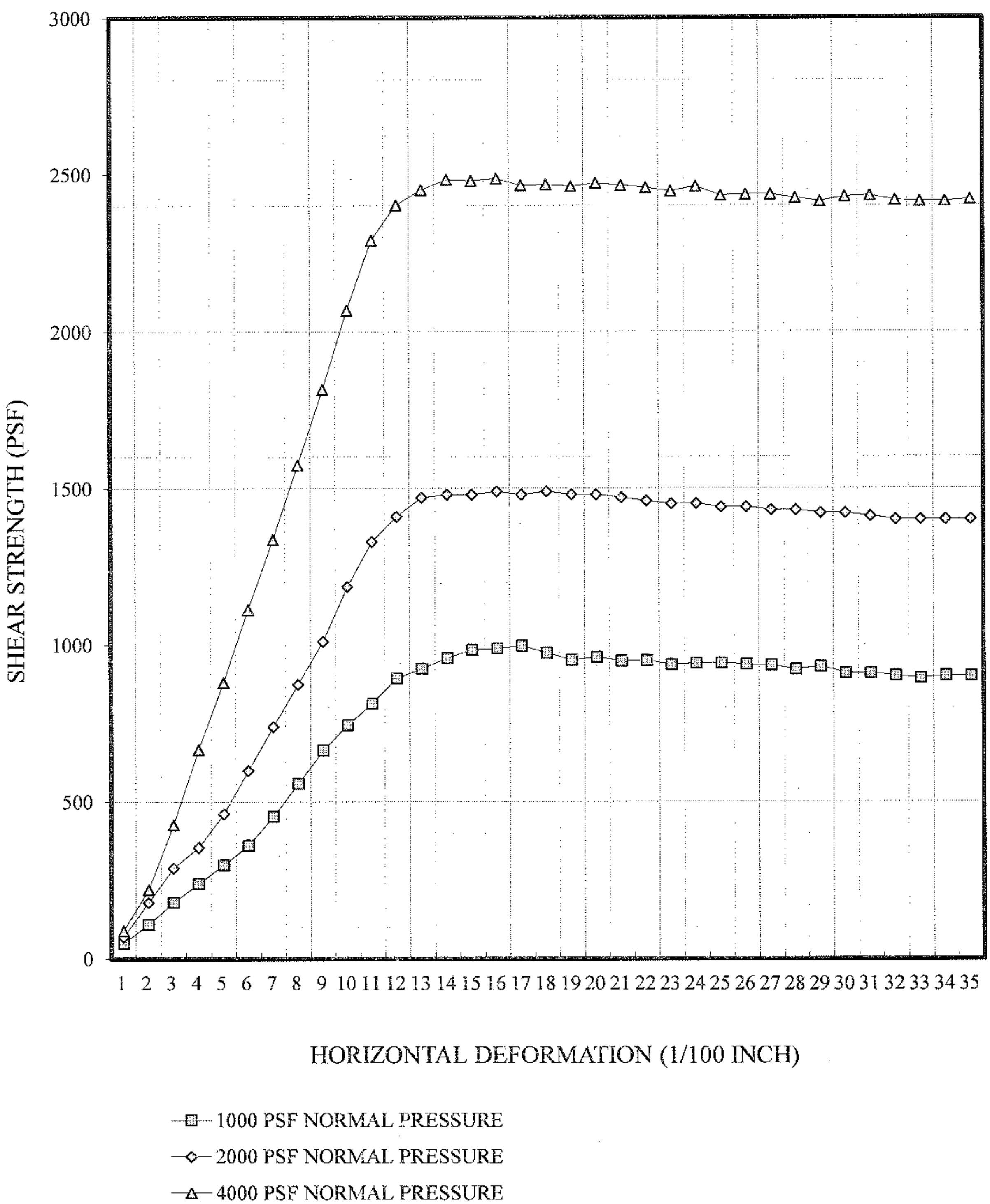
DIRECT SHEAR TEST

SAMPLE: **B-10@15' (Fault Zone Brx- Tm)** **2nd run**



CALWEST GEOTECHNICAL

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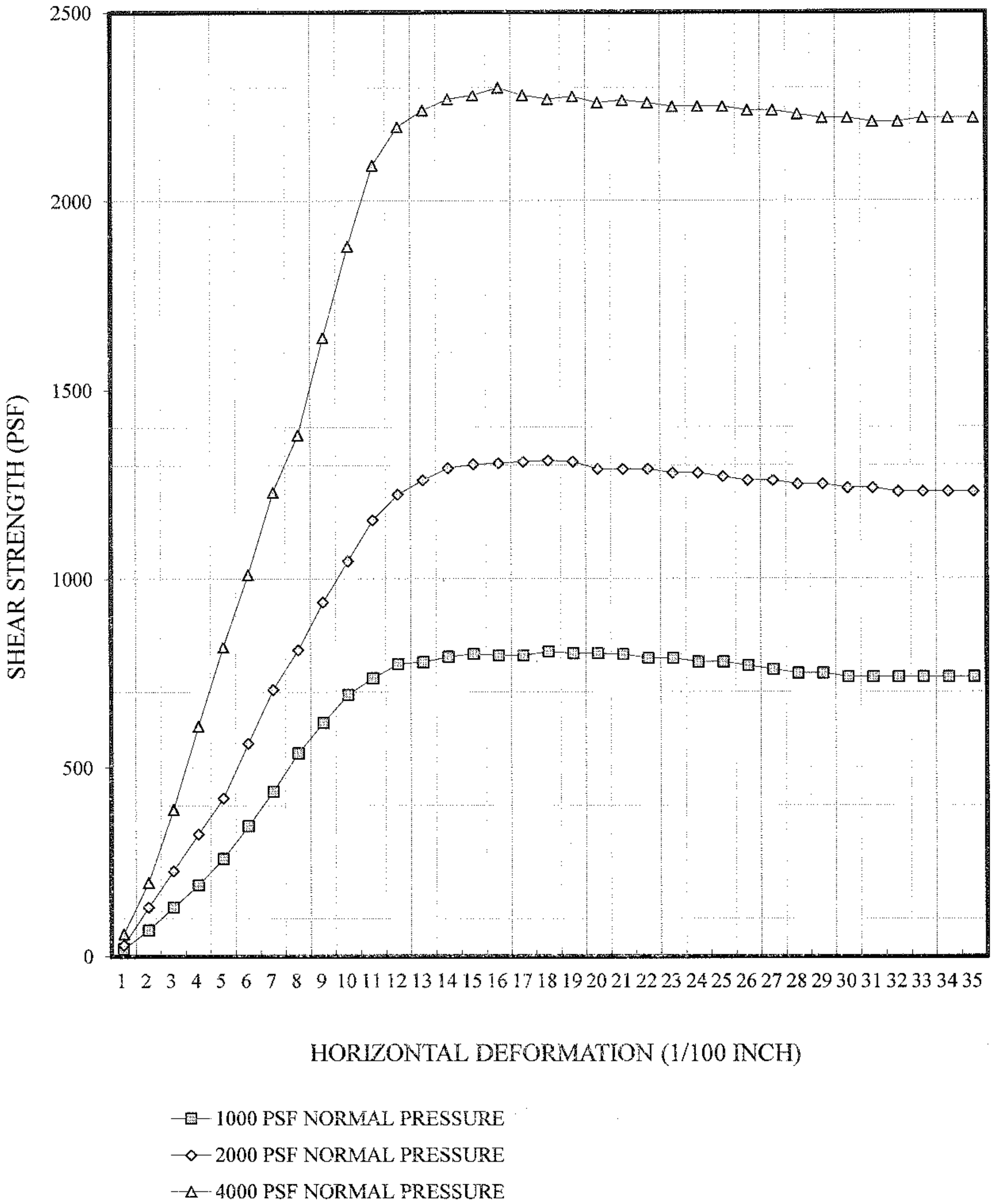
805-497-1244

DIRECT SHEAR TEST

SAMPLE: **B-10@15' (Fault Zone Brx- Tm)** **3rd run**



CALWEST GEOTECHNICAL

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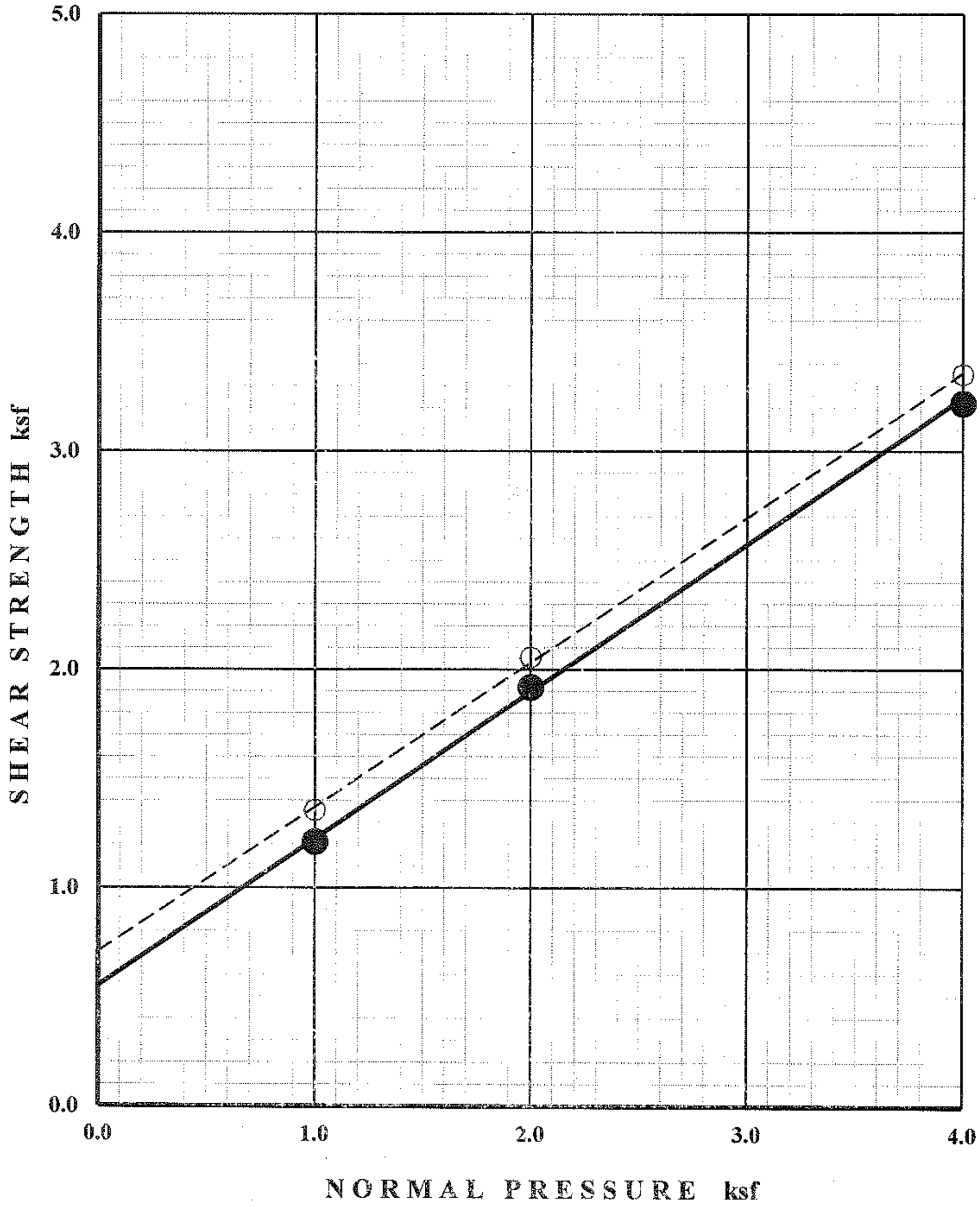
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-10 @ 25'(Fault Zone- Brx Tm) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 10.8 %
Final moisture content = 20.6 %

ULTIMATE SHEAR RESISTANCE
COHESION = 550 psf
PHI = 34 °

DRY DENSITY & WATER CONTENT - 106.2 pcf @ 21 %

PEAK SHEAR RESISTANCE
COHESION = 707 psf
PHI = 34 °

CALWEST GEOTECHNICAL

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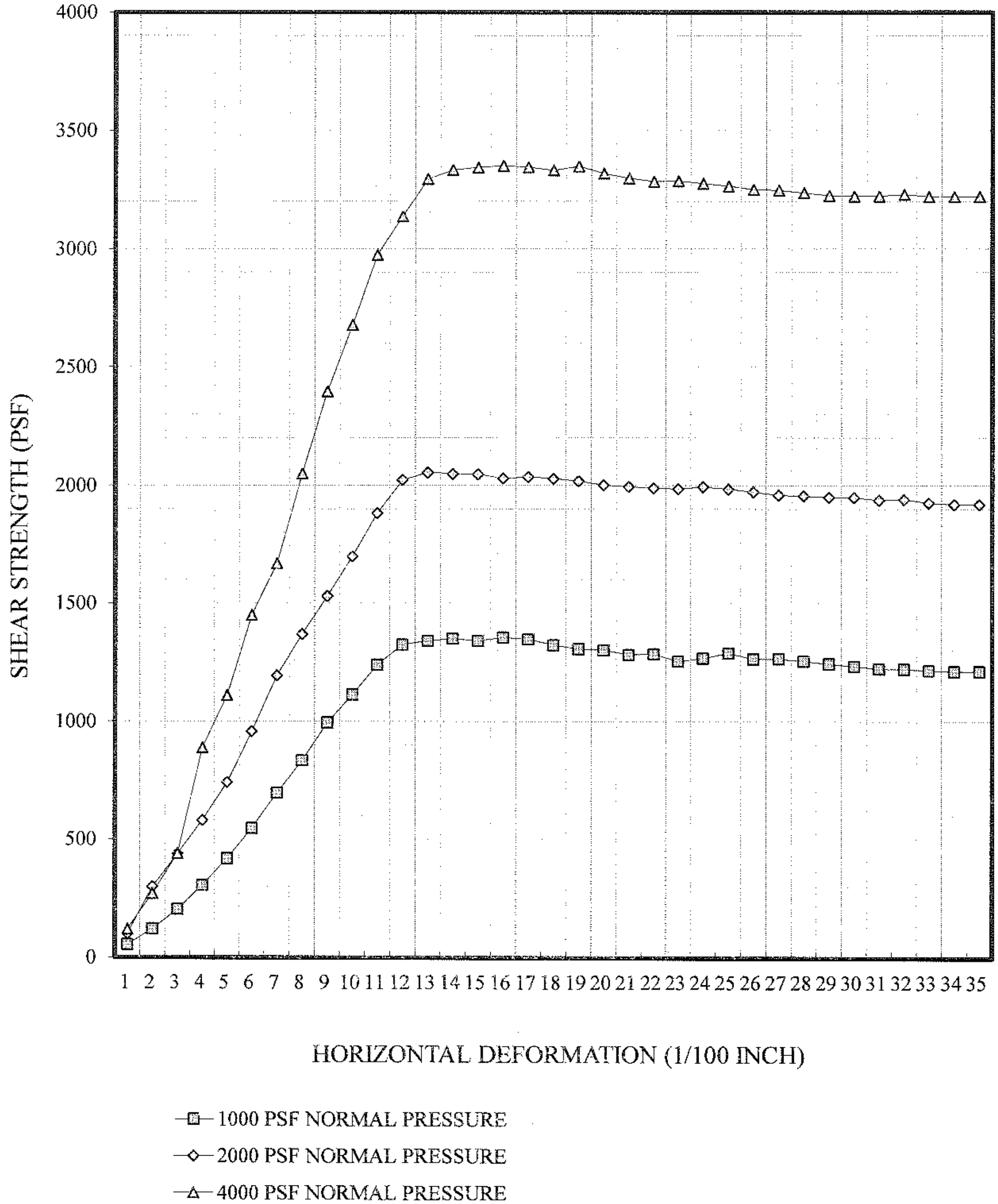
805-497-1244

DIRECT SHEAR TEST

SAMPLE: **B-10 @ 25'(Fault Zone- Brx Tm)** **first run**



CALWEST GEOTECHNICAL

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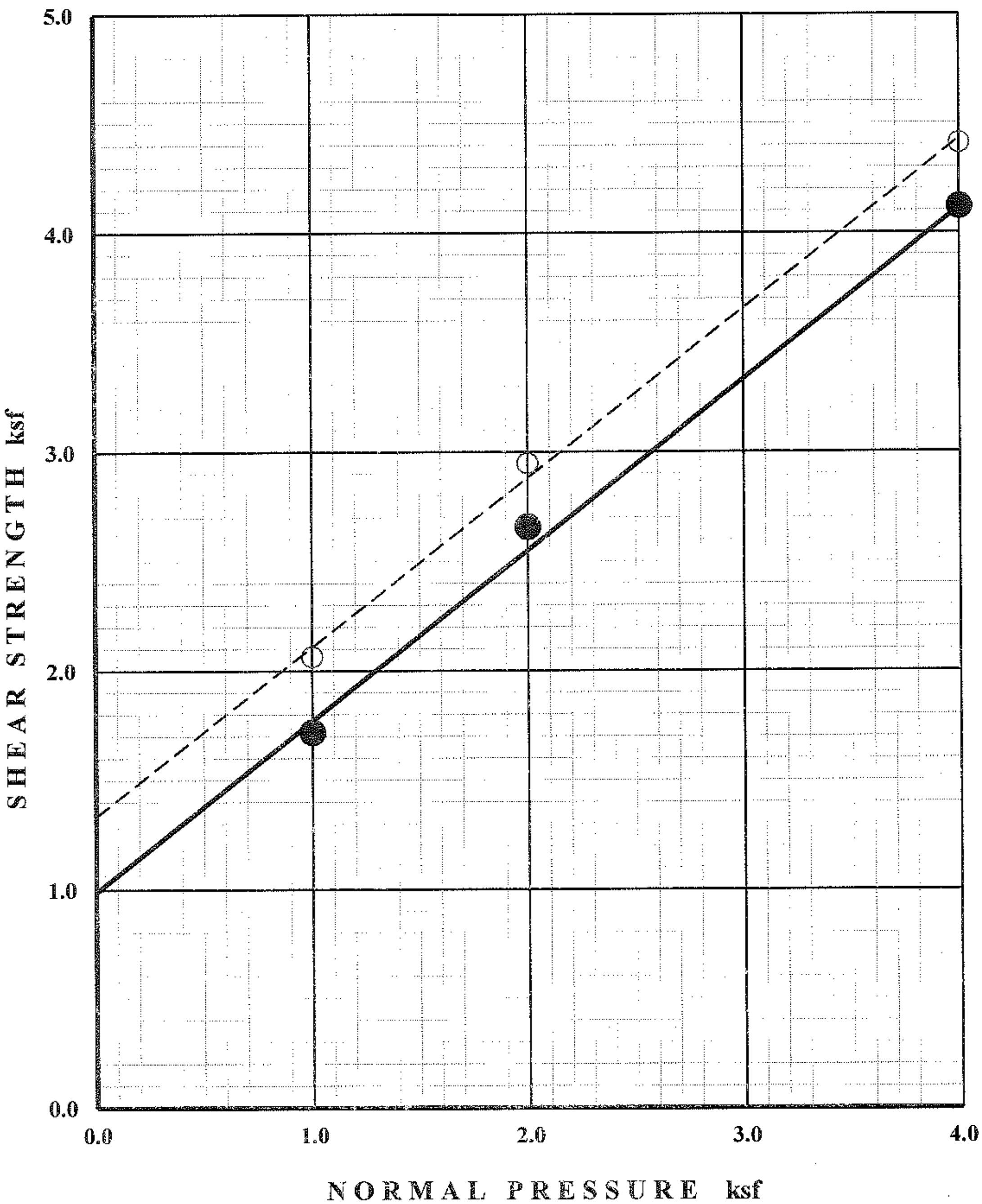
805-497-1244

SHEAR TEST DIAGRAM

PROJECT:	**Oak Pass LLC**	**NUMBER:**	**5750II**
SAMPLE:	**B-13 @ 10' (Basalt Brx- Tvb)**	**DATE:**	**Dec., 2018**



STRAIN RATE -0.005 in/min

SAMPLE SATURATION - 24 hrs

Initial moisture content = 10.3 %

Final moisture content = 15.8 %

ULTIMATE SHEAR RESISTANCE

COHESION = 990 psf

PHI = 38 °

DRY DENSITY & WATER CONTENT - 115.7 pcf @ 16 %

PEAK SHEAR RESISTANCE

COHESION = 1336 psf

PHI = 38 °

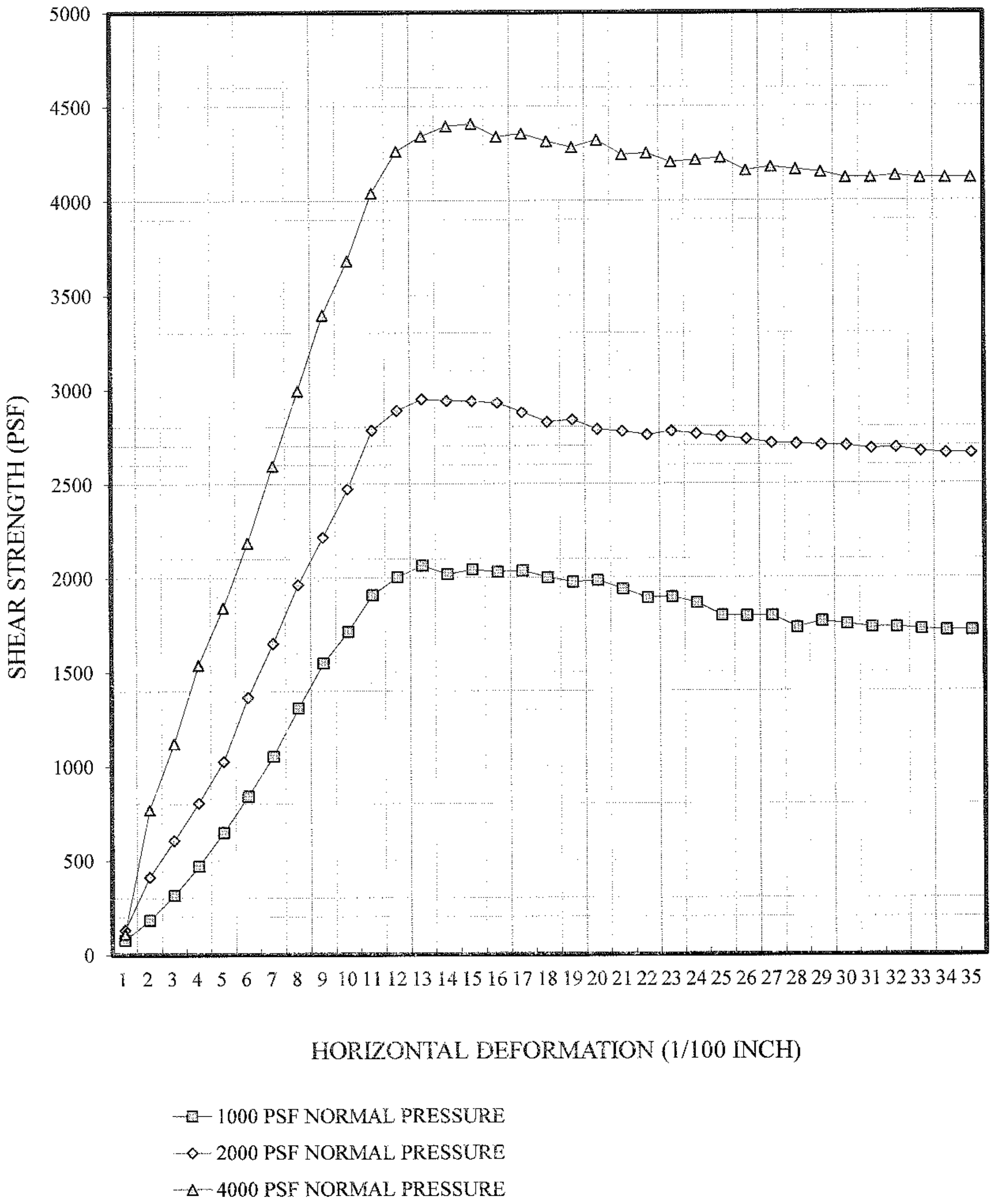
CALWEST GEOTECHNICAL

818-991-7148

805-497-1244

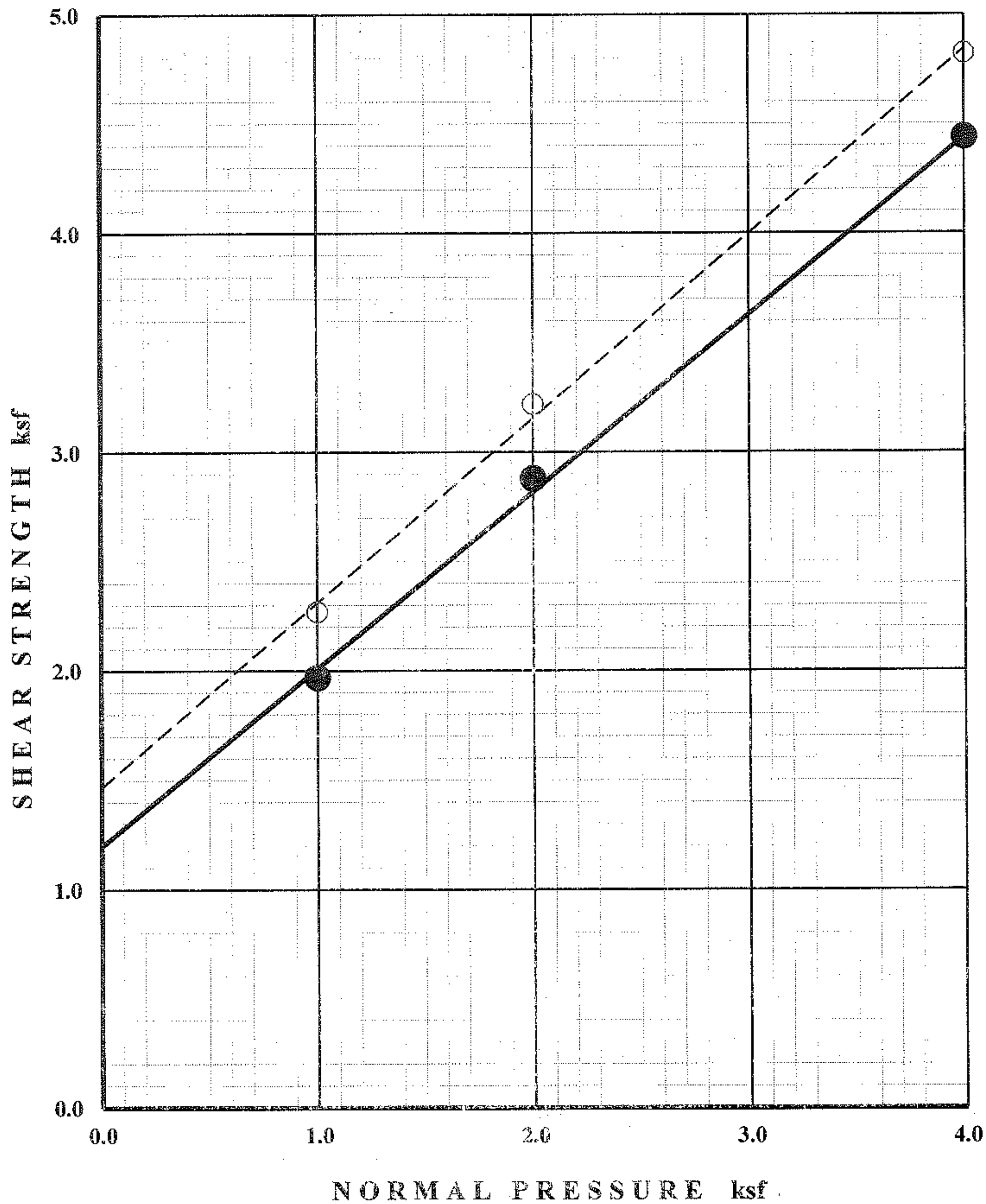
DIRECT SHEAR TEST

SAMPLE: **B-13 @ 10' (Basalt Brx- Tvb)** **first run**



SHEAR TEST DIAGRAM

PROJECT:	**Oak Pass LLC**	**NUMBER:**	**5750II**
SAMPLE:	**B-14 @ 10' (Slate Brx- Jsm)**	**DATE:**	**Dec., 2018**



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 5.1 %
Final moisture content = 15.8 %

DRY DENSITY & WATER CONTENT - **116 pcf @ 16 %**

ULTIMATE SHEAR RESISTANCE
COHESION = 1200 psf
PHI = 39 °

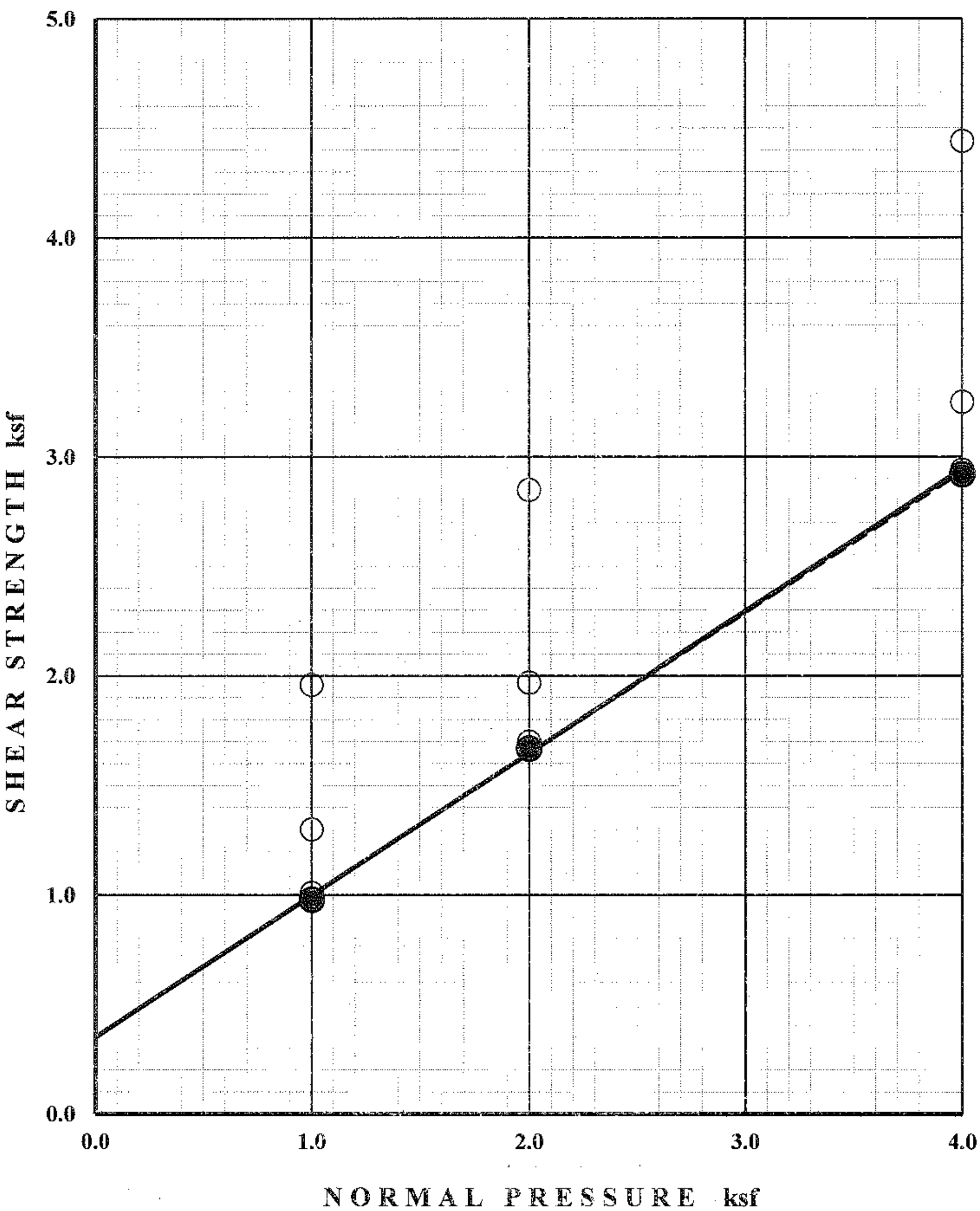
PEAK SHEAR RESISTANCE
COHESION = 1469 psf
PHI = 40 °

CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

SHEAR TEST DIAGRAM

PROJECT:	**Oak Pass LLC**	**NUMBER:**	**5750II**
SAMPLE:	**B-14 @ 10' (Slate Brx- Jsm)**	**DATE:**	**Dec., 2018**



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

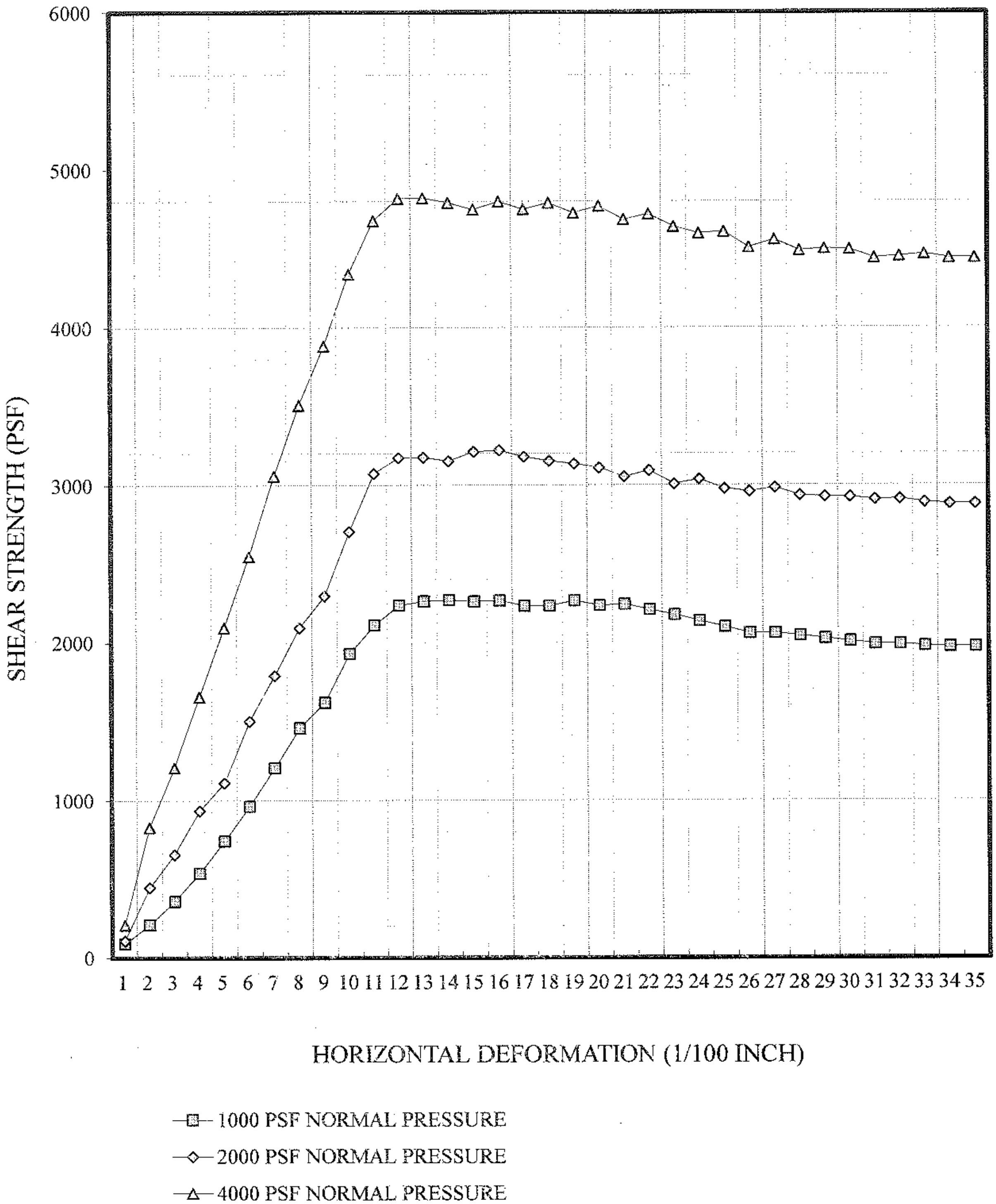
Initial moisture content = 5.1 %
Final moisture content = 15.8 %

Residual Reshear Resistance
COHESION = 350 psf
PHI = 33 °

DRY DENSITY & WATER CONTENT - 116 pcf @ 16 %

DIRECT SHEAR TEST

SAMPLE: **B-14 @ 10' (Slate Brx- Jsm)** **first run**



CALWEST GEOTECHNICAL

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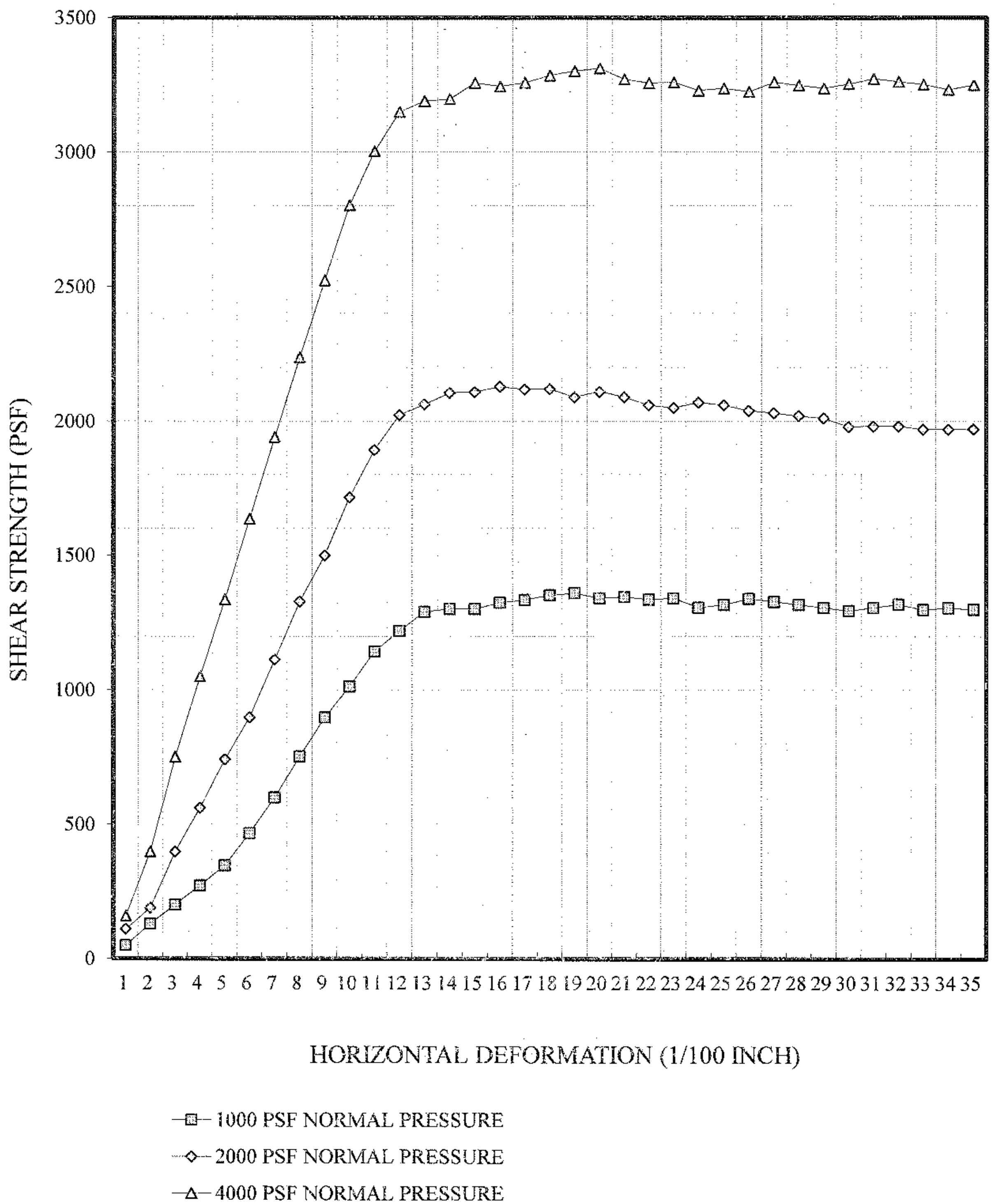
805-497-1244

DIRECT SHEAR TEST

SAMPLE: **B-14 @ 10' (Slate Brx- Jsm)** **2nd run**



CALWEST GEOTECHNICAL

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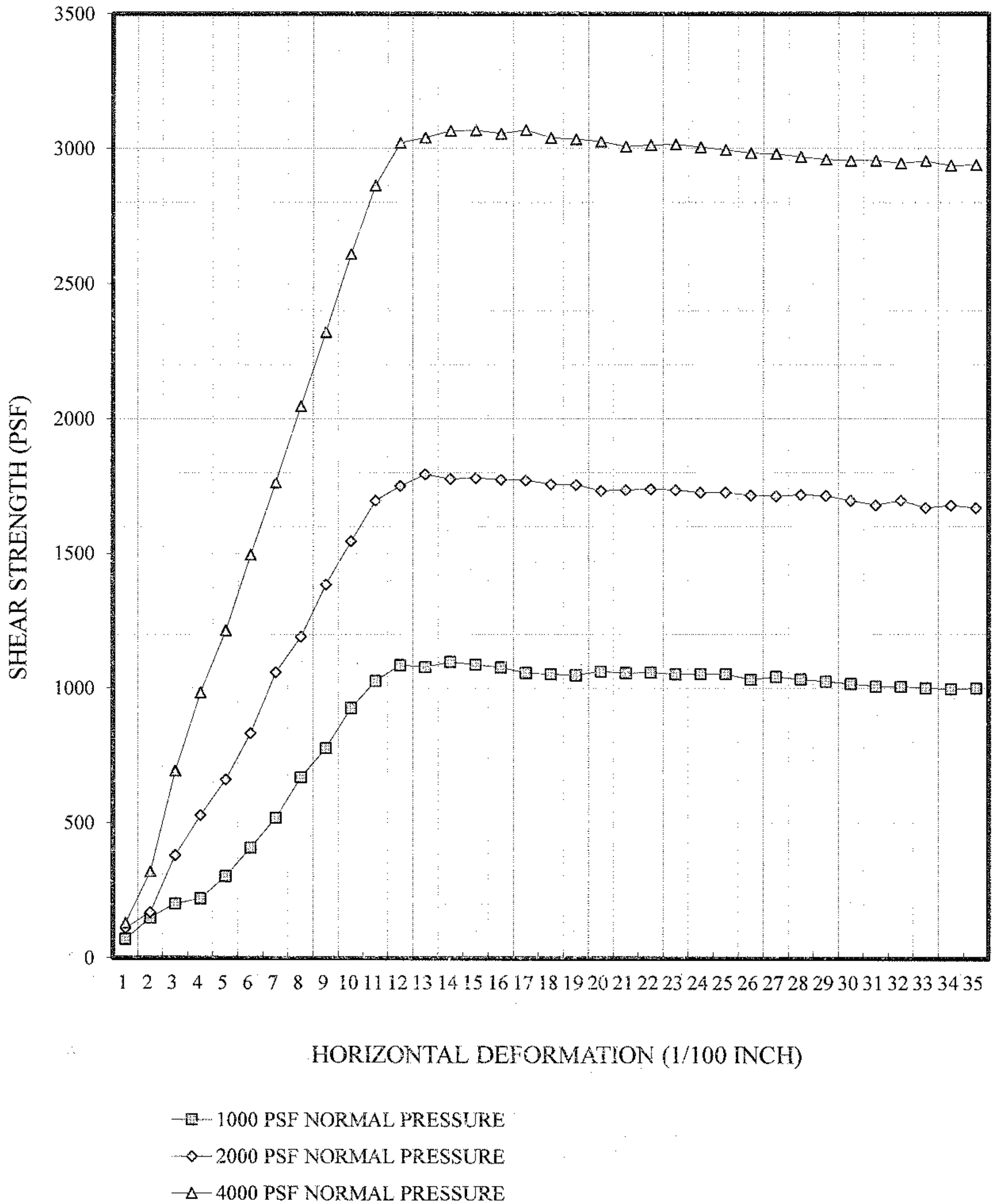
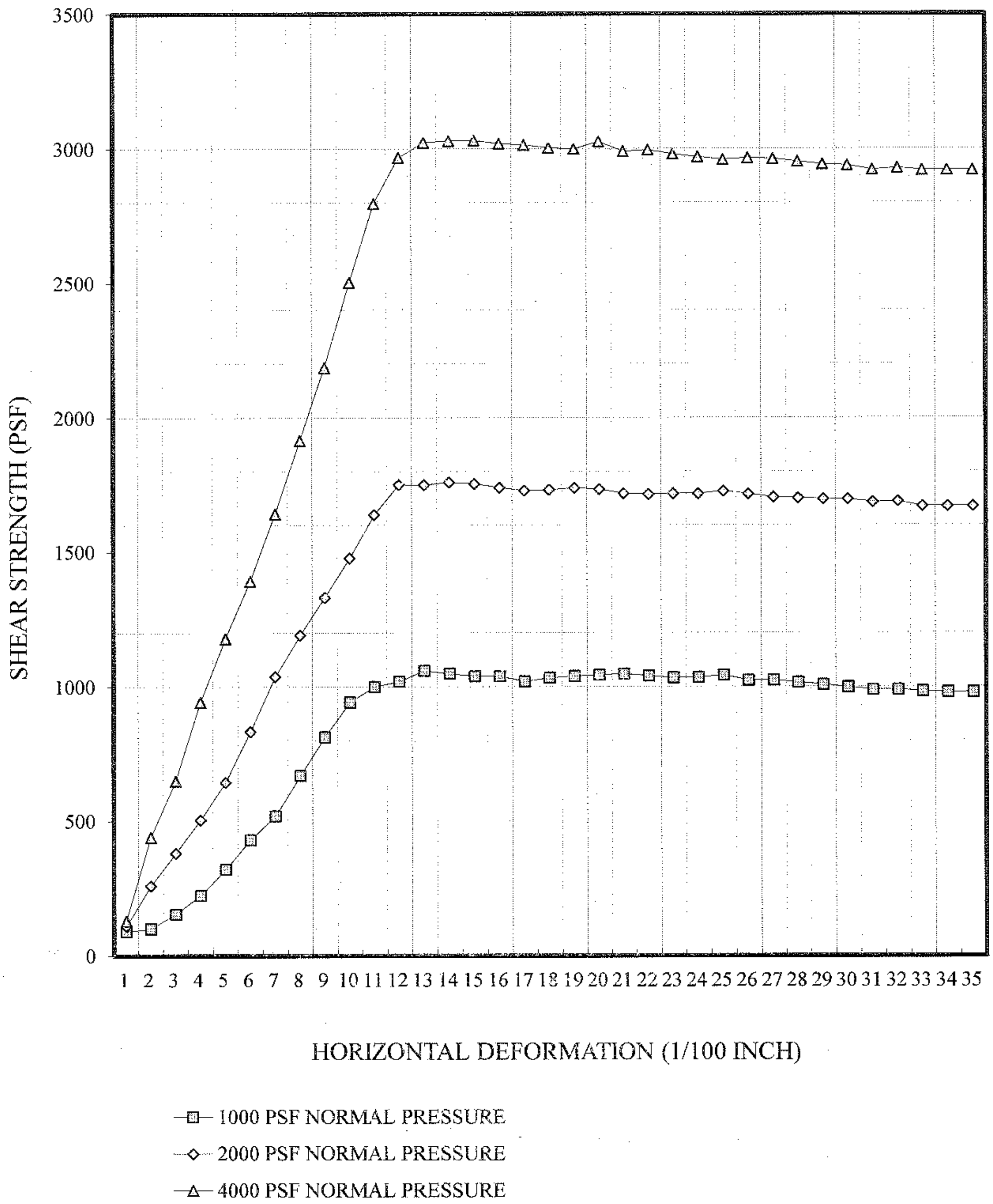
DIRECT SHEAR TEST

SAMPLE: **B-14 @ 10' (Slate Brx- Jsm)** **3rd run**



DIRECT SHEAR TEST

SAMPLE: **B-14 @ 10' (Slate Brx- Jsm)** **4th run**



CALWEST GEOTECHNICAL

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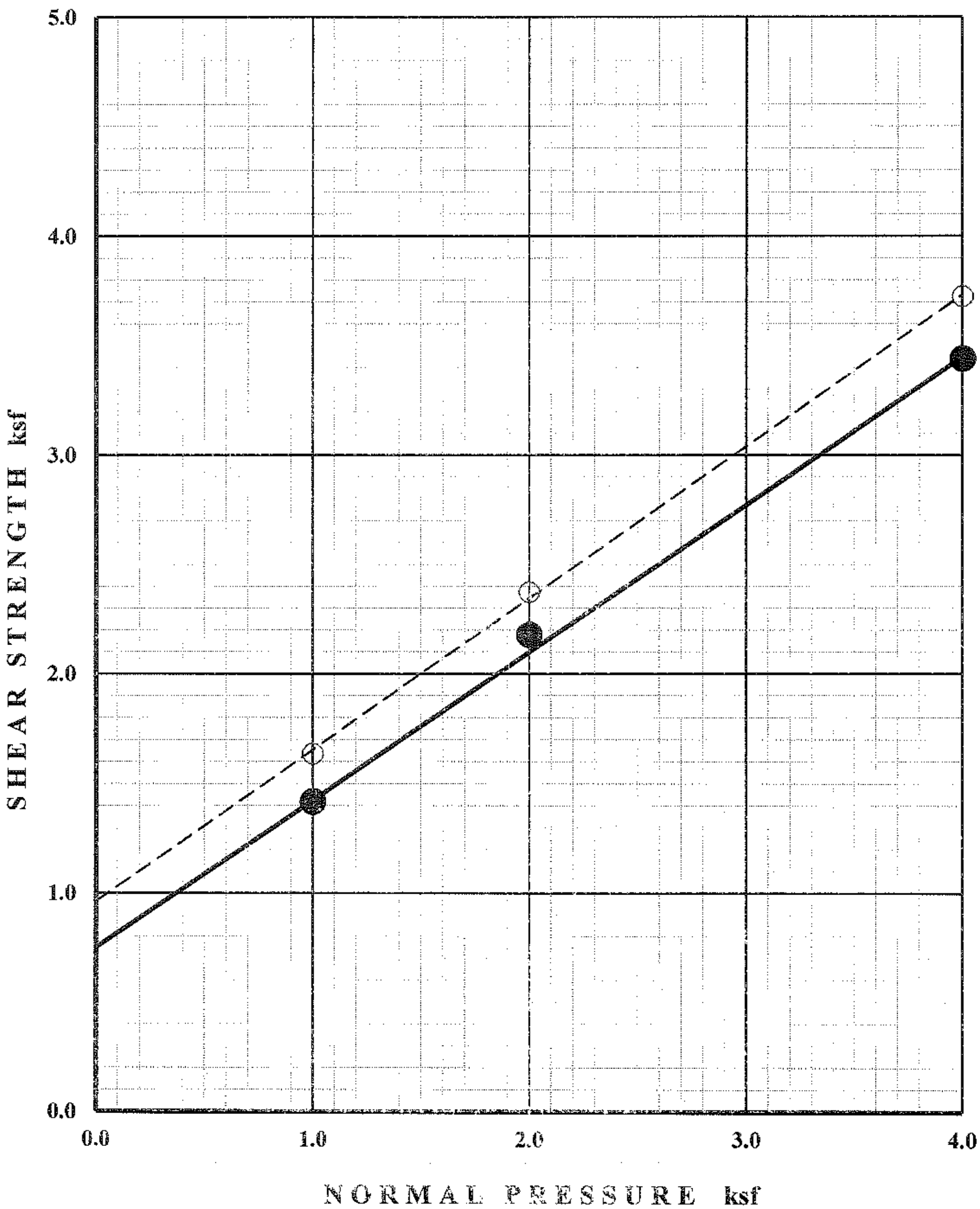
SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-15 @ 20' (Fault Zone Brx-Tm) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 16.6 %
Final moisture content = 19.0 %

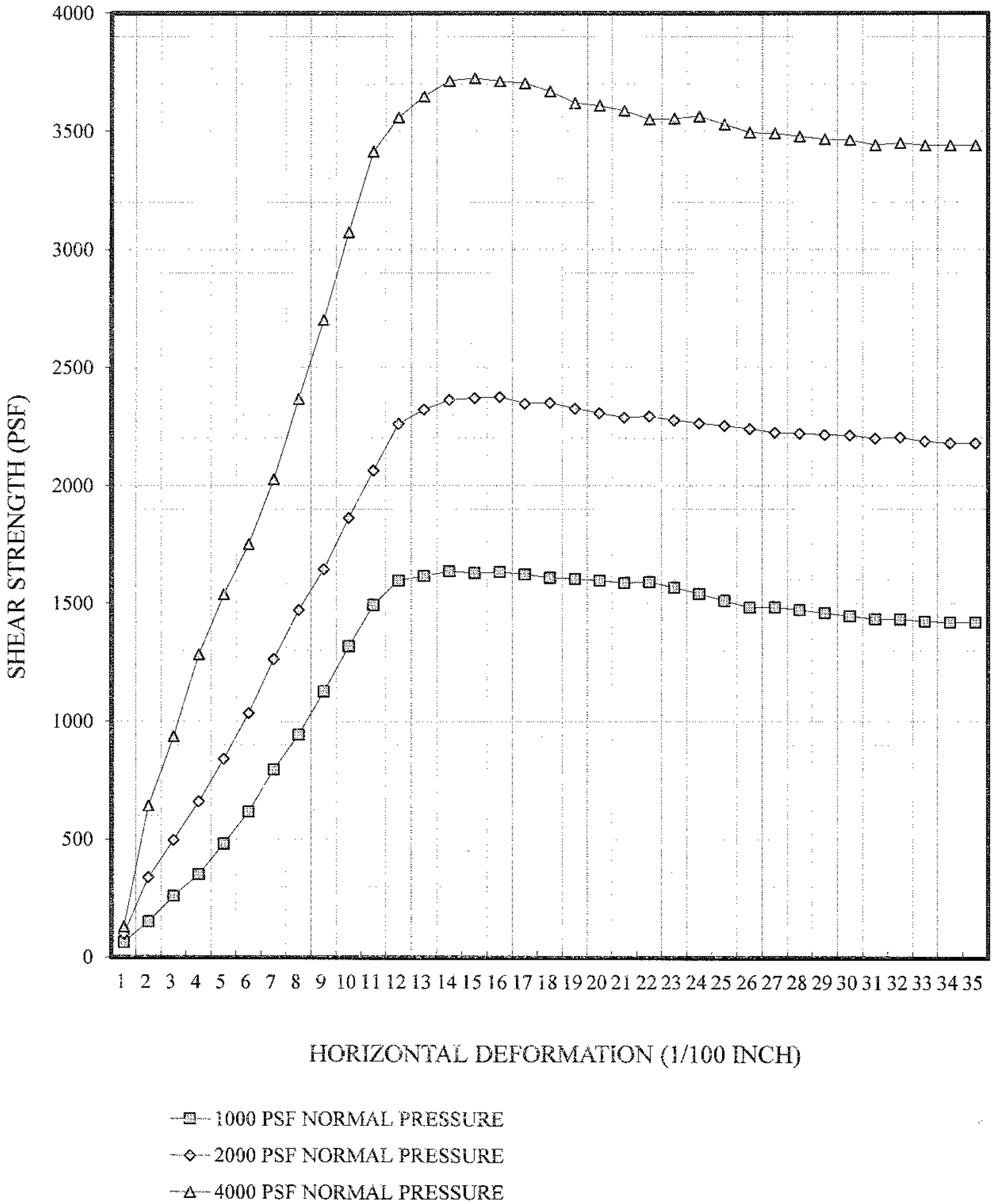
DRY DENSITY & WATER CONTENT - 109.4 pcf @ 19 %

ULTIMATE SHEAR RESISTANCE
COHESION = 750 psf
PHI = 34 °

PEAK SHEAR RESISTANCE
COHESION = 962 psf
PHI = 35 °

DIRECT SHEAR TEST

SAMPLE: **B-15 @ 20' (Fault Zone Brx-Tm)** **first run**



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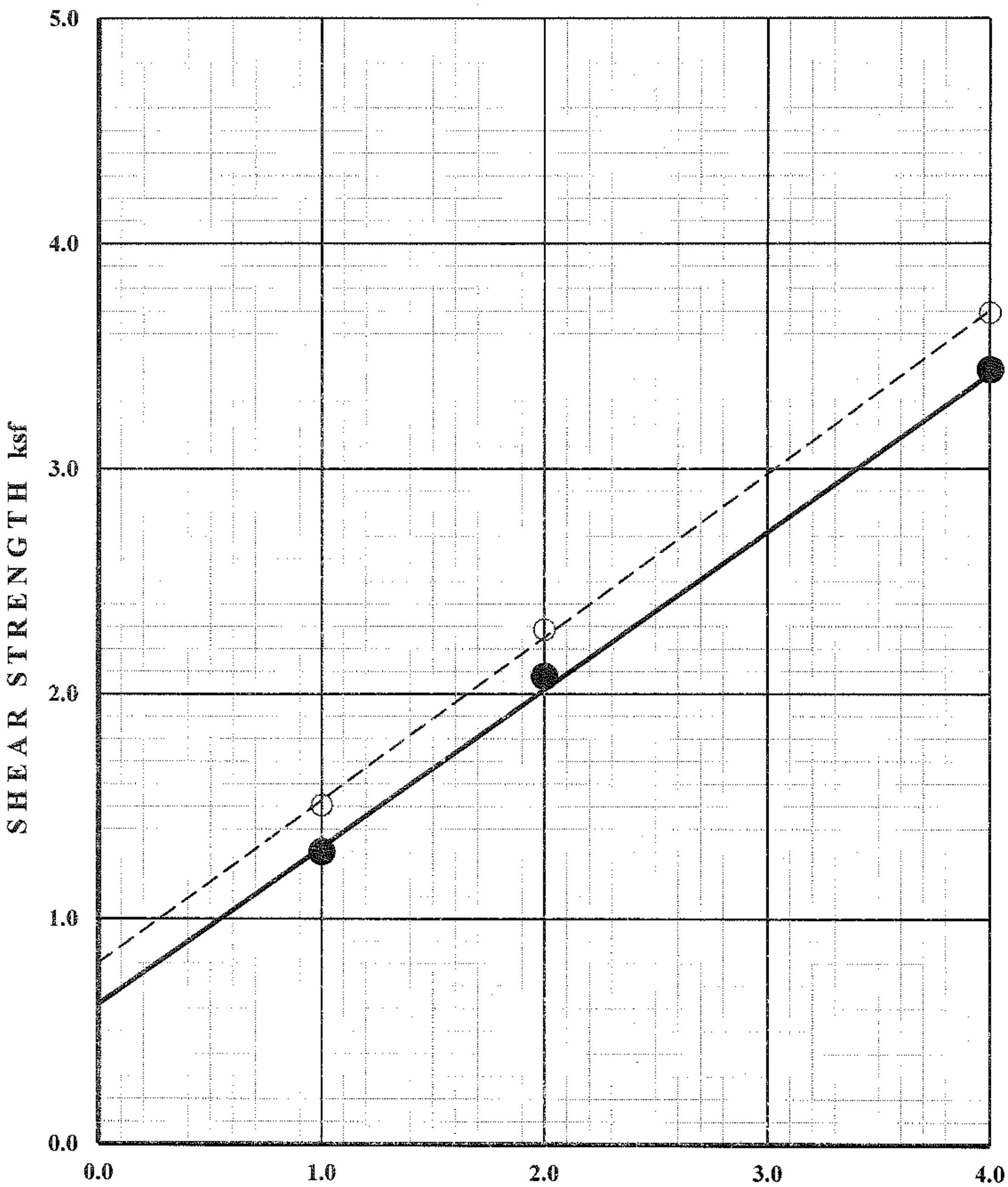
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-15 @ 35' (Fault Zone Brx- Tm) **DATE:** Dec., 2018



NORMAL PRESSURE ksf

STRAIN RATE -0.005 in/min Initial moisture content = 15.2 %

SAMPLE SATURATION - 24 hrs Final moisture content = 18.0 %

ULTIMATE SHEAR RESISTANCE

COHESION = 620 psf

PHI = 35 °

DRY DENSITY & WATER CONTENT - 111.7 pcf @ 18 %

PEAK SHEAR RESISTANCE

COHESION = 804 psf

PHI = 36 °

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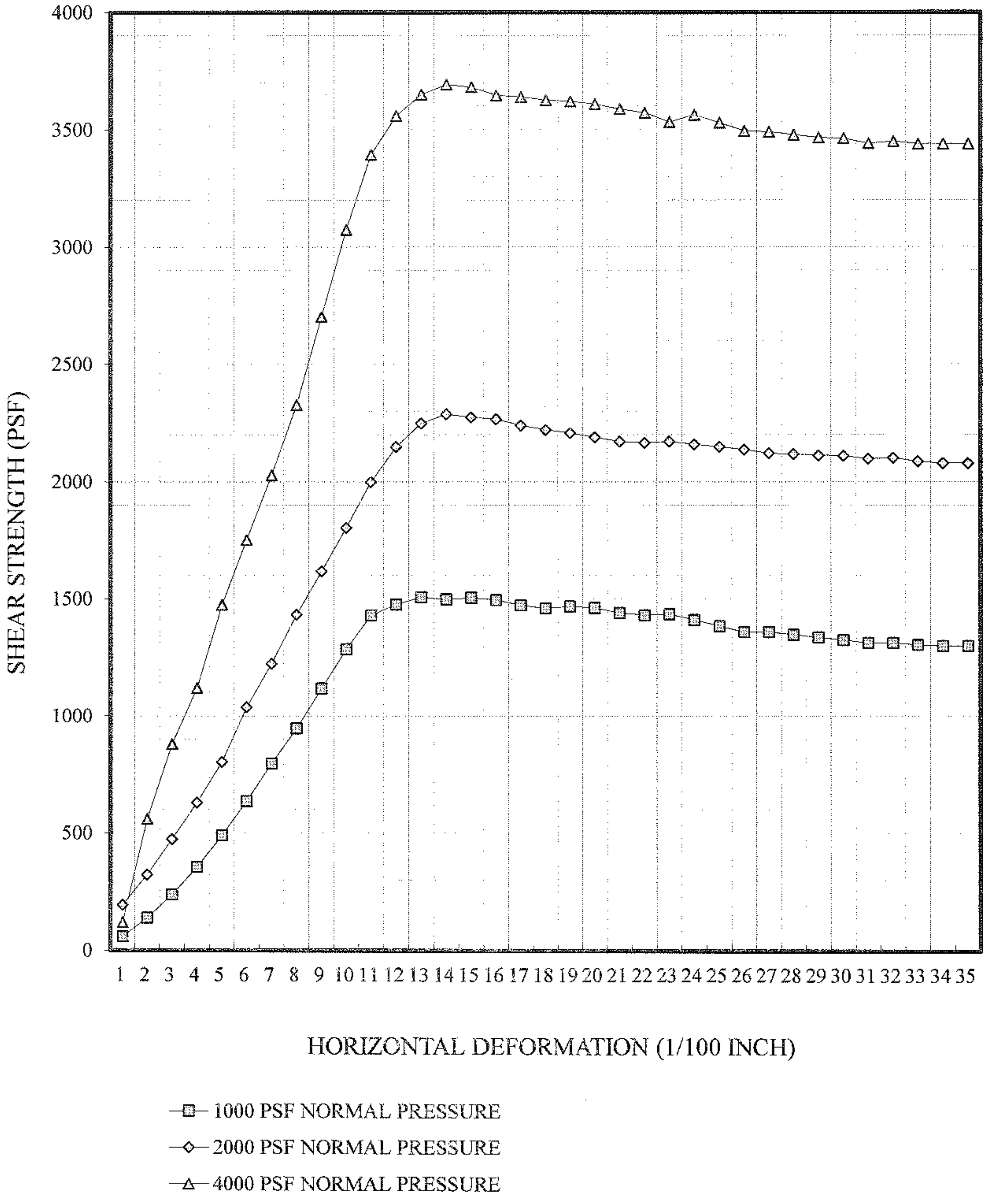
DIRECT SHEAR TEST

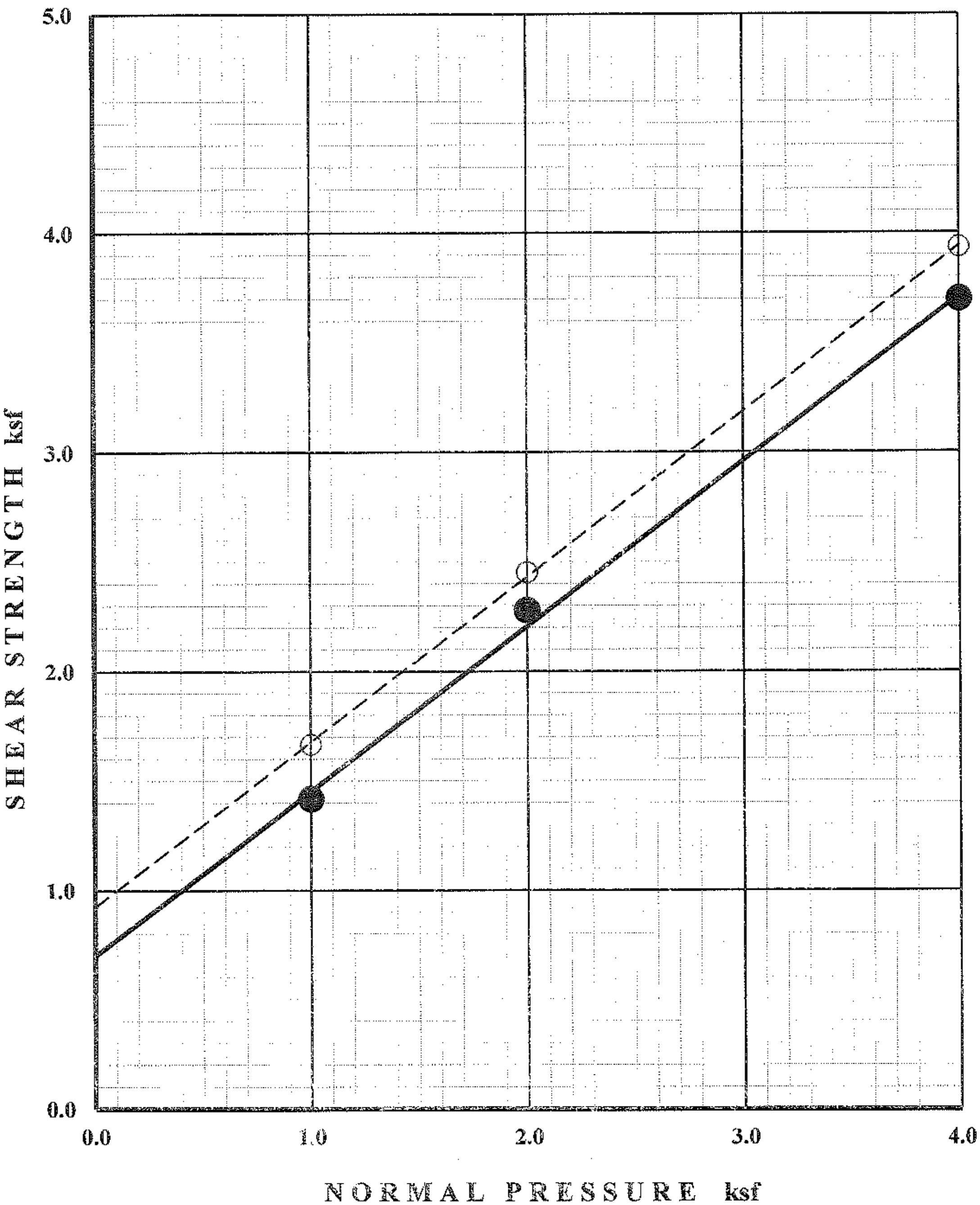
SAMPLE: **B-15 @ 35' (Fault Zone Brx- Tm)** **first run**



SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-16 @ 20' (Sandstone Brx- Tt) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 7.8 %
Final moisture content = 18.8 %

ULTIMATE SHEAR RESISTANCE
COHESION = 700 psf
PHI = 37 °

DRY DENSITY & WATER CONTENT - 109.7 pcf @ 19 %

PEAK SHEAR RESISTANCE
COHESION = 925 psf
PHI = 37 °

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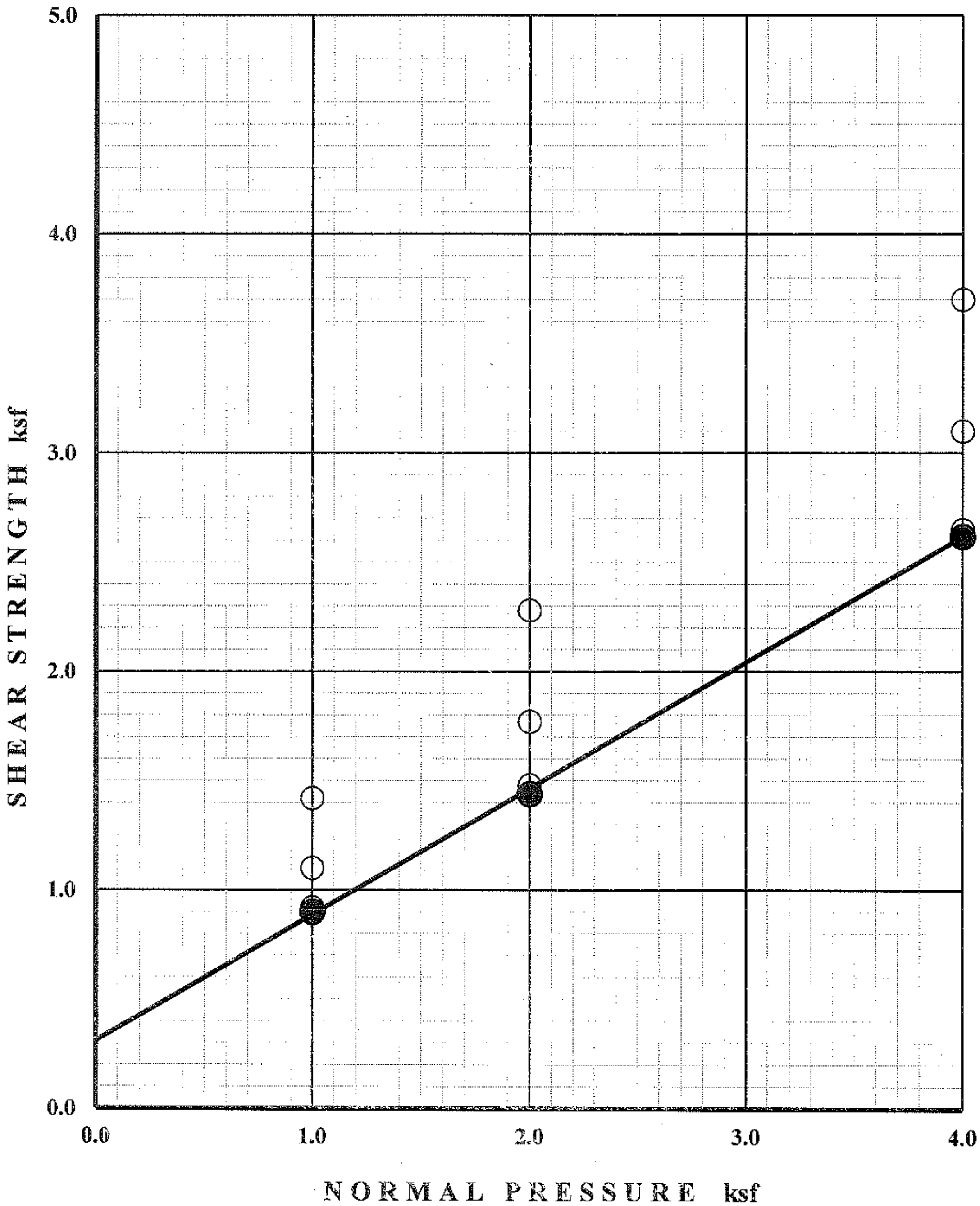
SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-16 @ 20'(Sandstone Brx-Tt) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 7.8 %
Final moisture content = 18.8 %

Residual Re-Shear Resistance
COHESION = 310 psf
PHI = 30 °

DRY DENSITY & WATER CONTENT - 109.7 pcf @ 19 %

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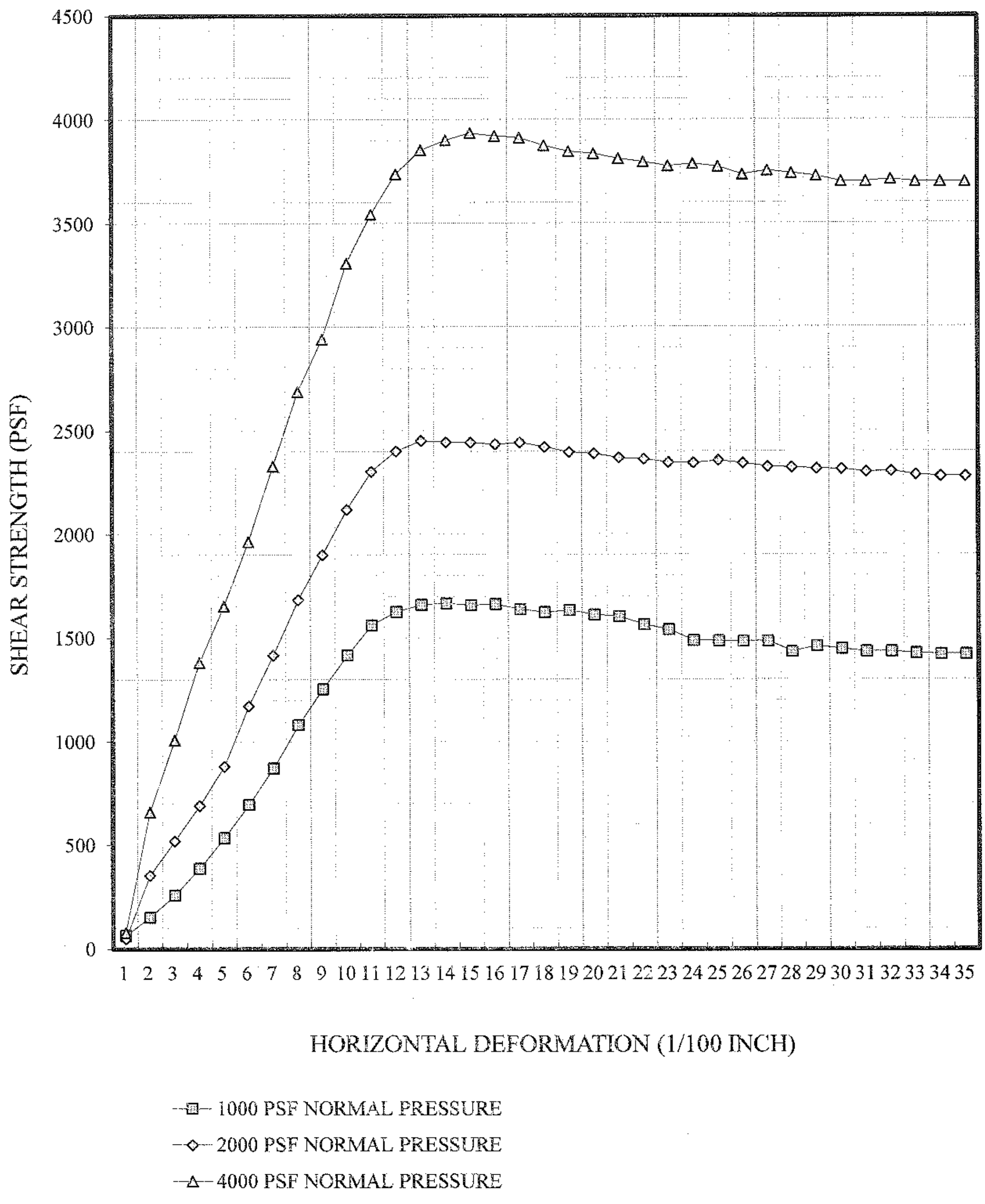
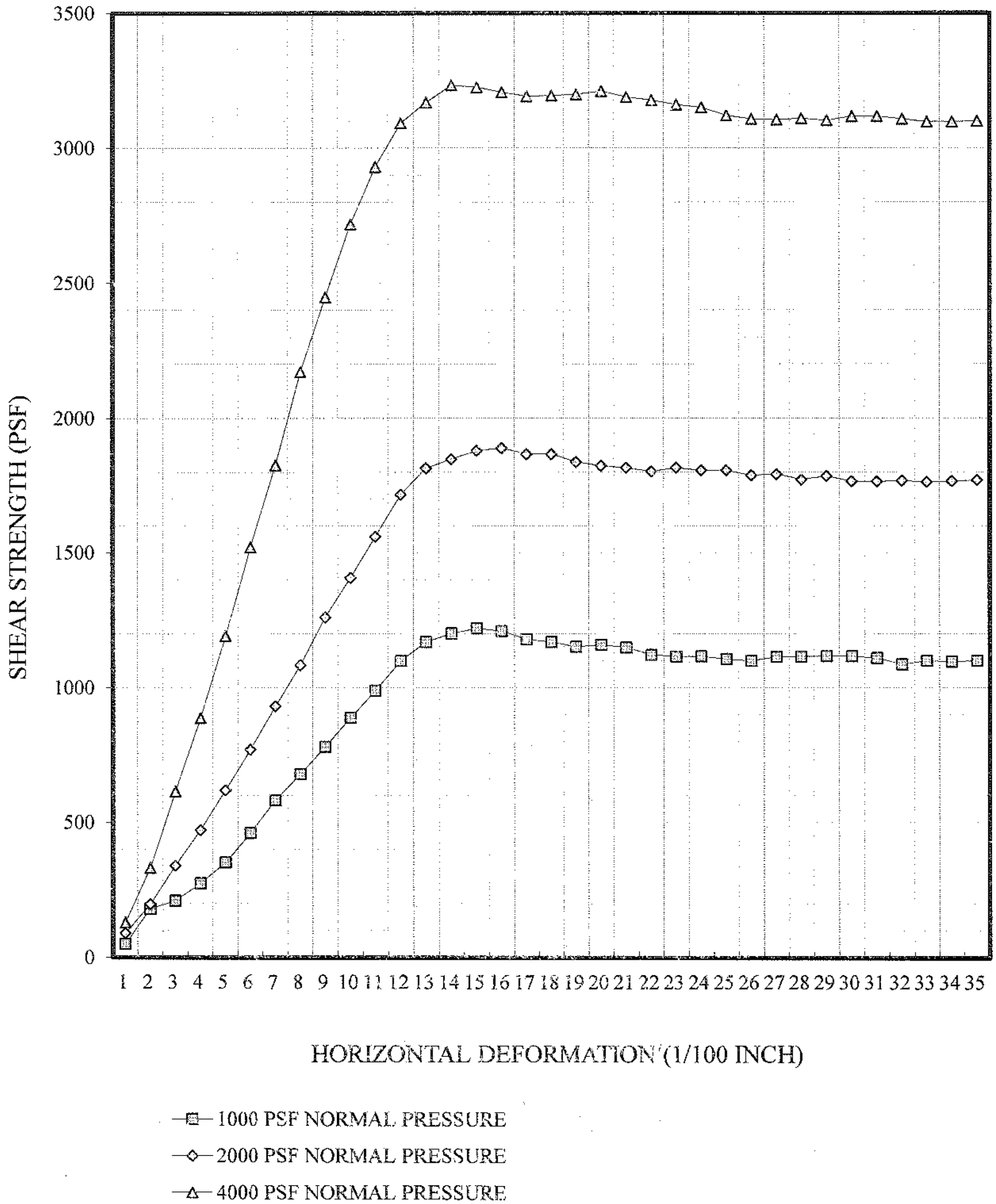
DIRECT SHEAR TEST

SAMPLE: **B-16 @ 20' (Sandstone Brx- Tt)** **first run**



DIRECT SHEAR TEST

SAMPLE: **B-16 @ 20'(Sandstone Brx-Tt)** **2nd run**



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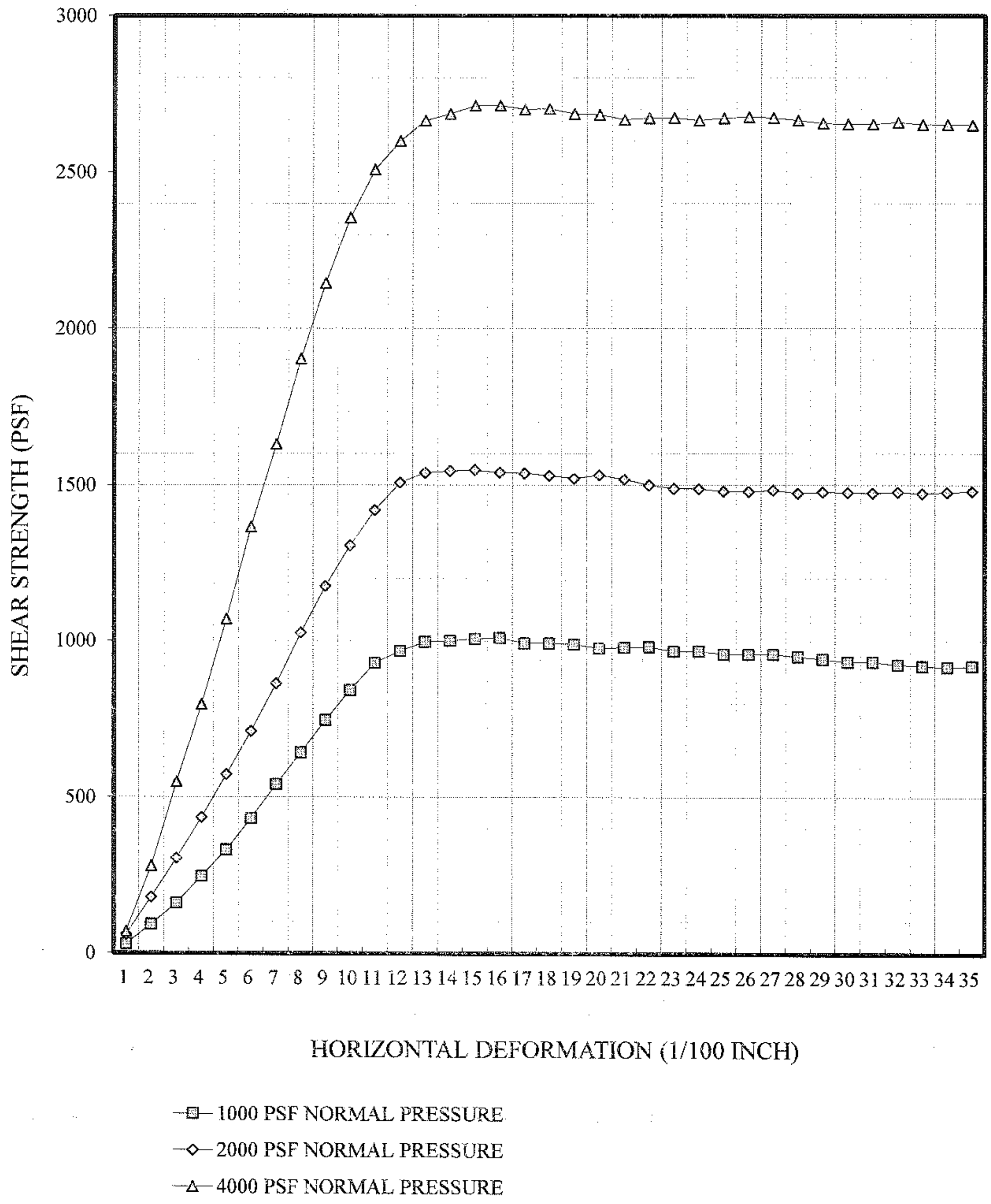
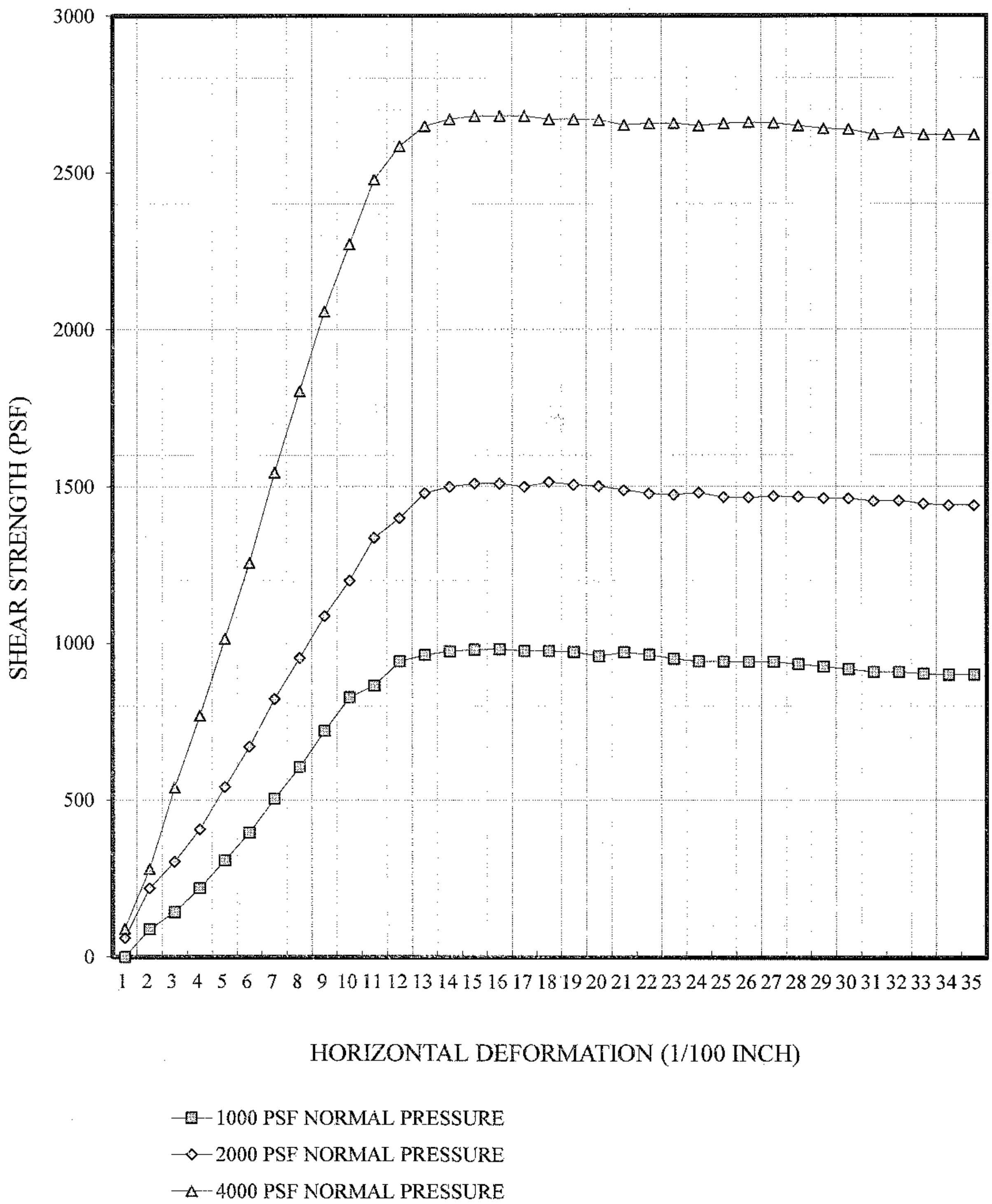
DIRECT SHEAR TEST

SAMPLE: **B-16 @ 20'(Sandstone Brx-Tt)** **3rd run**



DIRECT SHEAR TEST

SAMPLE: **B-16 @ 20'(Sandstone Brx-Tt)** **4th run**



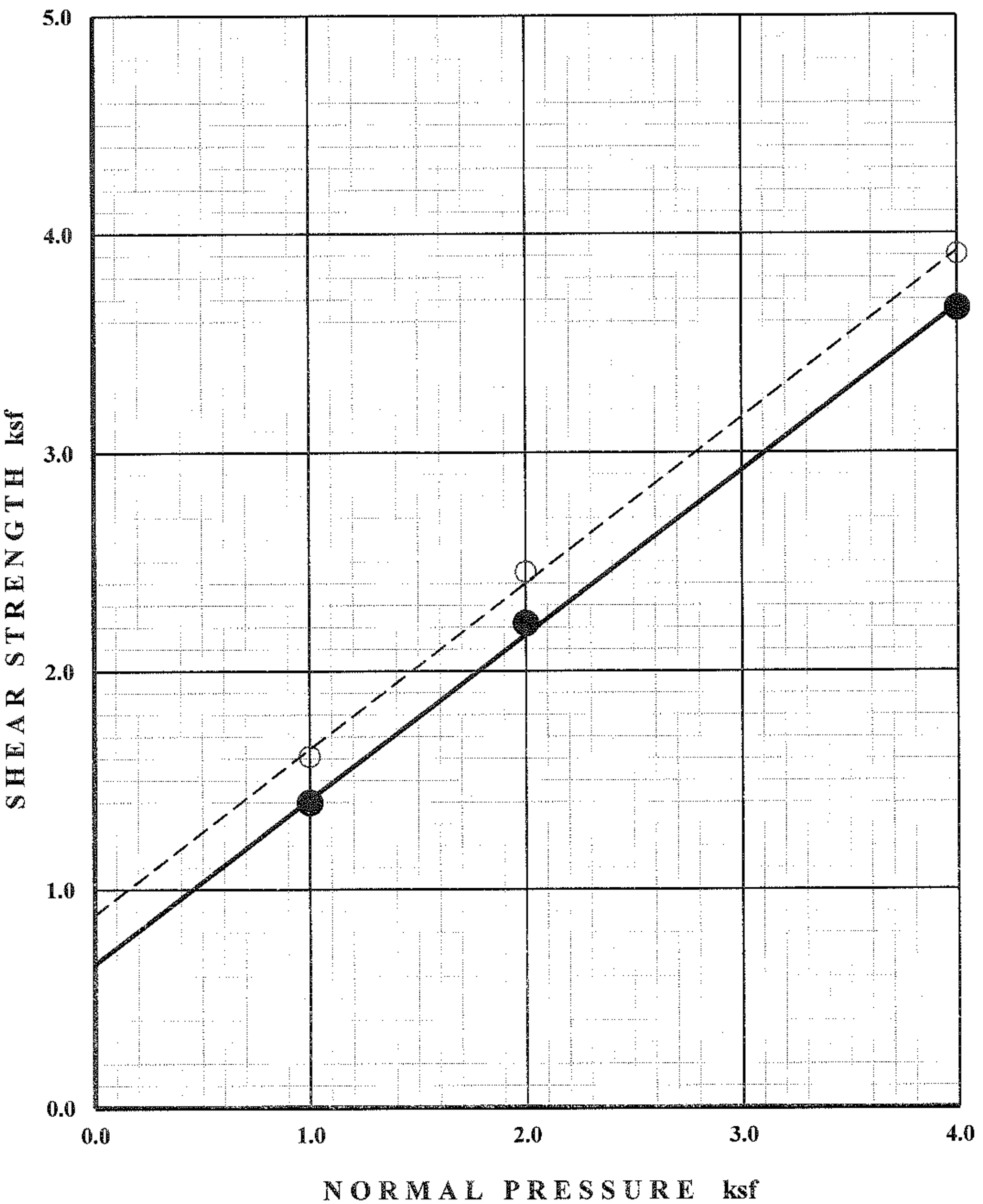
CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: B-16 @ 30' (Sandstone Brx- Tt) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min Initial moisture content = 11.0 %

SAMPLE SATURATION - 24 hrs Final moisture content = 18.7 %

DRY DENSITY & WATER CONTENT - **110 pcf @ 19 %**

ULTIMATE SHEAR RESISTANCE

COHESION = 660 psf

PHI = 37 °

PEAK SHEAR RESISTANCE

COHESION = 885 psf

PHI = 37 °

CALWEST GEOTECHNICAL

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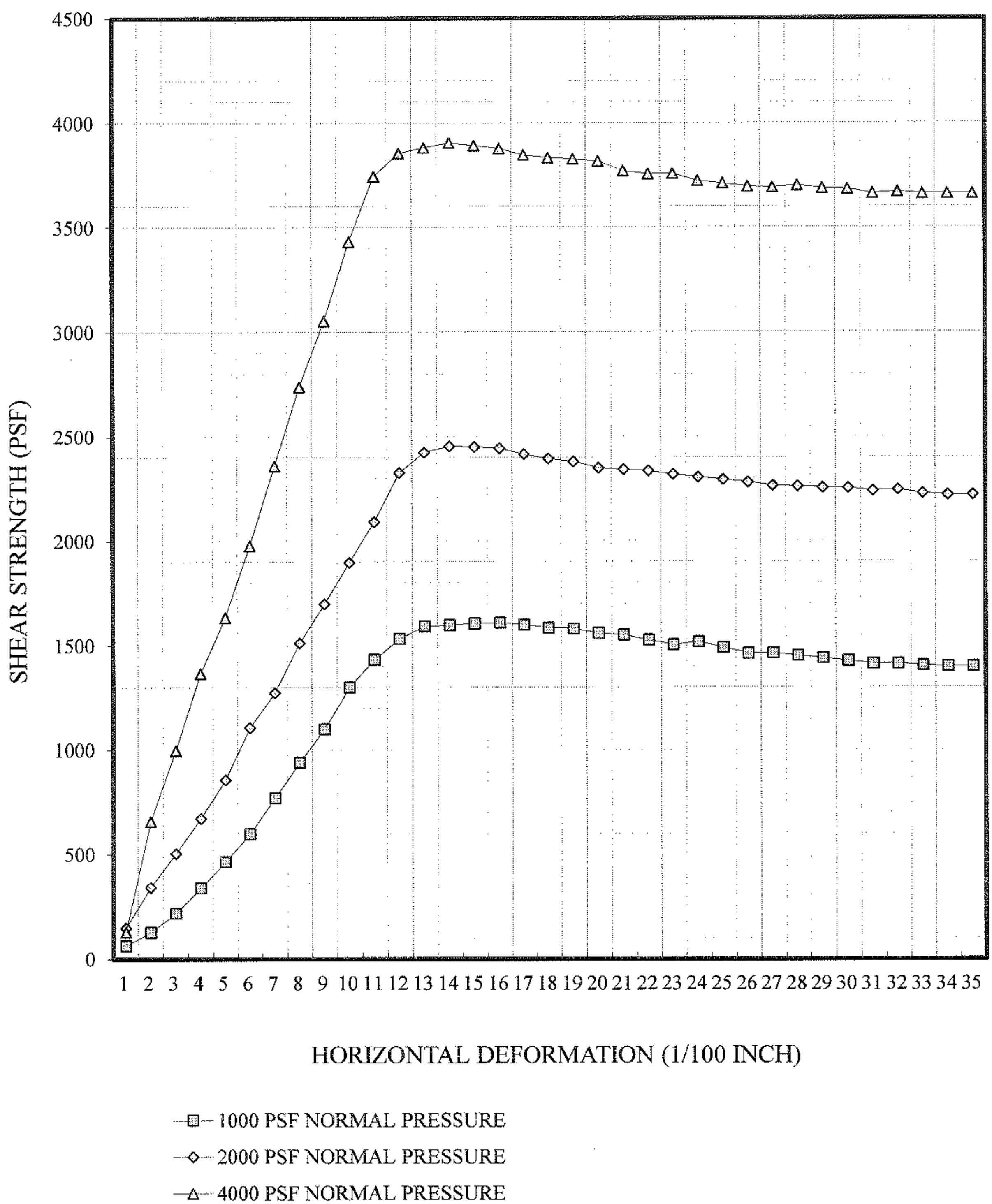
DIRECT SHEAR TEST

SAMPLE: **B-16 @ 30' (Sandstone Brx- Tt)** **first run**



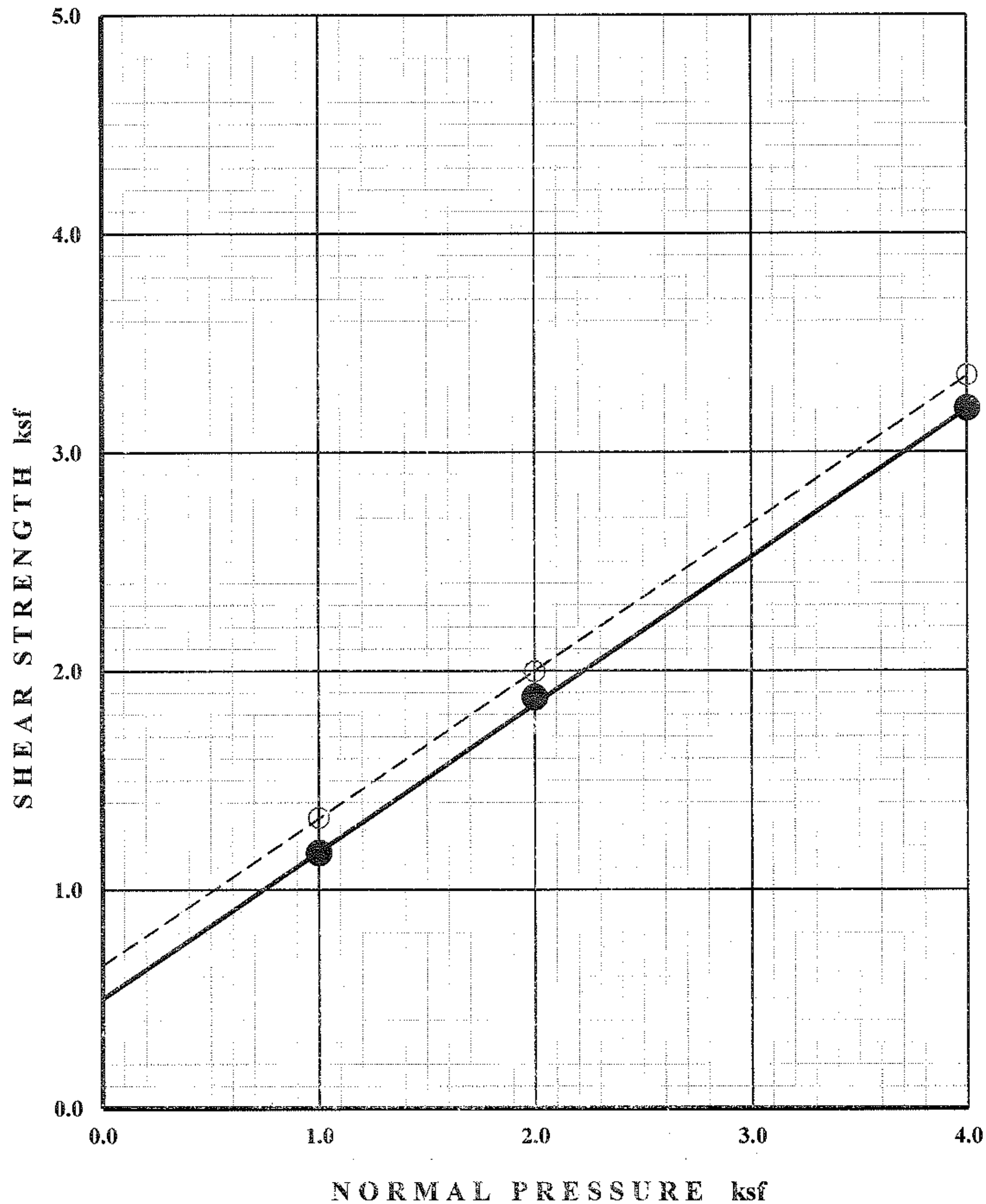
CALWEST GEOTECHNICAL

818-991-7148
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: TP-8 @ 4' (Bedrock- Tm) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min

SAMPLE SATURATION - 24 hrs

Initial moisture content = 24.6 %

Final moisture content = 27.7 %

ULTIMATE SHEAR RESISTANCE

COHESION = 500 psf

PHI = 34 °

DRY DENSITY & WATER CONTENT - 95.1 pcf @ 28 %

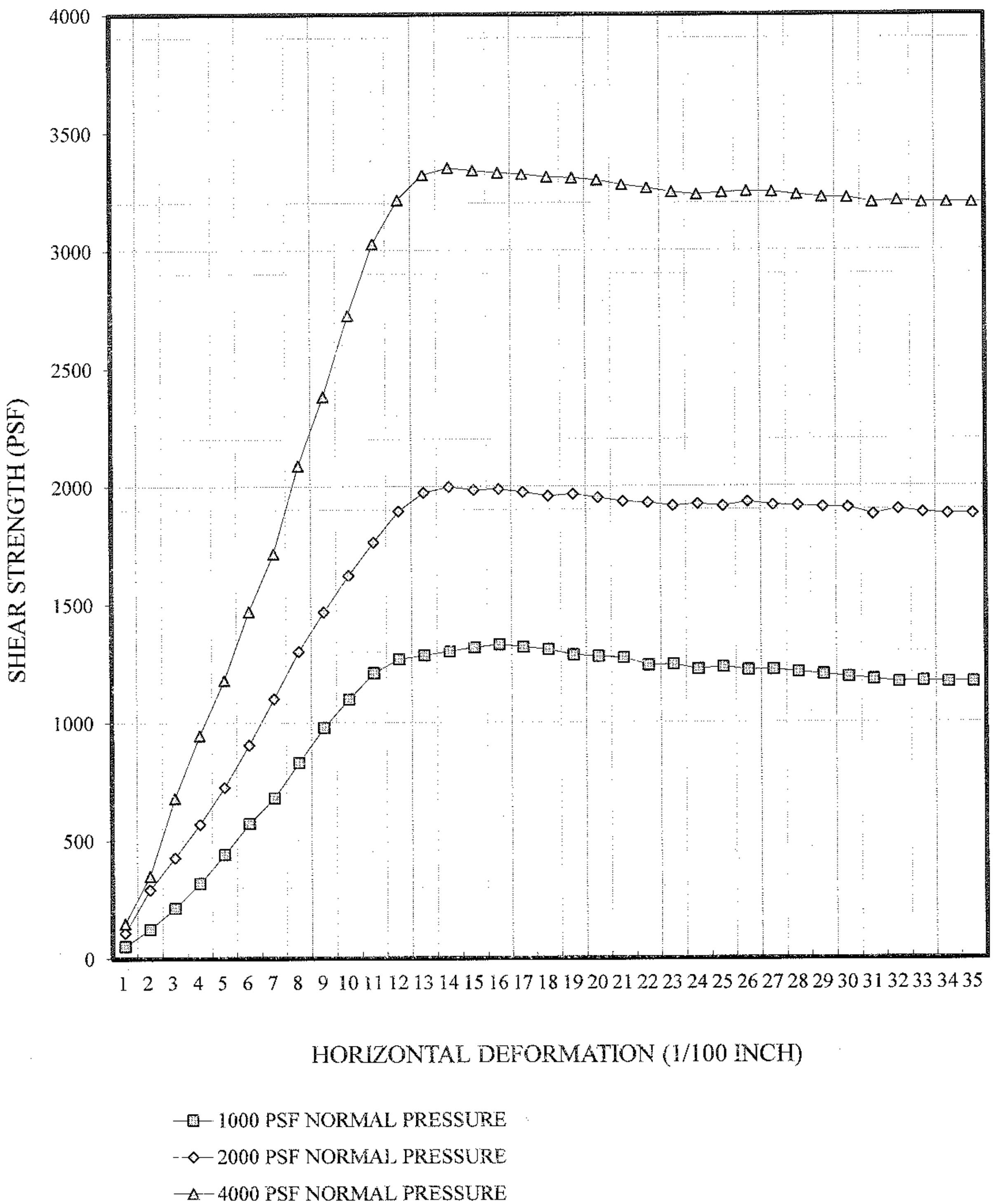
PEAK SHEAR RESISTANCE

COHESION = 654 psf

PHI = 34 °

DIRECT SHEAR TEST

SAMPLE: **TP-8 @ 4' (Bedrock- Tm)** **first run**



CALWEST GEOTECHNICAL

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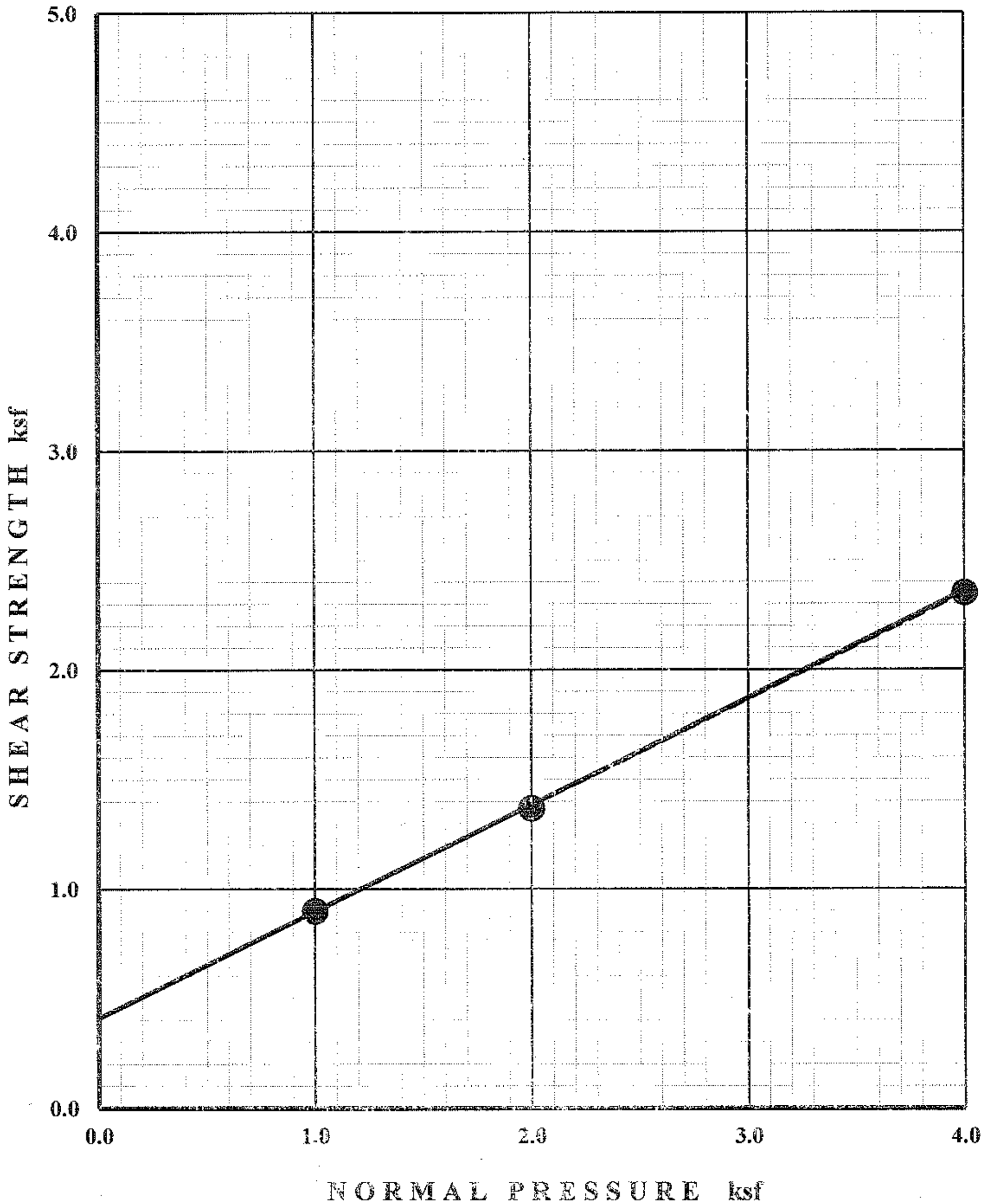
805-497-1244

SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: TP-11 @ 1.5' (Soil- Sandy Clay) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

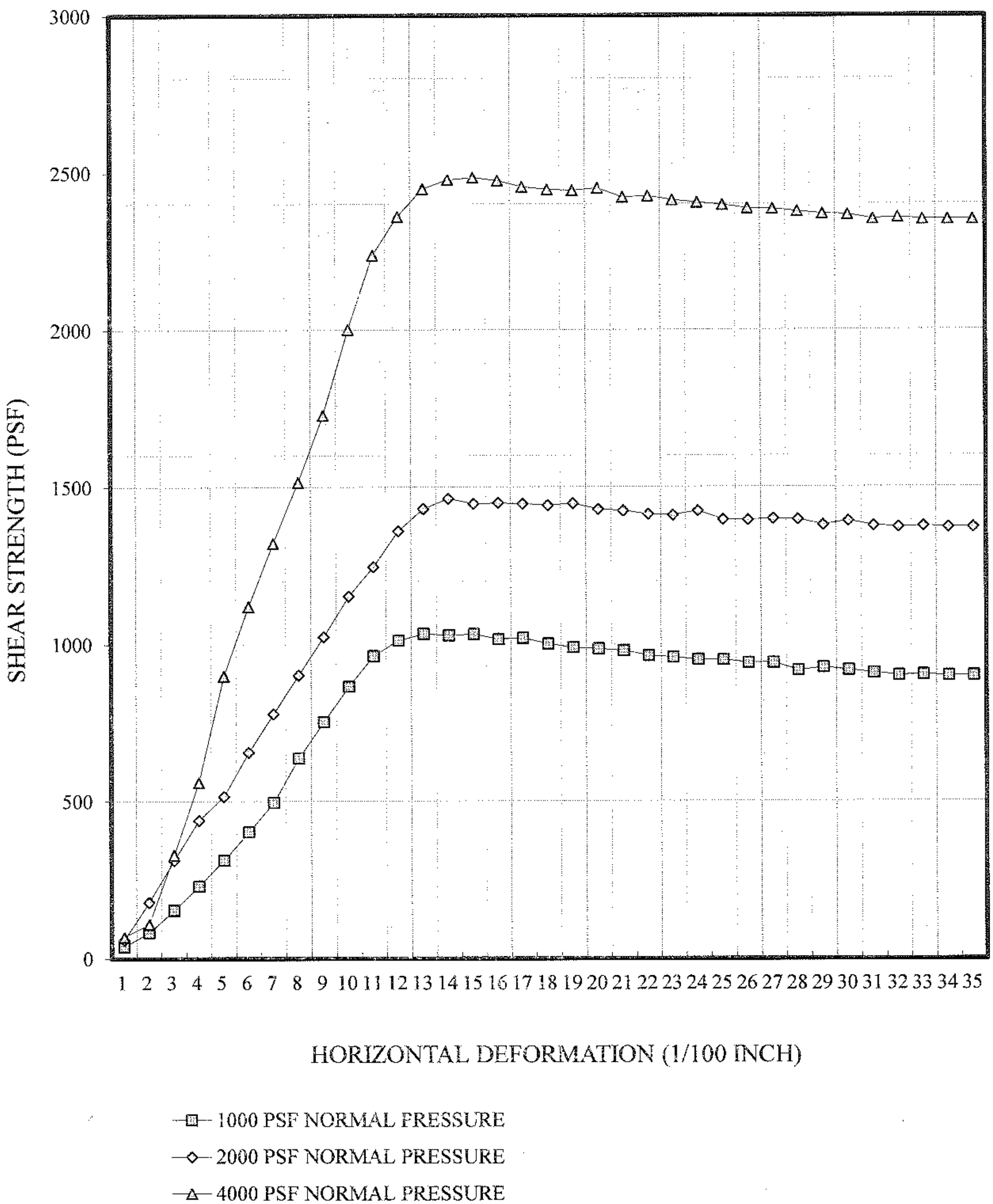
Initial moisture content = 13.7 %
Final moisture content = 28.8 %

ULTIMATE SHEAR RESISTANCE
COHESION = 410 psf
PHI = 26 °

DRY DENSITY & WATER CONTENT - 93.5 pcf @ 29 %

DIRECT SHEAR TEST

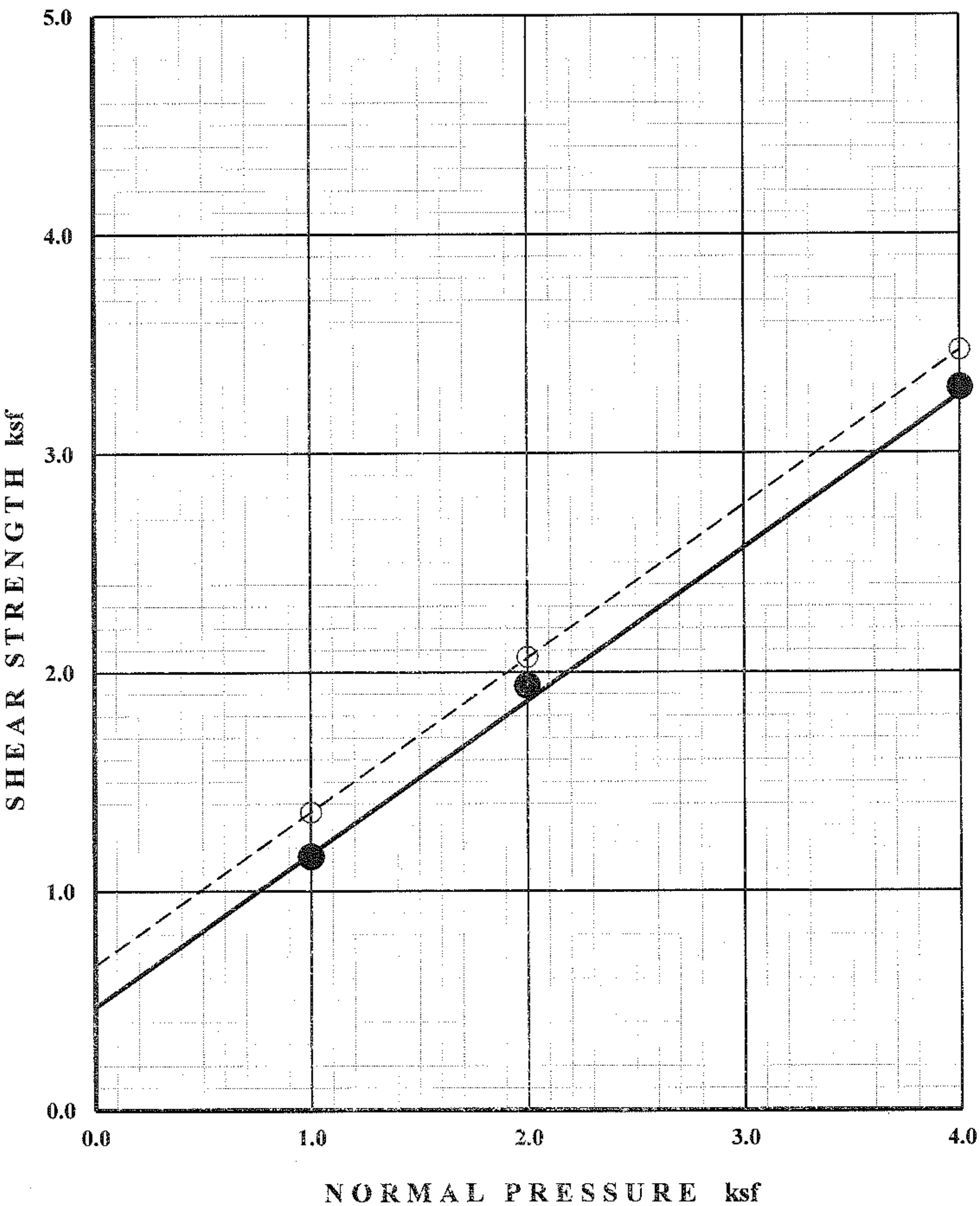
SAMPLE: **TP-11 @ 1.5' (Soil- Sandy Clay)** **first run**



SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: TP-18 @ 3.5' (Fault Zone Brx-Tm) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min
SAMPLE SATURATION - 24 hrs

Initial moisture content = 12.7 %
Final moisture content = 21.4 %

ULTIMATE SHEAR RESISTANCE
COHESION = 470 psf
PHI = 35 °

DRY DENSITY & WATER CONTENT - 105 pcf @ 21 %

PEAK SHEAR RESISTANCE
COHESION = 661 psf
PHI = 35 °

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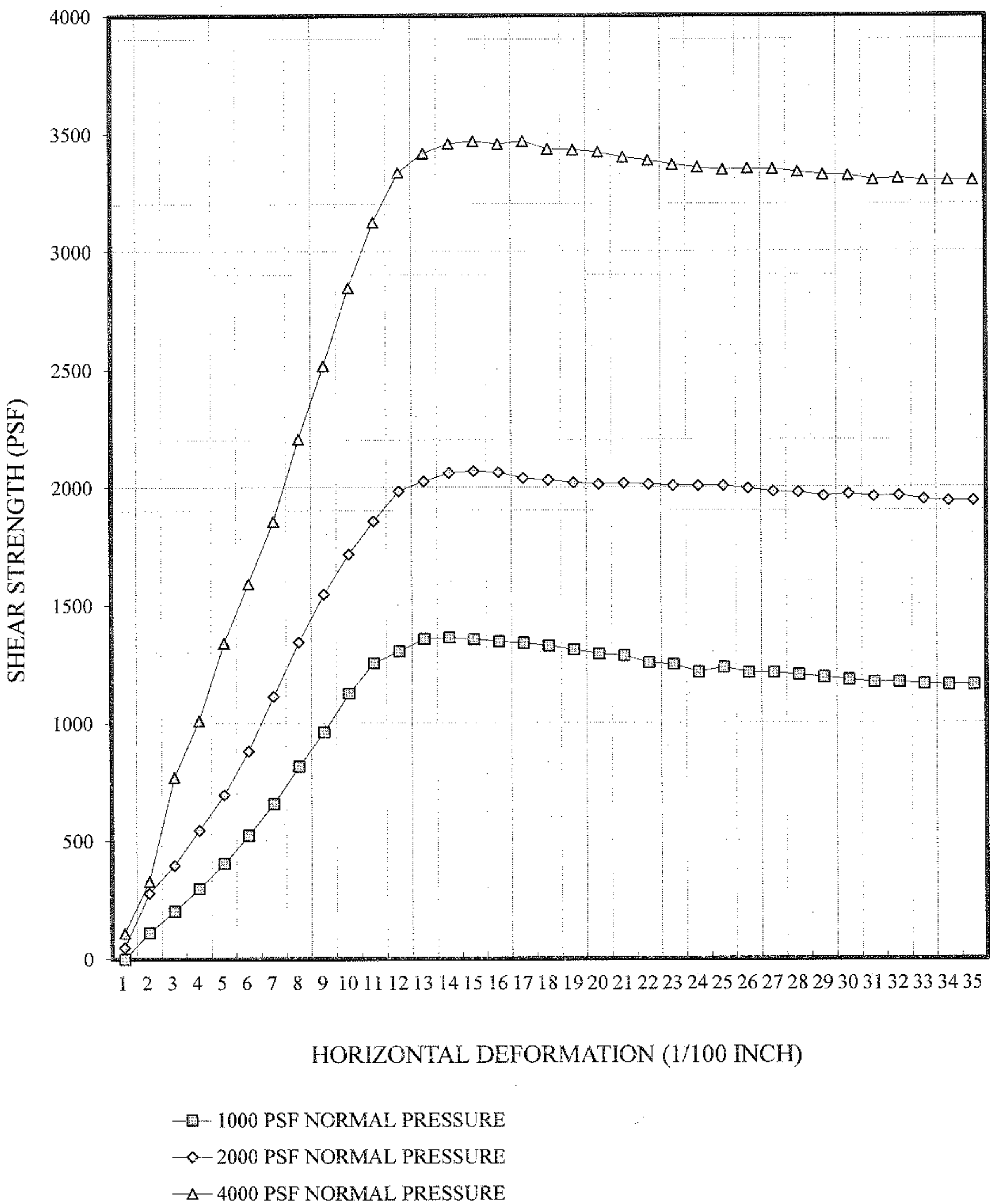
DIRECT SHEAR TEST

SAMPLE: **TP-18 @ 3.5' (Fault Zone Brx-Tm)** **first run**



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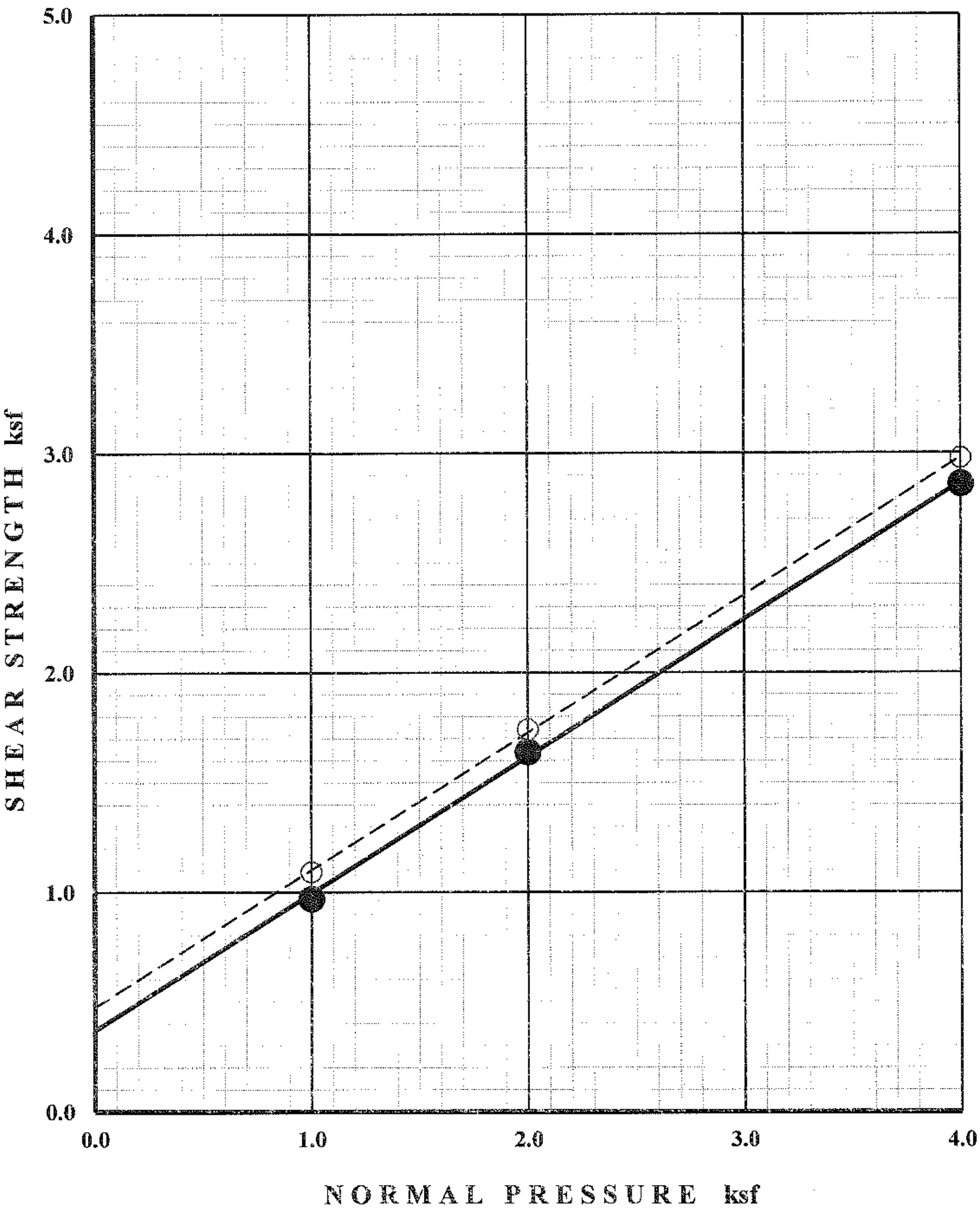
SHEAR TEST DIAGRAM

PROJECT: Oak Pass LLC **NUMBER:** 5750II

SAMPLE: TP-20 @ 4'(Weathered Brx- Tt) **DATE:** Dec., 2018



STRAIN RATE -0.005 in/min Initial moisture content = 13.9 %

SAMPLE SATURATION - 24 hrs Final moisture content = 22.3 %

DRY DENSITY & WATER CONTENT - 103.3 pcf @ 22 %

ULTIMATE SHEAR RESISTANCE

COHESION = 370 psf

PHI = 32 °

PEAK SHEAR RESISTANCE

COHESION = 476 psf

PHI = 32 °

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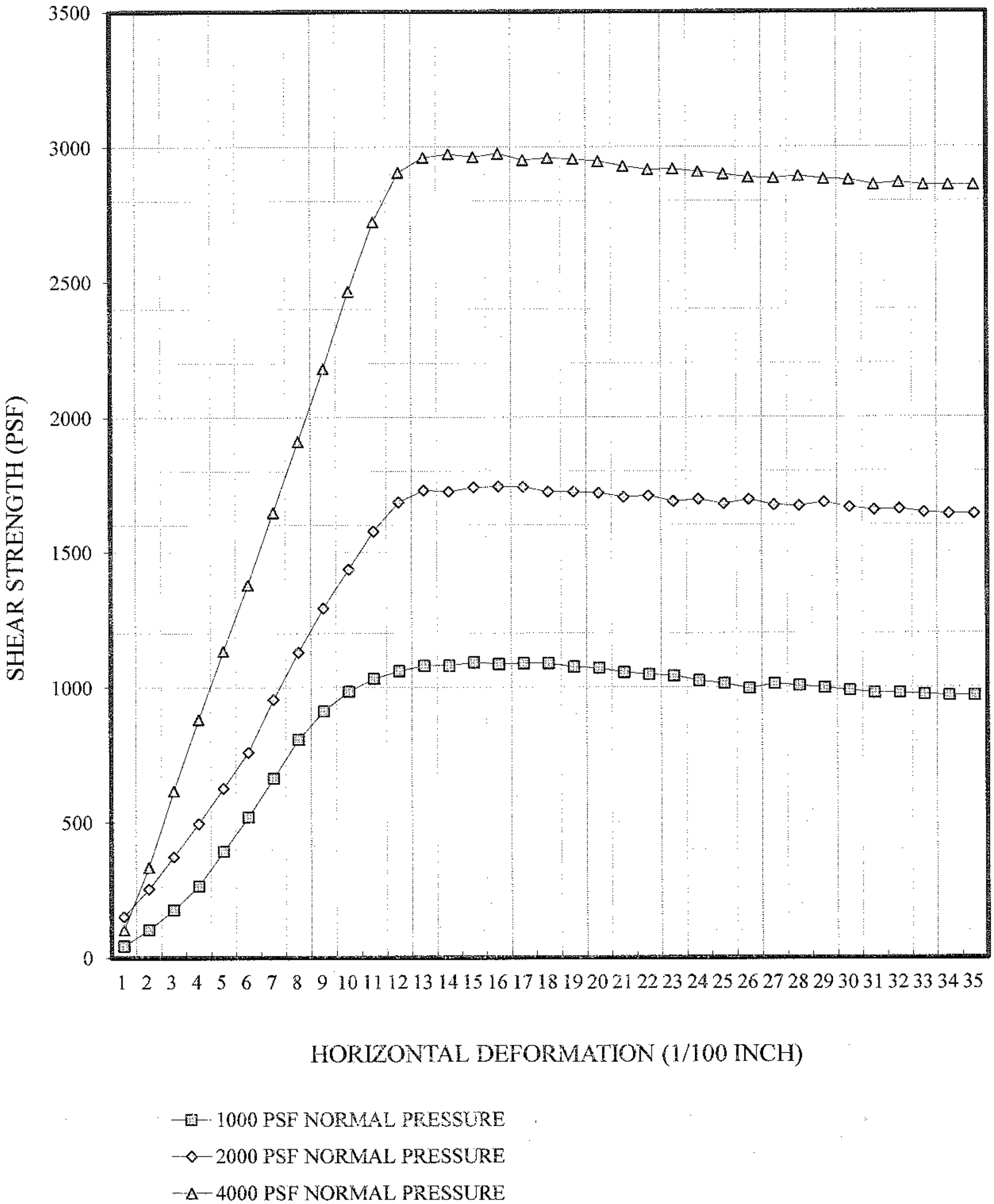
DIRECT SHEAR TEST

SAMPLE: **TP-20 @ 4'(Weathered Brx- Tt)** **first run**



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COMPACTION / EXPANSION DATA

PROJECT: Oak Pass LLC

JOB NO.: G5750 DATE: Dec., 2018

TEST PIT NUMBER	SAMPLE DEPTH	SOIL TYPE	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)	EXPANSION INDEX
B-6	0-5'	FILL- Sandy Clay	110.0	17.5	68
B-8	0-5'	FILL- Clayey Sand	124	12.5	19
B-11	1-6'	Silty Sand	115	14	26
TP-16	0-4'	Sandy Clay	106	18	65

Legend: Expansion Index:

0-20 Very Low 50-90 Moderate
20-50 Low 90-130 High

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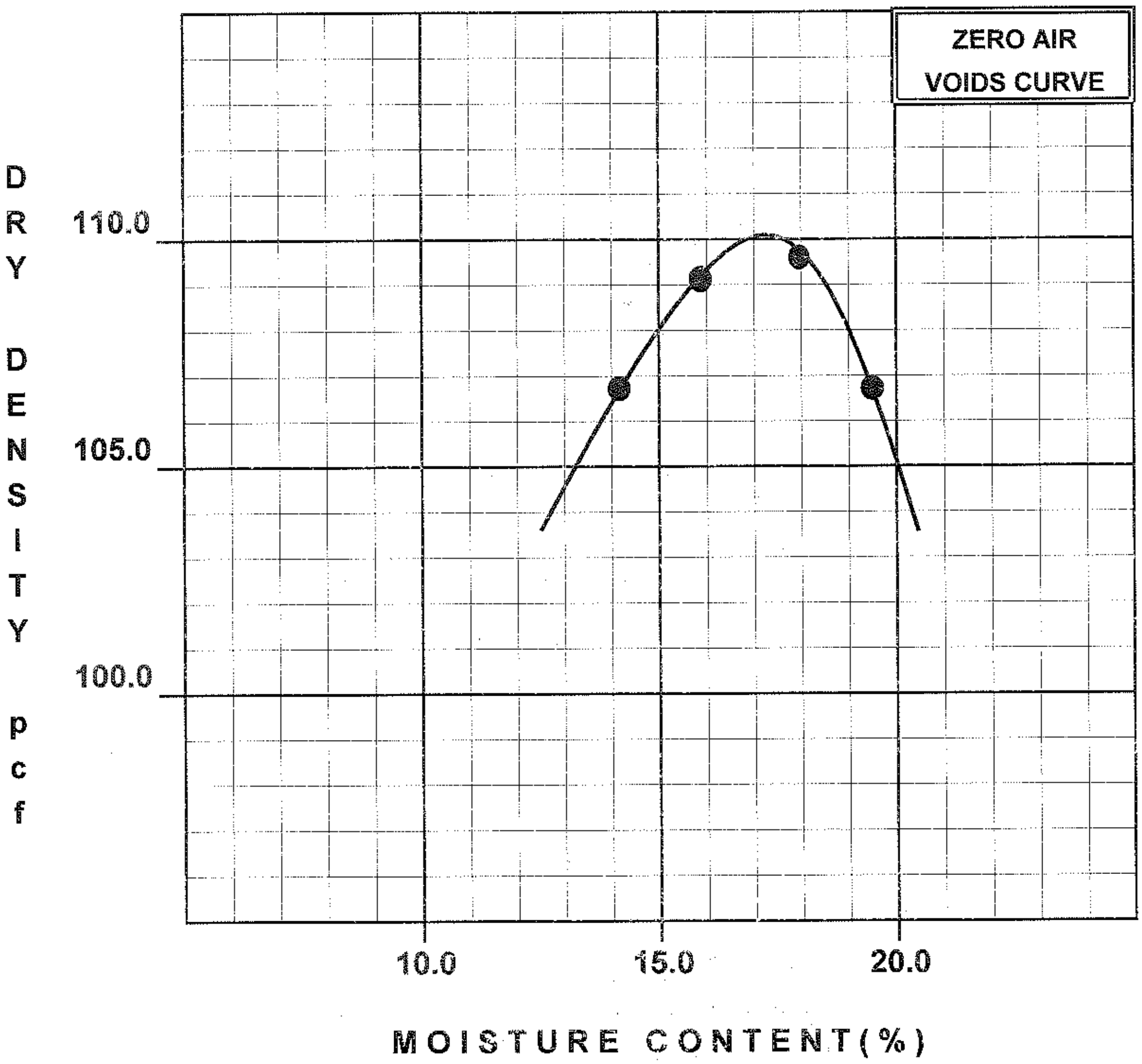
(805) 497-1244

MAXIMUM DENSITY TEST

PROJECT NAME: Oak Pass LLC **NUMBER:** G5750

SAMPLE (NO. & DEPTH)	TEST DESIGNATION	MAXIMUM DRY DENSITY	OPTIMUM MOISTURE CONTENT
B-6 (0-5')	ASTM D1557	110.0 (PCF)	17.5 %



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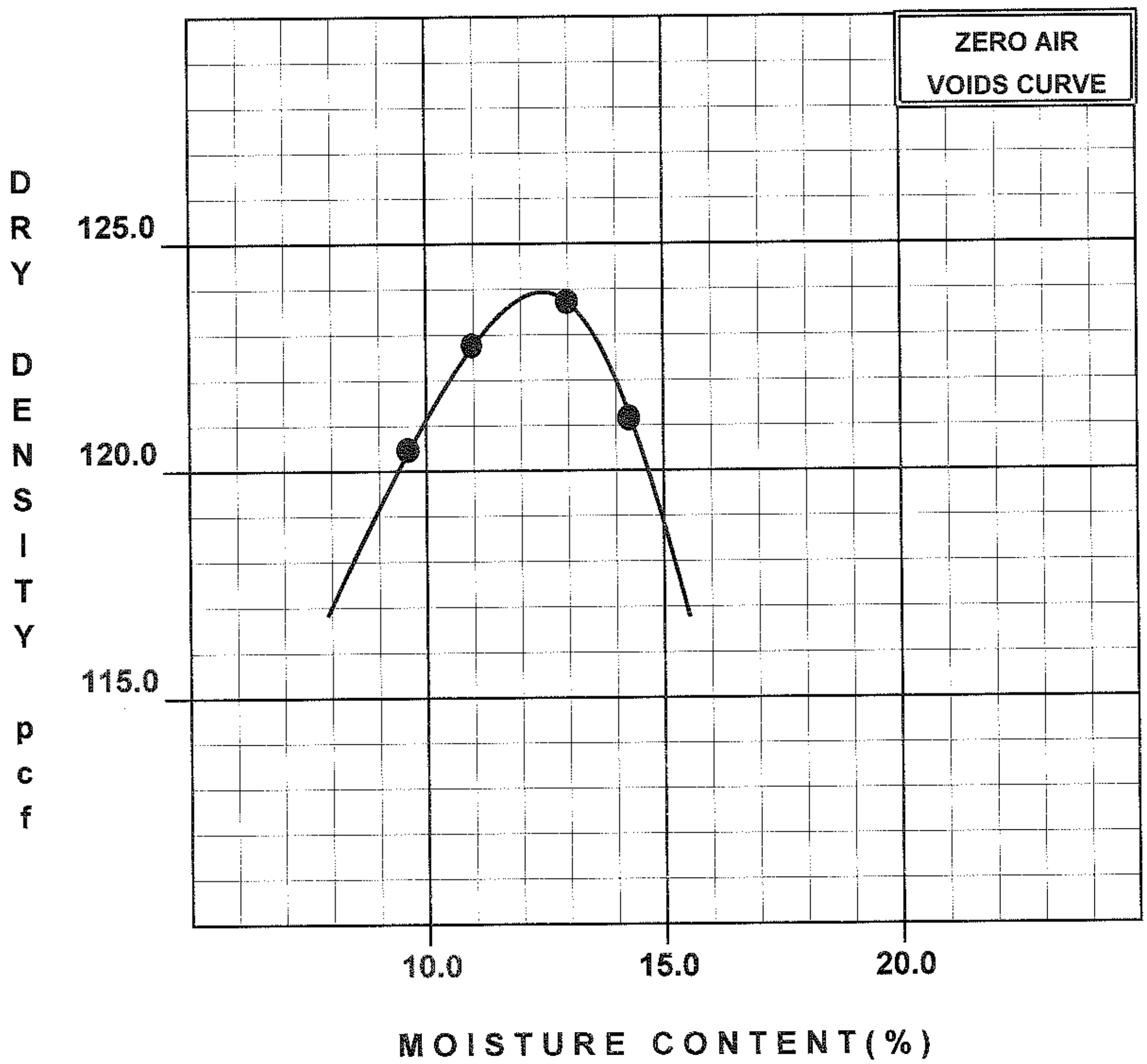
(805) 497-1244

MAXIMUM DENSITY TEST

PROJECT NAME: Oak Pass LLC **NUMBER:** G5750

SAMPLE (NO. & DEPTH)	TEST DESIGNATION	MAXIMUM DRY DENSITY	OPTIMUM MOISTURE CONTENT
B-8 (0-5')	ASTM D1557	124.0 (PCF)	12.5 %



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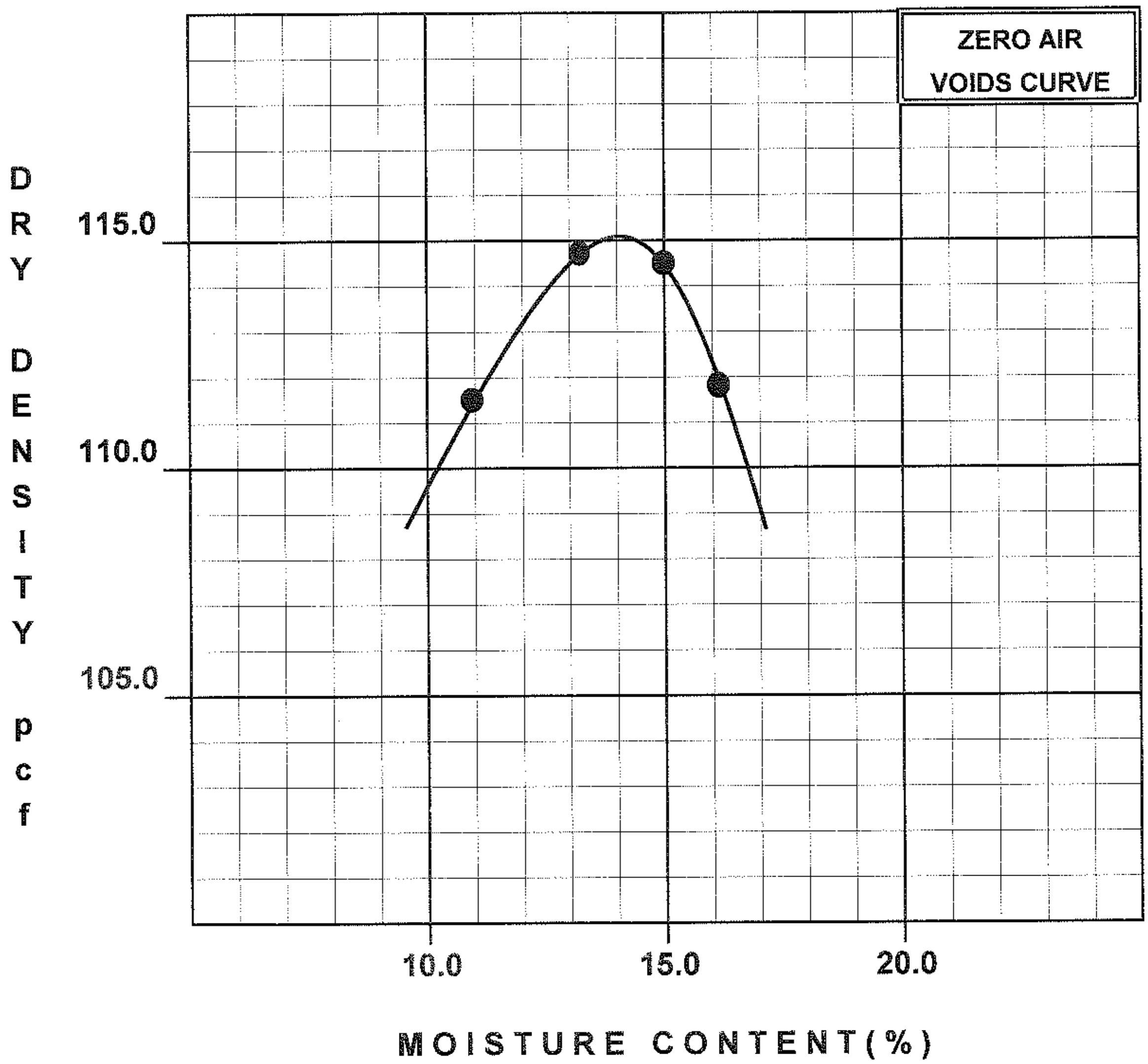
MAXIMUM DENSITY TEST

PROJECT NAME: Oak Pass LLC **NUMBER:** G5750

SAMPLE (NO. & DEPTH)	TEST DESIGNATION	MAXIMUM DRY DENSITY	OPTIMUM MOISTURE CONTENT
B-11 (1-6')	ASTM D1557	115.0 (PCF)	14.0 %



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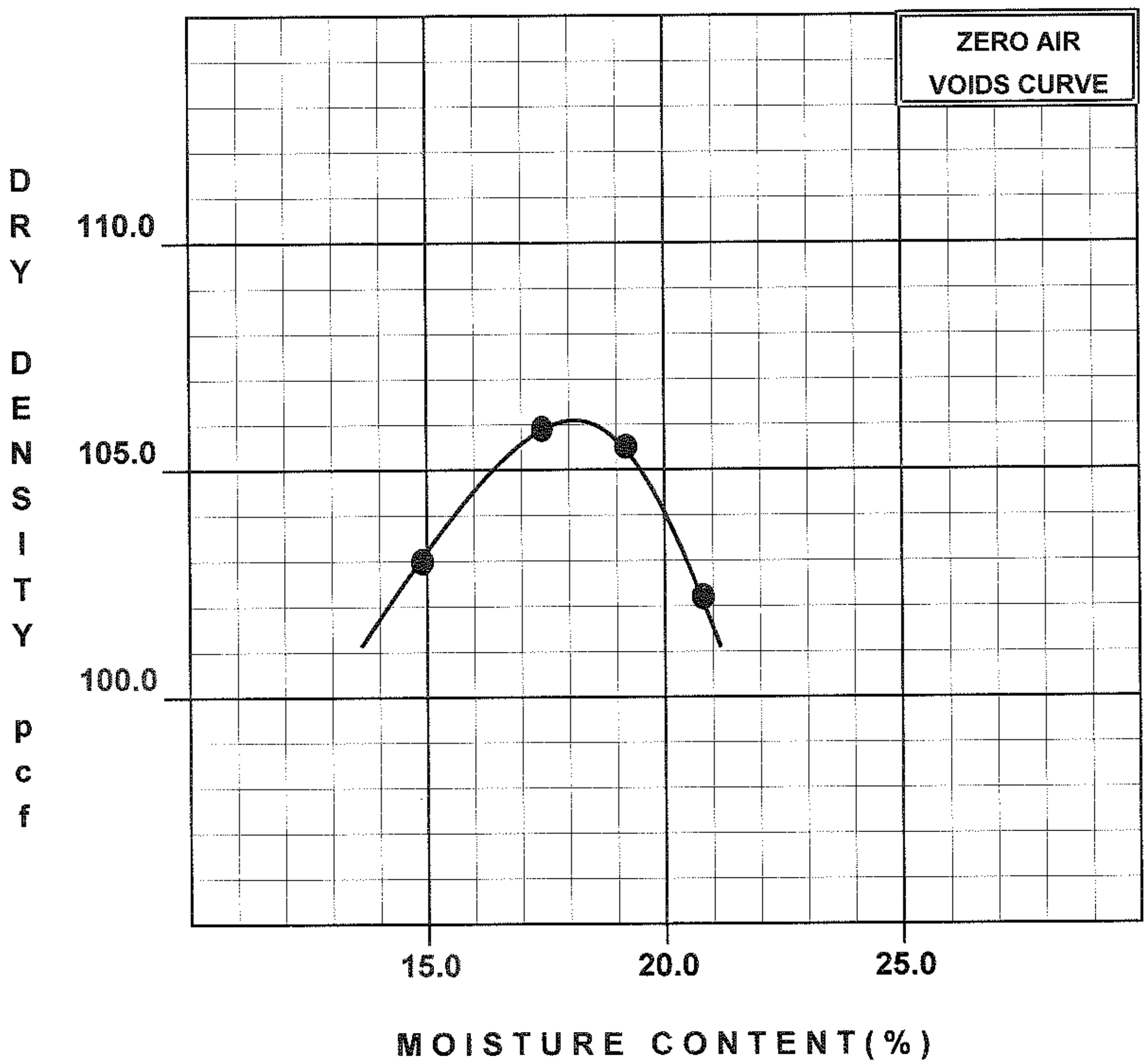
MAXIMUM DENSITY TEST

PROJECT NAME: Oak Pass LLC **NUMBER:** G5750

SAMPLE (NO. & DEPTH)	TEST DESIGNATION	MAXIMUM DRY DENSITY	OPTIMUM MOISTURE CONTENT
TP-16 (0-4')	ASTM D1557	106.0 (PCF)	18.0 %



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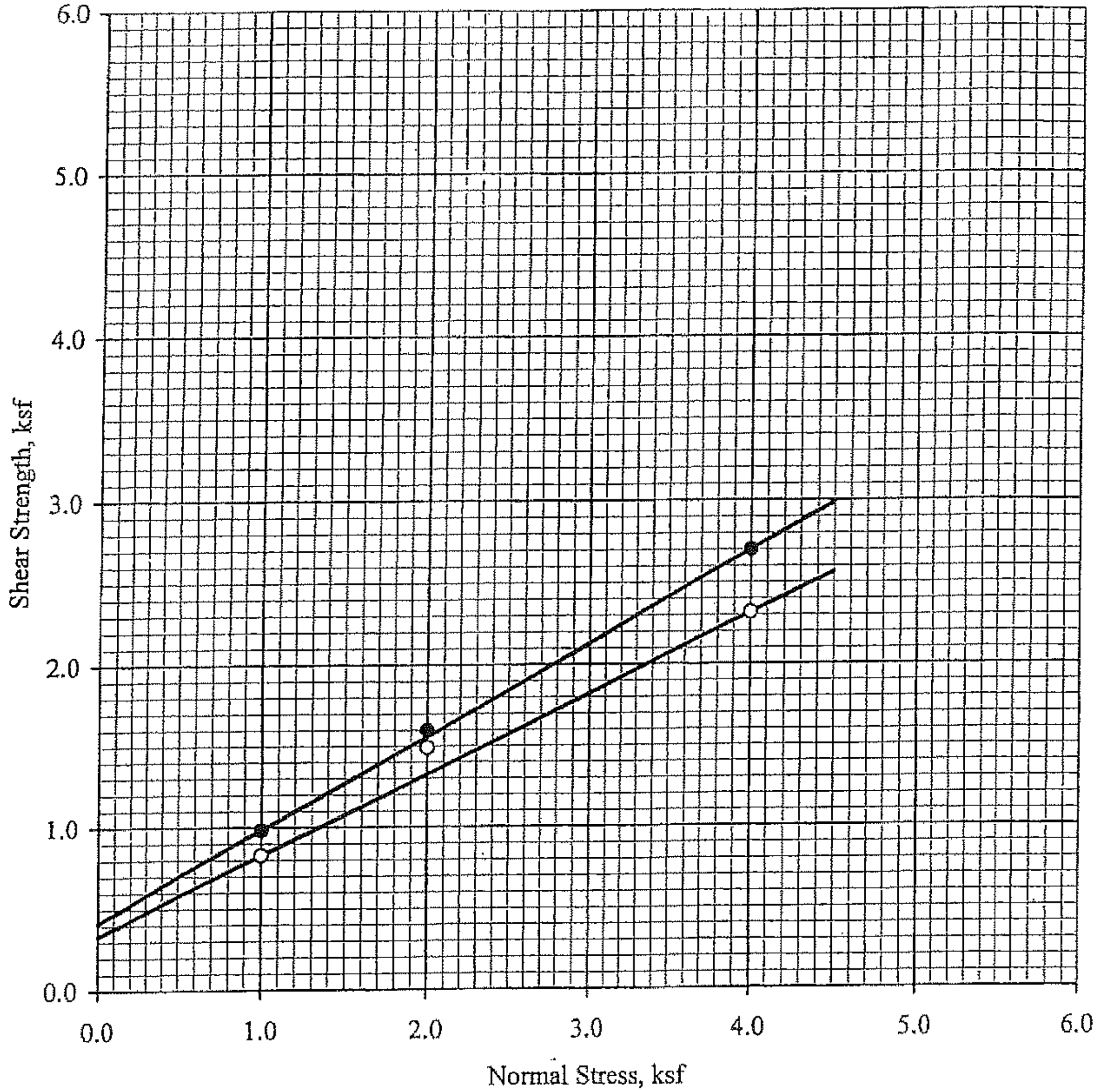
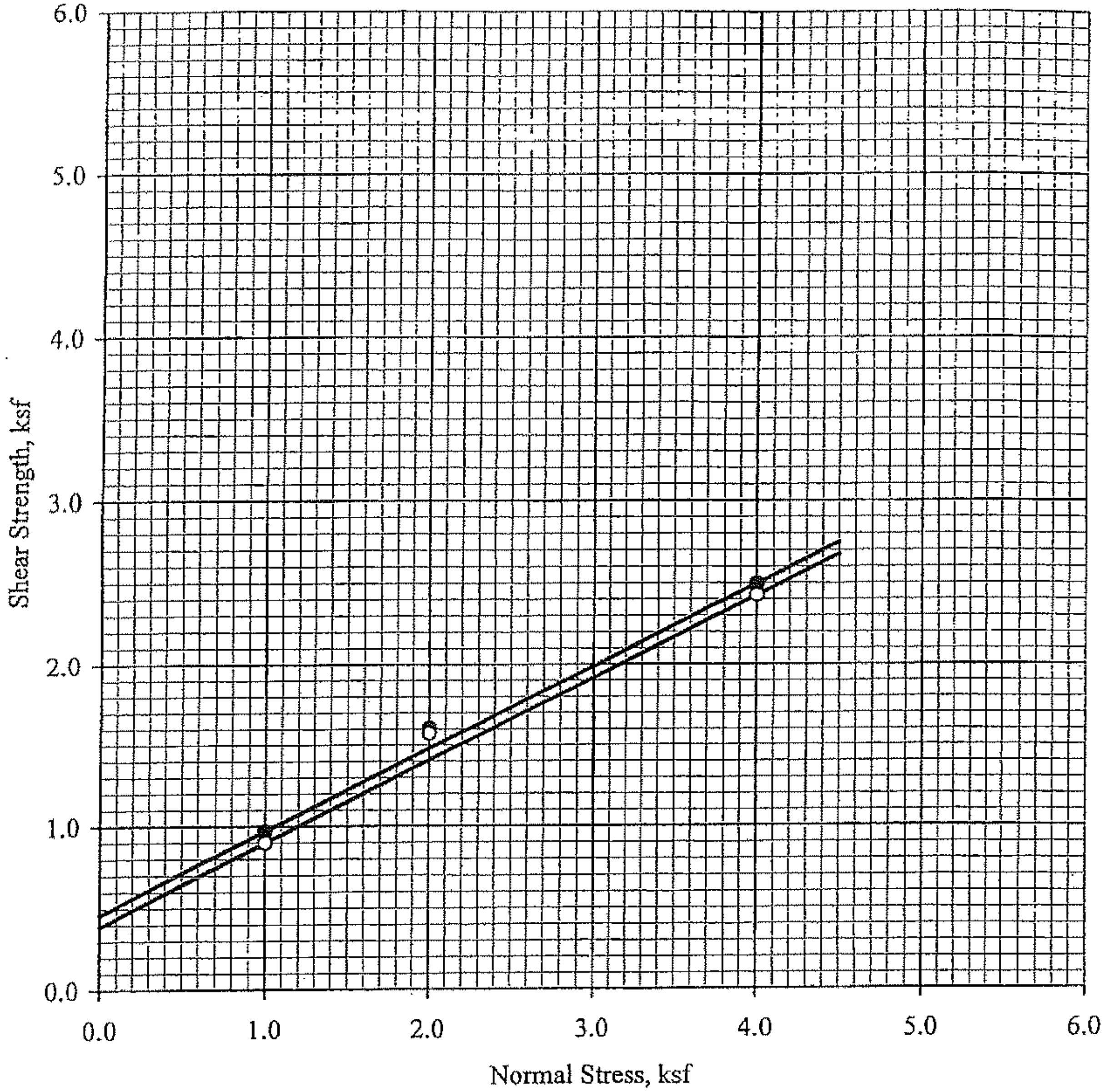
Shear Test Results, 9810, 9812 Wonda Park Dr., and 2530 Hutton Dr.,Prepared by C.Y. Geotechnical, July 2000 and July 2005.



● Peak	- At Saturation Moisture Content	C = 410 psf	φ = 29.5 °
○ Ultimate	- At Saturation Moisture Content	C = 330 psf	φ = 26 °

Field Dry Density = 85 pcf Field Moisture Content = 20 % Saturation Moisture Content = 36 %	Boring : B-1 Depth : 6 feet Description : Dark brown siliceous shale (Ttusi)
C. Y. GEOTECH, INC. Geotechnical Engineering and Engineering Geology	Machael Plyam Date : 07-2005 — P.N. No.: CYG-05-4113 **Shear Diagram**

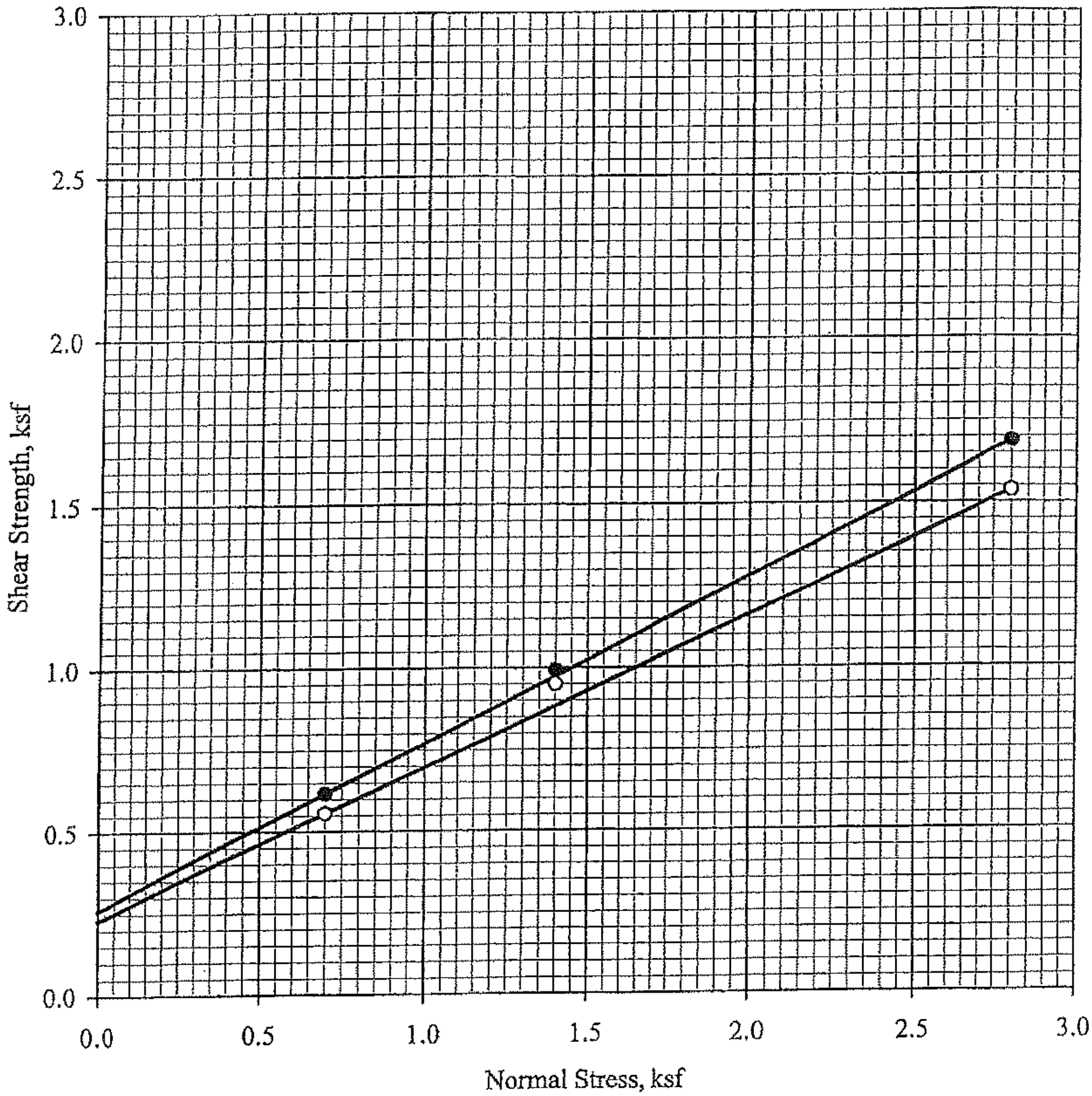
Plate DS - 1



● Peak	- At Saturation Moisture Content	C = 460 psf	ϕ = 26.5 °
○ Ultimate	- At Saturation Moisture Content	C = 390 psf	ϕ = 26.5 °

Field Dry Density = 101 pcf Field Moisture Content = 11 % Saturation Moisture Content = 24 %	Boring : B-3 Depth : 2 feet Description : Light brown sandstone (Ttusi)
C. Y. GEOTECH, INC. Geotechnical Engineering and Engineering Geology	Michael Plyam Date : 07-2005 / P.N. No.: CYG-05-4113 **Shear Diagram**

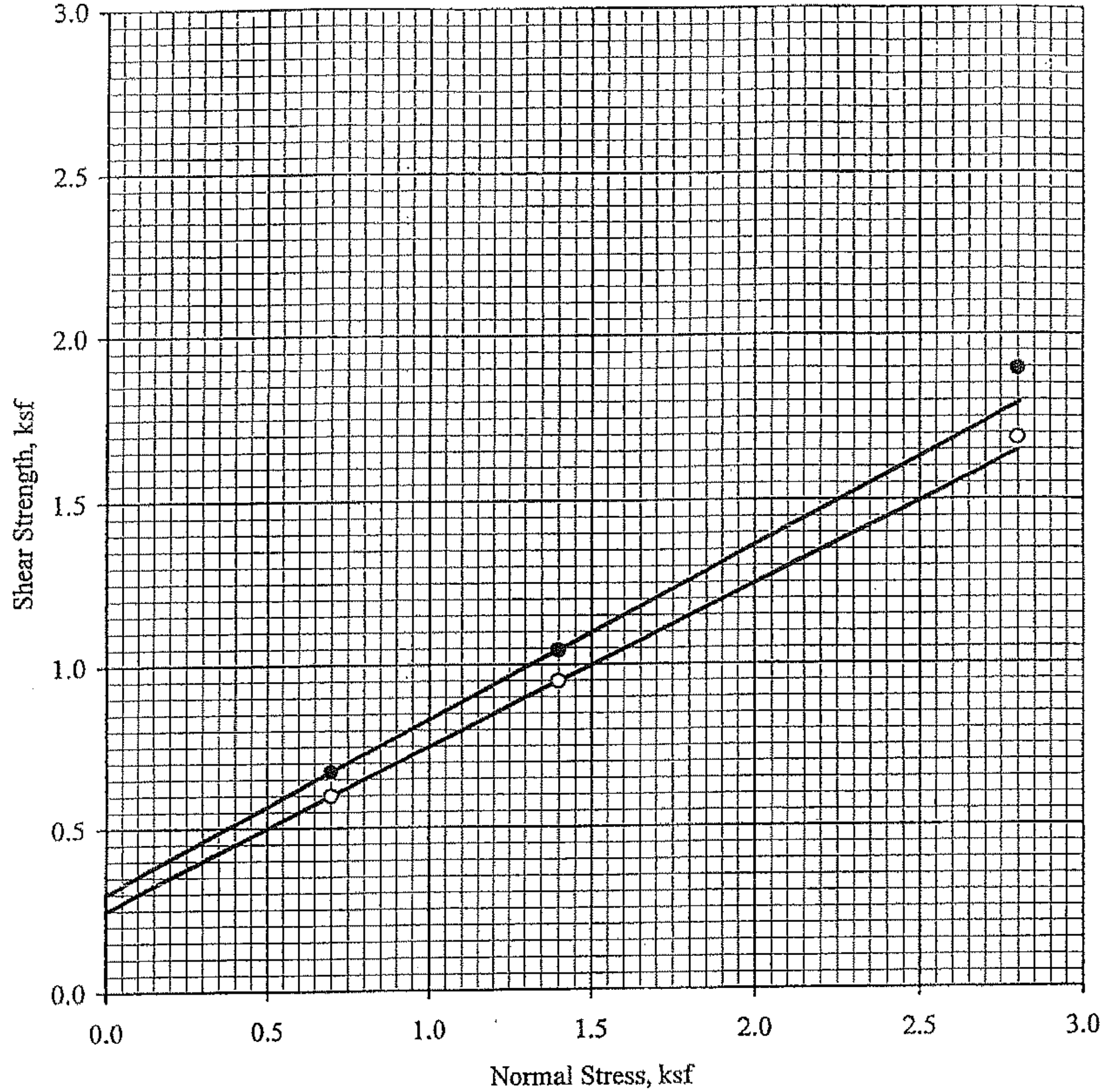
Plate DS - 2



● Peak	- At Saturation Moisture Content	C = 260 psf	ϕ = 27 °
○ Ultimate	- At Saturation Moisture Content	C = 230 psf	ϕ = 25 °

Field Dry Density = 94 pcf Field Moisture Content = 8 % Saturation Moisture Content = 29 %	Boring : B-5 Depth : 1.5 feet Description : Brown clayey sandy silt (Af)
C. Y. GEOTECH, INC. Geotechnical Engineering and Engineering Geology	Michael Plyam Date : 07-2005 — P.N. No.: CYG-05-4113 **Shear Diagram**

Plate DS - 3



● Peak - At Saturation Moisture Content C = 300 psf ϕ = 28 °

○ Ultimate - At Saturation Moisture Content C = 250 psf ϕ = 26.5 °

Field Dry Density = 82 pcf
Field Moisture Content = 16 %
Saturation Moisture Content = 38 %

Boring : B-6
Depth : 4 feet
Description : Brown clayey sandy silt (Af)

C. Y. GEOTECH, INC.

Geotechnical Engineering and Engineering Geology

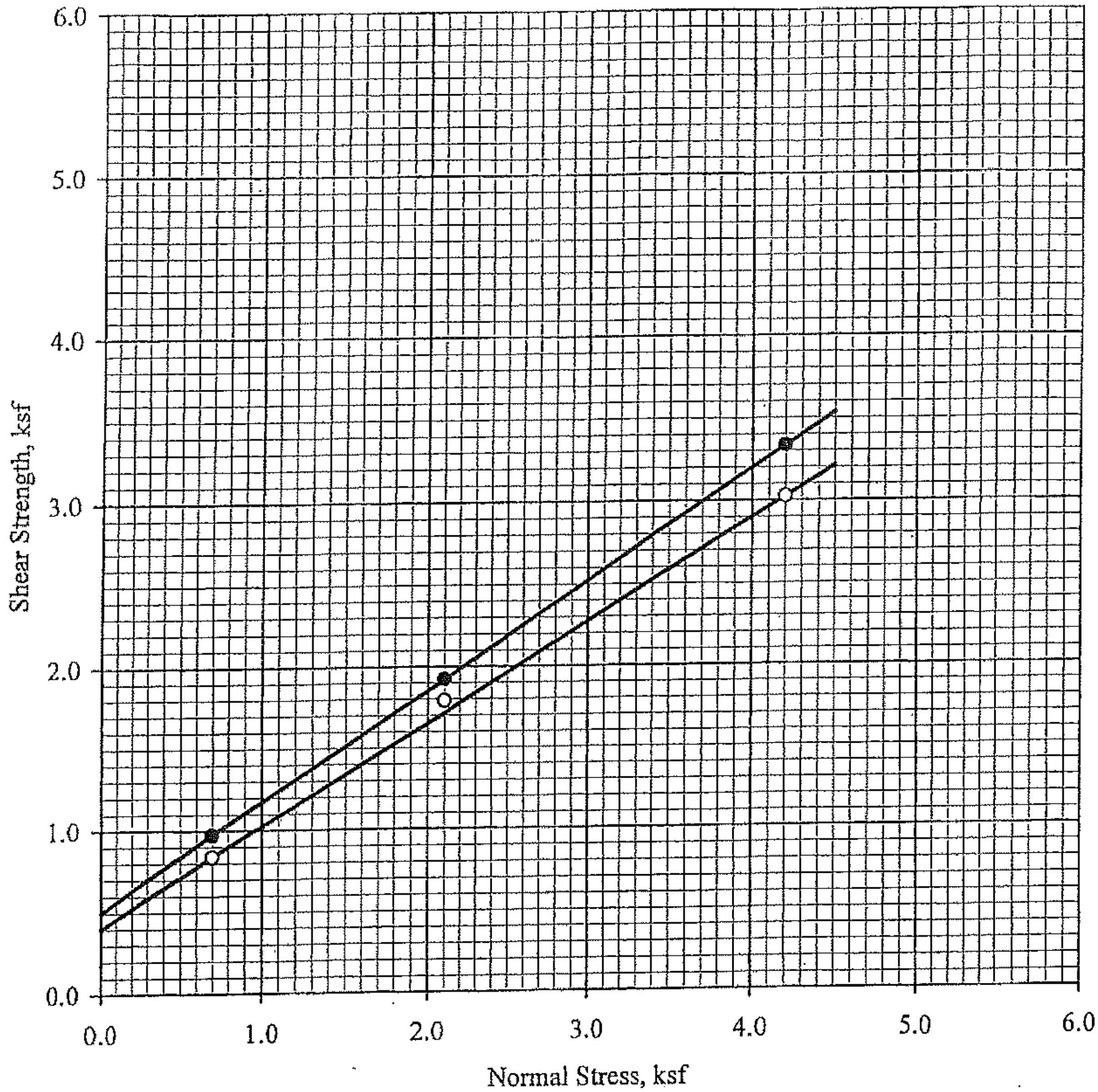
Michael Plyam

Date : 07-2005

P.N. No.: CYG-05-4113

Shear Diagram

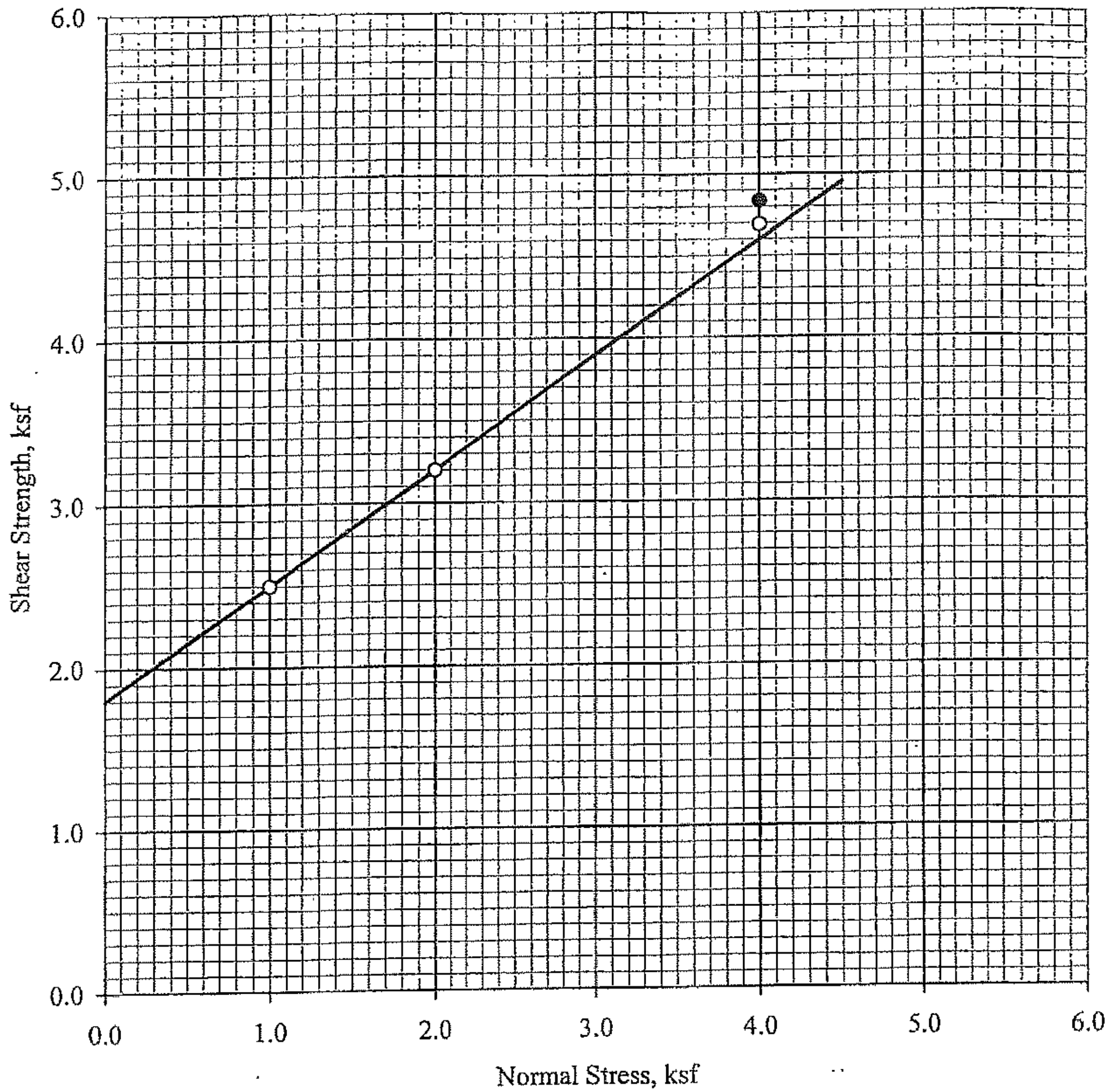
Plate DS - 4



● Peak - At Saturation Moisture Content C = 500 psf ϕ = 34 °

○ Ultimate - At Saturation Moisture Content C = 400 psf ϕ = 32 °

Field Dry Density = 92 pcf Field Moisture Content = 15 % Saturation Moisture Content = 30 %	Boring : B-6 Depth : 8 feet Description : Dark brown siliceous shale (Ttusi)
C. Y. GEOTECH, INC. Geotechnical Engineering and Engineering Geology	Michael Plyam Date : 07-2005 — P.N. No.: CYG-05-4113 **Shear Diagram**



● Peak	- At Saturation Moisture Content	C = 1800 psf	ϕ = 35 °
○ Ultimate	- At Saturation Moisture Content	C = 1800 psf	ϕ = 35 °

Field Dry Density = 119 pcf
Field Moisture Content = 2 %
Saturation Moisture Content = 12 %

Boring : Outcrop
Depth : -- --
Description : Light brown siliceous shale (Ttusi) (Across bedding)

C. Y. GEOTECH, INC.

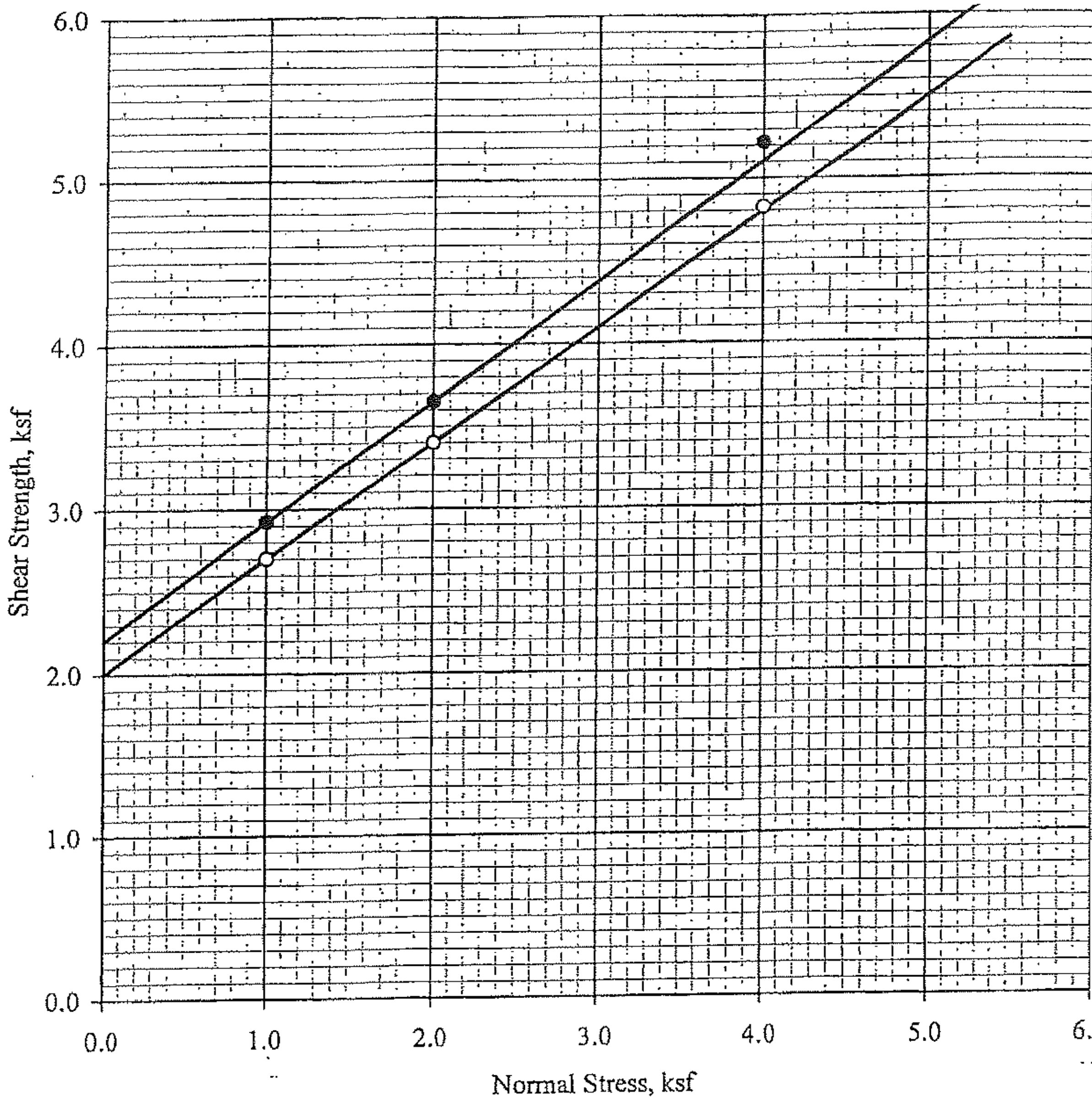
Geotechnical Engineering and Engineering Geology

Michael Plyam

Date : 07-2005

P.N. No.: CYG-05-4113

Shear Diagram



● Peak	- At Saturation Moisture Content	C = 2200 psf	ϕ = 36 °
○ Ultimate	- At Saturation Moisture Content	C = 2000 psf	ϕ = 35 °

Field Dry Density = 155 pcf Field Moisture Content = 1 % Saturation Moisture Content = 3 %	Boring : Outcrop Depth : -- -- Description : Light brown sandstone

C. Y. GEOTECH, INC. Geotechnical Engineering and Engineering Geology	Michael Plyam	
	Date : 07-2005	P.N. No.: CYG-05-4113
	Shear Diagram	

Plate DS - 7

1011122200641248

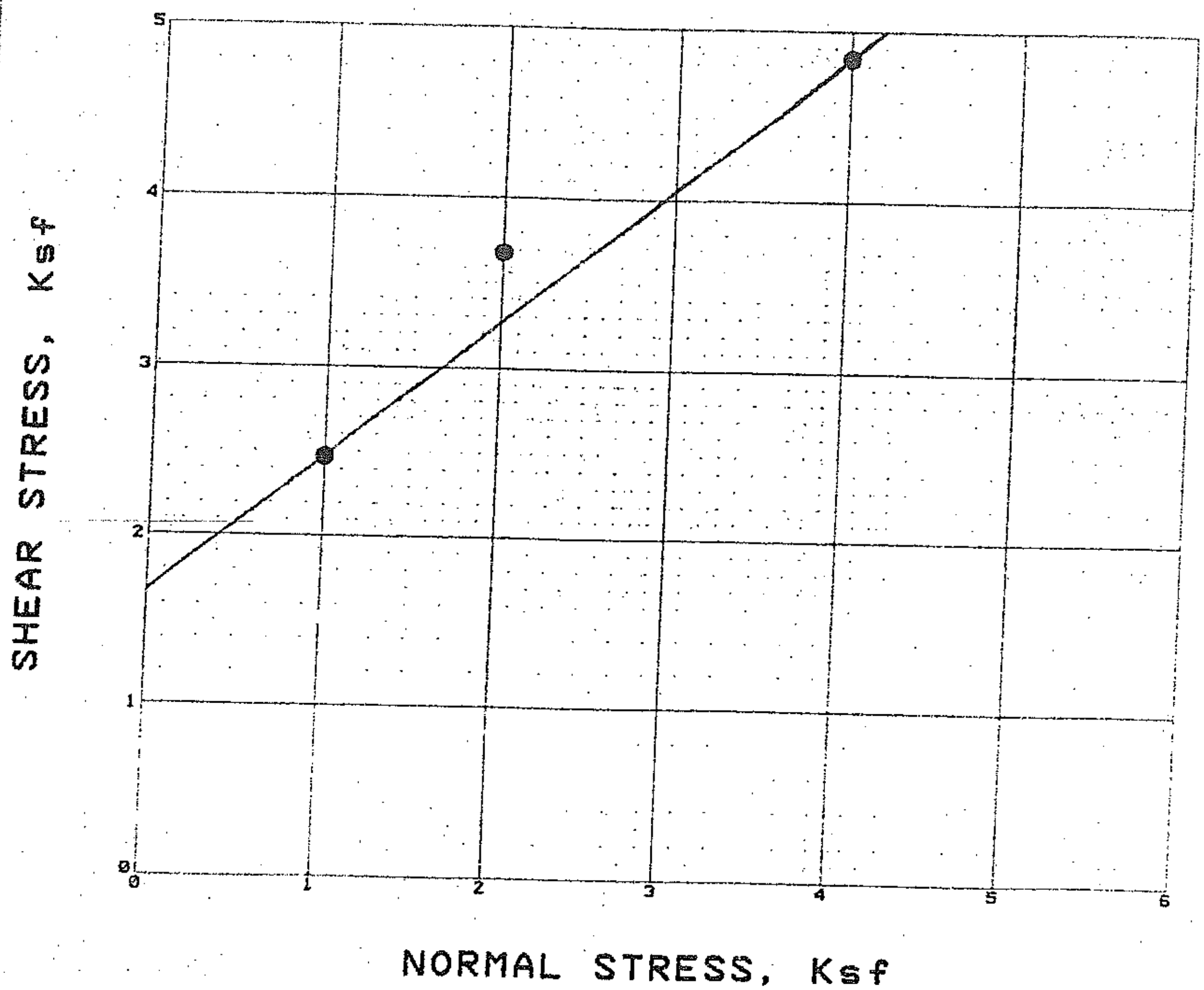
DIRECT SHEAR TEST

C. Y. GEOTECH, INC.

CLIENT	PSA/Alexander/PS 4439-W	LOG NO.	TP-2
LOCATION	2530 Hutton Drive	DEPTH(ft)	4.0
REMARKS		PROJECT NO.	CYG-00-1909

Dry Density = 93 pcf

Moisture (Saturated) = 30 %

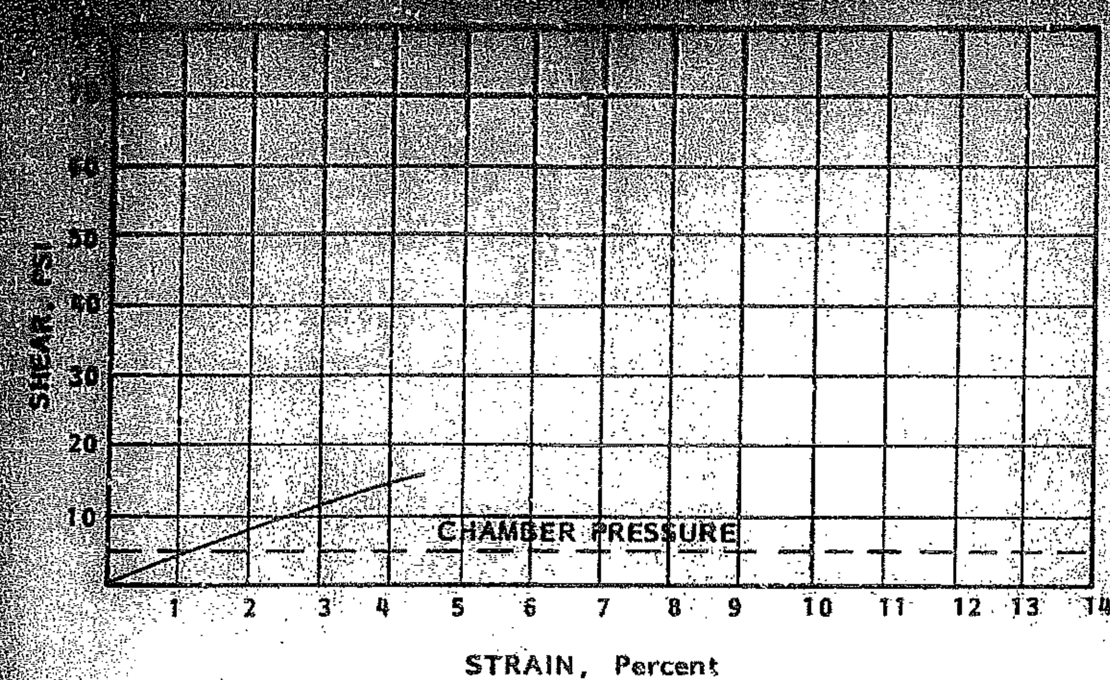


Peak Values	C(p) = 1680.0 psf	Phi(p) = 38.0 deg
● Ultimate Values	C(u) = 1680.0 psf	Phi(u) = 38.0 deg

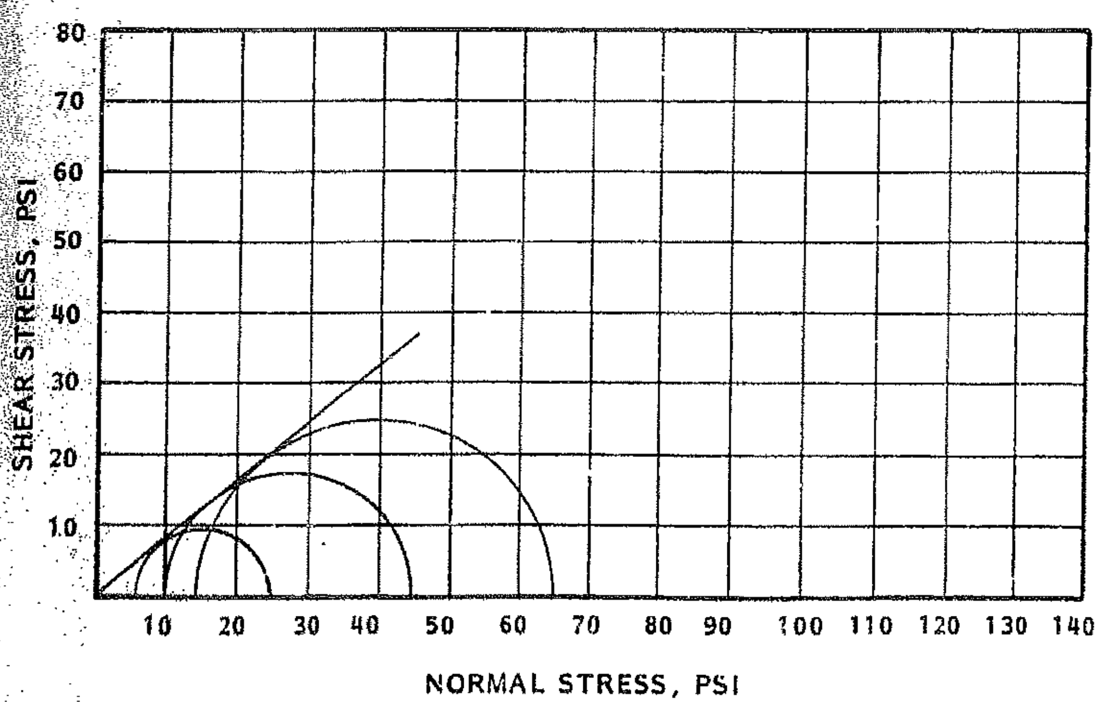
TEST SAMPLE: Siltstone

PLATE DS-1

**Shear Test Results, 9750 Wanda Park Dr.
Prepared by Smith Emery Company,
July, 1987.**



STRESS-STRAIN CURVE



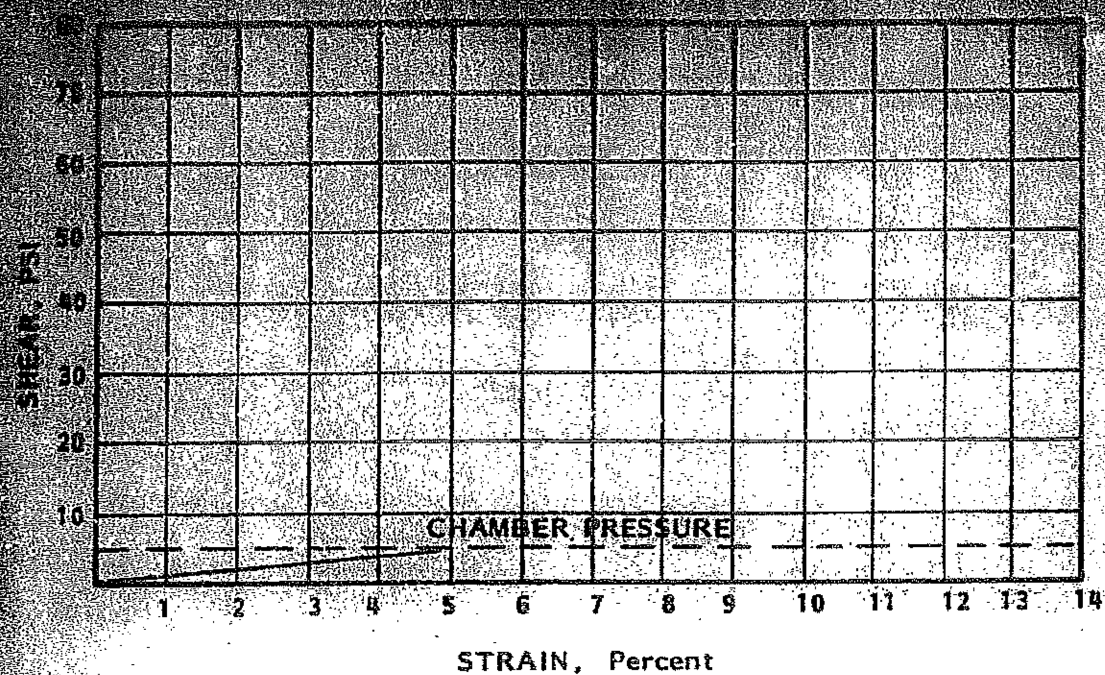
Ø = 34° PEAK STRENGTH

C = -0-

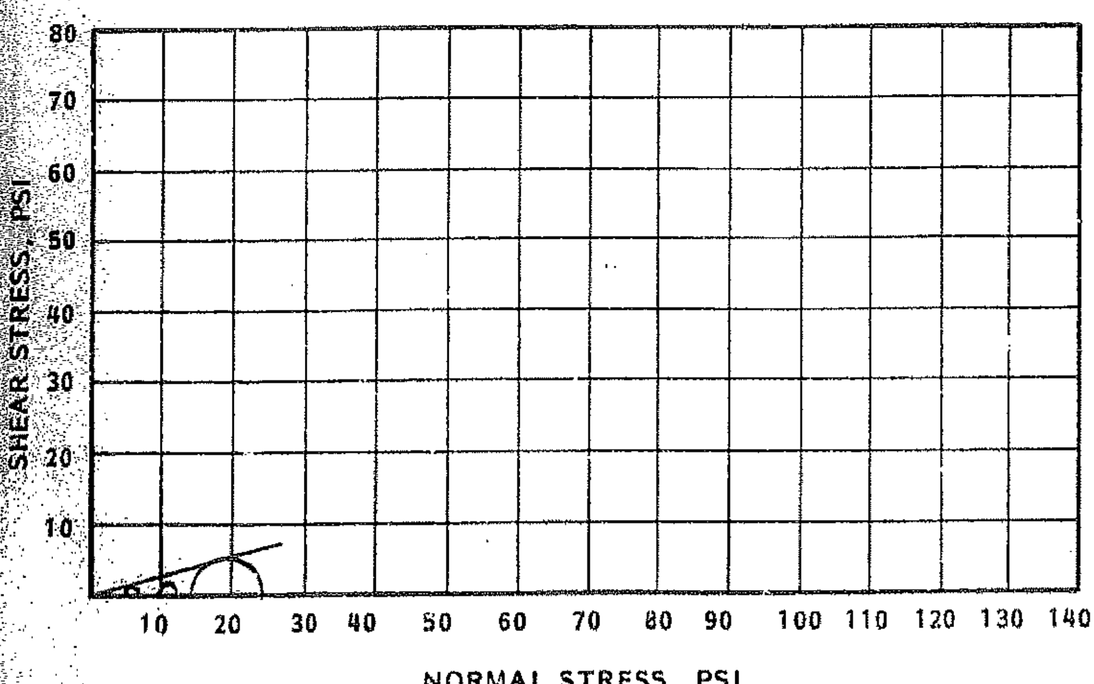
MOHR'S DIAGRAM

Boring No.: 3
Depth, Ft.: 3.5-4.0-Feet LIGHT BROWN SILTSTONE

SMITH - EMERY COMPANY



STRESS-STRAIN CURVE



Ø = 15° PEAK STRENGTH

C = -0-

MOHR'S DIAGRAM

Boring No.: 1
Depth, Ft.: 2-2.5-Feet HIGHLY WEATHERED SILTSTONE

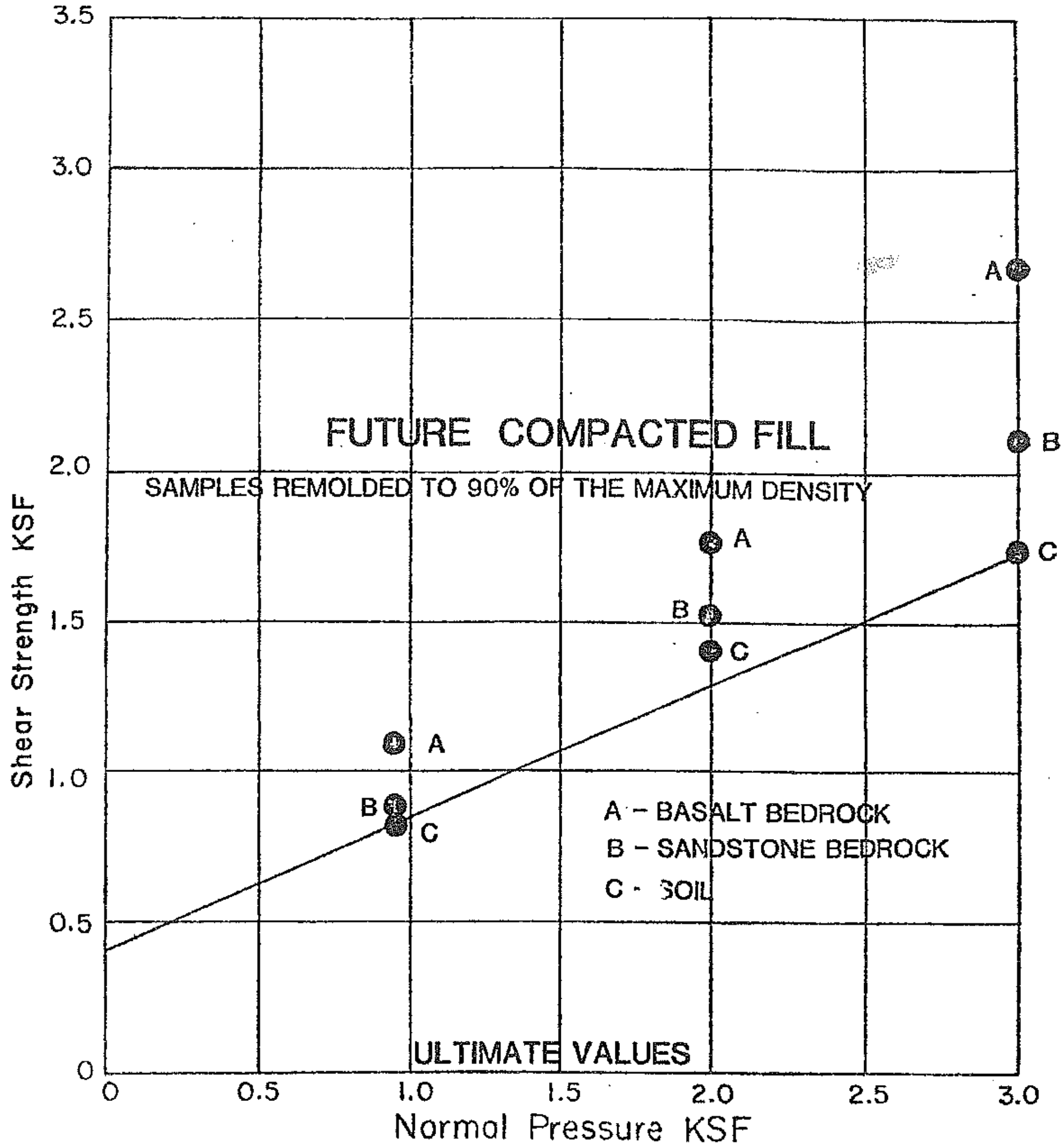
SMITH - EMERY COMPANY

Shear Test Results, 9800 Wonda Park Dr., Prepared by Kovac Byer & Associates, KB8274G, August,1984.

1985

SHEAR TEST DIAGRAM

Project TOPA THRIFT & LOAN KB 8274-G

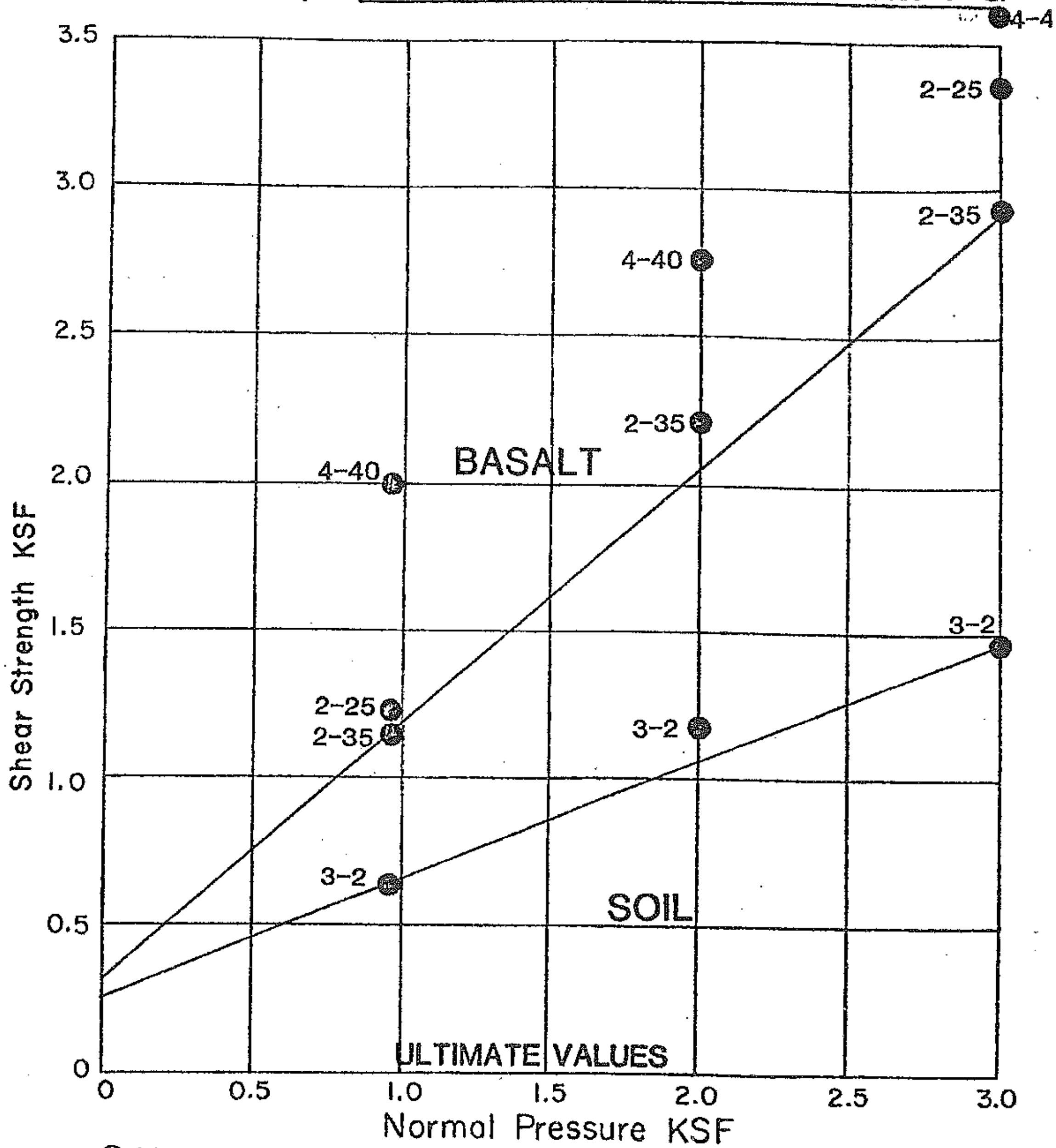


○ Direct Shear at Field Moisture
● Direct Shear, Saturated
◡ Unconfined Compression Test
⊕ Vane Shear Test
⊙ Penetrometer

KOVACS-BYER and ASSOCIATES Inc. PLATE B-1

SHEAR TEST DIAGRAM

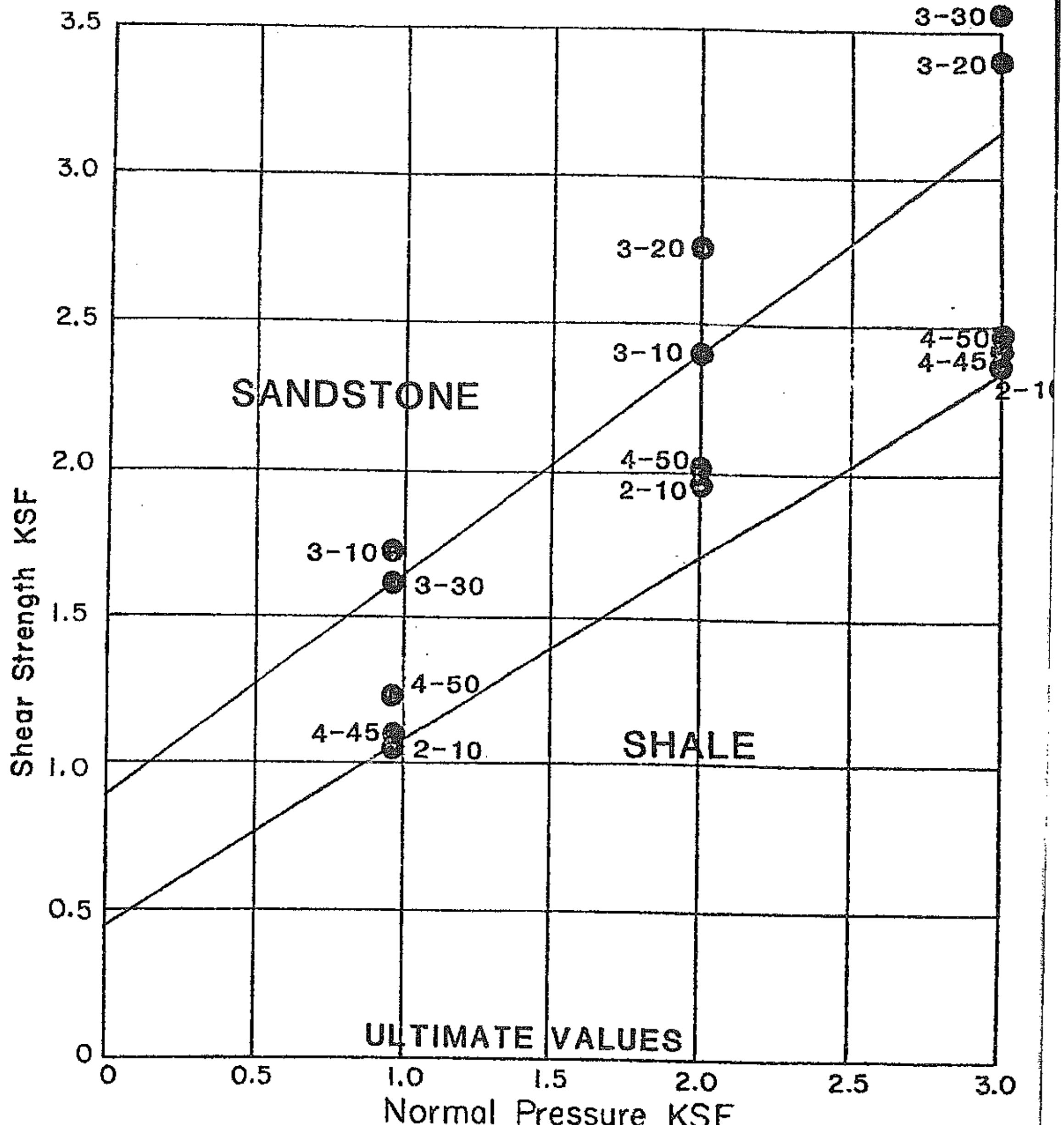
Project TOPA THRIFT & LOAN KB 8274-G



○ Direct Shear at Field Moisture
● Direct Shear, Saturated
∪ Unconfined Compression Test
⊕ Vane Shear Test
⊙ Penetrometer

SHEAR TEST DIAGRAM

Project TOPA THRIFT & LOAN KB 8274-G



○ Direct Shear at Field Moisture
● Direct Shear, Saturated
◡ Unconfined Compression Test
⊕ Vane Shear Test
⊙ Penetrometer

KOVACS-BYER and ASSOCIATES Inc. PLATE B-3

CHEMICAL TEST RESULTS
9712 OAK PASS ROAD
2018

QUALITY ANALYTICAL SERVICES SINCE 1987

1824 1st Street
San Fernando, CA 91340
(818) 639-5300 ph
(818) 639-5306 fx
pat-chem.com

PAT-CHEM
LABORATORIES

Customer: **Calwest Geotechnical**
889 Pierce Court, Suite 101
Thousand Oaks CA, 91360

Attention: Eli Katibath
Report Date: 01-Nov-18 09:01
Subject: Soil Samples

Project/P.O.#: Oak Pass llc, 5750-II

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT		NOTE
B-5 @ 15' (Sample I.D.# : 18J0618-01) Collected: 09-Oct-18 By EK							
pH	EPA 9045B	AJ82438	0.1	24-Oct-18 (PL)	8.6	pH Units	pH
Specific Conductance (EC)	CT 424	AJ82437	0.1	24-Oct-18 (PL)	58.0	uS/cm	
Chloride	CT 422	AJ82511	5.0	25-Oct-18 (AV)	39.5	mg/kg	
Sulfate as SO4	CT 417	AJ82511	5.0	25-Oct-18 (AV)	36.3	mg/kg	

Notes and Definitions

pH The temperature in Celsius was 23.4 when the pH was recorded.

Respectfully Submitted,

Steve R Jefferson 11/1/2018
Laboratory Director

1824 1st Street
San Fernando, CA 91340
(818) 639-5300 ph
(818) 639-5306 fx
pat-chem.com

QUALITY ANALYTICAL SERVICES SINCE 1987

PAT-CHEM
LABORATORIES

Customer: **Calwest Geotechnical**
889 Pierce Court, Suite 101
Thousand Oaks CA, 91360

Attention: Eli Katibath
Report Date: 01-Nov-18 09:08
Subject: Soil Samples

Project/P.O.#: Oak Pass llc, 5750-II

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
B-8 @ 20' (Sample I.D.# : 18J0621-01) Collected: 11-Oct-18 By Customer						
pH	EPA 9045B	AJ82438	0.1	24-Oct-18 (PL)	7.2 pH Units	pH
Specific Conductance (EC)	CT 424	AJ82437	0.1	24-Oct-18 (PL)	13.3 uS/cm	
Chloride	CT 422	AJ82511	5.0	25-Oct-18 (AV)	22.2 mg/kg	
Sulfate as SO4	CT 417	AJ82511	5.0	25-Oct-18 (AV)	20.1 mg/kg	

Notes and Definitions

pH The temperature in Celsius was 23.4 when the pH was recorded.

Respectfully Submitted,

Steve R Jefferson 11/1/2018
Laboratory Director

1824 1st Street
San Fernando, CA 91340
(818) 639-5300 ph
(818) 639-5306 fx
pat-chem.com

QUALITY ANALYTICAL SERVICES SINCE 1987

PAT-CHEM
LABORATORIES

Customer: **Calwest Geotechnical**
889 Pierce Court, Suite 101
Thousand Oaks CA, 91360

Attention: Eli Katibath
Report Date: 01-Nov-18 09:09
Subject: Soil Samples

Project/P.O.#: Oak Pass llc, 5750-II

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT		NOTE
B-11 @ 10' (Sample I.D.# : 18J0622-01) Collected: 15-Oct-18 By Customer							
pH	EPA 9045B	AJ82438	0.1	24-Oct-18 (PL)	8.3	pH Units	pH
Specific Conductance (EC)	CT 424	AJ82437	0.1	24-Oct-18 (PL)	38.8	uS/cm	
Chloride	CT 422	AJ82511	5.0	25-Oct-18 (AV)	37.2	mg/kg	
Sulfate as SO4	CT 417	AJ82511	5.0	25-Oct-18 (AV)	17.2	mg/kg	

Notes and Definitions

pH The temperature in Celsius was 23.4 when the pH was recorded.

Respectfully Submitted,

Steve R Jefferson 11/1/2018
Laboratory Director

PAT-CHEM
LABORATORIES

QUALITY ANALYTICAL SERVICES SINCE 1987

1824 1st Street
San Fernando, CA 91340
(818) 639-5300 ph
(818) 639-5306 fx
pat-chem.com

Customer: **Calwest Geotechnical**
889 Pierce Court, Suite 101
Thousand Oaks CA, 91360

Attention: Eli Katibath
Report Date: 28-Nov-18 12:50
Subject: Soil Samples

Project/P.O.#: Oak Pass LLC, 5750-II

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT		NOTE
B-15 @ 5' (Sample I.D.# : 18K0342-01) Collected: 14-Nov-18 By EK							
pH	EPA 9045B	AK81928	0.1	19-Nov-18 (PL)	8.1	pH Units	pH
Specific Conductance (EC)	CT 424	AK81927	0.1	19-Nov-18 (PL)	29.0	uS/cm	
Chloride	CT 422	AK81931	5.0	19-Nov-18 (AV)	14.1	mg/kg	
Sulfate as SO4	CT 417	AK81931	5.0	19-Nov-18 (AV)	16.7	mg/kg	

Notes and Definitions

pH The temperature in Celsius was 22.0 when the pH was recorded.

Respectfully Submitted,

Steve R Jefferson 11/28/2018
Laboratory Director

QUALITY ANALYTICAL SERVICES SINCE 1987

1824 1st Street
San Fernando, CA 91340
(818) 639-5300 ph
(818) 639-5306 fx
pat-chem.com

PAT-CHEM
LABORATORIES

Customer: **Calwest Geotechnical**
889 Pierce Court, Suite 101
Thousand Oaks CA, 91360

Attention: Eli Katibath
Report Date: 28-Nov-18 12:48
Subject: Soil Samples

Project/P.O.#: Oak Pass LLC, 5750-II

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
TP-13 @ 6' (Sample I.D.# : 18K0340-01) Collected: 09-Nov-18 By EK						
pH	EPA 9045B	AK81928	0.1	19-Nov-18 (PL)	7.3 pH Units	pH
Specific Conductance (EC)	CT 424	AK81927	0.1	19-Nov-18 (PL)	29.7 uS/cm	
Chloride	CT 422	AK81931	5.0	19-Nov-18 (AV)	13.2 mg/kg	
Sulfate as SO4	CT 417	AK81931	5.0	19-Nov-18 (AV)	10.6 mg/kg	

Notes and Definitions

pH The temperature in Celsius was 22.0 when the pH was recorded.

Respectfully Submitted,

Steve R Jefferson 11/28/2018
Laboratory Director

1824 1st Street
San Fernando, CA 91340
(818) 639-5300 ph
(818) 639-5306 fx
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QUALITY ANALYTICAL SERVICES SINCE 1987

PAT-CHEM
LABORATORIES

Customer: **Calwest Geotechnical**
889 Pierce Court, Suite 101
Thousand Oaks CA, 91360

Attention: Eli Katibath
Report Date: 28-Nov-18 12:49
Subject: Soil Samples

Project/P.O.#: Oak Pass LLC, 5750-II

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
TP-20 @ 4' (Sample I.D.# : 18K0341-01) Collected: 13-Nov-18 By EK						
pH	EPA 9045B	AK81928	0.1	19-Nov-18 (PL)	6.1 pH Units	pH
Specific Conductance (EC)	CT 424	AK81927	0.1	19-Nov-18 (PL)	4.9 uS/cm	
Chloride	CT 422	AK81931	5.0	19-Nov-18 (AV)	10.8 mg/kg	
Sulfate as SO4	CT 417	AK81931	5.0	19-Nov-18 (AV)	7.5 mg/kg	

Notes and Definitions

pH The temperature in Celsius was 22.0 when the pH was recorded.

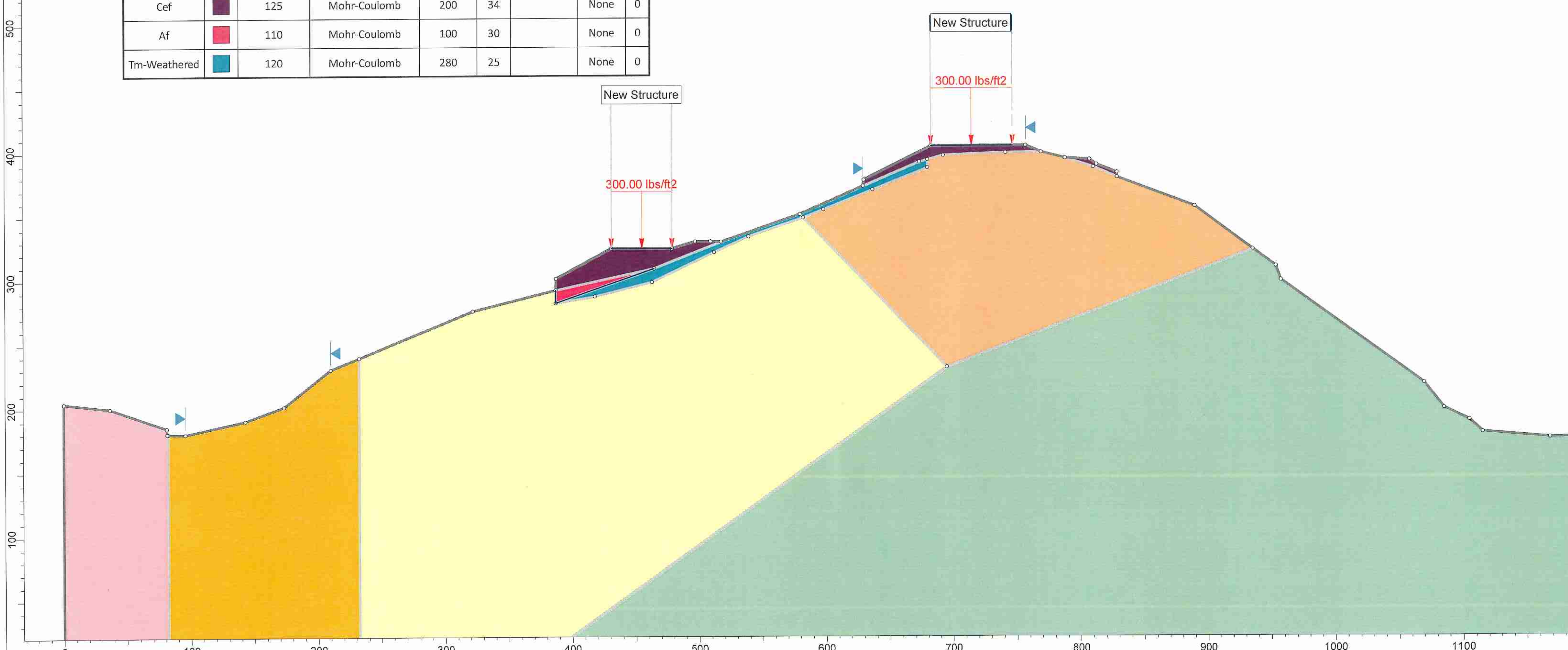
Respectfully Submitted,

Steve R Jefferson 11/28/2018
Laboratory Director

APPENDIX E

SLOPE STABILITY ANALYSIS CROSS-SECTION A-A'

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm_aniso2		120	Anisotropic function			Tm_Aniso-2	None	0
Jsm-Aniso		120	Anisotropic function			Jsm-Aniso	None	0
Tm_aniso1		120	Anisotropic function			Tm_Aniso-1	None	0
Tm_aniso3		120	Anisotropic function			Tm-Aniso-3	None	0
Tt_Aniso		130	Anisotropic function			Tt_Aniso	None	0
Cef		125	Mohr-Coulomb	200	34		None	0
Af		110	Mohr-Coulomb	100	30		None	0
Tm-Weathered		120	Mohr-Coulomb	280	25		None	0

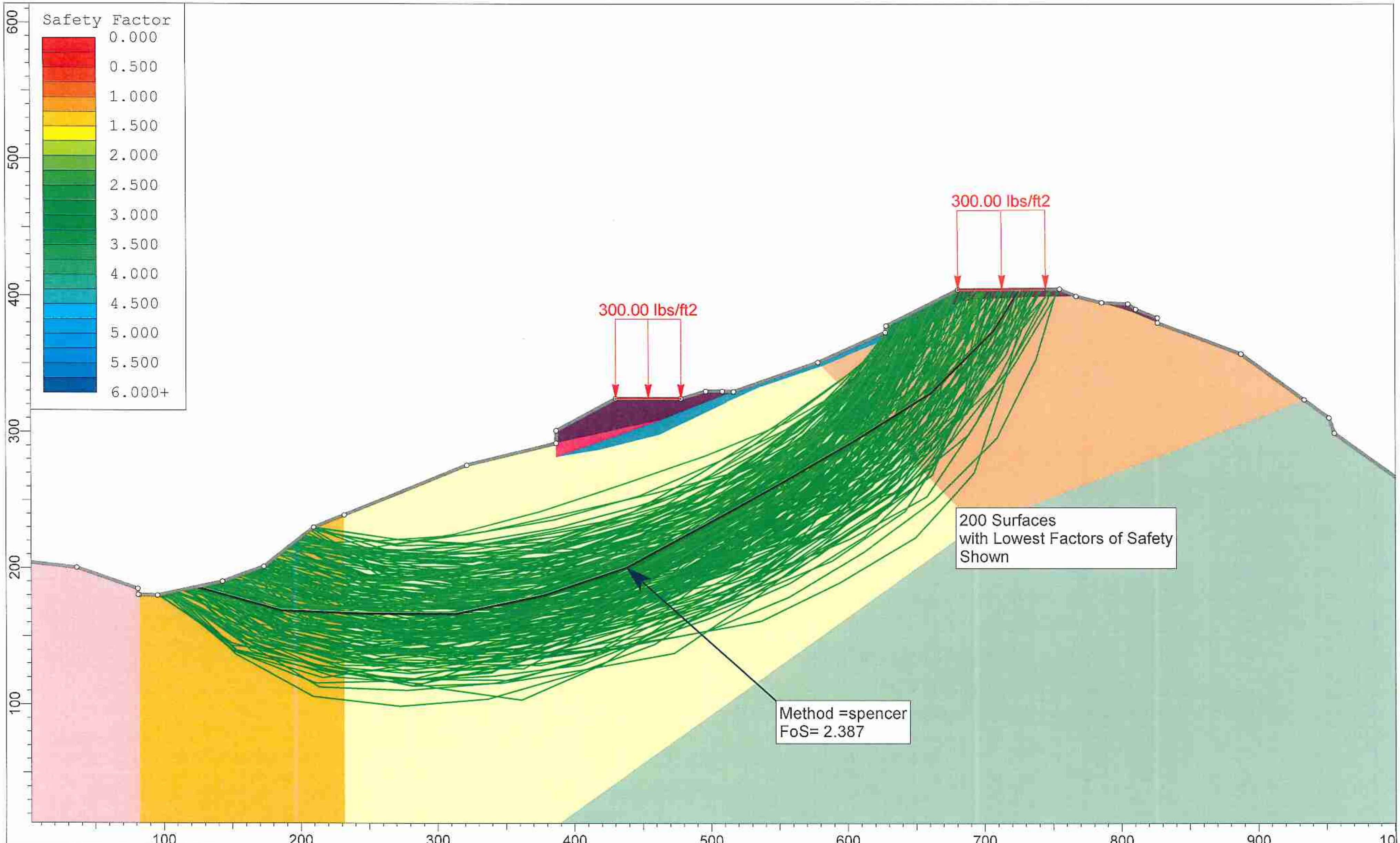


CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDE 6.035

Project	Oak Pass Road		
Analysis Description	Sect A-A		
Drawn By RK	*Scale* 1:900	*Company* Calwest	
Date 1.7.2019		*File Name* A-A Static.sli	

SLOPE STABILITY ANALYSIS CROSS-SECTION A-A' NORTH FACE



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project* Oak Pass Road		
	Analysis Description Sect A-A		
	Drawn By RK	*Scale* 1:1161	*Company* Calwest
SLIDEINTERPRET 6.035	*Date* 1.7.2019		*File Name* A-A Static.sli

Slide Analysis Information

Oak Pass Road

Project Summary

File Name: A-A Static
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect A-A
Author: RK
Company: Calwest
Date Created: 1.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Maximum
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project* Oak Pass Road			
	Analysis Description Sect A-A			
	Drawn By RK	*Scale*	*Company* Calwest	
SLIDEINTERPRET 6.035	*Date* 1.7.2019		*File Name* A-A Static.sli	

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Material Properties

Property	Tm_aniso2	Jsm-Aniso	Tm_aniso1	Tm_aniso3	Tt_Aniso	Cef	Af	Tm-Weathered
Color								
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	120	130	125	110	120
Cohesion [psf]						200	100	280
Friction Angle [deg]						34	30	25

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A		
Drawn By	RK	Scale	
Company	Calwest		
Date	1.7.2019	File Name	A-A Static.sli

SLIDEINTERPRET 6.035

Water Surface	None	None	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0	0	0

Anisotropic Functions

Name: Jsm-Aniso

Angle From	Angle To	c	phi
-90	19	1200	39
19	23	350	33
23	90	1200	39

Name: Tm-Aniso-3

Angle From	Angle To	c	phi
-90	-19	480	34
-19	-14	250	26
-14	90	480	34

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	660	37
30	35	310	30
35	90	660	37

Name: Tm_Aniso-2

Angle From	Angle To	c	phi
-90	30	580	35
30	35	300	25
35	90	580	35

Name: Tm_Aniso-1

Angle From	Angle To	c	phi
-90	20	480	34

20	25	250	26
25	90	480	34

Global Minimums

Method: spencer

FS: 2.386630
Axis Location: 206.196, 897.811
Left Slip Surface Endpoint: 123.775, 186.053
Right Slip Surface Endpoint: 726.150, 404.819
Resisting Moment=3.03048e+009 lb-ft
Driving Moment=1.26978e+009 lb-ft
Resisting Horizontal Force=3.82713e+006 lb
Driving Horizontal Force=1.60357e+006 lb
Total Slice Area=46849 ft2

Global Minimum Coordinates

Method: spencer

X	Y
123.775	186.053
185.769	168.934
250.039	166.538
314.353	166.778
377.269	180.115
438.284	200.449
494.765	231.21
550.924	262.554
606.623	294.71
661.195	328.742

706.956	373.934
726.15	404.819

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.38663

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	20.6647	12651.7	Tm_aniso3	250	26	283.449	676.487	874.429	0	874.429
2	20.6647	42196.8	Tm_aniso3	250	26	660.236	1575.74	2718.17	0	2718.17
3	20.6647	79040.2	Tm_aniso3	250	26	1130.1	2697.13	5017.38	0	5017.38
4	23.1155	143869	Tm_aniso3	480	34	2235.59	5335.53	7198.62	0	7198.62
5	23.1155	185671	Tm_aniso3	480	34	2819.3	6728.63	9263.98	0	9263.98
6	18.0387	164740	Tm_aniso2	580	35	3349.92	7995.02	10589.8	0	10589.8
7	21.4379	217265	Tm_aniso2	580	35	3583.17	8551.69	11384.7	0	11384.7
8	21.4379	239563	Tm_aniso2	580	35	3923.08	9362.95	12543.4	0	12543.4
9	21.4379	261861	Tm_aniso2	580	35	4263	10174.2	13702	0	13702
10	31.4581	406679	Tm_aniso2	580	35	3925.19	9367.97	12550.5	0	12550.5
11	31.4581	411485	Tm_aniso2	580	35	3968.59	9471.55	12698.5	0	12698.5
12	30.5075	426039	Tm_aniso2	580	35	3928.46	9375.78	12561.7	0	12561.7
13	30.5075	458132	Tm_aniso2	580	35	4226.02	10085.9	13575.9	0	13575.9
14	28.2404	397155	Tm_aniso2	580	35	3603.34	8599.83	11453.5	0	11453.5
15	28.2404	349203	Tm_aniso2	580	35	3163.77	7550.74	9955.24	0	9955.24
16	28.0799	307658	Tm_aniso2	580	35	2785.15	6647.12	8664.76	0	8664.76
17	28.0799	276392	Tm_aniso2	580	35	2525.63	6027.74	7780.17	0	7780.17
18	27.8493	253379	Tm_aniso2	580	35	2330.28	5561.52	7114.34	0	7114.34
19	27.8493	236461	Tm_aniso2	580	35	2190.07	5226.88	6636.44	0	6636.44
20	16.5023	133542	Tm_aniso2	300	25	1362.19	3251.05	6328.54	0	6328.54
21	38.0698	309019	Tm_aniso1	480	34	1956.42	4669.26	6210.85	0	6210.85

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A		
Drawn By RK	*Scale*	*Company*	Calwest
Date 1.7.2019		*File Name*	A-A Static.sli

22	22.8803	166155	Tm_aniso1	480	34	1531.53	3655.19	4707.41	0	4707.41
23	22.8803	116149	Tm_aniso1	480	34	1174.31	2802.64	3443.47	0	3443.47
24	15.3139	34482	Tm_aniso1	480	34	545.555	1302.04	1218.72	0	1218.72
25	3.88037	1508.46	Cef	200	34	178.773	426.666	336.045	0	336.045

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.38663

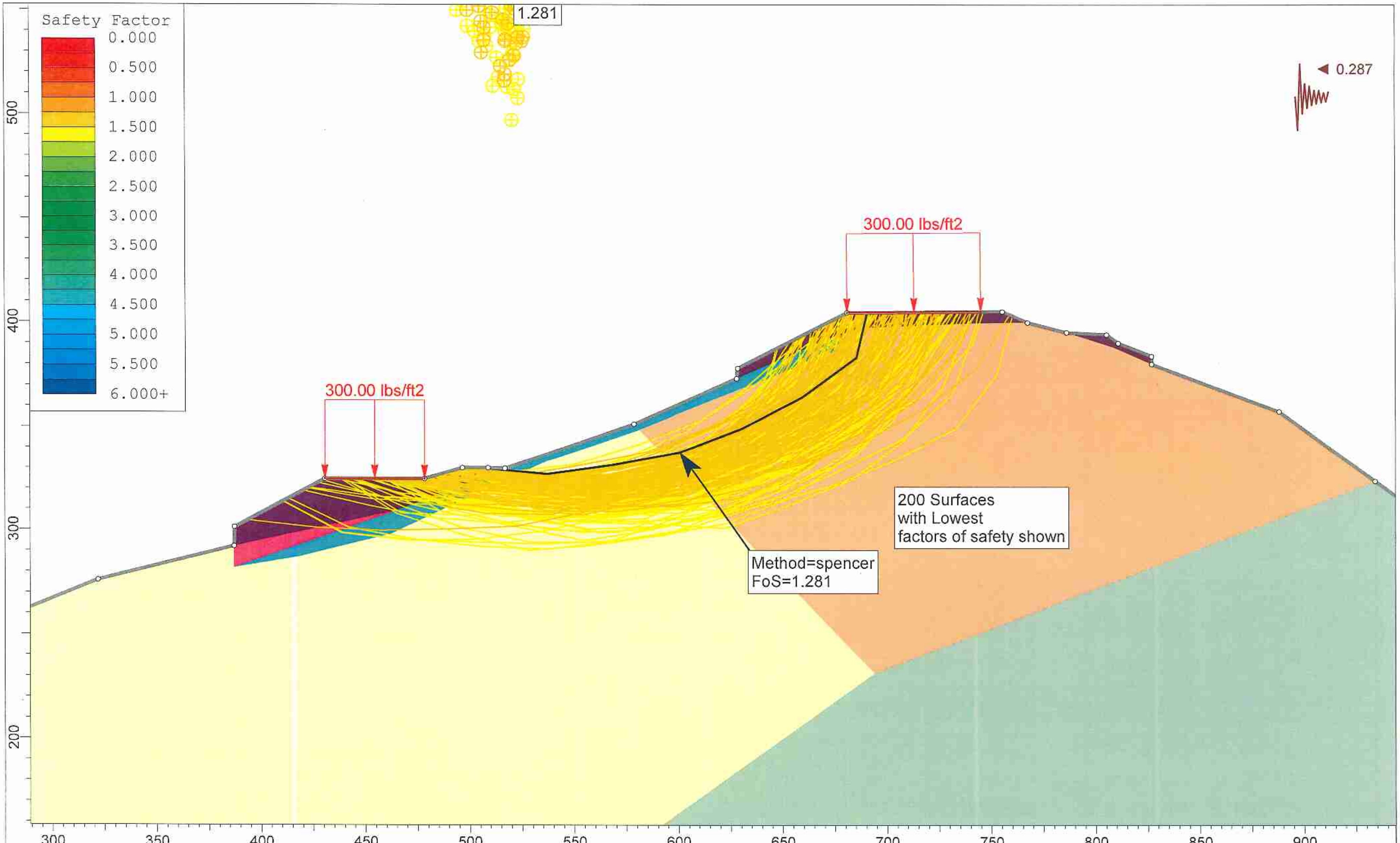
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	123.775	186.053	0	0	0
2	144.44	180.347	10840.6	3883.17	19.7078
3	165.104	174.64	39979.7	14321	19.7079
4	185.769	168.934	91937.4	32932.5	19.7078
5	208.885	168.072	149761	53645.1	19.7078
6	232	167.211	222842	79823.2	19.7078
7	250.039	166.538	290325	103996	19.7078
8	271.477	166.618	366147	131156	19.7078
9	292.915	166.698	449156	160890	19.7078
10	314.353	166.778	539352	193199	19.7078
11	345.811	173.446	579004	207402	19.7078
12	377.269	180.115	619034	221741	19.7078
13	407.776	190.282	611030	218874	19.7078
14	438.284	200.449	601782	215562	19.7078
15	466.524	215.83	527269	188871	19.7078
16	494.765	231.21	463400	165992	19.7078
17	522.844	246.882	405729	145334	19.7078
18	550.924	262.554	354642	127035	19.7078
19	578.774	278.632	305083	109283	19.7079

20	606.623	294.71	259308	92885.7	19.7078
21	623.125	305.001	216634	77599.7	19.7079
22	661.195	328.742	143580	51431.2	19.7078
23	684.075	351.338	72221.2	25870	19.7078
24	706.956	373.934	21294.7	7627.89	19.7078
25	722.27	398.575	-362.285	-129.773	19.7079
26	726.15	404.819	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A		
Drawn By RK	*Scale*	*Company* Calwest	
Date 1.7.2019		*File Name* A-A Static.sli	

SLIDEINTERPRET 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A Seismic Analysis		
Drawn By: RK	Scale: 1:762	Company	Calwest
Date: 1.7.2019		File Name	A-A Seismic.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

Oak Pass Road

Project Summary

File Name: A-A Seismic
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect A-A Seismic Analysis
Author: RK
Company: Calwest
Date Created: 1.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Maximum
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project* Oak Pass Road			
	Analysis Description Sect A-A Seismic Analysis			
	Drawn By RK	*Scale*	*Company* Calwest	
SLIDEINTERPRET 6.035	*Date* 1.7.2019		*File Name* A-A Seismic.sli	

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287
2 Distributed Loads present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project*	Oak Pass Road		
	Analysis Description	Sect A-A Seismic Analysis		
	Drawn By	RK	*Scale*	*Company* Calwest
SLIDEINTERPRET 6.035	*Date*	1.7.2019	*File Name*	A-A Seismic.sli

Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm_aniso2	Jsm-Aniso	Tm_aniso1	Tm_aniso3	Tt_Aniso	Cef	Af	Tm-Weathered
Color								
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	120	130	125	110	120
Cohesion [psf]						200	100	280
Friction Angle [deg]						34	30	25
Water Surface	None	None	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0	0	0

Anisotropic Functions

Name: Jsm-Aniso

Angle From	Angle To	c	phi
-90	19	1200	39
19	23	350	33
23	90	1200	39

Name: Tm-Aniso-3

Angle From	Angle To	c	phi
-90	-19	480	34
-19	-14	250	26

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A Seismic Analysis		
Drawn By RK	*Scale*	*Company*	Calwest
Date 1.7.2019		*File Name*	A-A Seismic.sli

-14	90	480	34

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	660	37
30	35	310	30
35	90	660	37

Name: Tm_Aniso-2

Angle From	Angle To	c	phi
-90	30	580	35
30	35	300	25
35	90	580	35

Name: Tm_Aniso-1

Angle From	Angle To	c	phi
-90	20	480	34
20	25	250	26
25	90	480	34

Global Minimums

Method: spencer

FS: 1.281420
Axis Location: 523.376, 553.134
Left Slip Surface Endpoint: 504.985, 330.100
Right Slip Surface Endpoint: 690.768, 404.600
Resisting Moment=7.5907e+007 lb-ft
Driving Moment=5.92366e+007 lb-ft
Resisting Horizontal Force=303119 lb
Driving Horizontal Force=236549 lb

Total Slice Area=3486.25 ft2

Global Minimum Coordinates

Method: spencer

X	Y
504.985	330.1
537.092	326.991
569.023	331.567
600.702	337.644
630.833	349.161
659.395	364.153
685.484	383.123
690.768	404.6

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.28142

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	10.0979	522.73	Cef	200	34	283.418	363.178	241.921	0	241.921
2	10.5454	3130.48	Tm-Weathered	280	25	422.227	541.05	559.825	0	559.825
3	5.73179	4140.41	Tm_aniso2	580	35	1289.64	1652.57	1531.79	0	1531.79
4	5.73179	5885.19	Tm_aniso2	580	35	1527.1	1956.86	1966.36	0	1966.36
5	7.98272	10185.2	Tm_aniso2	580	35	1265.23	1621.29	1487.12	0	1487.12
6	7.98272	11732.9	Tm_aniso2	580	35	1369.83	1755.33	1678.55	0	1678.55
7	7.98272	13280.6	Tm_aniso2	580	35	1474.43	1889.37	1869.97	0	1869.97
8	7.98272	14828.3	Tm_aniso2	580	35	1579.04	2023.41	2061.4	0	2061.4

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road		
	Analysis Description: Sect A-A Seismic Analysis		
	Drawn By: RK	Scale	Company: Calwest
SLIDEINTERPRET 6.035	Date: 1.7.2019		File Name: A-A Seismic.sli

9	8.03651	16303.7	Tm_aniso2	580	35	1585.22	2031.33	2072.72	0	2072.72
10	8.03651	17739.7	Tm_aniso2	580	35	1675.83	2147.44	2238.53	0	2238.53
11	8.03651	19684.5	Tm_aniso2	580	35	1798.54	2304.69	2463.12	0	2463.12
12	7.57003	20335.4	Tm_aniso1	480	34	1757.94	2252.66	2628.08	0	2628.08
13	7.53279	21314.1	Tm_aniso1	260	26	1001.23	1282.99	2097.43	0	2097.43
14	7.53279	21740.4	Tm_aniso1	260	26	1016.93	1303.12	2138.71	0	2138.71
15	7.53279	22166.6	Tm_aniso1	260	26	1032.64	1323.25	2179.99	0	2179.99
16	7.53279	24114.6	Tm_aniso1	260	26	1104.45	1415.26	2368.63	0	2368.63
17	7.14034	25844.1	Tm_aniso1	480	34	1630.61	2089.49	2386.18	0	2386.18
18	7.14034	25744.6	Tm_aniso1	480	34	1625.8	2083.33	2377.02	0	2377.02
19	7.14034	25645	Tm_aniso1	480	34	1620.98	2077.16	2367.88	0	2367.88
20	7.14034	25545.4	Tm_aniso1	480	34	1616.17	2070.99	2358.75	0	2358.75
21	8.69648	30060.7	Tm_aniso1	480	34	1369.54	1754.95	1890.2	0	1890.2
22	8.69648	28086.5	Tm_aniso1	480	34	1302.84	1669.49	1763.49	0	1763.49
23	8.69648	25529.2	Tm_aniso1	480	34	1271	1628.68	1702.98	0	1702.98
24	3.34167	6019.46	Tm_aniso1	480	34	419.021	536.941	84.4193	0	84.4193
25	1.94256	957.118	Cef	200	34	180.3	231.04	46.0182	0	46.0182

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.28142

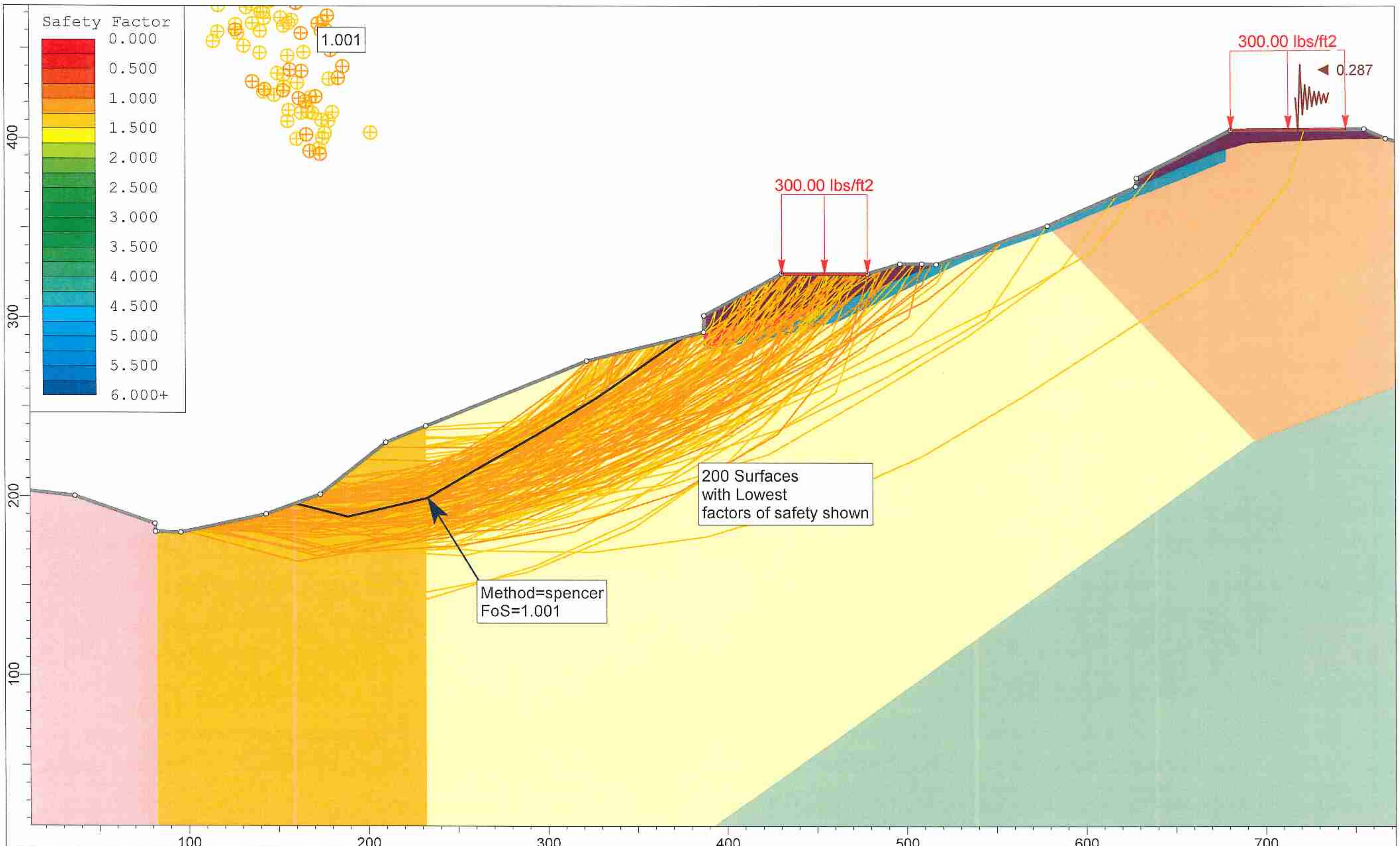
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	504.985	330.1	0	0	0
2	515.083	329.122	2957.07	1688.49	29.7264
3	525.628	328.101	7096.27	4051.97	29.7264
4	531.36	327.546	14172.4	8092.44	29.7264
5	537.092	326.991	22354.1	12764.2	29.7264
6	545.074	328.135	27859.8	15908	29.7265

7	553.057	329.279	33539.8	19151.3	29.7265
8	561.04	330.423	39394.1	22494.1	29.7264
9	569.023	331.567	45422.7	25936.4	29.7264
10	577.059	333.108	50326	28736.2	29.7264
11	585.096	334.65	55292	31571.8	29.7264
12	593.132	336.192	60342.8	34455.8	29.7264
13	600.702	337.644	64037.8	36565.6	29.7264
14	608.235	340.523	59446.3	33943.9	29.7264
15	615.768	343.402	54732.3	31252.2	29.7264
16	623.3	346.281	49895.9	28490.6	29.7264
17	630.833	349.161	44499.7	25409.3	29.7263
18	637.974	352.909	39816.7	22735.4	29.7264
19	645.114	356.657	35162.2	20077.6	29.7263
20	652.254	360.405	30536	17436.1	29.7264
21	659.395	364.153	25938.2	14810.7	29.7263
22	668.091	370.476	17304.2	9880.69	29.7263
23	676.788	376.8	9456.2	5399.5	29.7264
24	685.484	383.123	2455.31	1401.99	29.7265
25	688.826	396.705	991.771	566.302	29.7264
26	690.768	404.6	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A Seismic Analysis		
Drawn By: RK	Scale:	Company	Calwest
Date	1.7.2019	File Name	A-A Seismic.sli

SLIDEINTERPRET 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A Seismic Analysis		
Drawn By RK	*Scale* 1:886	*Company*	Calwest
Date 1.7.2019		*File Name*	A-A Seismic.sli

SLIDEINTERPRET 6.035

Slide Analysis Information
Oak Pass Road

Project Summary

File Name: A-A Seismic
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect A-A Seismic Analysis
Author: RK
Company: Calwest
Date Created: 1.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Maximum
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Road		
	Analysis Description	Sect A-A Seismic Analysis		
	Drawn By	RK	Scale	Company: Calwest
SLIDEINTERPRET 6.035	Date	1.7.2019	File Name	A-A Seismic.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 3000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287
2 Distributed Loads present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300

Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm_aniso2	Jsm-Aniso	Tm_aniso1	Tm_aniso3	Tt_Aniso	Cef	Af	Tm-Weathered
Color								
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	120	130	125	110	120
Cohesion [psf]						200	100	280
Friction Angle [deg]						34	30	25
Water Surface	None	None	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0	0	0

Anisotropic Functions

Name: Jsm-Aniso

Angle From	Angle To	c	phi
-90	19	1200	39
19	23	350	33
23	90	1200	39

Name: Tm-Aniso-3

Angle From	Angle To	c	phi
-90	-19	480	34
-19	-14	250	26

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A Seismic Analysis		
Drawn By RK	*Scale*	*Company*	Calwest
Date 1.7.2019		*File Name*	A-A Seismic.sli

SLIDEINTERPRET 6.035

-14	90	480	34

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	660	37
30	35	310	30
35	90	660	37

Name: Tm_Aniso-2

Angle From	Angle To	c	phi
-90	30	580	35
30	35	300	25
35	90	580	35

Name: Tm_Aniso-1

Angle From	Angle To	c	phi
-90	20	480	34
20	25	250	26
25	90	480	34

Global Minimums

Method: spencer

FS: 1.001370
Axis Location: 174.348, 459.878
Left Slip Surface Endpoint: 159.130, 196.092
Right Slip Surface Endpoint: 376.245, 289.432
Resisting Moment=1.02342e+008 lb-ft
Driving Moment=1.02202e+008 lb-ft
Resisting Horizontal Force=359877 lb
Driving Horizontal Force=359384 lb

Total Slice Area=5424.45 ft2

Global Minimum Coordinates

Method: spencer

X	Y
159.13	196.092
188.48	188.774
232.92	199.32
264.3	217.438
295.665	235.546
327.034	254.974
376.245	289.432

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.00137

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	9.78341	3516.75	Tm_aniso3	250	26	901.797	903.032	1338.92	0	1338.92
2	9.78341	11332.4	Tm_aniso3	250	26	1713.12	1715.47	3004.67	0	3004.67
3	9.78341	22846.1	Tm_aniso3	250	26	2908.34	2912.32	5458.57	0	5458.57
4	8.70403	28191.7	Tm_aniso3	480	34	2668.83	2672.49	3250.51	0	3250.51
5	8.70403	33257.4	Tm_aniso3	480	34	3033.62	3037.78	3792.06	0	3792.06
6	8.70403	37768.1	Tm_aniso3	480	34	3358.45	3363.05	4274.29	0	4274.29
7	8.70403	39657.1	Tm_aniso3	480	34	3494.47	3499.26	4476.24	0	4476.24
8	8.70403	41209.2	Tm_aniso3	480	34	3606.24	3611.18	4642.17	0	4642.17
9	0.919506	4444.04	Tm_aniso2	580	35	3966.77	3972.2	4844.57	0	4844.57

10	7.84506	37364.4	Tm_aniso2	300	25	1644.18	1646.43	2887.43	0	2887.43
11	7.84506	36114	Tm_aniso2	300	25	1599.49	1601.68	2791.47	0	2791.47
12	7.84506	34863.5	Tm_aniso2	300	25	1554.8	1556.93	2695.5	0	2695.5
13	7.84506	33613.1	Tm_aniso2	300	25	1510.11	1512.18	2599.53	0	2599.53
14	7.8412	32347	Tm_aniso2	300	25	1465.43	1467.44	2503.59	0	2503.59
15	7.8412	31097.7	Tm_aniso2	300	25	1420.76	1422.71	2407.67	0	2407.67
16	7.8412	29848.5	Tm_aniso2	300	25	1376.09	1377.98	2311.75	0	2311.75
17	7.8412	28599.3	Tm_aniso2	300	25	1331.44	1333.26	2215.82	0	2215.82
18	10.4565	35919	Tm_aniso2	300	25	1234.51	1236.2	2007.69	0	2007.69
19	10.4565	33146.9	Tm_aniso2	300	25	1162.72	1164.31	1853.52	0	1853.52
20	10.4565	30101.7	Tm_aniso2	300	25	1083.86	1085.34	1684.17	0	1684.17
21	9.84226	23650.4	Tm_aniso2	300	25	906.91	908.152	1304.18	0	1304.18
22	9.84226	18394.8	Tm_aniso2	300	25	771.241	772.298	1012.84	0	1012.84
23	9.84226	13139.1	Tm_aniso2	300	25	635.573	636.444	721.506	0	721.506
24	9.84226	7883.48	Tm_aniso2	300	25	499.905	500.59	430.166	0	430.166
25	9.84226	2627.83	Tm_aniso2	300	25	364.237	364.736	138.827	0	138.827

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.00137

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	159.13	196.092	0	0	0
2	168.913	193.653	11079.3	7382.67	33.6774
3	178.696	191.213	31916.3	21267.3	33.6773
4	188.48	188.774	67127.8	44730.5	33.6774
5	197.184	190.84	75552.2	50344	33.6774
6	205.888	192.905	84579.1	56359.1	33.6774
7	214.592	194.971	94142.6	62731.7	33.6774

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A Seismic Analysis		
Drawn By RK	*Scale*	*Company*	Calwest
Date 1.7.2019		*File Name*	A-A Seismic.sli

SLIDEINTERPRET 6.035

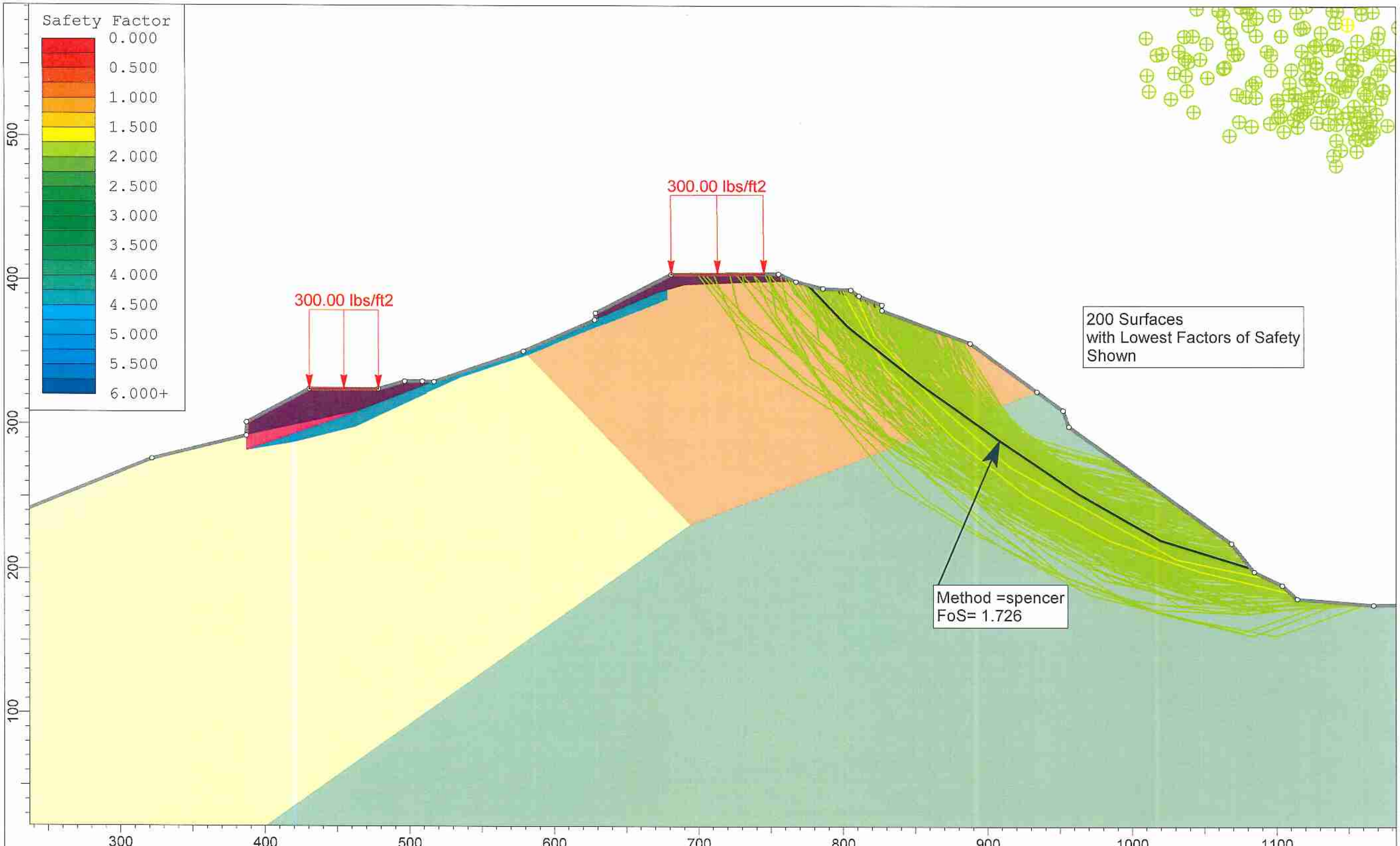
8	223.296	197.036	103931	69254.1	33.6774
9	232	199.102	113904	75899.5	33.6774
10	232.92	199.32	115219	76775.7	33.6773
11	240.765	203.85	104316	69510.4	33.6773
12	248.61	208.379	93855.4	62540.3	33.6774
13	256.455	212.908	83838.2	55865.4	33.6774
14	264.3	217.438	74263.9	49485.6	33.6774
15	272.141	221.965	65137.1	43403.9	33.6774
16	279.982	226.492	56452.7	37617.1	33.6774
17	287.823	231.019	48210.9	32125.2	33.6774
18	295.665	235.546	40411.6	26928.2	33.6774
19	306.121	242.022	30009.9	19997	33.6774
20	316.578	248.498	20651.5	13761.1	33.6775
21	327.034	254.974	12439.1	8288.76	33.6774
22	336.876	261.865	5589.48	3724.54	33.6774
23	346.719	268.757	920.759	613.546	33.6774
24	356.561	275.649	-1567.06	-1044.21	33.6775
25	366.403	282.54	-1873.98	-1248.72	33.6774
26	376.245	289.432	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect A-A Seismic Analysis		
Drawn By RK	*Scale*	*Company*	Calwest
Date 1.7.2019		*File Name*	A-A Seismic.sli

SLOPE STABILITY ANALYSIS CROSS-SECTION A-A' SOUTH FACE



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A		
Drawn By	RK	Scale	1:1101
Company	Calwest		
Date	1.7.2019	File Name	A-A Static.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

Oak Pass Road

Project Summary

File Name: A-A Static
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect A-A
Author: RK
Company: Calwest
Date Created: 1.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Left to Right
Data Output: Maximum
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project*	Oak Pass Road		
	Analysis Description	Sect A-A		
	Drawn By	RK	*Scale*	*Company* Calwest
SLIDEINTERPRET 6.035	*Date*	1.7.2019		*File Name* A-A Static.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Material Properties

Property	Tm_aniso2	Jsm-Aniso	Tm_aniso1	Tm_aniso3	Tt_Aniso	Cef	Af	Tm-Weathered
Color								
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	120	130	125	110	120
Cohesion [psf]						200	100	280
Friction Angle [deg]						34	30	25

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A		
Drawn By RK	*Scale*	*Company*	Calwest
Date 1.7.2019		*File Name*	A-A Static.sli

SLIDEINTERPRET 6.035

Water Surface	None	None	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0	0	0

Anisotropic Functions

Name: Jsm-Aniso

Angle From	Angle To	c	phi
-90	19	1200	39
19	23	350	33
23	90	1200	39

Name: Tm-Aniso-3

Angle From	Angle To	c	phi
-90	-19	480	34
-19	-14	250	26
-14	90	480	34

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	660	37
30	35	310	30
35	90	660	37

Name: Tm_Aniso-2

Angle From	Angle To	c	phi
-90	30	580	35
30	35	300	25
35	90	580	35

Name: Tm_Aniso-1

Angle From	Angle To	c	phi
-90	20	480	34

20	25	250	26
25	90	480	34

Global Minimums

Method: spencer

FS: 1.725940
Axis Location: 1125.021, 606.052
Left Slip Surface Endpoint: 775.853, 397.606
Right Slip Surface Endpoint: 1082.277, 201.650
Resisting Moment=4.61589e+008 lb-ft
Driving Moment=2.67441e+008 lb-ft
Resisting Horizontal Force=1.00803e+006 lb
Driving Horizontal Force=584047 lb
Total Slice Area=10735.9 ft2

Global Minimum Coordinates

Method: spencer

X	Y
775.853	397.606
803.584	368.575
854.862	327.753
908.17	289.62
962.47	252.914
1019.58	220.752
1082.28	201.65

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.72594

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	13.8654	9327.07	Tm_aniso1	480	34	395.331	682.318	299.949	0	299.949
2	13.8654	31177.6	Tm_aniso1	480	34	741.45	1279.7	1185.6	0	1185.6
3	12.8194	42595.5	Tm_aniso1	480	34	1098.9	1896.63	2100.24	0	2100.24
4	12.8194	48602.4	Tm_aniso1	480	34	1216.68	2099.91	2401.62	0	2401.62
5	12.8194	51860.8	Tm_aniso1	480	34	1280.57	2210.18	2565.09	0	2565.09
6	12.8194	60189.4	Tm_aniso1	480	34	1443.87	2492.03	2982.95	0	2982.95
7	10.5026	54983.9	Tm_aniso1	480	34	1654.37	2855.34	3521.59	0	3521.59
8	10.5026	59504.9	Tm_aniso1	480	34	1768.22	3051.85	3812.92	0	3812.92
9	10.5026	64025.9	Tm_aniso1	480	34	1882.08	3248.36	4104.25	0	4104.25
10	10.9002	69390.8	Jsm-Aniso	1200	39	2679.63	4624.88	4229.38	0	4229.38
11	10.9002	69230.9	Jsm-Aniso	1200	39	2675.01	4616.9	4219.52	0	4219.52
12	13.5751	85481.8	Jsm-Aniso	1200	39	2724.83	4702.9	4325.73	0	4325.73
13	13.5751	84275.7	Jsm-Aniso	1200	39	2696	4653.14	4264.27	0	4264.27
14	13.5751	83069.6	Jsm-Aniso	1200	39	2667.17	4603.37	4202.81	0	4202.81
15	13.5751	73661.3	Jsm-Aniso	1200	39	2442.24	4215.16	3723.41	0	3723.41
16	11.4219	55996.3	Jsm-Aniso	1200	39	2447.73	4224.64	3735.11	0	3735.11
17	11.4219	53606.5	Jsm-Aniso	1200	39	2373.54	4096.58	3576.98	0	3576.98
18	11.4219	51216.8	Jsm-Aniso	1200	39	2299.34	3968.52	3418.84	0	3418.84
19	11.4219	48827	Jsm-Aniso	1200	39	2225.15	3840.47	3260.71	0	3260.71
20	11.4219	46437.2	Jsm-Aniso	1200	39	2150.95	3712.41	3102.57	0	3102.57
21	12.5395	45790.3	Jsm-Aniso	1200	39	2439.71	4210.79	3718.02	0	3718.02
22	12.5395	38032.7	Jsm-Aniso	1200	39	2160.83	3729.47	3123.63	0	3123.63
23	12.5395	30275.1	Jsm-Aniso	1200	39	1881.95	3248.14	2529.25	0	2529.25
24	12.5395	22483.1	Jsm-Aniso	1200	39	1601.84	2764.68	1932.22	0	1932.22
25	12.5395	8903.52	Jsm-Aniso	1200	39	1113.33	1921.54	891.02	0	891.02

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A		
Drawn By	RK	Scale	
Company	Calwest		
Date	1.7.2019	File Name	A-A Static.sli

SLIDEINTERPRET 6.035

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.72594

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	775.853	397.606	0	0	0
2	789.719	383.091	-1122.18	-698.002	31.8818
3	803.584	368.575	5816.95	3618.17	31.8818
4	816.403	358.369	13177.5	8196.48	31.8818
5	829.223	348.164	22105.4	13749.7	31.8819
6	842.042	337.958	31883.5	19831.7	31.8818
7	854.862	327.753	43834.6	27265.4	31.8819
8	865.364	320.24	52933	32924.6	31.8818
9	875.867	312.727	63025.6	39202.2	31.8818
10	886.37	305.214	74112.2	46098.2	31.8818
11	897.27	297.417	77909.1	48459.8	31.8818
12	908.17	289.62	81679.4	50805	31.8818
13	921.745	280.444	84420.8	52510.2	31.8818
14	935.32	271.267	86989.3	54107.8	31.8818
15	948.895	262.09	89384.8	55597.8	31.8818
16	962.47	252.914	90431.6	56248.9	31.8818
17	973.892	246.481	86526.4	53819.9	31.8818
18	985.314	240.049	82450.7	51284.8	31.8818
19	996.736	233.617	78204.4	48643.5	31.8818
20	1008.16	227.185	73787.6	45896.2	31.8818
21	1019.58	220.752	69200.1	43042.8	31.8818
22	1032.12	216.932	52841.5	32867.7	31.8818
23	1044.66	213.111	37705.6	23453.1	31.8818
24	1057.2	209.291	23792.6	14799.1	31.8818
25	1069.74	205.47	11107.7	6909.03	31.8818

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A		
Drawn By	RK	Scale	Company: Calwest
Date	1.7.2019	File Name	A-A Static.sli

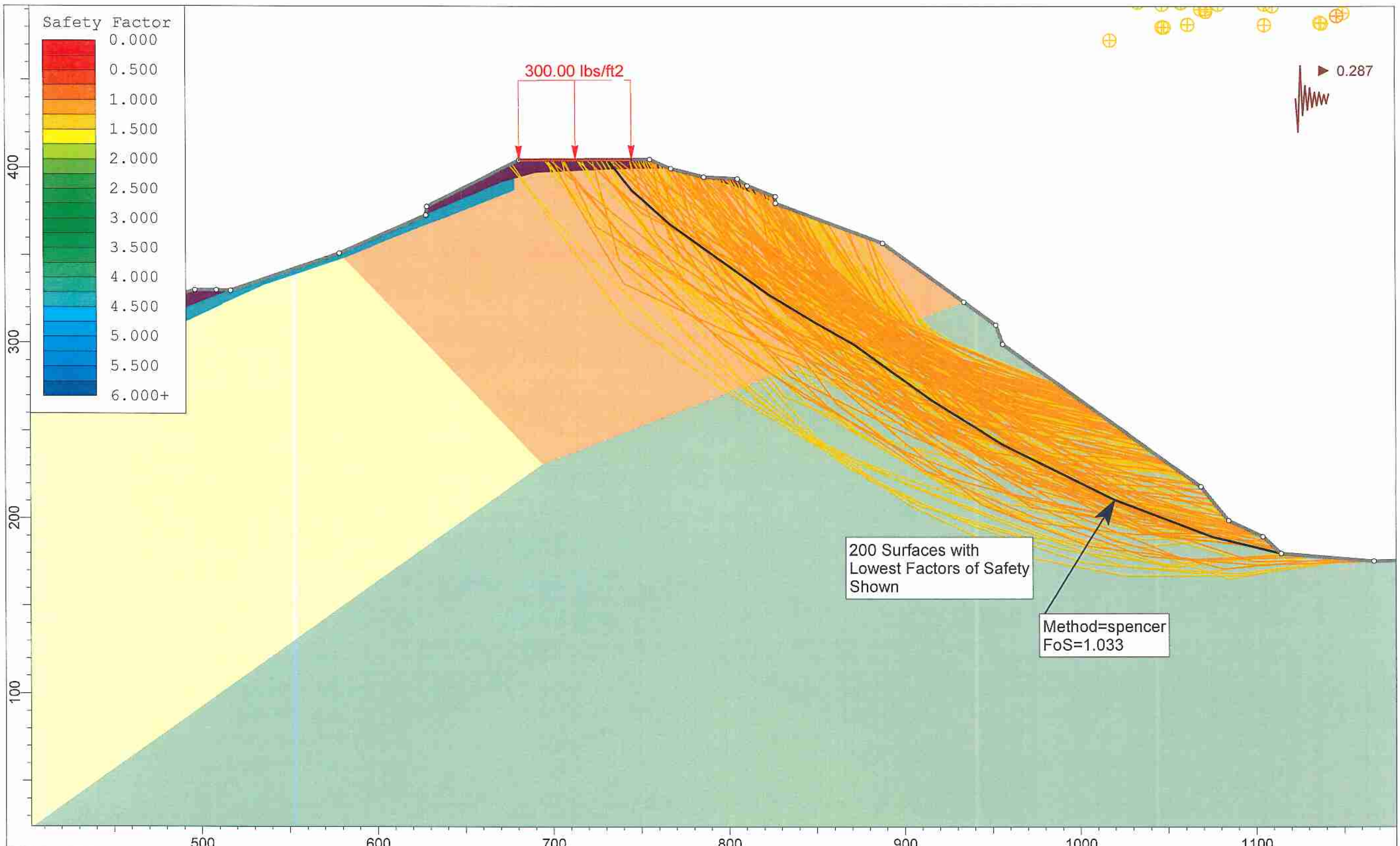
SLIDEINTERPRET 6.035

26	1082.28	201.65	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project Oak Pass Road			
Analysis Description Sect A-A			
Drawn By RK	*Scale*	*Company* Calwest	
Date 1.7.2019		*File Name* A-A Static.sli	



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road		
	Analysis Description: Sect A-A Seismic Analysis		
	Drawn By: RK	Scale: 1:904	Company: Calwest
SLIDEINTERPRET 6.035	Date: 1.7.2019		File Name: A-A Seismic.sli

Slide Analysis Information

Oak Pass Road

Project Summary

File Name: A-A Seismic
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect A-A Seismic Analysis
Author: RK
Company: Calwest
Date Created: 1.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Left to Right
Data Output: Maximum
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project*	Oak Pass Road		
	Analysis Description	Sect A-A Seismic Analysis		
	Drawn By RK	*Scale*	*Company*	Calwest
SLIDEINTERPRET 6.035	*Date* 1.7.2019		*File Name*	A-A Seismic.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 3000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287
2 Distributed Loads present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300

Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm_aniso2	Jsm-Aniso	Tm_aniso1	Tm_aniso3	Tt_Aniso	Cef	Af	Tm-Weathered
Color								
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	120	130	125	110	120
Cohesion [psf]						200	100	280
Friction Angle [deg]						34	30	25
Water Surface	None	None	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0	0	0

Anisotropic Functions

Name: Jsm-Aniso

Angle From	Angle To	c	phi
-90	19	1200	39
19	23	350	33
23	90	1200	39

Name: Tm-Aniso-3

Angle From	Angle To	c	phi
-90	-19	480	34
-19	-14	250	26

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road		
	Analysis Description: Sect A-A Seismic Analysis		
	Drawn By: RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 1.7.2019		File Name: A-A Seismic.sli

-14	90	480	34

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	660	37
30	35	310	30
35	90	660	37

Name: Tm_Aniso-2

Angle From	Angle To	c	phi
-90	30	580	35
30	35	300	25
35	90	580	35

Name: Tm_Aniso-1

Angle From	Angle To	c	phi
-90	20	480	34
20	25	250	26
25	90	480	34

Global Minimums

Method: spencer

FS: 1.032730
Axis Location: 1147.691, 675.347
Left Slip Surface Endpoint: 731.379, 404.851
Right Slip Surface Endpoint: 1114.300, 180.000
Resisting Moment=7.55741e+008 lb-ft
Driving Moment=7.31787e+008 lb-ft
Resisting Horizontal Force=1.38886e+006 lb
Driving Horizontal Force=1.34484e+006 lb

Total Slice Area=17269.1 ft2

Global Minimum Coordinates

Method: spencer

X	Y
731.379	404.851
745.054	387.55
767.091	367.909
822.508	328.21
848.068	312.57
871.277	299.28
915.334	267.818
955.287	242.794
1019.68	210.961
1075.38	189.338
1114.3	180

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.03273

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	4.49896	1608.29	Cef	200	34	328.955	339.722	207.146	0	207.146
2	9.1766	12978.7	Tm_aniso1	480	34	787.726	813.508	494.446	0	494.446
3	22.0371	68958.9	Tm_aniso1	480	34	1307.63	1350.43	1290.47	0	1290.47
4	18.4721	80232.4	Tm_aniso1	480	34	1877.62	1939.07	2163.16	0	2163.16
5	18.4721	103274	Tm_aniso1	480	34	2272.34	2346.71	2767.52	0	2767.52

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A-A Seismic Analysis		
Drawn By	RK	Scale	
Company	Calwest		
Date	1.7.2019	File Name	A-A Seismic.sli

SLIDEINTERPRET 6.035

6	18.4721	121543	Tm_aniso1	480	34	2585.3	2669.92	3246.69	0	3246.69
7	12.7803	86460.4	Tm_aniso1	480	34	2928.52	3024.37	3772.18	0	3772.18
8	12.7803	89002.7	Tm_aniso1	480	34	2999.01	3097.17	3880.11	0	3880.11
9	23.2085	172290	Tm_aniso1	480	34	3297.98	3405.92	4337.85	0	4337.85
10	14.6858	117493	Jsm-Aniso	1200	39	4379.3	4522.63	4103.1	0	4103.1
11	14.6858	122877	Jsm-Aniso	1200	39	4521.28	4669.26	4284.18	0	4284.18
12	14.6858	122541	Jsm-Aniso	1200	39	4512.42	4660.11	4272.88	0	4272.88
13	13.3174	109821	Jsm-Aniso	1200	39	4899.24	5059.59	4766.2	0	4766.2
14	13.3174	107604	Jsm-Aniso	1200	39	4827.64	4985.65	4674.89	0	4674.89
15	13.3174	104177	Jsm-Aniso	1200	39	4716.99	4871.38	4533.78	0	4533.78
16	16.0981	106730	Jsm-Aniso	1200	39	4915.93	5076.83	4787.48	0	4787.48
17	16.0981	99758.3	Jsm-Aniso	1200	39	4692.69	4846.28	4502.78	0	4502.78
18	16.0981	92871.5	Jsm-Aniso	1200	39	4472.16	4618.53	4221.53	0	4221.53
19	16.0981	85984.7	Jsm-Aniso	1200	39	4251.62	4390.78	3940.28	0	3940.28
20	13.9249	67587.1	Jsm-Aniso	1200	39	4642.79	4794.75	4439.15	0	4439.15
21	13.9249	59964.5	Jsm-Aniso	1200	39	4306.9	4447.86	4010.78	0	4010.78
22	13.9249	52341.8	Jsm-Aniso	1200	39	3971.01	4100.98	3582.41	0	3582.41
23	13.9249	43293.9	Jsm-Aniso	1200	39	3572.31	3689.23	3073.94	0	3073.94
24	19.4609	30959.5	Jsm-Aniso	1200	39	3371.05	3481.38	2817.27	0	2817.27
25	19.4609	13351.1	Jsm-Aniso	1200	39	2614.81	2700.39	1852.82	0	1852.82

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.03273

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	731.379	404.851	0	0	0
2	735.878	399.159	169.021	153.669	42.2762
3	745.054	387.55	2422.75	2202.7	42.2763

4	767.091	367.909	18743.1	17040.8	42.2764
5	785.564	354.676	35711.9	32468.3	42.2763
6	804.036	341.443	59999.7	54550.2	42.2763
7	822.508	328.21	90090.6	81908.2	42.2764
8	835.288	320.39	106975	97258.9	42.2763
9	848.068	312.57	124532	113221	42.2762
10	871.277	299.28	155090	141004	42.2763
11	885.963	288.792	167528	152312	42.2763
12	900.648	278.305	181325	164856	42.2763
13	915.334	267.818	195037	177323	42.2764
14	928.652	259.476	201066	182805	42.2765
15	941.969	251.135	206652	187883	42.2764
16	955.287	242.794	211550	192336	42.2763
17	971.385	234.836	201144	182875	42.2763
18	987.483	226.878	190065	172802	42.2763
19	1003.58	218.919	178322	162126	42.2763
20	1019.68	210.961	165914	150845	42.2764
21	1033.6	205.556	144658	131519	42.2762
22	1047.53	200.15	123576	112352	42.2763
23	1061.45	194.744	102668	93343.5	42.2764
24	1075.38	189.338	81966.9	74522.3	42.2763
25	1094.84	184.669	38403.3	34915.3	42.2763
26	1114.3	180	0	0	0

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

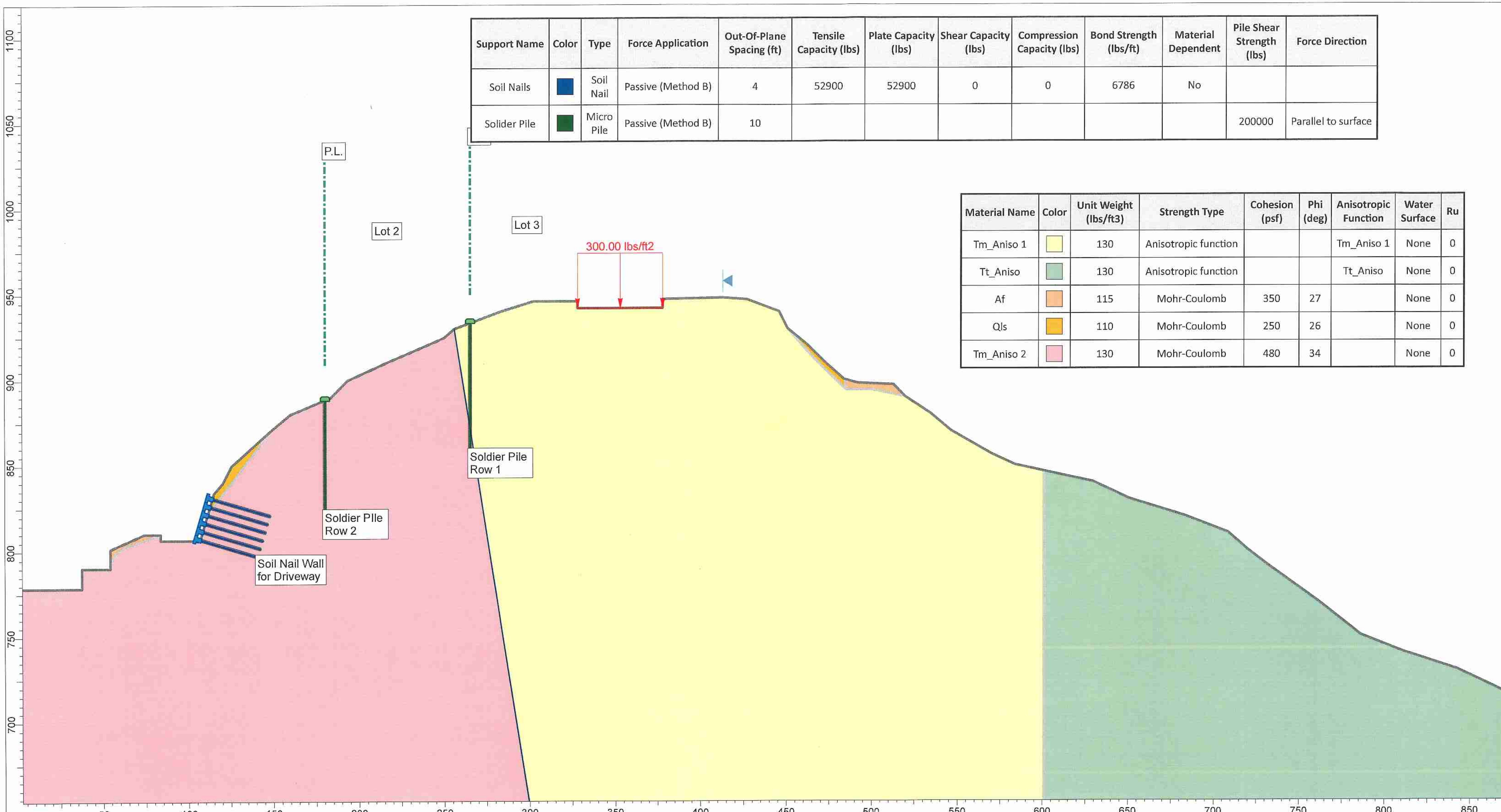
Project	Oak Pass Road		
Analysis Description	Sect A-A Seismic Analysis		
Drawn By	RK	Scale	Company: Calwest
Date	1.7.2019	File Name	A-A Seismic.sli

SLIDEINTERPRET 6.035

SLOPE STABILITY ANALYSIS CROSS-SECTION C-C'

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Material Dependent	Pile Shear Strength (lbs)	Force Direction
Soil Nails		Soil Nail	Passive (Method B)	4	52900	52900	0	0	6786	No		
Solider Pile		Micro Pile	Passive (Method B)	10							200000	Parallel to surface

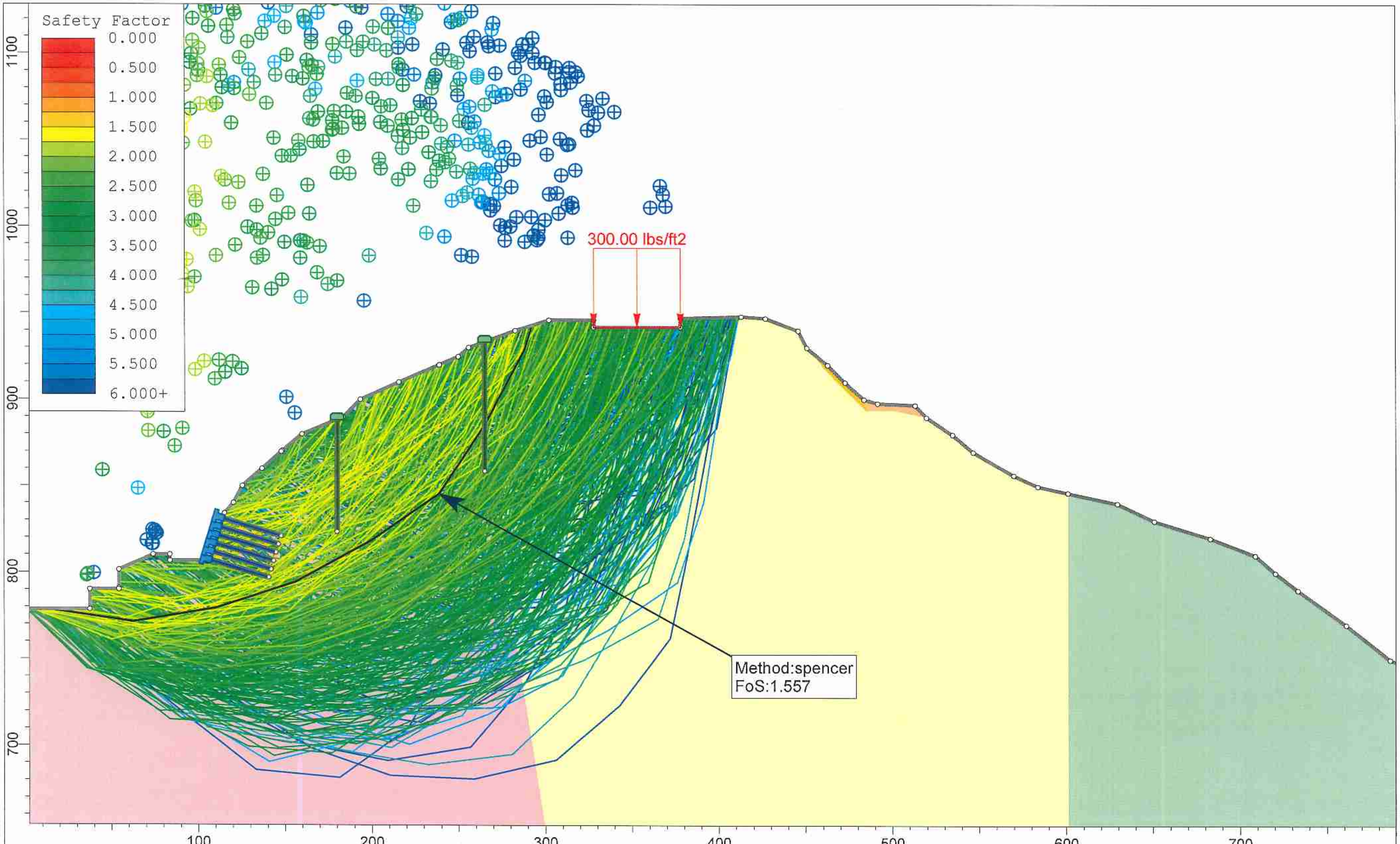
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm_Aniso 1		130	Anisotropic function			Tm_Aniso 1	None	0
Tt_Aniso		130	Anisotropic function			Tt_Aniso	None	0
Af		115	Mohr-Coulomb	350	27		None	0
Qls		110	Mohr-Coulomb	250	26		None	0
Tm_Aniso 2		130	Mohr-Coulomb	480	34		None	0



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Static		
Drawn By: RK	Scale: 1:642	Company	Calwest Geotechnical
Date: 1/3/2019, 9:48:13 AM		File Name	Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project* G5750		
	Analysis Description Section C - Static		
	Drawn By RK	*Scale* 1:916	*Company* Calwest Geotechnical
SLIDEINTERPRET 6.035	*Date* 1/3/2019, 9:48:13 AM		*File Name* Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

Slide Analysis Information
G5750

Project Summary

File Name: Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming
Slide Modeler Version: 6.035
Project Title: G5750
Analysis: Section C - Static
Author: RK
Company: Calwest Geotechnical
Date Created: 1/3/2019, 9:48:13 AM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 1000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Material Properties

Property	Tm_Aniso 1	Tt_Aniso	Af	Qls	Tm_Aniso 2

Color					
Strength Type	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	130	115	110	130
Cohesion [psf]			350	250	480
Friction Angle [deg]			27	26	34
Water Surface	None	None	None	None	None
Ru Value	0	0	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	660	37
30	37	310	30
37	90	660	37

Name: Tm_Aniso 1

Angle From	Angle To	c	phi
-90	12	480	34
12	18	250	26
18	90	480	34

Support Properties

Soil Nails

Support Type: Soil Nail
Force Application: Passive
Out-of-Plane Spacing: 4 ft
Tensile Capacity: 52900 lb
Plate Capacity: 52900 lb
Bond Strength: 6786 lb/ft

Solider Pile

Support Type: Micro-Pile
Force Application: Passive
Out-of-Plane Spacing: 10 ft
Pile Shear Strength: 200000 lb
Force Direction: Parallel to Surface

Global Minimums

Method: spencer

FS: 1.556930
Axis Location: -11.203, 1138.358
Left Slip Surface Endpoint: 14.513, 778.400
Right Slip Surface Endpoint: 292.193, 942.956
Resisting Moment=5.05123e+008 lb-ft
Driving Moment=3.24436e+008 lb-ft
Resisting Horizontal Force=1.13456e+006 lb
Driving Horizontal Force=728715 lb
Total Slice Area=14273.9 ft2

Global Minimum Coordinates

Method: spencer

X	Y
14.5132	778.4
62.4652	771.422
110.263	779.39
156.29	794.541
198.77	817.855
238.616	845.431

265.267	885.901
287.865	928.766
292.193	942.956

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.55693

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	11.988	1359.44	Tm_Aniso 2	480	34	494.873	770.483	430.658	0	430.658
2	11.988	5741.08	Tm_Aniso 2	480	34	726.701	1131.42	965.769	0	965.769
3	11.988	24988.4	Tm_Aniso 2	480	34	1745.05	2716.92	3316.37	0	3316.37
4	11.988	41336.5	Tm_Aniso 2	480	34	2610.01	4063.6	5312.91	0	5312.91
5	11.9494	54165.6	Tm_Aniso 2	480	34	2418.14	3764.87	4870.02	0	4870.02
6	11.9494	53774.2	Tm_Aniso 2	480	34	2403.19	3741.6	4835.51	0	4835.51
7	11.9494	46754.8	Tm_Aniso 2	480	34	2135.11	3324.21	4216.72	0	4216.72
8	11.9494	46246.6	Tm_Aniso 2	480	34	2115.7	3293.99	4171.92	0	4171.92
9	11.5069	76553.8	Tm_Aniso 2	480	34	2958.84	4606.71	6118.11	0	6118.11
10	11.5069	97358.4	Tm_Aniso 2	480	34	3674.76	5721.34	7770.6	0	7770.6
11	11.5069	108858	Tm_Aniso 2	480	34	4070.48	6337.45	8684.04	0	8684.04
12	11.5069	119201	Tm_Aniso 2	480	34	4426.39	6891.58	9505.55	0	9505.55
13	10.62	114798	Tm_Aniso 2	480	34	3923.99	6109.37	8345.93	0	8345.93
14	10.62	113211	Tm_Aniso 2	480	34	3873.88	6031.36	8230.23	0	8230.23
15	10.62	112170	Tm_Aniso 2	480	34	3841.01	5980.18	8154.35	0	8154.35
16	10.62	116523	Tm_Aniso 2	480	34	3978.44	6194.16	8471.57	0	8471.57
17	13.2819	143300	Tm_Aniso 2	480	34	3576.85	5568.91	7544.65	0	7544.65
18	13.2819	137644	Tm_Aniso 2	480	34	3446.95	5366.66	7244.75	0	7244.75
19	13.2819	131648	Tm_Aniso 2	480	34	3309.26	5152.29	6926.97	0	6926.97
20	12.3054	108510	Tm_Aniso 2	480	34	2041.15	3177.92	3999.82	0	3999.82

21	12.3054	90456.3	Tm_Aniso 2	480	34	1740.91	2710.47	3306.81	0	3306.81
22	2.03959	12941.7	Tm_Aniso 1	480	34	275.708	429.258	-75.2277	0	-75.2277
23	11.2994	57336.4	Tm_Aniso 1	480	34	1136.51	1769.46	1911.7	0	1911.7
24	11.2994	31926.5	Tm_Aniso 1	480	34	731.029	1138.16	975.765	0	975.765
25	4.32747	3617.32	Tm_Aniso 1	480	34	227.009	353.437	-187.638	0	-187.638

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.55693

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	14.5132	778.4	0	0	0
2	26.5012	776.655	6670.04	3081.51	24.7966
3	38.4892	774.911	17046.3	7875.26	24.7966
4	50.4772	773.166	43703	20190.5	24.7966
5	62.4652	771.422	84187.9	38894.1	24.7965
6	74.4145	773.414	103314	47730.1	24.7965
7	86.3639	775.406	122330	56515.6	24.7966
8	98.3132	777.398	139383	64394	24.7966
9	110.263	779.39	156294	72206.8	24.7966
10	121.77	783.178	167089	77193.7	24.7965
11	133.276	786.966	179843	83085.9	24.7965
12	144.783	790.753	193680	89478.6	24.7966
13	156.29	794.541	208491	96321.3	24.7966
14	166.91	800.369	201423	93055.6	24.7965
15	177.53	806.198	194497	89856.2	24.7966
16	188.15	812.026	187666	86700.1	24.7965
17	198.77	817.855	180442	83362.6	24.7965
18	212.052	827.047	158489	73220.8	24.7966

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Static		
Drawn By	RK	Scale	Company: Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

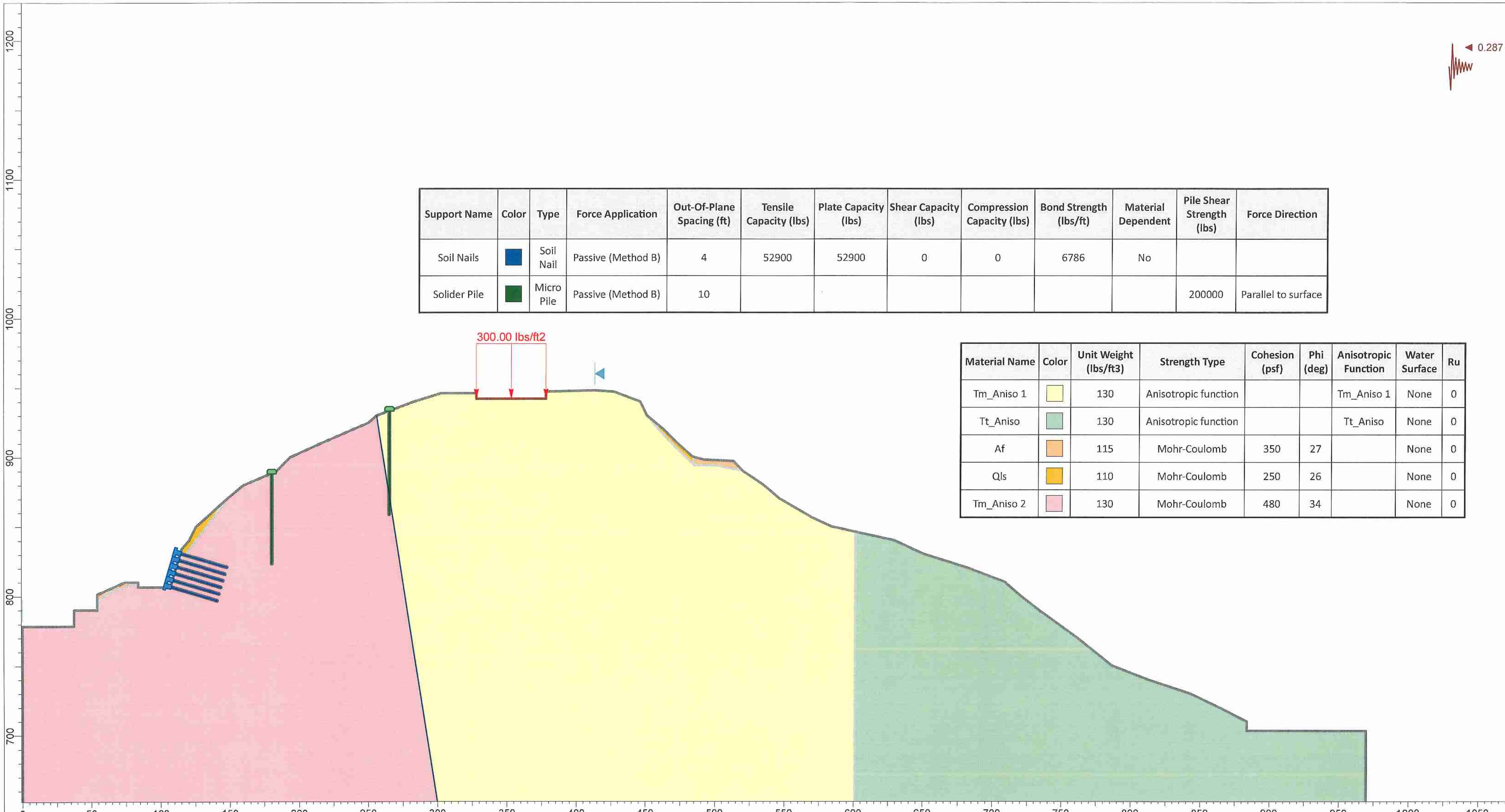
SLIDEINTERPRET 6.035

19	225.334	836.239	137572	63557	24.7965
20	238.616	845.431	117751	54400	24.7966
21	250.922	864.117	68066.7	31446.3	24.7966
22	263.227	882.804	27646.5	12772.5	24.7966
23	265.267	885.901	39440.1	18221	24.7965
24	276.566	907.333	11279.8	5211.17	24.7965
25	287.865	928.766	-1392.22	-643.196	24.7966
26	292.193	942.956	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	G5750		
Analysis Description	Section C - Static		
Drawn By: RK	Scale	Company	Calwest Geotechnical
Date: 1/3/2019, 9:48:13 AM		File Name	Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli



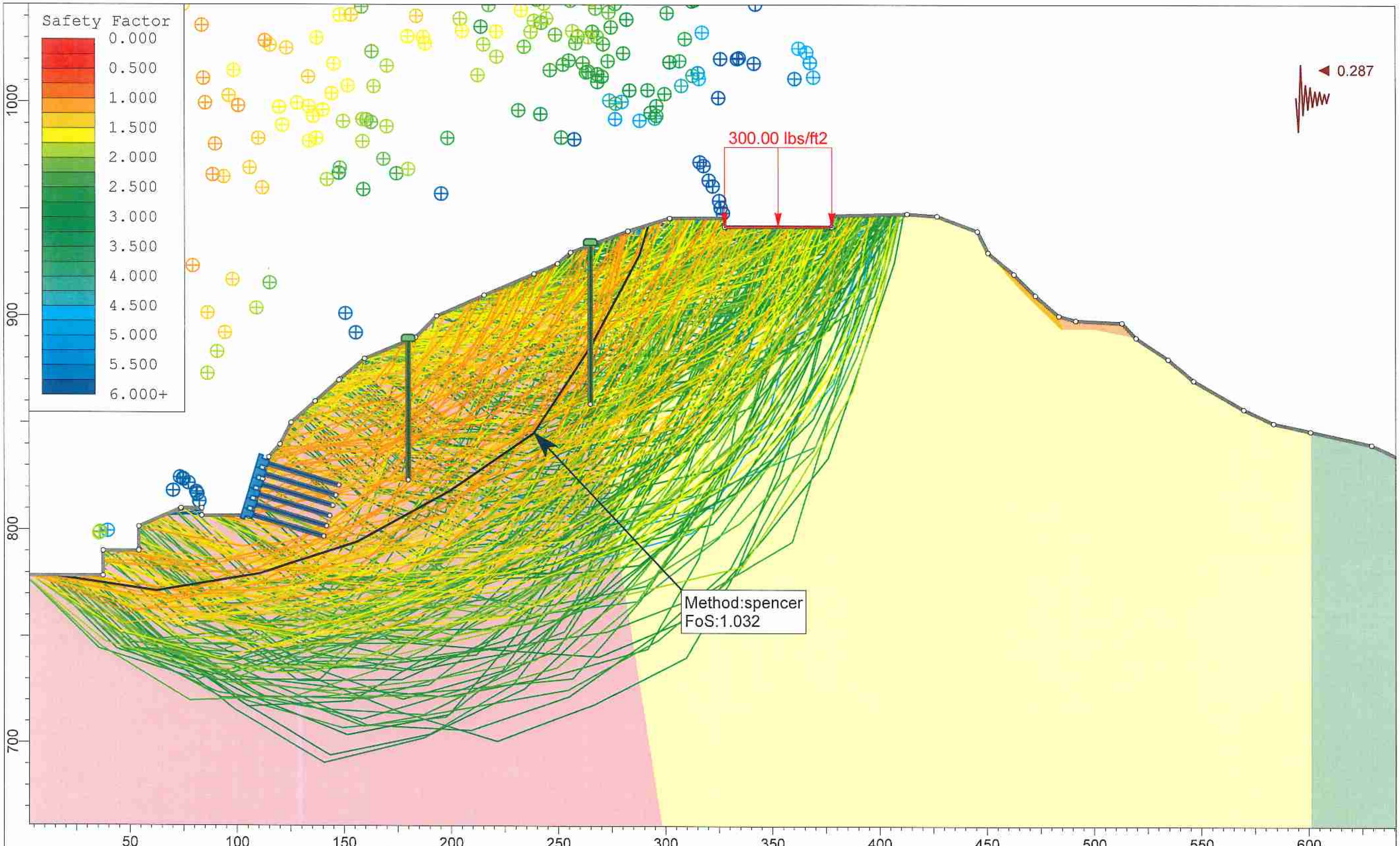
Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Material Dependent	Pile Shear Strength (lbs)	Force Direction
Soil Nails		Soil Nail	Passive (Method B)	4	52900	52900	0	0	6786	No		
Solider Pile		Micro Pile	Passive (Method B)	10							200000	Parallel to surface

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm_Aniso 1		130	Anisotropic function			Tm_Aniso 1	None	0
Tt_Aniso		130	Anisotropic function			Tt_Aniso	None	0
Af		115	Mohr-Coulomb	350	27		None	0
Qls		110	Mohr-Coulomb	250	26		None	0
Tm_Aniso 2		130	Mohr-Coulomb	480	34		None	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDE 6.035

Project	G5750		
Analysis Description	Section C - Seismic		
Drawn By: RK	Scale: 1:793	Company	Calwest Geotechnical
Date: 1/3/2019, 9:48:13 AM		File Name	Section C-NorthFace-Seismic Soil Nails-Soldier Piles-MinorTrimming.sli



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	G5750	
	Analysis Description	Section C - Static	
	Drawn By: RK	Scale: 1:742	Company: Calwest Geotechnical
SLIDEINTERPRET 6.035	Date: 1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Seismic Soil Nails-Soldier Piles-MinorTrimming.sli

Slide Analysis Information
G5750

Project Summary

File Name: Section C-NorthFace-Seismic Soil Nails-Soldier Piles-MinorTrimming
Slide Modeler Version: 6.035
Project Title: G5750
Analysis: Section C - Static
Author: RK
Company: Calwest Geotechnical
Date Created: 1/3/2019, 9:48:13 AM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 1000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287
1 Distributed Load present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm_Aniso 1	Tt_Aniso	Af	Qls	Tm_Aniso 2
Color					

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Static		
Drawn By	RK	Scale	Company: Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Seismic Soil Nails-Soldier Piles-MinorTrimming.sli

SLIDEINTERPRET 6.035

Strength Type	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	130	115	110	130
Cohesion [psf]			350	250	480
Friction Angle [deg]			27	26	34
Water Surface	None	None	None	None	None
Ru Value	0	0	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	660	37
30	37	310	30
37	90	660	37

Name: Tm_Aniso 1

Angle From	Angle To	c	phi
-90	12	480	34
12	18	250	26
18	90	480	34

Global Minimums

Method: spencer

FS: 1.032200
Axis Location: -11.203, 1138.358
Left Slip Surface Endpoint: 14.513, 778.400
Right Slip Surface Endpoint: 292.193, 942.956
Resisting Moment=4.70884e+008 lb-ft
Driving Moment=4.56195e+008 lb-ft
Resisting Horizontal Force=1.09503e+006 lb

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Static		
Drawn By	RK	Scale	Company: Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Seismic Soil Nails-Soldier Piles-MinorTrimming.sli

SLIDEINTERPRET 6.035

Driving Horizontal Force=1.06087e+006 lb
Total Slice Area=14273.9 ft2

Global Minimum Coordinates

Method: spencer

X	Y
14.5132	778.4
62.4652	771.422
110.263	779.39
156.29	794.541
198.77	817.855
238.616	845.431
265.267	885.901
287.865	928.766
292.193	942.956

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.0322

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	11.988	1359.44	Tm_Aniso 2	480	34	1632.92	1685.5	1787.22	0	1787.22
2	11.988	5741.08	Tm_Aniso 2	480	34	2280.92	2354.37	2778.87	0	2778.87
3	11.988	24988.4	Tm_Aniso 2	480	34	5127.46	5292.56	7134.92	0	7134.92
4	11.988	41336.5	Tm_Aniso 2	480	34	7545.21	7788.17	10834.8	0	10834.8
5	11.9494	54165.6	Tm_Aniso 2	480	34	3903.39	4029.08	5261.72	0	5261.72
6	11.9494	53774.2	Tm_Aniso 2	480	34	3880.44	4005.39	5226.61	0	5226.61
7	11.9494	46754.8	Tm_Aniso 2	480	34	3468.97	3580.67	4596.94	0	4596.94

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750
Analysis Description	Section C - Static
Drawn By	RK
Scale	
Company	Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM
File Name	Section C-NorthFace-Seismic Soil Nails-Soldier Piles-MinorTrimming.sli

SLIDEINTERPRET 6.035

8	11.9494	46246.6	Tm_Aniso 2	480	34	3439.18	3549.92	4551.35	0	4551.35
9	11.5069	76553.8	Tm_Aniso 2	480	34	4124.51	4257.32	5600.11	0	5600.11
10	11.5069	97358.4	Tm_Aniso 2	480	34	5079.23	5242.78	7061.11	0	7061.11
11	11.5069	108858	Tm_Aniso 2	480	34	5606.96	5787.5	7868.69	0	7868.69
12	11.5069	119201	Tm_Aniso 2	480	34	6081.58	6277.41	8595.06	0	8595.06
13	10.62	114798	Tm_Aniso 2	480	34	4807.66	4962.47	6645.53	0	6645.53
14	10.62	113211	Tm_Aniso 2	480	34	4748.43	4901.33	6554.89	0	6554.89
15	10.62	112170	Tm_Aniso 2	480	34	4709.56	4861.21	6495.41	0	6495.41
16	10.62	116523	Tm_Aniso 2	480	34	4872.04	5028.92	6744.05	0	6744.05
17	13.2819	143300	Tm_Aniso 2	480	34	4164.62	4298.72	5661.48	0	5661.48
18	13.2819	137644	Tm_Aniso 2	480	34	4019.36	4148.78	5439.19	0	5439.19
19	13.2819	131648	Tm_Aniso 2	480	34	3865.38	3989.85	5203.57	0	5203.57
20	12.3054	108510	Tm_Aniso 2	480	34	2047.68	2113.62	2421.94	0	2421.94
21	12.3054	90456.3	Tm_Aniso 2	480	34	1770.42	1827.43	1997.65	0	1997.65
22	2.03959	12941.7	Tm_Aniso 1	480	34	615.73	635.557	230.622	0	230.622
23	11.2994	57336.4	Tm_Aniso 1	480	34	1157.1	1194.36	1059.09	0	1059.09
24	11.2994	31926.5	Tm_Aniso 1	480	34	803.285	829.151	517.637	0	517.637
25	4.32747	3617.32	Tm_Aniso 1	480	34	401.194	414.112	-97.6822	0	-97.6822

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.0322

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	14.5132	778.4	0	0	0
2	26.5012	776.655	22370.6	17625.7	38.2344
3	38.4892	774.911	53008.7	41765.5	38.2345
4	50.4772	773.166	119964	94519.4	38.2345
5	62.4652	771.422	217766	171578	38.2346

6	74.4145	773.414	238542	187947	38.2345
7	86.3639	775.406	259225	204242	38.2344
8	98.3132	777.398	278243	219227	38.2345
9	110.263	779.39	297140	234116	38.2345
10	121.77	783.178	301581	237615	38.2345
11	133.276	786.966	305542	240735	38.2344
12	144.783	790.753	309236	243646	38.2345
13	156.29	794.541	312691	246368	38.2344
14	166.91	800.369	292243	230258	38.2345
15	177.53	806.198	272148	214425	38.2345
16	188.15	812.026	252284	198774	38.2345
17	198.77	817.855	231453	182362	38.2346
18	212.052	827.047	193791	152688	38.2346
19	225.334	836.239	157860	124377	38.2344
20	238.616	845.431	123762	97512.1	38.2346
21	250.922	864.117	72646.7	57238.1	38.2345
22	263.227	882.804	31217.3	24596.1	38.2346
23	265.267	885.901	39048.5	30766.3	38.2346
24	276.566	907.333	13013.8	10253.6	38.2346
25	287.865	928.766	1864.61	1469.12	38.2345
26	292.193	942.956	0	0	0

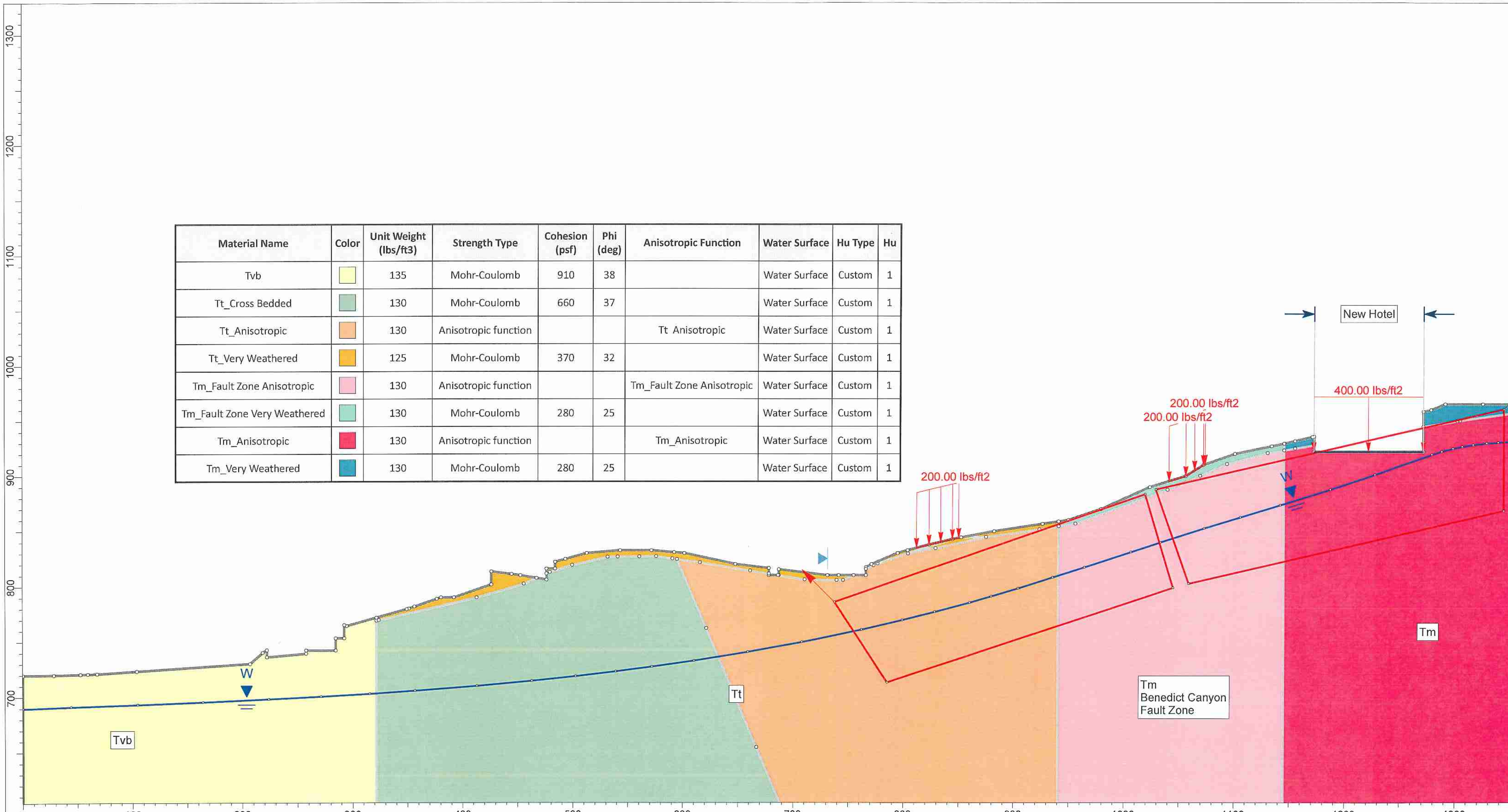
CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	G5750		
Analysis Description	Section C - Static		
Drawn By	RK	Scale	Company: Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Seismic Soil Nails-Soldier Piles-MinorTrimming.sli

SLOPE STABILITY ANALYSIS CROSS-SECTION E-E’

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Hu Type	Hu
Tvb		135	Mohr-Coulomb	910	38		Water Surface	Custom	1
Tt_Cross Bedded		130	Mohr-Coulomb	660	37		Water Surface	Custom	1
Tt_Anisotropic		130	Anisotropic function			Tt Anisotropic	Water Surface	Custom	1
Tt_Very Weathered		125	Mohr-Coulomb	370	32		Water Surface	Custom	1
Tm_Fault Zone Anisotropic		130	Anisotropic function			Tm_Fault Zone Anisotropic	Water Surface	Custom	1
Tm_Fault Zone Very Weathered		130	Mohr-Coulomb	280	25		Water Surface	Custom	1
Tm_Anisotropic		130	Anisotropic function			Tm_Anisotropic	Water Surface	Custom	1
Tm_Very Weathered		130	Mohr-Coulomb	280	25		Water Surface	Custom	1



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

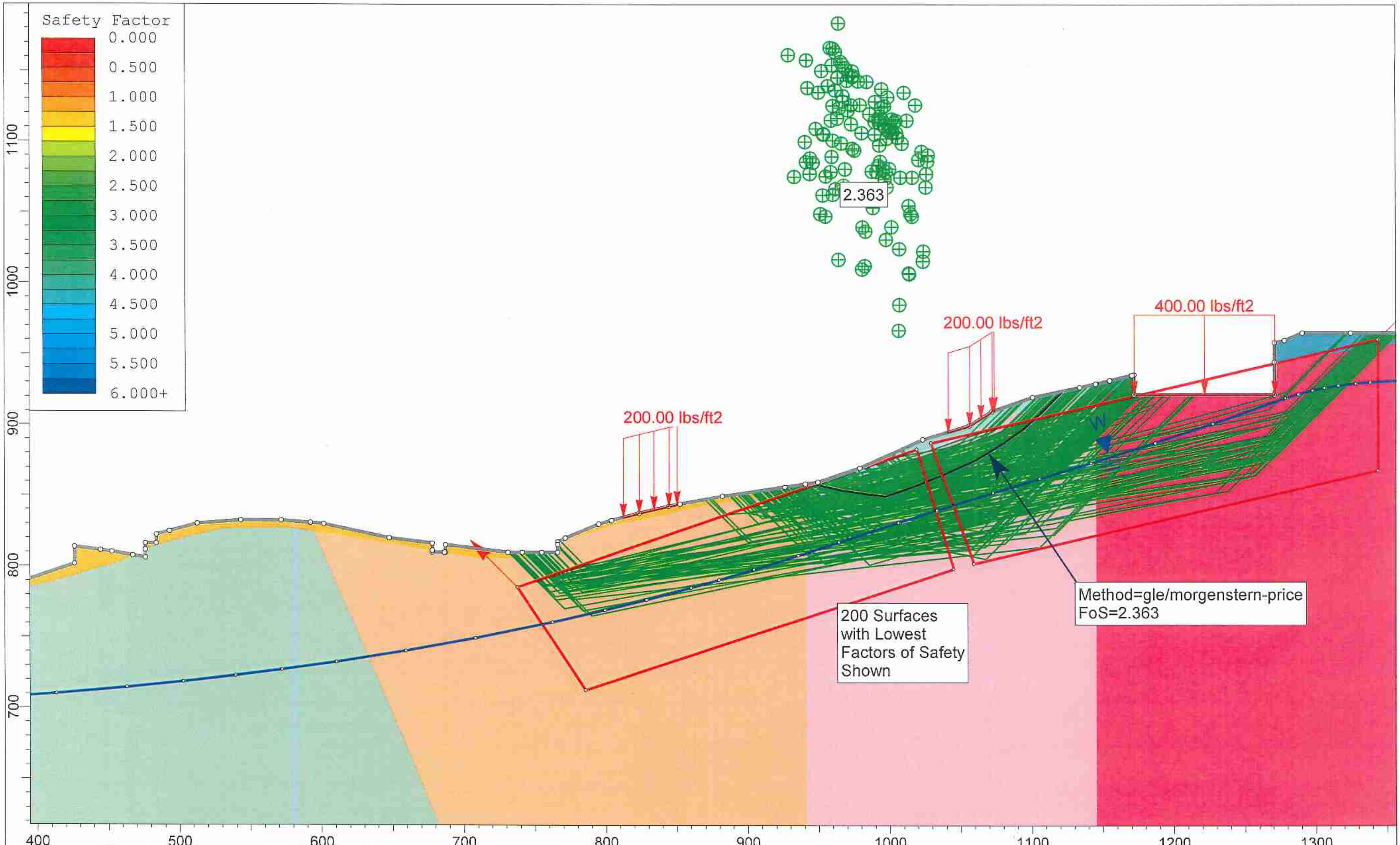
SLIDE 6.035

Project: Oak Pass Road G5270

Analysis Description: Sect E

Drawn By: RD/RK | Scale: 1:999 | Company: Calwest

Date: 1.9.2019 | File Name: Section E - Static.sli



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road G5270		
	Analysis Description: Sect E (STATIC CONDITION)		
	Drawn By: RD/RK	Scale: 1:1120	Company: Calwest
SLIDEINTERPRET 6.035	Date: 1.9.2019		File Name: Section E - Static.sli

Slide Analysis Information

Oak Pass Road G5270

Project Summary

File Name: Section E - Static
Slide Modeler Version: 6.035
Project Title: Oak Pass Road G5270
Analysis: Sect E
Author: RD/RK
Company: Calwest
Date Created: 1.9.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Road G5270		
	Analysis Description	Sect E		
	Drawn By: RD/RK	Scale	Company	Calwest
SLIDEINTERPRET 6.035	Date: 1.9.2019		File Name	Section E - Static.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Global Minimums

Method: gle/morgenstern-price

FS: 2.362710
Axis Location: 967.694, 1069.402
Left Slip Surface Endpoint: 944.214, 859.239
Right Slip Surface Endpoint: 1121.737, 924.520
Resisting Moment=8.17319e+007 lb-ft

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Road G5270		
	Analysis Description	Sect E		
	Drawn By	RD/RK	Scale	Company: Calwest
SLIDEINTERPRET 6.035	Date	1.9.2019	File Name	Section E - Static.sli

Driving Moment=3.45924e+007 lb-ft
Resisting Horizontal Force=342195 lb
Driving Horizontal Force=144831 lb
Total Slice Area=3706.22 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
944.214	859.239
966.594	854.072
981.714	851.947
996.833	849.822
1008.72	853.862
1017.18	857.021
1038.99	865.854
1060.8	875.849
1080.63	887.966
1094.98	898.404
1106.71	909.049
1121.74	924.52

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 2.36271

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	5.4046	724.711	Tm_Fault Zone Very Weathered	280	25	153.496	362.667	177.279	0	177.279
2	5.4046	2574.1	Tm_Fault Zone Very Weathered	280	25	230.16	543.802	565.726	0	565.726

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road G5270		
	Analysis Description: Sect E		
	Drawn By: RD/RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 1.9.2019		File Name: Section E - Static.sli

3	5.78522	5155.89	Tm_Fault Zone Anisotropic	250	26	323.814	765.079	1056.07	0	1056.07
4	5.78522	7638.05	Tm_Fault Zone Anisotropic	250	26	434.77	1027.24	1593.57	0	1593.57
5	7.55993	13386.7	Tm_Fault Zone Anisotropic	250	26	538.107	1271.39	2094.15	0	2094.15
6	7.55993	17018.4	Tm_Fault Zone Anisotropic	250	26	667.28	1576.59	2719.92	0	2719.92
7	7.55993	21259.2	Tm_Fault Zone Anisotropic	250	26	819.064	1935.21	3455.19	0	3455.19
8	7.55993	25651.2	Tm_Fault Zone Anisotropic	250	26	977.898	2310.49	4224.63	0	4224.63
9	5.94446	22151	Tm_Fault Zone Anisotropic	480	34	1205.99	2849.41	3512.8	0	3512.8
10	5.94446	22660	Tm_Fault Zone Anisotropic	480	34	1219.99	2882.48	3561.82	0	3561.82
11	8.45635	32955.2	Tm_Fault Zone Anisotropic	480	34	1208.88	2856.24	3522.92	0	3522.92
12	7.27047	28781.3	Tm_Fault Zone Anisotropic	480	34	1191.48	2815.12	3461.96	0	3461.96
13	7.27047	28426	Tm_Fault Zone Anisotropic	480	34	1168.43	2760.67	3381.23	0	3381.23
14	7.27047	27735.9	Tm_Fault Zone Anisotropic	480	34	1135.03	2681.75	3264.23	0	3264.23
15	10.9056	39897.7	Tm_Fault Zone Anisotropic	480	34	1097.19	2592.34	3131.68	0	3131.68
16	10.9056	38019.4	Tm_Fault Zone Anisotropic	480	34	1059.03	2502.18	2998.01	0	2998.01
17	6.60954	23434.3	Tm_Fault Zone Anisotropic	480	34	1000.94	2364.92	2794.51	0	2794.51
18	6.60954	23456.5	Tm_Fault Zone Anisotropic	480	34	998.878	2360.06	2787.3	0	2787.3
19	6.60954	22328.3	Tm_Fault Zone Anisotropic	480	34	920.523	2174.93	2512.84	0	2512.84
20	7.17723	22180.2	Tm_Fault Zone Anisotropic	480	34	827.08	1954.15	2185.51	0	2185.51
21	7.17723	19656.5	Tm_Fault Zone Anisotropic	480	34	762.214	1800.89	1958.29	0	1958.29
22	5.86432	13781.7	Tm_Fault Zone Anisotropic	480	34	650.901	1537.89	1568.39	0	1568.39
23	5.86432	10929.4	Tm_Fault Zone Anisotropic	480	34	559.306	1321.48	1247.54	0	1247.54
24	7.25741	8797.97	Tm_Fault Zone Anisotropic	480	34	415.022	980.576	742.134	0	742.134
25	7.76628	3208.36	Tm_Fault Zone Very Weathered	280	25	165.505	391.041	238.129	0	238.129

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 2.36271

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road G5270		
Analysis Description	Sect E		
Drawn By	RD/RK	*Scale*	*Company* Calwest
Date	1.9.2019		*File Name* Section E - Static.sli

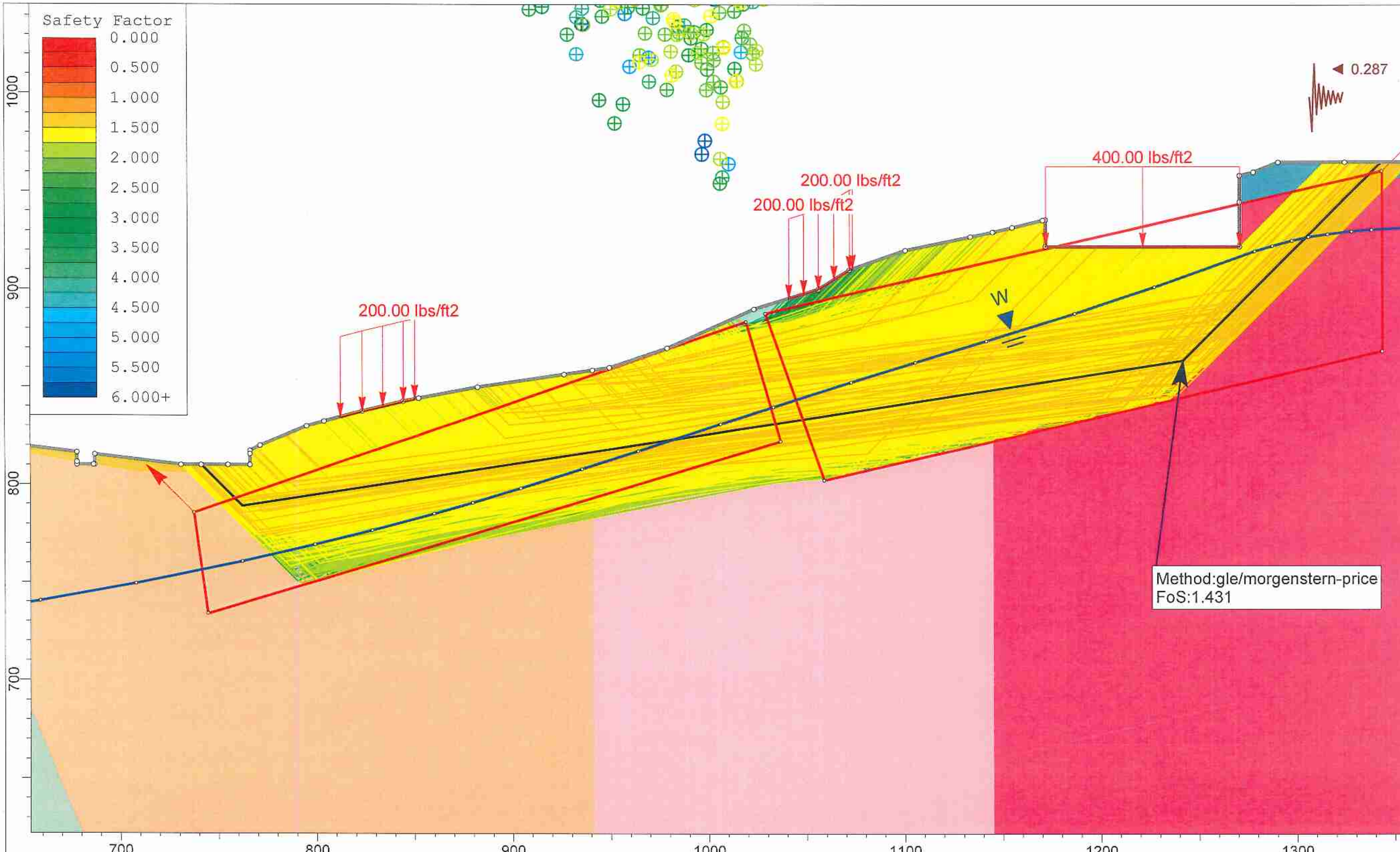
SLIDEINTERPRET 6.035

1	944.214	859.239	0	0	0
2	949.619	857.991	1050.78	41.887	2.28276
3	955.023	856.743	3000.59	238.129	4.53752
4	960.808	855.407	6284.43	759.332	6.88951
5	966.594	854.072	10928.1	1759.73	9.1477
6	974.154	853.009	17221.1	3632.93	11.9123
7	981.714	851.947	25155.5	6467.92	14.4194
8	989.273	850.884	35018.7	10459.4	16.6299
9	996.833	849.822	46900.1	15707.1	18.516
10	1002.78	851.842	46973.8	16873.7	19.7591
11	1008.72	853.862	47031.7	17851.1	20.7845
12	1017.18	857.021	46125.3	18505.9	21.8611
13	1024.45	859.965	44594.6	18402.9	22.4245
14	1031.72	862.909	43134	18000.3	22.6513
15	1038.99	865.854	41775.1	17338.9	22.5411
16	1049.9	870.851	38089.8	15191.8	21.7442
17	1060.8	875.849	34656.5	12747.3	20.1945
18	1067.41	879.888	29985.5	10263.3	18.8948
19	1074.02	883.927	25330.1	7904.4	17.3308
20	1080.63	887.966	21265.3	5902.62	15.5131
21	1087.81	893.185	15794.7	3725.08	13.2704
22	1094.98	898.404	11044.4	2101.94	10.7755
23	1100.85	903.727	6513.49	982.288	8.57605
24	1106.71	909.049	3153.21	345.831	6.25895
25	1113.97	916.523	619.017	35.4007	3.2731
26	1121.74	924.52	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road G5270		
Analysis Description	Sect E		
Drawn By	RD/RK	*Scale*	*Company* Calwest
Date	1.9.2019	*File Name*	Section E - Static.sli

SLIDEINTERPRET 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road G5270		
Analysis Description	Sect E (SEISMIC CONDITION)		
Drawn By	RD/RK	Scale 1:819	Company Calwest
Date	1.9.2019	File Name	Section E - Seismic.slim

SLIDEINTERPRET 6.035

Slide Analysis Information
Oak Pass Road G5270

Project Summary

File Name: Section E - Seismic
Slide Modeler Version: 6.035
Project Title: Oak Pass Road G5270
Analysis: Sect E
Author: RD/RK
Company: Calwest
Date Created: 1.9.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Road G5270		
	Analysis Description	Sect E		
	Drawn By: RD/RK	Scale	Company	Calwest
SLIDEINTERPRET 6.035	Date: 1.9.2019		File Name	Section E - Seismic.slim

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287
3 Distributed Loads present

Distributed Load 1

Distribution: Constant

Magnitude [psf]: 400
Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Distributed Load 3

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Material Properties

Property	Tvb	Tt_Cross Bedded	Tt_Anisotropic	Tt_Very Weathered	Tm_Fault Zone Anisotropic	Tm_Fault Zone Very Weathered	Tm_Anisotropic	Tm_Very Weathered
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb
Unit Weight [lbs/ft3]	135	130	130	125	130	130	130	130
Cohesion [psf]	910	660		370		280		280
Friction Angle [deg]	38	37		32		25		25
Water Surface	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Anisotropic Functions

Name: Tt Anisotropic

Angle From	Angle To	c	phi
-90	30	660	37
30	35	310	30
35	90	660	37

Name: Tm_Fault Zone Anisotropic

Angle From	Angle To	c	phi
-90	-13	480	34
-13	-8	250	26
-8	90	480	34

Name: Tm_Anisotropic

Angle From	Angle To	c	phi
-90	25	580	35
25	30	300	25
30	90	580	35

Global Minimums

Method: gle/morgenstern-price

FS: 1.431060
Axis Location: 886.982, 1489.721
Left Slip Surface Endpoint: 741.121, 810.000
Right Slip Surface Endpoint: 1343.243, 965.200
Resisting Moment=1.87206e+009 lb-ft
Driving Moment=1.30816e+009 lb-ft
Resisting Horizontal Force=2.6403e+006 lb
Driving Horizontal Force=1.845e+006 lb
Total Slice Area=30550.3 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
741.121	810
762.074	789.047
1241.77	863.723
1343.24	965.2

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.43106

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	4.2871	1148.7	Tt_Very Weathered	370	32	682.228	976.309	970.297	0	970.297
2	16.6656	27241.4	Tt_Anisotropic	660	37	3376.67	4832.22	5536.74	0	5536.74
3	25.5037	97226.8	Tt_Anisotropic	660	37	2536.23	3629.5	3940.66	0	3940.66
4	25.5037	120149	Tt_Anisotropic	660	37	3036.1	4344.84	4889.95	0	4889.95
5	25.5037	129713	Tt_Anisotropic	660	37	3379.34	4836.04	5541.77	0	5541.77
6	25.5037	135665	Tt_Anisotropic	660	37	3481.97	4982.91	5736.69	0	5736.69
7	25.5037	138544	Tt_Anisotropic	660	37	3523.12	5041.8	5814.83	0	5814.83
8	25.5037	138888	Tt_Anisotropic	660	37	3549.29	5079.25	5864.54	0	5864.54
9	25.5037	138447	Tt_Anisotropic	660	37	3542.79	5069.95	5852.18	0	5852.18
10	25.5251	142149	Tm_Fault Zone Anisotropic	480	34	3062.37	4382.44	5785.61	0	5785.61
11	25.5251	158003	Tm_Fault Zone Anisotropic	480	34	3292.65	4711.98	6274.15	0	6274.15
12	25.5251	181836	Tm_Fault Zone Anisotropic	480	34	3513.84	5028.51	6984.03	240.574	6743.45
13	25.5251	203174	Tm_Fault Zone Anisotropic	480	34	3670.95	5253.35	7590.05	513.264	7076.78
14	25.5251	219311	Tm_Fault Zone Anisotropic	480	34	3840.47	5495.94	8210.19	773.761	7436.43
15	25.5251	247047	Tm_Fault Zone Anisotropic	480	34	4014.22	5744.59	8832.12	1027.06	7805.06
16	25.5251	260534	Tm_Fault Zone Anisotropic	480	34	4023.16	5757.39	9092.84	1268.8	7824.04

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road G5270		
Analysis Description	Sect E		
Drawn By	RD/RK	*Scale*	
Company	Calwest		
Date	1.9.2019	*File Name*	Section E - Seismic.slim

SLIDEINTERPRET 6.035

17	25.5251	265647	Tm_Fault Zone Anisotropic	480	34	3925.27	5617.3	9123	1506.63	7616.37
18	24.2413	257651	Tm_Anisotropic	580	35	4088.25	5850.53	9272.75	1745.68	7527.07
19	24.2413	218325	Tm_Anisotropic	580	35	3359.47	4807.6	8020.54	1982.91	6037.63
20	24.2413	201491	Tm_Anisotropic	580	35	2902.2	4153.22	7346.59	2243.52	5103.07
21	24.2413	189598	Tm_Anisotropic	580	35	2532.64	3624.36	6862.31	2514.53	4347.78
22	30.2358	175045	Tm_Anisotropic	580	35	1104.45	1580.54	3488.1	2059.18	1428.92
23	30.2358	211873	Tm_Anisotropic	580	35	1987.85	2844.73	4054.96	820.596	3234.37
24	30.2358	101754	Tm_Anisotropic	580	35	1315.63	1882.74	1860.51	0	1860.51
25	10.7693	7538.61	Tm_Very Weathered	280	25	317.549	454.432	374.07	0	374.07

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.43106

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	741.121	810	0	0	0
2	745.408	805.713	6756.45	84.615	0.717511
3	762.074	789.047	147516	9011.9	3.49591
4	787.578	793.018	168685	22670.6	7.65446
5	813.081	796.988	192262	39476.1	11.603
6	838.585	800.958	219264	59776.5	15.2496
7	864.089	804.928	246403	82570.2	18.5261
8	889.593	808.899	273456	107101	21.3882
9	915.096	812.869	300881	132774	23.8111
10	940.6	816.839	328315	158613	25.7858
11	966.125	820.813	342739	176997	27.3127
12	991.65	824.786	356551	192746	28.395
13	1017.18	828.76	366353	203389	29.0378
14	1042.7	832.734	371634	208089	29.2458

15	1068.23	836.707	374149	207567	29.0202
16	1093.75	840.681	370671	200083	28.3596
17	1119.28	844.655	362513	186782	27.2594
18	1144.8	848.628	350269	168680	25.7142
19	1169.04	852.402	340488	150390	23.8305
20	1193.28	856.176	329044	129890	21.5416
21	1217.52	859.949	313883	107192	18.8552
22	1241.77	863.723	294999	83426.7	15.7911
23	1272	893.959	172708	35123.4	11.4954
24	1302.24	924.195	49432.1	5876.66	6.7797
25	1332.47	954.431	3775.41	118.72	1.80111
26	1343.24	965.2	0	0	0

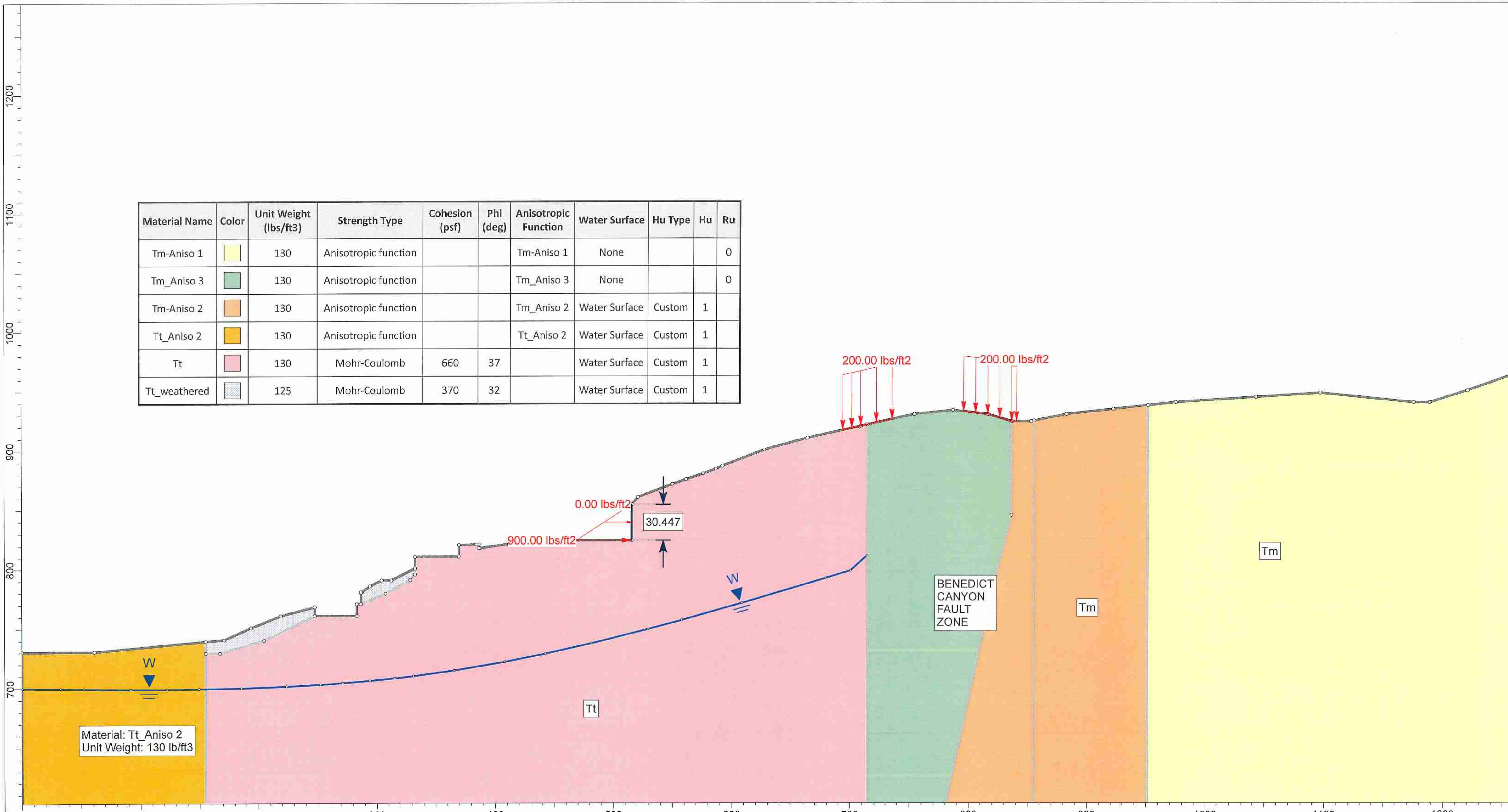
CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road G5270		
Analysis Description	Sect E		
Drawn By	RD/RK	Scale	Company: Calwest
Date	1.9.2019	File Name	Section E - Seismic.slim

SLOPE STABILITY ANALYSIS CROSS-SECTION G-G’

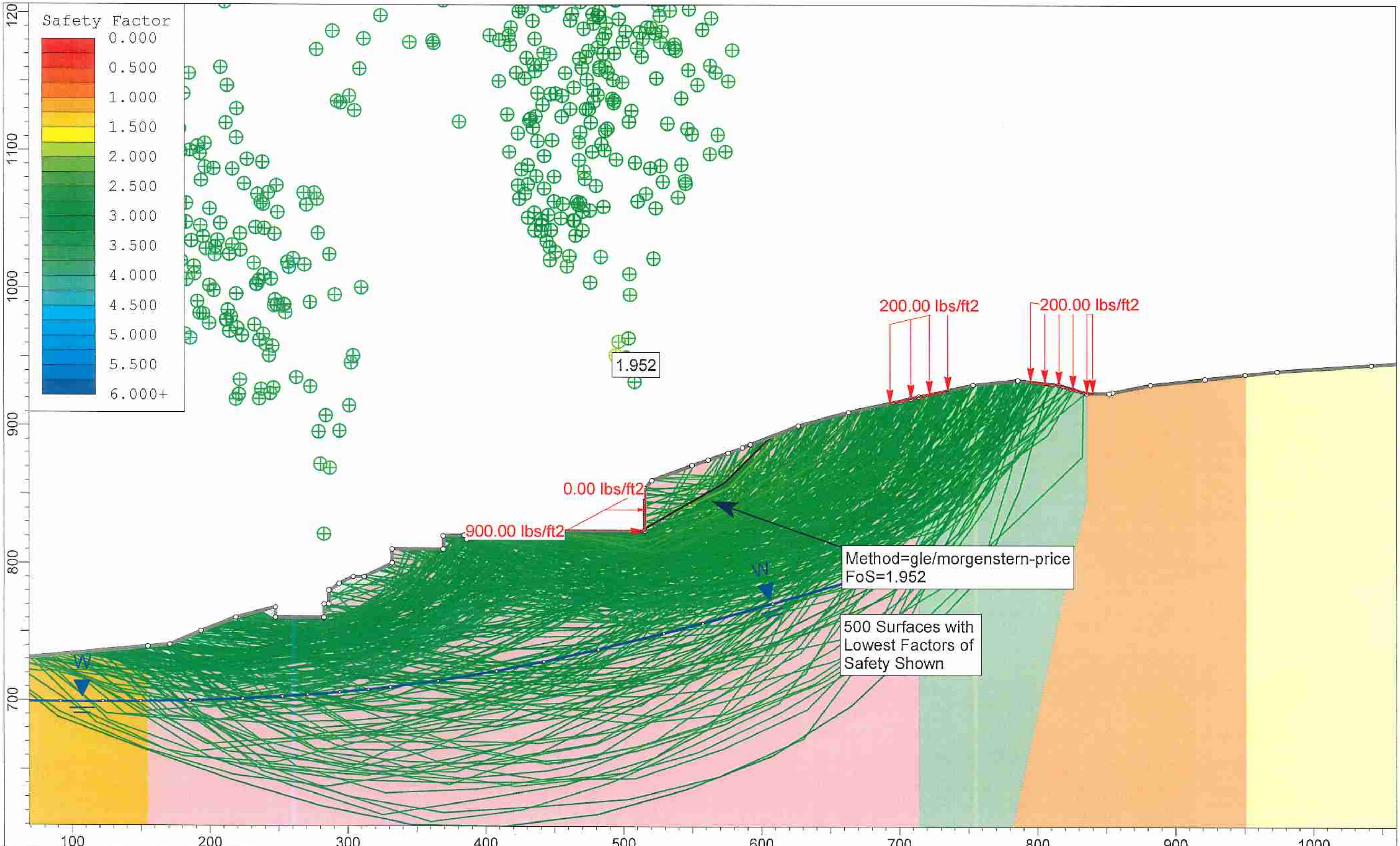
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Hu Type	Hu	Ru
Tm-Aniso 1		130	Anisotropic function			Tm-Aniso 1	None			0
Tm_Aniso 3		130	Anisotropic function			Tm_Aniso 3	None			0
Tm-Aniso 2		130	Anisotropic function			Tm_Aniso 2	Water Surface	Custom	1	
Tt_Aniso 2		130	Anisotropic function			Tt_Aniso 2	Water Surface	Custom	1	
Tt		130	Mohr-Coulomb	660	37		Water Surface	Custom	1	
Tt_weathered		125	Mohr-Coulomb	370	32		Water Surface	Custom	1	



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	9712 Oak Pass Road		
Analysis Description	Sect G		
Drawn By	RK	Scale	1:930
Company	Calwest		
Date	12/20/2018, 4:53:55 PM	File Name	Sect G.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	9712 Oak Pass Road		
	Analysis Description	Sect G		
	Drawn By	RK	Scale	1:1154
	Company	Calwest		
SLIDEINTERPRET 6.035	Date	12/20/2018, 4:53:55 PM	File Name	Sect G.sli

Slide Analysis Information
9712 Oak Pass Road

Project Summary

File Name: Sect G
Slide Modeler Version: 6.035
Project Title: 9712 Oak Pass Road
Analysis: Sect G
Author: RK
Company: Calwest
Date Created: 12/20/2018, 4:53:55 PM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	9712 Oak Pass Road		
	Analysis Description	Sect G		
	Drawn By: RK	Scale	Company	Calwest
SLIDEINTERPRET 6.035	Date: 12/20/2018, 4:53:55 PM		File Name	Sect G.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Material Properties

Property	Tm-Aniso 1	Tm_Aniso 3	Tm-Aniso 2	Tt_Aniso 2	Tt	Tt_weathered
Color						
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	130	130	130	130	125
Cohesion [psf]					660	370
Friction Angle [deg]					37	32

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	9712 Oak Pass Road	
	Analysis Description	Sect G	
	Drawn By: RK	Scale	Company: Calwest
SLIDEINTERPRET 6.035	Date: 12/20/2018, 4:53:55 PM		File Name: Sect G.sli

Water Surface	None	None	Water Table	Water Table	Water Table	Water Table
Hu Value			1	1	1	1
Ru Value	0	0				

Anisotropic Functions

Name: Tm-Aniso 1

Angle From	Angle To	c	phi
-90	25	580	35
25	30	300	25
30	90	580	35

Name: Tm_Aniso 2

Angle From	Angle To	c	phi
-90	20	480	34
20	25	250	26
25	90	480	34

Name: Tm_Aniso 3

Angle From	Angle To	c	phi
-90	-21	480	34
-21	-16	250	26
-16	90	480	34

Name: Tt_Aniso 2

Angle From	Angle To	c	phi
-90	-40	660	37
-40	-35	300	25
-35	90	660	37

Global Minimums

Method: gle/morgenstern-price

FS: 1.952400
Axis Location: 494.270, 951.527
Left Slip Surface Endpoint: 515.232, 825.897
Right Slip Surface Endpoint: 607.351, 892.918
Left Slope Intercept: 515.232 854.510
Right Slope Intercept: 607.351 892.918
Resisting Moment=2.85415e+007 lb-ft
Driving Moment=1.46187e+007 lb-ft
Resisting Horizontal Force=197300 lb
Driving Horizontal Force=101055 lb
Total Slice Area=1903.41 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
515.232	825.897
573.771	859.22
607.351	892.918

Slice Data

Global Minimum Query (gle/morgenstern-price) - **Safety Factor**: 1.9524

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	3.65869	14121.8	Tt	660	37	1538	3002.8	3109	0	3109
2	3.65869	14914.7	Tt	660	37	1599.89	3123.62	3269.33	0	3269.33
3	3.65869	14697.3	Tt	660	37	1574.34	3073.75	3203.15	0	3203.15

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	9712 Oak Pass Road		
Analysis Description	Sect G		
Drawn By	RK	Scale	Company: Calwest
Date	12/20/2018, 4:53:55 PM	File Name	Sect G.sli

SLIDEINTERPRET 6.035

4	3.65869	14362.2	Tt	660	37	1539	3004.75	3111.59	0	3111.59
5	3.65869	14027	Tt	660	37	1504.12	2936.65	3021.23	0	3021.23
6	3.65869	13691.9	Tt	660	37	1469.82	2869.68	2932.34	0	2932.34
7	3.65869	13356.8	Tt	660	37	1436.17	2803.98	2845.17	0	2845.17
8	3.65869	13021.7	Tt	660	37	1403.23	2739.67	2759.82	0	2759.82
9	3.65869	12686.6	Tt	660	37	1371.03	2676.79	2676.38	0	2676.38
10	3.65869	12341.2	Tt	660	37	1338.69	2613.66	2592.6	0	2592.6
11	3.65869	11952.1	Tt	660	37	1303.45	2544.85	2501.29	0	2501.29
12	3.65869	11557.9	Tt	660	37	1268.43	2476.49	2410.58	0	2410.58
13	3.65869	11163.8	Tt	660	37	1233.96	2409.19	2321.26	0	2321.26
14	3.65869	10769.7	Tt	660	37	1199.92	2342.72	2233.05	0	2233.05
15	3.65869	10375.6	Tt	660	37	1166.17	2276.83	2145.6	0	2145.6
16	3.65869	9981.44	Tt	660	37	1132.58	2211.25	2058.57	0	2058.57
17	3.73117	9384.64	Tt	660	37	890.934	1739.46	1432.49	0	1432.49
18	3.73117	8226.88	Tt	660	37	821.397	1603.7	1252.32	0	1252.32
19	3.73117	7076.25	Tt	660	37	751.364	1466.96	1070.88	0	1070.88
20	3.73117	5955.17	Tt	660	37	681.267	1330.11	889.26	0	889.26
21	3.73117	4937.24	Tt	660	37	615.363	1201.43	718.509	0	718.509
22	3.73117	3868.21	Tt	660	37	542.483	1059.14	529.683	0	529.683
23	3.73117	2763.01	Tt	660	37	462.89	903.747	323.463	0	323.463
24	3.73117	1657.8	Tt	660	37	378.686	739.346	105.295	0	105.295
25	3.73117	552.601	Tt	660	37	289.74	565.688	-125.157	0	-125.157

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.9524

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	515.232	825.897	12100.8	0	0

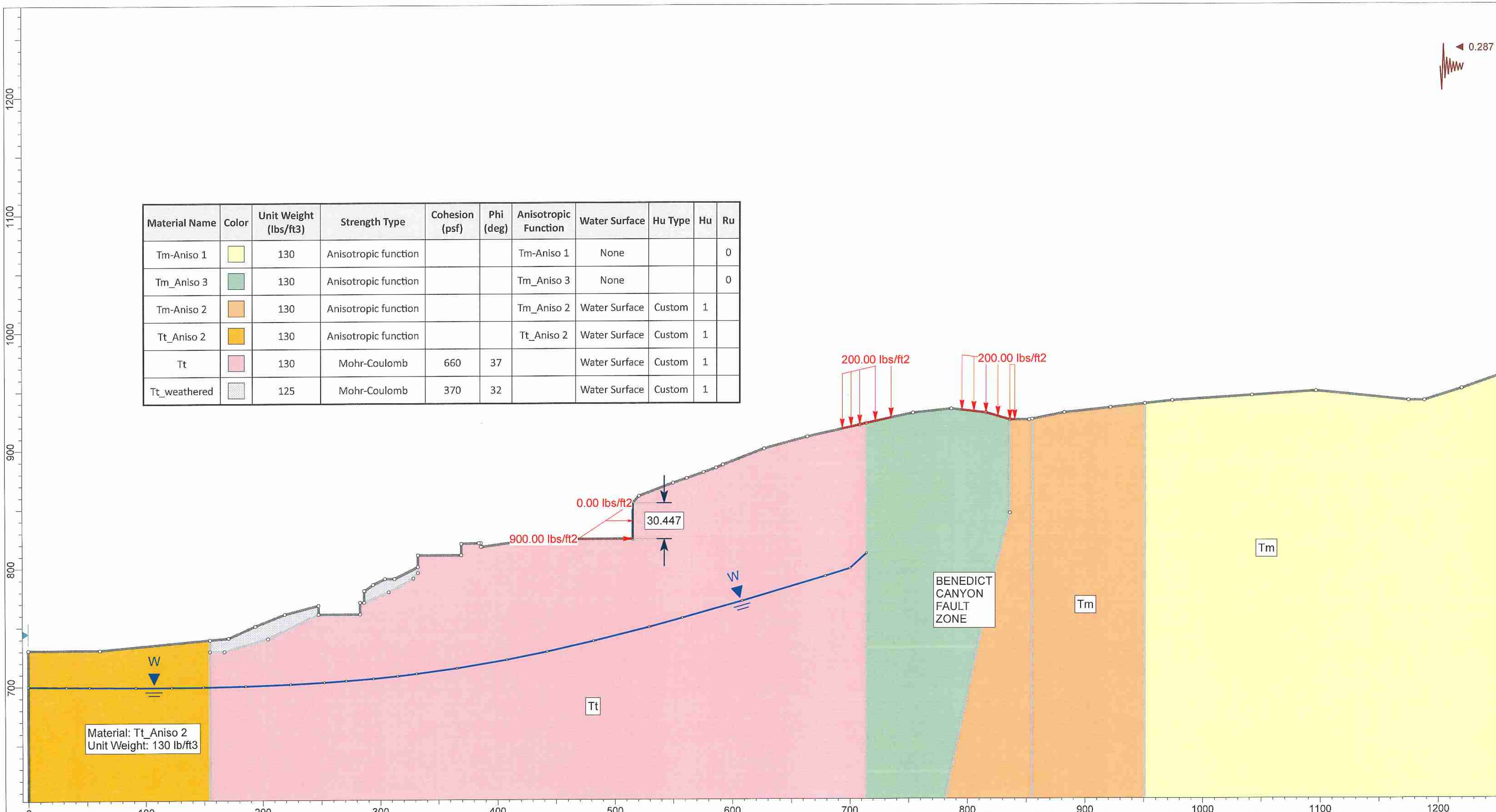
2	518.891	827.979	11250.3	451.389	2.29761
3	522.549	830.062	10292.1	819.47	4.55236
4	526.208	832.145	9378.39	1105.54	6.72309
5	529.867	834.227	8526.11	1315.66	8.7721
6	533.525	836.31	7734.48	1456.69	10.666
7	537.184	838.393	7002.51	1536.62	12.3767
8	540.843	840.475	6329.05	1564.07	13.8811
9	544.501	842.558	5712.88	1548.03	15.1615
10	548.16	844.641	5152.72	1497.41	16.2042
11	551.819	846.724	4648.79	1421.22	16.9993
12	555.477	848.806	4206.15	1329.48	17.5407
13	559.136	850.889	3824.4	1229.64	17.8239
14	562.795	852.972	3502.59	1127.74	17.8472
15	566.454	855.054	3239.99	1028.42	17.6102
16	570.112	857.137	3036.09	934.873	17.1146
17	573.771	859.22	2890.6	848.791	16.3643
18	577.502	862.964	849.764	233.152	15.3428
19	581.233	866.708	-775.843	-194.482	14.0725
20	584.964	870.453	-1983.25	-442.099	12.5667
21	588.696	874.197	-2772.06	-531.009	10.8441
22	592.427	877.941	-3167.33	-497.589	8.92822
23	596.158	881.685	-3127.39	-375.611	6.84863
24	599.889	885.429	-2612.17	-212.015	4.6402
25	603.62	889.174	-1594.11	-65.2198	2.34283
26	607.351	892.918	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	9712 Oak Pass Road		
Analysis Description	Sect G		
Drawn By	RK	Scale	Company: Calwest
Date	12/20/2018, 4:53:55 PM	File Name	Sect G.sli

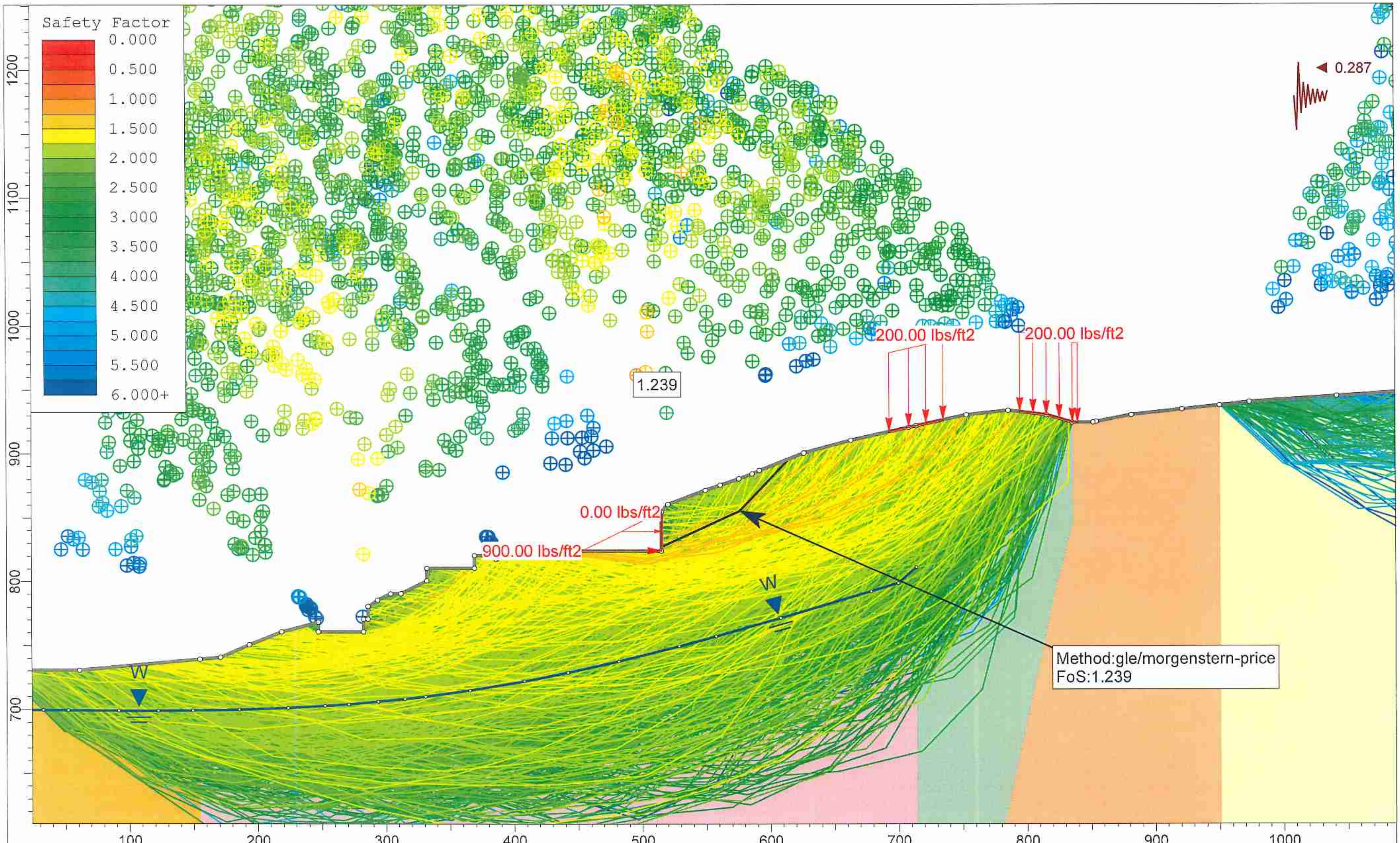
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Hu Type	Hu	Ru
Tm-Aniso 1		130	Anisotropic function			Tm-Aniso 1	None			0
Tm_Aniso 3		130	Anisotropic function			Tm_Aniso 3	None			0
Tm-Aniso 2		130	Anisotropic function			Tm_Aniso 2	Water Surface	Custom	1	
Tt_Aniso 2		130	Anisotropic function			Tt_Aniso 2	Water Surface	Custom	1	
Tt		130	Mohr-Coulomb	660	37		Water Surface	Custom	1	
Tt_weathered		125	Mohr-Coulomb	370	32		Water Surface	Custom	1	



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	9712 Oak Pass Road
Analysis Description	Sect G Seismic
Drawn By	RK
Scale	1:930
Company	Calwest
Date	12/20/2018, 4:53:55 PM
File Name	Sect G Seismic.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	9712 Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	1:1238
Company	Calwest		
Date	12/20/2018, 4:53:55 PM	File Name	Sect G Seismic.sli

SLIDEINTERPRET 6.035

Slide Analysis Information
9712 Oak Pass Road

Project Summary

File Name: Sect G Seismic
Slide Modeler Version: 6.035
Project Title: 9712 Oak Pass Road
Analysis: Sect G Seismic
Author: RK
Company: Calwest
Date Created: 12/20/2018, 4:53:55 PM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	9712 Oak Pass Road		
	Analysis Description	Sect G Seismic		
	Drawn By: RK	Scale	Company	Calwest
SLIDEINTERPRET 6.035	Date: 12/20/2018, 4:53:55 PM		File Name	Sect G Seismic.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287
3 Distributed Loads present

Distributed Load 1

Distribution: Triangular
Magnitude 1 [psf]: 0
Magnitude 2 [psf]: 900
Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Distributed Load 3

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Material Properties

Property	Tm-Aniso 1	Tm_Aniso 3	Tm-Aniso 2	Tt_Aniso 2	Tt	Tt_weathered
Color						
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	130	130	130	130	125
Cohesion [psf]					660	370
Friction Angle [deg]					37	32
Water Surface	None	None	Water Table	Water Table	Water Table	Water Table
Hu Value			1	1	1	1
Ru Value	0	0				

Anisotropic Functions

Name: Tm-Aniso 1

Angle From	Angle To	c	phi
-90	25	580	35
25	30	300	25
30	90	580	35

Name: Tm_Aniso 2

Angle From	Angle To	c	phi
-90	20	480	34
20	25	250	26

25	90	480	34

Name: Tm_Aniso 3

Angle From	Angle To	c	phi
-90	-21	480	34
-21	-16	250	26
-16	90	480	34

Name: Tt_Aniso 2

Angle From	Angle To	c	phi
-90	-40	660	37
-40	-35	300	25
-35	90	660	37

Global Minimums

Method: gle/morgenstern-price

FS: 1.239000
Axis Location: 496.358, 961.513
Left Slip Surface Endpoint: 515.232, 827.146
Right Slip Surface Endpoint: 615.176, 895.992
Left Slope Intercept: 515.232 854.510
Right Slope Intercept: 615.176 895.992
Resisting Moment=3.19949e+007 lb-ft
Driving Moment=2.58231e+007 lb-ft
Resisting Horizontal Force=211530 lb
Driving Horizontal Force=170726 lb
Total Slice Area=2227.06 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
515.232	827.146
576.374	855.41
615.176	895.992

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.239

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	4.07615	15251.7	Tt	660	37	2837.43	3515.58	3789.49	0	3789.49
2	4.07615	16306.3	Tt	660	37	2926.3	3625.69	3935.59	0	3935.59
3	4.07615	16183.4	Tt	660	37	2865.17	3549.95	3835.09	0	3835.09
4	4.07615	15998.5	Tt	660	37	2785.01	3450.63	3703.29	0	3703.29
5	4.07615	15813.6	Tt	660	37	2690.86	3333.98	3548.5	0	3548.5
6	4.07615	15628.7	Tt	660	37	2581.86	3198.93	3369.28	0	3369.28
7	4.07615	15443.9	Tt	660	37	2458.4	3045.96	3166.28	0	3166.28
8	4.07615	15259	Tt	660	37	2322.91	2878.09	2943.5	0	2943.5
9	4.07615	15062.9	Tt	660	37	2180.46	2701.59	2709.28	0	2709.28
10	4.07615	14812	Tt	660	37	2039.8	2527.31	2478	0	2478
11	4.07615	14553.9	Tt	660	37	1910.68	2367.33	2265.71	0	2265.71
12	4.07615	14295.8	Tt	660	37	1801.15	2231.63	2085.62	0	2085.62
13	4.07615	14037.6	Tt	660	37	1717.13	2127.52	1947.47	0	1947.47
14	4.07615	13779.5	Tt	660	37	1661	2057.98	1855.18	0	1855.18
15	4.07615	13521.8	Tt	660	37	1631.15	2021	1806.1	0	1806.1
16	3.88021	12091.3	Tt	660	37	1162.91	1440.85	1036.22	0	1036.22
17	3.88021	10764	Tt	660	37	807.086	999.979	451.167	0	451.167
18	3.88021	9451.85	Tt	660	37	681.764	844.705	245.111	0	245.111

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	9712 Oak Pass Road
Analysis Description	Sect G Seismic
Drawn By	RK
Scale	
Company	Calwest
Date	12/20/2018, 4:53:55 PM
File Name	Sect G Seismic.sli

19	3.88021	8254.96	Tt	660	37	713.772	884.364	297.741	0	297.741
20	3.88021	7029.89	Tt	660	37	793.146	982.708	428.247	0	428.247
21	3.88021	5751.73	Tt	660	37	849.448	1052.47	520.82	0	520.82
22	3.88021	4473.57	Tt	660	37	857.799	1062.81	534.551	0	534.551
23	3.88021	3195.41	Tt	660	37	811.09	1004.94	457.75	0	457.75
24	3.88021	1917.24	Tt	660	37	695.539	861.773	267.761	0	267.761
25	3.88021	639.081	Tt	660	37	479.84	594.522	-86.892	0	-86.892

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.239

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	515.232	827.146	11067.1	0	0
2	519.308	829.03	11072.2	5520.07	26.4987
3	523.384	830.915	10860.2	10740	44.6812
4	527.46	832.799	10624.6	15544.9	55.6482
5	531.537	834.683	10364.9	19831	62.4057
6	535.613	836.567	10067.6	23478.6	66.7904
7	539.689	838.452	9718.43	26362.9	69.7641
8	543.765	840.336	9303.43	28364.1	71.8405
9	547.841	842.22	8811.03	29383.9	73.3082
10	551.917	844.105	8237.76	29378.8	74.3366
11	555.993	845.989	7601.04	28422.9	75.0279
12	560.07	847.873	6914.09	26626.3	75.4434
13	564.146	849.757	6195.77	24160.8	75.6171
14	568.222	851.642	5470.63	21249	75.5625
15	572.298	853.526	4765.53	18133.5	75.2755
16	576.374	855.41	4105.66	15041.8	74.733

17	580.254	859.468	925.89	3215.8	73.9379
18	584.135	863.527	-874.26	-2824.82	72.8031
19	588.015	867.585	-1946.09	-5723.47	71.221
20	591.895	871.643	-2764.26	-7206.99	69.0156
21	595.775	875.701	-3453.61	-7717.66	65.8917
22	599.655	879.759	-3934.14	-7195.27	61.3316
23	603.536	883.817	-4071.29	-5683.58	54.385
24	607.416	887.876	-3710.5	-3496.64	43.3003
25	611.296	891.934	-2658.56	-1262.04	25.3941
26	615.176	895.992	0	0	0

List Of Coordinates

Water Table

X	Y
0	700.016
32.4473	699.567
52.0781	699.328
91.563	699.01
122.236	698.99
149.435	699.201
185.465	699.902
223.779	701.293
252.318	702.847
270.967	704.135
294.012	706.053
314.766	708.116
330.881	709.954
365.605	714.673
407.817	721.807

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	9712 Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	12/20/2018, 4:53:55 PM	File Name	Sect G Seismic.sli

SLIDEINTERPRET 6.035

442.157	728.635
481.656	737.49
529.01	749.307
557.591	756.965
608.146	771.256
678.704	792.21
699.892	798.604
714.2	811.395

Distributed Load

X	Y
515.232	854.51
515.232	824.064

Distributed Load

X	Y
735.159	926.448
714.2	921.788
708.451	920.51
693.23	917.135

Distributed Load

X	Y
839.874	924.51
835.812	924.51
815.598	930.51
795.02	932.862

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	9712 Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	12/20/2018, 4:53:55 PM	File Name	Sect G Seismic.sli

SLIDEINTERPRET 6.035

External Boundary

X	Y
1219.39	950.51
1187.91	940.51
1174.58	940.51
1095.91	948.51
1042.02	944.979
973.825	940.51
950.6	937.982
921.508	934.814
881.971	930.51
854.6	925.015
852.084	924.51
835.812	924.51
815.598	930.51
785.856	933.91
753.427	930.51
714.2	921.788
708.451	920.51
663.36	910.51
626.678	900.51
591.914	886.854
586.294	884.344
575.868	880.51
561.332	875.528
549.66	871.527
520.413	860.51
515.232	854.51
515.232	824.064
432.622	824.064

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	9712 Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By: RK	Scale	Company	Calwest
Date: 12/20/2018, 4:53:55 PM		File Name	Sect G Seismic.sli

	386.672	817.641
	386.001	817.641
	386.001	820.724
	384.174	820.724
	369.296	820.292
	369.296	810.527
	332.179	810.527
	332.179	800.55
	312.017	790.51
	303.975	790.51
	293.849	785.51
	286.959	780.51
	286.288	780.51
	286.288	770.51
	282.782	770.51
	282.782	760.51
	247.497	760.51
	247.497	768.057
	218.779	760.51
	193.585	750.51
	170.951	740.51
	155	739.059
	61.0267	730.51
	-5.2538e-006	730.51
	-5.2538e-006	600.51
	155	600.51
	714.2	600.51
	779.947	600.51
	854.6	600.51
	950.6	600.51
	1264.13	600.51

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	9712 Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	12/20/2018, 4:53:55 PM	File Name	Sect G Seismic.sli

1264.13	966.267

Material Boundary

X	Y
155	600.51
155	729.227
155	739.059

Material Boundary

X	Y
714.2	600.51
714.2	921.788

Material Boundary

X	Y
854.6	600.51
854.6	925.015

Material Boundary

X	Y
950.6	600.51
950.6	937.982

Material Boundary

X	Y
779.947	600.51
820.297	783.982

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: 9712 Oak Pass Road		
	Analysis Description: Sect G Seismic		
	Drawn By: RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 12/20/2018, 4:53:55 PM		File Name: Sect G Seismic.sli

835.812	845.384
835.812	924.51

Material Boundary

X	Y
155	729.227
167.373	729.227
204.666	739.948
247.497	760.51

Material Boundary

X	Y
286.288	770.51
307.223	779.406
328.242	790.924
332.179	795.531
332.179	800.55

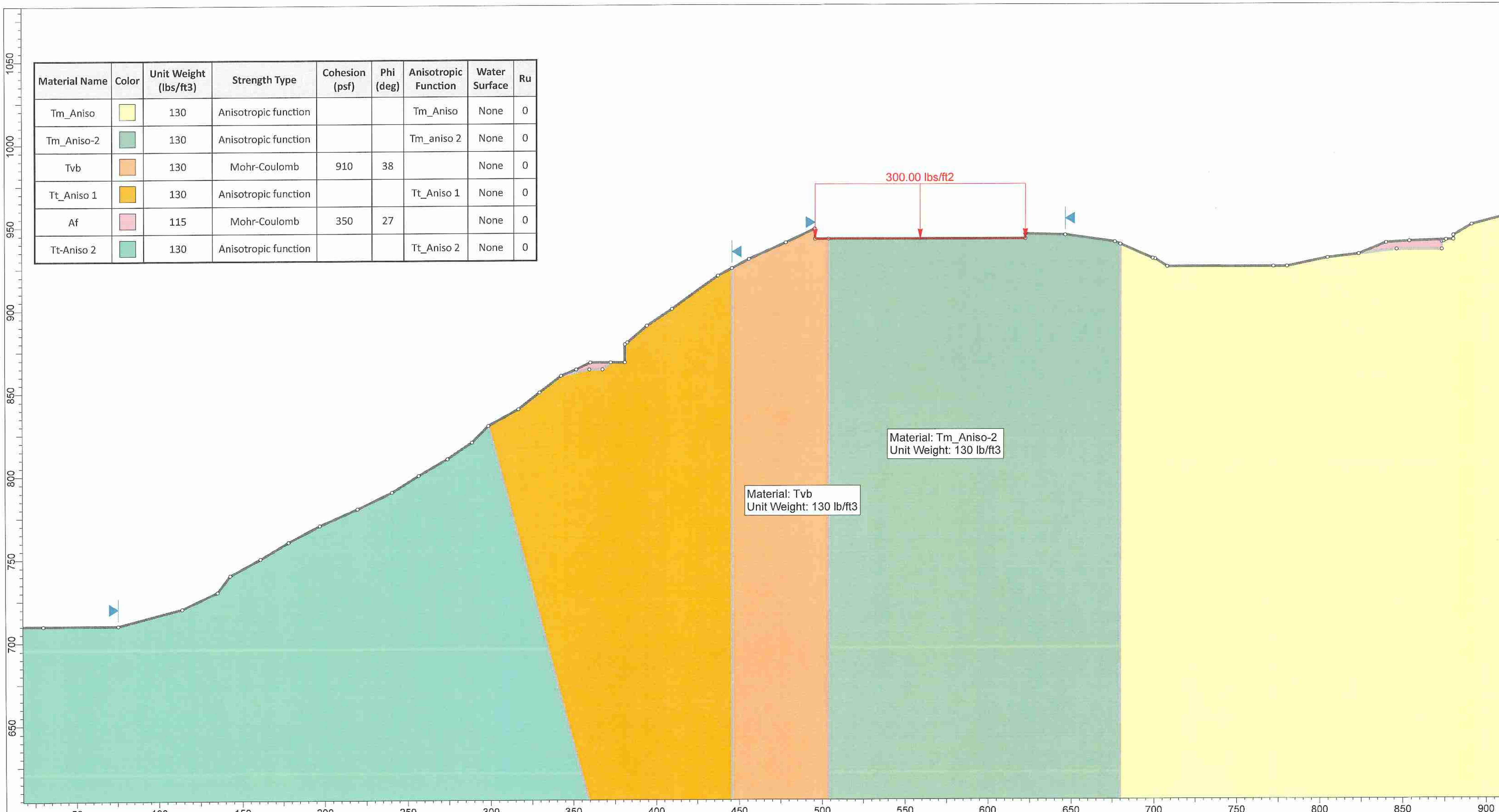
CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	9712 Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By RK	*Scale*	*Company*	Calwest
Date 12/20/2018, 4:53:55 PM		*File Name*	Sect G Seismic.sli

SLOPE STABILITY ANALYSIS CROSS-SECTION I-I'

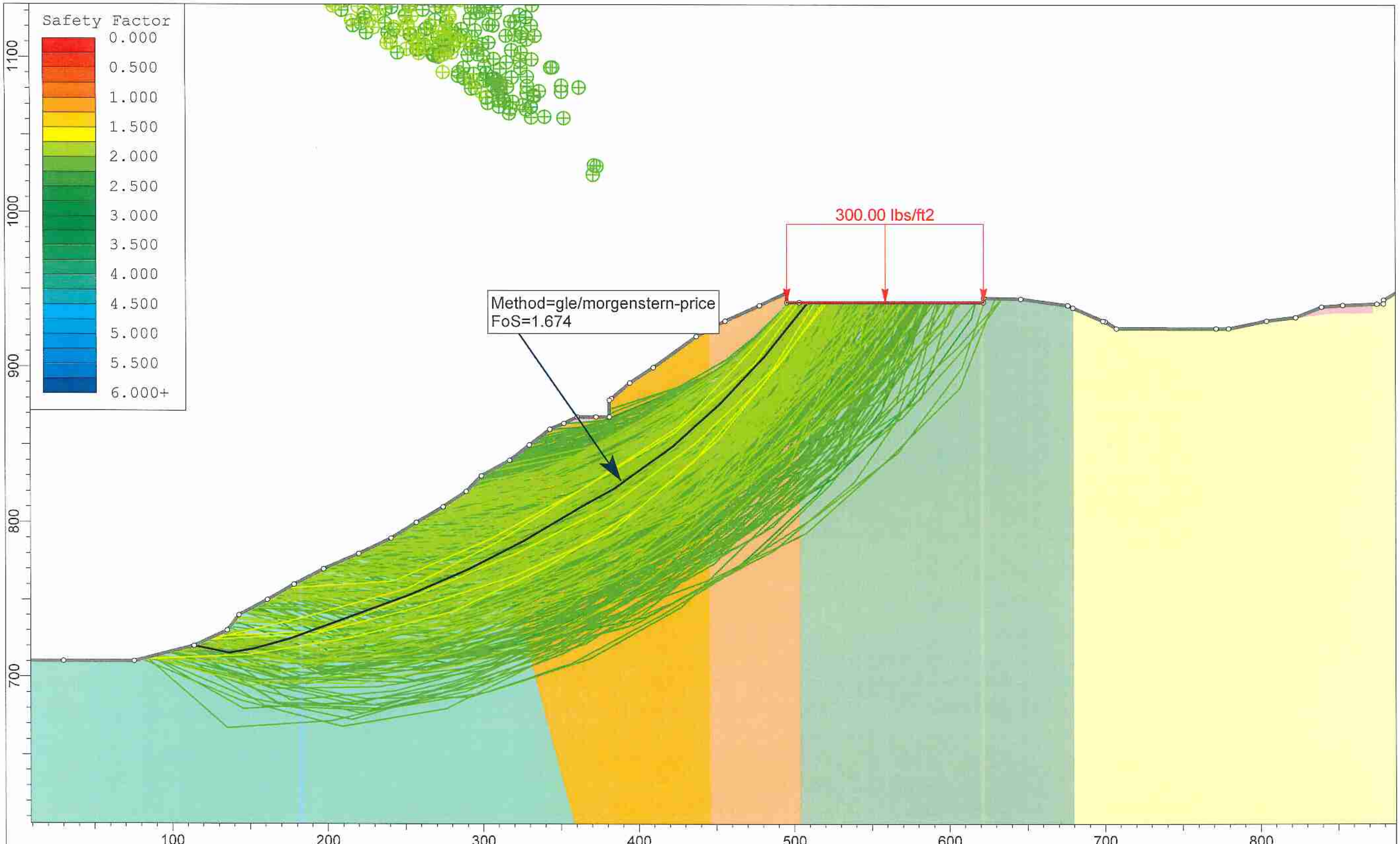
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm_Aniso		130	Anisotropic function			Tm_Aniso	None	0
Tm_Aniso-2		130	Anisotropic function			Tm_aniso 2	None	0
Tvb		130	Mohr-Coulomb	910	38		None	0
Tt_Aniso 1		130	Anisotropic function			Tt_Aniso 1	None	0
Af		115	Mohr-Coulomb	350	27		None	0
Tt-Aniso 2		130	Anisotropic function			Tt_Aniso 2	None	0



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section I - Static		
Drawn By		Scale 1:660	Company: Calwest Geotechnical
Date	1/3/2019, 12:15:45 PM		File Name: Section I - Static.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section I - Static		
Drawn By		Scale 1:1022	Company Calwest Geotechnical
Date	1/3/2019, 12:15:45 PM		File Name Section I - Static.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

G5750

Project Summary

File Name: Section I - Static
Slide Modeler Version: 6.035
Project Title: G5750
Analysis: Section I - Static
Company: Calwest Geotechnical
Date Created: 1/3/2019, 12:15:45 PM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50

Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Material Properties

Property	Tm_Aniso	Tm_Aniso-2	Tvb	Tt_Aniso 1	Af	Tt-Aniso 2
Color						
Strength Type	Anisotropic function	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	130	130	130	130	115	130
Cohesion [psf]			910		350	
Friction Angle [deg]			38		27	
Water Surface	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0

Anisotropic Functions

Name: Tm_Aniso

Angle From	Angle To	c	phi

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section I - Static		
Drawn By		Scale	
Company	Calwest Geotechnical		
Date	1/3/2019, 12:15:45 PM	File Name	Section I - Static.sli

SLIDEINTERPRET 6.035

-90	25	580	35
25	30	300	25
30	90	580	35

Name: Tm_aniso 2

Angle From	Angle To	c	phi
-90	-50	480	34
-50	-40	250	26
-40	90	480	34

Name: Tt_Aniso 1

Angle From	Angle To	c	phi
-90	-40	660	37
-40	-30	310	30
-30	90	660	37

Name: Tt_Aniso 2

Angle From	Angle To	c	phi
-90	40	660	37
40	45	310	30
45	90	660	37

Global Minimums

Method: gle/morgenstern-price

FS: 1.674070
Axis Location: 89.516, 1226.016
Left Slip Surface Endpoint: 114.008, 720.000
Right Slip Surface Endpoint: 509.024, 942.000
Resisting Moment=9.1441e+008 lb-ft
Driving Moment=5.4622e+008 lb-ft

Resisting Horizontal Force=1.56505e+006 lb
Driving Horizontal Force=934875 lb
Total Slice Area=17111.9 ft2

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.67407

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	22.6643	22511.4	Tt-Aniso 2	660	37	1000.84	1675.48	1347.58	0	1347.58
2	16.1747	49062.1	Tt-Aniso 2	660	37	1804.98	3021.67	3134.04	0	3134.04
3	24.0121	95661.6	Tt-Aniso 2	660	37	2163.46	3621.78	3930.41	0	3930.41
4	14.9121	68586.5	Tt-Aniso 2	660	37	2344.65	3925.1	4332.93	0	4332.93
5	14.9121	72503.4	Tt-Aniso 2	660	37	2473.37	4140.6	4618.92	0	4618.92
6	14.9121	74619	Tt-Aniso 2	660	37	2548.3	4266.04	4785.37	0	4785.37
7	14.9121	77229.4	Tt-Aniso 2	660	37	2629.17	4401.42	4965.04	0	4965.04
8	14.9121	81301.3	Tt-Aniso 2	660	37	2741.22	4589	5213.96	0	5213.96
9	13.4381	78308.2	Tt-Aniso 2	660	37	2738.21	4583.96	5207.27	0	5207.27
10	13.4381	81862.7	Tt-Aniso 2	660	37	2820.37	4721.49	5389.78	0	5389.78
11	13.4381	87104.8	Tt-Aniso 2	660	37	2945.38	4930.78	5667.51	0	5667.51
12	20.1736	145113	Tt-Aniso 2	660	37	2959.63	4954.62	5699.16	0	5699.16
13	14.5247	107891	Tt_Aniso 1	660	37	3003.99	5028.89	5797.71	0	5797.71
14	17.3686	136380	Tt_Aniso 1	660	37	2959.55	4954.5	5698.97	0	5698.97
15	17.3686	135503	Tt_Aniso 1	660	37	2915.7	4881.08	5601.55	0	5601.55
16	11.6199	83559.6	Tt_Aniso 1	660	37	2752.96	4608.65	5240.04	0	5240.04
17	11.6199	79416.4	Tt_Aniso 1	660	37	2614.57	4376.98	4932.61	0	4932.61
18	18.9681	148633	Tt_Aniso 1	660	37	2660.19	4453.34	5033.91	0	5033.91
19	18.9681	147686	Tt_Aniso 1	660	37	2663.18	4458.35	5040.59	0	5040.59
20	23.2397	173763	Tt_Aniso 1	660	37	2375.39	3976.57	4401.26	0	4401.26
21	6.89531	47411.7	Tvb	910	38	2433.69	4074.17	4049.96	0	4049.96

CALWEST GEOTECHNICAL CONSULTING ENGINEERS			
Project	G5750		
Analysis Description	Section I - Static		
Drawn By	Scale	Company	Calwest Geotechnical
Date 1/3/2019, 12:15:45 PM		File Name	Section I - Static.sli

SLIDEINTERPRET 6.035

22	14.2882	88246.4	Tvb	910	38	2113.66	3538.41	3364.21	0	3364.21
23	14.2882	72059.4	Tvb	910	38	1839.38	3079.25	2776.52	0	2776.52
24	22.6943	66769	Tvb	910	38	1216.48	2036.48	1441.83	0	1441.83
25	5.27322	2264.07	Tm_Aniso-2	480	34	386.42	646.894	247.43	0	247.43

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.67407

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	114.008	720	0	0	0
2	136.672	715.397	28886	3424.04	6.76009
3	152.847	718.116	49560	9961.72	11.3652
4	176.859	725.007	74424.4	23585.9	17.584
5	191.771	730.579	85243.5	32677.7	20.9741
6	206.683	736.152	96388.7	42834.5	23.96
7	221.596	741.724	107724	53775.5	26.5282
8	236.508	747.297	119263	65236	28.6783
9	251.42	752.869	131087	76961	30.4171
10	264.858	758.724	137394	84661	31.641
11	278.296	764.579	143737	91740.1	32.548
12	291.734	770.434	150134	98041.2	33.1455
13	311.908	780.964	149829	99065.1	33.4722
14	326.432	788.545	149506	98157.6	33.2867
15	343.801	798.8	142468	91110.6	32.5996
16	361.169	809.055	135667	82798.2	31.3959
17	372.789	815.56	133570	78035	30.2946
18	384.409	822.065	131864	72942.5	28.9498
19	403.377	835.684	113765	56023.7	26.218

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section I - Static		
Drawn By		Scale	Company: Calwest Geotechnical
Date	1/3/2019, 12:15:45 PM	File Name	Section I - Static.sli

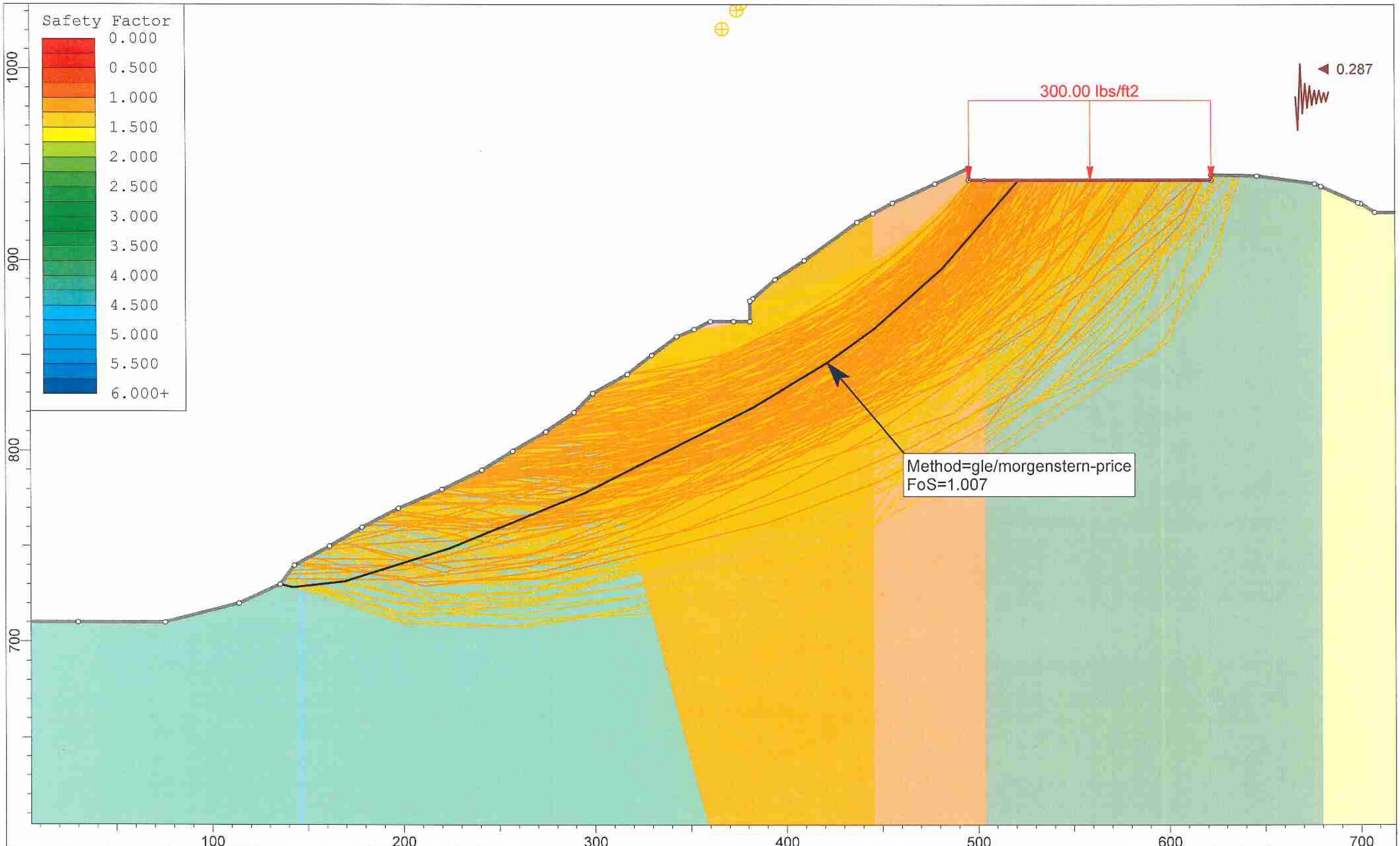
SLIDEINTERPRET 6.035

20	422.345	849.303	95632.8	40218.3	22.8092
21	445.585	870.315	58355.7	18651.8	17.7251
22	452.48	876.55	49887.5	14338.5	16.0355
23	466.769	891.758	28922.8	6306.42	12.3004
24	481.057	906.967	12977.2	1892.82	8.29849
25	503.751	935.395	-403.304	-11.1801	1.58791
26	509.024	942	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section I - Static		
Drawn By		Scale	Company: Calwest Geotechnical
Date	1/3/2019, 12:15:45 PM	File Name	Section I - Static.sli

SLIDEINTERPRET 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: G5750		
	Analysis Description: Section I - Seismic		
	Drawn By:	Scale: 1:830	Company: Calwest Geotechnical
SLIDEINTERPRET 6.035	Date: 1/3/2019, 12:15:45 PM		File Name: Section I - Seismic.slim

Slide Analysis Information
G5750

Project Summary

File Name: Section I - Seismic
Slide Modeler Version: 6.035
Project Title: G5750
Analysis: Section I - Seismic
Company: Calwest Geotechnical
Date Created: 1/3/2019, 12:15:45 PM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project* G5750			
	Analysis Description Section I - Seismic			
	Drawn By	*Scale*	*Company* Calwest Geotechnical	
SLIDEINTERPRET 6.035	*Date* 1/3/2019, 12:15:45 PM		*File Name* Section I - Seismic.slim	

Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287
1 Distributed Load present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm_Aniso	Tm_Aniso-2	Tvb	Tt_Aniso 1	Af	Tt-Aniso 2
Color						
Strength Type	Anisotropic function	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	130	130	130	130	115	130
Cohesion [psf]			910		350	
Friction Angle [deg]			38		27	
Water Surface	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0

Anisotropic Functions

Name: Tm_Aniso

Angle From	Angle To	c	phi
-90	25	580	35
25	30	300	25
30	90	580	35

Name: Tm_aniso 2

Angle From	Angle To	c	phi
-90	-50	480	34
-50	-40	250	26
-40	90	480	34

Name: Tt_Aniso 1

Angle From	Angle To	c	phi
-90	-40	660	37
-40	-30	310	30
-30	90	660	37

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section I - Seismic		
Drawn By		Scale	
Company	Calwest Geotechnical		
Date	1/3/2019, 12:15:45 PM	File Name	Section I - Seismic.slim

SLIDEINTERPRET 6.035

Name: Tt_Aniso 2

Angle From	Angle To	c	phi
-90	40	660	37
40	45	310	30
45	90	660	37

Global Minimums

Method: gle/morgenstern-price

FS: 1.007390
Axis Location: 116.478, 1222.229
Left Slip Surface Endpoint: 135.363, 730.000
Right Slip Surface Endpoint: 521.592, 942.000
Resisting Moment=7.36623e+008 lb-ft
Driving Moment=7.31222e+008 lb-ft
Resisting Horizontal Force=1.33426e+006 lb
Driving Horizontal Force=1.32447e+006 lb
Total Slice Area=16146.6 ft2

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.00739

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	6.63259	4459.51	Tt-Aniso 2	660	37	1479.1	1490.03	1101.48	0	1101.48
2	13.636	24759.9	Tt-Aniso 2	660	37	2074.87	2090.2	1897.94	0	1897.94
3	13.636	35415.2	Tt-Aniso 2	660	37	2920.93	2942.52	3029	0	3029
4	13.74	44522.6	Tt-Aniso 2	660	37	3010.13	3032.37	3148.24	0	3148.24
5	13.74	49926.6	Tt-Aniso 2	660	37	3411.25	3436.46	3684.49	0	3684.49

6	13.74	54058	Tt-Aniso 2	660	37	3761.34	3789.14	4152.5	0	4152.5
7	13.74	57113	Tt-Aniso 2	660	37	4060.34	4090.35	4552.23	0	4552.23
8	17.3724	75713	Tt-Aniso 2	660	37	3778.36	3806.28	4175.26	0	4175.26
9	17.3724	81253.9	Tt-Aniso 2	660	37	3975.38	4004.76	4438.65	0	4438.65
10	17.3724	88390.3	Tt-Aniso 2	660	37	4180.34	4211.23	4712.64	0	4712.64
11	17.3724	97685.7	Tt-Aniso 2	660	37	4406.04	4438.6	5014.37	0	5014.37
12	16.7723	107576	Tt-Aniso 2	660	37	4099.29	4129.58	4604.29	0	4604.29
13	14.5347	96284	Tt_Aniso 1	660	37	4069.19	4099.26	4564.05	0	4564.05
14	14.5347	103238	Tt_Aniso 1	660	37	4174.19	4205.04	4704.42	0	4704.42
15	14.5347	107336	Tt_Aniso 1	660	37	4195.45	4226.45	4732.83	0	4732.83
16	14.5347	103796	Tt_Aniso 1	660	37	3983.12	4012.56	4449	0	4449
17	14.5347	94999.7	Tt_Aniso 1	660	37	3611.13	3637.82	3951.7	0	3951.7
18	19.1379	148080	Tt_Aniso 1	660	37	3632.31	3659.15	3980.01	0	3980.01
19	19.1379	152583	Tt_Aniso 1	660	37	3753.63	3781.37	4142.2	0	4142.2
20	24.1453	194519	Tt_Aniso 1	660	37	3471.49	3497.14	3765.02	0	3765.02
21	0.854087	6716.43	Tvb	910	38	3830.47	3858.78	3774.26	0	3774.26
22	17.5599	130470	Tvb	910	38	3332.96	3357.59	3132.77	0	3132.77
23	17.5599	113411	Tvb	910	38	3118.77	3141.82	2856.6	0	2856.6
24	22.1921	101762	Tvb	910	38	2238.14	2254.68	1721.11	0	1721.11
25	17.841	23887.4	Tm_Aniso-2	480	34	876.226	882.701	597.031	0	597.031

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.00739

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	135.363	730	0	0	0
2	141.996	728.47	10215.6	583.232	3.2676
3	155.632	730.031	28440.2	4941.87	9.85749

4	169.268	731.592	53378.4	15389	16.0823
5	183.008	735.964	68193.6	27285.8	21.8075
6	196.748	740.337	84624.4	42900.6	26.8829
7	210.488	744.71	102633	62345.4	31.277
8	224.228	749.082	122126	85534.8	35.0067
9	241.601	756.272	136015	109523	38.842
10	258.973	763.463	149843	133963	41.7974
11	276.346	770.653	163214	157500	43.9793
12	293.718	777.843	175668	178606	45.4751
13	310.49	786.297	174624	182911	46.3278
14	325.025	793.623	172699	182775	46.6236
15	339.56	800.949	169275	178495	46.5187
16	354.095	808.275	164776	170686	46.0093
17	368.629	815.601	160287	160736	45.0801
18	383.164	822.927	156558	149629	43.7036
19	402.302	834.552	137307	119944	41.1387
20	421.44	846.177	117199	90270.3	37.6046
21	445.585	863.895	78486.5	48164.4	31.536
22	446.439	864.521	77465.1	47072.1	31.2852
23	463.999	880.15	49585	23704	25.55
24	481.559	895.779	27155.8	9197.83	18.7115
25	503.751	921.401	3520.81	539.065	8.70486
26	521.592	942	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

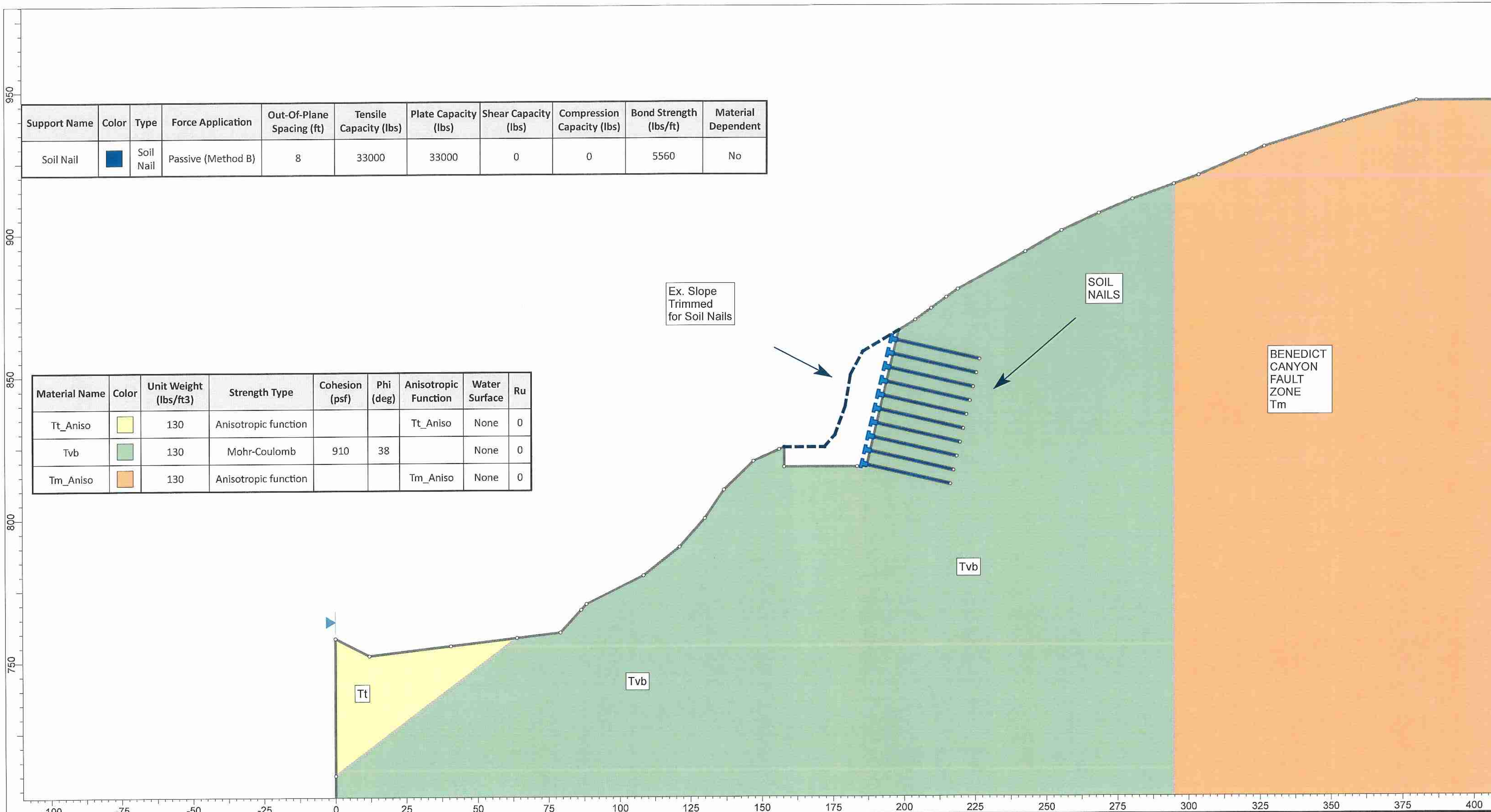
SLIDEINTERPRET 6.035

Project	G5750		
Analysis Description	Section I - Seismic		
Drawn By		Scale	Company: Calwest Geotechnical
Date	1/3/2019, 12:15:45 PM	File Name	Section I - Seismic.slim

SLOPE STABILITY ANALYSIS CROSS-SECTION N-N'

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Material Dependent
Soil Nail		Soil Nail	Passive (Method B)	8	33000	33000	0	0	5560	No

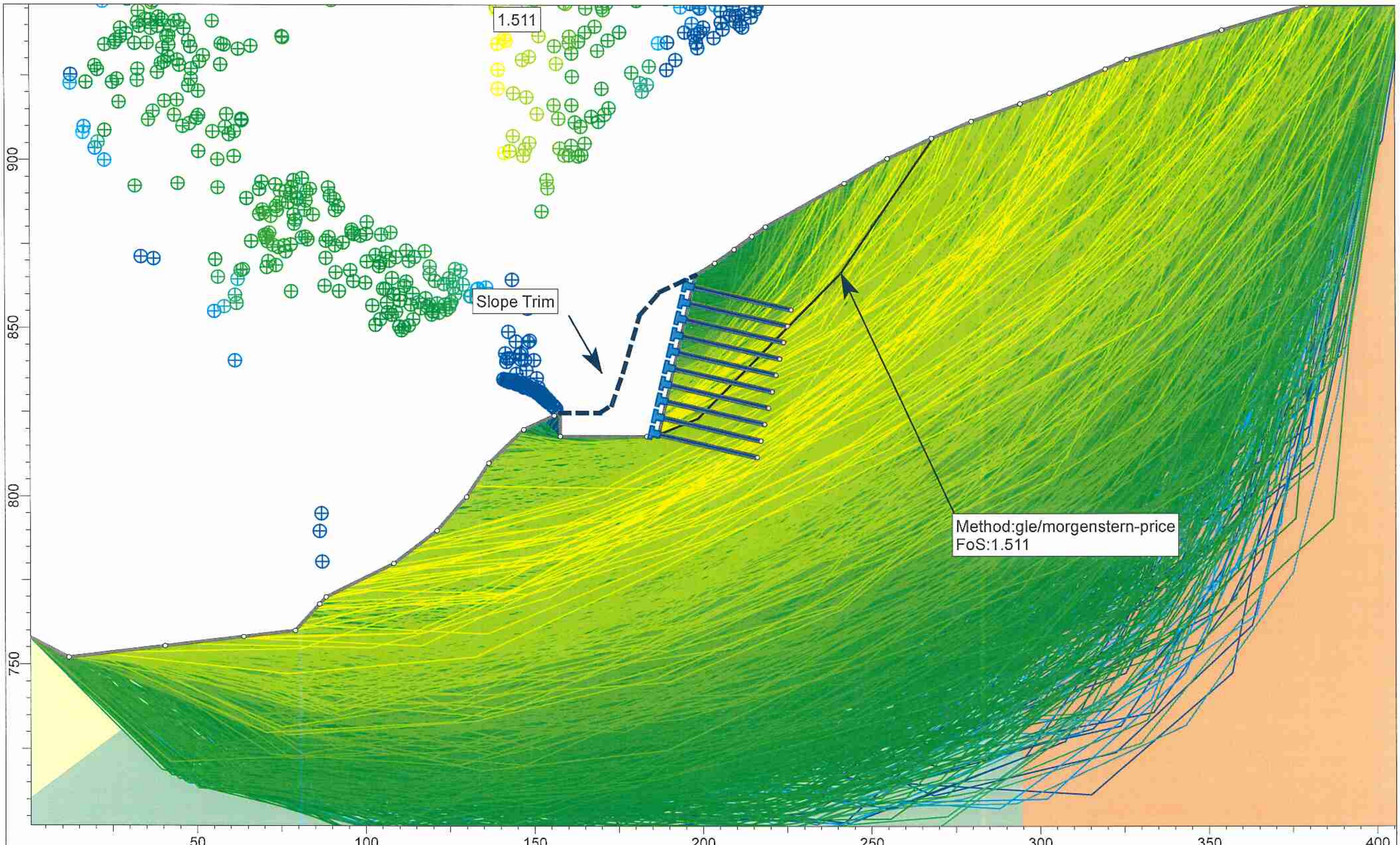
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tt_Aniso		130	Anisotropic function			Tt_Aniso	None	0
Tvb		130	Mohr-Coulomb	910	38		None	0
Tm_Aniso		130	Anisotropic function			Tm_Aniso	None	0



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Rd G5277
Analysis Description	Sect N Static with Soil Nails
Drawn By	RK
Scale	1:383
Company	CalWest
Date	1/9/2019, 9:11:16 AM
File Name	Sect N_Soil_Nails.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Rd G5277			
	Analysis Description: Sect N Static with Soil Nails			
	Drawn By: RK	Scale: 1:471	Company: CalWest	
SLIDEINTERPRET 6.035	Date: 1/9/2019, 9:11:16 AM		File Name: Sect N_Soil_Nails.sli	

Slide Analysis Information

Oak Pass Rd G5277

Project Summary

File Name: Sect N_Soil_Nails
Slide Modeler Version: 6.035
Project Title: Oak Pass Rd G5277
Analysis: Sect N Static with Soil Nails
Author: RK
Company: CalWest
Date Created: 1/9/2019, 9:11:16 AM

General Settings

Units of Measurement: Imperial Units
Time Units: days
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Material Properties

Property	Tt_Aniso	Tvb	Tm_Aniso
Color			
Strength Type	Anisotropic function	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	130	130	130
Cohesion [psf]		910	
Friction Angle [deg]		38	

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Static with Soil Nails		
Drawn By	RK	Scale	Company: CalWest
Date	1/9/2019, 9:11:16 AM	File Name	Sect N_Soil_Nails.sli

Water Surface	None	None	None
Ru Value	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	40	660	37
40	45	310	30
45	90	660	37

Name: Tm_Aniso

Angle From	Angle To	c	phi
-90	-67	480	34
-67	-60	310	30
-60	90	480	34

Global Minimums

Method: gle/morgenstern-price

FS: 1.511470
Axis Location: 139.500, 944.456
Left Slip Surface Endpoint: 187.026, 818.571
Right Slip Surface Endpoint: 268.724, 906.946
Resisting Moment=3.80709e+007 lb-ft
Driving Moment=2.51879e+007 lb-ft
Resisting Horizontal Force=219368 lb
Driving Horizontal Force=145135 lb
Total Slice Area=2129.2 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
187.026	818.571
198.703	823.287
241.179	866.577
268.724	906.946

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.51147

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	2.91919	2167.59	Tvb	910	38	814.201	1230.64	410.399	0	410.399
2	2.91919	6502.78	Tvb	910	38	1445.89	2185.42	1632.46	0	1632.46
3	2.91919	10838	Tvb	910	38	2161.09	3266.43	3016.09	0	3016.09
4	2.91919	15043.5	Tvb	910	38	2686.31	4060.27	4032.18	0	4032.18
5	3.26741	17983.4	Tvb	910	38	2317.08	3502.2	3317.87	0	3317.87
6	3.26741	17448.5	Tvb	910	38	2262.41	3419.57	3212.11	0	3212.11
7	3.26741	17001.1	Tvb	910	38	2161.41	3266.91	3016.71	0	3016.71
8	3.26741	16576.9	Tvb	910	38	2174.1	3286.08	3041.25	0	3041.25
9	3.26741	16167.8	Tvb	910	38	2131.88	3222.28	2959.58	0	2959.58
10	3.26741	15745.9	Tvb	910	38	2086.81	3154.15	2872.39	0	2872.39
11	3.26741	15240.1	Tvb	910	38	2007.23	3033.87	2718.42	0	2718.42
12	3.26741	14599.9	Tvb	910	38	1916.72	2897.07	2543.34	0	2543.34
13	3.26741	13956.7	Tvb	910	38	1849.68	2795.73	2413.63	0	2413.63
14	3.26741	13313.6	Tvb	910	38	1782.17	2693.7	2283.03	0	2283.03
15	3.26741	12670.4	Tvb	910	38	1714.29	2591.1	2151.7	0	2151.7
16	3.26741	12027.2	Tvb	910	38	1646.14	2488.09	2019.86	0	2019.86

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Static with Soil Nails		
Drawn By	RK	*Scale*	
Company	CalWest		
Date	1/9/2019, 9:11:16 AM	*File Name*	Sect N_Soil_Nails.sli

17	3.26741	11384	Tvb	910	38	1577.83	2384.85	1887.72	0	1887.72
18	3.44305	10965.4	Tvb	910	38	1285.07	1942.34	1321.34	0	1321.34
19	3.44305	9602.8	Tvb	910	38	1164.88	1760.69	1088.83	0	1088.83
20	3.44305	8242.48	Tvb	910	38	1045.47	1580.2	857.816	0	857.816
21	3.44305	6882.16	Tvb	910	38	926.884	1400.96	628.395	0	628.395
22	3.44305	5433.65	Tvb	910	38	801.708	1211.76	386.231	0	386.231
23	3.44305	3884.04	Tvb	910	38	669.064	1011.27	129.62	0	129.62
24	3.44305	2334.32	Tvb	910	38	537.787	812.849	-124.347	0	-124.347
25	3.44305	783.841	Tvb	910	38	407.824	616.414	-375.773	0	-375.773

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.51147

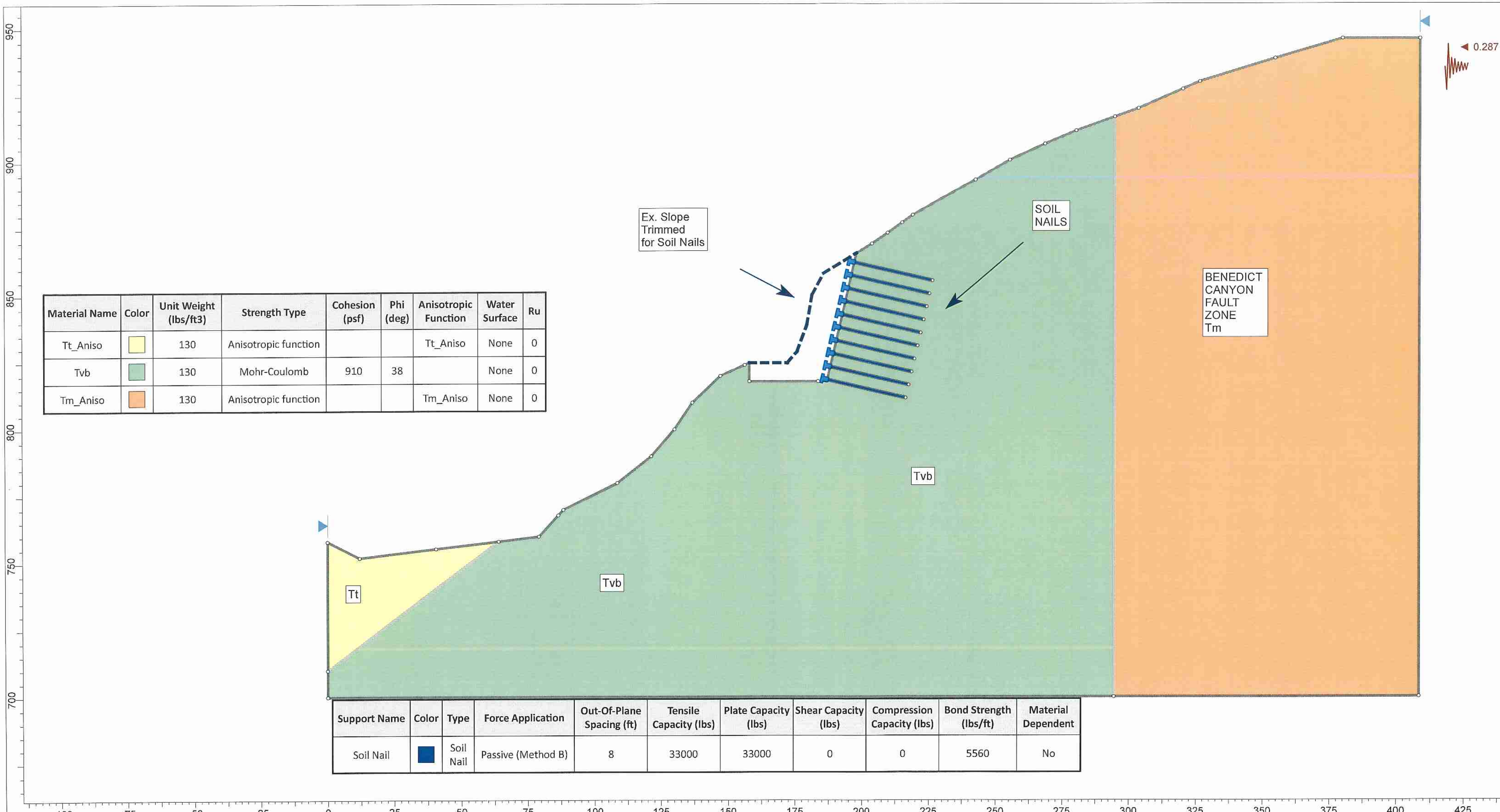
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	187.026	818.571	0	0	0
2	189.945	819.75	1892.93	-9.58873	-0.290232
3	192.864	820.929	4189.02	-42.1723	-0.576797
4	195.784	822.108	9600.31	-143.452	-0.856075
5	198.703	823.287	12688.1	-249.059	-1.12453
6	201.97	826.617	11869.3	-291.745	-1.40804
7	205.238	829.947	11224.1	-327.1	-1.66928
8	208.505	833.277	8240.87	-273.975	-1.90415
9	211.772	836.607	7876.06	-290.037	-2.10897
10	215.04	839.937	7645.26	-304.463	-2.28053
11	218.307	843.267	7488.52	-315.974	-2.41613
12	221.575	846.597	6216.43	-272.901	-2.51367
13	224.842	849.927	4009.97	-180.102	-2.57163
14	228.11	853.257	2016.36	-91.1772	-2.58908

15	231.377	856.587	237.066	-10.6232	-2.56577
16	234.644	859.917	-1326.72	57.9739	-2.50207
17	237.912	863.247	-2674.16	112.031	-2.39894
18	241.179	866.577	-3804.74	150.023	-2.25803
19	244.622	871.623	-6047.89	218.709	-2.07108
20	248.065	876.669	-7531.55	242.984	-1.84784
21	251.508	881.715	-8260.63	229.618	-1.59222
22	254.951	886.761	-8240.32	188.248	-1.30868
23	258.394	891.808	-7429	129.955	-1.00217
24	261.837	896.854	-5779.47	68.3993	-0.678057
25	265.281	901.9	-3300.37	19.7021	-0.342032
26	268.724	906.946	0	0	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Static with Soil Nails		
Drawn By RK	*Scale*	*Company*	CalWest
Date	1/9/2019, 9:11:16 AM	*File Name*	Sect N_Soil_Nails.sli



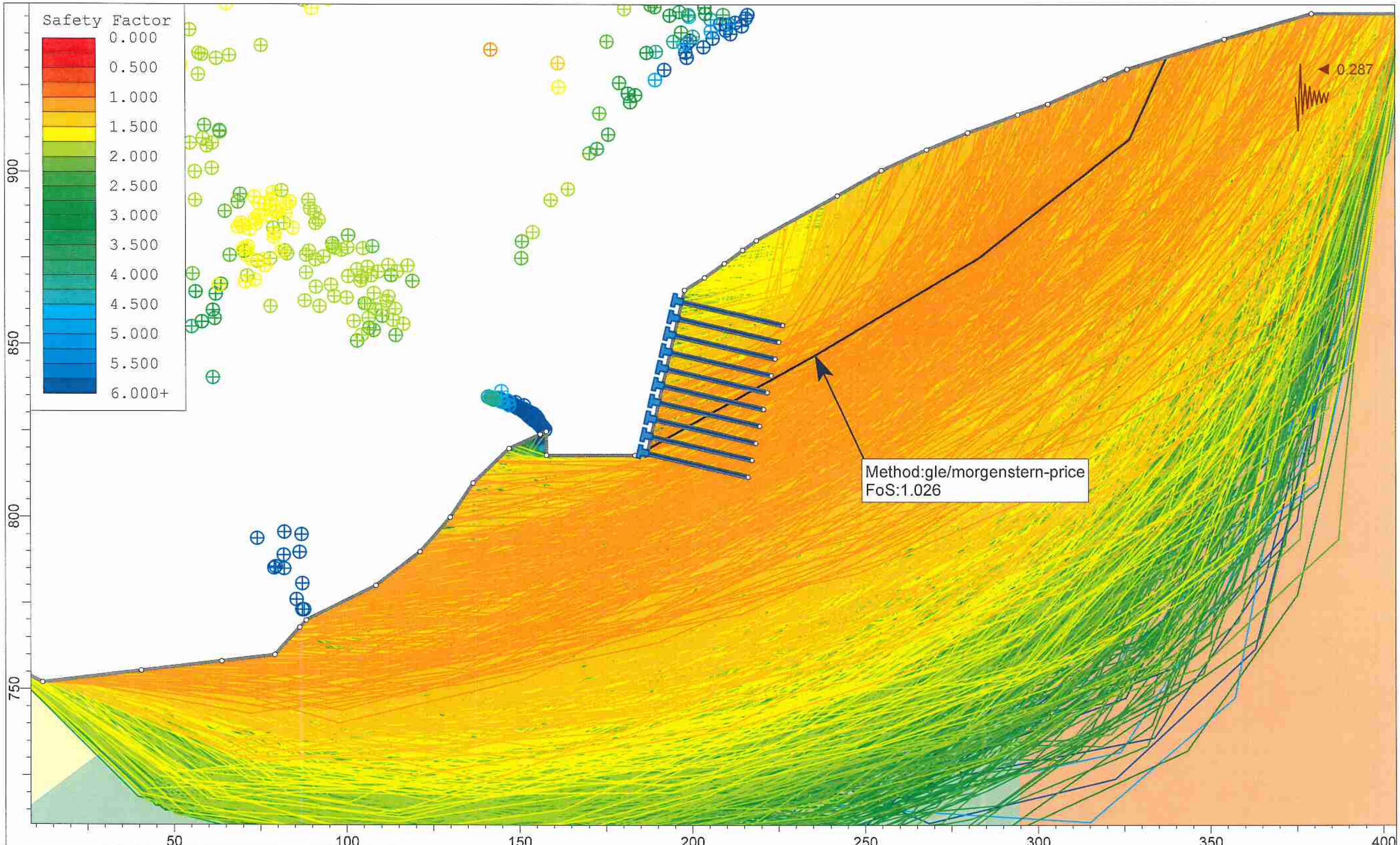
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tt_Aniso		130	Anisotropic function			Tt_Aniso	None	0
Tvb		130	Mohr-Coulomb	910	38		None	0
Tm_Aniso		130	Anisotropic function			Tm_Aniso	None	0

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Material Dependent
Soil Nail		Soil Nail	Passive (Method B)	8	33000	33000	0	0	5560	No

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Seismic with Soil Nails		
Drawn By: RK	Scale: 1:410	Company	CalWest
Date: 1/9/2019, 9:11:16 AM		File Name	Sect N_Soil_Nails Seismic.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Seismic with Soil Nails		
Drawn By: RK	Scale: 1:460	Company	CalWest
Date	1/9/2019, 9:11:16 AM	File Name	Sect N_Soil_Nails Seismic.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

Oak Pass Rd G5277

Project Summary

File Name: Sect N_Soil_Nails Seismic
Slide Modeler Version: 6.035
Project Title: Oak Pass Rd G5277
Analysis: Sect N Seismic with Soil Nails
Author: RK
Company: CalWest
Date Created: 1/9/2019, 9:11:16 AM

General Settings

Units of Measurement: Imperial Units
Time Units: days
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Rd G5277		
	Analysis Description	Sect N Seismic with Soil Nails		
	Drawn By: RK	Scale	Company	CalWest
SLIDEINTERPRET 6.035	Date: 1/9/2019, 9:11:16 AM		File Name	Sect N_Soil_Nails Seismic.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287

Material Properties

Property	Tt_Aniso	Tvb	Tm_Aniso
Color			

Strength Type	Anisotropic function	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	130	130	130
Cohesion [psf]		910	
Friction Angle [deg]		38	
Water Surface	None	None	None
Ru Value	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	40	660	37
40	45	310	30
45	90	660	37

Name: Tm_Aniso

Angle From	Angle To	c	phi
-90	-67	480	34
-67	-60	310	30
-60	90	480	34

Support Properties

Soil Nail

Support Type: Soil Nail
Force Application: Passive
Out-of-Plane Spacing: 8 ft
Tensile Capacity: 33000 lb
Plate Capacity: 33000 lb
Bond Strength: 5560 lb/ft

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Seismic with Soil Nails		
Drawn By RK	*Scale*	*Company*	CalWest
Date 1/9/2019, 9:11:16 AM		*File Name*	Sect N_Soil_Nails Seismic.sli

SLIDEINTERPRET 6.035

Global Minimums

Method: gle/morgenstern-price

FS: 1.026300
Axis Location: 148.830, 1027.071
Left Slip Surface Endpoint: 187.333, 819.897
Right Slip Surface Endpoint: 337.671, 933.569
Resisting Moment=1.05583e+008 lb-ft
Driving Moment=1.02877e+008 lb-ft
Resisting Horizontal Force=447718 lb
Driving Horizontal Force=436244 lb
Total Slice Area=5101.47 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
187.333	819.897
235.735	846.967
283.409	875.298
326.818	909.812
337.671	933.569

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.0263

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	6.05021	8941.23	Tvb	910	38	1680	1724.19	1042.11	0	1042.11

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277
Analysis Description	Sect N Seismic with Soil Nails
Drawn By	RK
Scale	
Company	CalWest
Date	1/9/2019, 9:11:16 AM
File Name	Sect N_Soil_Nails Seismic.sli

SLIDEINTERPRET 6.035

2	6.05021	26308.1	Tvb	910	38	3487.79	3579.52	3416.82	0	3416.82
3	6.05021	31682	Tvb	910	38	4192.54	4302.8	4342.6	0	4342.6
4	6.05021	32298.4	Tvb	910	38	4487.03	4605.04	4729.43	0	4729.43
5	6.05021	33062.8	Tvb	910	38	4158.72	4268.09	4298.17	0	4298.17
6	6.05021	33554.7	Tvb	910	38	4661.64	4784.24	4958.81	0	4958.81
7	6.05021	33553.6	Tvb	910	38	4214.81	4325.66	4371.84	0	4371.84
8	6.05021	33536.7	Tvb	910	38	4157.68	4267.03	4296.81	0	4296.81
9	5.95926	32935.3	Tvb	910	38	3809.79	3909.99	3839.81	0	3839.81
10	5.95926	32807.6	Tvb	910	38	3694.08	3791.23	3687.81	0	3687.81
11	5.95926	32754.5	Tvb	910	38	3578.75	3672.87	3536.32	0	3536.32
12	5.95926	32540.3	Tvb	910	38	3455.2	3546.07	3374.01	0	3374.01
13	5.95926	31937.4	Tvb	910	38	3315.75	3402.95	3190.83	0	3190.83
14	5.95926	31288.8	Tvb	910	38	3178.9	3262.51	3011.07	0	3011.07
15	5.95926	30499.8	Tvb	910	38	3040.47	3120.43	2829.23	0	2829.23
16	5.95926	29646.3	Tvb	910	38	2903.82	2980.19	2649.73	0	2649.73
17	5.54559	26230.8	Tvb	910	38	2061.72	2115.94	1543.53	0	1543.53
18	5.54559	24482.4	Tvb	910	38	1996.11	2048.61	1457.36	0	1457.36
19	6.4635	26328.4	Tm_Aniso	480	34	1228.7	1261.01	1157.9	0	1157.9
20	6.4635	24042.4	Tm_Aniso	480	34	1241.15	1273.79	1176.84	0	1176.84
21	6.4635	22070.1	Tm_Aniso	480	34	1270.91	1304.34	1222.14	0	1222.14
22	6.4635	20125	Tm_Aniso	480	34	1301.29	1335.52	1268.36	0	1268.36
23	6.4635	18176.3	Tm_Aniso	480	34	1322.15	1356.92	1300.09	0	1300.09
24	5.42692	10791.1	Tm_Aniso	480	34	668.961	686.555	306.231	0	306.231
25	5.42692	3597.04	Tm_Aniso	480	34	391.466	401.761	-115.994	0	-115.994

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.0263

Slice	X coordinate	Y coordinate - Bottom	Interslice Normal Force	Interslice Shear Force	Interslice Force Angle

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Rd G5277
Analysis Description	Sect N Seismic with Soil Nails
Drawn By	RK
Scale	
Company	CalWest
Date	1/9/2019, 9:11:16 AM
File Name	Sect N_Soil_Nails Seismic.sli

	[ft]	[ft]	[lbs]	[lbs]	[degrees]
1	187.333	819.897	0	0	0
2	193.383	823.281	8004.57	2145.51	15.0046
3	199.433	826.664	13945.2	7415.93	28.0036
4	205.484	830.048	19481.9	15333.4	38.2048
5	211.534	833.432	25317.5	26071.1	45.8402
6	217.584	836.816	26487.7	33269.3	51.4746
7	223.634	840.199	30957.1	45266.7	55.6325
8	229.685	843.583	32077	52770.4	58.7063
9	235.735	846.967	33109.6	59654.4	60.9687
10	241.694	850.508	32800.1	63234.5	62.584
11	247.653	854.05	32374.8	65532	63.7092
12	253.613	857.591	31812.8	66460.6	64.4209
13	259.572	861.133	31149.7	66090.3	64.7645
14	265.531	864.674	30475.8	64652.3	64.7617
15	271.49	868.215	29807.9	62247.9	64.4122
16	277.45	871.757	29184.1	59034.4	63.6942
17	283.409	875.298	28625.2	55133	62.5615
18	288.954	879.708	25743.7	46573.4	61.0681
19	294.5	884.117	23379.6	38995.6	59.0554
20	300.964	889.256	17827.8	26301.3	55.8694
21	307.427	894.395	12915.3	16218.9	51.4693
22	313.891	899.534	8528.93	8643.24	45.3814
23	320.354	904.673	4659.88	3506.83	36.9636
24	326.818	909.812	1322.06	631.951	25.548
25	332.244	921.691	-1776.19	-427.259	13.5254
26	337.671	933.569	0	0	0

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Seismic with Soil Nails		
Drawn By	RK	Scale	
Company	CalWest		
Date	1/9/2019, 9:11:16 AM	File Name	Sect N_Soil_Nails Seismic.sli

SLIDEINTERPRET 6.035

APPENDIX F

Maximum Horizontal Equivalent Acceleration

PROJECT: 9712 Oak Pass Rd

JOB NO: G5277
DATE: Jan-19

$2/3\ MCE_G\ (g) = MHA_r$	Maximum Considered Earthquake geometric Mean	0.589
M_w	Mean magnitude	6.77
$r\ (km)$	Mean distance	11.48
$u'\ (cm)$	Threshold displacement	5.00
NRF	Normalized Fundamental Period of slide	0.867
$D_{5\text{-}95}\ (sec)$	Significant duration of shaking	11.895
f_{eq}	Siesmicity site factor	0.487
k_{eq}	Maximum Horizontal Equivalent Acceleration	0.287

$$NRF \approx 0.6225 + 0.9196 \times Exp\left(\frac{-MHA_r / g}{0.4449}\right)$$

$NRF =$ 0.867

$$D_{5-95\,med} = \exp\left\{ \ln\left[\frac{\left(\frac{\exp[5.204 + 0.851 \times (M - 6)]}{10^{1.5M + 16.05}} \right)^{-1/3}}{15.7 \times 10^{6}} + 0.063 \times (r - 10) \right] + 0.8664 \right\}$$

For r < 10 km

$$D_{5-95\,med} = \exp\left\{ \ln\left[\frac{\left(\frac{\exp[5.204 + 0.851 \times (M - 6)]}{10^{1.5M + 16.05}} \right)^{-1/3}}{15.7 \times 10^{6}} \right] + 0.8664 \right\}$$

$D_{5\text{-}95\ med}\ (sec) =$ 11.895

$$f_{eq} = \frac{NRF}{3.477}\left[1.87 - \log_{10}\left(\frac{u'}{(MHA_r / g \times NRF \times D_{5-95})}\right)\right]$$

$f_{eq} =$ 0.487

$$k_{eq} = f_{eq} \times MHA_r$$

$k_{eq}\ (g) =$ 0.287

REFERENCES:

i Recommended procedures for implementation of DMG, Publication 117, June 2002

ii Guidelines for analyzing and mitigating landslide hazards in California, Special Publication 117A, September 2008

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

September 16, 2019 Project No. 5750

9712 Oak Pass Road LLC
9663 Santa Monica Blvd., Suite 406
Beverly Hills, CA 90210

SUBJECT: ADDENDUM GEOTECHNICAL ENGINEERING REPORT #1, RESPONSE TO THE CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT REVIEW LETTER, LOG #102633-01, DATED MAY 17, 2019, PROPOSED MULTI-STRUCTURE LUXURY HOTEL COMPLEX AND CUSTOM SINGLE FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-9, VESTING TENTATIVE TRACT MAP NO. 74908, 9712 OAK PASS ROAD (AKA 9750 & 9800 WANDA PARK DRIVE), BEL AIR AREA, CITY OF LOS ANGELES, CALIFORNIA.

REFERENCES: ADDENDUM ENGINEERING GEOLOGIC REPORT #1, PROPOSED MULTI-STRUCTURE LUXURY HOTEL AND CUSTOM SINGLE-FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-10, VESTING TENTATIVE TRACT 74908, 9712 OAK PASS ROAD, CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY LAND PHASES INC., PROJECT NO. LP1197, SEPTEMBER 9, 2019.

CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT REVIEW LETTER, LOG # 102633-01, DATED MAY 17, 2019, INCLUDED IN APPENDIX A.

UPDATE GEOTECHNICAL ENGINEERING INVESTIGATION REPORT, PROPOSED MULTI-STRUCTURE LUXURY HOTEL COMPLEX AND CUSTOM SINGLE FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-9, VESTING TENTATIVE TRACT MAP NO. 74908, 9712 OAK PASS ROAD (AKA 9750 & 9800 WANDA PARK DRIVE), BEL AIR AREA, CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY CALWEST GEOTECHNICAL, PROJECT NO. 5750, DATED MARCH 30, 2019.

REPORT OF ENGINEERING GEOLOGIC STUDY, PROPOSED MULTI-STRUCTURE LUXURY HOTEL AND CUSTOM SINGLE-FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-10, VESTING TENTATIVE TRACT 749008, 9712 OAK PASS ROAD, CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY LAND PHASES, INC., PROJECT NO. LP1197, DATED MARCH 30, 2019.

CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT REVIEW LETTER, LOG # 102633-01, DATED APRIL 20, 2018.

PRELIMINARY UPDATE AND SUPPLEMENTAL GEOTECHNICAL ENGINEERING REPORT, PROPOSED MULTI-STRUCTURE LUXURY HOTEL AND RESIDENTIAL DEVELOPMENT, 9712 OAK PASS ROAD (AKA 9750 & 9800 WANDA PARK DRIVE), CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY CALWEST GEOTECHNICAL, PROJECT NO. 5750, DATED FEBRUARY 10, 2017.

REPORT OF PRELIMINARY ENGINEERING GEOLOGIC STUDY, PROPOSED MULTI-STRUCTURE LUXURY HOTEL DEVELOPMENT, 9712 OAK PASS ROAD AND ADJACENT ASSOCIATED PROPERTIES, CITY OF LOS ANGELES, CALIFORNIA, PROJECT NO. LP 1197, PREPARED BY LAND PHASES, INC., DATED FEBRUARY 6, 2017.

ADDITIONAL REFERENCES ARE INCLUDED IN THE AFOREMENTIONED REPORTS.

Introduction

This Addendum Geotechnical Engineering Report #1 has been prepared at your request and is in response to the City of Los Angeles Geology and Soils Report Review Letter, Log # 102633-01dated May 17, 2019 (included in Appendix A). The Review letter was prepared following the City review of our referenced Update Geotechnical Engineering Investigation Report, dated March 30, 2019 and the corresponding referenced Report of Engineering Geologic Study, prepared by Land Phases, Inc., dated March 30, 2019. The Geology and Soils Report Review Letter requests additional information and/or clarification to 37 Review Comments prior to project approval. Of the 37 review comments, 15 (#23-37) are new comments, and 22 (#1-22) are from the previous LADBS Review Letter, dated April 20, 2018.

The review comments have been reproduced in abbreviated form for convenience, followed by our response.

Previous Review Comments (#1-22);

1. Provide a response to the Previous Department Review Letter, Lot # 102633, dated April 20, 2018. While it appears (…).

Response: As stated in this review comment, the project scope has been revised since the submittal of our previous reports dated February 6, and 10, 2017, and the corresponding Geology and Soils Report Review Letter, dated April 20, 2018. The review comments presented in the 2018 Review Letter were responded to in our referenced Update Geotechnical Engineering Investigation report, dated March 30, 2019 and the corresponding Report of Update Engineering Geologic Study, prepared by Land Phases, Inc. (LP), dated March 30, 2019.

For the purposes of this Addendum Geotechnical Engineering Report #1, all City review comments are responded to.

2. Research, review and reference all existing records at the Research Division of the Department of Building and Safety for the subject and adjacent properties (…).

Response: A research of all existing City Records were undertaken, and a detailed summary of the findings, conclusions and recommendations of the reports on file at the City of Los Angeles, is included in the "Previous Studies" section of our referenced Update Geotechnical Engineering Investigation Report, dated March 30, 2019 and in the corresponding Report of Engineering Geologic Study, prepared by LP, dated March 30, 2019. An electronic copy of the researched records is included with the submittal of this report.

3. Summarize previous investigations/conclusions/recommendations, Department approvals and clarify if construction (…).

Response: In regards to the previous investigations/conclusions/recommendations, see our response to the preceding review comment no. #2. Further, it is our understanding there has not been any recent construction at the subject site beyond demolition of the pre-existing fire destroyed residence.

4. The consultants shall provide a statement that referenced previous reports were reviewed, that they either concur with or do not (…).

Response: As stated in the "Previous Studies" section of our referenced Update Geotechnical Engineering Investigation Report, dated March 30, 2019, the researched reports on file at the City records have been reviewed, and unless specifically stated herein or in our aforementioned report, CalWest Geotechnical generally concurs with the findings, conclusions, and recommendations of those reports and accepts professional responsibility for any data adopted from those reports and utilized in our reports.

5. Delineate areas of certified and uncertified compacted fill (…).

Response: The areas of certified and uncertified compacted fill is shown on the Geologic and Geotechnical Maps and Cross-sections, prepared by LP, included in Appendix B. These areas have also been transferred onto our Geotechnical Maps and Cross-sections, consistent with those by LP.

6. Provide an updated Geologic Map suitable for archiving where the proposed development is visible for archiving purposes (…).

Response: This item has been addressed by LP and is shown on their Geologic Map and Cross-sections, which are the basis for our Geotechnical Map and Cross-sections, included in Appendix B. Note the updated Maps and Cross-sections are based on the current TTM and site plans prepared by the project civil engineer, LC Engineering Group, Inc., parent company to CalWest Geotechnical.

7. Provide geologic cross section(s) through the proposed (…).

Response: A Geologic (and Geotechnical) Cross-section E-E', located through the proposed hotel structure, had been prepared and is included in Appendix B.

8. Provide a copy of the private street submittal to the Planning Department to the Grading Division.

Response: The proposed Private Street is shown on the TTM and is part of the project submittal to planning. Further, the TTM is the basis for the Geologic/Geotechnical Maps and Cross-sections, included in Appendix B.

9. Address the stability and geotechnical design of the proposed private street and cart paths.

Response: Slope stability analyses have been performed utilizing the Cross-sections that intersect the proposed private street and cart paths. The slope stability analyses printouts are included in our referenced Update Geotechnical Engineering Investigation Reports, dated March 30, 2019. The slope stability analyses determined the proposed private street and cart paths are stable with Code conforming factors of safety. The Updated slope stability analyses is included in Appendix D.

10. Provide revised geologic cross sections that are to scale.

Response: The Geologic/Geotechnical Map and Cross-sections are drafted to scale in compliance with the TTM.

11. Provide subsurface exploration in the vicinity of the proposed hotel, condominiums, and bungalows.

Response: Subsurface exploration in the vicinity of the proposed hotel, condominiums and bungalows have been conducted. The locations of the exploratory test borings and test pits are shown on the Geologic/Geotechnical Maps and Cross-sections, included in Appendix B. The Logs of the exploratory test borings and test pits prepared by LP, are included in our referenced reports.

12. Provide additional subsurface exploration so that each lot of the proposed detached single family residences have subsurface (…).

Response: Exploratory test borings and test pits have been excavated across the subject site in strategic locations to interpret and characterize the lithology of the site and at each of the proposed lots (Lot 1-9). Geotechnical Cross-sections, utilizing the Geologic Cross-sections prepared by LP, include/cover each of the lots. Further, slope stability analysis was conducted utilizing the Geotechnical Cross-sections. The slope stability analyses printouts are included in our referenced reports. Updated slope stability analysis is included Appendix D.

13. Provide the locations of all previous subsurface exploration at the subject site (…).

Response: The locations of all previous subsurface exploration at the subject site are shown on the Geologic/Geotechnical Maps and Cross-sections included in our referenced reports and in Appendix B.

14. Provide the exploratory logs of all excavations at the subject site (…).

Response: The logs of the exploratory test borings and test pits excavated at the subject site by other consultants are included in our referenced reports.

15. Provide specific geotechnical recommendations to mitigate surficial failures.

Response: Surficial failures were observed on the northeast and northwest facing slopes below Lots 2 and 3. As part of the construction for the proposed private driveway, which traverses downslope of these Lots, a soil nail slope stabilization wall is proposed. The location of the proposed soil nail stabilization wall is shown on the Geotechnical Maps and Cross-sections, included in Appendix B. Construction of the soil nail stabilization wall will result in the removal and/or stabilization of all unstable surficial material from the slope face as the slope face will be covered and supported by the proposed soil nail stabilization wall. Therefore, the future potential for surficial failure along the northeast and northwest facing slopes is considered mitigated.

16. Provide subsurface exploration in the area of the Benedict Canyon Fault Zone, specifically in areas of proposed structures and buildings and in areas of slope stability.

Response: This review comment is responded to in our responses to review comments no. 11 and 12 above.

17. Additional site exploration throughout the site is appropriate to determine liquefaction (…).

Response: As stated in our referenced reports, due to the subsurface ground condition of shallow bedrock combined with the deep groundwater condition, liquefaction potential at the subject site is considered to be nil.

18. Determine the area of potential bedrock shattering as noted by the project engineering geologist (…).

Response: This item is addressed by the project engineering geologist, LP, in their referenced Addendum Engineering Geologic Report #1, dated September 9, 2019.

19. Provide specific geotechnical recommendations to reduce the incidence of bedrock shattering at the subject site.

Response: As stated by LP, there is a minor to moderate threat of bedrock shattering which could have an adverse effect on the subject site. LP stated that only the ridge top areas of the subject site are susceptible to a minor to moderate risk of bedrock shattering. If deemed necessary by LP during the grading operation, shattering prone bedrock in the ridge top areas will be removed and replaced as a certified compacted fill as part of the grading operation and prior to construction of the proposed structures in those areas.

20. For rock slopes 1:1 (H:V) or steeper, provide additional geologic mapping and analysis that incorporates, but not limited to, the following (…).

Response: As shown on the current TTM, 1:1 (H:V) unsupported rock slopes will not remain at the subject site. Existing steepened rock slopes that have gradients of 1:1 (H:V) or steeper, will be graded to a flatter gradient, or will be supported by conventional or soil nail type retaining structures. Therefore, a kinematic analysis is not warranted.

21. Revise and / or provide additional slope stability (global and surficial) based the comments above. Note that the slope stability analysis shall be performed on all crucial sections (…).

Response: Slope stability analysis is included in our referenced reports and the updated slope stability analyses is included in Appendix D. The slope stability analyses have been performed on the critical cross-sections with the steepest slopes and have taken into account adverse bedding conditions, if present. Building loads have been included in analyses, where applicable.

22. Provide calculations for temporary excavation and shoring or A-B-C slot-cut considering adverse bedding conditions, and / or sloping surcharge conditions.

Response: Recommendations for temporary excavations, shoring, and A-B-C slot-cut procedures are as included in our referenced reports.

New Review Comments, (#23-37);

23. Provide an updated copy of the VTT 74908 map (…).

Response: A copy of the current VTT (TTM) 74908 Map is included in Appendix F.

24. The Geologic Map depicts the proposed hotel as being partially on the mapped trace of the Benedict Canyon Fault Trace (…).

Response: The hotel structure footprint is partially supported on sedimentary bedrock (*Tm*) within the Benedict Canyon Fault Zone (BCFZ) and sedimentary bedrock (*Tm*) outside of the fault zone. To characterize and evaluate the bedrock within and outside the BCFZ, exploratory test borings and test pits had been excavated. Exploratory test borings B-10, B-15 and test pits TP-12, TP-13, TP-18 and TP-24 have been excavated within the BCFZ. The balance of the exploratory test borings and test pits have been excavated outside the BCFZ which allow interpretation and characterization of the bedrock inside and outside the BCFZ.

As stated by LP, based on their field observation and characterization, the bedrock material within the BCFZ consists of siltstone, shale and sandstone derived from the Modelo Formation, and the bedrock has a *greater* degree of fracturing, is locally sheared, folded and deformed. Further, the bedding planes within the BCFZ are locally offset/truncated by internal shear planes and micro-faults. An important observation made by LP within the BCFZ in terms of foundation settlement potential, is that appreciable thickness of fault gouge material or highly compressible materials is not present within the confines of the BCFZ.

In contrast, LP states the siltstone and shale outside of the BCFZ is thinly laminated to thinly bedded, somewhat friable to non-friable, moderately hard, slightly to moderately fractured and moderately weathered to slightly weathered with depth. The sandstone is fine to coarse grained, thinly bedded to massive, somewhat friable to non-friable, moderately hard to very hard, slightly to moderately fractured, and moderately weathered to slightly weathered with depth. In general, LP states the sedimentary bedrock (*Tm*) outside the BCFZ is of slightly better quality, with less fracturing and distortion.

However, since the bedrock within the BCFZ does not contain appreciable thicknesses of fault gouge material or highly compressible materials and/or open fractures or discontinuities, the foundation settlement within the BCFZ will be primarily a function of the elastic modulus of the bedrock, and not of clay gouge compression or closing of rock fractures.

Nevertheless, there is potential for differential or sympathetic compression between the varying bedrock materials. To account for the potential of any minor differential settlements, pile foundations should be connected with grade beams that collectively can account for differential settlement or, as an alternate, the proposed structure could be supported on a mat slab foundation system, (see also our response to the following item).

25. Proposed residences located in the BCFZ appear to utilize pile foundations. Justify the use of pile foundations as supposed to a Mat Foundation System.

Response: In furtherance to our response to review comment #24, it is acknowledged the bedrock within the BCFZ is of slightly inferior quality (increased fracturing and weathering) compared to bedrock outside of the BCFZ. However, the bedrock mass within the BCFZ does not include appreciable amounts of soft compressible material or open fractures. Therefore, foundation settlement will primarily be a function of the slightly lower elastic modulus of the bedrock within the BCFZ.

The bedrock type and quality is reported to be of similar quality across the BCFZ. Accordingly, foundation settlement will be similar where founded in the bedrock within the BCFZ. Further, the pile foundation system supporting proposed structures within the BCFZ will be connected by structural grade beams. The pile and grade beam foundation system shall be designed to withstand potential differential settlements of 1 inch in 20 feet, in both directions. Based on the above, the project civil/structural engineer may utilize a pile and grade beam foundation or a mat foundation system, designed to withstand the potential differential settlement.

26. Cross-Section D-D' depicts a proposed parking structure P1 and a proposed restaurant. Clearly depict the Code required setback (…).

Response: Cross-section D-D, included in Appendix B, has been updated to the current TTM and shows the recommended setbacks.

27. In the SE Corner of the hill on the BCFZ area, clearly depict the lateral extent of the proposed soldier piles and soil nail wall on the Geologic Map.

Response: The slope stability analysis for Cross-section C-C', included in Appendix D, has been updated to the current TTM, included in Appendix F. The updated slope stability analysis indicates that soldier piles are not required to improve the factor of safety to Code conforming values.

The extent of the soil nail stabilization wall is shown on the Geotechnical Maps and Cross-sections, included in Appendix B. In general, the soil nail stabilization wall borders the upslope side of the proposed private driveway, as shown on Cross-sections C-C, H-H, I-I, J-J and N-N.

28. Depict the lateral extent of the proposed soil nail wall on the Geologic Map based on the locations depicted on the Geologic Cross Section (…).

Response: The lateral extent of the proposed soil nail stabilization wall is shown on the Geotechnical

Maps and Cross-sections, included in Appendix D, which utilizes as a basis for the Geologic Maps and Cross-sections.

29. Provide a summary table to identify (by individual lots) the following items: shallow foundation, deep foundations, foundations on certified fill (…).

<u>Response:</u> Requested information is shown on the table below.

TABLE 1. FOUNDATION DESIGN SUMMARY

Lot No.	Foundation Type	Bearing Material
1-3	Deepened pile foundation	Sedimentary bedrock (*Tm*)
4	Combination of conventional shallow footings and deepened pile foundations	Conejo Volcanics (*Tvb*) and sedimentary bedrock (*Tm*)
5	Combination of conventional shallow footings and deepened pile foundations	Sedimentary bedrock (*Tm*)
6	Deepened pile Foundation	Sedimentary bedrock (*Tm*)
7	Combination ff conventional shallow footings and deepened pile foundations	Sedimentary bedrock (*Tm*) and Santa Monica Slate (*Jsm*) bedrock
8-9	Combination of conventional shallow footings and deepened pile foundations	Sedimentary bedrock (*Tm*)

30. Reference to page 14 of 03/30/2019 report, clarify how the ultimate shear strength and peak shear strength (…).

<u>Response:</u> Ultimate and peak shear strength parameters had been obtained from our laboratory testing which was performed on samples of bedrock and soil obtained from the exploratory test borings and test pits excavated across the subject site. The locations of the samples obtained are indicated on the exploratory test boring and test pit logs included in our referenced reports. Laboratory direct shear test results had been summarized in a table, included in our referenced reports.

In some instances, more than one direct shear test was performed for the same bedrock unit. Slightly different shear strength parameters were reported in the test results. Therefore, to determine the *characteristic shear strength parameters* of the bedrock unit, the shear stress versus normal stress data points from these tests were plotted on charts, included in Appendix C. From the charts, the average shear parameters strength values were determined, which were adopted as the characteristic shear strength parameters for the individual bedrock unit. Characteristic shear strength parameters adopted for the various bedrock units, including residual shear values, are indicated on the Table below.

TABLE 2. SHEAR STRENGTH PARAMETERS OF VARIOUS ROCK UNITS

#	Area	Sampling location	Soil/Rock Unit	Characteristic Shear Strength Parameters			
				γ (pcf)	ϕ (deg)	C' (psf)	Strength condition
1	Within BCFZ	B-10@15' B-10@25' B-15@20' B-15@35'	Modelo formation Bedrock (*Tm*)	125 125 125	34 36 27	600 800 200	Ultimate Peak Residual
2	South of the BCFZ	B-7@15' TP-8@4' B-1@10' B-1@25' B-1@45' B-2@20' B-3@15' B-3@35' B-3@45' B-4@30' B-4@40'	Modelo formation Bedrock (*Tm*)	130 130 130	36 36 27	600 650 380	Ultimate Peak Residual
3	South of the BCFZ	B-8@10' B-9@15'	Weathered Modelo formation Bedrock (*Tm*)	125 125	30 35	225 440	Ultimate Peak
4	South of the BCFZ	B-14@10'	Santa Monica Slate bedrock (*Jsm*)	130 130 130	39 40 33	1200 1470 350	Ultimate Peak Residual
5	North of the BCFZ	B-16@20' B-16@30'	Sedimentary bedrock Topanga formation (*Tt*)	125 125 125	36 36 27	600 650 380	Ultimate Peak Residual
6	North of the BCFZ	TP-20@4'	Weathered Topanga formation (*Tt*)	125 125	32 32	370 475	Ultimate Peak
7	North of the BCFZ	B-13@10'	Conejo Volcanics (*Tvb*)	130 130	30 35	225 440	Ultimate Peak

31. Residual shear strength shall be used for along-bedded condition, revise calculations accordingly. Note that Appendix D shown lower re-sheared value (…).

Response: Updated slope stability analyses, included in Appendix D, consider the residual shear strength of the bedrock unit to model along-bedded shear strength. As seen in the analyses, Code conforming factors of safety have been obtained for each Cross-section analyzed.

32. Show the proposed piles on cross section C-C'.

Response: As stated in our response to review comment #27, soldier piles are no longer required for the proposed project.

33. It appears that the lower row of piles was not used in the slope stability analysis as it did (…).

Response: Please see our response to review comments #27 and 32.

34. Specify where the shear load shall be applied and from what depth the passive resistance can be derived for the proposed soldier piles (…).

Response: See our response to review comment #27.

35. Analyze the global and internal stability for the proposed soil nail walls (…).

Response: Global and internal stability of the soil nail stabilization walls have been performed. The analyses were conducted utilizing Cross-sections C-C and N-N. Printouts of the analyses are included in Appendix E. As shown, Code compliant factors of safety have been obtained for all global and internal soil nail stabilization wall analyses. A summary of the analyses is presented below.

TABLE 3. SOIL NAIL WALL INTERNAL AND GLOBAL CHECK SUMMARY

Cross Section	Analysis mode	Computed Factors of Safety (Static/Seismic)	Target Factors of Safety (Static/Seismic)
C-C'	Internal	1.52/1.14	1.5/1.0 (ok)
	Global	1.57/1.13	1.5/1.0 (ok)
N-N'	Internal	1.63/1.18	1.5/1.0 (ok)
	Global	1.66/1.16	1.5/1.0 (ok)

36. Reference to page 130 of FHWA-HNI-14-007, provide lateral earth pressure for the purpose of analyzing sliding of soil nail walls.

Response: The lateral force P_a required to evaluate the lateral sliding stability of the soil nail block, as discussed in the referenced FHWA manual, cannot be computed. The active force coefficient, Ka, required to compute P_a, cannot be determined using the Coulomb or Rankine equations as recommended in the referenced manual as the backslope angle (β~43^0) above the soil nail wall is greater than the residual friction angle ($\phi_f = 27^0$) of the supported material and therefore expressions in the Coulomb and the Rankine equations require computing the square root of a negative number, which, in mathematical terms, is *imaginary*, and is not considered a real number. The limitation of both the Coulomb and Rankine equations require that the backslope angle (β) above the wall is equal to, or less than, the friction angle (ϕ_f) of the supported material. Thus, a manual lateral sliding analysis using the method included in the referenced FHWA manual is not applicable.

However, in lieu of the manual lateral sliding analysis, we have evaluated the internal and global stability of the soil nail stabilization wall. The analyses considered the residual shear strength parameters for the along-bedded condition for the bedrock material. Non-circular (planar) surfaces were analyzed for both the static and seismic conditions. In both conditions, the resulting factors of safety were determined to be Code compliant.

37. Provide performance monitoring and action plan for the proposed soil nail walls.

Response: Performance monitoring for the proposed soil nail stabilization walls should include 1) installation of inclinometers behind the wall face and 10 feet away 2) installation of load cells at individual nails to detect pressure build-up, and 3) installation of optical survey points. Performance monitoring should be carried out during construction and a period of at least six months post-construction. In case of wall and/or slope movement that exceeds established movement limits, action should be taken to mitigate the movement.

At least two sets of inclinometers should be installed at the northeast facing slope at Lot 2, and the northwest facing slope at Lot 3. A set of inclinometers would include one installed behind the wall facing, and a second one installed at least 10 feet away. During construction, inclinometer readings should be taken on a weekly basis. The frequency of readings can decrease to bi-weekly for the first two months after construction, and further decreased to once a month for the subsequent four months.

A minimum of 6 load cells should be installed on individual soil nails along the northeast and northwest facing slopes below Lots 2 and 3. The loads cells should be installed on selected production nails during construction, in accordance with instructions by the manufacturer. Selected soil nails should be at different rows and columns. Monitoring of load cells should be performed for at least six months post construction.

A number of optical survey points should be installed along the soil nail stabilization wall. Survey points should be installed at the top of the wall, and on the wall face. During construction, survey points should be measured on a weekly basis by a licensed professional surveyor. The frequency of measurement can be decrease to bi-weekly for the first two months after construction, and further decreased to once a month for the subsequent four months.

Allowable movement should be set by the project civil/structural engineer. A wall movement of 0.5%-1% of the wall height is not uncommon. For a 20-foot high wall, that translates into wall movement of 1-1/4 to 2-1/2 inches. For higher walls, the movement may be greater. For a measured wall movement that exceeds 50% of the allowable movement, the frequency of reading should be doubled, and the project civil/structural engineer notified. Measurement data should be sent to the project civil/structural engineer within 24 hours of measurement. After two successive readings, if the rate of movement has stabilized or decreased, then the reading frequency can go back to established monitoring protocol. If the measured reading exceeds 95% of the established reading, and it is observed that the movement rate is increasing, the work should stop, and mitigation measures, as determined by the project civil/structural engineer should be implemented. Mitigation measures may include increasing the monitoring frequency, site visits by the project civil/structural engineer to observe the wall and slope condition, installation of additional soil nails at sections with excessive movements, and/or improvement of drainage, as determined by the project civil/structural engineer.

Summary and Conclusions

CalWest Geotechnical has prepared this Addendum Geotechnical Engineering Report #1 in response to the City of Los Angeles Geology and Soils Report Review Letter, dated May 17, 2019, included in Appendix A. Based on our responses provided herein, and the geotechnical data and recommendations presented in this and our referenced reports, it continues to be the opinion of this office the proposed project, as planned, is considered feasible from a geotechnical engineering perspective, providing our recommendations and those of the project engineering geologist, Land Phases, Inc. are made part of the project plans and implemented during construction.

Limitations and Uniformity of Conditions

This report is prepared for use by 9712 Oak Pass Road LLC and their authorized agents, and should not be considered transferable. Prior to use by others, the subject site and this report should be reviewed by CalWest Geotechnical to determine if any additional work is required to update this report.

The findings presented in this report are valid as of this date and may be invalidated wholly or partially by changes outside our control. Therefore, this report should be subject to review and should not be relied upon after a period of one year or if any significant changes are made.

The professional opinions and geotechnical advice contained in this report are not intended to imply total performance of the project or guarantee that unusual conditions will not be discovered during or after construction.

This report has been prepared in accordance with generally accepted engineering practices and makes no warranties, either express or implied, as to the professional opinions provided.

Should you have any questions, please don't hesitate to call.

Respectfully submitted,

Leonard Liston
President
RCE 31902

Robi Khan, PE
Project Engineer
RCE 70510

Enc: Appendix A - City of Malibu – Geotechnical Review Sheet, Dated May 17, 2019.
Appendix B - Geotechnical Map and Cross-sections
Appendix C – Direct Shear Test Charts
Appendix D – Updated Slope Stability Analyses
Appendix E – Soil Nail Wall – Internal and External Check

cc: Land Phases, Inc.

APPENDIX A

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

FRANK M. BUSH
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT REVIEW LETTER

May 17, 2019

LOG # 102633-01
SOILS/GEOLOGY FILE - 2
LIQ/LAN

Oak Pass Road LLC
9663 Santa Monica Blvd.
Los Angeles, CA 90210

TRACT: VTT 74908
LOTS: 1 – 10
LOCATION: 9712 W. Oak Pass Road

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	5750	03/30/2019	CalWest Geotechnical
Oversized Documents	``	``	``
Geology Report	LP1197	03/30/2019	Landphases, Inc.
Oversized Documents	``	``	``

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	102633	04/20/2018	LADBS – Grading
Soils Report	5750	02/10/2017	CalWest Geotechnical
Geology Report	LP1197	02/06/2017	Landphases, Inc.
Dept. Approval Letter	87701	04/07/2015	LADBS
Geology Report	LP1197	03/19/2015	Landphases, Inc.
Dept. Approval Letter	80071	04/16/2013	LADBS
Soils Addendum Letter	5277	03/20/2013	Calwest Geotechnical
Dept. Approval Letter	73947-01	01/22/2013	LADBS
Soils Report	5277	11/19/2012	Calwest Geotechnical
Geology Report	JH7950	11/16/2012	Mountain Geology, Inc.
Soils Report	5277	07/13/2012	Calwest Geotechnical
Geology Report	JH7950	07/13/2012	Mountain Geology, Inc.
Request for Modification	20772	10/11/2012	LADBS - Grading
Dept. Correction Letter	73947	06/08/2011	LADBS
Soils Report	5277	04/22/2011	Calwest Geotechnical
Geology Report	JH7950	04/20/2011	Mountain Geology, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports dated March 30, 2019, February 10, 2017, and February 6, 2017, that provides recommendations for the proposed 5-level luxury hotel with 2 levels basement parking, detached multi-level parking structures, bungalows (revised locations from the 2017 report), condominiums (revised locations from the 2017 report), swimming pools, detached single family residences, retaining walls, cart paths, and private roads.

Previously, the Grading Division of the Department of Building and Safety had reviewed and approved (Log # 87701, dated April 7, 2015) the referenced report dated March 19, 2015, providing recommendations for the subsequent grading and construction of a new building pad with new retaining walls in anticipation of future residential construction and ancillary structures, and improvement of the existing private driveway.

The earth materials at the subsurface exploration locations consist of areas of certified fill and uncertified fill overlying a relatively thin layer of natural residual soil up to 5 feet in thickness, overlies the bedrock for the majority of the subject site, while the southern half of site is underlain by Modelo Formation sandstone and shale bedrock and the northern half is underlain by Topanga Formation shale and sandstone bedrock and volcanic bedrock.

The subject property is not located within a State designated Earthquake Fault Zone and no known potentially active or active faults cross the subject site. However, regional geologic mapping by Dibblee (1991) and City of Los Angeles (1960-1970) indicate that the Benedict Canyon Fault Zone (BCFZ) traverses the subject property. The consultants state that adverse effect due to fault rupture is considered low to nil for the proposed structures as the amped faults of the site are not interpreted to be active tectonic features.

The consultants recommend to support the proposed structures on conventional and/or drilled-pile foundations bearing on engineered fill or competent bedrock.

The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The site is located in a designated seismically induced landslide hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The review of the subject reports dated March 30, 2019 (2), cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Provide a response to the Previous Department Review Letter, Log # 102633, dated April 20, 2018. While it appears that the project has been revised, the 21 items of the previous Department Review Letter still apply.

2. Research, review and reference all existing records at the Research Division of the Department of Building and Safety for the subject and adjacent properties and incorporate the existing geologic data into the current evaluation. Include for review purposes a complete electronic PDF copy (including exploration logs, geologic map, cross-sections and lab data) of the previous report/s and the Department's review letters.

3. Summarize previous investigations/conclusions/recommendations, Department approvals and clarify if construction as proposed and approved, was achieved.

4. The consultants shall provide a statement that referenced previous reports were reviewed, that they either concur with or do not concur with the findings contained therein, and that they will accept professional responsibility for the use of any data from others.

5. Delineate areas of certified and uncertified compacted fill at the subject site(s).

6. Provide an updated Geologic Map suitable for archiving where the proposed development is visible for archiving purposes and review purposes. It is not clear what is proposed on the geologic map, it is too light in shade.

7. Provide geologic cross section(s) through the proposed multi –level hotel.

8. Provide a copy of the private street submittal to the Planning Department to the Grading Division.

9. Address the stability and geotechnical design of the proposed private street and cart paths.

10. Provide revised geologic cross sections that are to scale.

11. Provide subsurface exploration in the vicinity of the proposed hotel, condominiums, and bungalows.

12. Provide additional subsurface exploration so that each lot of the proposed detached single family residences have subsurface conditions and lithology identified, with slope stability determined.

13. Provide the locations of all previous subsurface exploration at the subject site on the Geologic Map.

14. Provide the exploratory logs of all excavations at the subject site(s). Provide an assumption of responsibility for these logs as appropriate.

15. Provide specific geotechnical recommendations to mitigate the surficial failures.

16. Provide subsurface exploration in the area of the Benedict Canyon Fault Zone, specifically in areas of proposed structures and buildings and in areas of slope stability.

17. Additional site exploration throughout the site is appropriate to determine liquefaction potential at the subject site.

18. Determine the area of potential bedrock shattering as noted by the project engineering geologist on page 32 of the February 6, 2007, referenced report.

19. Provide specific geotechnical recommendations to reduce the incidence of bedrock shattering at the subject site.

20. For rock slopes 1:1 (H:V) or steeper, provide additional geologic mapping and analysis that incorporates, but not limited to, the following:

a. Detailed mapping and description of discontinuities along the existing cut slope; such as bedding planes, lithologic contacts, joints, fractures, and faults, with characteristics such as orientation, spacing, presence of infilling or openness, continuity, etc.

b. Kinematic analysis of discontinuities relative to the slope face, using stereographic methods to assess potential planar, wedge and topple type failures. Show all great circles on the stereonet.

c. Slope stability analysis of the potential failures using appropriate methods for type of failure identified from the kinematic analysis.

21. Revise and / or provide additional slope stability analyses (global and surficial) based on the comments above. Note that slope stability analysis shall be performed on all critical sections with highest and steepest slopes and / or adverse bedding conditions. Note that in addition to circular searches, planar analysis shall be performed on sections with adverse bedding conditions. Note that building loads and loading from raising of site grades above current grades shall be included in the analysis.

22. Provide calculations for temporary excavation and shoring or A-B-C slot-cut considering adverse bedding conditions, and / or sloping surcharge conditions.

New Items:

23. Provide an updated copy of the VTT 74908 map as the project has been revised.

24. The Geologic Map depicts the proposed hotel as being partially on the mapped trace of the Benedict Canyon Fault Trace (BCFZ) and partially founded on the adjacent underlying bedrock. Provide revised foundation recommendations for the proposed hotel to protect from any potential ground movement / or sympathetic ground movement as a result on being essentially two different bearing materials, one bearing on a fault zone.

25. Proposed residences located in the BCFZ appear to utilize pile foundations. Justify the use of pile foundations as opposed to a Matt Foundation system.

26. Cross Section D-D' depicts a proposed parking structure P1 and a proposed restaurant. Clearly depict the Code required setback from the toe of the ascending slope and from the face of the descending slope. Currently, the parking structure and restaurant appear to be basements on Section D-D' with no setbacks from the face of the slope.

27. In the SE Corner of the hill in the BCFZ area, clearly depict the lateral extent of the proposed soldier piles and soil nail wall on the Geologic Map.

28. Depict the lateral extent of the proposed soil nail wall on the Geologic Map based on the locations depicted on the Geologic Cross Sections C-C', H-H', I-I', and J-J'.

29. Provide a summary table to identify (by individual lots) the following items: shallow foundation, deep foundations, foundation on certified fill, and foundation on bedrock.

30. Reference to page 14 of 03/30/2019 report, clarify how the ultimate shear strength and peak shear strength are determined.

31. Residual shear strength shall be used for along-bedding condition, revise calculations accordingly. Note that Appendix D showed lower re-sheared value which shall be used for along-bedding condition.

32. Show the proposed piles on cross-section C-C'.

33. It appears that the lower row of piles was not used in the slope stability analysis as it did not extend below the critical failure surface. Please explain.

34. Specify where the shear load shall be applied and from what depth the passive resistance can be derived for the proposed soldier piles (page 16 of the 03/30/2019 report).

35. Analyze the global and internal stability for the proposed soil nail walls.

36. Reference to page 130 of FHWA-HNI-14-007, provide lateral earth pressure for the purpose of analyzing sliding of soil nail walls.

37. Provide performance monitoring and action plan for the proposed soil nail walls.

The project engineering geologist and soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer and/or geologist may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in a CD or flash drive, and the appropriate fees will be required for submittal.

JEFFREY T. WILSON
Engineering Geologist I

YING LIU
Geotechnical Engineer II

Log No. 102633-01
213-482-0480

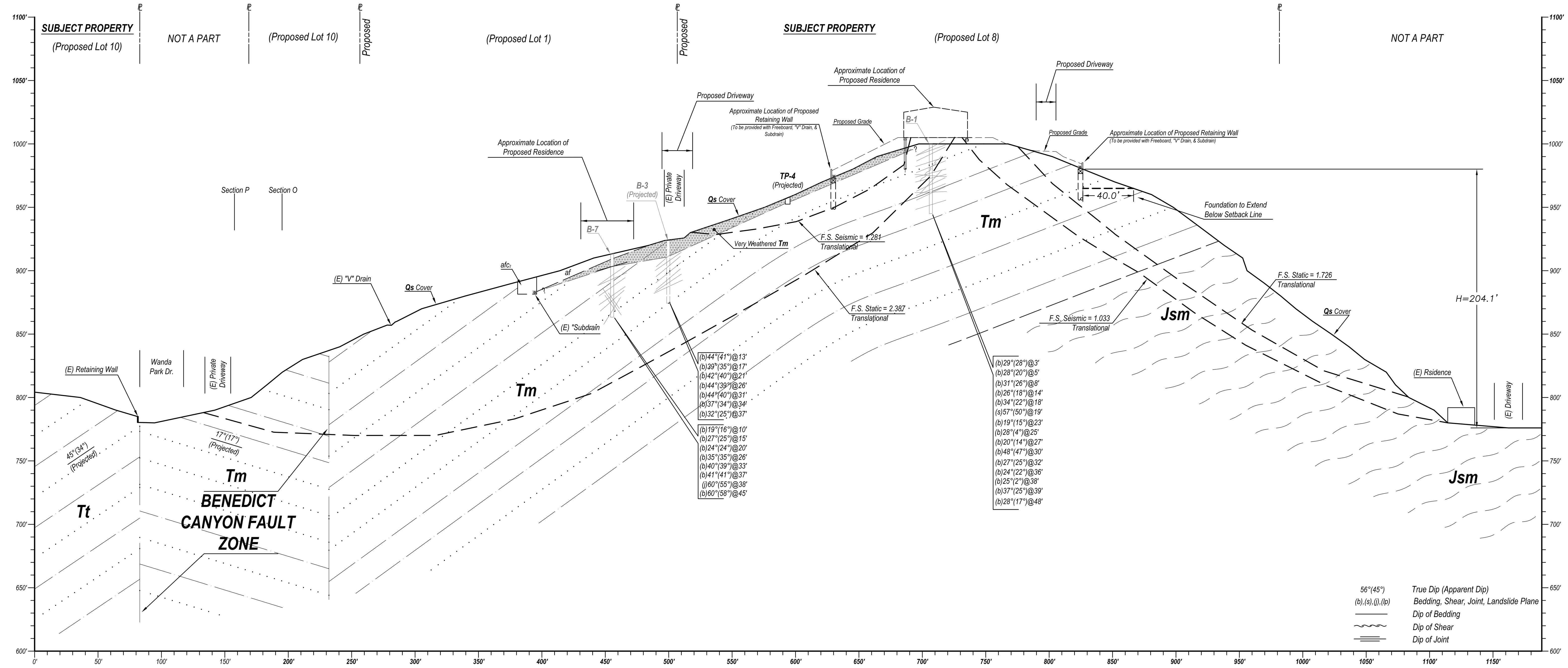
cc: Blythe McKinney, Permits Unlimited, Applicant
CalWest Geotechnical, Project Consultant
Landphases, Inc., Project Consultant
WL District Office

APPENDIX B

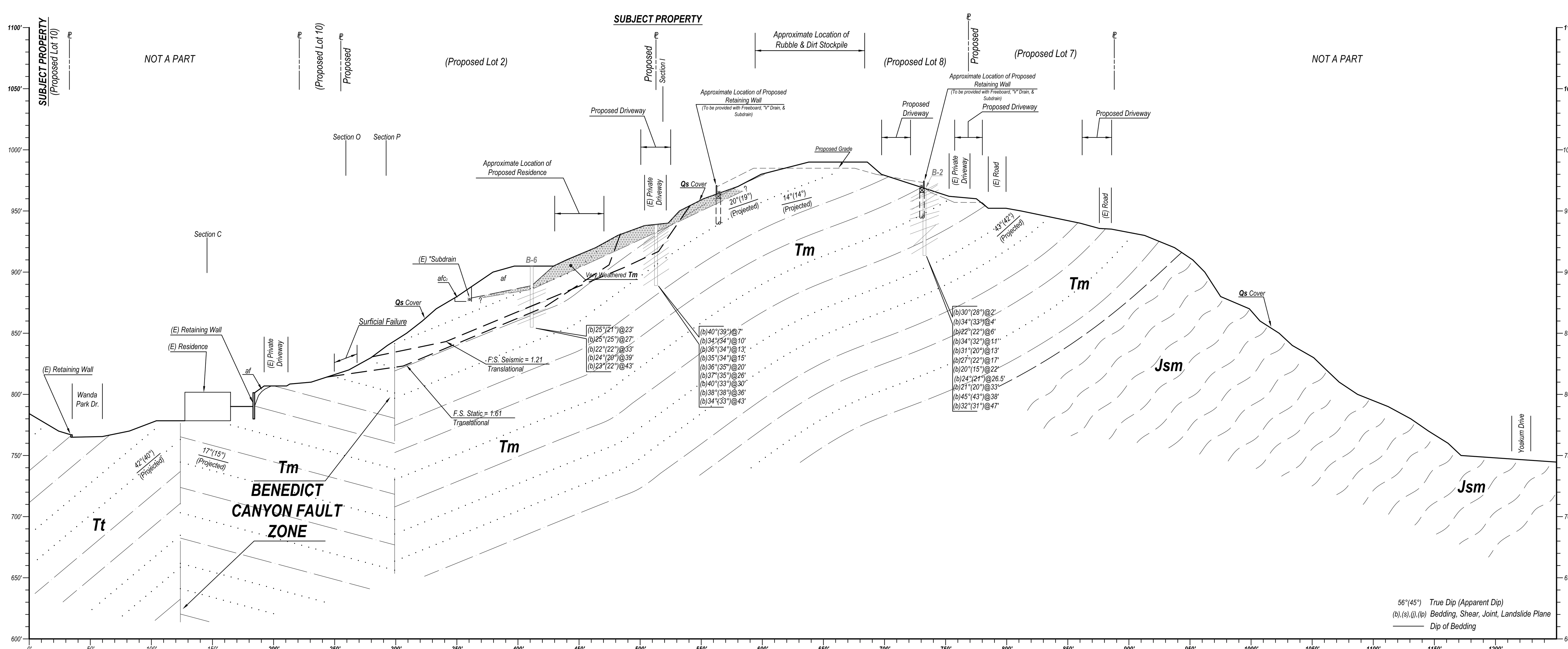
GEOTECHNICAL SECTIONS A & B

PROPOSED HOTEL AND RESIDENTIAL DEVELOPMENT

OAK PASS ROAD, BEVERLY HILLS AREA, CITY OF LOS ANGELES, CA



Geotechnical Section A-A'
Scale: 1" Equals 50'



Geotechnical Section B-B'
Scale: 1" Equals 50'

GEOLOGIC UNITS

Surficial Sediments:

af	Uncertified Artificial Fill
afc2	Certified Compacted Fill - CalWest Geotechnical, 2015
afc	Certified Compacted Fill - Kovacs-Byer and Assoc., Inc., 1986, 1988
Qs	Soil
Qal	Alluvium
Qls	Landslide Debris

Bedrock:

Tm	Modelo Formation
Tvb	Conejo Volcanics
Tt	Topanga Formation

LANDPHASES INC
CONSULTING ENGINEERING GEOLOGISTS
5158 COCHRAN ST., SIMI VALLEY, CA., 93063
www.landphases.com
(805) 522-5174
(805) 582-1228 (FAX)

JOB NAME: 9712 Oak Pass Rd., LLC	JOB NUMBER: LP 1197	DATE: Feb., 2017	DRAFTED BY: BAS	PLATE 2

No:	DATE:	REVISION DESCRIPTION:
1	Dec., 2018	Utilize Current Site Plan, Add Additional Geologic Borings, Test Pits, And Sections
2	Feb., 2019	Utilize Current Site Plan
3	March, 2019	Utilize Current Site Plan
4	Sept., 2019	Utilize Current Site Plan and Add Geologic Sections O & P

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS
A DIVISION OF LC ENGINEERING, INC.
889 PIERCE COURT, SUITE 101 (818)991-7148
THOUSAND OAKS, CA. 91360 (805)497-1244

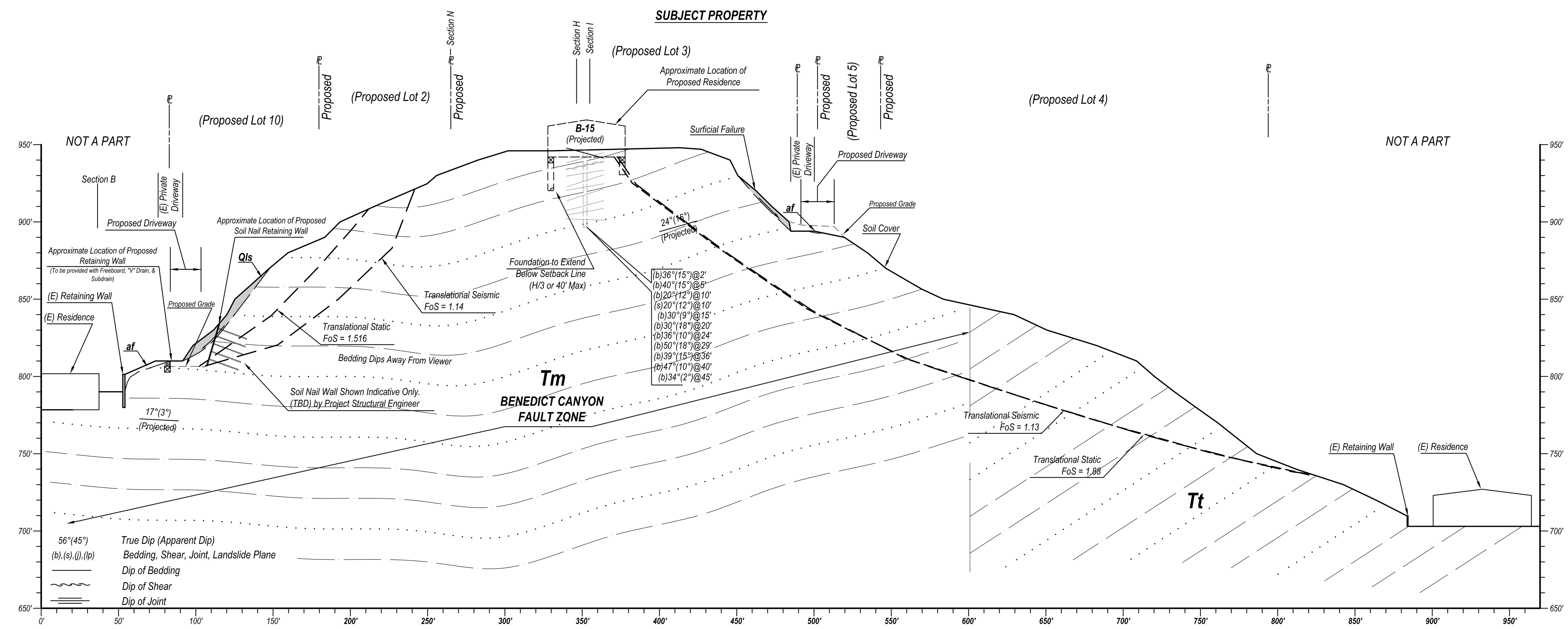
CLIENT: Oak Pass Rd LLC — JOB #: 5750-II
LOCATION: 9712 Oak Pass Road — SCALE: 1" = 50'
DATE: Sept., 2019 — DRAWN BY: RK

PLATE: 2

GEOTECHNICAL SECTIONS C & D

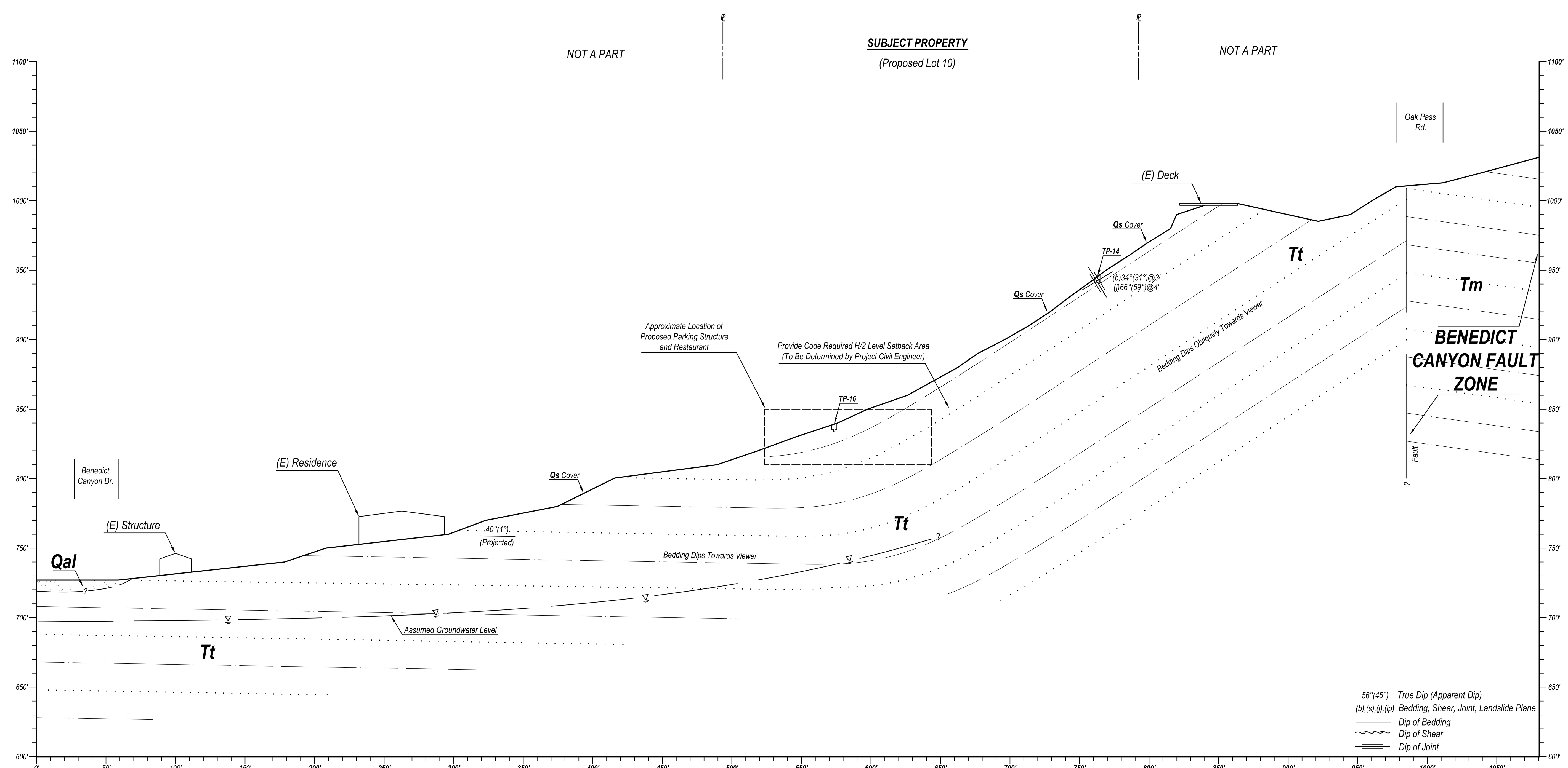
PROPOSED HOTEL AND RESIDENTIAL DEVELOPMENT

OAK PASS ROAD, BEVERLY HILLS AREA, CITY OF LOS ANGELES, CA



Geotechnical Section C-C'

Scale: 1" Equals 50'



Geotechnical Section D-D'

Scale: 1" Equals 50'

GEOLOGIC UNITS

Surficial Sediments:

af	Uncertified Artificial Fill
afc2	Certified Compacted Fill - CalWest Geotechnical, 2015
afc	Certified Compacted Fill - Kovacs-Byer and Assoc., Inc., 1986, 1988
Qs	Soil
Qal	Alluvium
Qls	Landslide Debris

Bedrock:

Tm	Modelo Formation
Tvb	Conejo Volcanics
Tt	Topanga Formation

LANDPHASES INC
CONSULTING ENGINEERING GEOLOGISTS

5158 COCHRAN ST.,
SIMI VALLEY, CA., 93063
www.landphases.com

(805) 522-5174
(805) 582-1228 (FAX)

JOB NAME: 9712 Oak Pass Rd., LLC	JOB NUMBER: LP 1197	DATE: Feb., 2017	DRAFTED BY: BAS	PLATE 3

No:	DATE:	REVISION DESCRIPTION:
1	Dec., 2018	Utilize Current Site Plan, Add Additional Geologic Borings, Test Pits, And Sections
2	Feb., 2019	Utilize Current Site Plan
3	March, 2019	Utilize Current Site Plan

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

A DIVISION OF LC ENGINEERING, INC.
889 PIERCE COURT, SUITE 101 (818)991-7148
THOUSAND OAKS, CA. 91360 (805)497-1244

CLIENT: Oak Pass Rd LLC — JOB #: 5750-II
LOCATION: 9712 Oak Pass Road — SCALE: 1" = 50'
DATE: Sept., 2019 — DRAWN BY: RK

PLATE: 3

EXPLANATION

GEOLOGIC SYMBOLS

- Geologic Contact - approximately located, queried where uncertain, dotted where concealed
- Fault Contact - Approximately located, queried where uncertain, dotted where concealed, arrow indicates dip of fault plane
- B-15 — Location of boring - Mountain Geology, Inc., 2011, 2012 & Land Phases, Inc., 2018
- TP-25 — Location of test pit - Mountain Geology, Inc., 2011 & Land Phases, Inc., 2018
- JBB-1-91 — Location of boring - The J. Byer Group, Inc., 1991
- SEB-1 — Location of boring - Smith-Emery Company, 1986
- KBTP-3-88 — Location of test pit - Kovacs-Byer and Associates, Inc., 1988 (Shaded where buried or removed by grading)
- JBTP-4-84 — Location of test pit - The J. Byer Group, Inc., 1984
- Strike and dip of bedding
- Strike and dip of foliation
- Strike and dip of shearing
- Strike and dip joint
- Strike of vertical joint
- Strike and dip joint set
- Strike of vertical joint set
- Arrows within mapped landslide and surficial failures show interpreted failure direction, barbed contacts denote interpreted limits of headscarp
- BE ~200' — Approximate bottom elevation (feet)

GEOLOGIC UNITS

Surficial Sediments:

af	Uncertified Artificial Fill
afc_2	Certified Compacted Fill - CalWest Geotechnical, 2015
afc	Certified Compacted Fill - Kovacs-Byer and Assoc., Inc., 1986, 1988
Qs	Soil
Qal	Alluvium
Qls	Landslide Debris

Bedrock:

Tm	Modelo Formation
Tvb	Conejo Volcanics
Tt	Topanga Formation

GEOLOGIC SHEET INDEX

Plate 1	GEOLOGIC MAP
Plate 2	GEOLOGIC SECTIONS A & B
Plate 3	GEOLOGIC SECTIONS C & D
Plate 4	GEOLOGIC SECTIONS E, F & G
Plate 5	GEOLOGIC SECTIONS H, I, J, K, L, M, & N
Plate 6	GEOLOGIC SECTIONS O & P

0 25 50 75 100 150 feet
Graphic Scale: 1" equals 50'

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(805) 522-5174
(805) 582-1228 (FAX)

JOB NAME:	JOB NUMBER:	DATE:	DRAFTED BY:	PLATE 1
9712 Oak Pass Rd., LLC	LP 1197	Feb., 2017	BAS	

No:	DATE:	REVISION DESCRIPTION:
1	Dec., 2018	Utilize Current Site Plan, Add Additional Geologic Borings, Test Pits, And Sections
2	Feb., 2019	Utilize Current Site Plan
3	March, 2019	Utilize Current Site Plan
4	Sept., 2019	Utilize Current Site Plan and Add Geologic Sections O & P

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS
A DIVISION OF LC ENGINEERING, INC.
889 PIERCE COURT, SUITE 101 (818)991-7148
THOUSAND OAKS, CA. 91360 (805)497-1244

CLIENT: Oak Pass Rd LLC JOB #: 5750-II
LOCATION: 9712 Oak Pass Road SCALE: 1" = 50'
DATE: March, 2019 DRAWN BY: RK

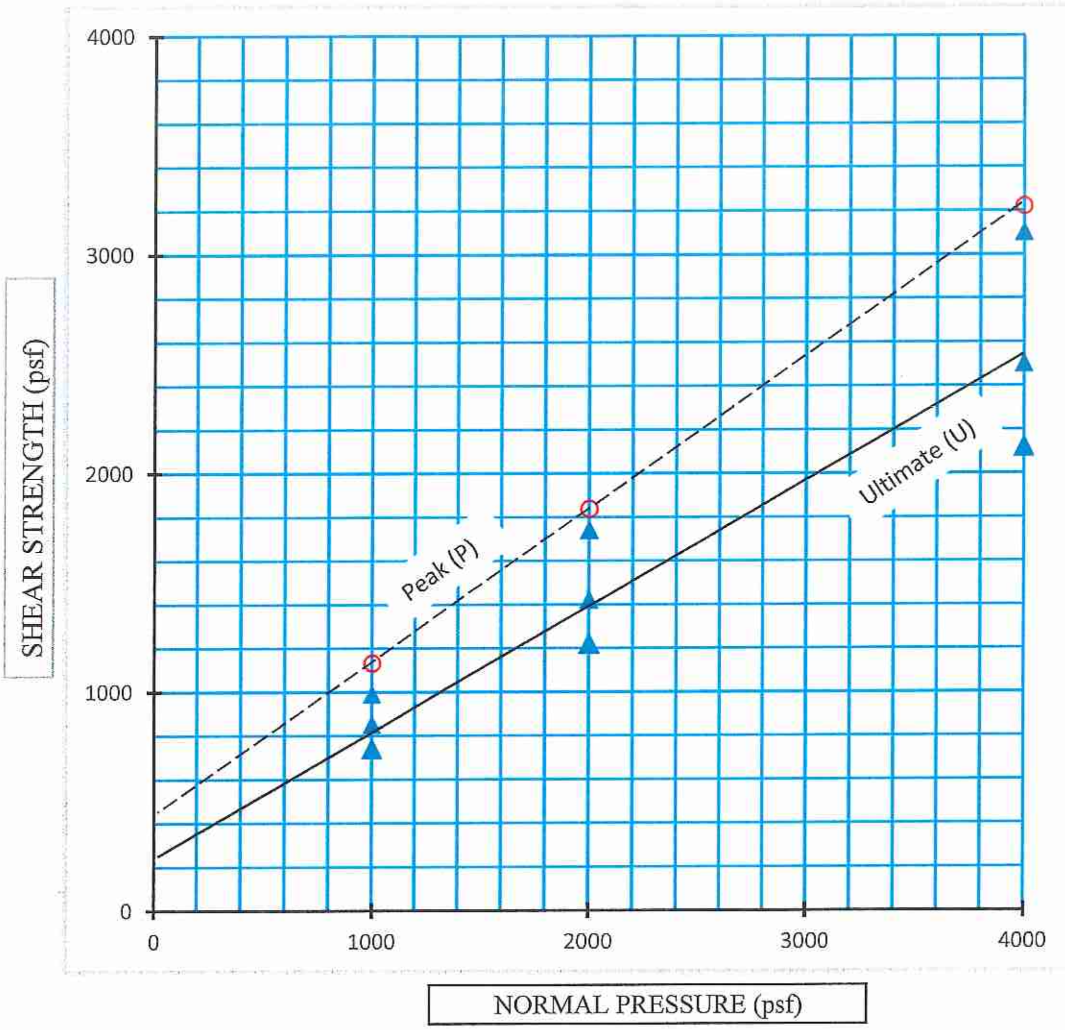
PLATE: 1

APPENDIX C

SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC **NUMBER:** 5750

SAMPLE: Weathered Tm **DATE:** July-19



Strain Rate: -0.005 in/min

Sample satuation: -24 hrs

Initial Moisture Content:

Final Moisture Content:

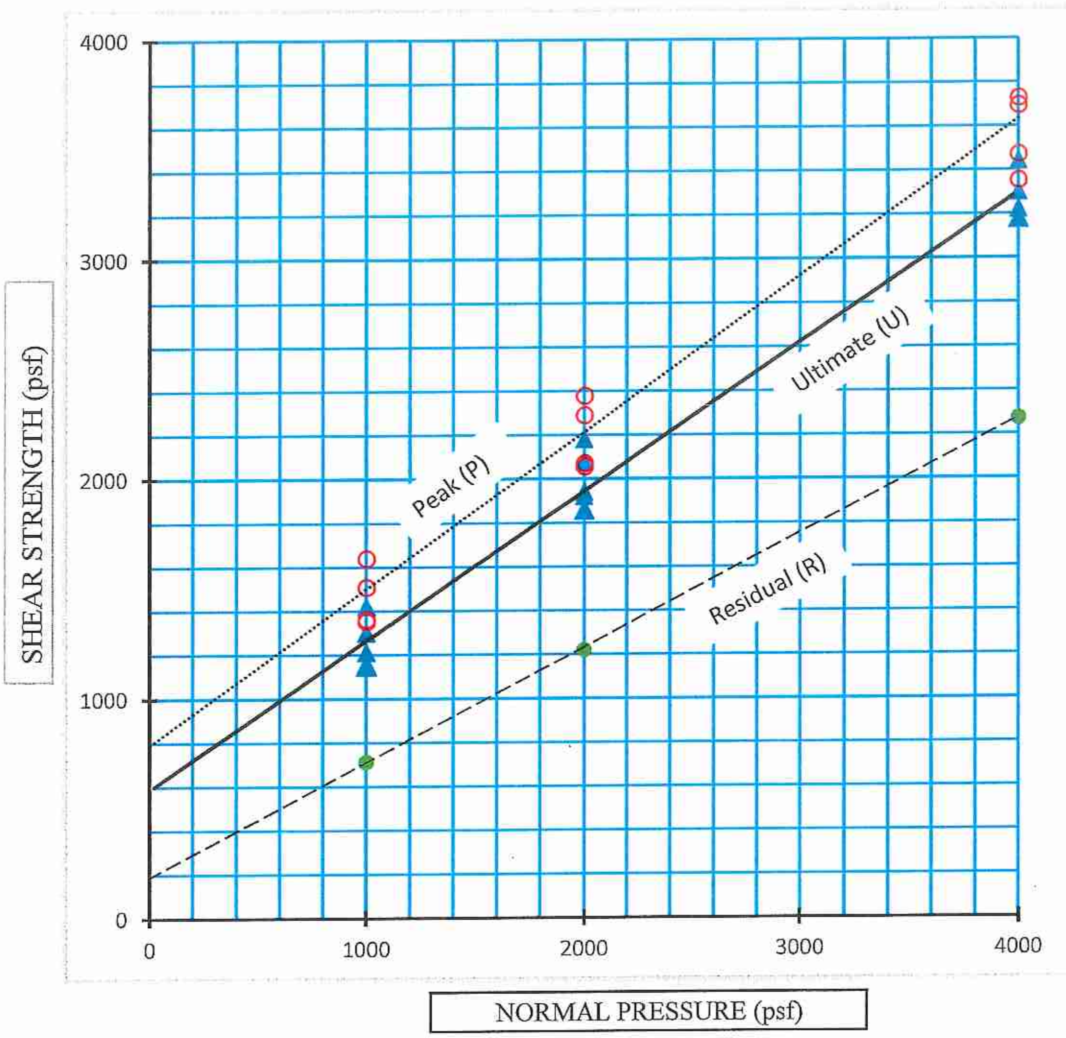
Dry Density (pcf):

Condition	γ (pcf)	ϕ (degrees)	C'(psf)
Ultimate	125	30	225
Peak	125	35	440

SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC **NUMBER:** 5750

SAMPLE: Tm - Within BCFZ **DATE:** July-19



Strain Rate: -0.005 in/min

Sample satuation: -24 hrs

Initial Moisture Content:

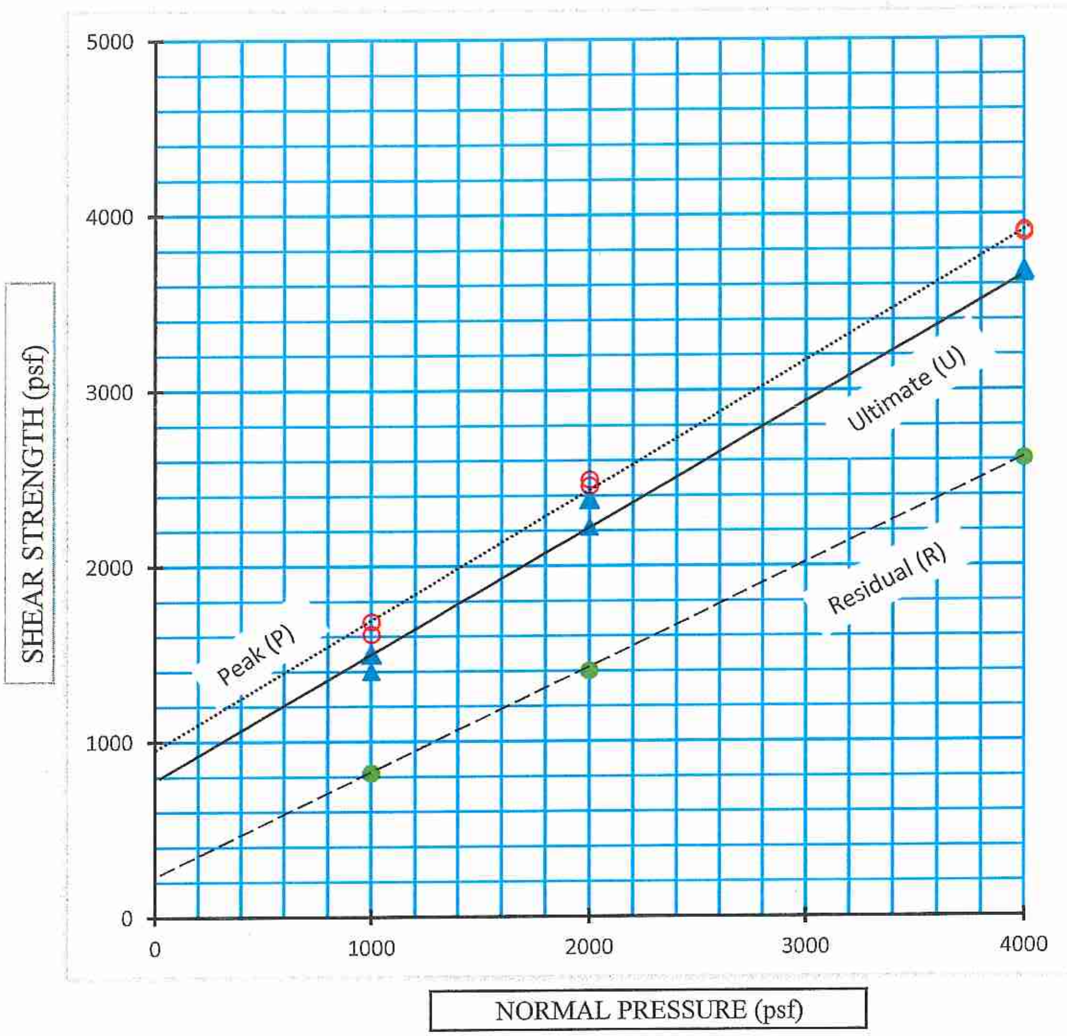
Final Moisture Content:

Dry Density (pcf):

Condition	γ (pcf)	ϕ (degrees)	C'(psf)
Ultimate	125	34	600
Peak	125	36	800
Residual	125	27	200

SHEAR TEST DIAGRAM

PROJECT:	Oak Pass Road, LLC	**NUMBER:**	5750
SAMPLE:	Tt	**DATE:**	July-19



Strain Rate: -0.005 in/min

Sample satuation: -24 hrs

Initial Moisture Content:

Final Moisture Content:

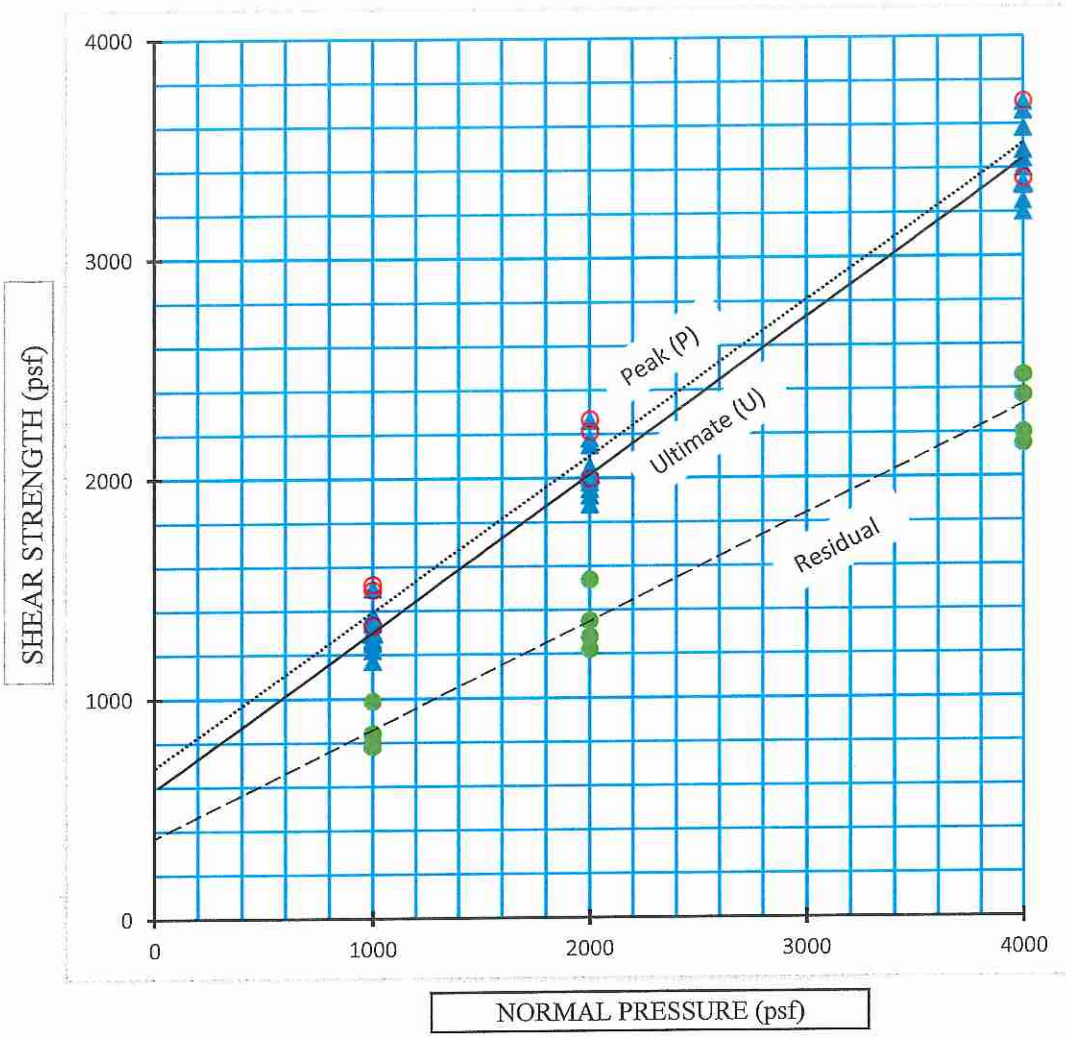
Dry Density (pcf):

Condition	γ (pcf)	ϕ (degrees)	C'(psf)
Ultimate	130	35	800
Peak	130	36	975
Residual	130	30	210

SHEAR TEST DIAGRAM

PROJECT: Oak Pass Road, LLC **NUMBER:** 5750

SAMPLE: Tm - Southside of BCFZ **DATE:** July-19

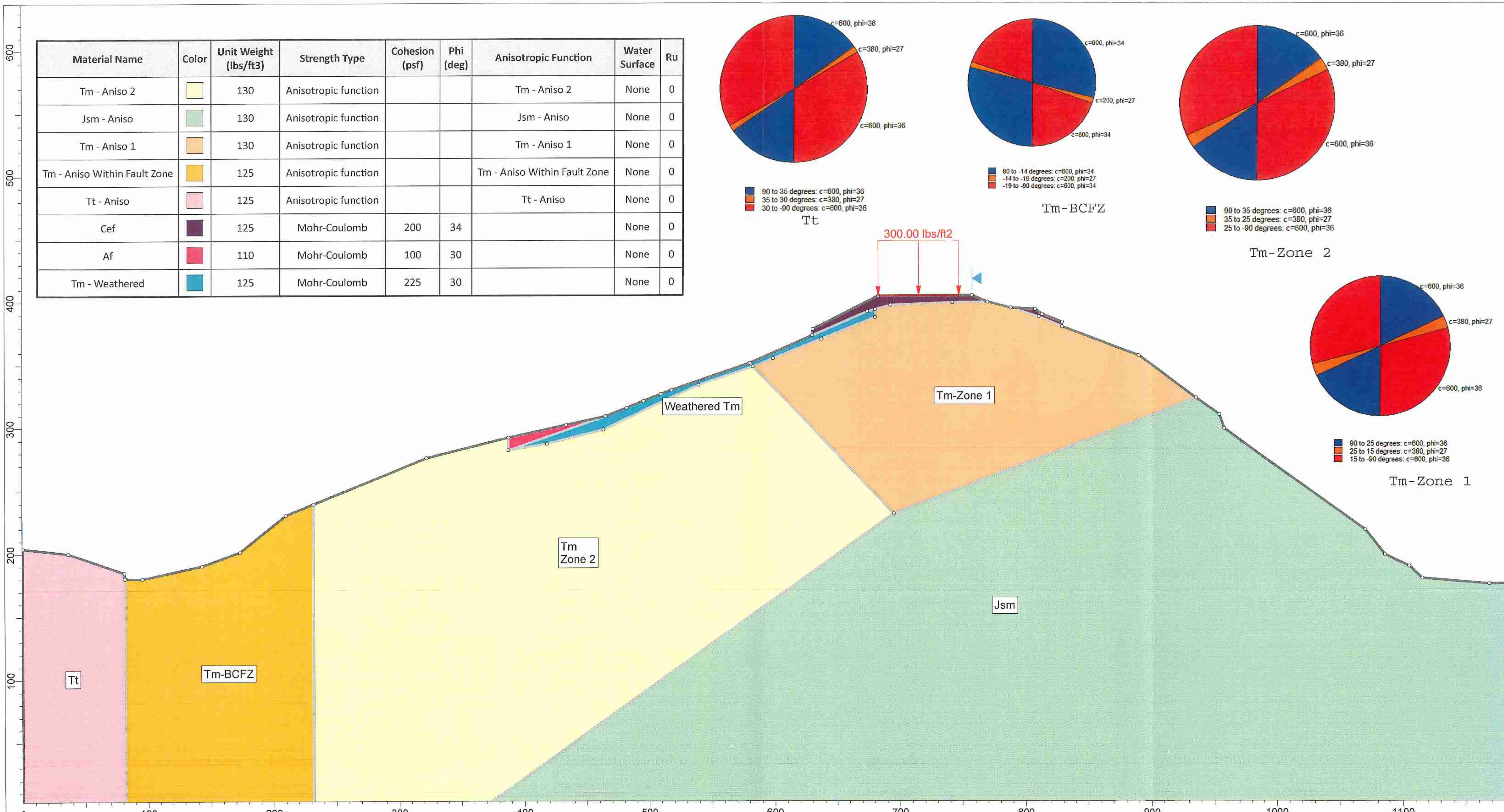


Strain Rate: -0.005 in/min	
Sample satuation: -24 hrs	
Initial Moisture Content:	
Final Moisture Content:	
Dry Density (pcf):	

SYMBOL	Condition	γ (pcf)	ϕ (degrees)	C'(psf)
▲	Ultimate	130	36	600
○	Peak	130	36	650
●	Residual	130	27	380

APPENDIX D

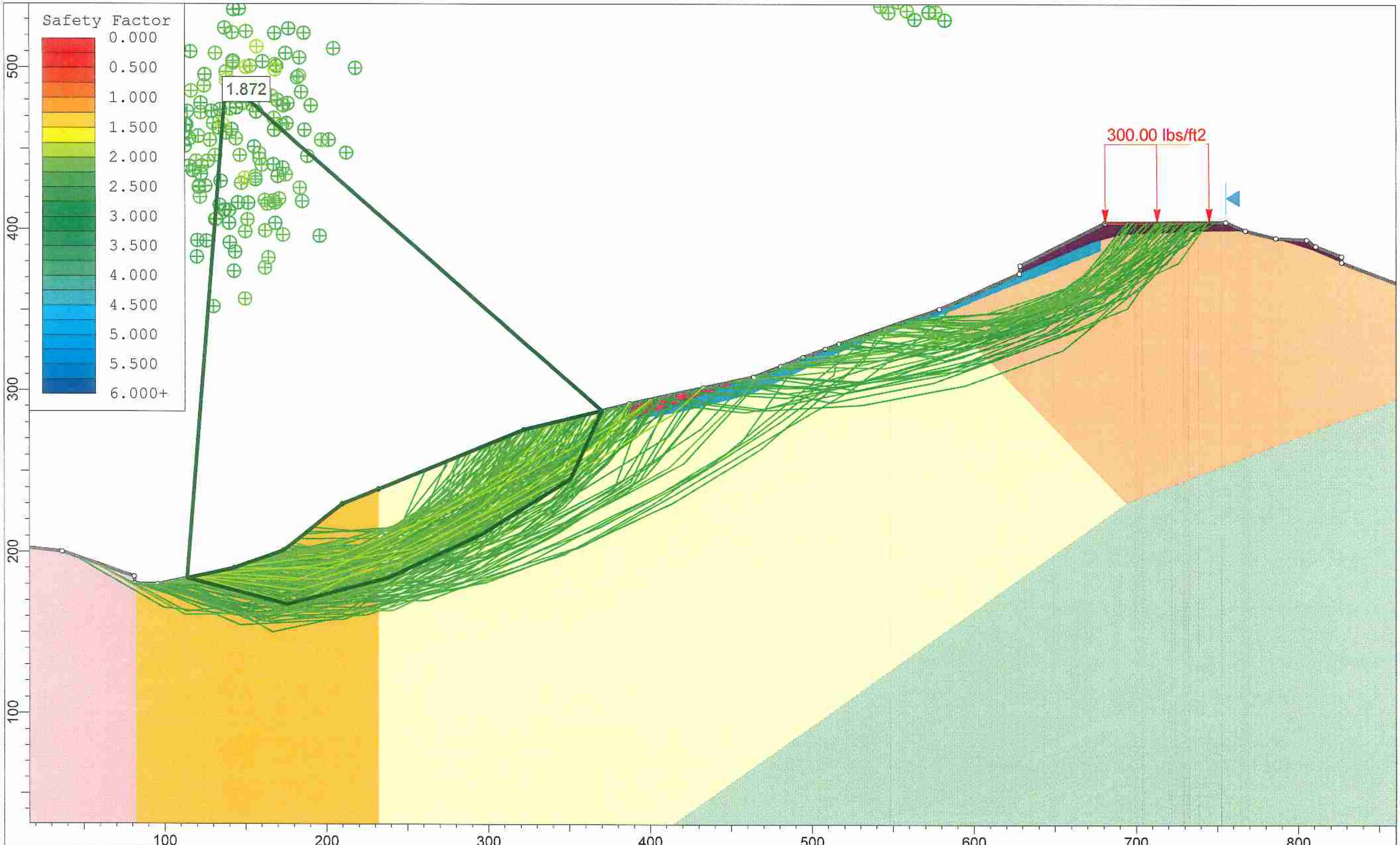
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm - Aniso 2		130	Anisotropic function			Tm - Aniso 2	None	0
Jsm - Aniso		130	Anisotropic function			Jsm - Aniso	None	0
Tm - Aniso 1		130	Anisotropic function			Tm - Aniso 1	None	0
Tm - Aniso Within Fault Zone		125	Anisotropic function			Tm - Aniso Within Fault Zone	None	0
Tt - Aniso		125	Anisotropic function			Tt - Aniso	None	0
Cef		125	Mohr-Coulomb	200	34		None	0
Af		110	Mohr-Coulomb	100	30		None	0
Tm - Weathered		125	Mohr-Coulomb	225	30		None	0



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDE 6.035

Project	Oak Pass Road		
Analysis Description	Sect A Static		
Drawn By RK	*Scale* 1:874	*Company*	Calwest
Date 8.7.2019		*File Name*	Section A - Static.sli



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Road	
	Analysis Description	Sect A Static	
	Drawn By: RK	Scale: 1:983	Company: Calwest
SLIDEINTERPRET 6.035	Date: 8.7.2019		File Name: Section A - Static.sli

Slide Analysis Information
Oak Pass Road

Project Summary

File Name: Section A - Static
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect A Static
Author: RK
Company: Calwest
Date Created: 8.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Maximum
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project*	Oak Pass Road		
	Analysis Description	Sect A Static		
	Drawn By	RK	*Scale*	*Company* Calwest
SLIDEINTERPRET 6.035	*Date*	8.7.2019		*File Name* Section A - Static.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Random Seed: 1565222207
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: 30
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

1 Distributed Load present

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road		
	Analysis Description: Sect A Static		
	Drawn By: RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 8.7.2019		File Name: Section A - Static.sli

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm - Aniso 2	Jsm - Aniso	Tm - Aniso 1	Tm - Aniso Within Fault Zone	Tt - Aniso	Cef	Af	Tm - Weathered
Color								
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	130	130	125	125	125	110	125
Cohesion [psf]						200	100	225
Friction Angle [deg]						34	30	30
Water Surface	None	None	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0	0	0

Anisotropic Functions

Name: Jsm - Aniso

Angle From	Angle To	c	phi
-90	19	1200	39
19	23	350	33
23	90	1200	39

Name: Tm - Aniso Within Fault Zone

Angle From	Angle To	c	phi
-90	-19	600	34

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road
	Analysis Description: Sect A Static
	Drawn By: RK / Scale: / Company: Calwest
SLIDEINTERPRET 6.035	Date: 8.7.2019 / File Name: Section A - Static.sli

-19	-14	200	27
-14	90	600	34

Name: Tt - Aniso

Angle From	Angle To	c	phi
-90	30	600	36
30	35	380	27
35	90	600	36

Name: Tm - Aniso 2

Angle From	Angle To	c	phi
-90	25	600	36
25	35	380	27
35	90	600	36

Name: Tm - Aniso 1

Angle From	Angle To	c	phi
-90	15	600	36
15	25	380	27
25	90	600	36

Global Minimums

Method: spencer

FS: 1.871920
Axis Location: 137.833, 492.283
Left Slip Surface Endpoint: 113.671, 183.862
Right Slip Surface Endpoint: 370.073, 287.901
Resisting Moment=2.71655e+008 lb-ft
Driving Moment=1.45121e+008 lb-ft
Resisting Horizontal Force=760229 lb

Driving Horizontal Force=406122 lb
Total Slice Area=10225.4 ft2

Global Minimum Coordinates

Method: spencer

X	Y
113.671	183.862
175.933	167.746
238.104	184.213
296.26	211.676
350.729	245.872
370.073	287.901

Valid / Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 4769
Number of Invalid Surfaces: 231

Error Codes:

Error Code -107 reported for 2 surfaces
Error Code -108 reported for 69 surfaces
Error Code -111 reported for 138 surfaces
Error Code -112 reported for 21 surfaces
Error Code -114 reported for 1 surface

Error Codes

The following errors were encountered during the computation:

-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-111 = safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-114 = Surface with Reverse Curvature.

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.87192

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	10.377	3201.47	Tm - Aniso Within Fault Zone	200	27	245.141	458.884	508.088	0	508.088
2	10.377	9604.41	Tm - Aniso Within Fault Zone	200	27	472.664	884.79	1343.97	0	1343.97
3	10.377	16040.4	Tm - Aniso Within Fault Zone	200	27	701.36	1312.89	2184.18	0	2184.18
4	10.377	23754.9	Tm - Aniso Within Fault Zone	200	27	975.49	1826.04	3191.29	0	3191.29
5	10.377	32125.7	Tm - Aniso Within Fault Zone	200	27	1272.94	2382.84	4284.07	0	4284.07
6	10.377	40698	Tm - Aniso Within Fault Zone	200	27	1577.55	2953.04	5403.16	0	5403.16
7	11.2133	54098.2	Tm - Aniso Within Fault Zone	600	34	1973.12	3693.53	4586.35	0	4586.35
8	11.2133	62423	Tm - Aniso Within Fault Zone	600	34	2225.63	4166.2	5287.11	0	5287.11
9	11.2133	70747.7	Tm - Aniso Within Fault Zone	600	34	2478.14	4638.88	5987.88	0	5987.88
10	11.2133	76103.4	Tm - Aniso Within Fault Zone	600	34	2640.59	4942.97	6438.72	0	6438.72
11	11.2133	78354	Tm - Aniso Within Fault Zone	600	34	2708.86	5070.76	6628.17	0	6628.17
12	6.10383	45340.7	Tm - Aniso 2	600	36	3062.41	5732.58	7064.39	0	7064.39
13	9.69263	72157.6	Tm - Aniso 2	380	27	1883.01	3524.84	6172.11	0	6172.11
14	9.69263	71373.5	Tm - Aniso 2	380	27	1864.7	3490.57	6104.84	0	6104.84
15	9.69263	70589.4	Tm - Aniso 2	380	27	1846.39	3456.3	6037.58	0	6037.58
16	9.69263	69805.3	Tm - Aniso 2	380	27	1828.09	3422.03	5970.32	0	5970.32

17	9.69263	69021.2	Tm - Aniso 2	380	27	1809.78	3387.76	5903.06	0	5903.06
18	9.69263	68237	Tm - Aniso 2	380	27	1791.47	3353.49	5835.8	0	5835.8
19	10.8939	74558.5	Tm - Aniso 2	380	27	1622.62	3037.42	5215.49	0	5215.49
20	10.8939	71168	Tm - Aniso 2	380	27	1557.56	2915.62	4976.43	0	4976.43
21	10.8939	67232.2	Tm - Aniso 2	380	27	1482.02	2774.22	4698.93	0	4698.93
22	10.8939	61512.6	Tm - Aniso 2	380	27	1372.25	2568.75	4295.66	0	4295.66
23	10.8939	55654.3	Tm - Aniso 2	380	27	1259.82	2358.29	3882.61	0	3882.61
24	9.67166	35107.1	Tm - Aniso 2	600	36	805.517	1507.86	1249.57	0	1249.57
25	9.67166	11702.4	Tm - Aniso 2	600	36	418.312	783.046	251.941	0	251.941

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.87192

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	113.671	183.862	0	0	0
2	124.048	181.176	3907.61	1447.81	20.3302
3	134.425	178.49	12420.6	4601.94	20.3301
4	144.802	175.804	25562.7	9471.21	20.3301
5	155.179	173.118	44253.5	16396.3	20.3301
6	165.556	170.432	68965	25552.2	20.3302
7	175.933	167.746	99842.2	36992.5	20.3302
8	187.147	170.716	108337	40140	20.3302
9	198.36	173.686	117581	43565.1	20.3302
10	209.573	176.656	127575	47267.6	20.3301
11	220.787	179.626	138050	51148.8	20.3301
12	232	182.596	148727	55104.9	20.3302
13	238.104	184.213	155992	57796.4	20.3301
14	247.796	188.79	145985	54088.8	20.3301

15	257.489	193.367	136108	50429.5	20.3302
16	267.182	197.944	126363	46818.6	20.3301
17	276.874	202.521	116747	43256	20.3302
18	286.567	207.099	107262	39741.8	20.3302
19	296.26	211.676	97908	36275.9	20.3302
20	307.154	218.515	79908.1	29606.7	20.3301
21	318.047	225.354	62834.6	23280.8	20.3301
22	328.941	232.194	46836.4	17353.4	20.3302
23	339.835	239.033	32401	12004.9	20.3302
24	350.729	245.872	19566.1	7249.44	20.3302
25	360.401	266.886	1095.12	405.752	20.3301
26	370.073	287.901	0	0	0

List Of Coordinates

Distributed Load

X	Y
745.054	404.936
681	404.54

External Boundary

X	Y
1188.4	0
1188.4	176
1167.2	175.6
1114.3	180
1103.9	189.6
1084.4	199
1068.7	218.6

956.1	299.2
952.2	310.3
934.103	323.521
888	357.2
827	380
827	383.75
811	390
805.4	394
786.2	395
767.54	399.7
755.44	405
681	404.54
628.5	378
628	373.13
578.7	351.2
516.8	329.8
508.18	326.397
494.465	321.119
480.844	315.605
463.994	308.953
432.823	302.13
387	292.1
321.7	275.9
232	239.299
209.7	230.2
173.2	201.2
142.9	190.2
95.4	179.9
82	180.28
81.3	180.3
81	184.8

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect A Static		
Drawn By	RK	*Scale*	
Company	Calwest		
Date	8.7.2019	*File Name*	Section A - Static.sli

36.4	200.2
0	204.2
0	0
82	0
232	0
369.7	0

Material Boundary

X	Y
369.7	0
693.9	231.4
934.103	323.521

Material Boundary

X	Y
232	0
232	239.299

Material Boundary

X	Y
578.7	351.2
581.292	348.504
693.9	231.4

Material Boundary

X	Y
82	0
82	180.28

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A Static		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Section A - Static.sli

SLIDEINTERPRET 6.035

Material Boundary

X	Y
480.844	315.605
495.126	321.243
508.18	326.397

Material Boundary

X	Y
628	373.13
672.1	392.119
678.422	393.852
690.704	397.22
739.851	399.33
767.54	399.7

Material Boundary

X	Y
786.2	395
808.311	387.992
827	380

Material Boundary

X	Y
387	282.1
417.663	287.157
462.386	298.338
511.483	321.671

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section A - Static.sli

SLIDEINTERPRET 6.035

538.219	333.824
581.292	348.504
597.039	354.97
635.442	370.283
678.422	387.54
678.422	393.852

Material Boundary

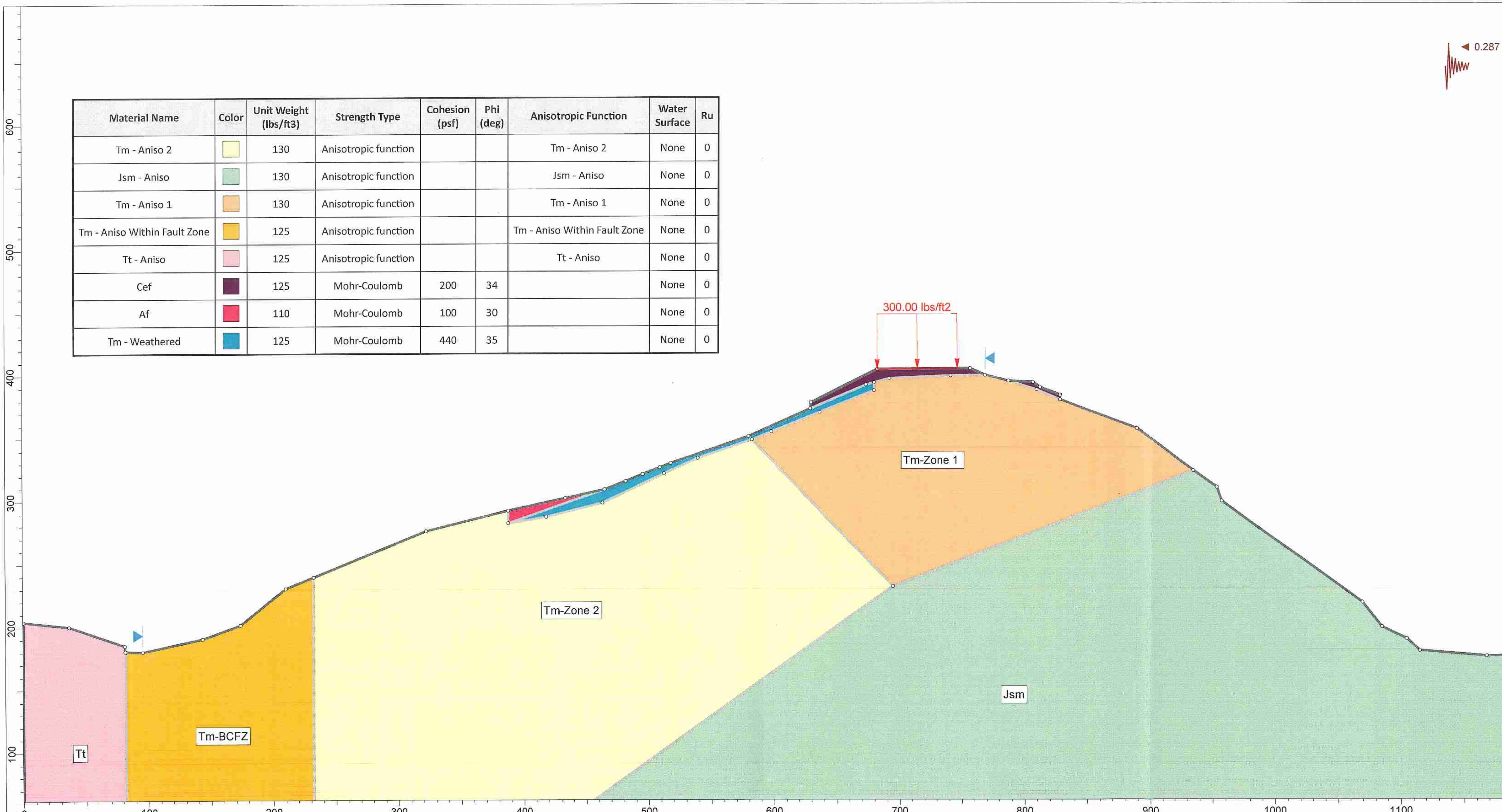
X	Y
387	292.1
387	282.1
463.994	308.953

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A Static		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Section A - Static.sli

SLIDEINTERPRET 6.035

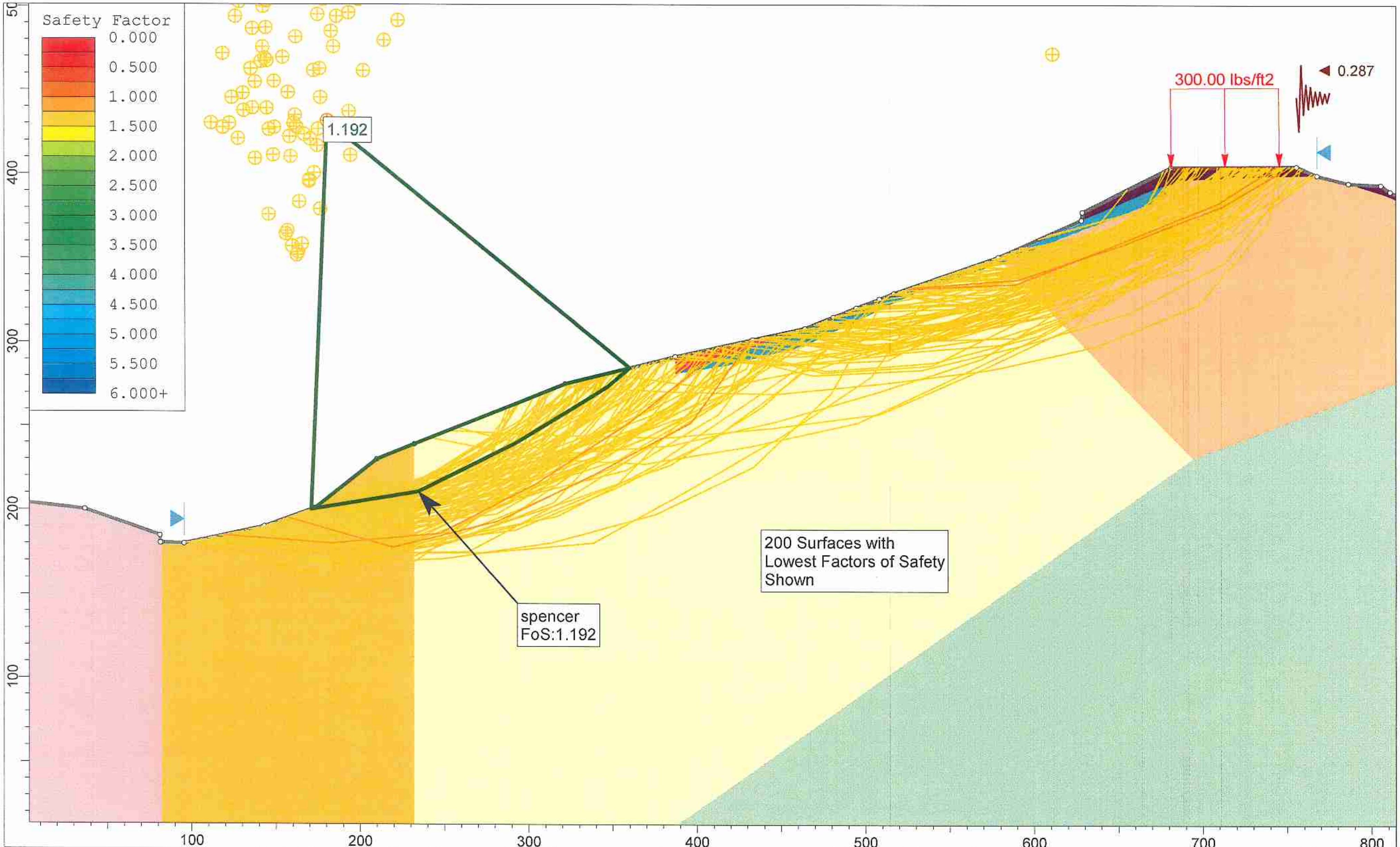
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm - Aniso 2		130	Anisotropic function			Tm - Aniso 2	None	0
Jsm - Aniso		130	Anisotropic function			Jsm - Aniso	None	0
Tm - Aniso 1		130	Anisotropic function			Tm - Aniso 1	None	0
Tm - Aniso Within Fault Zone		125	Anisotropic function			Tm - Aniso Within Fault Zone	None	0
Tt - Aniso		125	Anisotropic function			Tt - Aniso	None	0
Cef		125	Mohr-Coulomb	200	34		None	0
Af		110	Mohr-Coulomb	100	30		None	0
Tm - Weathered		125	Mohr-Coulomb	440	35		None	0



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect A SEISMIC		
Drawn By RK	*Scale* 1:874	*Company*	Calwest
Date 8.7.2019		*File Name*	Section A - Seismic.sli

SLIDE 6.035



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project			
Analysis Description			
Drawn By	Scale 1:944	Company	
Date		File Name	Section A - Seismic.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

Project Summary

File Name: Section A - Seismic
Slide Modeler Version: 6.035

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Maximum
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project		
	Analysis Description		
	Drawn By	Scale	Company
SLIDEINTERPRET 6.035	Date		File Name: Section A - Seismic.sli

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Random Seed: 1565224654
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287
1 Distributed Load present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm - Aniso 2	Jsm - Aniso	Tm - Aniso 1	Tm - Aniso Within Fault Zone	Tt - Aniso	Cef	Af	Tm - Weathered
Color								
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	130	130	125	125	125	110	125
Cohesion [psf]						200	100	440
Friction Angle [deg]						34	30	35
Water Surface	None	None	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0	0	0

Anisotropic Functions

Name: Jsm - Aniso

Angle From	Angle To	c	phi
-90	19	1470	40
19	23	350	33
23	90	1470	40

Name: Tm - Aniso Within Fault Zone

Angle From	Angle To	c	phi
-90	-19	800	36
-19	-14	200	27
-14	90	800	36

Name: Tt - Aniso

Angle From	Angle To	c	phi

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project		
Analysis Description		
Drawn By	Scale	Company
Date		File Name Section A - Seismic.sli

SLIDEINTERPRET 6.035

-90	30	650	36
30	35	380	27
35	90	650	36

Name: Tm - Aniso 2

Angle From	Angle To	c	phi
-90	25	650	36
25	35	380	27
35	90	650	36

Name: Tm - Aniso 1

Angle From	Angle To	c	phi
-90	15	650	36
15	25	380	27
25	90	650	36

Global Minimums

Method: spencer

FS: 1.192180
Axis Location: 180.348, 431.859
Left Slip Surface Endpoint: 170.864, 200.352
Right Slip Surface Endpoint: 359.863, 285.368
Resisting Moment=7.87758e+007 lb-ft
Driving Moment=6.60769e+007 lb-ft
Resisting Horizontal Force=323992 lb
Driving Horizontal Force=271764 lb
Total Slice Area=3607.39 ft2

Global Minimum Coordinates

Method: spencer

X	Y
170.864	200.352
234.3	210.942
291.834	239.686
346.316	273.862
359.863	285.368

Valid / Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 4076
Number of Invalid Surfaces: 924

Error Codes:

Error Code -106 reported for 1 surface
Error Code -107 reported for 2 surfaces
Error Code -108 reported for 592 surfaces
Error Code -111 reported for 329 surfaces

Error Codes

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.19218

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	7.64201	1474.99	Tm - Aniso Within Fault Zone	800	36	1041.68	1241.87	608.176	0	608.176
2	7.64201	5909.21	Tm - Aniso Within Fault Zone	800	36	1397.05	1665.54	1191.31	0	1191.31
3	7.64201	10490.6	Tm - Aniso Within Fault Zone	800	36	1764.23	2103.28	1793.81	0	1793.81
4	7.64201	15072	Tm - Aniso Within Fault Zone	800	36	2131.4	2541.01	2396.29	0	2396.29
5	7.64201	19653.4	Tm - Aniso Within Fault Zone	800	36	2498.57	2978.75	2998.79	0	2998.79
6	7.64201	23045.8	Tm - Aniso Within Fault Zone	800	36	2770.45	3302.88	3444.92	0	3444.92
7	7.64201	24815.3	Tm - Aniso Within Fault Zone	800	36	2912.27	3471.95	3677.62	0	3677.62
8	7.64201	26575.3	Tm - Aniso Within Fault Zone	800	36	3053.32	3640.11	3909.08	0	3909.08
9	2.30035	8677.94	Tm - Aniso 2	650	36	3060.8	3649.02	4127.8	0	4127.8
10	8.21907	30900.2	Tm - Aniso 2	380	27	1365.41	1627.82	2448.98	0	2448.98
11	8.21907	30096	Tm - Aniso 2	380	27	1338.66	1595.92	2386.37	0	2386.37
12	8.21907	29291.8	Tm - Aniso 2	380	27	1311.89	1564.01	2323.76	0	2323.76
13	8.21907	28487.7	Tm - Aniso 2	380	27	1285.13	1532.11	2261.15	0	2261.15
14	8.21907	27683.5	Tm - Aniso 2	380	27	1258.38	1500.21	2198.53	0	2198.53
15	8.21907	26879.3	Tm - Aniso 2	380	27	1231.62	1468.31	2135.93	0	2135.93
16	8.21907	26075.1	Tm - Aniso 2	380	27	1204.86	1436.41	2073.31	0	2073.31
17	7.7832	23448.3	Tm - Aniso 2	380	27	1064.32	1268.86	1744.48	0	1744.48
18	7.7832	21721.7	Tm - Aniso 2	380	27	1009.73	1203.78	1616.76	0	1616.76
19	7.7832	19995.1	Tm - Aniso 2	380	27	955.146	1138.71	1489.05	0	1489.05
20	7.7832	18251.8	Tm - Aniso 2	380	27	900.033	1073	1360.09	0	1360.09
21	7.7832	15707	Tm - Aniso 2	380	27	819.581	977.088	1171.85	0	1171.85
22	7.7832	12720.8	Tm - Aniso 2	380	27	725.172	864.536	950.955	0	950.955
23	7.7832	9734.54	Tm - Aniso 2	380	27	630.763	751.983	730.058	0	730.058
24	6.77339	5379.11	Tm - Aniso 2	650	36	742.642	885.363	323.95	0	323.95

25	6.77339	1793.04	Tm - Aniso 2	650	36	587.316	700.187	69.076	0	69.076

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.19218

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	170.864	200.352	0	0	0
2	178.506	201.628	6770.34	4540.09	33.8452
3	186.148	202.903	14243	9551.14	33.8452
4	193.79	204.179	22441.3	15048.8	33.8452
5	201.432	205.455	31365.3	21033.1	33.8452
6	209.074	206.731	41014.9	27503.9	33.8451
7	216.716	208.006	51201.8	34335.1	33.8452
8	224.358	209.282	61669	41354.3	33.8452
9	232	210.558	72414.9	48560.3	33.8452
10	234.3	210.942	75388.1	50554.1	33.8452
11	242.519	215.048	67698.7	45397.7	33.8452
12	250.738	219.154	60276.9	40420.8	33.8452
13	258.958	223.261	53122.9	35623.4	33.8452
14	267.177	227.367	46236.5	31005.5	33.8452
15	275.396	231.473	39617.9	26567.2	33.8452
16	283.615	235.58	33267	22308.4	33.8453
17	291.834	239.686	27183.8	18229.1	33.8453
18	299.617	244.568	20230.3	13566.1	33.8451
19	307.4	249.45	13970.6	9368.45	33.8451
20	315.183	254.333	8404.59	5635.99	33.8452
21	322.967	259.215	3539.08	2373.25	33.8452
22	330.75	264.097	-303.936	-203.815	33.8452

23	338.533	268.98	-2947.06	-1976.25	33.8452
24	346.316	273.862	-4390.29	-2944.06	33.8452
25	353.09	279.615	-2761.86	-1852.06	33.8452
26	359.863	285.368	0	0	0

List Of Coordinates

Distributed Load

X	Y
745.054	404.936
681	404.54

External Boundary

X	Y
1188.4	0
1188.4	176
1167.2	175.6
1114.3	180
1103.9	189.6
1084.4	199
1068.7	218.6
956.1	299.2
952.2	310.3
934.103	323.521
888	357.2
827	380
827	383.75
811	390
805.4	394

786.2	395
767.54	399.7
755.44	405
681	404.54
628.5	378
628	373.13
578.7	351.2
516.8	329.8
508.18	326.397
494.465	321.119
480.844	315.605
463.994	308.953
432.823	302.13
387	292.1
321.7	275.9
232	239.299
209.7	230.2
173.2	201.2
142.9	190.2
95.4	179.9
82	180.28
81.3	180.3
81	184.8
36.4	200.2
0	204.2
0	0
82	0
232	0
369.7	0

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project		
Analysis Description		
Drawn By	Scale	Company
Date		File Name: Section A - Seismic.sli

Material Boundary

X	Y
369.7	0
693.9	231.4
934.103	323.521

Material Boundary

X	Y
232	0
232	239.299

Material Boundary

X	Y
578.7	351.2
581.292	348.504
693.9	231.4

Material Boundary

X	Y
82	0
82	180.28

Material Boundary

X	Y
480.844	315.605
495.126	321.243
508.18	326.397

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project		
Analysis Description		
Drawn By	Scale	Company
Date		File Name Section A - Seismic.sli

SLIDEINTERPRET 6.035

Material Boundary

X	Y
628	373.13
672.1	392.119
678.422	393.852
690.704	397.22
739.851	399.33
767.54	399.7

Material Boundary

X	Y
786.2	395
808.311	387.992
827	380

Material Boundary

X	Y
387	282.1
417.663	287.157
462.386	298.338
511.483	321.671
538.219	333.824
581.292	348.504
597.039	354.97
635.442	370.283
678.422	387.54
678.422	393.852

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project		
Analysis Description		
Drawn By	Scale	Company
Date		File Name Section A - Seismic.sli

Material Boundary

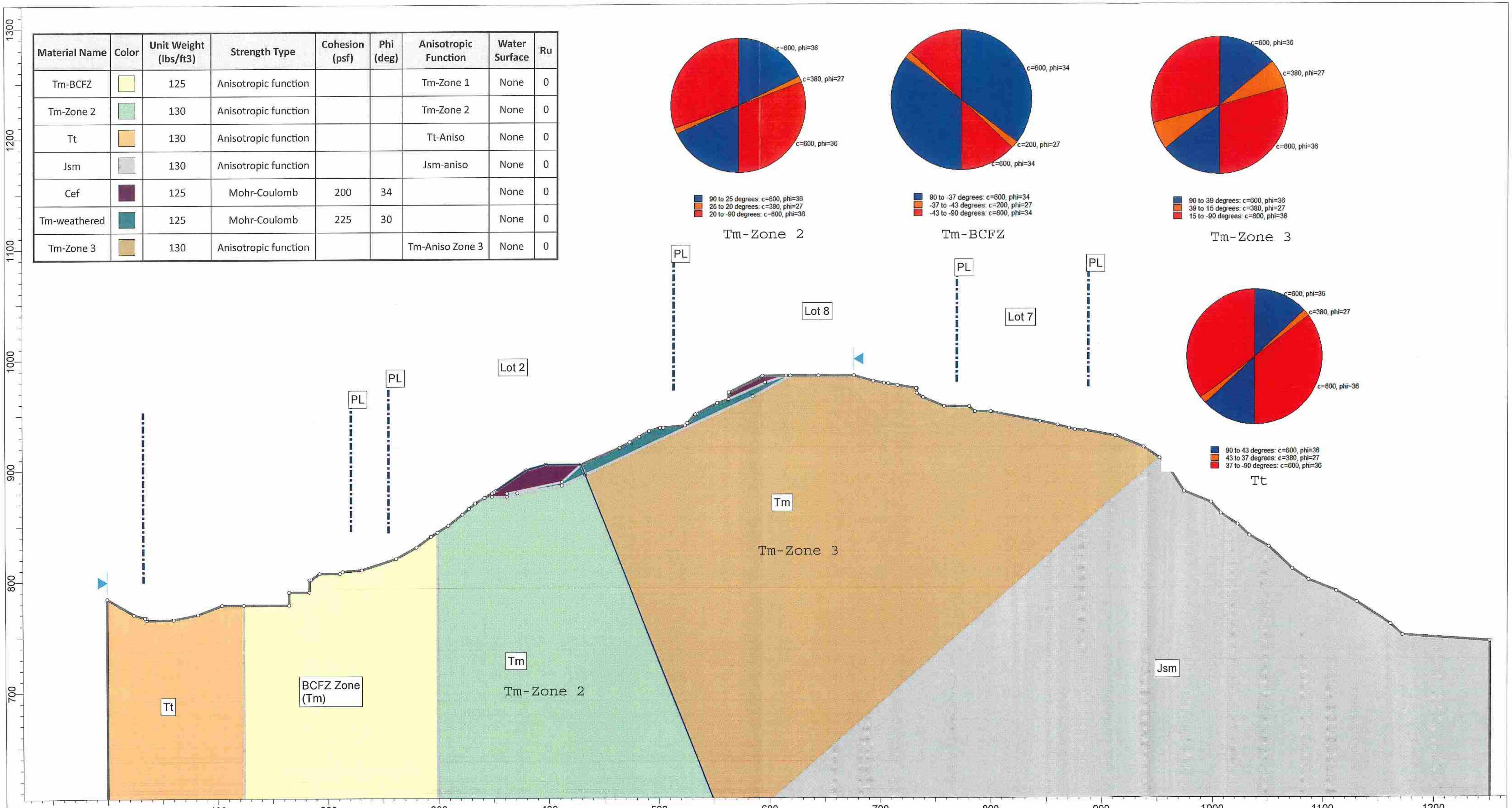
X	Y
387	292.1
387	282.1
463.994	308.953

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project		
Analysis Description		
Drawn By	Scale	Company
Date		File Name Section A - Seismic.sli

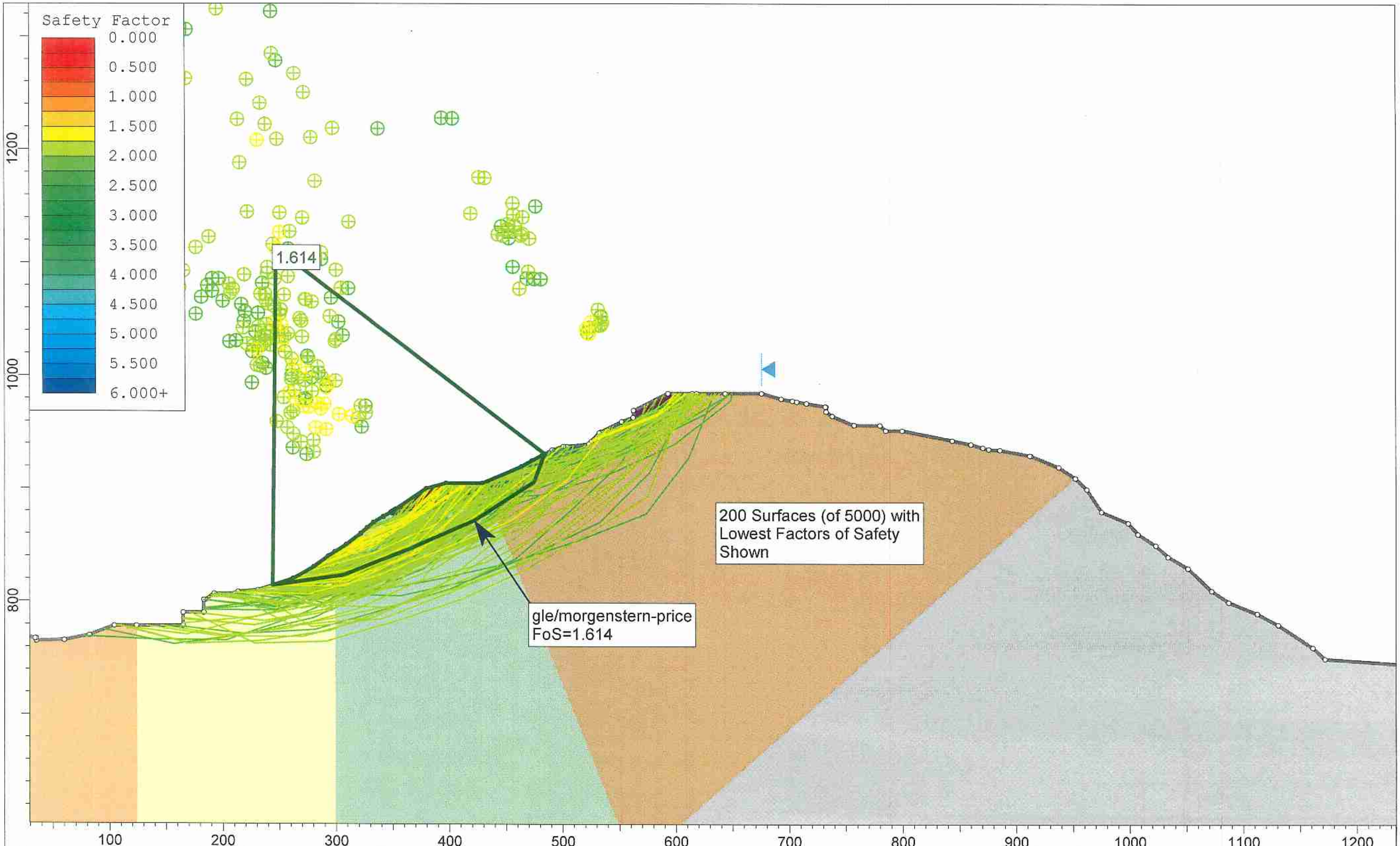
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm-BCFZ		125	Anisotropic function			Tm-Zone 1	None	0
Tm-Zone 2		130	Anisotropic function			Tm-Zone 2	None	0
Tt		130	Anisotropic function			Tt-Aniso	None	0
Jsm		130	Anisotropic function			Jsm-aniso	None	0
Cef		125	Mohr-Coulomb	200	34		None	0
Tm-weathered		125	Mohr-Coulomb	225	30		None	0
Tm-Zone 3		130	Anisotropic function			Tm-Aniso Zone 3	None	0



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDE 6.035

Project	Oak Pass LLC		
Analysis Description	Sect B STATIC		
Drawn By RK	*Scale* 1:988	*Company* CalWest	
Date 6/10/2019, 12:06:08 PM		*File Name* SECT B No Grading.slim	



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B		
Drawn By	RK	Scale	1:1403
Company	CalWest		
Date	6/10/2019, 12:06:08 PM	File Name	SECT B No Grading.slim

SLIDEINTERPRET 6.035

Slide Analysis Information

Oak Pass LLC

Project Summary

File Name: SECT B No Grading
Slide Modeler Version: 6.035
Project Title: Oak Pass LLC
Analysis: Sect B
Author: RK
Company: CalWest
Date Created: 6/10/2019, 12:06:08 PM

General Settings

Units of Measurement: Imperial Units
Time Units: days
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass LLC		
	Analysis Description	Sect B		
	Drawn By	RK	Scale	Company: CalWest
SLIDEINTERPRET 6.035	Date	6/10/2019, 12:06:08 PM		File Name: SECT B No Grading.slim

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Material Properties

Property	Tm-BCFZ	Tm-Zone 2	Tt	Jsm	Cef	Tm-weathered	Tm-Zone 3

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B		
Drawn By	RK	Scale	
Company	CalWest		
Date	6/10/2019, 12:06:08 PM	File Name	SECT B No Grading.slim

SLIDEINTERPRET 6.035

Color							
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	125	130	130	130	125	125	130
Cohesion [psf]					200	225	
Friction Angle [deg]					34	30	
Water Surface	None	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0	0

Anisotropic Functions

Name: Tm-Zone 1

Angle From	Angle To	c	phi
-90	-43	600	34
-43	-37	200	27
-37	90	600	34

Name: Tm-Zone 2

Angle From	Angle To	c	phi
-90	20	600	36
20	25	380	27
25	90	600	36

Name: Tt-Aniso

Angle From	Angle To	c	phi
-90	37	600	36
37	43	380	27
43	90	600	36

Name: Jsm-aniso

Angle From	Angle To	c	phi
-90	38	1200	39

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass LLC
Analysis Description	Sect B
Drawn By	RK
Scale	
Company	CalWest
Date	6/10/2019, 12:06:08 PM
File Name	SECT B No Grading.slim

38	44	350	33
44	90	1200	39

Name: Tm-Aniso Zone 3

Angle From	Angle To	c	phi
-90	15	600	36
15	39	380	27
39	90	600	36

Global Minimums

Method: gle/morgenstern-price

FS: 1.614130
Axis Location: 246.954, 1112.737
Left Slip Surface Endpoint: 243.888, 814.258
Right Slip Surface Endpoint: 483.897, 931.196
Resisting Moment=1.60392e+008 lb-ft
Driving Moment=9.93679e+007 lb-ft
Resisting Horizontal Force=493896 lb
Driving Horizontal Force=305984 lb
Total Slice Area=6548.4 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
243.888	814.258
306.086	823.191
364.543	846.237
422.063	871.532

474.655	905.918
483.897	931.196

Valid / Invalid Surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 4801
Number of Invalid Surfaces: 199

Error Codes:

Error Code -106 reported for 50 surfaces
Error Code -107 reported for 31 surfaces
Error Code -108 reported for 73 surfaces
Error Code -111 reported for 26 surfaces
Error Code -112 reported for 19 surfaces

Error Codes

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.61413

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	11.0224	1368.42	Tm-BCFZ	600	34	410.071	661.908	91.7831	0	91.7831
2	11.0224	4378.4	Tm-BCFZ	600	34	542.782	876.12	409.364	0	409.364
3	11.0224	10021.1	Tm-BCFZ	600	34	780.01	1259.04	977.065	0	977.065
4	11.0224	17030.9	Tm-BCFZ	600	34	1078.24	1740.42	1690.74	0	1690.74
5	11.0224	25803.9	Tm-BCFZ	600	34	1453.29	2345.8	2588.26	0	2588.26
6	7.08573	21473.2	Tm-Zone 2	600	36	1900.39	3067.48	3396.2	0	3396.2
7	9.74287	33666.4	Tm-Zone 2	380	27	1229.94	1985.29	3150.57	0	3150.57
8	9.74287	38409.6	Tm-Zone 2	380	27	1354.36	2186.12	3544.71	0	3544.71
9	9.74287	44061.6	Tm-Zone 2	380	27	1502.94	2425.94	4015.37	0	4015.37
10	9.74287	47544.6	Tm-Zone 2	380	27	1590.11	2566.64	4291.52	0	4291.52
11	9.74287	49929.5	Tm-Zone 2	380	27	1646.56	2657.76	4470.36	0	4470.36
12	9.74287	52957.4	Tm-Zone 2	380	27	1721.32	2778.44	4707.21	0	4707.21
13	11.5039	66397.3	Tm-Zone 2	380	27	1753.82	2830.9	4810.17	0	4810.17
14	11.5039	68585.3	Tm-Zone 2	380	27	1797.01	2900.61	4946.98	0	4946.98
15	11.5039	65988.3	Tm-Zone 2	380	27	1733.58	2798.22	4746.03	0	4746.03
16	11.5039	60098.1	Tm-Zone 2	380	27	1596.67	2577.24	4312.33	0	4312.33
17	11.5039	52727.4	Tm-Zone 2	380	27	1426.55	2302.64	3773.39	0	3773.39
18	8.04786	31698.1	Tm-Zone 2	600	36	1600.08	2582.74	2729.01	0	2729.01
19	8.04786	28527.8	Tm-Zone 2	600	36	1470.12	2372.96	2440.26	0	2440.26
20	9.1241	30143.5	Tm-Zone 3	380	27	997.516	1610.12	2414.24	0	2414.24
21	9.1241	27806.4	Tm-Zone 3	380	27	946.287	1527.43	2251.95	0	2251.95
22	9.1241	25494.5	Tm-Zone 3	380	27	895.095	1444.8	2089.78	0	2089.78
23	9.1241	23987	Tm-Zone 3	380	27	865.333	1396.76	1995.5	0	1995.5
24	4.16045	8221.21	Tm-Zone 3	600	36	557.62	900.071	413.013	0	413.013
25	5.08235	3518.72	Tm-weathered	225	30	194.841	314.499	155.017	0	155.017

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B		
Drawn By	RK	Scale	Company: CalWest
Date	6/10/2019, 12:06:08 PM		File Name: SECT B No Grading.slim

SLIDEINTERPRET 6.035

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.61413

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	243.888	814.258	0	0	0
2	254.91	815.841	4379.97	293.679	3.83597
3	265.933	817.424	9721.68	1290.14	7.55941
4	276.955	819.007	16782.6	3282.79	11.0677
5	287.978	820.59	26004.7	6616.69	14.2755
6	299	822.173	37944.8	11686.6	17.1183
7	306.086	823.191	47970	16266.5	18.7317
8	315.829	827.032	47866.2	18048.5	20.6595
9	325.571	830.873	47462.1	19407.3	22.2397
10	335.314	834.714	46699.4	20272.2	23.4657
11	345.057	838.555	45726.4	20679.7	24.3348
12	354.8	842.396	44617.1	20660	24.8466
13	364.543	846.237	43327.4	20205	25.0012
14	376.047	851.296	39192.2	18046.5	24.7243
15	387.551	856.355	34862.1	15484.7	23.9494
16	399.055	861.414	30818.2	12876.5	22.6762
17	410.559	866.473	27391.5	10464.1	20.9079
18	422.063	871.532	24732	8348.88	18.6533
19	430.11	876.794	23264.5	7022.87	16.7975
20	438.158	882.056	22269.1	5852.8	14.7255
21	447.282	888.021	16978.8	3651.28	12.1366
22	456.406	893.987	12188.6	2001.55	9.32559
23	465.531	899.953	7898.32	877.027	6.33615
24	474.655	905.918	3898.57	219.423	3.22138
25	478.815	917.297	1521.81	47.1778	1.77566

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass LLC		
Analysis Description	Sect B		
Drawn By	RK	Scale	
Company	CalWest		
Date	6/10/2019, 12:06:08 PM	File Name	SECT B No Grading.slim

26	483.897	931.196	0	0	0

List Of Coordinates

External Boundary

X	Y
1171.81	750
1161.18	760
1130.7	780
1112.2	790
1087.11	800
1072.13	810.011
1051.23	830
1033.72	840
1022.92	850
1007.28	860
998.563	870
975.08	880
962.111	900
952.221	910
952.096	910.084
937.353	920
912.829	930
912	930.157
885.666	935.152
875.802	935.706
870.641	937.117
860.101	940
843.72	943.39
799.454	952.2

785.081	952.2
780	956.9
757.15	957
738	965
732.523	968.822
732.523	973.222
731.852	973.239
715.18	976.029
706.591	977.565
702.849	978.235
693	980
675.6	984.9
643.484	984.9
618.3	984.9
614.364	984.9
592.87	984.9
562.8	969.8
562.417	969.8
562.128	963.632
551.946	960
533.378	950.594
532.205	950
525.037	942.251
522.954	940
503.602	937.991
500.528	938
490.735	935
481.747	930
472.71	925
472.7	925
463.67	920

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B		
Drawn By	RK	Scale	Company: CalWest
Date	6/10/2019, 12:06:08 PM	File Name	SECT B No Grading.slim

SLIDEINTERPRET 6.035

429.1	904.9
397	904.9
379.5	900
352.128	881.404
350.062	880
348.4	879.019
341.588	875
333.115	870
327.422	865
321.729	860
308.848	850
299	843.743
293.109	840
280.187	830.374
261.619	820
230.739	810
213.277	808.477
210.712	806.872
192.292	806.872
184.507	801.328
183.155	801.328
183.155	790.073
164.8	790.073
164.8	778.4
123.7	778.4
104.137	778.4
81.9654	770
59.9262	765.5
35.2221	764.974
35.2221	766.974
34.0534	766.974

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass LLC		
Analysis Description	Sect B		
Drawn By	RK	*Scale*	
		Company	CalWest
Date	6/10/2019, 12:06:08 PM	*File Name*	SECT B No Grading.slim

24.117	769.974
0	784.255
0	600
123.7	600
299	600
550	600
600	600
1249.96	600
1249.96	744.63

Material Boundary

X	Y
123.7	600
123.7	778.4

Material Boundary

X	Y
299	600
299	843.743

Material Boundary

X	Y
600	600
952.096	910.084

Material Boundary

X	Y
562.128	963.632

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B		
Drawn By	RK	Scale	
Company	CalWest		
Date	6/10/2019, 12:06:08 PM	File Name	SECT B No Grading.slim

SLIDEINTERPRET 6.035

595.267	978.826
614.364	984.9

Material Boundary

X	Y
348.4	879.019
348.4	876
362	876
362	878.8
411.5	889.2
429.1	904.9

Material Boundary

X	Y
362	876
371.5	879.16
411.5	886
432.688	895.851
584	966.2
618.3	984.9

Material Boundary

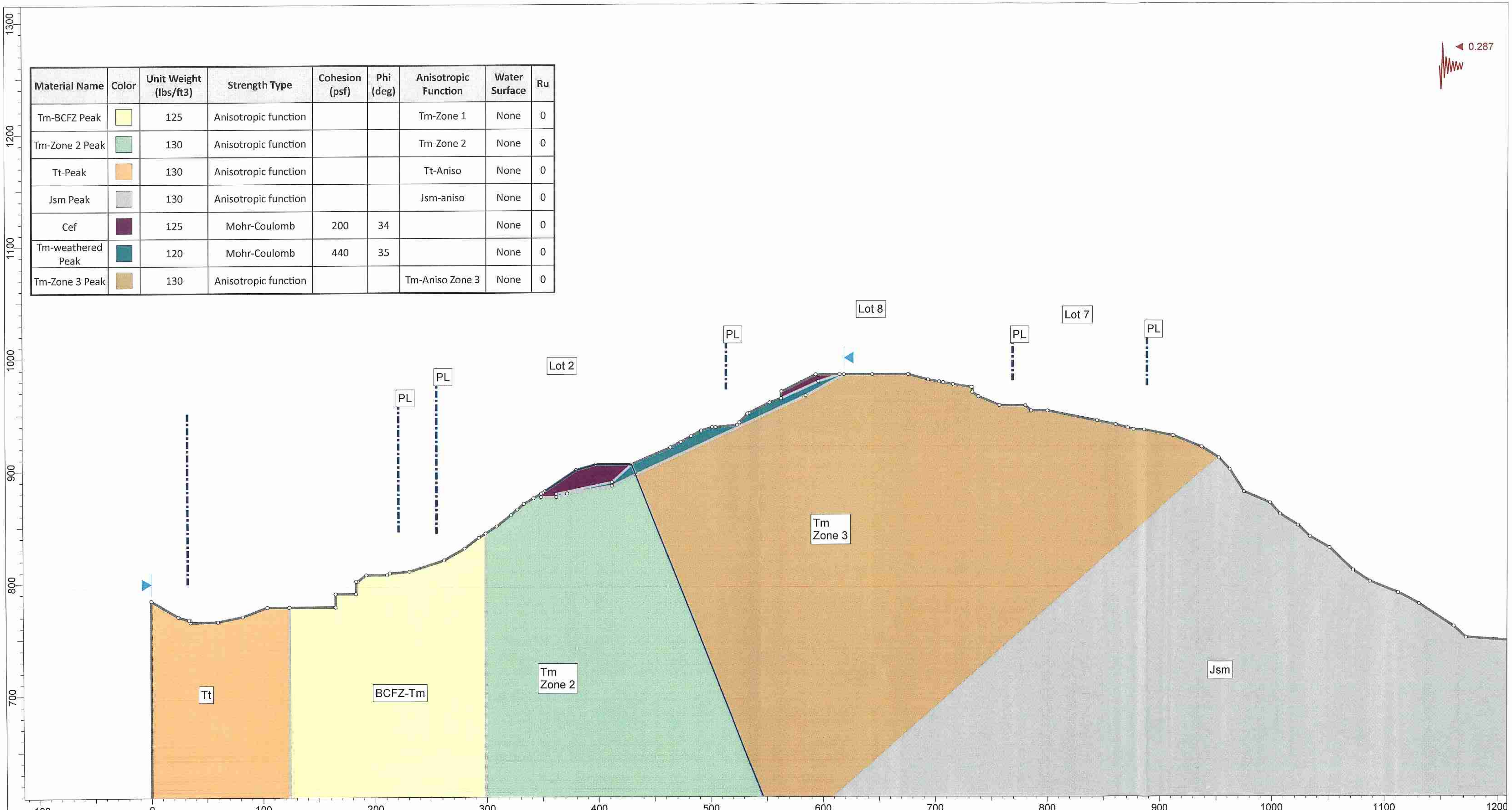
X	Y
429.1	904.9
432.688	895.851
550	600

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B		
Drawn By	RK	Scale	
Company	CalWest		
Date	6/10/2019, 12:06:08 PM	File Name	SECT B No Grading.slim

SLIDEINTERPRET 6.035

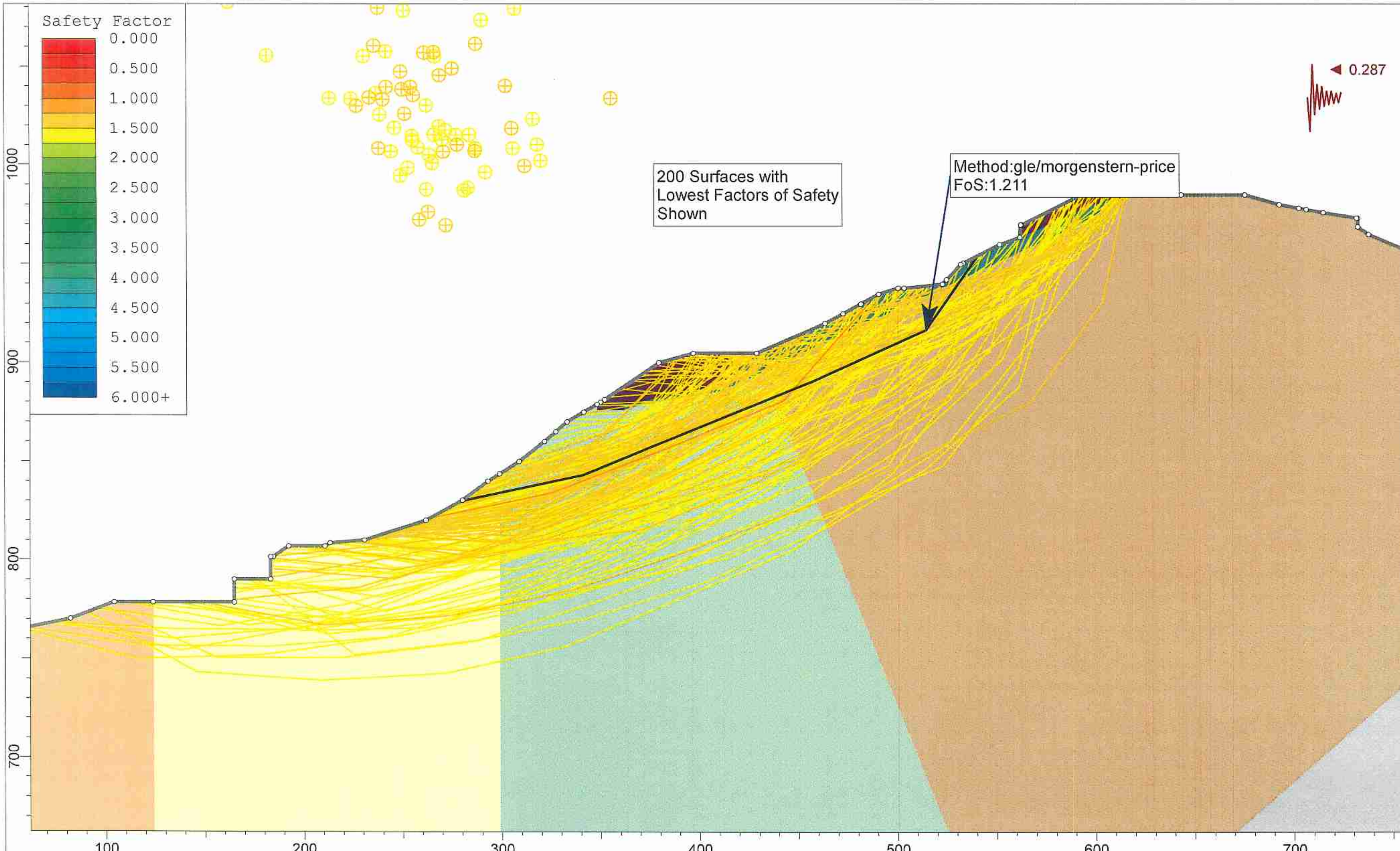
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm-BCFZ Peak		125	Anisotropic function			Tm-Zone 1	None	0
Tm-Zone 2 Peak		130	Anisotropic function			Tm-Zone 2	None	0
Tt-Peak		130	Anisotropic function			Tt-Aniso	None	0
Jsm Peak		130	Anisotropic function			Jsm-aniso	None	0
Cef		125	Mohr-Coulomb	200	34		None	0
Tm-weathered Peak		120	Mohr-Coulomb	440	35		None	0
Tm-Zone 3 Peak		130	Anisotropic function			Tm-Aniso Zone 3	None	0



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By	RK	Scale	1:973
Company	CalWest		
Date		File Name	SECT B No Grading Seis.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By	RK	Scale	1:811
Company	CalWest		
Date		File Name	SECT B No Grading Seis.sli

Slide Analysis Information
Oak Pass LLC

Project Summary

File Name: SECT B No Grading Seis
Slide Modeler Version: 6.035
Project Title: Oak Pass LLC
Analysis: Sect B Seismic
Author: RK
Company: CalWest

General Settings

Units of Measurement: Imperial Units
Time Units: days
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50

Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: 20
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287

Material Properties

Property	Tm-Zone 1	Tm-Zone 2	Tt	Jsm	Cef	Tm-weathered	Tm-Zone 3
Color							
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	130	130	130	130	125	120	130
Cohesion [psf]					200	280	
Friction Angle [deg]					34	25	
Water Surface	None	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0	0

Anisotropic Functions

Name: Tm-Zone 1

Angle From	Angle To	c	phi
-90	-43	900	43
-43	-37	400	32
-37	90	900	43

Name: Tm-Zone 2

Angle From	Angle To	c	phi
-90	20	900	43
20	25	400	32
25	90	900	43

Name: Tt-Aniso

Angle From	Angle To	c	phi
-90	37	660	37
37	43	300	35
43	90	660	37

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By	RK	Scale	
Company	CalWest		
Date		File Name	SECT B No Grading Seis.sli

SLIDEINTERPRET 6.035

Name: Jsm-aniso

Angle From	Angle To	c	phi
-90	38	900	43
38	44	400	32
44	90	900	43

Name: Tm-Aniso Zone 3

Angle From	Angle To	c	phi
-90	15	900	43
15	39	400	32
39	90	900	43

Global Minimums

Method: gle/morgenstern-price

FS: 1.211490
Axis Location: 285.844, 1153.460
Left Slip Surface Endpoint: 279.555, 830.020
Right Slip Surface Endpoint: 540.823, 954.365
Resisting Moment=2.02524e+008 lb-ft
Driving Moment=1.67169e+008 lb-ft
Resisting Horizontal Force=595994 lb
Driving Horizontal Force=491951 lb
Total Slice Area=6633.08 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
279.555	830.02

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By	RK	Scale	Company: CalWest
Date		File Name	SECT B No Grading Seis.sli

SLIDEINTERPRET 6.035

341.011	843.117
399.184	866.87
457.348	890.648
514.525	916.707
540.823	954.365

Valid / Invalid Surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 4908
Number of Invalid Surfaces: 92

Error Codes:

Error Code -108 reported for 36 surfaces
Error Code -111 reported for 48 surfaces
Error Code -112 reported for 7 surfaces
Error Code -114 reported for 1 surface

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-114 = Surface with Reverse Curvature.

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.21149

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	9.72247	3123.94	Tm-Zone 1	900	43	904.848	1096.21	210.414	0	210.414
2	9.72247	9407.68	Tm-Zone 1	900	43	1471.03	1782.14	945.976	0	945.976
3	10.5028	16109.9	Tm-Zone 2	900	43	2036.06	2466.67	1680.05	0	1680.05
4	10.5028	23297.9	Tm-Zone 2	900	43	2742.51	3322.52	2597.84	0	2597.84
5	10.5028	31885.6	Tm-Zone 2	900	43	3599.82	4361.15	3711.63	0	3711.63
6	10.5028	40236.9	Tm-Zone 2	900	43	4486.1	5434.87	4863.06	0	4863.06
7	11.6346	49254.2	Tm-Zone 2	400	32	2222.69	2692.77	3669.19	0	3669.19
8	11.6346	53049.6	Tm-Zone 2	400	32	2256.46	2733.68	3734.67	0	3734.67
9	11.6346	57421.8	Tm-Zone 2	400	32	2305.62	2793.23	3829.97	0	3829.97
10	11.6346	60246.1	Tm-Zone 2	400	32	2312.17	2801.17	3842.68	0	3842.68
11	11.6346	58124.9	Tm-Zone 2	400	32	2183.91	2645.78	3594	0	3594
12	9.6798	44248.5	Tm-Zone 2	400	32	1991.85	2413.11	3221.65	0	3221.65
13	9.6798	39319.1	Tm-Zone 2	400	32	1788.35	2166.57	2827.1	0	2827.1
14	9.6798	34358.9	Tm-Zone 2	400	32	1592.24	1928.98	2446.88	0	2446.88
15	9.6798	31601	Tm-Zone 2	400	32	1480.14	1793.18	2229.55	0	2229.55
16	9.72214	32087.1	Tm-Zone 3	400	32	1484.9	1798.94	2238.77	0	2238.77
17	9.72214	32457.7	Tm-Zone 3	400	32	1497.69	1814.44	2263.57	0	2263.57
18	11.4355	38436.2	Tm-Zone 3	400	32	1449.44	1755.98	2170.02	0	2170.02
19	11.4355	39698.3	Tm-Zone 3	400	32	1512.77	1832.71	2292.82	0	2292.82
20	11.4355	41243.6	Tm-Zone 3	400	32	1597.38	1935.21	2456.85	0	2456.85
21	11.4355	40447	Tm-Zone 3	400	32	1616.82	1958.76	2494.54	0	2494.54
22	11.4355	35486.1	Tm-Zone 3	400	32	1497.92	1814.72	2264.02	0	2264.02
23	8.88867	18774	Tm-Zone 3	900	43	1118.24	1354.73	487.641	0	487.641
24	8.88867	10515.9	Tm-Zone 3	900	43	809.671	980.908	86.7635	0	86.7635
25	8.52017	4030.84	Tm-weathered	280	25	265.915	322.154	90.3992	0	90.3992

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By	RK	Scale	
Company	CalWest		
Date		File Name	SECT B No Grading Seis.sli

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.21149

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	279.555	830.02	0	0	0
2	289.278	832.092	7480.09	799.062	6.09751
3	299	834.164	17147	3638.46	11.98
4	309.503	836.402	30184.7	9741.15	17.8858
5	320.006	838.64	46537.8	19923	23.1759
6	330.508	840.878	66953.3	35262.3	27.7744
7	341.011	843.117	91719.4	56577	31.6683
8	352.646	847.867	86057	60689	35.1922
9	364.28	852.618	79387.8	61907.3	37.9474
10	375.915	857.369	71583.9	60070.5	40.0021
11	387.55	862.12	62985.5	55560.7	41.4161
12	399.184	866.87	54682.3	49642.7	42.2344
13	408.864	870.827	48548.8	44457.5	42.4812
14	418.544	874.785	43417.9	39563.6	42.3407
15	428.224	878.742	39313.6	35161.9	41.8093
16	437.903	882.699	35773.9	30960.8	40.8748
17	447.625	886.673	32128.5	26493.4	39.5092
18	457.348	890.648	28402.8	21941.2	37.6861
19	468.783	895.859	22665.4	15815.4	34.9065
20	480.219	901.071	16651.4	10155.4	31.3783
21	491.654	906.283	10308.2	5262.01	27.0429
22	503.09	911.495	4219.74	1693.91	21.8718
23	514.525	916.707	-605.449	-172.432	15.897
24	523.414	929.436	-2243.75	-427.026	10.7756
25	532.302	942.164	843.189	78.9768	5.35096

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By	RK	Scale	Company: CalWest
Date		File Name	SECT B No Grading Seis.sli

SLIDEINTERPRET 6.035

26	540.823	954.365	0	0	0

List Of Coordinates

External Boundary

X	Y
1171.81	750
1161.18	760
1130.7	780
1112.2	790
1087.11	800
1072.13	810.011
1051.23	830
1033.72	840
1022.92	850
1007.28	860
998.563	870
975.08	880
962.111	900
952.221	910
952.096	910.084
937.353	920
912.829	930
912	930.157
885.666	935.152
875.802	935.706
870.641	937.117
860.101	940
843.72	943.39
799.454	952.2

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By RK	*Scale*	*Company*	CalWest
Date		*File Name*	SECT B No Grading Seis.sli

SLIDEINTERPRET 6.035

785.081	952.2
780	956.9
757.15	957
738	965
732.523	968.822
732.523	973.222
731.852	973.239
715.18	976.029
706.591	977.565
702.849	978.235
693	980
675.6	984.9
643.484	984.9
618.3	984.9
614.364	984.9
592.87	984.9
562.8	969.8
562.417	969.8
562.128	963.632
551.946	960
533.378	950.594
532.205	950
525.037	942.251
522.954	940
503.602	937.991
500.528	938
490.735	935
481.747	930
472.71	925
472.7	925
463.67	920

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By	RK	Scale	Company: CalWest
Date		File Name	SECT B No Grading Seis.sli

	429.1	904.9
	397	904.9
	379.5	900
	352.128	881.404
	350.062	880
	348.4	879.019
	341.588	875
	333.115	870
	327.422	865
	321.729	860
	308.848	850
	299	843.743
	293.109	840
	280.187	830.374
	261.619	820
	230.739	810
	213.277	808.477
	210.712	806.872
	192.292	806.872
	184.507	801.328
	183.155	801.328
	183.155	790.073
	164.8	790.073
	164.8	778.4
	123.7	778.4
	104.137	778.4
	81.9654	770
	59.9262	765.5
	35.2221	764.974
	35.2221	766.974
	34.0534	766.974

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project Oak Pass LLC			
Analysis Description Sect B Seismic			
Drawn By RK	*Scale*	*Company* CalWest	
Date		*File Name* SECT B No Grading Seis.sli	

24.117	769.974
0	784.255
0	600
123.7	600
299	600
550	600
600	600
1249.96	600
1249.96	744.63

Material Boundary

X	Y
123.7	600
123.7	778.4

Material Boundary

X	Y
299	600
299	843.743

Material Boundary

X	Y
600	600
952.096	910.084

Material Boundary

X	Y
562.128	963.632

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By	RK	Scale	Company: CalWest
Date		File Name	SECT B No Grading Seis.sli

SLIDEINTERPRET 6.035

595.267	978.826
614.364	984.9

Material Boundary

X	Y
348.4	879.019
348.4	876
362	876
362	878.8
411.5	889.2
429.1	904.9

Material Boundary

X	Y
362	876
371.5	879.16
411.5	886
432.688	895.851
584	966.2
618.3	984.9

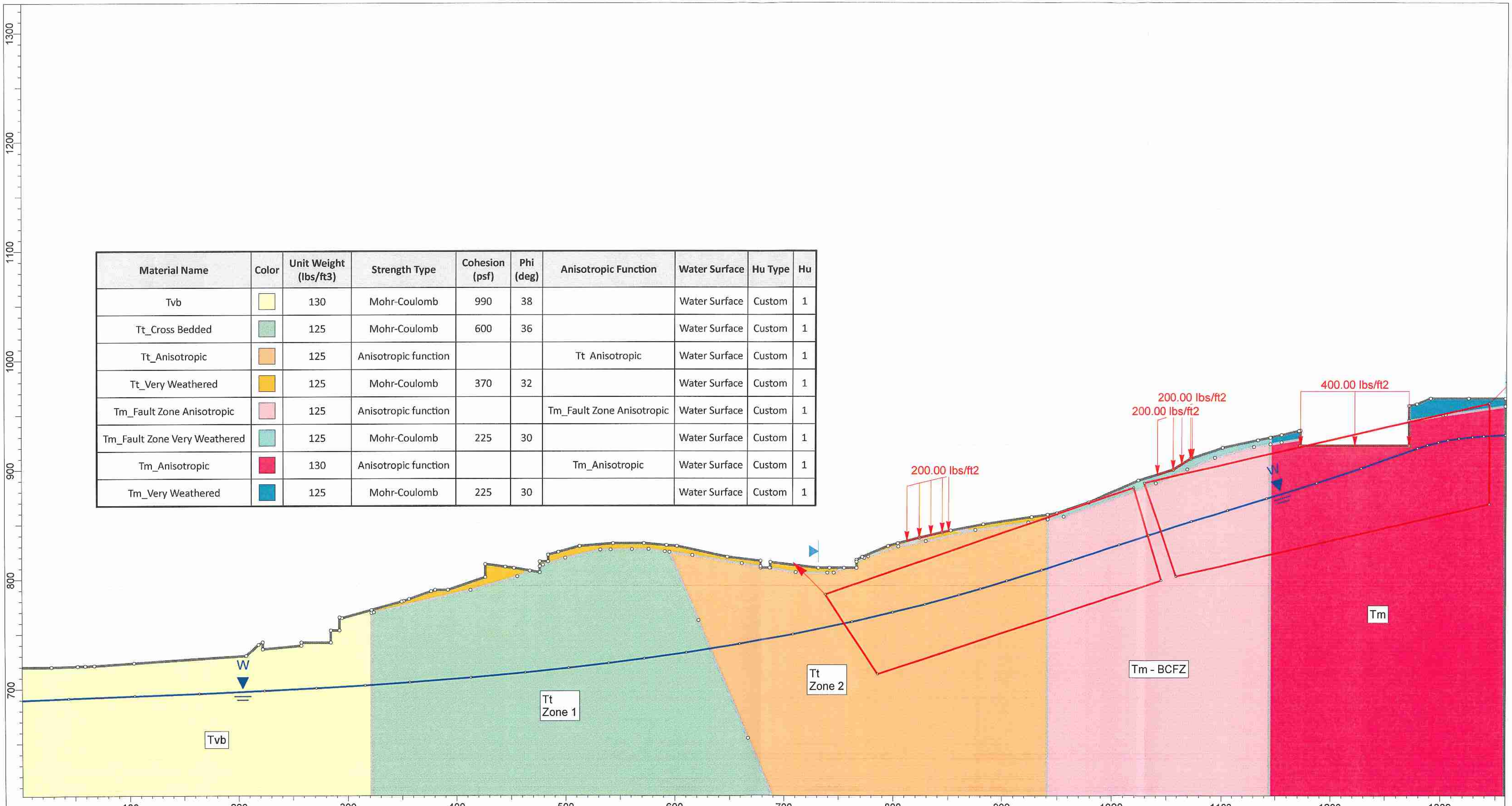
Material Boundary

X	Y
429.1	904.9
432.688	895.851
550	600

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass LLC		
Analysis Description	Sect B Seismic		
Drawn By	RK	Scale	
Company	CalWest		
Date		File Name	SECT B No Grading Seis.sli

SLIDEINTERPRET 6.035

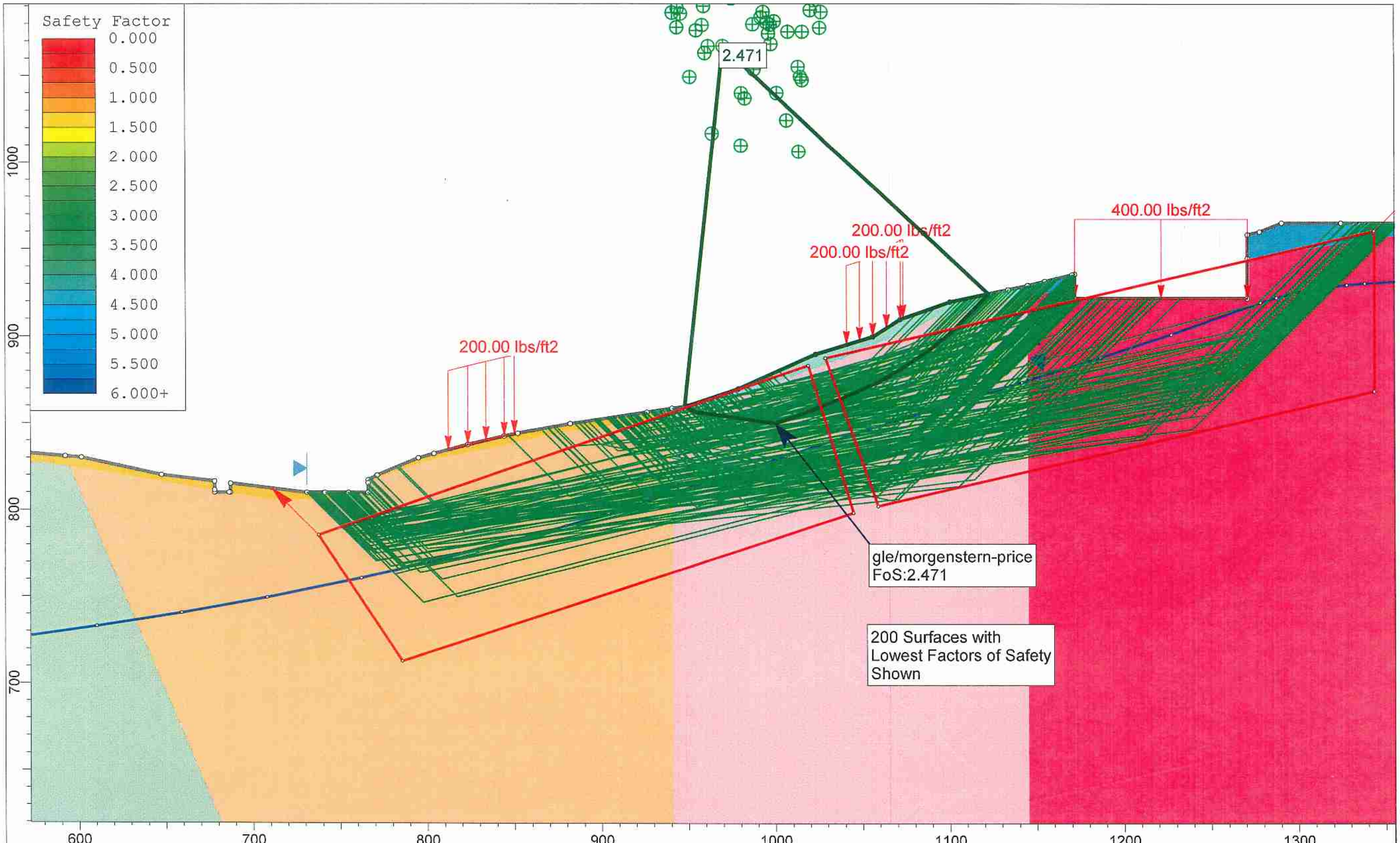


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Hu Type	Hu
Tvb		130	Mohr-Coulomb	990	38		Water Surface	Custom	1
Tt_Cross Bedded		125	Mohr-Coulomb	600	36		Water Surface	Custom	1
Tt_Anisotropic		125	Anisotropic function			Tt Anisotropic	Water Surface	Custom	1
Tt_Very Weathered		125	Mohr-Coulomb	370	32		Water Surface	Custom	1
Tm_Fault Zone Anisotropic		125	Anisotropic function			Tm_Fault Zone Anisotropic	Water Surface	Custom	1
Tm_Fault Zone Very Weathered		125	Mohr-Coulomb	225	30		Water Surface	Custom	1
Tm_Anisotropic		130	Anisotropic function			Tm_Anisotropic	Water Surface	Custom	1
Tm_Very Weathered		125	Mohr-Coulomb	225	30		Water Surface	Custom	1

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road
Analysis Description	Sect E Static
Drawn By	RK
Scale	1:999
Company	Calwest
Date	8.7.2019
File Name	Section E - Static.sli

SLIDE 6.035



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Static		
Drawn By	RK	Scale	1:912
Company	Calwest		
Date	8.7.2019	File Name	Section E - Static.sli

SLIDEINTERPRET 6.035

Slide Analysis Information
Oak Pass Road

Project Summary

File Name: Section E - Static
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect E Static
Author: RK
Company: Calwest
Date Created: 8.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Road		
	Analysis Description	Sect E Static		
	Drawn By: RK	Scale	Company	Calwest
SLIDEINTERPRET 6.035	Date: 8.7.2019		File Name	Section E - Static.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Loading

3 Distributed Loads present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 400
Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Distributed Load 3

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Material Properties

Property	Tvb	Tt_Cross Bedded	Tt_Anisotropic	Tt_Very Weathered	Tm_Fault Zone Anisotropic	Tm_Fault Zone Very Weathered	Tm_Anisotropic	Tm_Very Weathered
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	125	125	125	125	125	130	125
Cohesion [psf]	990	600		370		225		225
Friction Angle [deg]	38	36		32		30		30
Water Surface	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table

Project	Oak Pass Road
Analysis Description	Sect E Static
Drawn By	RK
Scale	
Company	Calwest
Date	8.7.2019
File Name	Section E - Static.sli

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Hu Value	1	1	1	1	1	1	1	1

Anisotropic Functions

Name: Tt Anisotropic

Angle From	Angle To	c	phi
-90	30	600	36
30	35	380	27
35	90	600	36

Name: Tm_Fault Zone Anisotropic

Angle From	Angle To	c	phi
-90	-13	600	34
-13	-8	200	27
-8	90	600	34

Name: Tm_Anisotropic

Angle From	Angle To	c	phi
-90	25	600	36
25	30	380	27
30	90	600	36

Global Minimums

Method: gle/morgenstern-price

FS: 2.470620
Axis Location: 970.216, 1066.729
Left Slip Surface Endpoint: 947.825, 859.781
Right Slip Surface Endpoint: 1122.340, 924.647
Resisting Moment=8.26151e+007 lb-ft
Driving Moment=3.34391e+007 lb-ft

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road		
	Analysis Description: Sect E Static		
	Drawn By: RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 8.7.2019		File Name: Section E - Static.sli

Resisting Horizontal Force=349129 lb
Driving Horizontal Force=141313 lb
Total Slice Area=3793.67 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
947.825	859.781
953.906	856.594
969.771	854.364
984.806	852.251
999.841	850.138
1011.78	854.171
1023.77	858.724
1034.23	862.911
1044.88	867.376
1060.99	874.877
1071.72	881.195
1085.67	890.368
1096.76	898.919
1104.1	905.641
1122.34	924.647

Valid / Invalid Surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 4428
Number of Invalid Surfaces: 573

Error Codes:

Error Code -105 reported for 388 surfaces
Error Code -108 reported for 97 surfaces
Error Code -111 reported for 88 surfaces

Error Codes

The following errors were encountered during the computation:

-105 = More than two surface / slope intersections with no valid slip surface.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 2.47062

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	6.08143	1811.17	Tm_Fault Zone Very Weathered	225	30	188.007	464.493	414.813	0	414.813
2	0.100428	62.7628	Tm_Fault Zone Very Weathered	225	30	253.538	626.396	695.238	0	695.238
3	15.7638	17356.6	Tm_Fault Zone Anisotropic	200	27	338.585	836.516	1249.23	0	1249.23
4	7.51757	13529.5	Tm_Fault Zone Anisotropic	200	27	517.21	1277.83	2115.37	0	2115.37
5	7.51757	17177.4	Tm_Fault Zone Anisotropic	200	27	647.19	1598.96	2745.62	0	2745.62
6	7.51757	21338.8	Tm_Fault Zone Anisotropic	200	27	796.925	1968.9	3471.66	0	3471.66
7	7.51757	25514.6	Tm_Fault Zone Anisotropic	200	27	949.252	2345.24	4210.26	0	4210.26
8	5.9705	22173.4	Tm_Fault Zone Anisotropic	600	34	1199.14	2962.62	3502.74	0	3502.74
9	5.9705	22676	Tm_Fault Zone Anisotropic	600	34	1212.09	2994.61	3550.15	0	3550.15
10	5.99177	23167.5	Tm_Fault Zone Anisotropic	600	34	1194.16	2950.32	3484.49	0	3484.49
11	5.99177	23480.7	Tm_Fault Zone Anisotropic	600	34	1197.48	2958.53	3496.68	0	3496.68

12	10.4685	40530.5	Tm_Fault Zone Anisotropic	600	34	1161.9	2870.62	3366.33	0	3366.33
13	10.6462	39740.4	Tm_Fault Zone Anisotropic	600	34	1122.31	2772.79	3221.3	0	3221.3
14	8.05415	28796.1	Tm_Fault Zone Anisotropic	600	34	1080.84	2670.34	3069.41	0	3069.41
15	8.05415	28006.5	Tm_Fault Zone Anisotropic	600	34	1056.71	2610.72	2981.01	0	2981.01
16	5.36658	19058.7	Tm_Fault Zone Anisotropic	600	34	1016.21	2510.67	2832.68	0	2832.68
17	5.36658	19210.1	Tm_Fault Zone Anisotropic	600	34	1024.23	2530.49	2862.07	0	2862.07
18	6.97473	24152.3	Tm_Fault Zone Anisotropic	600	34	937.004	2314.98	2542.56	0	2542.56
19	6.97473	22284.2	Tm_Fault Zone Anisotropic	600	34	877.768	2168.63	2325.59	0	2325.59
20	5.54562	16166.9	Tm_Fault Zone Anisotropic	600	34	795.234	1964.72	2023.28	0	2023.28
21	5.54562	14549.8	Tm_Fault Zone Anisotropic	600	34	744.275	1838.82	1836.61	0	1836.61
22	7.33569	16151.4	Tm_Fault Zone Anisotropic	600	34	639.869	1580.87	1454.21	0	1454.21
23	5.32312	8610.23	Tm_Fault Zone Anisotropic	600	34	514.908	1272.14	996.491	0	996.491
24	5.32312	5668.58	Tm_Fault Zone Anisotropic	600	34	409.597	1011.96	610.755	0	610.755
25	7.5961	2995.1	Tm_Fault Zone Very Weathered	225	30	146.271	361.381	236.218	0	236.218

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 2.47062

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	947.825	859.781	0	0	0
2	953.906	856.594	2465.38	112.301	2.60809
3	954.007	856.579	2500.66	115.781	2.65091
4	969.771	854.364	10605.7	1701.74	9.11571
5	977.288	853.307	16728.8	3528.18	11.9094
6	984.806	852.251	24494.9	6307.37	14.4398
7	992.323	851.194	34153.8	10225	16.6667
8	999.841	850.138	45738.1	15358.4	18.5615
9	1005.81	852.155	45833.3	16516.5	19.8171

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road		
	Analysis Description: Sect E Static		
	Drawn By: RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 8.7.2019		File Name: Section E - Static.sli

10	1011.78	854.171	45910.1	17481.3	20.8455
11	1017.77	856.448	45133.1	17910.5	21.645
12	1023.77	858.724	44348.3	18107	22.2097
13	1034.23	862.911	42416.5	17681.9	22.6295
14	1044.88	867.376	39981.6	16410.3	22.3155
15	1052.93	871.127	37175.3	14705.4	21.5822
16	1060.99	874.877	34506.1	12849.9	20.4251
17	1066.36	878.036	31011.8	10934	19.4214
18	1071.72	881.195	27467.8	9049.78	18.2354
19	1078.7	885.781	22342.1	6588.31	16.4299
20	1085.67	890.368	17798.4	4550.23	14.3407
21	1091.22	894.643	13557.7	3003.81	12.4925
22	1096.76	898.919	9832.37	1821.51	10.4954
23	1104.1	905.641	4751.26	638.876	7.65832
24	1109.42	911.187	1965.45	188.86	5.4887
25	1114.74	916.733	758.438	43.1041	3.25278
26	1122.34	924.647	0	0	0

List Of Coordinates

Water Table

X	Y
0	689.933
44.0164	691.309
104.412	693.297
163.998	695.486
223.728	698.04
271.117	700.412
315.668	702.987
356.589	705.698

412.972	710.063
462.622	714.599
502.359	718.756
539.081	723.057
571.85	727.298
610.194	732.781
658.974	740.631
707.881	749.575
762.09	760.863
799.139	769.478
828.3	776.809
859.865	785.319
879.566	790.948
904	798.263
935.341	808.083
963.952	817.338
1005.99	831.146
1033.01	839.976
1072.6	852.573
1105.32	862.638
1141.56	873.689
1186.68	887.791
1227.28	901.292
1278.5	919.544
1287.57	922.369
1297.51	925.024
1306	926.841
1315.73	928.409
1327.99	929.785
1338.28	930.586
1358.18	931.751

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Static		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Section E - Static.sli

SLIDEINTERPRET 6.035

Distributed Load

X	Y
1270.87	922
1171.86	922

Distributed Load

X	Y
1073.32	910.528
1071.81	910
1055.95	900
1040.88	895.408

Distributed Load

X	Y
849.939	843.812
844.142	842.673
823.228	837.704
812.042	834.718

Block Search Window

X	Y
785.487	713.015
1044.73	798.631
1018.91	883.506
737.367	785.754

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Static.sli

SLIDEINTERPRET 6.035

Block Search Window

X	Y
1058.87	802.448
1343.52	868.561
1343.52	960.658
1028.79	887.772

External Boundary

X	Y
1324.55	965.2
1290.54	965.2
1277.82	960
1270.87	958.44
1270.87	944.769
1270.87	922
1171.86	922
1171.86	927.914
1171.86	935.839
1170.43	935.494
1154.8	931.767
1145.26	929.492
1144.8	929.395
1133.63	927.034
1100.35	920
1071.81	910
1055.95	900
1023.12	890
978.731	870
949.286	860

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Static		
Drawn By: RK	Scale	Company: Calwest	
Date: 8.7.2019		File Name: Section E - Static.sli	

SLIDEINTERPRET 6.035

940.6	858.696
926.093	856.518
882.115	849.894
852	844.217
844.142	842.673
823.228	837.704
803.828	832.526
794.891	830
771.148	820
765.98	817.279
765.98	815.625
765.98	810
754.743	810
741.102	810
730.893	810
686.955	815.261
686.955	810
686.241	810
677.804	810
677.804	811.367
677.804	816.356
647.37	820
601.356	830
592.041	830.777
571.396	832.5
542.956	832.5
512.415	830
492.896	824.659
483.616	822.12
483.616	816
475.868	816

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect E Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Static.sli

475.868	811.583
475.868	806
466.852	807.526
452.243	810
444.315	811.078
426.078	813.467
426.078	801.598
391.913	790
380.233	790
376.426	788.696
356.05	781.638
351.032	779.878
349.17	779.363
321.6	771.744
294.589	764.279
292.312	765
292.312	753.132
284.419	753.132
284.419	742.132
257.605	742.132
257.605	739.177
222.067	736
222.067	742.408
218.28	740
206.812	730
103.671	723.334
67.5609	721
59.1501	720.786
52.4045	720.614
28.2764	720
0	720

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Static		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Section E - Static.sli

SLIDEINTERPRET 6.035

0	600
321.6	600
690	600
940.6	600
1144.8	600
1358.18	600
1358.18	958.09
1358.18	965.2

Material Boundary

X	Y
940.6	600
940.6	854.421
940.6	858.696

Material Boundary

X	Y
321.6	600
321.6	769.111
321.6	771.744

Material Boundary

X	Y
1270.87	944.769
1301.51	949.987
1304.01	950.378
1358.18	958.09

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect E Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Static.sli

Material Boundary

X	Y
1144.8	923.363
1154.8	925.045
1171.86	927.914

Material Boundary

X	Y
1144.8	600
1144.8	923.363
1144.8	929.395

Material Boundary

X	Y
940.632	854.427
955.626	856.84
1039.33	887.565
1068.72	900.186
1093.11	910.85
1129.92	920.86
1144.8	923.363

Material Boundary

X	Y
852	844.217
874.835	844.654
923.18	851.617
940.6	854.421

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect E Static		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Section E - Static.sli

940.632	854.427

Material Boundary

X	Y
765.98	815.625
772.902	819.09
776.652	820.606
804.213	829.617
844.142	842.673

Material Boundary

X	Y
686.241	810
710.273	806.106
739.242	805.606
745.176	805.606
754.743	810

Material Boundary

X	Y
475.868	811.583
478.854	812.927
499.3	819.286
531.451	826.654
540.737	826.764
560.434	826.998
575.749	827.18
590.559	825.113

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect E Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Static.sli

594.69	824.536
615.442	821.64
660.9	814.106
677.804	811.367

Material Boundary

X	Y
321.6	769.111
323.668	769.594
412.643	789.907
455.266	802.313
466.852	807.526

Material Boundary

X	Y
594.69	824.536
621.188	762.111
666.893	654.438
690	600

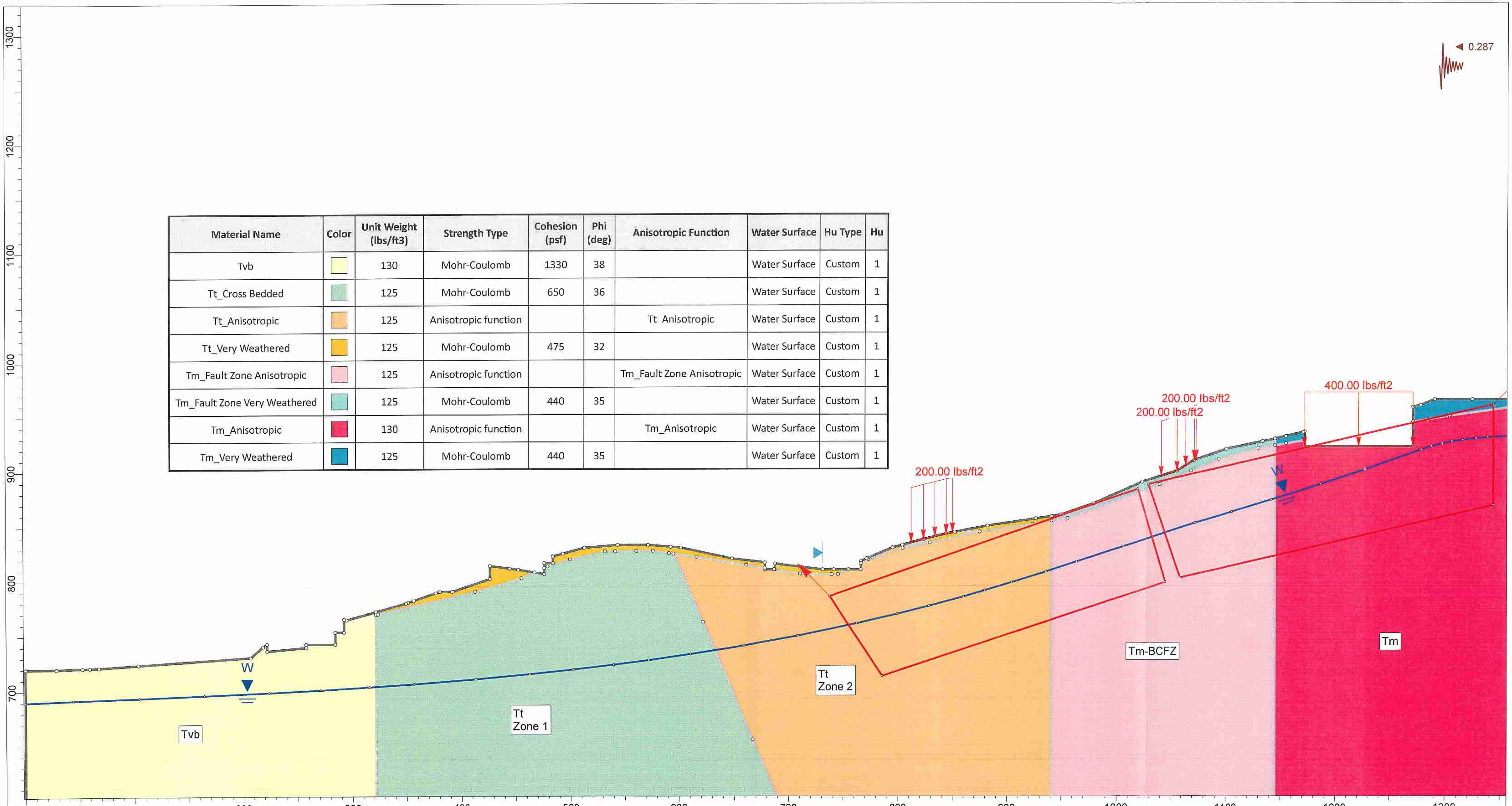
Material Boundary

X	Y
804.213	829.617
829.006	834.494
874.835	844.654

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project: Oak Pass Road			
Analysis Description: Sect E Static			
Drawn By: RK	Scale:	Company: Calwest	
Date: 8.7.2019		File Name: Section E - Static.sli	

SLIDEINTERPRET 6.035

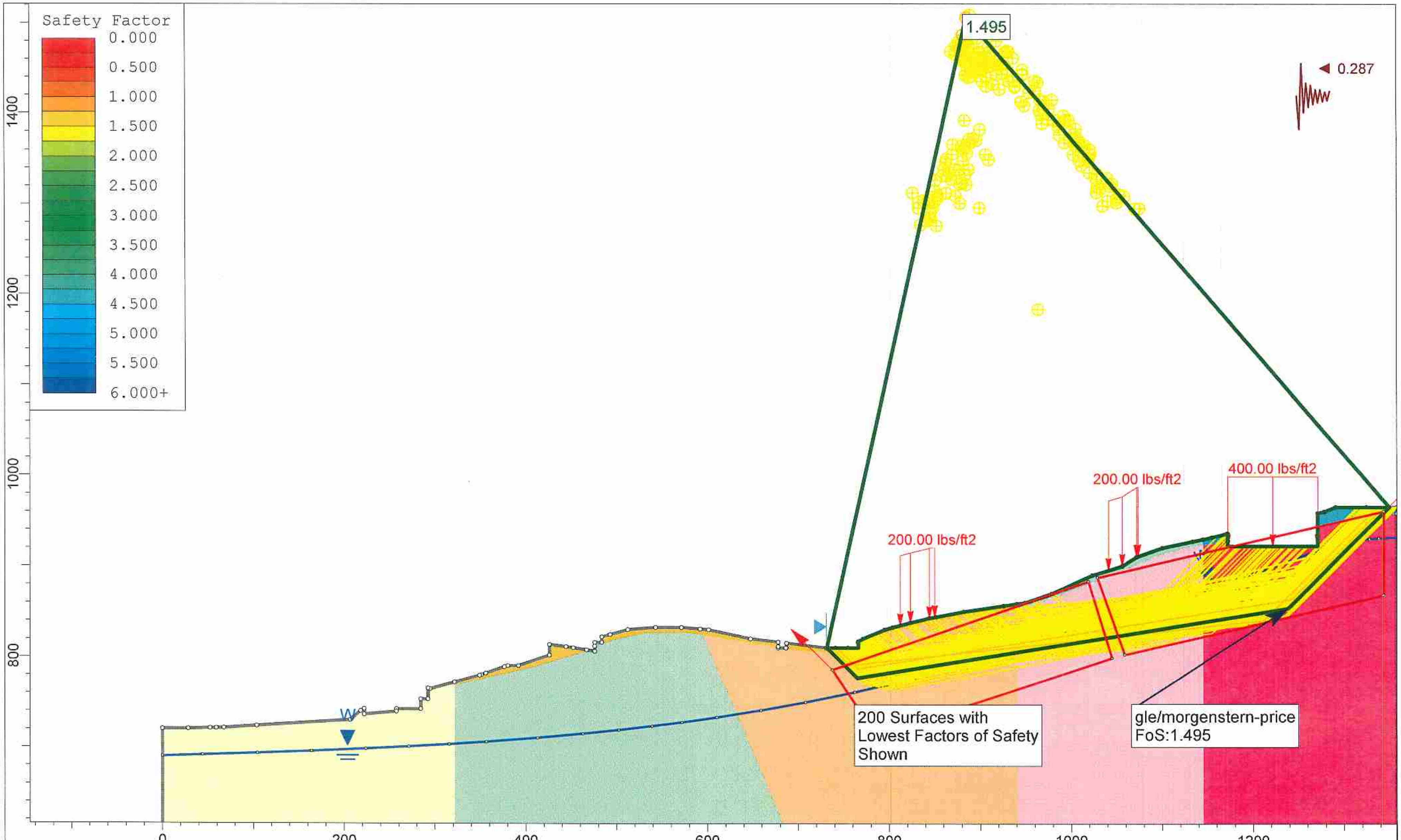


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Hu Type	Hu
Tvb		130	Mohr-Coulomb	1330	38		Water Surface	Custom	1
Tt_Cross Bedded		125	Mohr-Coulomb	650	36		Water Surface	Custom	1
Tt_Anisotropic		125	Anisotropic function			Tt Anisotropic	Water Surface	Custom	1
Tt_Very Weathered		125	Mohr-Coulomb	475	32		Water Surface	Custom	1
Tm_Fault Zone Anisotropic		125	Anisotropic function			Tm_Fault Zone Anisotropic	Water Surface	Custom	1
Tm_Fault Zone Very Weathered		125	Mohr-Coulomb	440	35		Water Surface	Custom	1
Tm_Anisotropic		130	Anisotropic function			Tm_Anisotropic	Water Surface	Custom	1
Tm_Very Weathered		125	Mohr-Coulomb	440	35		Water Surface	Custom	1

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	1:999
Company	Calwest		
Date	8.7.2019	File Name	Section E - Seismic.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	1:1750
Company	Calwest		
Date	8.7.2019	File Name	Section E - Seismic.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

Oak Pass Road

Project Summary

File Name: Section E - Seismic
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect E Seismic
Author: RK
Company: Calwest
Date Created: 8.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287
3 Distributed Loads present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 400
Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Distributed Load 3

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Material Properties

Property	Tvb	Tt_Cross Bedded	Tt_Anisotropic	Tt_Very Weathered	Tm_Fault Zone Anisotropic	Tm_Fault Zone Very Weathered	Tm_Anisotropic	Tm_Very Weathered
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	125	125	125	125	125	130	125
Cohesion [psf]	1330	650		475		440		440
Friction Angle [deg]	38	36		32		35		35

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Seismic.sli

SLIDEINTERPRET 6.035

Water Surface	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Anisotropic Functions

Name: Tt Anisotropic

Angle From	Angle To	c	phi
-90	30	650	36
30	35	380	27
35	90	650	36

Name: Tm_Fault Zone Anisotropic

Angle From	Angle To	c	phi
-90	-13	800	36
-13	-8	200	27
-8	90	800	36

Name: Tm_Anisotropic

Angle From	Angle To	c	phi
-90	25	650	36
25	30	380	27
30	90	650	36

Global Minimums

Method: gle/morgenstern-price

FS: 1.494600
Axis Location: 885.329, 1505.923
Left Slip Surface Endpoint: 731.368, 810.000
Right Slip Surface Endpoint: 1349.691, 965.200
Resisting Moment=2.32481e+009 lb-ft

Driving Moment=1.55547e+009 lb-ft
Resisting Horizontal Force=3.14087e+006 lb
Driving Horizontal Force=2.10148e+006 lb
Total Slice Area=36910.3 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
731.368	810
764.924	776.444
1237.97	853.474
1349.69	965.2

Valid / Invalid Surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 4412
Number of Invalid Surfaces: 588

Error Codes:

Error Code -105 reported for 388 surfaces
Error Code -108 reported for 118 surfaces
Error Code -111 reported for 82 surfaces

Error Codes

The following errors were encountered during the computation:

-105 = More than two surface / slope intersections with no valid slip surface.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary

number).
-111 = safety factor equation did not converge

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.4946

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	4.33291	1173.38	Tt_Very Weathered	475	32	756.511	1130.68	1049.31	0	1049.31
2	29.2228	69200.5	Tt_Anisotropic	650	36	3977.71	5945.09	7288.08	0	7288.08
3	29.2794	162478	Tt_Anisotropic	650	36	3313.62	4952.53	5921.91	0	5921.91
4	29.2794	183882	Tt_Anisotropic	650	36	3715.51	5553.2	6748.68	0	6748.68
5	29.2794	193341	Tt_Anisotropic	650	36	3936.35	5883.27	7202.98	0	7202.98
6	29.2794	197593	Tt_Anisotropic	650	36	3918.75	5856.97	7166.78	0	7166.78
7	29.2794	198325	Tt_Anisotropic	650	36	3919.66	5858.32	7168.63	0	7168.63
8	29.2794	197010	Tt_Anisotropic	650	36	3783.5	5654.82	7043.06	154.533	6888.53
9	25.5251	174000	Tm_Fault Zone Anisotropic	800	36	3740.95	5591.23	7017.83	423.26	6594.57
10	25.5251	188662	Tm_Fault Zone Anisotropic	800	36	3793.79	5670.2	7387.03	683.778	6703.25
11	25.5251	210993	Tm_Fault Zone Anisotropic	800	36	3967.03	5929.12	8007.22	947.599	7059.62
12	25.5251	230928	Tm_Fault Zone Anisotropic	800	36	4097.69	6124.41	8537.28	1208.88	7328.4
13	25.5251	245860	Tm_Fault Zone Anisotropic	800	36	4245.05	6344.65	9089.53	1457.96	7631.57
14	25.5251	271946	Tm_Fault Zone Anisotropic	800	36	4392.08	6564.4	9633.86	1699.84	7934.02
15	25.5251	284331	Tm_Fault Zone Anisotropic	800	36	4379	6544.86	9837.29	1930.18	7907.11
16	25.5251	288664	Tm_Fault Zone Anisotropic	800	36	4261.78	6369.66	9822.56	2156.59	7665.97
17	23.2911	277645	Tm_Anisotropic	650	36	4252.22	6355.37	10232.9	2380.08	7852.78
18	23.2911	242601	Tm_Anisotropic	650	36	3594.39	5372.17	9097.12	2597.6	6499.52
19	23.2911	224711	Tm_Anisotropic	650	36	3138.67	4691.06	8397.57	2835.53	5562.04
20	23.2911	213227	Tm_Anisotropic	650	36	2792.21	4173.23	7931.42	3082.13	4849.29
21	25.5067	184934	Tm_Anisotropic	650	36	1247.24	1864.12	4380.23	2709.14	1671.09
22	25.5067	191098	Tm_Anisotropic	650	36	1782.35	2663.9	4456.66	1684.75	2771.91

23	25.5067	157018	Tm_Anisotropic	650	36	1922.23	2872.96	3601.64	542.005	3059.64
24	25.5067	72980.2	Tm_Anisotropic	650	36	1191.73	1781.16	1556.91	0	1556.91
25	9.6989	5879.29	Tm_Very Weathered	440	35	393.947	588.793	212.498	0	212.498

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.4946

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	731.368	810	0	0	0
2	735.701	805.667	7495.81	87.0378	0.665262
3	764.924	776.444	317140	28382.9	5.11414
4	794.203	781.212	339535	56212	9.40039
5	823.482	785.98	363642	86531.5	13.3851
6	852.762	790.748	389350	118792	16.9671
7	882.041	795.516	413494	151136	20.0778
8	911.321	800.284	437445	182783	22.6772
9	940.6	805.051	458376	211286	24.7471
10	966.125	809.208	474993	232860	26.1159
11	991.65	813.364	487219	249116	27.0807
12	1017.18	817.521	494891	259212	27.6445
13	1042.7	821.677	497983	262662	27.8095
14	1068.23	825.834	498264	260229	27.5768
15	1093.75	829.99	492558	250376	26.945
16	1119.28	834.147	482117	234225	25.9117
17	1144.8	838.303	467495	212792	24.4738
18	1168.09	842.096	448285	188513	22.8077
19	1191.38	845.889	428080	162664	20.806
20	1214.67	849.682	405023	135331	18.4761

21	1237.97	853.474	378939	107470	15.8337
22	1263.47	878.981	246030	55049.7	12.6123
23	1288.98	904.488	123085	19711.3	9.09831
24	1314.49	929.994	35305.7	3313.47	5.36155
25	1339.99	955.501	5121.15	133.063	1.48838
26	1349.69	965.2	0	0	0

List Of Coordinates

Water Table

X	Y
0	689.933
44.0164	691.309
104.412	693.297
163.998	695.486
223.728	698.04
271.117	700.412
315.668	702.987
356.589	705.698
412.972	710.063
462.622	714.599
502.359	718.756
539.081	723.057
571.85	727.298
610.194	732.781
658.974	740.631
707.881	749.575
762.09	760.863
799.139	769.478
828.3	776.809

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Seismic.sli

859.865	785.319
879.566	790.948
904	798.263
935.341	808.083
963.952	817.338
1005.99	831.146
1033.01	839.976
1072.6	852.573
1105.32	862.638
1141.56	873.689
1186.68	887.791
1227.28	901.292
1278.5	919.544
1287.57	922.369
1297.51	925.024
1306	926.841
1315.73	928.409
1327.99	929.785
1338.28	930.586
1358.18	931.751

Distributed Load

X	Y
1270.87	922
1171.86	922

Distributed Load

X	Y
1073.32	910.528

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Seismic.sli

SLIDEINTERPRET 6.035

1071.81	910
1055.95	900
1040.88	895.408

Distributed Load

X	Y
849.939	843.812
844.142	842.673
823.228	837.704
812.042	834.718

Block Search Window

X	Y
785.487	713.015
1044.73	798.631
1018.91	883.506
737.367	785.754

Block Search Window

X	Y
1058.87	802.448
1343.52	868.561
1343.52	960.658
1028.79	887.772

External Boundary

X	Y
1324.55	965.2

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Seismic.sli

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1290.54	965.2
1277.82	960
1270.87	958.44
1270.87	944.769
1270.87	922
1171.86	922
1171.86	927.914
1171.86	935.839
1170.43	935.494
1154.8	931.767
1145.26	929.492
1144.8	929.395
1133.63	927.034
1100.35	920
1071.81	910
1055.95	900
1023.12	890
978.731	870
949.286	860
940.6	858.696
926.093	856.518
882.115	849.894
852	844.217
844.142	842.673
823.228	837.704
803.828	832.526
794.891	830
771.148	820
765.98	817.279
765.98	815.625
765.98	810

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road
Analysis Description	Sect E Seismic
Drawn By	RK
Scale	
Company	Calwest
Date	8.7.2019
File Name	Section E - Seismic.sli

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754.743	810
741.102	810
730.893	810
686.955	815.261
686.955	810
686.241	810
677.804	810
677.804	811.367
677.804	816.356
647.37	820
601.356	830
592.041	830.777
571.396	832.5
542.956	832.5
512.415	830
492.896	824.659
483.616	822.12
483.616	816
475.868	816
475.868	811.583
475.868	806
466.852	807.526
452.243	810
444.315	811.078
426.078	813.467
426.078	801.598
391.913	790
380.233	790
376.426	788.696
356.05	781.638
351.032	779.878

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Section E - Seismic.sli

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349.17	779.363
321.6	771.744
294.589	764.279
292.312	765
292.312	753.132
284.419	753.132
284.419	742.132
257.605	742.132
257.605	739.177
222.067	736
222.067	742.408
218.28	740
206.812	730
103.671	723.334
67.5609	721
59.1501	720.786
52.4045	720.614
28.2764	720
0	720
0	600
321.6	600
690	600
940.6	600
1144.8	600
1358.18	600
1358.18	958.09
1358.18	965.2

Material Boundary

X	Y

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By RK	*Scale*	*Company*	Calwest
Date 8.7.2019		*File Name*	Section E - Seismic.sli

940.6	600
940.6	854.421
940.6	858.696

Material Boundary

X	Y
321.6	600
321.6	769.111
321.6	771.744

Material Boundary

X	Y
1270.87	944.769
1301.51	949.987
1304.01	950.378
1358.18	958.09

Material Boundary

X	Y
1144.8	923.363
1154.8	925.045
1171.86	927.914

Material Boundary

X	Y
1144.8	600
1144.8	923.363
1144.8	929.395

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Section E - Seismic.sli

Material Boundary

X	Y
940.632	854.427
955.626	856.84
1039.33	887.565
1068.72	900.186
1093.11	910.85
1129.92	920.86
1144.8	923.363

Material Boundary

X	Y
852	844.217
874.835	844.654
923.18	851.617
940.6	854.421
940.632	854.427

Material Boundary

X	Y
765.98	815.625
772.902	819.09
776.652	820.606
804.213	829.617
844.142	842.673

Material Boundary

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Seismic.sli

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X	Y
686.241	810
710.273	806.106
739.242	805.606
745.176	805.606
754.743	810

Material Boundary

X	Y
475.868	811.583
478.854	812.927
499.3	819.286
531.451	826.654
540.737	826.764
560.434	826.998
575.749	827.18
590.559	825.113
594.69	824.536
615.442	821.64
660.9	814.106
677.804	811.367

Material Boundary

X	Y
321.6	769.111
323.668	769.594
412.643	789.907
455.266	802.313
466.852	807.526

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Road		
	Analysis Description	Sect E Seismic		
	Drawn By	RK	Scale	Company: Calwest
SLIDEINTERPRET 6.035	Date	8.7.2019		File Name: Section E - Seismic.sli

Material Boundary

X	Y
594.69	824.536
621.188	762.111
666.893	654.438
690	600

Material Boundary

X	Y
804.213	829.617
829.006	834.494
874.835	844.654

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect E Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section E - Seismic.sli

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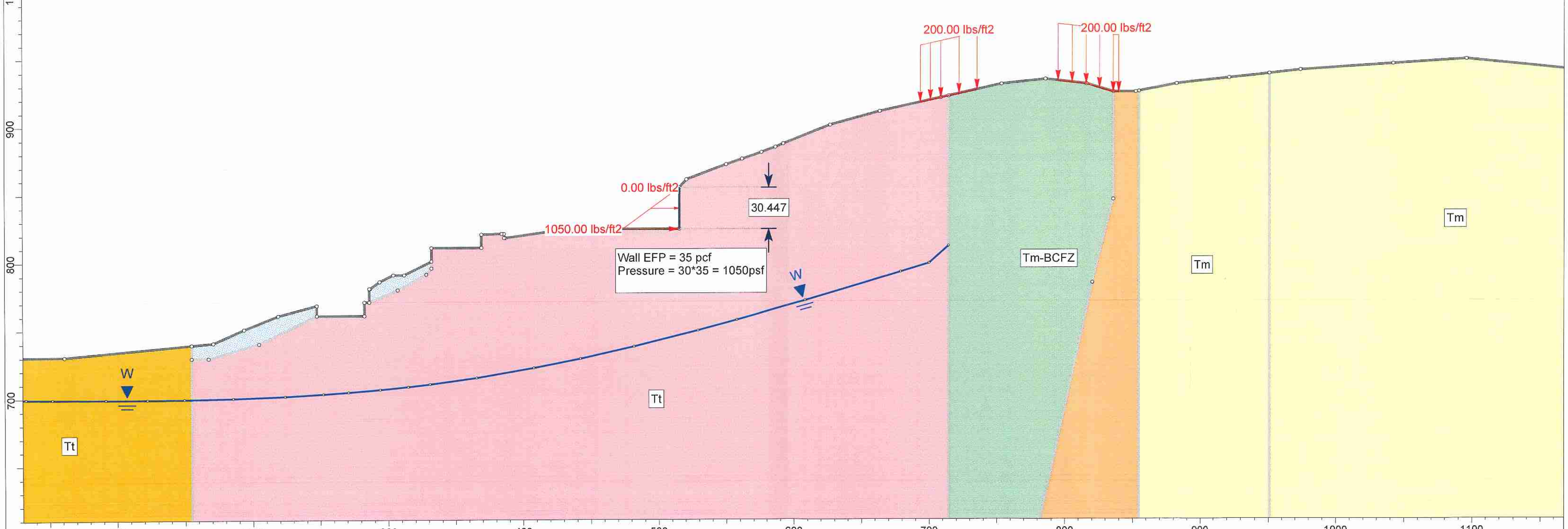
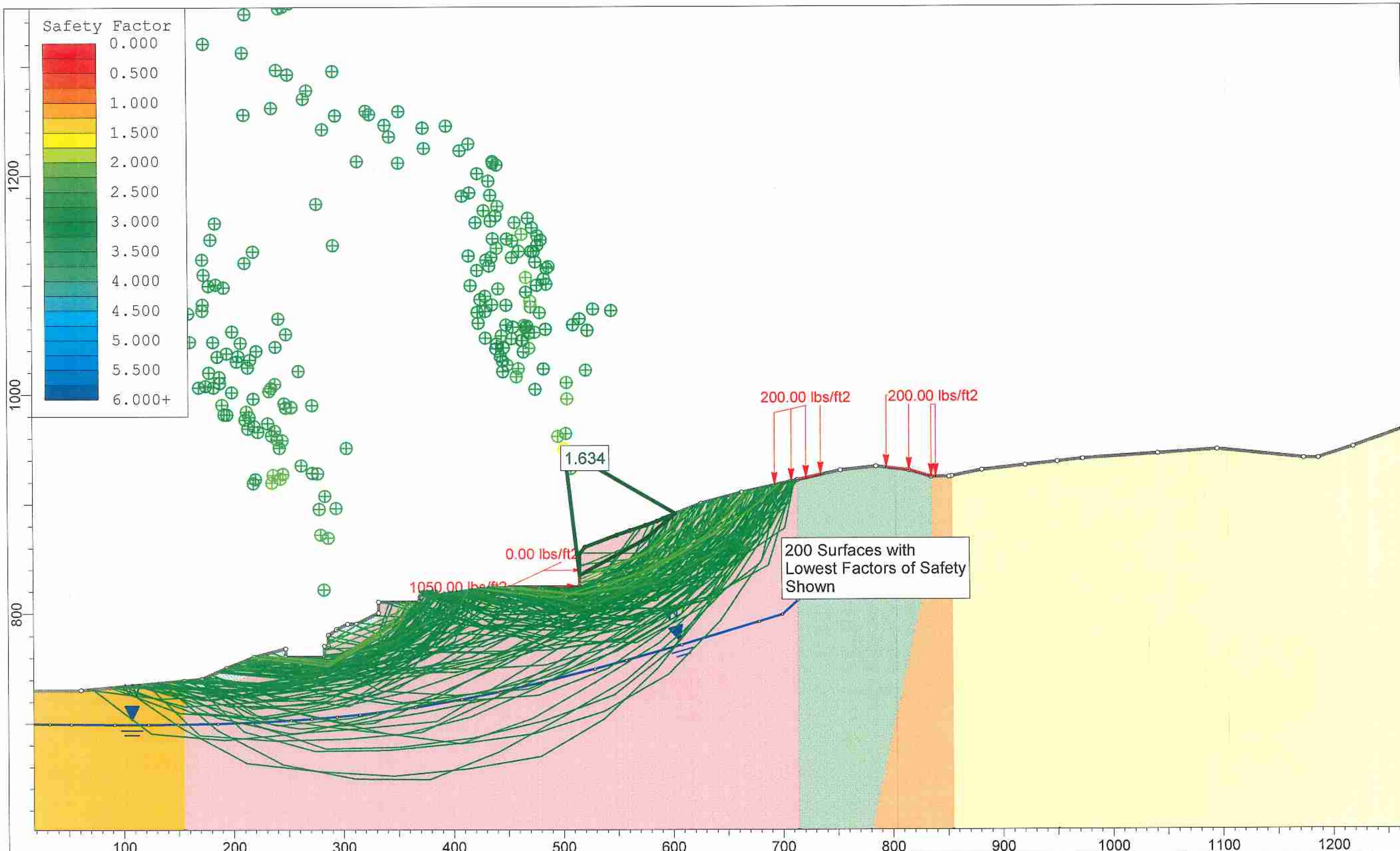
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Hu Type	Hu
Tm - Aniso		130	Anisotropic function			Tm - Aniso	Water Surface	Custom	1
Tm - Within Fault Zone		125	Mohr-Coulomb	600	34		Water Surface	Custom	1
Tm - Aniso Within Fault Zone		125	Anisotropic function			Tm - Aniso Within Fault Zone	Water Surface	Custom	1
Tt		125	Mohr-Coulomb	600	36		Water Surface	Custom	1
Tt - Aniso		125	Anisotropic function			Tt - Aniso	Water Surface	Custom	1
Tt - Weathered		125	Mohr-Coulomb	370	32		Water Surface	Custom	1



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road
Analysis Description	Sect G Static
Drawn By	RK
Scale	1:837
Company	Calwest
Date	8.7.2019
File Name	Section G - Static.sli

SLIDE 6.035



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Static		
Drawn By	RK	Scale	1:1451
Company	Calwest		
Date	8.7.2019	File Name	Section G - Static.sli

SLIDEINTERPRET 6.035

Slide Analysis Information
Oak Pass Road

Project Summary

File Name: Section G - Static
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect G Static
Author: RK
Company: Calwest
Date Created: 8.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

3 Distributed Loads present

Distributed Load 1

Distribution: Triangular
Magnitude 1 [psf]: 0
Magnitude 2 [psf]: 1050
Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Distributed Load 3

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Material Properties

Property	Tm - Aniso	Tm - Within Fault Zone	Tm - Aniso Within Fault Zone	Tt	Tt - Aniso	Tt - Weathered
Color						
Strength Type	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	125	125	125	125	125
Cohesion [psf]		600		600		370
Friction Angle [deg]		34		36		32
Water Surface	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1

Anisotropic Functions

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Static		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Section G - Static.sli

SLIDEINTERPRET 6.035

Name: Tm - Aniso

Angle From	Angle To	c	phi
-90	25	600	36
25	30	380	27
30	90	600	36

Name: Tm - Aniso Within Fault Zone

Angle From	Angle To	c	phi
-90	20	600	34
20	25	200	27
25	90	600	34

Name: Tt - Aniso

Angle From	Angle To	c	phi
-90	28	600	36
28	33	380	27
33	90	600	36

Global Minimums

Method: gle/morgenstern-price

FS: 1.633910
Axis Location: 502.181, 950.113
Left Slip Surface Endpoint: 515.232, 834.311
Right Slip Surface Endpoint: 602.653, 891.072
Left Slope Intercept: 515.232 854.510
Right Slope Intercept: 602.653 891.072
Resisting Moment=1.32649e+007 lb-ft
Driving Moment=8.11848e+006 lb-ft
Resisting Horizontal Force=103136 lb
Driving Horizontal Force=63122 lb
Total Slice Area=1273.22 ft2

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section G - Static.sli

SLIDEINTERPRET 6.035

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
515.232	834.311
574.073	867.097
602.653	891.072

Valid / Invalid Surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 1786
Number of Invalid Surfaces: 3214

Error Codes:

Error Code -106 reported for 68 surfaces
Error Code -107 reported for 141 surfaces
Error Code -108 reported for 31 surfaces
Error Code -110 reported for 2955 surfaces
Error Code -111 reported for 6 surfaces
Error Code -112 reported for 5 surfaces
Error Code -114 reported for 2 surfaces
Error Code -1000 reported for 6 surfaces

Error Codes

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-110 = The water table or a piezoline does not span the slip region for a given slip surface, when Water Surfaces is specified as the method of pore pressure calculation. If this error occurs, check that the water table or piezoline(s) span the appropriate soil cells.

-111 = safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-114 = Surface with Reverse Curvature.

-1000 = No valid slip surfaces are generated at a grid center. Unable to draw a surface.

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.63391

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	3.46126	9189.29	Tt - Aniso	380	27	958.217	1565.64	2326.95	0	2326.95
2	3.46126	9941.06	Tt - Aniso	380	27	991.664	1620.29	2434.2	0	2434.2
3	3.46126	9815.12	Tt - Aniso	380	27	960.2	1568.88	2333.31	0	2333.31
4	3.46126	9544.79	Tt - Aniso	380	27	921.507	1505.66	2209.23	0	2209.23
5	3.46126	9274.46	Tt - Aniso	380	27	886.469	1448.41	2096.87	0	2096.87
6	3.46126	9004.13	Tt - Aniso	380	27	854.992	1396.98	1995.94	0	1995.94
7	3.46126	8733.79	Tt - Aniso	380	27	826.849	1351	1905.69	0	1905.69
8	3.46126	8463.46	Tt - Aniso	380	27	801.72	1309.94	1825.11	0	1825.11
9	3.46126	8193.13	Tt - Aniso	380	27	779.242	1273.21	1753.02	0	1753.02
10	3.46126	7922.73	Tt - Aniso	380	27	759.044	1240.21	1688.26	0	1688.26
11	3.46126	7624.36	Tt - Aniso	380	27	738.985	1207.43	1623.93	0	1623.93
12	3.46126	7303.24	Tt - Aniso	380	27	719.117	1174.97	1560.22	0	1560.22
13	3.46126	6982.11	Tt - Aniso	380	27	700.632	1144.77	1500.95	0	1500.95
14	3.46126	6660.99	Tt - Aniso	380	27	683.285	1116.43	1445.32	0	1445.32

15	3.46126	6339.87	Tt - Aniso	380	27	666.866	1089.6	1392.67	0	1392.67
16	3.46126	6018.74	Tt - Aniso	380	27	651.18	1063.97	1342.36	0	1342.36
17	3.46126	5697.62	Tt - Aniso	380	27	636.022	1039.2	1293.76	0	1293.76
18	3.57248	5324.17	Tt - Aniso	600	36	779.388	1273.45	926.925	0	926.925
19	3.57248	4567.5	Tt - Aniso	600	36	726.851	1187.61	808.775	0	808.775
20	3.57248	3815.85	Tt - Aniso	600	36	671.314	1096.87	683.88	0	683.88
21	3.57248	3085.3	Tt - Aniso	600	36	612.522	1000.81	551.662	0	551.662
22	3.57248	2448.28	Tt - Aniso	600	36	554.904	906.663	422.084	0	422.084
23	3.57248	1779.01	Tt - Aniso	600	36	487.113	795.899	269.632	0	269.632
24	3.57248	1067.41	Tt - Aniso	600	36	406.606	664.358	88.581	0	88.581
25	3.57248	355.803	Tt - Aniso	600	36	315.695	515.817	-115.868	0	-115.868

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.63391

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	515.232	834.311	7035.37	0	0
2	518.693	836.24	5868.63	715.275	6.949
3	522.154	838.168	4610.96	1115.3	13.5976
4	525.616	840.097	3438.83	1231.58	19.7044
5	529.077	842.025	2371.89	1112.1	25.1203
6	532.538	843.954	1400.21	801.41	29.7847
7	535.999	845.883	514.105	342.901	33.7027
8	539.461	847.811	-295.491	-222.008	36.9182
9	542.922	849.74	-1036.77	-854.34	39.4899
10	546.383	851.668	-1716.94	-1517.83	41.4777
11	549.845	853.597	-2342.19	-2179.09	42.934
12	553.306	855.526	-2912.91	-2803.15	43.8999

13	556.767	857.454	-3429.62	-3358.98	44.4038
14	560.228	859.383	-3896.08	-3823.43	44.4608
15	563.69	861.311	-4315.37	-4177.9	44.0727
16	567.151	863.24	-4690.02	-4408.5	43.2278
17	570.612	865.169	-5022.03	-4506.16	41.9009
18	574.073	867.097	-5312.83	-4466.6	40.0544
19	577.646	870.094	-5302.71	-4076.36	37.5506
20	581.218	873.091	-5126.44	-3506.95	34.3757
21	584.791	876.088	-4774.54	-2808.34	30.4636
22	588.363	879.085	-4236.71	-2044.67	25.7623
23	591.936	882.082	-3516.66	-1297.94	20.2583
24	595.508	885.079	-2582.23	-644.221	14.0083
25	599.081	888.075	-1393.19	-175.23	7.1688
26	602.653	891.072	0	0	0

List Of Coordinates

Water Table

X	Y
0	700.016
32.4473	699.567
52.0781	699.328
91.563	699.01
122.236	698.99
149.435	699.201
185.465	699.902
223.779	701.293
252.318	702.847
270.967	704.135
294.012	706.053

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road
Analysis Description	Sect G Static
Drawn By	RK
Scale	
Company	Calwest
Date	8.7.2019
File Name	Section G - Static.sli

SLIDEINTERPRET 6.035

314.766	708.116
330.881	709.954
365.605	714.673
407.817	721.807
442.157	728.635
481.656	737.49
529.01	749.307
557.591	756.965
608.146	771.256
678.704	792.21
699.892	798.604
714.2	811.395

Distributed Load

X	Y
515.232	854.51
515.232	824.064

Distributed Load

X	Y
735.159	926.448
714.2	921.788
708.451	920.51
693.23	917.135

Distributed Load

X	Y
839.874	924.51

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect G Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section G - Static.sli

835.812	924.51
815.598	930.51
795.02	932.862

External Boundary

X	Y
1219.39	950.51
1187.91	940.51
1174.58	940.51
1095.91	948.51
1042.02	944.979
973.825	940.51
950.6	937.982
921.508	934.814
881.971	930.51
854.6	925.015
852.084	924.51
835.812	924.51
815.598	930.51
785.856	933.91
753.427	930.51
714.2	921.788
708.451	920.51
663.36	910.51
626.678	900.51
591.914	886.854
586.294	884.344
575.868	880.51
561.332	875.528
549.66	871.527

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section G - Static.sli

SLIDEINTERPRET 6.035

520.413	860.51
515.232	854.51
515.232	824.064
432.622	824.064
386.672	817.641
386.001	817.641
386.001	820.724
384.174	820.724
369.296	820.292
369.296	810.527
332.179	810.527
332.179	800.55
312.017	790.51
303.975	790.51
293.849	785.51
286.959	780.51
286.288	780.51
286.288	770.51
282.782	770.51
282.782	760.51
247.497	760.51
247.497	768.057
218.779	760.51
193.585	750.51
170.951	740.51
155	739.059
61.0267	730.51
-5.2538e-006	730.51
-5.2538e-006	600.51
155	600.51
714.2	600.51

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect G Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section G - Static.sli

779.947	600.51
854.6	600.51
950.6	600.51
1264.13	600.51
1264.13	966.267

Material Boundary

X	Y
155	600.51
155	729.227
155	739.059

Material Boundary

X	Y
714.2	600.51
714.2	921.788

Material Boundary

X	Y
854.6	600.51
854.6	925.015

Material Boundary

X	Y
950.6	600.51
950.6	937.982

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Static		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section G - Static.sli

SLIDEINTERPRET 6.035

Material Boundary

X	Y
779.947	600.51
820.297	783.982
835.812	845.384
835.812	924.51

Material Boundary

X	Y
155	729.227
167.373	729.227
204.666	739.948
247.497	760.51

Material Boundary

X	Y
286.288	770.51
307.223	779.406
328.242	790.924
332.179	795.531
332.179	800.55

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Static		
Drawn By	RK	*Scale*	
Company	Calwest		
Date	8.7.2019	*File Name*	Section G - Static.sli

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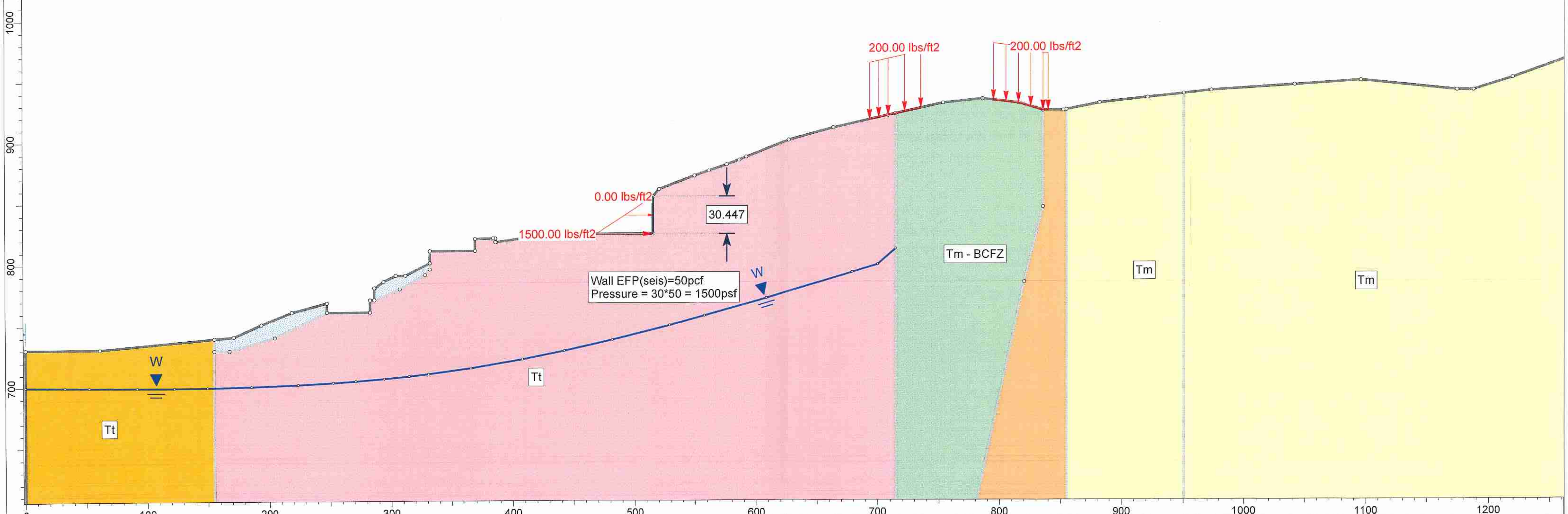
0.287

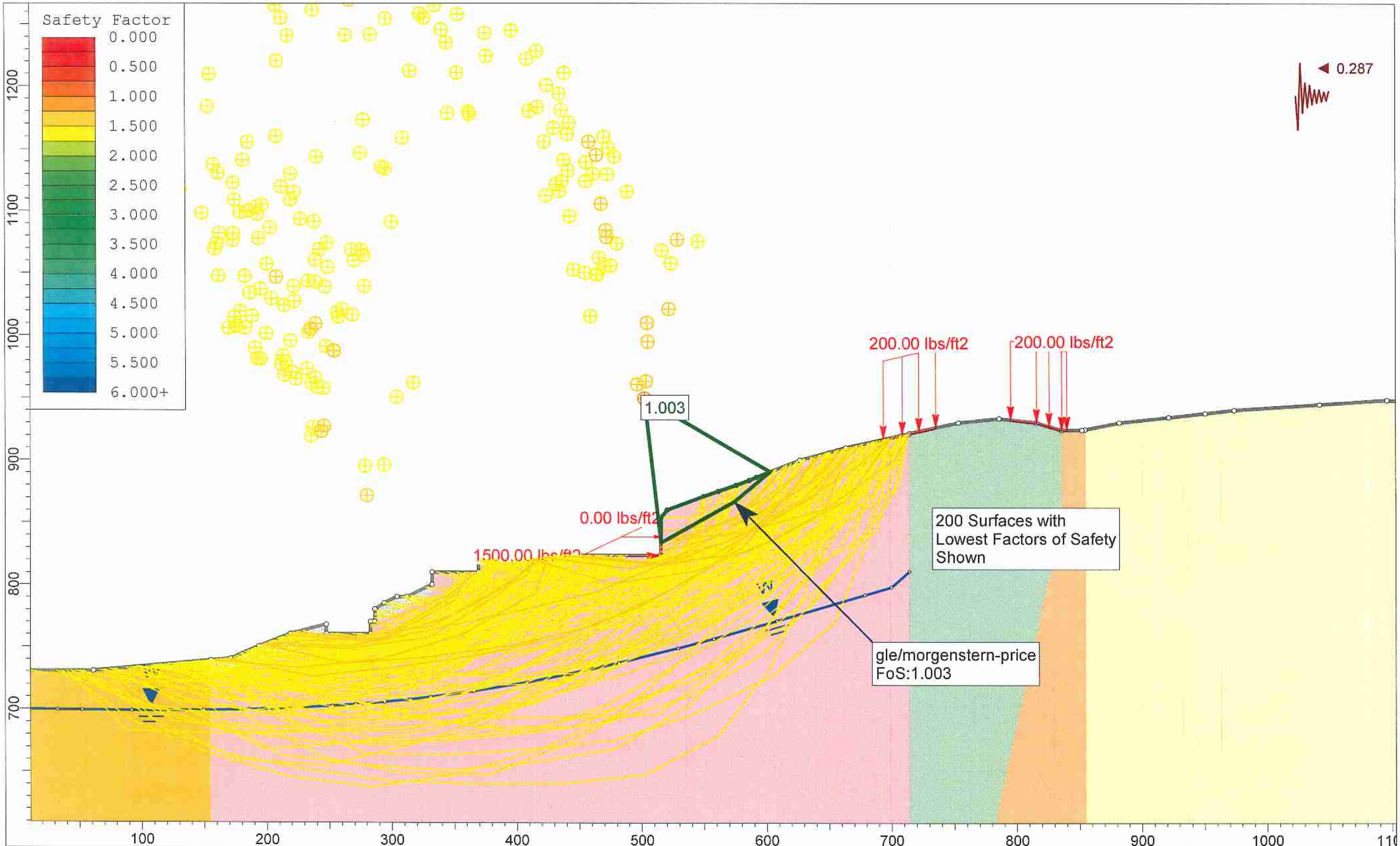
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Hu Type	Hu
Tm - Aniso		130	Anisotropic function			Tm - Aniso	Water Surface	Custom	1
Tm - Within Fault Zone		125	Mohr-Coulomb	800	36		Water Surface	Custom	1
Tm - Aniso Within Fault Zone		125	Anisotropic function			Tm - Aniso Within Fault Zone	Water Surface	Custom	1
Tt		125	Mohr-Coulomb	650	36		Water Surface	Custom	1
Tt - Aniso		125	Anisotropic function			Tt - Aniso	Water Surface	Custom	1
Tt - Weathered		125	Mohr-Coulomb	475	32		Water Surface	Custom	1



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale 1:930	Company Calwest
Date	8.7.2019		File Name Section G - Seismic.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	1:1271
Date	8.7.2019	Company	Calwest
		File Name	Section G - Seismic.sli

SLIDEINTERPRET 6.035

Slide Analysis Information
Oak Pass Road

Project Summary

File Name: Section G - Seismic
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect G Seismic
Author: RK
Company: Calwest
Date Created: 8.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section G - Seismic.sli

SLIDEINTERPRET 6.035

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287

3 Distributed Loads present

Distributed Load 1

Distribution: Triangular
Magnitude 1 [psf]: 0
Magnitude 2 [psf]: 1500
Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Distributed Load 3

Distribution: Constant
Magnitude [psf]: 200
Orientation: Vertical

Material Properties

Property	Tm - Aniso	Tm - Within Fault Zone	Tm - Aniso Within Fault Zone	Tt	Tt - Aniso	Tt - Weathered
Color						
Strength Type	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	125	125	125	125	125
Cohesion [psf]		800		650		475
Friction Angle [deg]		36		36		32
Water Surface	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1

Anisotropic Functions

Name: Tm - Aniso

Angle From	Angle To	c	phi
-90	25	650	36
25	30	380	27
30	90	650	36

Name: Tm - Aniso Within Fault Zone

Angle From	Angle To	c	phi
-90	20	800	36
20	25	200	27
25	90	800	36

Name: Tt - Aniso

Angle From	Angle To	c	phi
-90	28	650	36
28	33	380	27
33	90	650	36

Global Minimums

Method: gle/morgenstern-price

FS: 1.002620
Axis Location: 502.181, 950.113
Left Slip Surface Endpoint: 515.232, 834.311
Right Slip Surface Endpoint: 602.653, 891.072
Left Slope Intercept: 515.232 854.510
Right Slope Intercept: 602.653 891.072
Resisting Moment=1.18857e+007 lb-ft
Driving Moment=1.18546e+007 lb-ft
Resisting Horizontal Force=93345.2 lb

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By RK	*Scale*	*Company*	Calwest
Date 8.7.2019		*File Name*	Section G - Seismic.sli

SLIDEINTERPRET 6.035

Driving Horizontal Force=93101.2 lb
Total Slice Area=1273.22 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
515.232	834.311
574.073	867.097
602.653	891.072

Valid / Invalid Surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 1784
Number of Invalid Surfaces: 3216

Error Codes:

Error Code -106 reported for 68 surfaces
Error Code -107 reported for 22 surfaces
Error Code -108 reported for 30 surfaces
Error Code -110 reported for 3049 surfaces
Error Code -111 reported for 39 surfaces
Error Code -114 reported for 2 surfaces
Error Code -1000 reported for 6 surfaces

Error Codes

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-110 = The water table or a piezoline does not span the slip region for a given slip surface, when Water Surfaces is specified as the method of pore pressure calculation. If this error occurs, check that the water table or piezoline(s) span the appropriate soil cells.

-111 = safety factor equation did not converge

-114 = Surface with Reverse Curvature.

-1000 = No valid slip surfaces are generated at a grid center. Unable to draw a surface.

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.00262

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	3.46126	9189.29	Tt - Aniso	380	27	1334.81	1338.31	1880.78	0	1880.78
2	3.46126	9941.06	Tt - Aniso	380	27	1426.3	1430.04	2060.82	0	2060.82
3	3.46126	9815.12	Tt - Aniso	380	27	1417.18	1420.89	2042.87	0	2042.87
4	3.46126	9544.79	Tt - Aniso	380	27	1390.94	1394.58	1991.22	0	1991.22
5	3.46126	9274.46	Tt - Aniso	380	27	1364.04	1367.61	1938.3	0	1938.3
6	3.46126	9004.13	Tt - Aniso	380	27	1336.4	1339.9	1883.91	0	1883.91
7	3.46126	8733.79	Tt - Aniso	380	27	1307.95	1311.38	1827.93	0	1827.93
8	3.46126	8463.46	Tt - Aniso	380	27	1278.66	1282.01	1770.3	0	1770.3
9	3.46126	8193.13	Tt - Aniso	380	27	1248.52	1251.79	1710.99	0	1710.99
10	3.46126	7922.73	Tt - Aniso	380	27	1217.54	1220.73	1650.03	0	1650.03
11	3.46126	7624.36	Tt - Aniso	380	27	1182.48	1185.58	1581.04	0	1581.04
12	3.46126	7303.24	Tt - Aniso	380	27	1144.01	1147.01	1505.34	0	1505.34
13	3.46126	6982.11	Tt - Aniso	380	27	1104.92	1107.81	1428.41	0	1428.41
14	3.46126	6660.99	Tt - Aniso	380	27	1065.33	1068.12	1350.51	0	1350.51
15	3.46126	6339.87	Tt - Aniso	380	27	1025.38	1028.07	1271.9	0	1271.9

16	3.46126	6018.74	Tt - Aniso	380	27	985.215	987.796	1192.87	0	1192.87
17	3.46126	5697.62	Tt - Aniso	380	27	944.985	947.461	1113.71	0	1113.71
18	3.57248	5324.17	Tt - Aniso	650	36	1058.66	1061.44	566.294	0	566.294
19	3.57248	4567.5	Tt - Aniso	650	36	960.2	962.716	430.417	0	430.417
20	3.57248	3815.85	Tt - Aniso	650	36	863.83	866.093	297.425	0	297.425
21	3.57248	3085.3	Tt - Aniso	650	36	771.787	773.809	170.408	0	170.408
22	3.57248	2448.28	Tt - Aniso	650	36	693.399	695.216	62.2348	0	62.2348
23	3.57248	1779.01	Tt - Aniso	650	36	612.487	614.092	-49.4236	0	-49.4236
24	3.57248	1067.41	Tt - Aniso	650	36	527.79	529.173	-166.304	0	-166.304
25	3.57248	355.803	Tt - Aniso	650	36	444.626	445.791	-281.069	0	-281.069

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.00262

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	515.232	834.311	10050.5	0	0
2	518.693	836.24	8407.31	-104.305	-0.710802
3	522.154	838.168	6517.89	-160.478	-1.4104
4	525.616	840.097	4667.65	-170.161	-2.08782
5	529.077	842.025	2903.73	-138.585	-2.73246
6	532.538	843.954	1226.35	-71.447	-3.33428
7	535.999	845.883	-364.251	24.7302	-3.88404
8	539.461	847.811	-1867.8	142.845	-4.37333
9	542.922	849.74	-3284.01	275.463	-4.79475
10	546.383	851.668	-4612.61	415.073	-5.142
11	549.845	853.597	-5853.3	554.323	-5.40993
12	553.306	855.526	-6996.68	685.362	-5.59458
13	556.767	857.454	-8035.1	801.055	-5.69326

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By: RK	Scale	Company	Calwest
Date: 8.7.2019		File Name	Section G - Seismic.sli

SLIDEINTERPRET 6.035

14	560.228	859.383	-8968.34	895.877	-5.70454
15	563.69	861.311	-9796.25	965.406	-5.62824
16	567.151	863.24	-10518.7	1006.44	-5.46548
17	570.612	865.169	-11135.6	1017.07	-5.21863
18	574.073	867.097	-11647	996.724	-4.89133
19	577.646	870.094	-11089.1	867.72	-4.47427
20	581.218	873.091	-10258.6	714.352	-3.98333
21	584.791	876.088	-9158.27	548.328	-3.42635
22	588.363	879.085	-7796.5	383.005	-2.81241
23	591.936	882.082	-6207.83	233.224	-2.15155
24	595.508	885.079	-4381.59	111.271	-1.45472
25	599.081	888.075	-2303.5	29.4916	-0.733515
26	602.653	891.072	0	0	0

List Of Coordinates

Water Table

X	Y
0	700.016
32.4473	699.567
52.0781	699.328
91.563	699.01
122.236	698.99
149.435	699.201
185.465	699.902
223.779	701.293
252.318	702.847
270.967	704.135
294.012	706.053
314.766	708.116

330.881	709.954
365.605	714.673
407.817	721.807
442.157	728.635
481.656	737.49
529.01	749.307
557.591	756.965
608.146	771.256
678.704	792.21
699.892	798.604
714.2	811.395

Distributed Load

X	Y
515.232	854.51
515.232	824.064

Distributed Load

X	Y
735.159	926.448
714.2	921.788
708.451	920.51
693.23	917.135

Distributed Load

X	Y
839.874	924.51
835.812	924.51

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Section G - Seismic.sli

SLIDEINTERPRET 6.035

815.598	930.51
795.02	932.862

External Boundary

X	Y
1219.39	950.51
1187.91	940.51
1174.58	940.51
1095.91	948.51
1042.02	944.979
973.825	940.51
950.6	937.982
921.508	934.814
881.971	930.51
854.6	925.015
852.084	924.51
835.812	924.51
815.598	930.51
785.856	933.91
753.427	930.51
714.2	921.788
708.451	920.51
663.36	910.51
626.678	900.51
591.914	886.854
586.294	884.344
575.868	880.51
561.332	875.528
549.66	871.527
520.413	860.51

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section G - Seismic.sli

SLIDEINTERPRET 6.035

515.232	854.51
515.232	824.064
432.622	824.064
386.672	817.641
386.001	817.641
386.001	820.724
384.174	820.724
369.296	820.292
369.296	810.527
332.179	810.527
332.179	800.55
312.017	790.51
303.975	790.51
293.849	785.51
286.959	780.51
286.288	780.51
286.288	770.51
282.782	770.51
282.782	760.51
247.497	760.51
247.497	768.057
218.779	760.51
193.585	750.51
170.951	740.51
155	739.059
61.0267	730.51
-5.2538e-006	730.51
-5.2538e-006	600.51
155	600.51
714.2	600.51
779.947	600.51

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section G - Seismic.sli

854.6	600.51
950.6	600.51
1264.13	600.51
1264.13	966.267

Material Boundary

X	Y
155	600.51
155	729.227
155	739.059

Material Boundary

X	Y
714.2	600.51
714.2	921.788

Material Boundary

X	Y
854.6	600.51
854.6	925.015

Material Boundary

X	Y
950.6	600.51
950.6	937.982

Material Boundary

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By	RK	Scale	
Company	Calwest		
Date	8.7.2019	File Name	Section G - Seismic.sli

X	Y
779.947	600.51
820.297	783.982
835.812	845.384
835.812	924.51

Material Boundary

X	Y
155	729.227
167.373	729.227
204.666	739.948
247.497	760.51

Material Boundary

X	Y
286.288	770.51
307.223	779.406
328.242	790.924
332.179	795.531
332.179	800.55

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

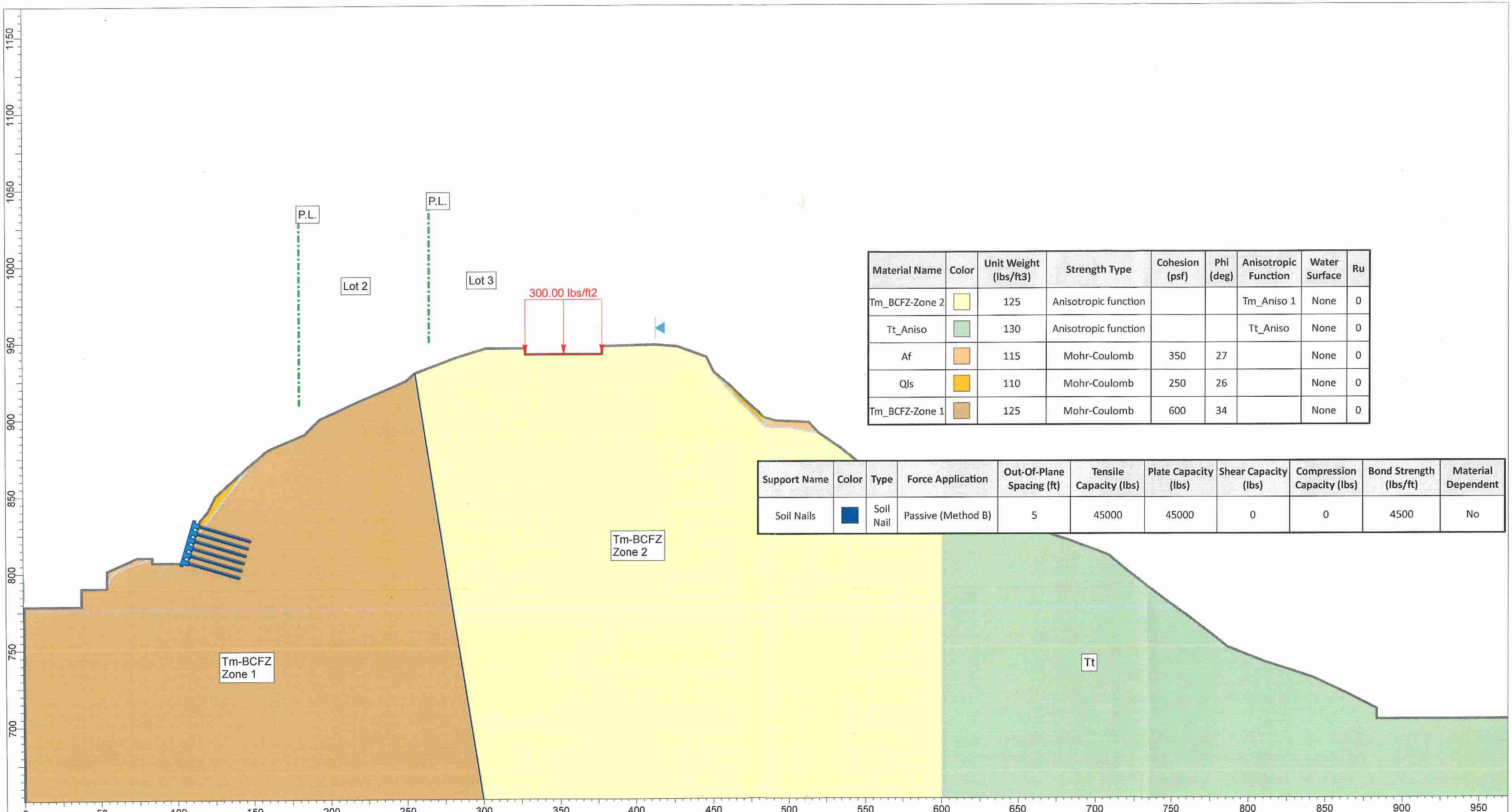
Project	Oak Pass Road		
Analysis Description	Sect G Seismic		
Drawn By: RK	Scale:	Company	Calwest
Date	8.7.2019	File Name	Section G - Seismic.sli

SLIDEINTERPRET 6.035

APPENDIX E

PRIVATE STREET SOIL NAIL WALL INTERNAL STABILITY ANALYSIS

SECTION C-C’



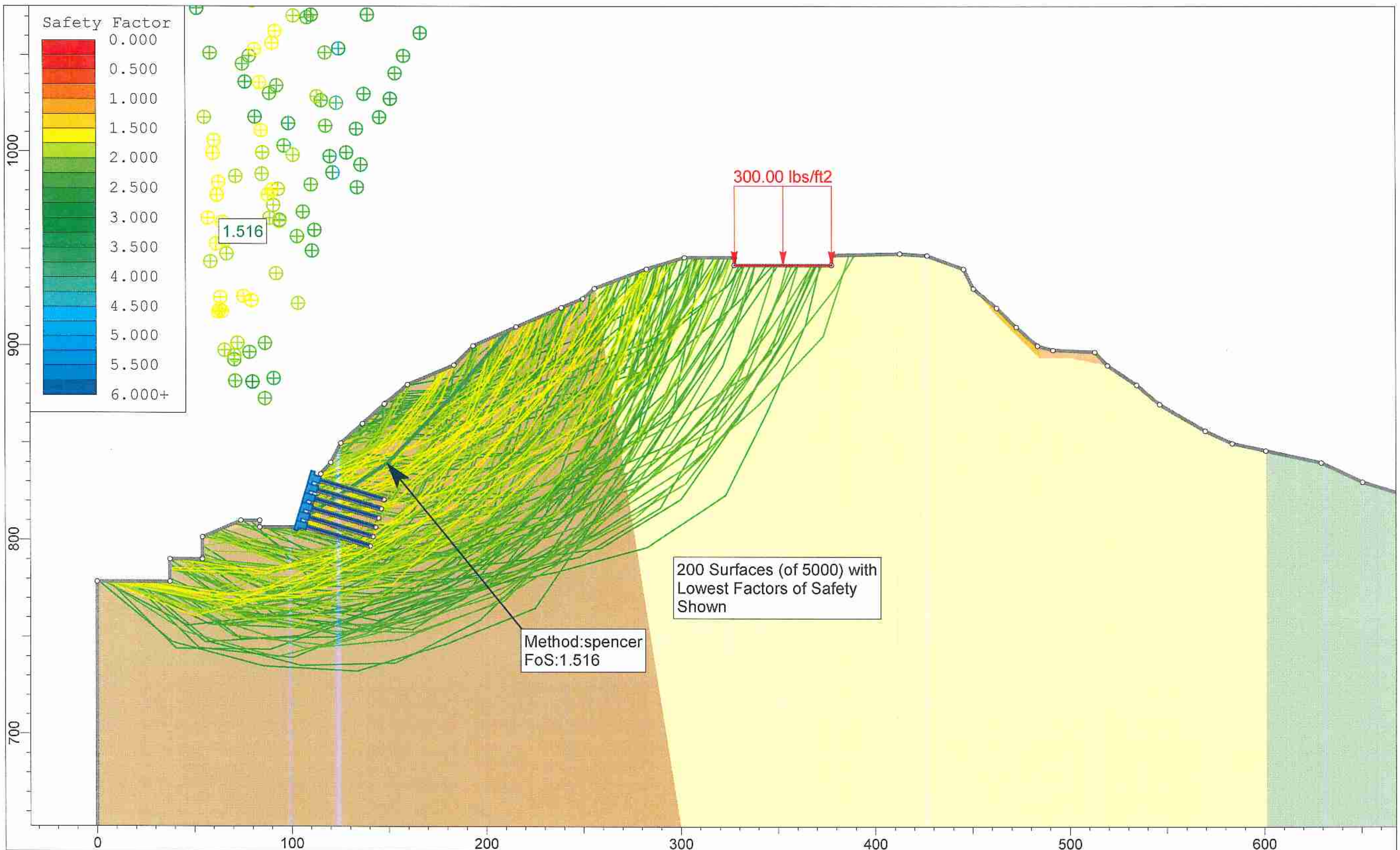
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm_BCFZ-Zone 2		125	Anisotropic function			Tm_Aniso 1	None	0
Tt_Aniso		130	Anisotropic function			Tt_Aniso	None	0
Af		115	Mohr-Coulomb	350	27		None	0
Qls		110	Mohr-Coulomb	250	26		None	0
Tm_BCFZ-Zone 1		125	Mohr-Coulomb	600	34		None	0

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Material Dependent
Soil Nails		Soil Nail	Passive (Method B)	5	45000	45000	0	0	4500	No

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Static		
Drawn By	RK	Scale	1:713
Company	Calwest Geotechnical		
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

SLIDE 6.035



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Static		
Drawn By	RK	Scale	1:817
Company	Calwest Geotechnical		
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

G5750

Project Summary

File Name: Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming
Slide Modeler Version: 6.035
Project Title: G5750
Analysis: Section C - Static
Author: RK
Company: Calwest Geotechnical
Date Created: 1/3/2019, 9:48:13 AM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	G5750		
	Analysis Description	Section C - Static		
	Drawn By	RK	Scale	Company: Calwest Geotechnical
SLIDEINTERPRET 6.035	Date	1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 1000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

1 Distributed Load present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm_BCFZ-Zone 2	Tt_Aniso	Af	Qls	Tm_BCFZ-Zone 1
Color					
Strength Type	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	130	115	110	125
Cohesion [psf]			350	250	600
Friction Angle [deg]			27	26	34
Water Surface	None	None	None	None	None
Ru Value	0	0	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	600	36
30	37	380	27
37	90	600	36

Name: Tm_Aniso 1

Angle From	Angle To	c	phi
-90	12	600	34
12	18	200	27
18	90	600	34

Support Properties

Soil Nails

Support Type: Soil Nail
Force Application: Passive
Out-of-Plane Spacing: 5 ft
Tensile Capacity: 45000 lb
Plate Capacity: 45000 lb
Bond Strength: 4500 lb/ft

Global Minimums

Method: spencer

FS: 1.515520
Axis Location: 64.575, 963.896
Left Slip Surface Endpoint: 108.610, 812.688
Right Slip Surface Endpoint: 211.962, 908.400
Resisting Moment=3.8844e+007 lb-ft
Driving Moment=2.56308e+007 lb-ft
Resisting Horizontal Force=209238 lb
Driving Horizontal Force=138064 lb
Total Slice Area=2071.82 ft2

Global Minimum Coordinates

Method: spencer

X	Y
108.61	812.688
149.034	839.41

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Static		
Drawn By	RK	Scale	
Company	Calwest Geotechnical		
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

SLIDEINTERPRET 6.035

182.631	874.328
211.962	908.4

Valid / Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 819
Number of Invalid Surfaces: 181

Error Codes:

Error Code -106 reported for 43 surfaces
Error Code -107 reported for 28 surfaces
Error Code -108 reported for 46 surfaces
Error Code -111 reported for 62 surfaces
Error Code -112 reported for 2 surfaces

Error Codes

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.51552

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	4.04236	2754.56	Tm_BCFZ-Zone 1	600	34	577.79	875.653	408.672	0	408.672
2	4.04236	7530.53	Tm_BCFZ-Zone 1	600	34	1412.88	2141.25	2285.01	0	2285.01
3	4.04236	9200.59	Tm_BCFZ-Zone 1	600	34	1547.03	2344.55	2586.41	0	2586.41
4	4.04236	11148.4	Tm_BCFZ-Zone 1	600	34	1703.48	2581.66	2937.94	0	2937.94
5	4.04236	12892.2	Tm_BCFZ-Zone 1	600	34	1392.08	2109.72	2238.27	0	2238.27
6	4.04236	13472.6	Tm_BCFZ-Zone 1	600	34	1890.17	2864.59	3357.4	0	3357.4
7	4.04236	14039.4	Tm_BCFZ-Zone 1	600	34	1484.24	2249.39	2445.32	0	2445.32
8	4.04236	14618.9	Tm_BCFZ-Zone 1	600	34	1530.78	2319.93	2549.9	0	2549.9
9	4.04236	15207.4	Tm_BCFZ-Zone 1	600	34	1578.05	2391.57	2656.1	0	2656.1
10	4.04236	15787.7	Tm_BCFZ-Zone 1	600	34	1624.66	2462.2	2760.83	0	2760.83
11	4.19967	16429.4	Tm_BCFZ-Zone 1	600	34	1366	2070.2	2179.66	0	2179.66
12	4.19967	15982.3	Tm_BCFZ-Zone 1	600	34	1337.61	2027.17	2115.87	0	2115.87
13	4.19967	15431.2	Tm_BCFZ-Zone 1	600	34	1302.62	1974.14	2037.25	0	2037.25
14	4.19967	14191.8	Tm_BCFZ-Zone 1	600	34	1223.93	1854.89	1860.45	0	1860.45
15	4.19967	12826.3	Tm_BCFZ-Zone 1	600	34	1137.23	1723.49	1665.65	0	1665.65
16	4.19967	11460.8	Tm_BCFZ-Zone 1	600	34	1050.53	1592.1	1470.85	0	1470.85
17	4.19967	10095.2	Tm_BCFZ-Zone 1	600	34	963.83	1460.7	1276.04	0	1276.04
18	4.19967	8729.72	Tm_BCFZ-Zone 1	600	34	877.129	1329.31	1081.24	0	1081.24
19	4.19016	7634.78	Tm_BCFZ-Zone 1	600	34	773.987	1172.99	849.497	0	849.497
20	4.19016	7277.87	Tm_BCFZ-Zone 1	600	34	752.495	1140.42	801.207	0	801.207
21	4.19016	6825.31	Tm_BCFZ-Zone 1	600	34	725.242	1099.12	739.974	0	739.974
22	4.19016	5456.72	Tm_BCFZ-Zone 1	600	34	642.828	974.218	554.801	0	554.801
23	4.19016	3897.66	Tm_BCFZ-Zone 1	600	34	548.944	831.935	343.858	0	343.858
24	4.19016	2338.59	Tm_BCFZ-Zone 1	600	34	455.06	689.652	132.914	0	132.914
25	4.19016	779.531	Tm_BCFZ-Zone 1	600	34	115.215	174.61	-630.667	0	-630.667

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Static		
Drawn By	RK	Scale	Company: Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

SLIDEINTERPRET 6.035

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.51552

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	108.61	812.688	0	0	0
2	112.653	815.361	1239.05	440.98	19.5907
3	116.695	818.033	9461.36	3367.32	19.5908
4	120.737	820.705	17419.5	6199.64	19.5908
5	124.78	823.377	25069.5	8922.3	19.5908
6	128.822	826.049	24704.9	8792.53	19.5908
7	132.865	828.721	31987.2	11384.3	19.5907
8	136.907	831.393	31441.1	11190	19.5908
9	140.949	834.066	30803.3	10963	19.5908
10	144.992	836.738	30072.4	10702.9	19.5909
11	149.034	839.41	29249.8	10410.1	19.5908
12	153.234	843.775	25461.5	9061.79	19.5907
13	157.433	848.139	21832.6	7770.26	19.5907
14	161.633	852.504	18400.2	6548.67	19.5908
15	165.833	856.869	15409.7	5484.34	19.5907
16	170.032	861.234	12906	4593.29	19.5908
17	174.232	865.599	10889.3	3875.53	19.5908
18	178.432	869.964	9359.42	3331.04	19.5908
19	182.631	874.328	8316.43	2959.84	19.5908
20	186.821	879.196	7418.38	2640.22	19.5908
21	191.012	884.063	6665.5	2372.27	19.5908
22	195.202	888.931	6096.68	2169.83	19.5908
23	199.392	893.798	6084.53	2165.5	19.5908
24	203.582	898.665	6706.5	2386.86	19.5908
25	207.772	903.533	7962.6	2833.91	19.5908

26	211.962	908.4	0	0	0

List Of Coordinates

Distributed Load

X	Y
377.808	942
327.782	942

External Boundary

X	Y
0	650
300	650
600.885	650
969.73	650
969.73	703
883.807	703
883.807	709.7
863.6	720
842.494	730
811.906	740
786.423	750
761.202	770
733.271	790
720.245	800
708.752	810
682.839	820
650.681	830
629.382	840

600.885	846.231
583.651	850
569.73	856.471
546.424	870
534.587	880
519.604	890
519.604	890
513.053	897
491.511	898
483.6	900.231
472.678	910
462.653	920
450.664	930
450.664	930
445.718	940
426.917	947
412.932	948
377.808	947.15
377.808	942
327.782	942
327.782	946
302.098	946
282.577	940
255.772	930
249.73	924.712
238.769	920
215.508	910
193.347	900
183.448	890
159.635	880
148.209	870.442

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

Project	G5750		
Analysis Description	Section C - Static		
Drawn By	RK	Scale	Company: Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

147.68	870
136.553	860
125.287	850
120.161	840
114.915	833.928
111.849	823.6
106.887	806.883
105.384	806
103.379	806.5
83.504	806.5
83.504	810
83.504	810
73.8867	810
54.1435	801.328
54.1435	790.63
54.1435	790.073
37.3934	790.073
37.3934	778.4
0	778.4

Material Boundary

X	Y
54.1435	790.63
55.6009	795.961
57.4833	799.52
63.1814	803.079
83.504	810

Material Boundary

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	G5750
Analysis Description	Section C - Static
Drawn By	RK
Scale	
Company	Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM
File Name	Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

SLIDEINTERPRET 6.035

X	Y
483.6	900.231
483.858	900
484.937	894
500.183	894
519.604	890
519.605	890

Material Boundary

X	Y
111.849	823.6
113.678	825.633
116.499	829.017
118.221	831.189
119.968	833.433
122.802	837.094
125.293	840.326
127.29	842.925
129.44	845.731
132.299	849.472
135.826	854.103
139.238	858.595
142.649	863.097
148.209	870.442

Material Boundary

X	Y
450.664	930
458.965	920.336

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: G5750		
	Analysis Description: Section C - Static		
	Drawn By: RK	Scale	Company: Calwest Geotechnical
SLIDEINTERPRET 6.035	Date: 1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Static-Soil Nails-Soldier Piles-MinorTrimming.sli

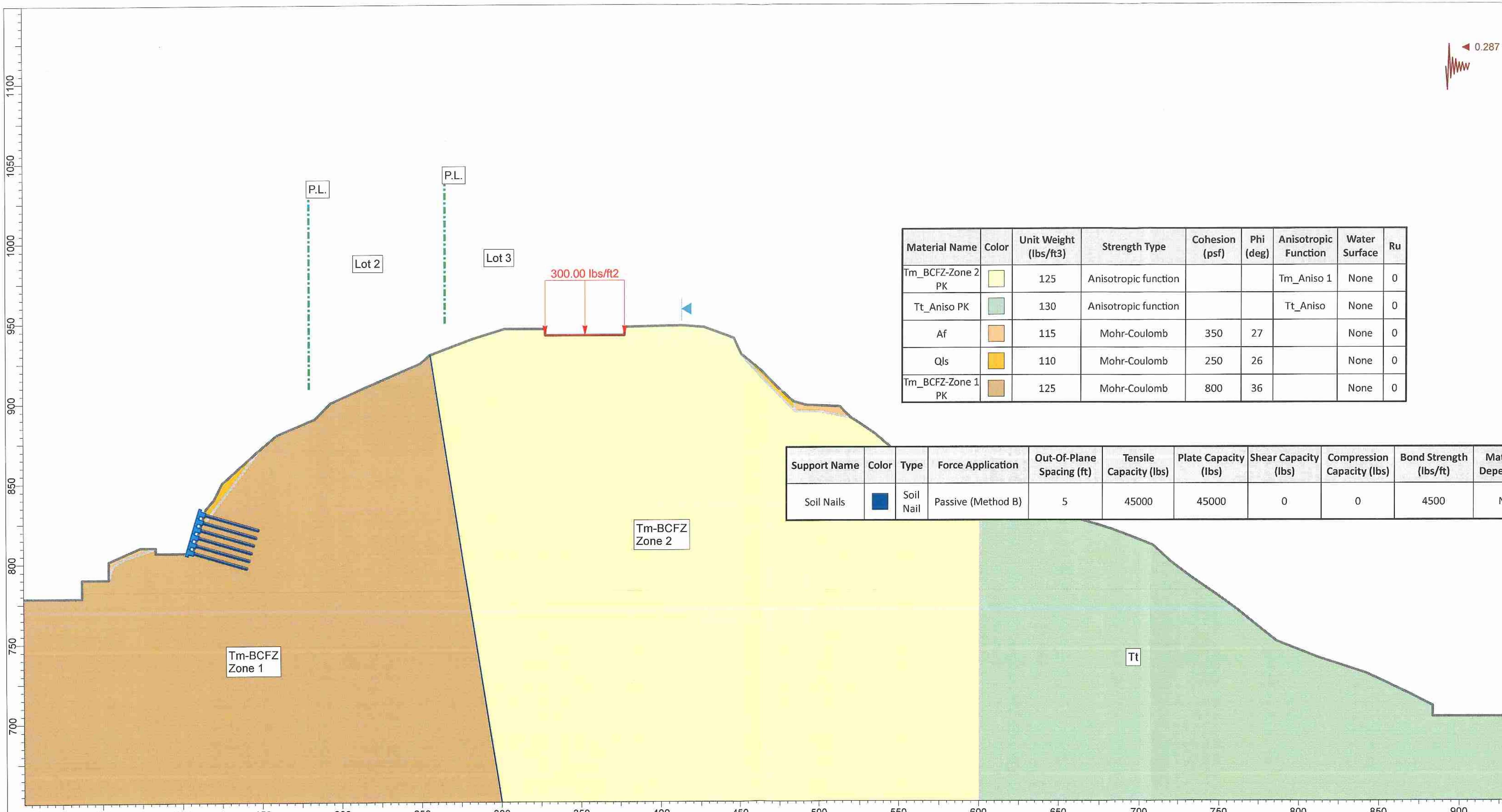
464.165	914.594
470.861	907.662
478.611	900.056
484.937	894

Material Boundary

X	Y
600.885	650
600.885	846.231

Material Boundary

X	Y
255.772	930
300	650



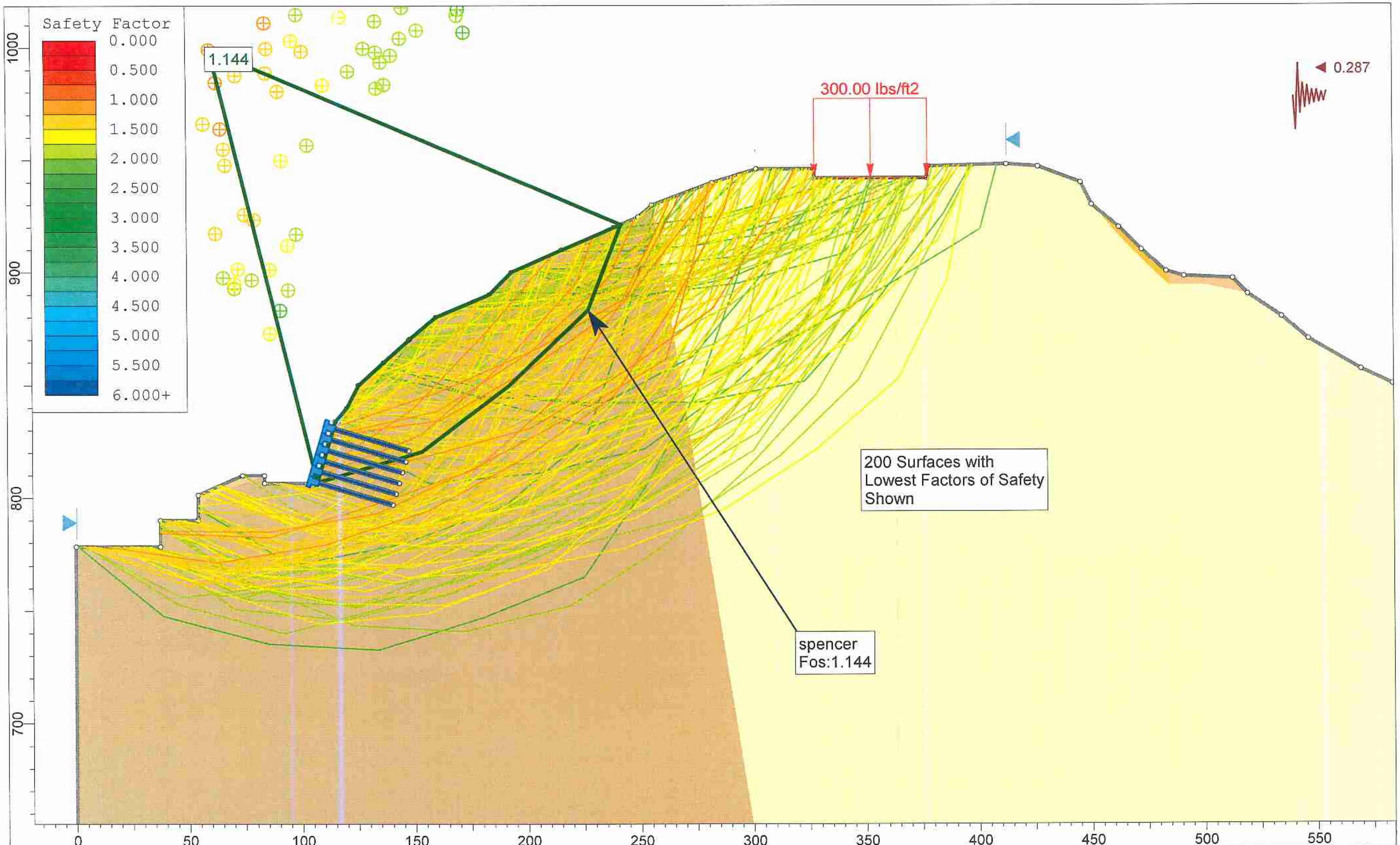
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tm_BCFZ-Zone 2 PK		125	Anisotropic function			Tm_Aniso 1	None	0
Tt_Aniso PK		130	Anisotropic function			Tt_Aniso	None	0
Af		115	Mohr-Coulomb	350	27		None	0
Qls		110	Mohr-Coulomb	250	26		None	0
Tm_BCFZ-Zone 1 PK		125	Mohr-Coulomb	800	36		None	0

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Mater Depend
Soil Nails		Soil Nail	Passive (Method B)	5	45000	45000	0	0	4500	No

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Seis North Face		
Drawn By RK	*Scale* 1:687	*Company*	Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM	*File Name*	Section C-NorthFace-Seismic.slim

SLIDE 6.035



CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750
Analysis Description	Section C - Seis North Face
Drawn By	RK
Scale	1:702
Company	Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM
File Name	Section C-NorthFace-Seismic.slim

SLIDEINTERPRET 6.035

Slide Analysis Information

G5750

Project Summary

File Name: Section C-NorthFace-Seismic
Slide Modeler Version: 6.035
Project Title: G5750
Analysis: Section C - Seis North Face
Author: RK
Company: Calwest Geotechnical
Date Created: 1/3/2019, 9:48:13 AM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	G5750		
	Analysis Description	Section C - Seis North Face		
	Drawn By	RK	Scale	Company: Calwest Geotechnical
SLIDEINTERPRET 6.035	Date	1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Seismic.slim

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 1000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287

1 Distributed Load present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm_BCFZ-Zone 2 PK	Tt_Aniso PK	Af	Qls	Tm_BCFZ-Zone 1 PK
Color					
Strength Type	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	130	115	110	125
Cohesion [psf]			350	250	800
Friction Angle [deg]			27	26	36
Water Surface	None	None	None	None	None
Ru Value	0	0	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	650	36
30	37	380	27
37	90	650	36

Name: Tm_Aniso 1

Angle From	Angle To	c	phi
-90	12	800	36
12	18	200	27

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750
Analysis Description	Section C - Seis North Face
Drawn By	RK
Scale	
Company	Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM
File Name	Section C-NorthFace-Seismic.slim

SLIDEINTERPRET 6.035

18	90	800	36

Support Properties

Soil Nails

Support Type: Soil Nail
Force Application: Passive
Out-of-Plane Spacing: 5 ft
Tensile Capacity: 45000 lb
Plate Capacity: 45000 lb
Bond Strength: 4500 lb/ft

Global Minimums

Method: spencer

FS: 1.143880
Axis Location: 59.868, 999.053
Left Slip Surface Endpoint: 106.835, 806.852
Right Slip Surface Endpoint: 241.809, 921.307
Resisting Moment=1.10191e+008 lb-ft
Driving Moment=9.63305e+007 lb-ft
Resisting Horizontal Force=474817 lb
Driving Horizontal Force=415093 lb
Total Slice Area=5327.87 ft2

Global Minimum Coordinates

Method: spencer

X	Y
106.835	806.852

153.307	820.582
191.964	849.8
227.166	883.101
241.809	921.307

Valid / Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 560
Number of Invalid Surfaces: 440

Error Codes:

Error Code -106 reported for 43 surfaces
Error Code -107 reported for 13 surfaces
Error Code -108 reported for 233 surfaces
Error Code -111 reported for 151 surfaces

Error Codes

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.14388

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	5.16348	5028.91	Tm_BCFZ-Zone 1 PK	800	36	3659.47	4186	4660.44	0	4660.44
2	5.16348	14188	Tm_BCFZ-Zone 1 PK	800	36	4604.54	5267.04	6148.35	0	6148.35
3	5.16348	18333.2	Tm_BCFZ-Zone 1 PK	800	36	3076.56	3519.21	3742.67	0	3742.67
4	5.16348	22910.7	Tm_BCFZ-Zone 1 PK	800	36	5504.57	6296.57	7565.37	0	7565.37
5	5.16348	25563.3	Tm_BCFZ-Zone 1 PK	800	36	3822.59	4372.58	4917.23	0	4917.23
6	5.16348	27707.3	Tm_BCFZ-Zone 1 PK	800	36	5999.5	6862.71	8344.6	0	8344.6
7	5.16348	29875.7	Tm_BCFZ-Zone 1 PK	800	36	5082.54	5813.82	6900.93	0	6900.93
8	5.16348	32054	Tm_BCFZ-Zone 1 PK	800	36	4492.32	5138.67	5971.66	0	5971.66
9	5.16348	34032.2	Tm_BCFZ-Zone 1 PK	800	36	4696.43	5372.15	6293.02	0	6293.02
10	5.5225	37516.5	Tm_BCFZ-Zone 1 PK	800	36	2580.71	2952.02	2962	0	2962
11	5.5225	37244.9	Tm_BCFZ-Zone 1 PK	800	36	2567.89	2937.36	2941.82	0	2941.82
12	5.5225	35981.3	Tm_BCFZ-Zone 1 PK	800	36	2508.28	2869.17	2847.97	0	2847.97
13	5.5225	34700.9	Tm_BCFZ-Zone 1 PK	800	36	2447.87	2800.07	2752.86	0	2752.86
14	5.5225	33420.5	Tm_BCFZ-Zone 1 PK	800	36	2387.46	2730.97	2657.74	0	2657.74
15	5.5225	32470.8	Tm_BCFZ-Zone 1 PK	800	36	2342.65	2679.71	2587.21	0	2587.21
16	5.5225	33204.7	Tm_BCFZ-Zone 1 PK	800	36	2377.28	2719.32	2641.72	0	2641.72
17	5.86695	35226.4	Tm_BCFZ-Zone 1 PK	800	36	2039.48	2332.92	2109.88	0	2109.88
18	5.86695	33164.4	Tm_BCFZ-Zone 1 PK	800	36	1963.89	2246.45	1990.86	0	1990.86
19	5.86695	31035.6	Tm_BCFZ-Zone 1 PK	800	36	1885.85	2157.19	1868.01	0	1868.01
20	5.86695	28906.9	Tm_BCFZ-Zone 1 PK	800	36	1807.81	2067.92	1745.14	0	1745.14
21	5.86695	26733.4	Tm_BCFZ-Zone 1 PK	800	36	1728.14	1976.78	1619.69	0	1619.69
22	5.86695	24512.8	Tm_BCFZ-Zone 1 PK	800	36	1646.73	1883.66	1491.53	0	1491.53
23	4.88097	16224.7	Tm_BCFZ-Zone 1 PK	800	36	809.602	926.088	173.545	0	173.545
24	4.88097	9734.81	Tm_BCFZ-Zone 1 PK	800	36	744.858	852.029	71.6111	0	71.6111
25	4.88097	3244.94	Tm_BCFZ-Zone 1 PK	800	36	572.491	654.861	-199.767	0	-199.767

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.14388

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	106.835	806.852	0	0	0
2	111.999	808.378	18888.8	22011.4	49.3659
3	117.162	809.903	37737.7	43976.4	49.3659
4	122.326	811.429	42583.4	49623.3	49.366
5	127.489	812.955	61394.4	71544	49.366
6	132.653	814.48	66208.7	77154.2	49.366
7	137.816	816.006	84998.8	99050.7	49.366
8	142.98	817.531	95622.3	111430	49.3659
9	148.143	819.057	100408	117008	49.3661
10	153.307	820.582	105186	122575	49.3659
11	158.829	824.756	96245.4	112157	49.3661
12	164.352	828.93	87396.8	101845	49.3659
13	169.874	833.104	78974.7	92030.7	49.366
14	175.397	837.278	70985	82720.1	49.366
15	180.919	841.452	63427.5	73913.3	49.366
16	186.442	845.626	56190.7	65480.1	49.366
17	191.964	849.8	48706.1	56758.1	49.366
18	197.831	855.35	38799.7	45214	49.366
19	203.698	860.9	29704.1	34614.7	49.3659
20	209.565	866.451	21445.5	24990.8	49.3659
21	215.432	872.001	14023.9	16342.3	49.366
22	221.299	877.551	7456.84	8689.6	49.366
23	227.166	883.101	1762.93	2054.37	49.3659
24	232.047	895.836	-1169.18	-1362.46	49.3658
25	236.928	908.572	-1255.17	-1462.67	49.3659
26	241.809	921.307	0	0	0

CALWEST GEOTECHNICAL CONSULTING ENGINEERS				
Project	G5750			
Analysis Description	Section C - Seis North Face			
Drawn By	RK	Scale	Company	Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM		File Name	Section C-NorthFace-Seismic.slim

SLIDEINTERPRET 6.035

List Of Coordinates

Distributed Load

X	Y
377.808	942
327.782	942

External Boundary

X	Y
0	650
300	650
600.885	650
969.73	650
969.73	703
883.807	703
883.807	709.7
863.6	720
842.494	730
811.906	740
786.423	750
761.202	770
733.271	790
720.245	800
708.752	810
682.839	820
650.681	830
629.382	840
600.885	846.231
583.651	850

CALWEST GEOTECHNICAL CONSULTING ENGINEERS			
Project	G5750		
Analysis Description	Section C - Seis North Face		
Drawn By	RK	Scale	
Company	Calwest Geotechnical		
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Seismic.slim

SLIDEINTERPRET 6.035

569.73	856.471
546.424	870
534.587	880
519.604	890
519.604	890
513.053	897
491.511	898
483.6	900.231
472.678	910
462.653	920
450.664	930
450.664	930
445.718	940
426.917	947
412.932	948
377.808	947.15
377.808	942
327.782	942
327.782	946
302.098	946
282.577	940
255.772	930
249.73	924.712
238.769	920
215.508	910
193.347	900
183.448	890
159.635	880
148.209	870.442
147.68	870
136.553	860

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Seis North Face		
Drawn By	RK	Scale	
Company	Calwest Geotechnical		
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Seismic.slim

SLIDEINTERPRET 6.035

125.287	850
120.161	840
114.915	833.928
111.849	823.6
106.887	806.883
105.384	806
103.379	806.5
83.504	806.5
83.504	810
83.504	810
73.8867	810
54.1435	801.328
54.1435	790.63
54.1435	790.073
37.3934	790.073
37.3934	778.4
0	778.4

Material Boundary

X	Y
54.1435	790.63
55.6009	795.961
57.4833	799.52
63.1814	803.079
83.504	810

Material Boundary

X	Y
483.6	900.231

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: G5750		
	Analysis Description: Section C - Seis North Face		
	Drawn By: RK	Scale	Company: Calwest Geotechnical
SLIDEINTERPRET 6.035	Date: 1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Seismic.slim

483.858	900
484.937	894
500.183	894
519.604	890
519.605	890

Material Boundary

X	Y
111.849	823.6
113.678	825.633
116.499	829.017
118.221	831.189
119.968	833.433
122.802	837.094
125.293	840.326
127.29	842.925
129.44	845.731
132.299	849.472
135.826	854.103
139.238	858.595
142.649	863.097
148.209	870.442

Material Boundary

X	Y
450.664	930
458.965	920.336
464.165	914.594
470.861	907.662

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Seis North Face		
Drawn By RK	*Scale*	*Company*	Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM	*File Name*	Section C-NorthFace-Seismic.slim

SLIDEINTERPRET 6.035

478.611	900.056
484.937	894

Material Boundary

X	Y
600.885	650
600.885	846.231

Material Boundary

X	Y
255.772	930
300	650

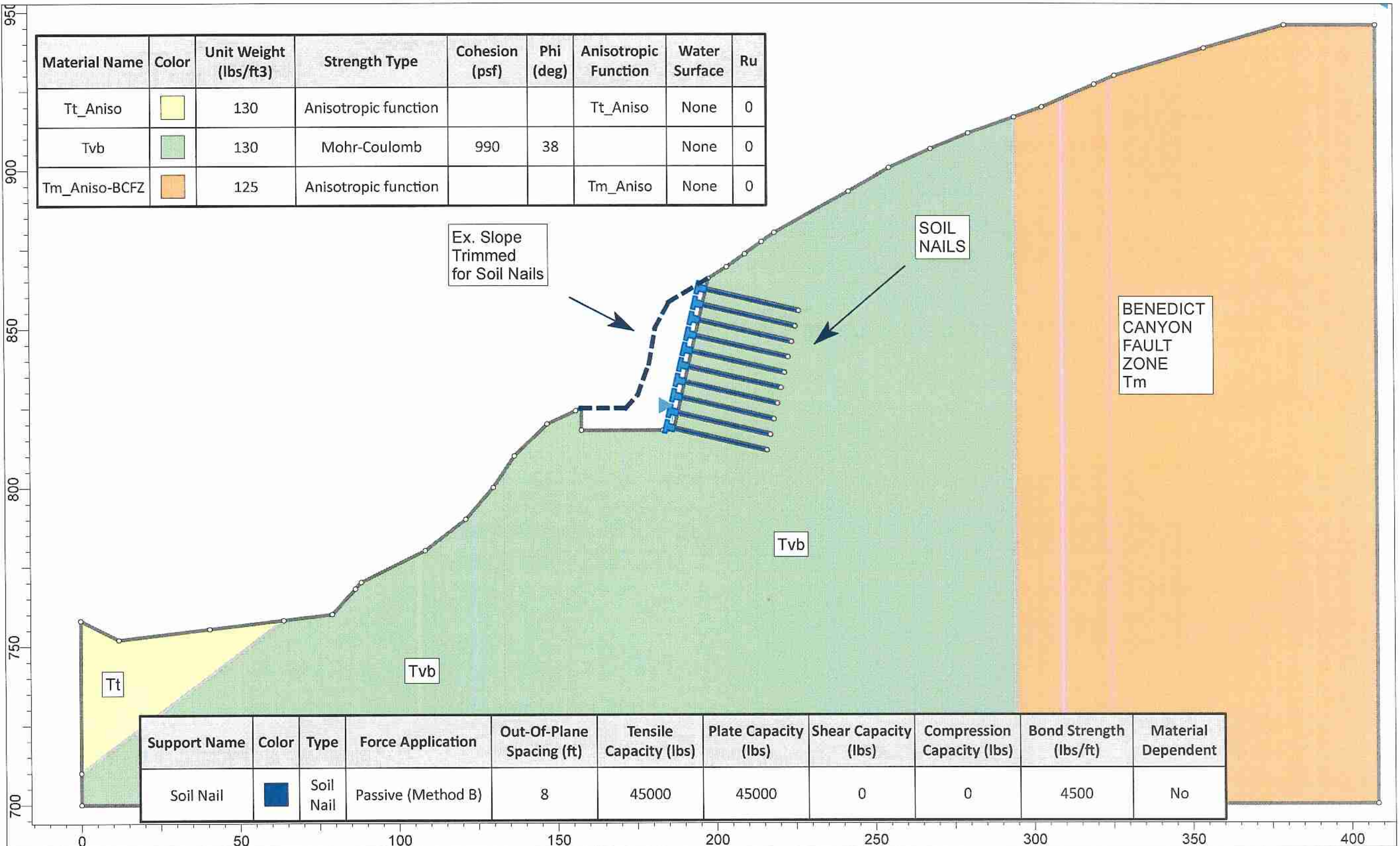
CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Seis North Face		
Drawn By	RK	Scale	
Company	Calwest Geotechnical		
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Seismic.slim

SLIDEINTERPRET 6.035

SECTION N-N'

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tt_Aniso		130	Anisotropic function			Tt_Aniso	None	0
Tvb		130	Mohr-Coulomb	990	38		None	0
Tm_Aniso-BCFZ		125	Anisotropic function			Tm_Aniso	None	0

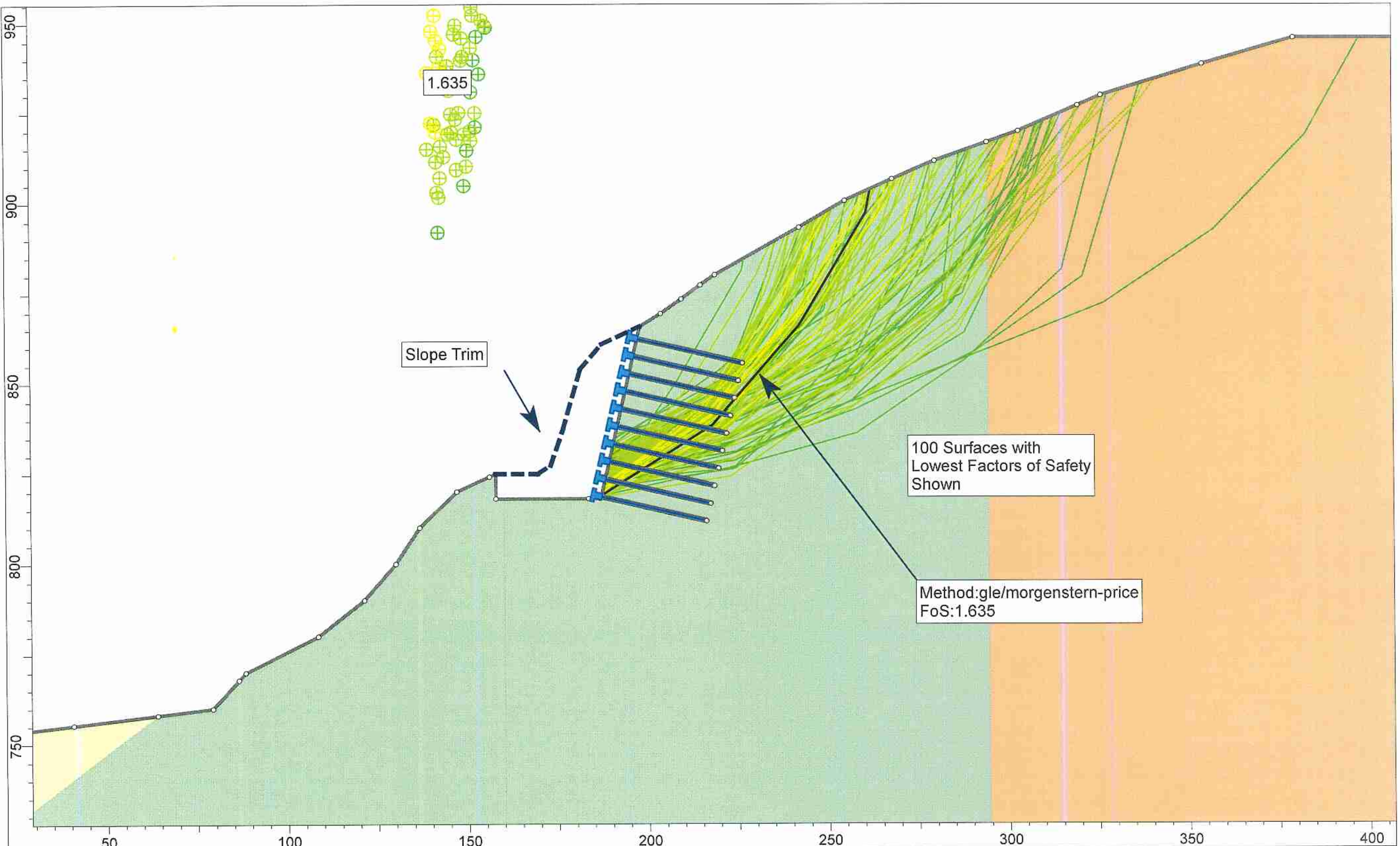


Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Material Dependent
Soil Nail		Soil Nail	Passive (Method B)	8	45000	45000	0	0	4500	No

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277
Analysis Description	Sect N Soil Nails Static Internal
Drawn By	RK
Scale	1:500
Company	CalWest
Date	1/9/2019, 9:11:16 AM
File Name	Sect N_Soil_Nails.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Rd G5277	
	Analysis Description	Sect N Soil Nails Static Internal	
	Drawn By: RK	Scale: 1:440	Company: CalWest
	Date: 1/9/2019, 9:11:16 AM		File Name: Sect N_Soil_Nails.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

Oak Pass Rd G5277

Project Summary

File Name: Sect N_Soil_Nails
Slide Modeler Version: 6.035
Project Title: Oak Pass Rd G5277
Analysis: Sect N Soil Nails Static Internal
Author: RK
Company: CalWest
Date Created: 1/9/2019, 9:11:16 AM

General Settings

Units of Measurement: Imperial Units
Time Units: days
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Rd G5277		
	Analysis Description	Sect N Soil Nails Static Internal		
	Drawn By: RK	Scale	Company	CalWest
SLIDEINTERPRET 6.035	Date: 1/9/2019, 9:11:16 AM		File Name	Sect N_Soil_Nails.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Material Properties

Property	Tt_Aniso	Tvb	Tm_Aniso-BCFZ

Color			
Strength Type	Anisotropic function	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	130	130	125
Cohesion [psf]		990	
Friction Angle [deg]		38	
Water Surface	None	None	None
Ru Value	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	40	600	36
40	45	380	27
45	90	600	36

Name: Tm_Aniso

Angle From	Angle To	c	phi
-90	-67	600	34
-67	-60	200	27
-60	90	600	34

Support Properties

Soil Nail

Support Type: Soil Nail
Force Application: Passive
Out-of-Plane Spacing: 8 ft
Tensile Capacity: 45000 lb
Plate Capacity: 45000 lb
Bond Strength: 4500 lb/ft

Global Minimums

Method: gle/morgenstern-price

FS: 1.634560
Axis Location: 139.616, 936.337
Left Slip Surface Endpoint: 187.110, 818.935
Right Slip Surface Endpoint: 262.034, 903.891
Resisting Moment=3.80066e+007 lb-ft
Driving Moment=2.32519e+007 lb-ft
Resisting Horizontal Force=230726 lb
Driving Horizontal Force=141155 lb
Total Slice Area=2167.12 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
187.11	818.935
218.006	838.476
242.064	866.002
260.821	897.38
262.034	903.891

Valid / Invalid Surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 4673
Number of Invalid Surfaces: 327

Error Codes:

Error Code -107 reported for 1 surface
Error Code -108 reported for 238 surfaces
Error Code -111 reported for 61 surfaces
Error Code -112 reported for 27 surfaces

Error Codes

The following errors were encountered during the computation:

-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.63456

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	3.08963	2286.26	Tvb	990	38	748.259	1223.07	298.321	0	298.321
2	3.08963	6858.77	Tvb	990	38	1440.86	2355.18	1747.35	0	1747.35
3	3.08963	11431.3	Tvb	990	38	1873.31	3062.04	2652.09	0	2652.09
4	3.08963	15463.2	Tvb	990	38	2517.91	4115.67	4000.68	0	4000.68
5	3.08963	16060	Tvb	990	38	2429.69	3971.48	3816.12	0	3816.12
6	3.08963	16070.3	Tvb	990	38	2630.74	4300.11	4236.75	0	4236.75
7	3.08963	16158	Tvb	990	38	2443.89	3994.68	3845.8	0	3845.8
8	3.08963	16259.2	Tvb	990	38	2675.91	4373.94	4331.26	0	4331.26

9	3.08963	16373.7	Tvb	990	38	2459.61	4020.38	3878.71	0	3878.71
10	3.08963	16477	Tvb	990	38	2597.74	4246.16	4167.7	0	4167.7
11	3.00721	15779.9	Tvb	990	38	1928.36	3152.02	2767.25	0	2767.25
12	3.00721	15095.2	Tvb	990	38	1811.82	2961.53	2523.45	0	2523.45
13	3.00721	14403.4	Tvb	990	38	1744.05	2850.75	2381.64	0	2381.64
14	3.00721	13711.6	Tvb	990	38	1680.86	2747.46	2249.44	0	2249.44
15	3.00721	13019.8	Tvb	990	38	1621.46	2650.38	2125.18	0	2125.18
16	3.00721	12328.1	Tvb	990	38	1565.13	2558.3	2007.33	0	2007.33
17	3.00721	11636.3	Tvb	990	38	1511.15	2470.06	1894.39	0	1894.39
18	3.00721	10944.5	Tvb	990	38	1458.77	2384.44	1784.8	0	1784.8
19	3.12612	10322.6	Tvb	990	38	1162.14	1899.59	1164.23	0	1164.23
20	3.12612	8937.7	Tvb	990	38	1075.71	1758.31	983.396	0	983.396
21	3.12612	7552.9	Tvb	990	38	985.171	1610.32	793.975	0	793.975
22	3.12612	6168.1	Tvb	990	38	887.816	1451.19	590.295	0	590.295
23	3.12612	4728.34	Tvb	990	38	776.329	1268.96	357.048	0	357.048
24	3.12612	3189.42	Tvb	990	38	643.58	1051.97	79.3183	0	79.3183
25	1.21322	469.386	Tvb	990	38	234.858	383.889	-775.787	0	-775.787

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.63456

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	187.11	818.935	0	0	0
2	190.2	820.889	1726.08	95.8739	3.17919
3	193.289	822.843	6110.43	673.109	6.28621
4	196.379	824.797	6708.75	1093.02	9.25358
5	199.469	826.751	10013.4	2132.48	12.0223
6	202.558	828.705	10054	2608.31	14.5436

7	205.648	830.659	13245.6	3994.2	16.7806
8	208.738	832.614	13272	4494.08	18.7068
9	211.827	834.568	16418.3	6074.85	20.3047
10	214.917	836.522	16428.9	6492.61	21.5637
11	218.006	838.476	18203.8	7532.01	22.4778
12	221.014	841.917	15271.5	6493.04	23.0339
13	224.021	845.357	12031	5171.35	23.2597
14	227.028	848.798	9074.77	3881.03	23.1551
15	230.035	852.239	6383.63	2672.95	22.72
16	233.042	855.68	3941.64	1588.94	21.9552
17	236.05	859.12	1735.95	661.596	20.8626
18	239.057	862.561	-243.275	-85.8903	19.446
19	242.064	866.002	-2002.78	-639.682	17.7133
20	245.19	871.231	-4462.83	-1245.3	15.5911
21	248.316	876.461	-6247.06	-1461.13	13.1643
22	251.442	881.691	-7323.34	-1352.84	10.4663
23	254.569	886.921	-7638.4	-1011.33	7.54214
24	257.695	892.151	-7081.73	-550.95	4.44858
25	260.821	897.38	-5487.08	-119.961	1.25243
26	262.034	903.891	0	0	0

List Of Coordinates

External Boundary

X	Y
0	700
294.5	700
408.278	700
408.278	946.1
379.522	946.1

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Soil Nails Static Internal		
Drawn By	RK	Scale	Company: CalWest
Date	1/9/2019, 9:11:16 AM		File Name: Sect N_Soil_Nails.sli

SLIDEINTERPRET 6.035

354.278	938.715
326.152	930
319.761	927.208
303.266	920
294.5	916.864
280.022	911.684
268.189	906.722
255.072	900.688
242.316	893.253
218.853	880.214
214.83	877.368
209.521	873.518
203.786	869.447
197.968	865.808
187.026	818.571
186.964	818.346
186.629	818.149
183.518	818
157.804	818
157.804	824.9
156.045	824.102
147.001	820
136.632	810
129.968	800
121.233	790
108.414	780
88.2833	770
86.4033	767.94
79.1591	760
63.8755	758.18
40.5627	755.403

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Soil Nails Static Internal		
Drawn By	RK	Scale	Company: CalWest
Date	1/9/2019, 9:11:16 AM	File Name	Sect N_Soil_Nails.sli

SLIDEINTERPRET 6.035

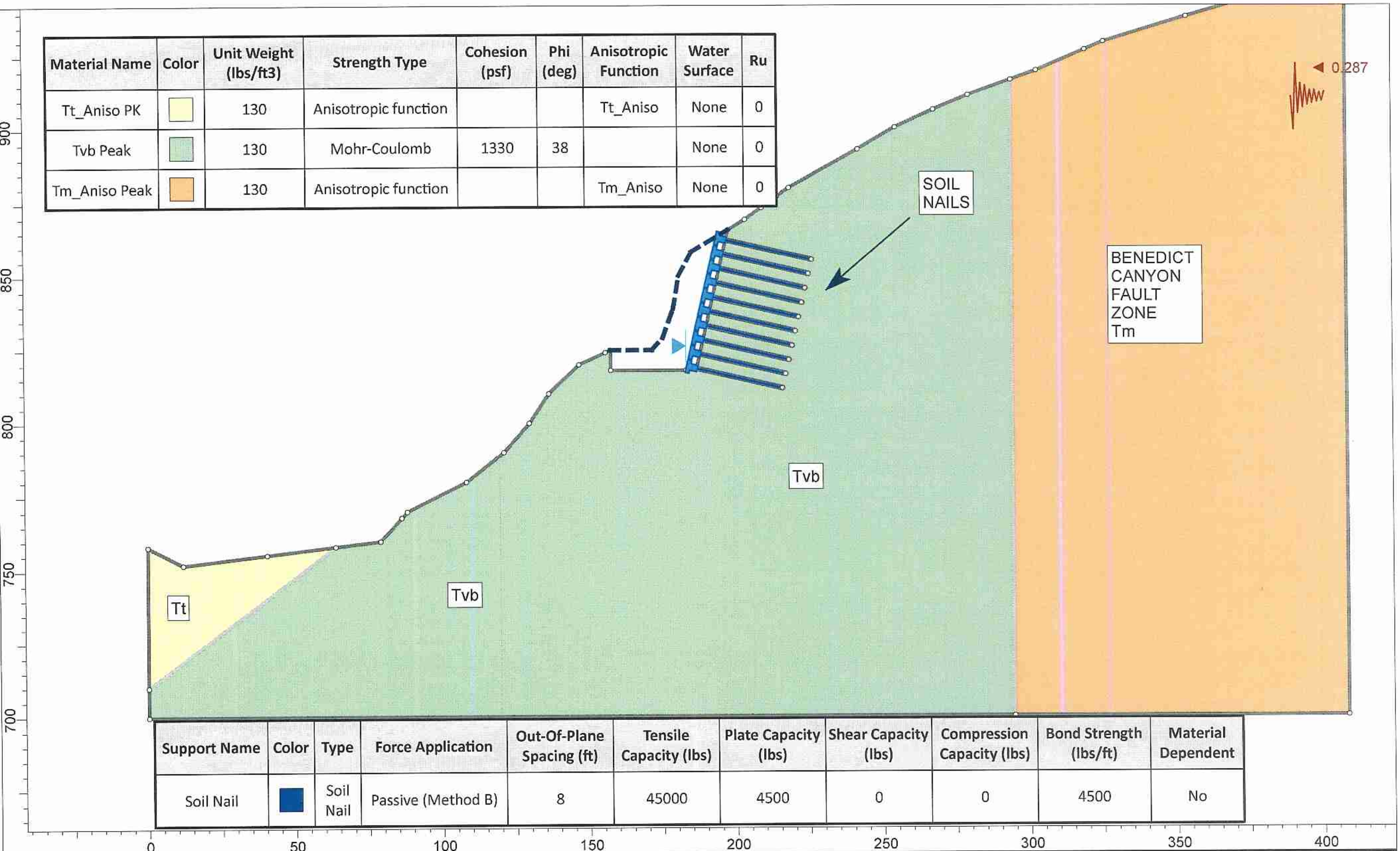
11.9905	752
0	758.099
0	710

Material Boundary

X	Y
0	710
63.8755	758.18

Material Boundary

X	Y
294.5	700
294.5	916.864



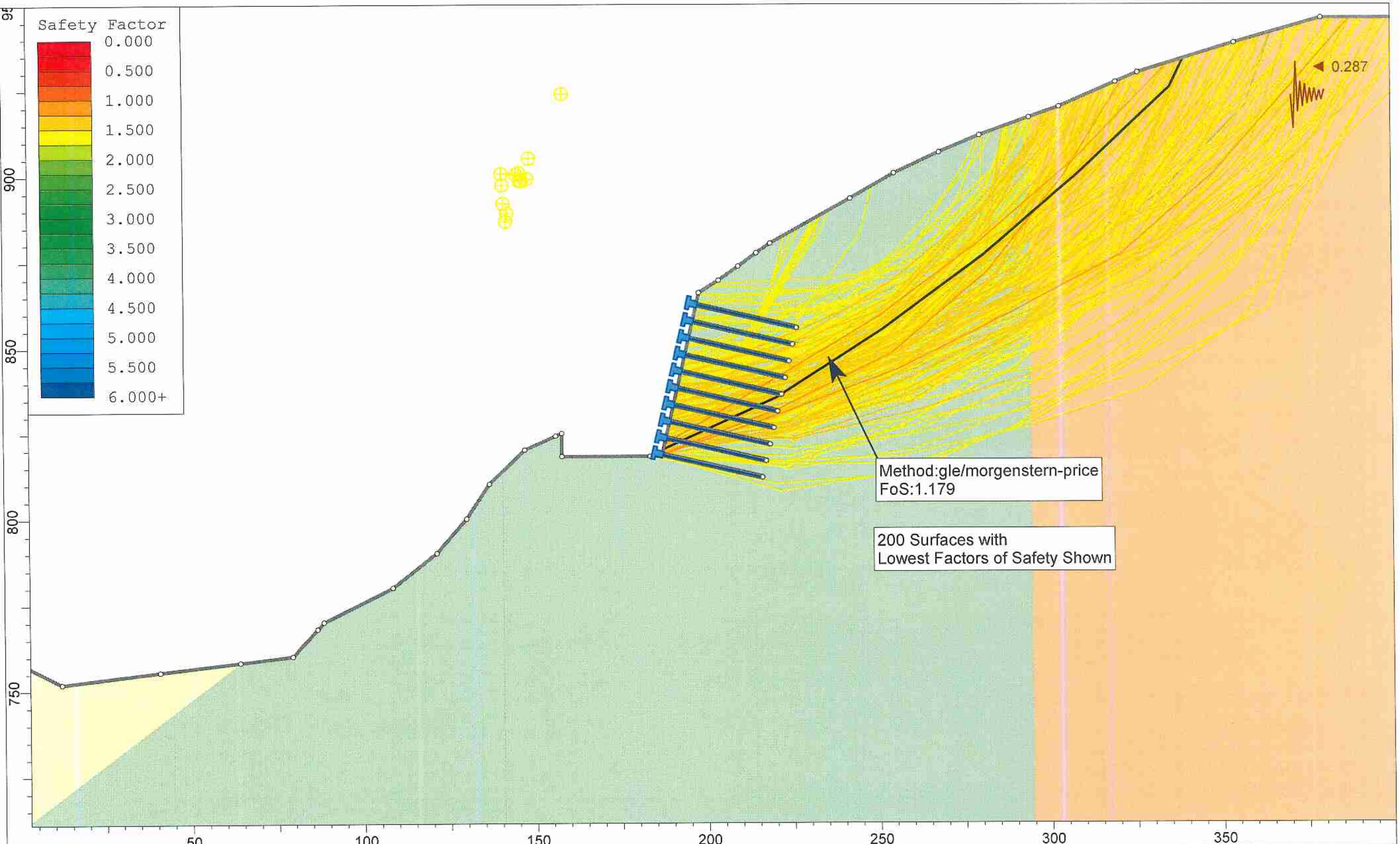
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tt_Aniso PK		130	Anisotropic function			Tt_Aniso	None	0
Tvb Peak		130	Mohr-Coulomb	1330	38		None	0
Tm_Aniso Peak		130	Anisotropic function			Tm_Aniso	None	0

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Material Dependent
Soil Nail		Soil Nail	Passive (Method B)	8	45000	4500	0	0	4500	No

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Soil Nail Internal Check Seismic		
Drawn By	RK	*Scale* 1:542	*Company* CalWest
Date	1/9/2019, 9:11:16 AM	*File Name*	Sect N_Soil_Nails Seismic.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Seismic with Soil Nails		
Drawn By	RK	Scale	1:462
Company	CalWest		
Date	1/9/2019, 9:11:16 AM	File Name	Sect N_Soil_Nails Seismic.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

Oak Pass Rd G5277

Project Summary

File Name: Sect N_Soil_Nails Seismic
Slide Modeler Version: 6.035
Project Title: Oak Pass Rd G5277
Analysis: Sect N Seismic with Soil Nails
Author: RK
Company: CalWest
Date Created: 1/9/2019, 9:11:16 AM

General Settings

Units of Measurement: Imperial Units
Time Units: days
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Rd G5277		
	Analysis Description	Sect N Seismic with Soil Nails		
	Drawn By	RK	Scale	Company: CalWest
SLIDEINTERPRET 6.035	Date	1/9/2019, 9:11:16 AM		File Name: Sect N_Soil_Nails Seismic.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287

Material Properties

Property	Tt_Aniso PK	Tvb Peak	Tm_Aniso Peak
Color			
Strength Type	Anisotropic function	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	130	130	130
Cohesion [psf]		1330	
Friction Angle [deg]		38	
Water Surface	None	None	None
Ru Value	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	40	650	36
40	45	380	27
45	90	650	36

Name: Tm_Aniso

Angle From	Angle To	c	phi
-90	-67	800	36
-67	-60	200	27
-60	90	800	36

Support Properties

Soil Nail

Support Type: Soil Nail

Force Application: Passive
Out-of-Plane Spacing: 8 ft
Tensile Capacity: 45000 lb
Plate Capacity: 4500 lb
Bond Strength: 4500 lb/ft

Global Minimums

Method: gle/morgenstern-price

FS: 1.179490
Axis Location: 149.425, 1029.210
Left Slip Surface Endpoint: 187.386, 820.124
Right Slip Surface Endpoint: 339.471, 934.127
Resisting Moment=1.1926e+008 lb-ft
Driving Moment=1.01112e+008 lb-ft
Resisting Horizontal Force=493733 lb
Driving Horizontal Force=418599 lb
Total Slice Area=4940.77 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
187.386	820.124
220.661	835.366
251.433	855.18
280.995	876.759
308.742	900.627
335.447	925.655
339.471	934.127

Valid / Invalid Surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 4443
Number of Invalid Surfaces: 557

Error Codes:

Error Code -108 reported for 225 surfaces
Error Code -111 reported for 325 surfaces
Error Code -112 reported for 7 surfaces

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.17949

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	5.54584	7714.93	Tvb Peak	1330	38	1842.73	2173.48	1079.6	0	1079.6
2	5.54584	23082.5	Tvb Peak	1330	38	3389.29	3997.63	3414.41	0	3414.41
3	5.54584	29838.4	Tvb Peak	1330	38	4696.48	5539.45	5387.85	0	5387.85
4	5.54584	30690.3	Tvb Peak	1330	38	5274.67	6221.42	6260.74	0	6260.74
5	5.54584	31728	Tvb Peak	1330	38	5522.44	6513.66	6634.77	0	6634.77

6	5.54584	32724.5	Tvb Peak	1330	38	5284.33	6232.81	6275.31	0	6275.31
7	6.15457	36468.9	Tvb Peak	1330	38	3846.37	4536.76	4104.47	0	4104.47
8	6.15457	36034.8	Tvb Peak	1330	38	3633.09	4285.19	3782.47	0	3782.47
9	6.15457	35600.7	Tvb Peak	1330	38	3437.69	4054.72	3487.49	0	3487.49
10	6.15457	35182.1	Tvb Peak	1330	38	3263.39	3849.13	3224.34	0	3224.34
11	6.15457	34863.8	Tvb Peak	1330	38	3114.04	3672.98	2998.88	0	2998.88
12	5.91233	32972	Tvb Peak	1330	38	2627.53	3099.14	2264.4	0	2264.4
13	5.91233	31850.9	Tvb Peak	1330	38	2530.85	2985.11	2118.44	0	2118.44
14	5.91233	30621.6	Tvb Peak	1330	38	2460.24	2901.83	2011.84	0	2011.84
15	5.91233	29274.2	Tvb Peak	1330	38	2409.95	2842.51	1935.93	0	1935.93
16	5.91233	27858.8	Tvb Peak	1330	38	2374.23	2800.38	1881.99	0	1881.99
17	6.75248	29474.2	Tvb Peak	1330	38	2047.83	2415.4	1389.24	0	1389.24
18	6.75248	26496.1	Tvb Peak	1330	38	2025.25	2388.76	1355.16	0	1355.16
19	7.121	24715.8	Tm_Aniso Peak	800	36	1305.4	1539.71	1018.13	0	1018.13
20	7.121	21558.1	Tm_Aniso Peak	800	36	1334.25	1573.73	1064.95	0	1064.95
21	6.6763	17441.5	Tm_Aniso Peak	800	36	1277.03	1506.25	972.069	0	972.069
22	6.6763	14542.8	Tm_Aniso Peak	800	36	1255.83	1481.24	937.643	0	937.643
23	6.6763	11587.5	Tm_Aniso Peak	800	36	1186.27	1399.19	824.72	0	824.72
24	6.6763	8088.5	Tm_Aniso Peak	800	36	1025.67	1209.76	563.991	0	563.991
25	4.0234	1889.57	Tm_Aniso Peak	800	36	482.102	568.634	-318.448	0	-318.448

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.17949

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	187.386	820.124	0	0	0
2	192.931	822.664	7780.4	2370.79	16.9467
3	198.477	825.204	11281.5	6830.17	31.192

4	204.023	827.745	19727	17719.1	41.9307
5	209.569	830.285	28917.7	34100.3	49.7014
6	215.115	832.826	36443.1	52651.9	55.3109
7	220.661	835.366	40420.5	68366.3	59.407
8	226.815	839.329	37367.5	72454.3	62.7181
9	232.97	843.292	34400.4	74141.8	65.1096
10	239.124	847.254	31524.1	73664.3	66.8318
11	245.279	851.217	28737.7	71285.3	68.0438
12	251.433	855.18	26016.8	67235.2	68.846
13	257.346	859.496	22318.6	59025.7	69.2876
14	263.258	863.812	19000.2	50648.7	69.4371
15	269.17	868.128	16077.3	42556	69.3039
16	275.083	872.443	13571.3	35133.6	68.8796
17	280.995	876.759	11493	28641.8	68.1361
18	287.748	882.568	8794.95	20548.1	66.8282
19	294.5	888.376	6997.13	14940.3	64.9045
20	301.621	894.502	2964.66	5568.35	61.9686
21	308.742	900.627	-242.933	-384.007	57.6815
22	315.418	906.884	-2803.47	-3562.13	51.7965
23	322.095	913.141	-4458.28	-4174.71	43.1187
24	328.771	919.398	-5022.83	-2935.31	30.3017
25	335.447	925.655	-4024.23	-890.536	12.4781
26	339.471	934.127	0	0	0

List Of Coordinates

External Boundary

X	Y
0	700
294.5	700

408.278	700
408.278	946.1
379.522	946.1
354.278	938.715
326.152	930
319.761	927.208
303.266	920
294.5	916.864
280.022	911.684
268.189	906.722
255.072	900.688
242.316	893.253
218.853	880.214
214.83	877.368
209.521	873.518
203.786	869.447
197.968	865.808
187.026	818.571
186.964	818.346
186.629	818.149
183.518	818
157.804	818
157.804	824.9
156.045	824.102
147.001	820
136.632	810
129.968	800
121.233	790
108.414	780
88.2833	770
86.4033	767.94

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Seismic with Soil Nails		
Drawn By	RK	Scale	Company: CalWest
Date	1/9/2019, 9:11:16 AM	File Name	Sect N_Soil_Nails Seismic.sli

SLIDEINTERPRET 6.035

79.1591	760
63.8755	758.18
40.5627	755.403
11.9905	752
0	758.099
0	710

Material Boundary

X	Y
0	710
63.8755	758.18

Material Boundary

X	Y
294.5	700
294.5	916.864

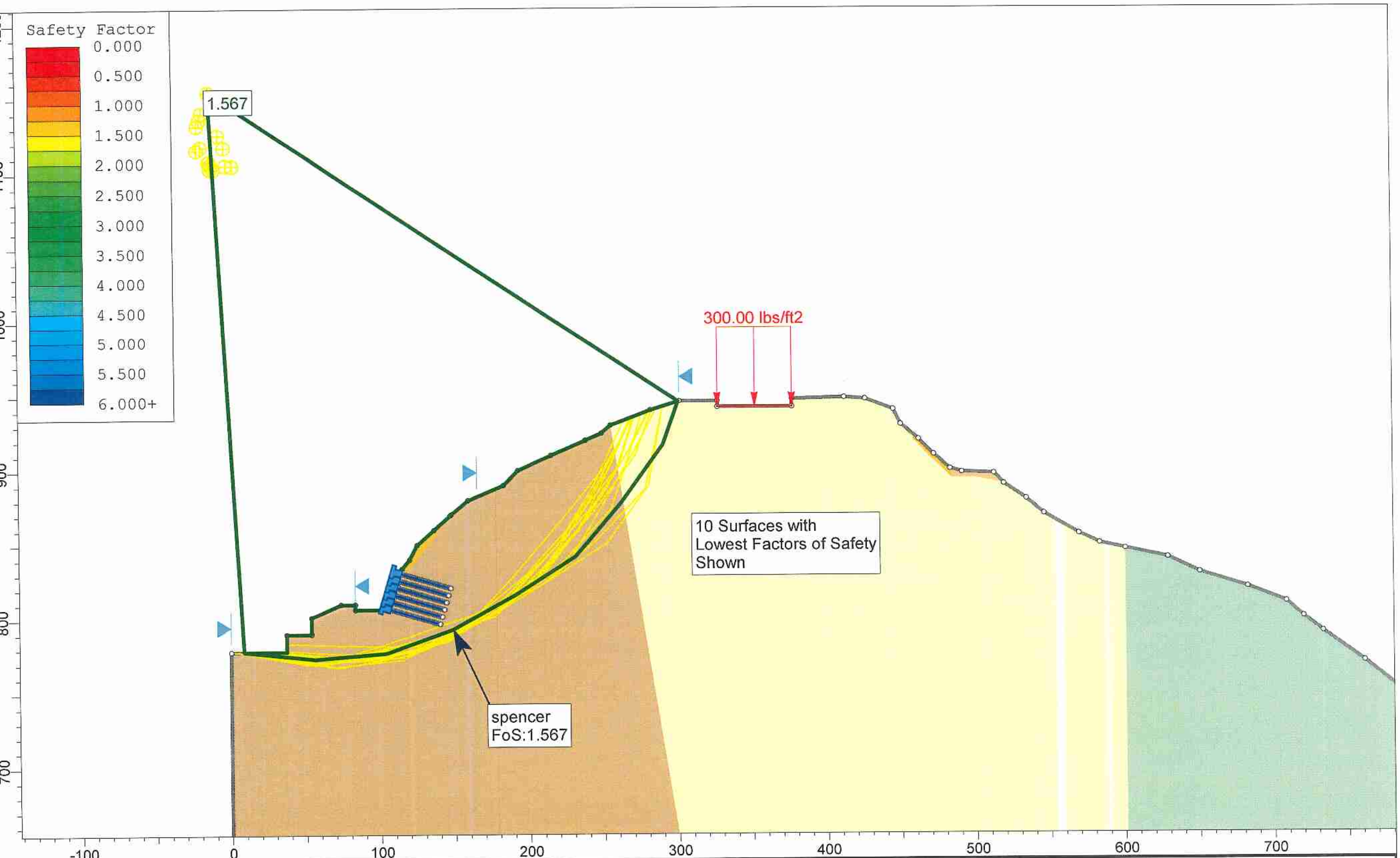
CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Rd G5277		
Analysis Description	Sect N Seismic with Soil Nails		
Drawn By: RK	Scale	Company	CalWest
Date: 1/9/2019, 9:11:16 AM		File Name	Sect N_Soil_Nails Seismic.sli

SLIDEINTERPRET 6.035

PRIVATE STREET SOIL NAIL WALL EXTERNAL STABILITY ANALYSIS

SECTION C-C'



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Soil Nail External-Static		
Drawn By	RK	Scale	1:1074
Company	Calwest Geotechnical		
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Static-Soil Nails-External.slim

SLIDEINTERPRET 6.035

Slide Analysis Information

G5750

Project Summary

File Name: Section C-NorthFace-Static-Soil Nails-External
Slide Modeler Version: 6.035
Project Title: G5750
Analysis: Section C - Soil Nail External-Static
Author: RK
Company: Calwest Geotechnical
Date Created: 1/3/2019, 9:48:13 AM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Soil Nail External-Static		
Drawn By: RK	Scale	Company	Calwest Geotechnical
Date: 1/3/2019, 9:48:13 AM		File Name	Section C-NorthFace-Static-Soil Nails-External.slim

SLIDEINTERPRET 6.035

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: 80
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

1 Distributed Load present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm_BCFZ-Zone 2	Tt_Aniso	Af	Qls	Tm_BCFZ-Zone 1
Color					
Strength Type	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	130	115	110	125
Cohesion [psf]			350	250	600
Friction Angle [deg]			27	26	34
Water Surface	None	None	None	None	None
Ru Value	0	0	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	600	36
30	37	380	27
37	90	600	36

Name: Tm_Aniso 1

Angle From	Angle To	c	phi
-90	12	600	34
12	18	200	27
18	90	600	34

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	*Project*	G5750		
	Analysis Description	Section C - Soil Nail External-Static		
	Drawn By RK	*Scale*	*Company*	Calwest Geotechnical
SLIDEINTERPRET 6.035	*Date* 1/3/2019, 9:48:13 AM		*File Name*	Section C-NorthFace-Static-Soil Nails-External.slim

Support Properties

Soil Nails

Support Type: Soil Nail
Force Application: Passive
Out-of-Plane Spacing: 5 ft
Tensile Capacity: 45000 lb
Plate Capacity: 45000 lb
Bond Strength: 4500 lb/ft

Global Minimums

Method: spencer

FS: 1.566730
Axis Location: -12.321, 1154.670
Left Slip Surface Endpoint: 8.752, 778.400
Right Slip Surface Endpoint: 301.338, 945.767
Resisting Moment=5.21498e+008 lb-ft
Driving Moment=3.32857e+008 lb-ft
Resisting Horizontal Force=1.13341e+006 lb
Driving Horizontal Force=723425 lb
Total Slice Area=14403.2 ft2

Global Minimum Coordinates

Method: spencer

X	Y
8.75191	778.4
56.3858	773.496

CALWEST GEOTECHNICAL CONSULTING ENGINEERS			
Project	G5750		
Analysis Description	Section C - Soil Nail External-Static		
Drawn By	RK	Scale	Company: Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Static-Soil Nails-External.slim

SLIDEINTERPRET 6.035

104.13	777.175
149.248	793.22
191.21	816.289
231.683	841.882
262.703	878.362
290.94	917.037
301.338	945.767

Valid / Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 4205
Number of Invalid Surfaces: 795

Error Codes:

Error Code -108 reported for 432 surfaces
Error Code -111 reported for 359 surfaces
Error Code -112 reported for 3 surfaces
Error Code -114 reported for 1 surface

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-114 = Surface with Reverse Curvature.

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.56673

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	11.9085	912.503	Tm_BCFZ-Zone 1	600	34	566.456	887.483	426.211	0	426.211
2	11.9085	2737.51	Tm_BCFZ-Zone 1	600	34	660.471	1034.78	644.588	0	644.588
3	11.9085	14898.6	Tm_BCFZ-Zone 1	600	34	1286.95	2016.31	2099.76	0	2099.76
4	11.9085	26891.4	Tm_BCFZ-Zone 1	600	34	1904.76	2984.25	3534.79	0	3534.79
5	11.936	45891.5	Tm_BCFZ-Zone 1	600	34	2389.46	3743.64	4660.64	0	4660.64
6	11.936	51249.1	Tm_BCFZ-Zone 1	600	34	2614.43	4096.11	5183.19	0	5183.19
7	11.936	47213.7	Tm_BCFZ-Zone 1	600	34	2444.98	3830.63	4789.6	0	4789.6
8	11.936	44430.4	Tm_BCFZ-Zone 1	600	34	2328.11	3647.52	4518.14	0	4518.14
9	11.2794	53912.1	Tm_BCFZ-Zone 1	600	34	2249.3	3524.05	4335.09	0	4335.09
10	11.2794	82244.7	Tm_BCFZ-Zone 1	600	34	3219.02	5043.34	6587.53	0	6587.53
11	11.2794	96214.3	Tm_BCFZ-Zone 1	600	34	3697.15	5792.43	7698.1	0	7698.1
12	11.2794	105576	Tm_BCFZ-Zone 1	600	34	4017.58	6294.46	8442.35	0	8442.35
13	13.9875	139708	Tm_BCFZ-Zone 1	600	34	3691.4	5783.42	7684.73	0	7684.73
14	13.9875	139342	Tm_BCFZ-Zone 1	600	34	3682.71	5769.82	7664.56	0	7664.56
15	13.9875	138391	Tm_BCFZ-Zone 1	600	34	3660.13	5734.44	7612.12	0	7612.12
16	13.4908	137322	Tm_BCFZ-Zone 1	600	34	3555.25	5570.12	7368.48	0	7368.48
17	13.4908	133351	Tm_BCFZ-Zone 1	600	34	3463.03	5425.64	7154.28	0	7154.28
18	13.4908	128901	Tm_BCFZ-Zone 1	600	34	3359.67	5263.7	6914.21	0	6914.21
19	10.34	92044.4	Tm_BCFZ-Zone 1	600	34	2376.98	3724.09	4631.66	0	4631.66
20	10.34	82265.8	Tm_BCFZ-Zone 1	600	34	2158.23	3381.37	4123.54	0	4123.54
21	10.34	75084.6	Tm_BCFZ-Zone 1	600	34	1997.58	3129.67	3750.4	0	3750.4
22	1.00768	6766.77	Tm_BCFZ-Zone 1	600	34	1734.64	2717.72	3139.66	0	3139.66
23	13.6145	79024.3	Tm_BCFZ-Zone 2	600	34	1540.78	2413.99	2689.35	0	2689.35
24	13.6145	55646.7	Tm_BCFZ-Zone 2	600	34	1175.28	1841.35	1840.38	0	1840.38
25	10.3986	16594.6	Tm_BCFZ-Zone 2	600	34	460.288	721.147	179.608	0	179.608

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Soil Nail External-Static		
Drawn By	RK	Scale	Company: Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Static-Soil Nails-External.slim

SLIDEINTERPRET 6.035

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.56673

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	8.75191	778.4	0	0	0
2	20.6604	777.174	7285.81	3626.22	26.46
3	32.5689	775.948	15961.9	7944.39	26.46
4	44.4774	774.722	33901.9	16873.3	26.46
5	56.3858	773.496	60977.8	30349.3	26.46
6	68.3219	774.416	85286.4	42447.9	26.46
7	80.2579	775.335	111807	55647.3	26.4599
8	92.194	776.255	136661	68017.6	26.46
9	104.13	777.175	160366	79816.1	26.4601
10	115.409	781.186	168415	83822	26.46
11	126.689	785.197	178395	88789.2	26.46
12	137.968	789.208	189328	94230.6	26.46
13	149.248	793.22	200899	99989.6	26.46
14	163.235	800.909	193574	96344.1	26.4601
15	177.223	808.599	186283	92715.2	26.4601
16	191.21	816.289	179079	89129.4	26.46
17	204.701	824.82	164306	81776.7	26.46
18	218.192	833.351	150113	74712.7	26.46
19	231.683	841.882	136570	67972.3	26.46
20	242.023	854.042	104891	52205.3	26.46
21	252.363	866.202	77122.7	38384.8	26.46
22	262.703	878.362	52226.6	25993.7	26.46
23	263.711	879.742	49645.8	24709.3	26.4601
24	277.325	898.39	20528.7	10217.4	26.4601
25	290.94	917.037	2253.52	1121.6	26.46

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

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SLIDEINTERPRET 6.035

26	301.338	945.767	0	0	0

List Of Coordinates

Distributed Load

X	Y
377.808	942
327.782	942

External Boundary

X	Y
0	650
300	650
600.885	650
969.73	650
969.73	703
883.807	703
883.807	709.7
863.6	720
842.494	730
811.906	740
786.423	750
761.202	770
733.271	790
720.245	800
708.752	810
682.839	820
650.681	830
629.382	840

600.885	846.231
583.651	850
569.73	856.471
546.424	870
534.587	880
519.604	890
519.604	890
513.053	897
491.511	898
483.6	900.231
472.678	910
462.653	920
450.664	930
450.664	930
445.718	940
426.917	947
412.932	948
377.808	947.15
377.808	942
327.782	942
327.782	946
302.098	946
282.577	940
255.772	930
249.73	924.712
238.769	920
215.508	910
193.347	900
183.448	890
159.635	880
148.209	870.442

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Soil Nail External-Static		
Drawn By	RK	*Scale*	*Company* Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM	*File Name*	Section C-NorthFace-Static-Soil Nails-External.slim

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147.68	870
136.553	860
125.287	850
120.161	840
114.915	833.928
111.849	823.6
106.887	806.883
105.384	806
103.379	806.5
83.504	806.5
83.504	810
83.504	810
73.8867	810
54.1435	801.328
54.1435	790.63
54.1435	790.073
37.3934	790.073
37.3934	778.4
0	778.4

Material Boundary

X	Y
54.1435	790.63
55.6009	795.961
57.4833	799.52
63.1814	803.079
83.504	810

Material Boundary

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	G5750		
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Company	Calwest Geotechnical		
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SLIDEINTERPRET 6.035

X	Y
483.6	900.231
483.858	900
484.937	894
500.183	894
519.604	890
519.605	890

Material Boundary

X	Y
111.849	823.6
113.678	825.633
116.499	829.017
118.221	831.189
119.968	833.433
122.802	837.094
125.293	840.326
127.29	842.925
129.44	845.731
132.299	849.472
135.826	854.103
139.238	858.595
142.649	863.097
148.209	870.442

Material Boundary

X	Y
450.664	930
458.965	920.336

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

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Drawn By	RK	Scale	
Company	Calwest Geotechnical		
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SLIDEINTERPRET 6.035

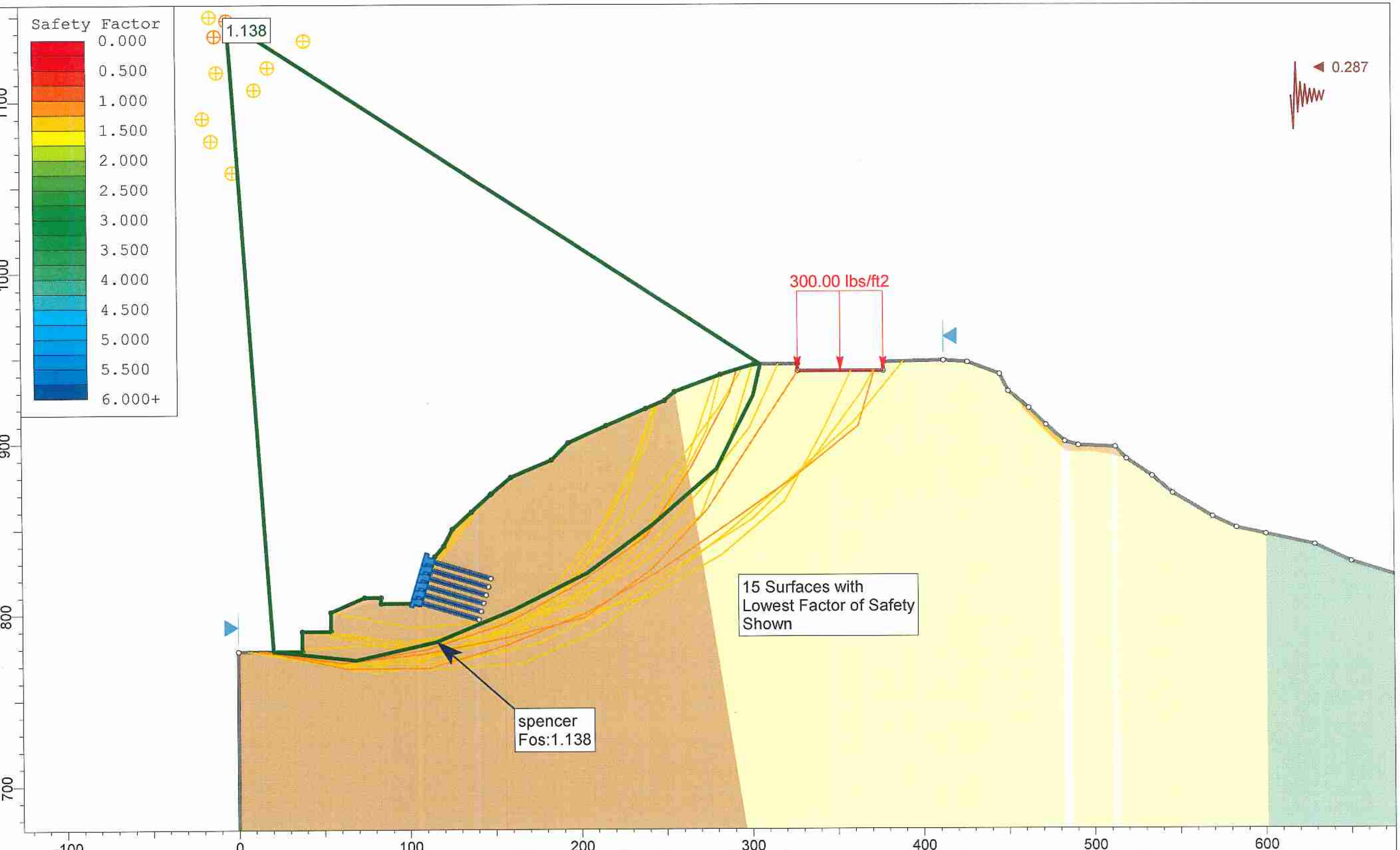
464.165	914.594
470.861	907.662
478.611	900.056
484.937	894

Material Boundary

X	Y
600.885	650
600.885	846.231

Material Boundary

X	Y
255.772	930
300	650



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	G5750	
	Analysis Description	Section C - Seis North Face	
	Drawn By: RK	Scale: 1:933	Company: Calwest Geotechnical
SLIDEINTERPRET 6.035	Date: 1/3/2019, 9:48:13 AM	File Name: Section C-NorthFace-Seismic-Soil Nails-External.slim	

Slide Analysis Information

G5750

Project Summary

File Name: Section C-NorthFace-Seismic-Soil Nails-External
Slide Modeler Version: 6.035
Project Title: G5750
Analysis: Section C - Seis North Face
Author: RK
Company: Calwest Geotechnical
Date Created: 1/3/2019, 9:48:13 AM

General Settings

Units of Measurement: Imperial Units
Time Units: seconds
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Spencer

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	G5750		
	Analysis Description	Section C - Seis North Face		
	Drawn By	RK	Scale	Company: Calwest Geotechnical
SLIDEINTERPRET 6.035	Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Seismic-Soil Nails-External.slim

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 1000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: 80
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287

CALWEST GEOTECHNICAL CONSULTING ENGINEERS				
	Project	G5750		
	Analysis Description	Section C - Seis North Face		
	Drawn By	RK	Scale	Company: Calwest Geotechnical
SLIDEINTERPRET 6.035	Date	1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Seismic-Soil Nails-External.slim

1 Distributed Load present

Distributed Load 1

Distribution: Constant
Magnitude [psf]: 300
Orientation: Normal to boundary

Material Properties

Property	Tm_BCFZ-Zone 2 PK	Tt_Aniso PK	Af	Qls	Tm_BCFZ-Zone 1 PK
Color					
Strength Type	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	130	115	110	125
Cohesion [psf]			350	250	800
Friction Angle [deg]			27	26	36
Water Surface	None	None	None	None	None
Ru Value	0	0	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	30	650	36
30	37	380	27
37	90	650	36

Name: Tm_Aniso 1

Angle From	Angle To	c	phi
-90	12	800	36
12	18	200	27

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	G5750	
	Analysis Description	Section C - Seis North Face	
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18	90	800	36

Support Properties

Soil Nails

Support Type: Soil Nail
Force Application: Passive
Out-of-Plane Spacing: 5 ft
Tensile Capacity: 45000 lb
Plate Capacity: 45000 lb
Bond Strength: 4500 lb/ft

Global Minimums

Method: spencer

FS: 1.138290
Axis Location: -4.315, 1147.556
Left Slip Surface Endpoint: 20.607, 778.400
Right Slip Surface Endpoint: 305.963, 946.000
Resisting Moment=5.29655e+008 lb-ft
Driving Moment=4.65309e+008 lb-ft
Resisting Horizontal Force=1.22028e+006 lb
Driving Horizontal Force=1.07203e+006 lb
Total Slice Area=14696 ft2

Global Minimum Coordinates

Method: spencer

X	Y
20.6074	778.4

68.7754	773.114
116.013	783.915
160.744	802.55
204.147	824.097
243.098	852.922
279.945	884.393
301.677	927.704
305.963	946

Valid / Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 451
Number of Invalid Surfaces: 549

Error Codes:

Error Code -108 reported for 389 surfaces
Error Code -111 reported for 159 surfaces
Error Code -114 reported for 1 surface

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-114 = Surface with Reverse Curvature.

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.13829

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	12.042	994.664	Tm_BCFZ-Zone 1 PK	800	36	1943.55	2212.32	1943.9	0	1943.9
2	12.042	13632.4	Tm_BCFZ-Zone 1 PK	800	36	3431.65	3906.21	4275.33	0	4275.33
3	12.042	26191	Tm_BCFZ-Zone 1 PK	800	36	4910.43	5589.49	6592.18	0	6592.18
4	12.042	46843.1	Tm_BCFZ-Zone 1 PK	800	36	7342.23	8357.59	10402.1	0	10402.1
5	11.8095	51443.2	Tm_BCFZ-Zone 1 PK	800	36	3639.06	4142.3	4600.29	0	4600.29
6	11.8095	44567.6	Tm_BCFZ-Zone 1 PK	800	36	3288.13	3742.84	4050.47	0	4050.47
7	11.8095	39308.1	Tm_BCFZ-Zone 1 PK	800	36	3019.68	3437.27	3629.9	0	3629.9
8	11.8095	52806.1	Tm_BCFZ-Zone 1 PK	800	36	3708.62	4221.49	4709.27	0	4709.27
9	11.1827	78398.6	Tm_BCFZ-Zone 1 PK	800	36	4033.97	4591.83	5219.01	0	5219.01
10	11.1827	90818.5	Tm_BCFZ-Zone 1 PK	800	36	4537.09	5164.52	6007.24	0	6007.24
11	11.1827	99066.4	Tm_BCFZ-Zone 1 PK	800	36	4871.18	5544.82	6530.69	0	6530.69
12	11.1827	106245	Tm_BCFZ-Zone 1 PK	800	36	5161.98	5875.83	6986.28	0	6986.28
13	10.8507	105117	Tm_BCFZ-Zone 1 PK	800	36	4783.42	5444.92	6393.19	0	6393.19
14	10.8507	103991	Tm_BCFZ-Zone 1 PK	800	36	4740.9	5396.52	6326.56	0	6326.56
15	10.8507	106443	Tm_BCFZ-Zone 1 PK	800	36	4833.51	5501.94	6471.67	0	6471.67
16	10.8507	109892	Tm_BCFZ-Zone 1 PK	800	36	4963.78	5650.22	6675.75	0	6675.75
17	12.9839	128052	Tm_BCFZ-Zone 1 PK	800	36	3849.73	4382.11	4930.35	0	4930.35
18	12.9839	121689	Tm_BCFZ-Zone 1 PK	800	36	3694.09	4204.95	4686.51	0	4686.51
19	12.9839	115154	Tm_BCFZ-Zone 1 PK	800	36	3534.25	4023	4436.08	0	4436.08
20	10.9473	91678.1	Tm_BCFZ-Zone 1 PK	800	36	3092.24	3519.87	3743.57	0	3743.57
21	10.9473	88101.4	Tm_BCFZ-Zone 1 PK	800	36	2998.37	3413.01	3596.51	0	3596.51
22	14.9518	108814	Tm_BCFZ-Zone 2 PK	800	36	2777.1	3161.15	3249.84	0	3249.84
23	10.8661	61962.6	Tm_BCFZ-Zone 2 PK	800	36	1373.83	1563.81	1051.3	0	1051.3
24	10.8661	37113.7	Tm_BCFZ-Zone 2 PK	800	36	1041.81	1185.88	531.117	0	531.117
25	4.28621	4897.88	Tm_BCFZ-Zone 2 PK	800	36	586.26	667.334	-182.598	0	-182.598

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Seis North Face		
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Company	Calwest Geotechnical		
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Seismic-Soil Nails-External.slim

SLIDEINTERPRET 6.035

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.13829

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	20.6074	778.4	0	0	0
2	32.6494	777.078	25769.4	20397.9	38.3636
3	44.6914	775.757	68975.1	54597.7	38.3636
4	56.7334	774.435	129508	102513	38.3636
5	68.7754	773.114	218535	172983	38.3636
6	80.5848	775.814	234473	185599	38.3637
7	92.3943	778.514	249710	197660	38.3637
8	104.204	781.215	264412	209297	38.3636
9	116.013	783.915	280489	222024	38.3637
10	127.196	788.574	278943	220799	38.3636
11	138.379	793.233	275805	218316	38.3637
12	149.561	797.891	271611	214996	38.3637
13	160.744	802.55	266498	210949	38.3637
14	171.595	807.937	253975	201036	38.3637
15	182.445	813.324	241671	191297	38.3637
16	193.296	818.711	228890	181180	38.3637
17	204.147	824.097	215438	170532	38.3637
18	217.131	833.706	181474	143647	38.3636
19	230.115	843.314	149650	118457	38.3637
20	243.098	852.922	120026	95007.5	38.3636
21	254.046	862.273	92680.7	73362.1	38.3636
22	264.993	871.623	66705.8	52801.5	38.3637
23	279.945	884.393	35641.5	28212.3	38.3636
24	290.811	906.049	10072.2	7972.73	38.3637
25	301.677	927.704	-721.09	-570.785	38.3637

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SLIDEINTERPRET 6.035

26	305.963	946	0	0	0

List Of Coordinates

Distributed Load

X	Y
377.808	942
327.782	942

External Boundary

X	Y
0	650
300	650
600.885	650
969.73	650
969.73	703
883.807	703
883.807	709.7
863.6	720
842.494	730
811.906	740
786.423	750
761.202	770
733.271	790
720.245	800
708.752	810
682.839	820
650.681	830
629.382	840

600.885	846.231
583.651	850
569.73	856.471
546.424	870
534.587	880
519.604	890
519.604	890
513.053	897
491.511	898
483.6	900.231
472.678	910
462.653	920
450.664	930
450.664	930
445.718	940
426.917	947
412.932	948
377.808	947.15
377.808	942
327.782	942
327.782	946
302.098	946
282.577	940
255.772	930
249.73	924.712
238.769	920
215.508	910
193.347	900
183.448	890
159.635	880
148.209	870.442

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Date	1/3/2019, 9:48:13 AM		File Name: Section C-NorthFace-Seismic-Soil Nails-External.slim

SLIDEINTERPRET 6.035

147.68	870
136.553	860
125.287	850
120.161	840
114.915	833.928
111.849	823.6
106.887	806.883
105.384	806
103.379	806.5
83.504	806.5
83.504	810
83.504	810
73.8867	810
54.1435	801.328
54.1435	790.63
54.1435	790.073
37.3934	790.073
37.3934	778.4
0	778.4

Material Boundary

X	Y
54.1435	790.63
55.6009	795.961
57.4833	799.52
63.1814	803.079
83.504	810

Material Boundary

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

SLIDEINTERPRET 6.035

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Analysis Description	Section C - Seis North Face		
Drawn By	RK	*Scale*	*Company* Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM		*File Name* Section C-NorthFace-Seismic-Soil Nails-External.slim

X	Y
483.6	900.231
483.858	900
484.937	894
500.183	894
519.604	890
519.605	890

Material Boundary

X	Y
111.849	823.6
113.678	825.633
116.499	829.017
118.221	831.189
119.968	833.433
122.802	837.094
125.293	840.326
127.29	842.925
129.44	845.731
132.299	849.472
135.826	854.103
139.238	858.595
142.649	863.097
148.209	870.442

Material Boundary

X	Y
450.664	930
458.965	920.336

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	G5750		
Analysis Description	Section C - Seis North Face		
Drawn By	RK	*Scale*	*Company* Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM		*File Name* Section C-NorthFace-Seismic-Soil Nails-External.slim

SLIDEINTERPRET 6.035

464.165	914.594
470.861	907.662
478.611	900.056
484.937	894

Material Boundary

X	Y
600.885	650
600.885	846.231

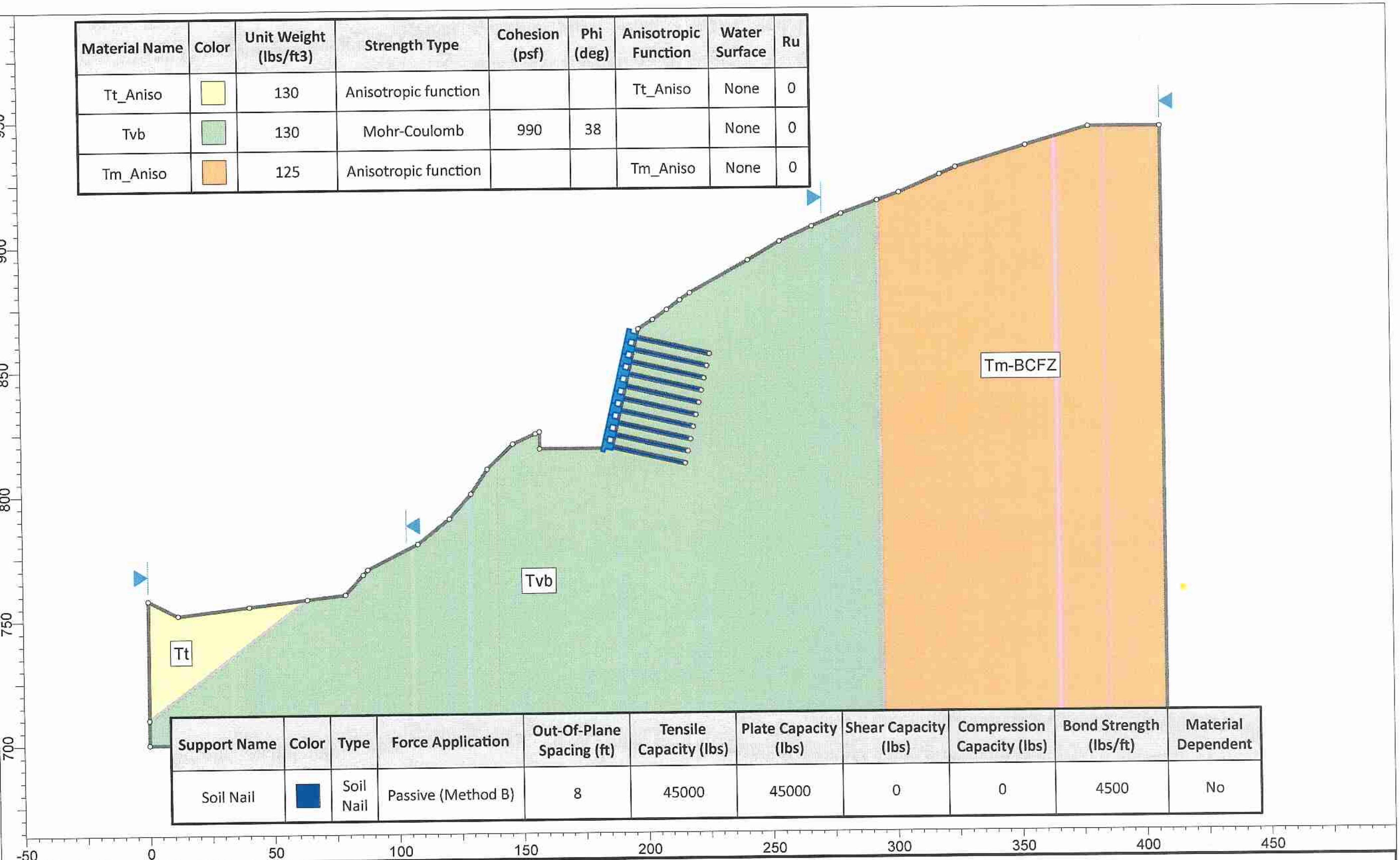
Material Boundary

X	Y
255.772	930
300	650

CALWEST GEOTECHNICAL CONSULTING ENGINEERS			
Project	G5750		
Analysis Description	Section C - Seis North Face		
Drawn By	RK	Scale	Company: Calwest Geotechnical
Date	1/3/2019, 9:48:13 AM	File Name	Section C-NorthFace-Seismic-Soil Nails-External.slim

SLIDEINTERPRET 6.035

SECTION N-N’



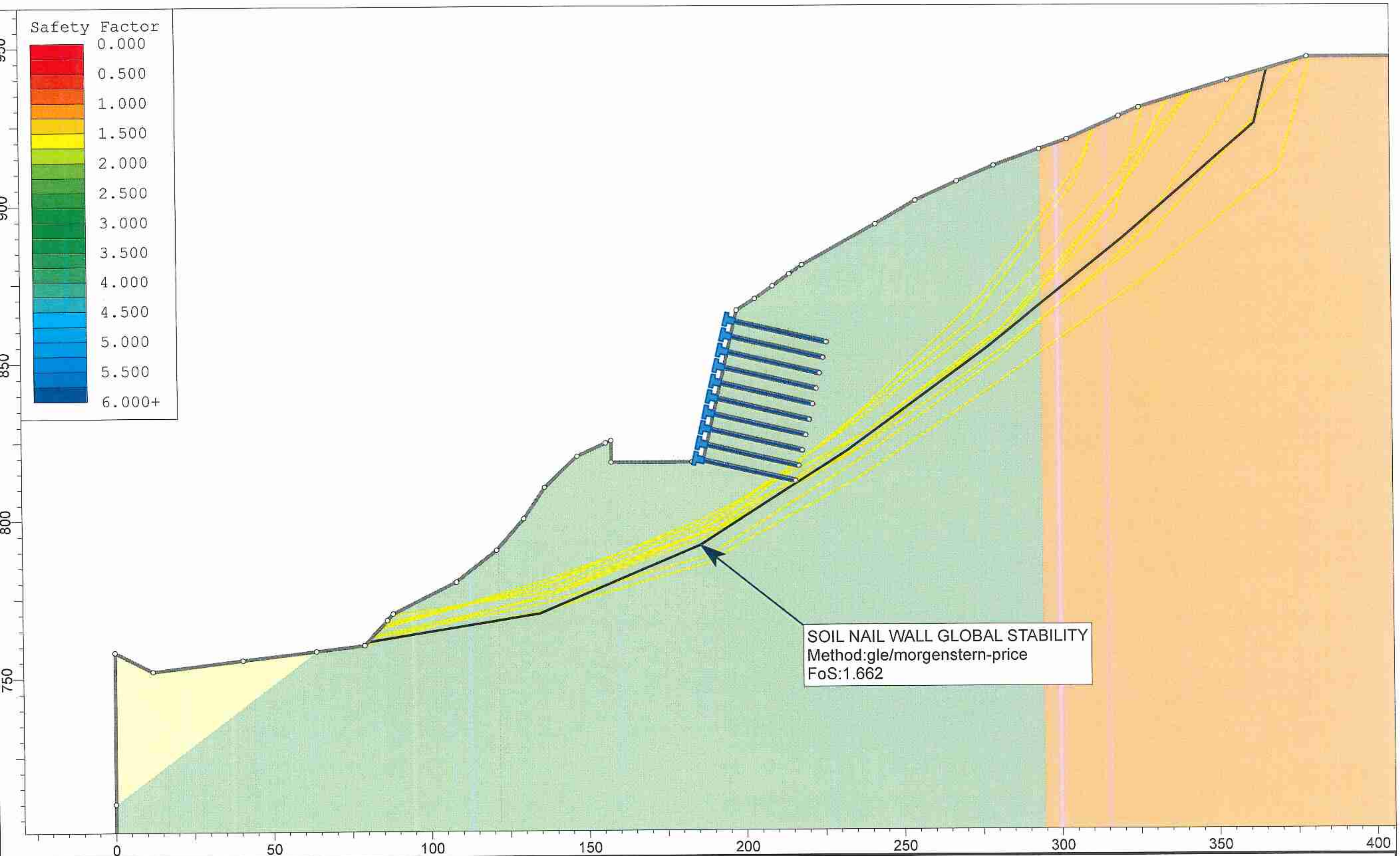
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tt_Aniso		130	Anisotropic function			Tt_Aniso	None	0
Tvb		130	Mohr-Coulomb	990	38		None	0
Tm_Aniso		125	Anisotropic function			Tm_Aniso	None	0

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Material Dependent
Soil Nail		Soil Nail	Passive (Method B)	8	45000	45000	0	0	4500	No

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	9712 Oak Pass Rd G5750		
Analysis Description	Sect N Soil Nail External Check Static		
Drawn By RK	*Scale* 1:640	*Company*	Calwest
Date	5.28.19	*File Name*	Sect N_Soil_Nails Static Ext.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: 9712 Oak Pass Rd G5750		
	Analysis Description: Sect N Soil Nail External Check Static		
	Drawn By: RK	Scale: 1:506	Company: Calwest
SLIDEINTERPRET 6.035	Date: 5.28.19		File Name: Sect N_Soil_Nails Static Ext.sli

Slide Analysis Information
9712 Oak Pass Rd G5750

Project Summary

File Name: Sect N_Soil_Nails Static Ext
Slide Modeler Version: 6.035
Project Title: 9712 Oak Pass Rd G5750
Analysis: Sect N Soil Nail External Check Static
Author: RK
Company: Calwest
Date Created: 5.28.19

General Settings

Units of Measurement: Imperial Units
Time Units: days
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Material Properties

Property	Tt_Aniso	Tvb	Tm_Aniso

Color			
Strength Type	Anisotropic function	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	130	130	125
Cohesion [psf]		990	
Friction Angle [deg]		38	
Water Surface	None	None	None
Ru Value	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	40	600	36
40	45	380	27
45	90	600	36

Name: Tm_Aniso

Angle From	Angle To	c	phi
-90	-67	600	34
-67	-60	200	27
-60	90	600	34

Support Properties

Soil Nail

Support Type: Soil Nail
Force Application: Passive
Out-of-Plane Spacing: 8 ft
Tensile Capacity: 45000 lb
Plate Capacity: 45000 lb
Bond Strength: 4500 lb/ft

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	9712 Oak Pass Rd G5750		
Analysis Description	Sect N Soil Nail External Check Static		
Drawn By RK	*Scale*	*Company*	Calwest
Date 5.28.19		*File Name*	Sect N_Soil_Nails Static Ext.sli

SLIDEINTERPRET 6.035

Global Minimums

Method: gle/morgenstern-price

FS: 1.661890
Axis Location: 42.083, 1138.395
Left Slip Surface Endpoint: 80.089, 761.020
Right Slip Surface Endpoint: 366.787, 942.375
Resisting Moment=4.86544e+008 lb-ft
Driving Moment=2.92766e+008 lb-ft
Resisting Horizontal Force=1.10856e+006 lb
Driving Horizontal Force=667047 lb
Total Slice Area=11715.9 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
80.0894	761.02
134.824	769.94
185.975	791.367
232.633	821.343
277.505	853.931
320.738	888.664
362.677	924.949
366.787	942.375

Valid / Invalid Surfaces

Method: gle/morgenstern-price

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: 9712 Oak Pass Rd G5750		
	Analysis Description: Sect N Soil Nail External Check Static		
	Drawn By: RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 5.28.19		File Name: Sect N_Soil_Nails Static Ext.sli

Number of Valid Surfaces: 4896
Number of Invalid Surfaces: 104

Error Codes:

Error Code -108 reported for 24 surfaces
Error Code -111 reported for 74 surfaces
Error Code -112 reported for 6 surfaces

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.66189

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	10.947	6972.45	Tvb	990	38	859.542	1428.46	561.208	0	561.208
2	10.947	14787.4	Tvb	990	38	1244.95	2068.97	1381.02	0	1381.02
3	10.947	20362.8	Tvb	990	38	1559.63	2591.94	2050.39	0	2050.39
4	10.947	29381.1	Tvb	990	38	2041.6	3392.92	3075.6	0	3075.6
5	10.947	43589.1	Tvb	990	38	2779.11	4618.57	4644.36	0	4644.36
6	12.7877	69369.9	Tvb	990	38	2955.42	4911.59	5019.4	0	5019.4
7	12.7877	72617	Tvb	990	38	3083.27	5124.05	5291.35	0	5291.35
8	12.7877	57632.8	Tvb	990	38	2623.4	4359.81	4313.16	0	4313.16

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: 9712 Oak Pass Rd G5750		
	Analysis Description: Sect N Soil Nail External Check Static		
	Drawn By: RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 5.28.19		File Name: Sect N_Soil_Nails Static Ext.sli

9	12.7877	48746.7	Tvb	990	38	2338.16	3885.77	3706.42	0	3706.42
10	11.6644	67128.4	Tvb	990	38	2605.68	4330.35	4275.45	0	4275.45
11	11.6644	101196	Tvb	990	38	3534.14	5873.35	6250.4	0	6250.4
12	11.6644	102249	Tvb	990	38	3525.62	5859.2	6232.29	0	6232.29
13	11.6644	101648	Tvb	990	38	3475.51	5775.92	6125.7	0	6125.7
14	11.2181	95631.2	Tvb	990	38	3193.79	5307.72	5526.43	0	5526.43
15	11.2181	93120.8	Tvb	990	38	3109.54	5167.71	5347.22	0	5347.22
16	11.2181	89771.4	Tvb	990	38	3008.83	5000.34	5133.01	0	5133.01
17	11.2181	85186.7	Tvb	990	38	2879.11	4784.77	4857.08	0	4857.08
18	16.995	117216	Tvb	990	38	2550.11	4238.01	4157.26	0	4157.26
19	13.1189	76111.2	Tm_Aniso	600	34	1825.33	3033.49	3607.79	0	3607.79
20	13.1189	67847	Tm_Aniso	600	34	1689.14	2807.16	3272.24	0	3272.24
21	10.4847	47927.2	Tm_Aniso	600	34	1516.72	2520.63	2847.46	0	2847.46
22	10.4847	40529.2	Tm_Aniso	600	34	1355.43	2252.58	2450.06	0	2450.06
23	10.4847	32898.4	Tm_Aniso	600	34	1178.6	1958.7	2014.36	0	2014.36
24	10.4847	25191.1	Tm_Aniso	600	34	986.912	1640.14	1542.07	0	1542.07
25	4.11071	4167.92	Tm_Aniso	600	34	288.784	479.928	-178.014	0	-178.014

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.66189

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	80.0894	761.02	0	0	0
2	91.0364	762.804	8413.39	705.19	4.79119
3	101.983	764.588	19585.6	3259.64	9.44915
4	112.93	766.372	33010.4	8142.05	13.8555
5	123.877	768.156	49885.1	16129.2	17.9174
6	134.824	769.94	72039.1	28481.1	21.5717

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	9712 Oak Pass Rd G5750
Analysis Description	Sect N Soil Nail External Check Static
Drawn By	RK
Scale	
Company	Calwest
Date	5.28.19
File Name	Sect N_Soil_Nails Static Ext.sli

SLIDEINTERPRET 6.035

7	147.612	775.296	82965.6	39179.1	25.2782
8	160.4	780.653	94071.2	50784.4	28.3624
9	173.187	786.01	104533	62394.2	30.8324
10	185.975	791.367	114595	73595.3	32.7094
11	197.639	798.861	112965	75981.5	33.9252
12	209.304	806.355	107370	74303.2	34.6844
13	220.968	813.849	101811	71284.1	34.9982
14	232.633	821.343	96466.6	67224.2	34.8713
15	243.851	829.49	87291.3	59617.2	34.3318
16	255.069	837.637	78630.4	51799	33.3755
17	266.287	845.784	70584.3	44088.3	31.9897
18	277.505	853.931	63330.2	36797.8	30.1586
19	294.5	867.585	49930.1	24894.3	26.5001
20	307.619	878.124	35863.9	15169.2	22.9267
21	320.738	888.664	23546.7	7973.49	18.7074
22	331.222	897.736	13627.8	3626.44	14.9014
23	341.707	906.807	5621.83	1068.59	10.7623
24	352.192	915.878	-286.866	-31.9982	6.36469
25	362.677	924.949	-3922.23	-123.704	1.80646
26	366.787	942.375	0	0	0

List Of Coordinates

External Boundary

X	Y
0	700
294.5	700
408.278	700
408.278	946.1
379.522	946.1

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	9712 Oak Pass Rd G5750
Analysis Description	Sect N Soil Nail External Check Static
Drawn By	RK
Scale	
Company	Calwest
Date	5.28.19
File Name	Sect N_Soil_Nails Static Ext.sli

SLIDEINTERPRET 6.035

354.278	938.715
326.152	930
319.761	927.208
303.266	920
294.5	916.864
280.022	911.684
268.189	906.722
255.072	900.688
242.316	893.253
218.853	880.214
214.83	877.368
209.521	873.518
203.786	869.447
197.968	865.808
187.026	818.571
186.964	818.346
186.629	818.149
183.518	818
157.804	818
157.804	824.9
156.045	824.102
147.001	820
136.632	810
129.968	800
121.233	790
108.414	780
88.2833	770
86.4033	767.94
79.1591	760
63.8755	758.18
40.5627	755.403

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	9712 Oak Pass Rd G5750		
Analysis Description	Sect N Soil Nail External Check Static		
Drawn By	RK	Scale	Company: Calwest
Date	5.28.19		File Name: Sect N_Soil_Nails Static Ext.sli

SLIDEINTERPRET 6.035

11.9905	752
0	758.099
0	710

Material Boundary

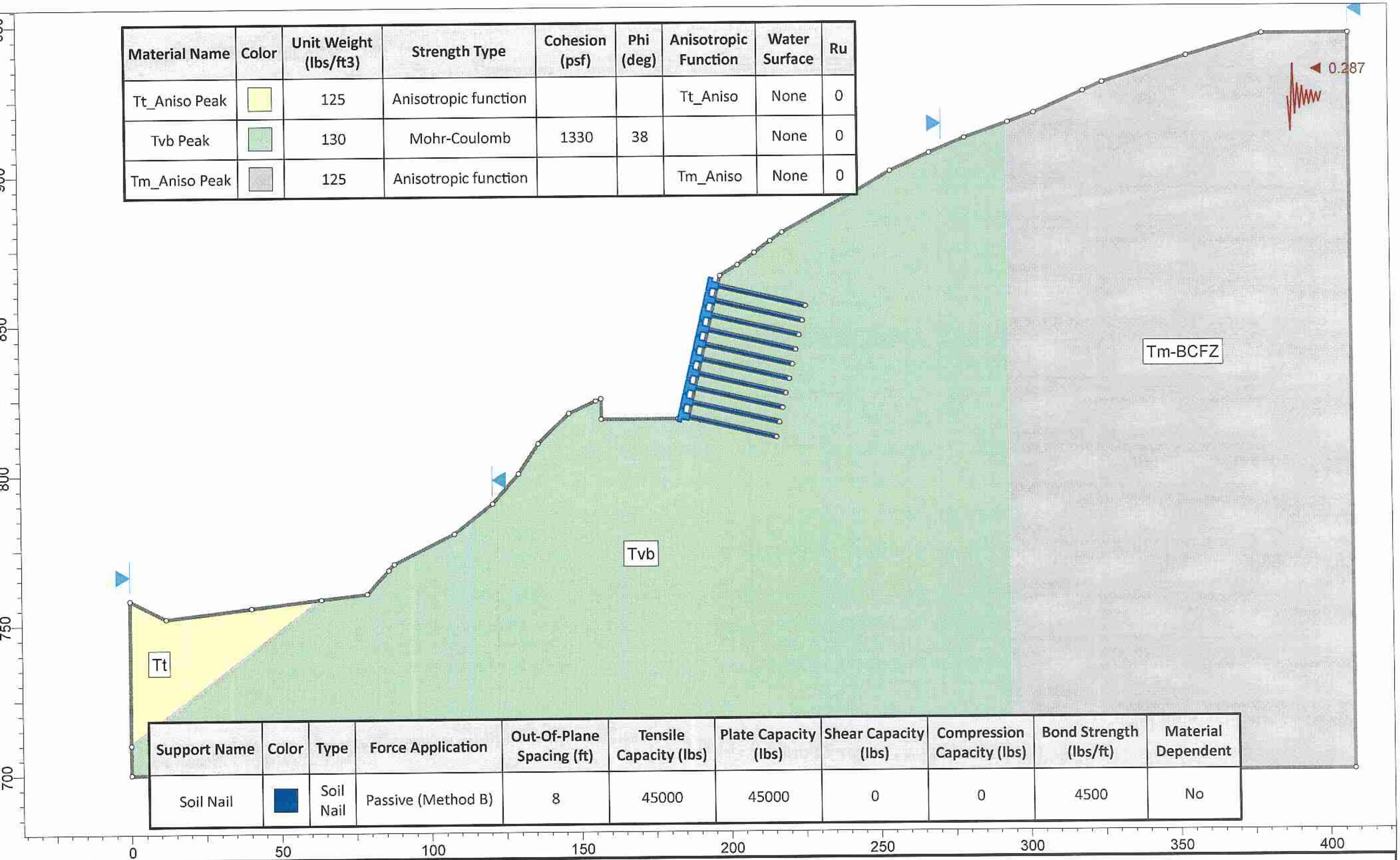
X	Y
0	710
63.8755	758.18

Material Boundary

X	Y
294.5	700
294.5	916.864

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	9712 Oak Pass Rd G5750	
	Analysis Description	Sect N Soil Nail External Check Static	
	Drawn By: RK	Scale	Company: Calwest
SLIDEINTERPRET 6.035	Date: 5.28.19		File Name: Sect N_Soil_Nails Static Ext.sli

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Tt_Aniso Peak		125	Anisotropic function			Tt_Aniso	None	0
Tvb Peak		130	Mohr-Coulomb	1330	38		None	0
Tm_Aniso Peak		125	Anisotropic function			Tm_Aniso	None	0

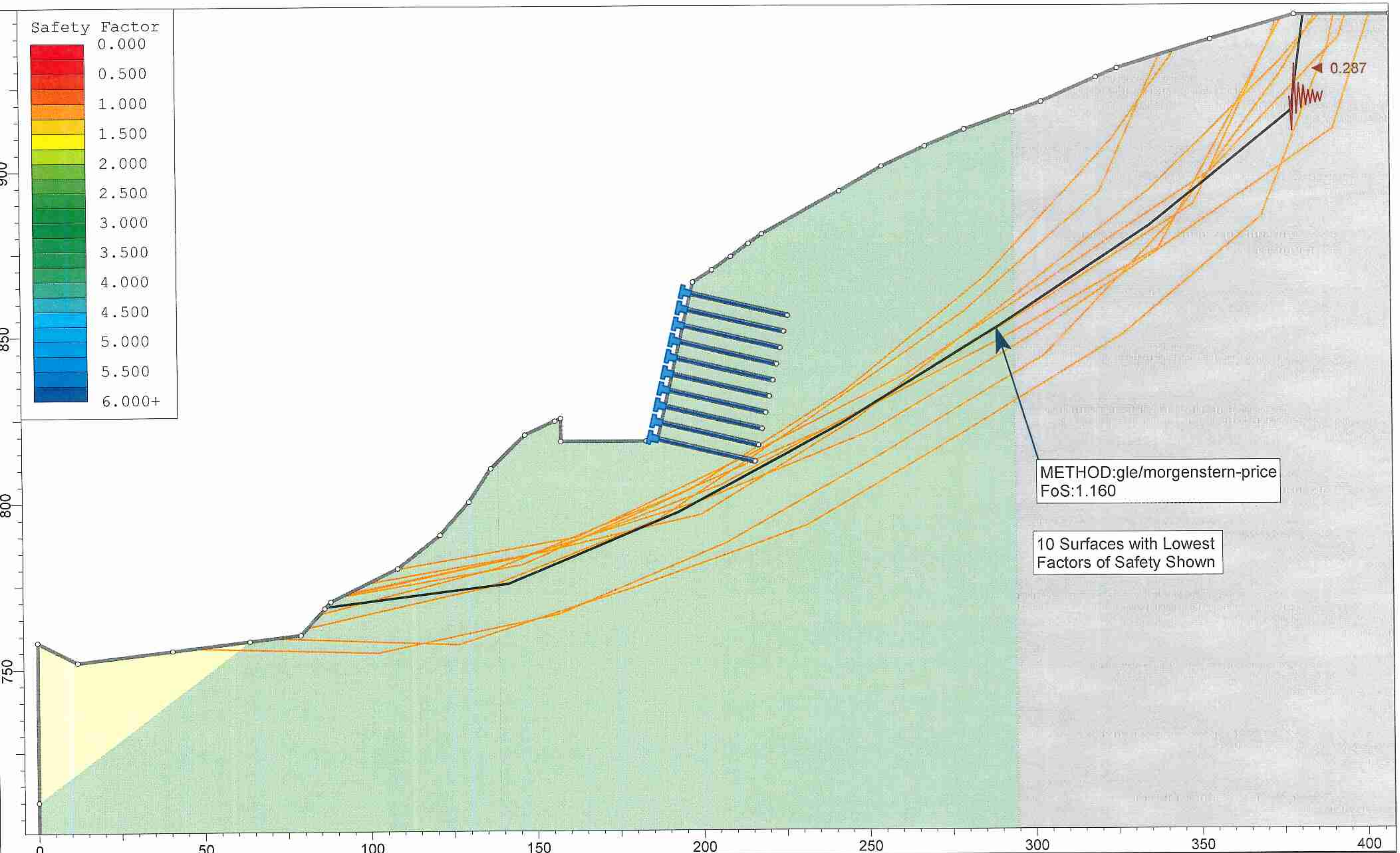


Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (ft)	Tensile Capacity (lbs)	Plate Capacity (lbs)	Shear Capacity (lbs)	Compression Capacity (lbs)	Bond Strength (lbs/ft)	Material Dependent
Soil Nail		Soil Nail	Passive (Method B)	8	45000	45000	0	0	4500	No

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road
Analysis Description	Sect N Soil Nail External Check Seismic
Drawn By	RK
Scale	1:533
Company	Calwest
Date	8.7.2019
File Name	Sect N_Soil_Nails Seis Ext.sli

SLIDE 6.035



CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect N Soil Nail External Check Seismic		
Drawn By	RK	Scale	1:480
Company	Calwest		
Date	8.7.2019	File Name	Sect N_Soil_Nails Seis Ext.sli

SLIDEINTERPRET 6.035

Slide Analysis Information

Oak Pass Road

Project Summary

File Name: Sect N_Soil_Nails Seis Ext
Slide Modeler Version: 6.035
Project Title: Oak Pass Road
Analysis: Sect N Soil Nail External Check Seismic
Author: RK
Company: Calwest
Date Created: 8.7.2019

General Settings

Units of Measurement: Imperial Units
Time Units: days
Permeability Units: feet/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

GLE/Morgenstern-Price with interslice force function: Half Sine

Number of slices: 25
Tolerance: 0.005

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road		
	Analysis Description: Sect N Soil Nail External Check Seismic		
	Drawn By: RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 8.7.2019		File Name: Sect N_Soil_Nails Seis Ext.sli

Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft3
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Non-Circular Path Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Segment Length: Auto Defined
Minimum Elevation: Not Defined
Minimum Depth: Not Defined
Upper Angle: Auto Defined
Lower Angle: Auto Defined

Loading

Seismic Load Coefficient (Horizontal): 0.287

Material Properties

Property	Tt_Aniso Peak	Tvb Peak	Tm_Aniso Peak
Color			
Strength Type	Anisotropic function	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	125	130	125
Cohesion [psf]		1330	
Friction Angle [deg]		38	
Water Surface	None	None	None
Ru Value	0	0	0

Anisotropic Functions

Name: Tt_Aniso

Angle From	Angle To	c	phi
-90	40	650	36
40	45	380	27
45	90	650	36

Name: Tm_Aniso

Angle From	Angle To	c	phi
-90	-67	800	36
-67	-60	200	27
-60	90	800	36

Support Properties

Soil Nail

Support Type: Soil Nail

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect N Soil Nail External Check Seismic		
Drawn By	RK	*Scale*	
Company	Calwest		
Date	8.7.2019	*File Name*	Sect N_Soil_Nails Seis Ext.sli

SLIDEINTERPRET 6.035

Force Application: Passive
Out-of-Plane Spacing: 8 ft
Tensile Capacity: 45000 lb
Plate Capacity: 45000 lb
Bond Strength: 4500 lb/ft

Global Minimums

Method: gle/morgenstern-price

FS: 1.159720
Axis Location: 56.713, 1152.723
Left Slip Surface Endpoint: 86.743, 768.311
Right Slip Surface Endpoint: 382.260, 946.100
Resisting Moment=5.47391e+008 lb-ft
Driving Moment=4.72003e+008 lb-ft
Resisting Horizontal Force=1.2612e+006 lb
Driving Horizontal Force=1.08751e+006 lb
Total Slice Area=13542.4 ft2

Global Minimum Coordinates

Method: gle/morgenstern-price

X	Y
86.7425	768.311
141.758	775.298
192.966	796.586
241.875	822.729
289.154	851.714
335.334	882.422
378.495	917.244
382.26	946.1

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect N Soil Nail External Check Seismic		
Drawn By	RK	*Scale*	*Company* Calwest
Date	8.7.2019		*File Name* Sect N_Soil_Nails Seis Ext.sli

SLIDEINTERPRET 6.035

Valid / Invalid Surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 4790
Number of Invalid Surfaces: 210

Error Codes:

Error Code -108 reported for 70 surfaces
Error Code -111 reported for 139 surfaces
Error Code -112 reported for 1 surface

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.15972

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	13.7538	6104.84	Tvb Peak	1330	38	1472.77	1708	483.814	0	483.814
2	13.7538	15917.5	Tvb Peak	1330	38	2290.39	2656.21	1697.48	0	1697.48
3	13.7538	31911.1	Tvb Peak	1330	38	3582.36	4154.54	3615.24	0	3615.24

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project: Oak Pass Road		
	Analysis Description: Sect N Soil Nail External Check Seismic		
	Drawn By: RK	Scale:	Company: Calwest
SLIDEINTERPRET 6.035	Date: 8.7.2019		File Name: Sect N_Soil_Nails Seis Ext.sli

4	13.7538	58084.6	Tvb Peak	1330	38	5640.48	6541.38	6670.26	0	6670.26
5	12.8022	69929.6	Tvb Peak	1330	38	4845.93	5619.92	5490.85	0	5490.85
6	12.8022	60382	Tvb Peak	1330	38	4546.29	5272.42	5046.07	0	5046.07
7	12.8022	48925.5	Tvb Peak	1330	38	4148.4	4810.98	4455.45	0	4455.45
8	12.8022	50457	Tvb Peak	1330	38	4185.68	4854.22	4510.79	0	4510.79
9	12.2271	99951.6	Tvb Peak	1330	38	5101.26	5916.03	5869.85	0	5869.85
10	12.2271	108773	Tvb Peak	1330	38	5194.77	6024.48	6008.66	0	6008.66
11	12.2271	111072	Tvb Peak	1330	38	5091.92	5905.2	5855.99	0	5855.99
12	12.2271	111504	Tvb Peak	1330	38	4948.81	5739.23	5643.55	0	5643.55
13	11.8198	107697	Tvb Peak	1330	38	4363.23	5060.13	4774.35	0	4774.35
14	11.8198	106277	Tvb Peak	1330	38	4248.26	4926.79	4603.68	0	4603.68
15	11.8198	103291	Tvb Peak	1330	38	4121.06	4779.28	4414.88	0	4414.88
16	11.8198	99458.1	Tvb Peak	1330	38	3996.18	4634.45	4229.51	0	4229.51
17	5.34581	43376.3	Tvb Peak	1330	38	3702.39	4293.73	3793.4	0	3793.4
18	13.6112	101356	Tm_Aniso Peak	800	36	2828.54	3280.32	3413.87	0	3413.87
19	13.6112	95695.6	Tm_Aniso Peak	800	36	2811.57	3260.63	3386.77	0	3386.77
20	13.6112	89745.5	Tm_Aniso Peak	800	36	2803.28	3251.02	3373.54	0	3373.54
21	10.7903	64394	Tm_Aniso Peak	800	36	2476.53	2872.08	2851.98	0	2851.98
22	10.7903	57154.3	Tm_Aniso Peak	800	36	2386.21	2767.33	2707.8	0	2707.8
23	10.7903	49741.8	Tm_Aniso Peak	800	36	2263.67	2625.22	2512.2	0	2512.2
24	10.7903	42257.2	Tm_Aniso Peak	800	36	2103.81	2439.83	2257.03	0	2257.03
25	3.7655	6771.72	Tm_Aniso Peak	800	36	333.95	387.288	-568.051	0	-568.051

Interslice Data

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 1.15972

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	86.7425	768.311	0	0	0

CALWEST GEOTECHNICAL CONSULTING ENGINEERS	Project	Oak Pass Road	
	Analysis Description	Sect N Soil Nail External Check Seismic	
	Drawn By: RK	Scale	Company: Calwest
	Date: 8.7.2019		File Name: Sect N_Soil_Nails Seis Ext.sli

SLIDEINTERPRET 6.035

2	100.496	770.058	17710.7	3124.93	10.0064
3	114.25	771.805	41759.5	14579.1	19.2451
4	128.004	773.551	75683.4	38927.7	27.219
5	141.758	775.298	125139	83667.7	33.7666
6	154.56	780.62	138043	110355	38.6397
7	167.362	785.942	152210	139341	42.4726
8	180.164	791.264	167700	170142	45.4141
9	192.966	796.586	182935	200296	47.5938
10	205.194	803.121	178418	205671	49.0586
11	217.421	809.657	171607	204409	49.9856
12	229.648	816.193	163875	198197	50.4151
13	241.875	822.729	155652	187924	50.366
14	253.695	829.975	141850	168225	49.8619
15	265.515	837.221	128330	147044	48.8878
16	277.334	844.468	115528	125655	47.4044
17	289.154	851.714	103689	104968	45.3512
18	294.5	855.269	97598.3	94958	44.2144
19	308.111	864.32	76208.1	65447.3	40.6559
20	321.722	873.371	56456.3	41026.6	36.0058
21	335.334	882.422	38418.7	22260.2	30.0885
22	346.124	891.127	21900.2	9940.04	24.4123
23	356.914	899.833	7737.46	2494.44	17.8685
24	367.705	908.539	-3920.64	-731.795	10.5727
25	378.495	917.244	-12938.6	-627.083	2.77473
26	382.26	946.1	0	0	0

List Of Coordinates

External Boundary

X	Y

CALWEST GEOTECHNICAL CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect N Soil Nail External Check Seismic		
Drawn By	RK	Scale	Company: Calwest
Date	8.7.2019	File Name	Sect N_Soil_Nails Seis Ext.sli

SLIDEINTERPRET 6.035

0	700
294.5	700
408.278	700
408.278	946.1
379.522	946.1
354.278	938.715
326.152	930
319.761	927.208
303.266	920
294.5	916.864
280.022	911.684
268.189	906.722
255.072	900.688
242.316	893.253
218.853	880.214
214.83	877.368
209.521	873.518
203.786	869.447
197.968	865.808
187.026	818.571
186.964	818.346
186.629	818.149
183.518	818
157.804	818
157.804	824.9
156.045	824.102
147.001	820
136.632	810
129.968	800
121.233	790
108.414	780

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

Project	Oak Pass Road		
Analysis Description	Sect N Soil Nail External Check Seismic		
Drawn By RK	*Scale*	*Company*	Calwest
Date 8.7.2019		*File Name*	Sect N_Soil_Nails Seis Ext.sli

SLIDEINTERPRET 6.035

88.2833	770
86.4033	767.94
79.1591	760
63.8755	758.18
40.5627	755.403
11.9905	752
0	758.099
0	710

Material Boundary

X	Y
0	710
63.8755	758.18

Material Boundary

X	Y
294.5	700
294.5	916.864

CALWEST GEOTECHNICAL CONSULTING ENGINEERS			
Project	Oak Pass Road		
Analysis Description	Sect N Soil Nail External Check Seismic		
Drawn By RK	*Scale*	*Company*	Calwest
Date 8.7.2019		*File Name*	Sect N_Soil_Nails Seis Ext.sli

SLIDEINTERPRET 6.035

CALWEST GEOTECHNICAL
CONSULTING ENGINEERS

December 17, 2019 | Project No. 5750

9712 Oak Pass Road LLC
9663 Santa Monica Blvd. Suite 406
Beverly Hills, CA 90210

SUBJECT: **ADDENDUM GEOTECHNICAL ENGINEERING REPORT #2, RESPONSE TO THE CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT REVIEW LETTER, LOG #102633-02, DATED NOVEMBER 1, 2019, PROPOSED MULTI-STRUCTURE LUXURY HOTEL COMPLEX AND CUSTOM SINGLE FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-9, VESTING TENTATIVE TRACT MAP NO. 74908, 9712 OAK PASS ROAD (AKA 9750 & 9800 WANDA PARK DRIVE), BEL AIR AREA, CITY OF LOS ANGELES, CALIFORNIA.**

REFERENCES: ADDENDUM ENGINEERING GEOLOGIC REPORT #2, PROPOSED MULTI-STRUCTURE LUXURY HOTEL AND CUSTOM SINGLE-FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-10, VESTING TENTATIVE TRACT 74908, 9712 OAK PASS ROAD, CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY LAND PHASES INC., PROJECT NO. LP1197, DECEMBER 17, 2019.

CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT REVIEW LETTER, LOG # 102633-02, DATED NOVEMBER 1, 2019.

ADDENDUM GEOTECHNICAL ENGINEERING REPORT #1, RESPONSE TO THE CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT REVIEW LETTER, LOG #102633-01, DATED MAY 17, 2019, PROPOSED MULTI-STRUCTURE LUXURY HOTEL COMPLEX AND CUSTOM SINGLE FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-9, VESTING TENTATIVE TRACT MAP NO. 74908, 9712 OAK PASS ROAD (AKA 9750 & 9800 WANDA PARK DRIVE), BEL AIR AREA, CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY CALWEST GEOTECHNICAL, PROJECT NO. 5750, DATED SEPTEMBER 16, 2019.

ADDENDUM ENGINEERING GEOLOGIC REPORT #1, PROPOSED MULTI-STRUCTURE LUXURY HOTEL AND CUSTOM SINGLE-FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-10, VESTING TENTATIVE TRACT 74908, 9712 OAK PASS ROAD, CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY LAND PHASES INC., PROJECT NO. LP1197, SEPTEMBER 9, 2019.

CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT REVIEW LETTER, LOG # 102633-01, DATED MAY 17, 2019.

UPDATE GEOTECHNICAL ENGINEERING INVESTIGATION REPORT, PROPOSED MULTI-STRUCTURE LUXURY HOTEL COMPLEX AND CUSTOM SINGLE FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-9, VESTING TENTATIVE TRACT MAP NO. 74908, 9712 OAK PASS ROAD (AKA 9750 & 9800 WANDA PARK DRIVE), BEL AIR AREA, CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY CALWEST GEOTECHNICAL, PROJECT NO. 5750, DATED MARCH 30, 2019.

REPORT OF ENGINEERING GEOLOGIC STUDY, PROPOSED MULTI-STRUCTURE LUXURY HOTEL AND CUSTOM SINGLE-FAMILY RESIDENTIAL DEVELOPMENT, LOTS 1-10, VESTING TENTATIVE TRACT 749008, 9712 OAK PASS ROAD, CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY LAND PHASES, INC., PROJECT NO. LP1197, DATED MARCH 30, 2019.

CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT REVIEW LETTER, LOG # 102633-01, DATED APRIL 20, 2018.

PRELIMINARY UPDATE AND SUPPLEMENTAL GEOTECHNICAL ENGINEERING REPORT, PROPOSED MULTI-STRUCTURE LUXURY HOTEL AND RESIDENTIAL DEVELOPMENT, 9712 OAK PASS ROAD (AKA 9750 & 9800 WANDA PARK DRIVE), CITY OF LOS ANGELES, CALIFORNIA, PREPARED BY CALWEST GEOTECHNICAL, PROJECT NO. 5750, DATED FEBRUARY 10, 2017.

REPORT OF PRELIMINARY ENGINEERING GEOLOGIC STUDY, PROPOSED MULTI-STRUCTURE LUXURY HOTEL DEVELOPMENT, 9712 OAK PASS ROAD AND ADJACENT ASSOCIATED PROPERTIES, CITY OF LOS ANGELES, CALIFORNIA, PROJECT NO. LP 1197, PREPARED BY LAND PHASES, INC., DATED FEBRUARY 6, 2017.

ADDITIONAL REFERENCES ARE INCLUDED IN THE AFOREMENTIONED REPORTS.

Introduction

This Addendum Geotechnical Engineering Report #2 has been prepared at your request and is in response to the City of Los Angeles Geology and Soils Report Review Letter, Log # 102633-02 dated November 1, 2019 (included in Appendix A). The Review letter was prepared following the City review of our referenced Addendum Geotechnical Engineering Report #1, dated September 16, 2019 and the corresponding referenced Addendum Geologic Report #1, prepared by Land Phases, Inc., dated September 5, 2019. The Geology and Soils Report Review Letter requests additional information and/or clarification to 8 Review Comments prior to project approval.

The review comments have been restated in abbreviated form followed by our response.

Review Comments:

1. **The Department does not approve soils nail walls unless it can be demonstrated that conventional retaining structures or slope trimming are not feasible to eliminate geological hazards or bring the site to code conformance. Revise recommendations (…).**

Response: The soil nail retaining wall slope stabilization system is required to stabilize the existing over-steepened cut slope on the upslope side of the proposed private driveway. The existing over-steepened cut slope is on the order of 20 to 30 feet in height, which far exceeds the allowed conventional retaining wall height. Secondly, a 2:1 (H:V) slope with a ten (10) foot high retaining wall at the toe/edge of the proposed private driveway (existing driveway) would extend approximately 100 feet in height and still not catch the existing grade at the top of the slope, see slope exhibit in Appendix B. In fact, any combination of a conventional retaining wall and 2:1 (H:V) grading will exceed the allowed retaining wall height and grading quantities. Considering the above and the constructability issues with a conventional retaining wall and required extensive pile foundation system, a "conventional" retaining wall system is both impractical and infeasible from a constructability and Code compliance standpoint, not to mention the grading would result in the removal of all the trees and mature vegetation.

The soil nail retaining wall stabilization system can be built at grade eliminating the need for the 2:1 (H:V) grading and allowing for a means of meeting Code slope stability requirements without the invasiveness of extensive and impractical grading and substantial pile foundations required for a conventional retaining wall system.

2. In the event that soil nail walls are justified, obtain a clarification from building plan check to show whether or not the proposed soil nail walls/retaining walls conform to Zoning Code Section 12.21 C8 (…).

Response: The proposed soil nail retaining wall system will be "faced" with a reinforced concrete facing at or near the existing grade minimizing grading. The soil nail system is considered a retaining wall and therefore will require City approval for over in-height retaining wall.

3. It appears that the landslide material or alluvium will remain in place on some of the over-steepened slopes. Provide surficial stability analysis for slopes steeper than 2(H):1(V) (…).

Response: Surficial stability analyses were performed utilizing soil strength data obtained in our laboratory which is reduced to account for the low over-burden pressure. The analysis assumes a range of slope inclinations and saturated soil thickness. The analysis is based on an infinite slope model that assumes a uniform planer slope, uniform soils density and shear strength, and uniform seepage parallel to the slope. The results of the surficial stability analysis indicate the site slopes inclined at a gradient of 1.75:1 (H:V) or less have a factor of safety in excess of 1.5.

Slopes which exceed 1.75:1 (H:V) in gradient shall be provided with appropriate drainage and debris protection devices, where appropriate, once the final site design is completed. The drainage debris protection devises shall be designed by the project civil engineer and detailed on the final grading and drainage plans during the plan check review process. All final project plans shall be reviewed and approved by manual stamp and signature by this office and Land Phases, Inc., prior to final City approval and permit issuance. The surficial stability analysis is included in Appendix C.

4. Depict on geologic maps and cross-sections how the Code required building clearance can be achieved.

Response: When the final project architectural and civil plans are being prepared during the plan check review process, the Code required building clearance will be integrated into the site and building design so that all structures are Code compliant, per the following;

All structure foundations including retaining walls should be embedded such that the minimum horizontal distance from the face of the descending slope to the bottom of the foundation is at least 1/3 the overall height of the adjacent descending slope steeper than 3:1 (H:V). The maximum required horizontal setback is 40 feet, and the minimum is 5 feet.

The foundation of the proposed swimming pool/spa should be embedded such that the minimum horizontal distance from the face of the descending slope to the bottom of the foundation is at least $^1/_6$ the overall height of the adjacent descending slope steeper than 3:1 (H:V). The maximum required horizontal distance is 20 feet and the minimum is 2.5 feet.

All habitable structures should be located such that the minimum horizontal distance from the edge of the structure to the toe of any adjacent ascending slope is at least 1/2 the overall height of the slope. The minimum required distance is three feet; the maximum required distance is 15 feet.

5. **As previously requested, and noted by the Consultants, provide the following: Research, review and reference all existing records at the Research Division of the Department Building and Safety (…). Include for review purposes a completed electronic PDF copy (…).**

Response: The project engineering geologist, Land Phases, Inc., will provide an electronic PDF copy along with their corresponding and referenced Addendum Engineering Geologic Report #2, to be submitted with this report.

6. **Provide an updated Geologic Map suitable for archiving where the proposed development is visible for archiving purposes (…).**

Response: The requested Update Geologic Map, prepared by the project engineering geologist, Land Phases, Inc., suitable for archiving, shall be included in their corresponding and referenced Addendum Engineering Geologic Report #2. An electronic PDF copy shall be submitted with this report.

7. **As previously requested, Cross Section D-D' depicts a proposed parking structure P1 and a proposed restaurant. Clearly depict the Code required setback from the toe of the ascending slope and from the face of the descending slope (…).**

Response: As stated in our response to item #4 above, the Code required setbacks will be integrated into the formal site and building design during the plan check review process. In the interim, a note has been added to Cross-section D-D' stating all structures shall comply with the Code required setbacks.

8. **As previously requested, in the SE corner of the hill in the BCFZ area, clearly and legibly (suitable for archiving) depict the lateral extent of the proposed soil nail wall on the Geologic Map.**

Response: As stated in our response to item #6 above, an electronic PDF copy of the Update Geologic Map, suitable for archiving and clearly showing the lateral extent of the soil nail retaining wall/stabilization system shall be included with the referenced Addendum Engineering Geologic Report #2 prepared by Land Phases, Inc., to be submitted with this report.

Summary and Conclusions

CalWest Geotechnical has prepared this Addendum Geotechnical Engineering Report #2 in response to the City of Los Angeles Geology and Soils Report Review Letter, Log # 102633-02, dated November 1, 2019 included in Appendix A. Based on our responses provided herein, and the geotechnical data and recommendations presented in this and our referenced reports, the reports prepared by it continues to be the opinion of this office the proposed project, as planned, is considered feasible from a geotechnical engineering perspective, providing our recommendations and those of the project engineering geologist, Land Phases, Inc. are made part of the project plans and implemented during construction.

Limitations and Uniformity of Conditions

This report is prepared for use by 9712 Oak Pass Road, LLC and their authorized agents, and should not be considered transferable. Prior to use by others, the subject site and this report should be reviewed by CalWest Geotechnical to determine if any additional work is required to update this report.

The findings presented in this report are valid as of this date and may be invalidated wholly or partially by changes outside our control. Therefore, this report should be subject to review and should not be relied upon after a period of one year or if any significant changes are made.

The professional opinions and geotechnical advice contained in this report are not intended to imply total performance of the project or guarantee that unusual conditions will not be discovered during or after construction.

This report has been prepared in accordance with generally accepted engineering practices and makes no warranties, either express or implied, as to the professional opinions provided.

Should you have any questions, please don't hesitate to call.

Respectfully submitted,

Leonard Liston
President
RCE 31902

Robi Khan, PE
Project Engineer
RCE 70510

Enc: Appendix A - City of Los Angeles Geology and Soils Report Review Letter, Log # 102633-02, Dated November 1, 2019

Appendix B- Slope Exhibit

Appendix C- Surficial Stability Analysis

cc: Land Phases, Inc.

APPENDIX A

CITY OF LOS ANGELES

CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

FRANK M. BUSH
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT REVIEW LETTER

November 1, 2019

LOG # 102633-02
SOILS/GEOLOGY FILE - 2
LIQ/LAN

Oak Pass Road LLC
9663 Santa Monica Blvd.
Los Angeles, CA 90210

TRACT:	VTT 74908
LOTS:	1 – 10
LOCATION:	9712 W. Oak Pass Road

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	5750	09/16/2019	CalWest Geotechnical
Oversized Documents	"	"	"
Geology Report	LP1197	09/05/2019	Landphases, Inc.
Oversized Documents	"	"	"

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	102633-01	05/17/2019	LADBS – Grading
Soils Report	5750	03/30/2019	CalWest Geotechnical
Geology Report	LP1197	03/30/2019	Landphases, Inc.
Dept. Review Letter	102633	04/20/2018	LADBS – Grading
Soils Report	5750	02/10/2017	CalWest Geotechnical
Geology Report	LP1197	02/06/2017	Landphases, Inc.
Dept. Approval Letter	87701	04/07/2015	LADBS
Geology Report	LP1197	03/19/2015	Landphases, Inc.
Dept. Approval Letter	80071	04/16/2013	LADBS
Soils Addendum Letter	5277	03/20/2013	Calwest Geotechnical
Dept. Approval Letter	73947-01	01/22/2013	LADBS
Soils Report	5277	11/19/2012	Calwest Geotechnical
Geology Report	JH7950	11/16/2012	Mountain Geology, Inc.
Soils Report	5277	07/13/2012	Calwest Geotechnical
Geology Report	JH7950	07/13/2012	Mountain Geology, Inc.
Request for Modification	20772	10/11/2012	LADBS - Grading
Dept. Correction Letter	73947	06/08/2011	LADBS
Soils Report	5277	04/22/2011	Calwest Geotechnical

The Grading Division of the Department of Building and Safety has reviewed the referenced reports dated September 5, 2019, and September 16, 2019, that provides recommendations for the proposed 5-level luxury hotel with 2 levels basement parking, detached multi-level parking structures, bungalows (revised locations from the 2017 report), condominiums (revised locations from the 2017 report), hotel funicular, swimming pools, detached single family residences, retaining walls, cart paths, and private roads.

Previously, the Grading Division of the Department of Building and Safety had reviewed and approved (Log # 87701, dated April 7, 2015) the referenced report dated March 19, 2015, providing recommendations for the subsequent grading and construction of a new building pad with new retaining walls in anticipation of future residential construction and ancillary structures, and improvement of the existing private driveway.

The earth materials at the subsurface exploration locations consist of areas of certified fill and uncertified fill overlying a relatively thin layer of natural residual soil up to 5 feet in thickness, overlies the bedrock for the majority of the subject site, while the southern half of site is underlain by Modelo Formation sandstone and shale bedrock and the northern half is underlain by Topanga Formation shale and sandstone bedrock and volcanic bedrock.

The subject property is not located within a State designated Earthquake Fault Zone and no known potentially active or active faults cross the subject site. However, regional geologic mapping by Dibblee (1991) and City of Los Angeles (1960-1970) indicate that the Benedict Canyon Fault Zone (BCFZ) traverses the subject property. The consultants state that adverse effect due to fault rupture is considered low to nil for the proposed structures as the mapped faults of the site are not interpreted to be active tectonic features.

The consultants recommend to support the proposed structures on conventional and/or drilled-pile foundations bearing on engineered fill or competent bedrock.

The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The site is located in a designated seismically induced landslide hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The review of the subject reports dated September 5, 2019, and September 16, 2019, cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. The Department does not approve soils nail walls unless it can be demonstrated that conventional retaining structures or slope trimming are not feasible to eliminate geological hazards or bring the site to code conformance. Revise recommendations so that the over-steepened slopes are either trimmed to Code conformance or retained with conventional retaining structures.

2. In the event that soil nail walls are justified, obtain a clarification from building plan check to show whether or not the proposed soil nail walls / retaining walls conform to Zoning Code Section 12.21 C8 in terms of heights and total number of retaining walls.

3. It appears that the landslide material or alluvium will remain in place on some of the over-steepened slopes. Provide surficial stability analysis for slopes steeper than 2(H) : 1 (V) and mitigation measures to mitigate potential surficial instability.

4. Depict on geologic maps and cross-sections how the Code required building clearance can be achieved.

5. As previously requested, and noted by the Consultants, provide the following: Research, review and reference all existing records at the Research Division of the Department of Building and Safety for the subject and adjacent properties and incorporate the existing geologic data into the current evaluation. **Include for review purposes a complete electronic PDF copy** (including exploration logs, geologic map, cross-sections and lab data) of the previous report/s and the Department's review letters.

6. Provide an updated Geologic Map suitable for archiving where the proposed development is visible for archiving purposes and review purposes. It is not clear what is proposed on the geologic map, as it is too light in shade or not labelled. Label proposed structures with names, i.e. proposed condominiums, bungalows, new single family residences.

7. As previously requested, Cross Section D-D' depicts a proposed parking structure P1 and a proposed restaurant. Clearly depict the Code required setback from the toe of the ascending slope and from the face of the descending slope. Currently, the parking structure and restaurant appear to be basements on Section D-D' with no setbacks from the face of the slope.

8. As previously requested, in the SE Corner of the hill in the BCFZ area, clearly and legibly (suitable for archiving) depict the lateral extent of the proposed soil nail wall on the Geologic Map.

The project engineering geologist and soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer and/or geologist may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in a CD or flash drive, and the appropriate fees will be required for submittal.

Jeffrey T. Wilson

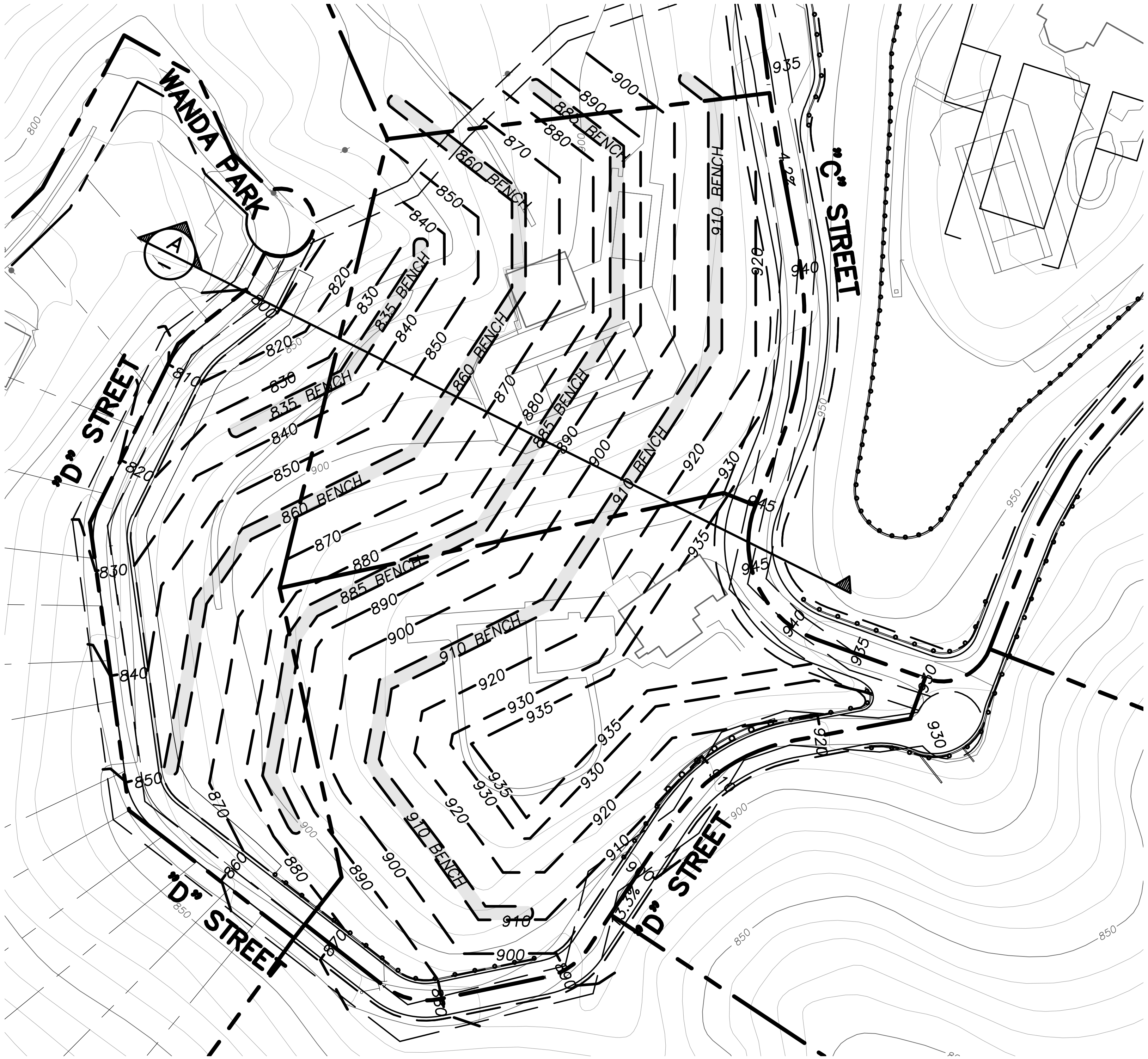
JEFFREY T. WILSON
Engineering Geologist I

YING LIU
Geotechnical Engineer II

Log No. 102633-02
213-482-0480

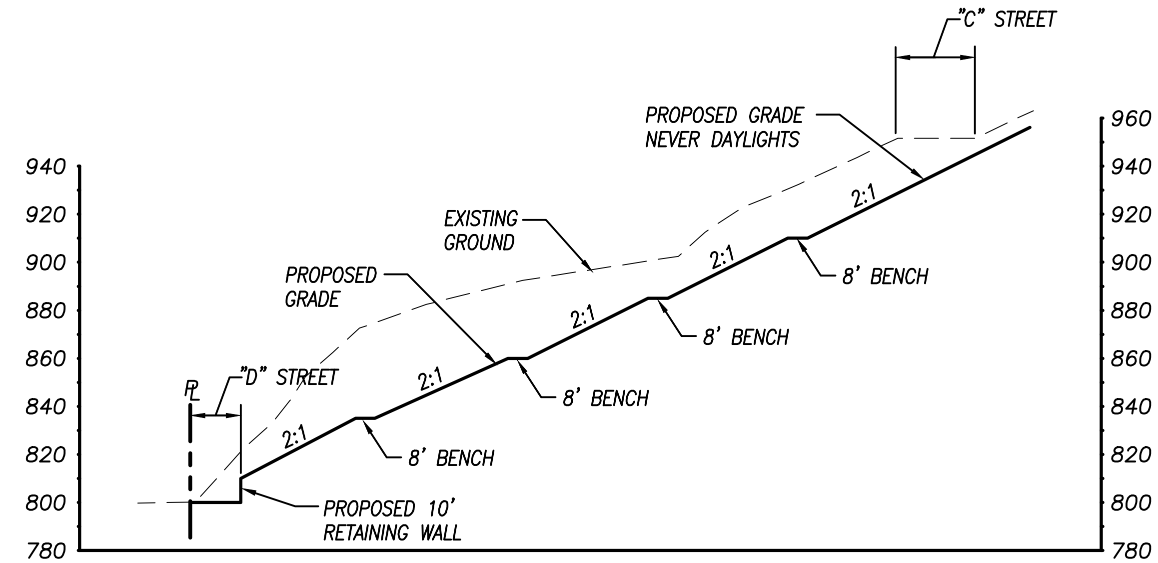
cc: Blythe McKinney, Permits Unlimited, Applicant
CalWest Geotechnical, Project Consultant
Landphases, Inc., Project Consultant
WL District Office

APPENDIX B



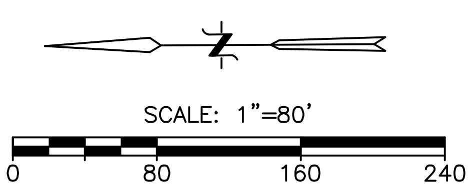
SLOPE EXHIBIT

SCALE: 1"=80'



CROSS SECTION "A"

SCALE: 1"=80'



REGISTERED PROFESSIONAL ENGINEER
LEONARD I. LISTON
No.31902
CIVIL
STATE OF CALIFORNIA

LC ENGINEERING GROUP, INC.
CONSULTING ENGINEERS
889 Pierce Court, Suite 101, Thousand Oaks, California 91360
818-991-7148 • 805-497-1244 • lcegroupinc.com • workfiles@lcegroupinc.com

SLOPE EXHIBIT
FOR
THE RETREAT AT BENEDICT CANYON

9712 OAK PASS ROAD
LOS ANGELES, CA 90210

APPENDIX C

SURFICIAL SLOPE STABILITY - INFINITE SLOPE ANALYSIS

$$\text{Factor of Safety} = \frac{\{ H \times (\gamma_d - \gamma_w) \times \cos^2(\alpha) \times \tan(\phi) \} + C}{\{ H \times \gamma_d \times \cos(\alpha) \times \sin(\alpha) \}}$$

ROCK PARAMETERS: **Soil**

SOIL DENSITY (γ_d) = **120.0** **pcf**

WATER DENSITY (γ_w) = **62.4** **pcf**

PHI (ϕ) = **24.0** **degrees**

COHESION (C) = **175.0** **psf**

MINIMUM DEPTH = **1.0** **ft** **DEPTH INCREMENT = 0.25 ft**

SLOPE GRADIENT (H:V)	SLOPE ANGLE α (Degrees)	THICKNESS, H (feet)												
		1.0	**1.3**	**1.5**	**1.8**	**2.0**	**2.3**	**2.5**	**2.8**	**3.0**	3.3	3.5	3.8	4.0
		- FACTORS OF SAFETY -												
0.50:1	**63.4**	3.7	3.0	2.5	2.2	1.9	1.7	1.6	1.4	1.3				
0.75:1	**55.1**	3.3	2.6	2.2	1.9	1.7	1.5	1.4	1.3	1.2				
1:1	**45.0**	3.1	2.5	2.2	1.9	1.7	1.5	1.4	1.3	1.2				
1.25:1	**38.7**	3.3	2.7	2.3	2.0	1.8	1.6	1.5	1.4	1.3				
1.50:1	**33.7**	3.5	2.8	2.4	2.1	1.9	1.7	1.6	1.5	1.4				
1.75:1	**29.7**	3.8	3.1	2.6	2.3	2.1	1.9	1.7	1.6	1.5				
2:1	**26.6**	4.1	3.3	2.9	2.5	2.3	2.0	1.9	1.8	1.6				
2.25:1	**24.0**	4.4	3.6	3.1	2.7	2.4	2.2	2.1	1.9	1.8				
2.50:1	**21.8**	4.8	3.9	3.4	3.0	2.6	2.4	2.2	2.1	1.9				
2.75:1	**20.0**	5.1	4.2	3.6	3.2	2.9	2.6	2.4	2.2	2.1				
3:1	**18.4**	5.5	4.5	3.9	3.4	3.1	2.8	2.6	2.4	2.3				

PROJECT: OAK PASS **JOB NUMBER: G5750**

CAL WEST GEOTECHNICAL

THOUSAND OAKS
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CITY OF LOS ANGELES
CALIFORNIA

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FRANK M. BUSH
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT APPROVAL LETTER

February 7, 2020

LOG # 102633-03
SOILS/GEOLOGY FILE - 2
LIQ/LAN

Oak Pass Road LLC
9663 Santa Monica Blvd.
Los Angeles, CA 90210

TRACT: VTT 74908
LOTS: 1 – 10
LOCATION: 9712 W. Oak Pass Road

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	5750	12/17/2019	CalWest Geotechnical
Oversized Documents	ˋˋ	ˋˋ	ˋˋ
Geology Report	LP1197	12/17/2019	Landphases, Inc.
Oversized Documents	ˋˋ	ˋˋ	ˋˋ

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	102633-02	11/01/2019	LADBS
Soils Report	5750	09/16/2019	CalWest Geotechnical
Geology Report	LP1197	09/05/2019	Landphases, Inc.
Dept. Review Letter	102633-01	05/17/2019	LADBS – Grading
Soils Report	5750	03/30/2019	CalWest Geotechnical
Geology Report	LP1197	03/30/2019	Landphases, Inc.
Dept. Review Letter	102633	04/20/2018	LADBS – Grading
Soils Report	5750	02/10/2017	CalWest Geotechnical
Geology Report	LP1197	02/06/2017	Landphases, Inc.
Dept. Approval Letter	87701	04/07/2015	LADBS
Geology Report	LP1197	03/19/2015	Landphases, Inc.
Dept. Approval Letter	80071	04/16/2013	LADBS
Soils Addendum Letter	5277	03/20/2013	Calwest Geotechnical
Dept. Approval Letter	73947-01	01/22/2013	LADBS
Soils Report	5277	11/19/2012	Calwest Geotechnical
Geology Report	JH7950	11/16/2012	Mountain Geology, Inc.
Soils Report	5277	07/13/2012	Calwest Geotechnical
Geology Report	JH7950	07/13/2012	Mountain Geology, Inc.

Request for Modification	20772	10/11/2012	LADBS - Grading
Dept. Correction Letter	73947	06/08/2011	LADBS
Soils Report	5277	04/22/2011	Calwest Geotechnical
Geology Report	JH7950	04/20/2011	Mountain Geology, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports dated December 17, 2019, that provide recommendations for the proposed 5-level luxury hotel with 2 levels basement parking, detached multi-level parking structures, bungalows, condominiums, hotel funicular, swimming pools, detached single family residences, retaining walls, cart paths, and private roads.

The earth materials at the subsurface exploration locations consist of areas of certified fill and uncertified fill overlying a relatively thin layer of natural residual soil up to 5 feet in thickness, overlies the bedrock for the majority of the subject site, while the southern half of site is underlain by Modelo Formation sandstone and shale bedrock and the northern half is underlain by Topanga Formation shale and sandstone bedrock and volcanic bedrock.

The subject property is not located within a State designated Earthquake Fault Zone and no known potentially active or active faults cross the subject site. However, regional geologic mapping by Dibblee (1991) and City of Los Angeles (1960-1970) indicate that the Benedict Canyon Fault Zone (BCFZ) traverses the subject property. The consultants state that adverse effect due to fault rupture is considered low to nil for the proposed structures as the mapped faults of the site are not interpreted to be active tectonic features.

The consultants recommend to support the proposed structures on conventional and/or drilled-pile foundations bearing on engineered fill or competent bedrock.

The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The Liquefaction study included as a part of the reports demonstrates that the site does not possess a liquefaction potential. This satisfies the requirement of the 2020 Los Angeles City Building Code Section 1803.5.12.

The site is located in a designated seismically induced landslide hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The above reports include an acceptable seismic slope stability analysis and the requirements of the 2020 City of Los Angeles Building Code have been satisfied.

The referenced reports dated December 17, 2019, are acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2020 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. This approval is only applicable for the purpose of the filing of Vesting Tentative Tract Maps (VTT 74908) with the Department of City Planning. No grading or building permits shall be issued based on the referenced report and this approval letter.

2. Prior to the issuance of grading or building permits, a comprehensive soils and geology report (as mentioned on pages 13 & 17 of the 02/10/2017 report and elsewhere in the referenced reports) suitable for the proposed development shall be submitted to the Grading

Division of the Department of Building and Safety for review and approval. The comprehensive soils and geology report shall include but not limited to the following:

a. Detailed grading and foundation recommendations for each individual structure.

b. Geology map and cross-sections showing the final proposed developments and proposed grading.

c. Justification for use of soil nails. The consultants shall evaluate other conventional stabilization methods such as trimming of the slope (the Department will allow cut slopes evaluated as stable with the required minimum factor of safety of 1.5 for gross and surficial stability and exposing hazard-free geology, up to a maximum horizontal to vertical slope gradient of 1.5H:1V (33 degrees) on private property and up to a maximum horizontal to vertical slope gradient of 1H:1V (45 degrees) for street cuts, retaining walls, or a combination of retaining walls & trimming of the slope. In addition, a combination of retaining walls, slope trimming, and soil nails could be considered.

d. In the event the use of soil nails are justified, provide detailed design recommendations for the soil nail walls including diameter, length, spacing, bond strength, corrosion protection, load testing, and long-term monitoring of the soil nails.

e. Geologic map and cross-sections that show the code required building clearance for all proposed building structures.

f. Geologic map and cross-section(s) that demonstrate the surficial unstable material on the north and southwest facing slopes below Lots 2 and 3 are eliminated either by removal or through construction of the soil nail wall.

g. Geologic map and cross-section(s) that demonstrate appropriate drainage and debris protection devices are provided for slopes steeper than 1.75 (H) : 1 (V).

Jeffrey T. Wilson
JEFFREY T. WILSON
Engineering Geologist I

YING LIU
Geotechnical Engineer II

Log No. 102633-03
213-482-0480

cc: Blythe McKinney, Permits Unlimited, Applicant
CalWest Geotechnical, Project Consultant
Landphases, Inc., Project Consultant
WL District Office