GEOTECHNICAL AND FAULT RUPTURE HAZARD INVESTIGATIONS

PROPOSED RESIDENCES – 7248 ENCELIA DRIVE AND 7231 ROMERO DRIVE

La Jolla, California

Prepared By:
SCST, LLC
6280 Riverdale Street
San Diego, California 92120

Prepared For:
Dr. Ihor Lys
c/o Susan Smith
Education Lab Architects, LLC
7248 Encelia Drive
La Jolla, California 92037

Providing Professional Engineering Services Since 1959

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Report No. 4

Dr. Ihor Lys
c/o Susan Smith
Education Lab Architects, LLC
7248 Encelia Drive
La Jolla, CA 92037

Subject: GEOTECHNICAL AND FAULT RUPTURE HAZARD INVESTIGATIONS
PROPOSED RESIDENCES – 7248 ENCELIA DRIVE AND
7231 ROMERO DRIVE
LA JOLLA, CALIFORNIA

Dear Dr. Lys:

SCST, LLC (SCST) is pleased to present our report describing the geotechnical and fault rupture hazard investigations performed for the subject project. SCST conducted the investigations in general conformance with the scope of work presented in our proposal dated March 11, 2019. If you have any questions, please call us at (619) 280-4321.

Respectfully Submitted,
SCST, LLC

Elizabeth White, GIT
Staff Geologist/Project Manager

Isaac Chun, GE 2649
Principal Engineer

No. 2649
EXP. 12/31/19

Exp 10/2019
No. 2136

Jonathan Goodmacher, CEG 2136
Principal Geologist

EMW:GLC:JG:IC:ER:hu

(1) Addressee via e-mail: ihor.lys@gmail.com
(1) Ms. Susan Smith via e-mail: ssmith.educationlab@gmail.com
(1) Mr. Walter Smith via e-mail: wsmith.educationlab@gmail.com

TABLE OF CONTENTS

SECTION **PAGE**

1 INTRODUCTION 1
2 SCOPE OF RECENT WORK 1
  2.1 BORINGS 1
  2.2 LABORATORY TESTING 1
  2.3 FAULT RUPTURE HAZARD EVALUATION 2
  2.4 ANALYSIS AND REPORT 2
3 SITE DESCRIPTION 3
4 PREVIOUS SITE INVESTIGATIONS 3
  4.1 ROMERO DRIVE PROPERTY 3
  4.2 ENCELIA DRIVE PROPERTY 4
  4.3 EMERGENCY SLOPE REPAIR 4
5 PROPOSED DEVELOPMENT 5
6 GEOLOGY AND TECTONIC SETTING 5
  6.1 SUBSURFACE CONDITIONS 6
7 GEOLOGIC HAZARDS 7
  7.1 CITY OF SAN DIEGO SEISMIC SAFETY 7
  7.2 FAULT RUPTURE HAZARD EVALUATION 8
    7.2.1 On-Site Faulting 8
  7.3 CBC SEISMIC DESIGN PARAMETERS 9
  7.4 LIQUEFACTION AND DYNAMIC SETTLEMENT 10
  7.5 LANDSLIDES 10
  7.6 SLOPE STABILITY 10
  7.7 FLOODING, TSUNAMIS, AND SEICHES 12
  7.8 SUBSIDENCE 12
  7.9 HYDRO-CONSOLIDATION 13
8 CONCLUSIONS AND RECOMMENDATIONS 13
  8.1 SITE PREPARATION AND GRADING 13
    8.1.1 Site Preparation 13
    8.1.2 Remedial Grading 14
    8.1.3 Expansive Soil 14
    8.1.4 Compacted Fill 14
    8.1.5 Imported Soil 15
    8.1.6 Excavation Characteristics 15
    8.1.7 Oversized Material 15
    8.1.8 Temporary Excavations 15
    8.1.9 Temporary Shoring 16
    8.1.10 Temporary Dewatering 17
    8.1.11 Slopes 17

TABLE OF CONTENTS (continued)

SECTION **PAGE**

8.1.12 Surface Drainage 17
8.1.13 Grading Plan Review 17
8.2 FOUNDATIONS 18
8.2.1 Deep Foundations 18
8.2.2 Shallow Spread Footings 19
8.2.3 Settlement Characteristics 19
8.2.4 Foundation Plan Review 20
8.2.5 Foundation Excavation Observations 20
8.3 SLABS-ON-GRADE 20
8.3.1 Interior Slabs-on-Grade 20
8.3.2 Exterior Slabs-on-Grade 20
8.4 CONVENTIONAL RETAINING WALLS 21
8.4.1 Foundations 21
8.4.2 Lateral Earth Pressures 21
8.4.3 Seismic Earth Pressure 21
8.4.4 Backfill 22
8.5 PIPELINES 22
8.5.1 Thrust Blocks 22
8.5.2 Modulus of Soil Reaction 22
8.5.3 Pipe Bedding 22
8.5.4 Cutoff Walls 23
8.6 SOIL CORROSIVITY 23
9 GEOTECHNICAL ENGINEERING DURING CONSTRUCTION 23
10 CLOSURE 23
11 REFERENCES AND REVIEWED DOCUMENTS 24

ATTACHMENTS

FIGURES

Figure 1 .... Site Vicinity Map
Figure 2 .... Geology and Subsurface Exploration Map
Figure 3 .... Cross-Section A - A’
Figure 4 .... Cross-Section B - B’
Figure 5 .... Cross-Section C - C’
Figure 6 .... Regional Geology Map
Figure 7 .... City of San Diego Seismic Safety Study
Figure 8 .... USGS Fault Map
Figure 9 .... Typical Retaining Wall Backdrain Details

TABLE OF CONTENTS (continued)

SECTION **PAGE**

TABLES

Table 1 ....Seismic Design Parameters
Table 2 .... Allowable Axial Capacities of Piles

APPENDICES

Appendix I ....2019 Boring and Test Pit Logs
Appendix II ....2019 Laboratory Testing
Appendix III .... Fault Rupture Hazard Analysis
Appendix IV..Previous Geotechnical Report Data
Appendix V...Slope Stability Analysis

1 INTRODUCTION

This report presents the results of the geotechnical and fault rupture hazard investigations SCST, LLC (SCST) performed for this project. The project site includes the adjacent properties at 7248 Encelia Drive and 7231 Romero Drive in the La Jolla area in the city of San Diego, California. Figure 1 presents a site vicinity map.

We understand that the multi-phase project includes: a) the demolition of the existing single-family residence at 7248 Encelia Drive and the construction of a new, single-family residence at that location and b) the construction of a single-family residence at 7231 Romero Drive.

The purpose of this geotechnical and fault rupture hazard investigation is to provide information regarding the existing subsurface conditions at the site and provide conclusions and recommendations regarding the geotechnical aspects of the project. To assist in the preparation of this report, we reviewed previous geotechnical and geologic reports for the site, researched readily available geologic literature pertaining to the site, and researched documents at the City of San Diego Developmental Services Department.

2 SCOPE OF RECENT WORK

2.1 BORINGS

We drilled two borings (B-1 and B-2, SCST, 2019) and excavated two test pits (TP-1 and TP-2, SCST, 2019) at the site to explore the subsurface conditions. Boring B-1 (SCST, 2019) was drilled on April 22 and 23, 2019 and was drilled to an approximate depth of 62 feet below the existing adjacent grade with a truck-mounted bucket auger. Boring B-2 (SCST, 2019) was drilled on May 14 through 20, 2019, and due to limited access was excavated to an approximate depth of 17 feet adjacent to the existing grade using power and hand tools. Test pits TP-1 and TP-2 (SCST, 2019) were excavated using a backhoe to depths extending up to approximately 3½ feet below existing adjacent grade. An SCST geologist entered and logged the large-diameter borings and test pits and collected samples of materials encountered for laboratory testing.

Figure 2 shows the approximate locations of the borings, test pits, distribution of fill, and geologic units. The logs of the recent borings and test pits are presented in Appendix I. Soils are classified according to the Unified Soil Classification System illustrated on Figure I-1.

2.2 LABORATORY TESTING

Selected samples obtained from the borings were tested to evaluate pertinent soil classification and engineering properties and enable development of geotechnical conclusions and recommendations. The laboratory tests consisted of:

- Particle-size distribution

- Plasticity index
- Natural moisture and density
- Direct shear
- Expansion index
- Corrosivity

The results of the recent laboratory tests and brief explanations of test procedures are presented in Appendix II.

2.3 FAULT RUPTURE HAZARD EVALUATION

SCST evaluated the fault rupture hazard potential at the site by surficial mapping, reviewing geologic data and historical maps and photographs, and excavating two exploratory trenches (T-1 and T-2, SCST, 2019) and two exploratory test pits (TP-1 and TP-2, SCST, 2019). The fault was also encountered and logged in B-2 (SCST, 2019). The trenches and test pits were excavated using a track-mounted backhoe with a 24-inch bucket. The trenches and test pits varied in length from approximately 6 to 35 feet, and in depth from approximately 3 to 10 feet below existing grades. The trenches were supported using hydraulic shoring for personnel to enter the excavations safely. The trenches were visually logged by our geologist. Graphic logs of the trenches are presented in Appendix III.

As noted, additional geologic research of readily available published and unpublished geologic data was performed, and historical aerial photographs and topographic maps were also reviewed for geomorphic evidence of faulting.

2.4 ANALYSIS AND REPORT

The results of the recent and previous field and laboratory tests were evaluated to develop conclusions and recommendations regarding:

- Subsurface conditions beneath the site
- Potential geologic hazards including active and potentially active surface fault rupture
- Criteria for seismic design in accordance with the 2016 California Building Code (CBC)
- Site preparation and grading
- Foundation alternatives and geotechnical engineering criteria for design of the foundations
- Estimated foundation settlements
- Support for concrete slabs-on-grade
- Lateral pressures for the design of retaining walls
- Soil corrosivity

3 SITE DESCRIPTION

As noted, the project site consists of two adjoining residential lots, one fronting on Encelia Drive and the other fronting on Romero Drive. The overall site covers approximately 0.7 acres. The Encelia Drive property is east and upslope of the Romero Drive property. Site elevations range from approximately 610 feet above MSL (Mean Sea Level) near Romero Drive to 690 feet near Encelia Drive.

Existing structures on the Encelia Drive property include the main residential structure and a garage. Other existing improvements include the driveway, miscellaneous hardscape, retaining walls, swimming pool, and perimeter walls and fences.

The property on Romero Drive was partially graded and then structurally reinforced along the property boundary between the two lots (see discussion regarding slope reinforcement in the following section of this report). A three- to four-foot-high, cement-block retaining wall at its western end (next to Romero Drive) is the only visible improvement to this property.

4 PREVIOUS SITE INVESTIGATIONS

Several geologic and geotechnical investigations have been carried out at the site and its immediate vicinity since 1999. A list of the available, reviewed documents is appended to this report. Figure 2 presents the locations of previous geotechnical explorations.

4.1 ROMERO DRIVE PROPERTY

The first report available for review was for a proposed single-family residence on the Romero Drive property by Geocon (1999). They identified that the site is underlain primarily by the massive conglomerate, thinly-bedded siltstone, and massive medium- to fine-grained sandstone of the Cabrillo Formation and massively bedded sandstone, conglomerate, and thinly-bedded siltstone of the Mount Soledad Formation. They also identified that the site was underlain by the potentially active Country Club Fault (which was exposed in the Romero Drive cut slope). Soldier piles and lagging would be required for the proposed construction, according to Geocon (1999), due to the out of slope bedding of the on-site formations and the steep natural slopes.

SCST, Inc. (2003, 2010) subsequently performed geotechnical investigations on the Romero Drive site and encountered the same geologic units. However, they differed in indicating that the on-site fault was not the Country Club Fault but was instead a subsidiary strand as its orientation was different from the mapped Country Club Fault. They also indicated that a landslide was present in the southeastern portion of the site. Their recommendations included shear pins to stabilize the site, and that future construction be supported on deep foundations consisting of drilled, cast-in-place piers.

A coastal development permit was approved for a single-family residence at this site in 2006. Development at the property began in 2009 when Chao, the former owner, began grading for construction of a planned single-family residence. The grading resulted in a landslide on the Romero Drive property and the adjacent, upslope residence at Encelia Drive. Apparently, the recommendations for shear pins and slope reinforcement were not implemented at that time. The ongoing slope failure resulted in distress to the existing structure on the Encelia Drive property.

4.2 ENCELIA DRIVE PROPERTY

In 2009, subsequent to the distress caused by grading on the downslope property, Christian-Wheeler Engineering was retained to perform a limited geotechnical survey of the Encelia Drive property. The results of their investigation indicated that the observed distress was not attributable to the grading of the downslope Romero Drive property (Christian Wheeler, 2009).

C.W. La Monte Company, Inc. (CW La Monte) was retained in 2011 to perform geotechnical investigations and floor-level surveys on the existing Encelia Drive property and structures. Per the reviewed report (CW La Monte, 2011), the observed distress was caused by “settlement and/or lateral creep of soft surficial deposits underlying the residence.” CW La Monte did not find indications that the site was underlain by a deep-seated landslide. They recommended installing a deepened foundation system to underpin the existing residence and mitigate future distress.

In 2012, Accutech Engineering (Accutech) installed two slope inclinometers at the site to evaluate the potential for a deep-seated landslide to be present beneath the existing residence. According to Accutech (2012), there was evidence (not depicted on our figures) of a slide plane beneath the Encelia Drive property and that the slide plane would not have been activated had the grading on the Romero Drive property not occurred. A letter report by Mike Hart Consulting, Engineering Geologist, was appended to the Accutech report. Hart (2012) concluded that bedding planes in the formational soils underlying the Encelia Drive property dip out of slope. Hart also indicated that bedding plane shears were visible in cut slopes on the Romero Drive property. According to Hart, the out of slope bedding and bedding plane shears were most likely the cause of the observed distress on the Encelia Drive property.

4.3 EMERGENCY SLOPE REPAIR

In 2012, Geokinetics was retained by the owner of the Encelia Drive property to provide plans, specifications, and design parameters for the repair of the slope that was apparently caused by the grading on the Romero Drive property. Geokinetics (2012) reviewed the previously available geotechnical and geologic data and installed an additional slope inclinometer in the rear yard of the Encelia Drive property. According to Geokinetics (2013), the observed landslide was occurring on an approximately 6- to 12-inch-thick siltstone bed dipping out of slope toward Romero Drive. Geokinetics recommended placing reinforced concrete shear pins to stabilize the landslide. In 2014, 14 reinforced concrete shear pins and 13 tie-back anchors were installed, as shown on Figure 2. The shear pins were constructed to a minimum depth of approximately 20 feet into competent conglomerate (Geokinetics, 2014). Additional grading and fill placement took place on the Romero Drive property to provide additional stabilization.

Each shear pin was constructed with a 6,000 psi concrete mix and reinforced with 15 #18 bars extending through the full length of each shear pin. The shear pins were structurally tied together with a 40-inch-wide by 48-inch-high reaction wall/grade beam. The beams were reinforced with 16 #8 bars tied with #6 stirrups at 12 inches on center. The beams were also constructed with a 6,000 psi concrete mix. DYWIDAG strand tie-back anchors were installed along the mid-span between each pair of shear pins along the reaction wall/grade beams. The anchors were drilled at an inclination of 25 degrees from the horizontal and extended approximately 125 feet from the back face of the beams. Each tie-back anchor was proof- or performance-tested before being locked into place.

5 PROPOSED DEVELOPMENT

Based on our review of the preliminary plans (Education Lab Architects, 2018), we understand that the project will include the design and construction two single-family residences, one at 7248 Encelia Drive and one at 7231 Romero Drive. The project includes the replacement of the existing residence at 7248 Encelia Drive with a newly constructed multi-story residence with a partial subterranean level. Additional proposed improvements include an infinity-style swimming pool, site and retaining walls, and hardscape. The proposed residence at 7231 Romero Drive consists of a three-story building with a subterranean basement, garage, swimming pool, and exterior improvements. Presented on Figure 2 are the outlines of the proposed structures and some of the ancillary development.

6 GEOLOGY AND TECTONIC SETTING

San Diego is located within the coastal plain portion of the Peninsular Ranges geomorphic province of California. Primarily Tertiary-age marine sediments and Quaternary-age marine and non-marine sediments, with localized outcrops of Cretaceous and Jurassic metavolcanic and plutonic rocks, underlie this coastal plain. Farther inland, primarily Cretaceous plutonic rocks crop out in the Peninsular Ranges.

Several prominent active right-lateral, strike-slip faults traverse the Peninsular Ranges province. The San Jacinto and Elsinore Faults are present in the central portion of the province. Faults in the coastal plain include the Rose Canyon and La Nacion Faults. Offshore faults include the San Clemente, Coronado Bank, and San Diego Trough Faults.

In 2010, SCST was of the opinion that the on-site fault was not the County Club Fault, but was likely associated with it. However, a review of published literature indicates that the Country Club Fault crosses the western portion of the Romero property (Kennedy et al., 1975). The Country Club Fault trends northwest and is mapped as extending from Rose Creek in a northerly direction toward La Jolla Cove. The Country Club Fault is considered to be a potentially active dip-slip fault with the down-dropped side on the west (Lindvall and Rockwell, 1995). The active Rose Canyon Fault is located approximately ½ mile east of the site. Other active faults in the region that could possibly affect the subject site include the Coronado Bank, San Diego Trough, and San Clemente Faults to the west, the Elsinore and San Jacinto Faults to the northeast, and the Agua Blanca and San Miguel Faults to the south.

6.1 SUBSURFACE CONDITIONS

Based on published geologic mapping (Kennedy and Tan, 2008) and the review of the referenced reports, the site is underlain by fill, surficial soils, landslide deposits, and bedrock of the Mount Soledad and Cabrillo Formations. Figure 2 shows the geology of the site. Figures 3 through 5 present geologic cross-sections of the site. Figure 6 presents the regional geology.

Fill (Qaf): Fill was observed in all the borings, trenches, and test pits. These materials appeared to have been placed during different stages of improvements made on the retaining wall along the southwestern property line at Romero and during the installation of the emergency slope stabilization performed by Geokinetics in 2013. In general, the fill consisted of brown, moist, loose to medium dense clayey sand with varying amounts of gravel and cobble. Fills up to 10 feet deep were observed on the Romero property. In B-1 (SCST, 2019) located on the Encelia property, the fill extended to a depth of approximately 5 feet below the existing ground surface.

Surficial Soils (Qcol): Surficial soils, consisting of talus and colluvium deposits, was encountered in TP-1. The surficial soils consisted of sandy clay to clayey sand with gravel and cobble. These materials were approximately 1 foot thick.

Recent Landslide Deposit (Qls_2): As discussed, in 2009, grading on the Romero Property resulted in a landslide underneath the property and the adjacent, upslope residence at Encelia Drive. The depths and the extent of recent landslide were mapped and documented by GeoKinetics (2013). The recent landslide occurred within the Cabrillo Formation.

Ancient Landslide Deposit (Qls$_1$): The ancient landslide deposits were previously encountered Borings B-2 and B-3 (SCST, 2005). The materials consisted of clayey conglomerate overlying silty sand with varying amounts of cobble and gravel. The ancient landslide is generally confined to the southeastern portion of the Romero property.

Mount Soledad Formation (Tms): The Mount Soledad Formation was exposed in part of the slope face adjacent to TP-1 and was encountered in B-2 (Geocon, 1999) and B-2 (SCST, 2019). The Mount Soledad Formation ranged from light brown, moderately to strongly cemented silty sandstone to gray, strongly cemented siltstone. This material was exposed on the western side of the fault zone observed in TP-1 and B-2 (SCST, 2019).

Cabrillo Formation (Kcs/Kcg): The Cabrillo Formation underlies the site and was encountered in SCST 2019 Borings B-1 and B-2 and in SCST 2019 Trench T-1. The Cabrillo Formation is composed of interbedded yellowish to reddish brown, brown, and gray sandstone, conglomerate, claystone and siltstone. In general, it consisted of strongly cemented silty to clayey sandstone with layers gray claystone and lenses of siltstone rip-up clasts interbedded with strongly cemented cobble conglomerate. Bedding contacts were measured to generally strike to the northwest and dip approximately 20 degrees towards the southwest. Contact and bedding attitudes, as noted in our down-hole observations, are indicated on the recent boring logs in Appendix I.

Groundwater: Groundwater was encountered in Boring B-1 (SCST, 2019) at a depth of approximately 62 feet (an elevation of 625 MSL) below the existing ground surface. This differs from the previous investigations in which only groundwater seepage was encountered. Groundwater levels may fluctuate in the future due to rainfall, irrigation, broken pipes, or changes in site drainage. Because groundwater rise or seepage is difficult to predict, such conditions are typically mitigated if and when they occur.

7 GEOLOGIC HAZARDS

7.1 CITY OF SAN DIEGO SEISMIC SAFETY

According to the City of San Diego Seismic Safety Map (2008b), the site is located in Geologic Hazard Category 53 (Figure 7). Category 53 is defined as areas with level or sloping to steep terrain, unfavorable geologic structure, and have a low to moderate risk.

7.2 FAULT RUPTURE HAZARD EVALUATION

As previously mentioned, the potentially active or inactive Country Club Fault crosses the westerly portion of the Romero property (SCST, 2008). The closest known active fault is the Mount Soledad Segment of the Rose Canyon Fault located about ½ miles (¾ kilometers) northwest of the site (Figure 8). The site is not located in an Alquist-Priolo Earthquake Fault Zone. No active faults are known to underlie or project toward the site.

As discussed, SCST evaluated the fault rupture hazard potential at the Romero property by excavating two exploratory trenches (T-1 and T-2) approximately 40 and 80 feet south of fault exposure in the adjacent slope and perpendicular to the strike. The trenches were excavated using a track-mounted backhoe with a 24-inch bucket. The trenches were approximately 35 feet in length and up to 10 feet in depth below the existing ground surface. Two additional test pits (TP-1 and TP-2) were excavated to trace the fault from the hill slope exposure onto the site. The test pits were approximately 6 feet in length and approximately 3 to 4 feet in depth below the existing ground surface. The fault was also observed in Boring B-2 (SCST, 2019).

The trenches, test pits, and B-2 (SCST, 2019) were visually logged and evaluated for evidence of Holocene-age or residual soils by SCST personnel. In the event Holocene age or residual soils were encountered, SCST personnel planned on excavating within these soils to look for evidence of faulting and obtain samples for age dating. However, no Holocene-age or residual soils were observed. Graphic logs of the trenches and test pits are presented on Plates 1 through 4 in Appendix III.

Additionally, geologic research of readily available published and unpublished geologic data was performed. Historical aerial photographs and topographic maps were reviewed for geomorphic evidence of faulting.

7.2.1 On-Site Faulting

Description of Faulting

The field mapping, fault trenching, and observations made of the excavation sidewalls confirmed the presence of on-site faulting. The trace of the fault across the site is shown on Figure 2.

The fault appears to offset stratigraphic units of the Mount Soledad and the Cabrillo Formations. The relative displacement of the fault could not be determined due to the lack of distinct, correlatable beds on opposite sides of the fault. However, a minimum normal displacement of at least 12 feet (west side down) is inferred based on the total depth of Boring B-2 (SCST, 2019). The observed portion of the fault across the site has a strike of N10°W to N20°W and an apparent dip ranging from 72°NE to 85°SW with the dip direction switching orientations at approximately 12 feet below the ground surface in Boring B-2 (SCST, 2019). The disturbed zone of the fault varied from approximately 1 to 3 feet in width and was infilled with clay and aligned gravels and cobbles along the principle slip surface.

Age of Faulting

The California Geologic Survey and the city of San Diego have provided criteria for defining active and potentially active faults. Active faults are those that have conclusive evidence of movement during the Holocene Epoch (the most recent 11,000 years). Potentially active faults have demonstrated during the Pleistocene Epoch (11,000 to 1.6 million years before present), but no movement with the Holocene Epoch. Faults with no demonstrable movement within the Pleistocene or Holocene Epochs are typically considered to be inactive.

As mapped by the City of San Diego (Figure 7), the Country Club Fault is currently considered to be potentially active or inactive due to lack of evidence of Holocene movement. Our review of readily available geologic literature and historical topographic and aerial photographs maintained in-house and by the City of San Diego, did not reveal evidence of Holocene movement along the Country Club Fault (i.e. aligned vegetation or geomorphic surfaces, springs, or similar lineaments). No evidence of active faulting, as defined by the criteria set forth by the California Geologic Survey (2008) and the City of San Diego (2008a), was observed in our fault trenches.

It appears that Holocene soils, if originally present at the site, were excavated during previous grading and emergency construction of the existing structural improvements. Exposures of the cut/fill contact observed in the excavations were characterized by a sharp contact free of topsoil, slopewash, or residual soils.

7.3 CBC SEISMIC DESIGN PARAMETERS

A geologic hazard likely to affect the project is ground shaking as a result of movement along an active fault zone in the vicinity of the subject site. The site coefficients and maximum considered earthquake (MCER) spectral response acceleration parameters in accordance with the 2016 CBC are presented below:

TABLE 1
2016 CALIFORNIA BUILDING CODE

Site Coordinates	
Latitude	**Longitude**
32.840506°	-117.258386°

Site Coefficients and Spectral Response Acceleration Parameters	Values
Site Class	D
Site Coefficients, F_a	1.000g
Site Coefficients, F_v	1.505g
Mapped Spectral Response Acceleration at Short Period, S_s	1.280g
Mapped Spectral Response Acceleration at 1-Second Period, S_1	0.495g
Design Spectral Acceleration at Short Period, S_{DS}	0.853g
Design Spectral Acceleration at 1-Second Period, S_{D1}	0.496g
Site Peak Ground Acceleration, PGA_M	0.576g

Computed from SEAOC-OSHPD's "U.S. Seismic Design Maps" online program

7.4 LIQUEFACTION AND DYNAMIC SETTLEMENT

Liquefaction occurs when loose, saturated, generally fine sands and silts are subjected to strong ground shaking. The soils lose shear strength and become liquid; resulting in large total and differential ground surface settlements as well as possible lateral spreading during an earthquake. Given the relatively dense nature of the materials beneath the site, the potential for liquefaction and dynamic settlement to occur is considered low.

7.5 LANDSLIDES

Evidence of recent landslides or slope instabilities since the installation of the reinforced concrete shear pins was not observed during our investigation. The potential for landslides or slope instabilities to occur at the site and impact the proposed construction is considered low if mitigation measures discussed in this report are implemented.

7.6 SLOPE STABILITY

Slope stability analyses were performed using SLIDE v. 6.0, a product of Rocscience, Inc. SLIDE is a two-dimensional, limit equilibrium slope stability program, which can evaluate the factor of safety of soil and rock slopes against both circular and non-circular failure surfaces. The Spencer's method was used to evaluate the factor of safety against failure surfaces. This method of analysis provides the factor of safety based on both force and moment equilibrium. The analyses were performed under static and pseudostatic conditions. A horizontal seismic load coefficient of 0.15 was used for pseudostatic analyses.

Our analyses were conducted on Cross-Sections A-A', B-B' and C-C' (Figures 3 through 5). The results are presented in Appendix V. Global, and Lower stability analyses were performed on each cross section. The global stability analyses evaluated the existing shear pins and tiebacks. The Lower stability analyses evaluated the stability of the proposed cuts at Romero residence and proposed infinity pool. Based on our analyses, the static and pseudostatic factors of safety are equal to or exceed 1.5 and 1.1, respectively (see Figures in Appendix V). A summary of our stability analyses is presented below.

TABLE 2
Slope Stability Analyses

Cross Section	Factor of Safety	
	Static	Pseudostatic
A-A' (Global)	2.408	1.840
A-A' (Lower)	1.509	1.217
B-B' (Global)	2.781	1.990
B-B' (Lower)	1.767	1.388
C-C' (Global)	2.304	1.697
C-C' (Lower)	1.721	1.369

Soil materials were modeled to represent the subsurface conditions. These materials are labeled as fill (Qaf and Qf), landslide deposits (Qls), Cabrillo Formation—Sandstone (Kcs), Cabrillo Formation—Conglomerate (Kcg), and Mount Soledad Formation (Tms). The properties of materials selected for the analysis are listed Table 3. The shear strength parameters were derived from our laboratory testing results performed during this investigation and laboratory results from previous investigations at the site (Geocon 1999, SCST 2003, SCST 2010). When laboratory data was unavailable, soil strength parameters were selected using our experience with similar materials in previous projects in the project area.

The shear strengths of the recent landslide deposits (Qls_2) are largely controlled by the orientation of the beds (cross-bedding vs. along-bedding) of the Cabrillo Formation – Sandstone (Kcs). The adverse bedding conditions were modeled in the computer program SLIDE using an anisotropic Mohr-Coulomb model to account for the differences between cross-bedding and along-bedding strengths. Shear strength parameters for cross-bedding in the slope stability analyses are based on our laboratory direct shear test results (2019). Strength parameters for the along-bedding was based on back-calculated correlations from the previous geotechnical study (Geokinetics, 2014) and consideration of our laboratory testing. The along-bedding strength values were assigned to an inclination of 17 degrees (apparent dip) based on field measurements. As such, the strength variations inherent to the inclination of the failure surface are incorporated in the landslide deposits (Qls_2) through the anisotropic model.

TABLE 3
Strength Parameters for Stability Analyses

Material Name	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Reference
Artificial Fill (Qaf)	120	200	30	Assumed
Landslide Deposits, Ancient (Qls1)	128	100	28	SCST (2003)
Cabrillo Formation Sandstone (Kcs) Cross Bedding	120	186	30	SCST (2019)
Cabrillo Formation Sandstone (Kcs) Along Bedding	120	50	10	Geokinetics (2014)
Cabrillo Formation Conglomerate (Kcg)	130	500	36	SCST (2010)
Mount Soledad (Tms)	135	650	40	Geocon (1999)

7.7 FLOODING, TSUNAMIS, AND SEICHES

The site is not located within a flood zone. The site is not located within a mapped area on the State of California Tsunami Inundation Maps (Cal EMA, 2009). Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays, or reservoirs. The site is not located adjacent to any lakes or confined bodies of water. The site is not located within a flood zone or dam inundation area (County of San Diego, 2019). Therefore, the potential for flooding, tsunamis, or seiches to affect the site is considered low.

7.8 SUBSIDENCE

The site is not located in an area of known subsidence associated with fluid withdrawal (groundwater or petroleum); therefore, the potential for subsidence due to the extraction of fluids is considered low.

7.9 HYDRO-CONSOLIDATION

Hydro-consolidation can occur in recently deposited sediments (less than 10,000 years old) that were deposited in a semi-arid environment. Examples of such sediments are aeolian sands, alluvial fan deposits, and mudflow sediments deposited during flash floods. The pore spaces between the particle grains can re-adjust when inundated by groundwater, causing the material to consolidate. The relatively dense materials underlying the site are not considered susceptible to hydro-consolidation.

8 CONCLUSIONS AND RECOMMENDATIONS

The main geotechnical considerations affecting the proposed construction are the presence of potentially disturbed compressible fill soils and stabilized landslide deposits. In our opinion, the site is suitable for the proposed development and will not destabilize or result in settlement of adjacent properties or the City of San Diego Right-of-Way, provided the recommendations presented in this report are implemented.

Based on the information obtained in our study and presented herein, our conclusions regarding the subject site are as follows:

- No evidence of active faulting, as defined by the criteria set forth by the California Geologic Survey and the City of San Diego, was observed in our fault trenches. Due to lack of evidence for Holocene movement along the Country Club Fault, in our opinion, the fault observed should be considered potentially active or inactive. Therefore, given the lack of evidence for Holocene movement along the fault observed at the site, it is our opinion that no structural setbacks are required for the planned development.

- Remedial grading will need to be performed to reduce the potential for distress to site improvements. Remedial grading recommendations are provided in the following sections of this report. Select grading or import materials should be anticipated for retaining wall backfill materials, and possibly for fill materials. To reduce the potential for differential settlement, the Encelia structure and swimming pool should be supported on cast-in-place deep foundations. The Romero property structure may be supported on conventional foundations.

8.1 SITE PREPARATION AND GRADING

8.1.1 Site Preparation

Site preparation should begin with the removal of existing improvements, foundations, topsoil, vegetation, and debris. Subsurface improvements that are to be abandoned should be removed, and the resulting excavations should be backfilled and compacted in accordance with the recommendations of this report. Pipeline abandonment can consist of capping or rerouting at the project perimeter and removal within the project perimeter. If appropriate, abandoned pipelines can be filled with grout or slurry as recommended by and observed by the geotechnical consultant. The debris and unsuitable material generated during clearing and grubbing should be removed from areas to be graded and disposed of in accordance with applicable regulations.

8.1.2 Remedial Grading

The existing materials should be excavated to the planned bottom of the proposed structures. Additionally, the existing fill materials should be excavated and replaced with compacted fill to a minimum depth of 2 feet beneath retaining wall footings, exterior slabs, pavements, or areas to receive new fills. Horizontally, excavations should extend at least 2 feet outside the perimeter of the planned structure, exterior slab or pavement, or up to temporary shoring or existing improvements, whichever is less. An SCST representative should observe conditions exposed in the bottom of the excavation to evaluate whether additional excavation is recommended.

8.1.3 Expansive Soil

The on-site soils tested have a medium expansion potential. The foundation recommendations presented in this report reflect a medium expansion potential.

8.1.4 Compacted Fill

Excavated material, except for soil containing roots, debris, and rock greater than 6 inches, can be used as compacted fill. Concrete slabs-on-grade should be underlain by at least 2 feet of material with an expansion index of 20 or less determined in accordance with ASTM D4829. Based on our laboratory test results, we expect that most of the on-site soils will not meet the expansion index criteria.

The material exposed at the bottom of excavations should be scarified to a depth of 12 inches, moisture conditioned to near above optimum moisture content, and compacted to 90% relative compaction based on ASTM D1557 laboratory test procedure. Fills should be placed in horizontal lifts at a thickness appropriate for the equipment spreading, mixing, and compacting the material, but generally should not exceed 8 inches in loose thickness. Fill should be moisture conditioned to near optimum moisture content and compacted to at least 95% relative compaction. The maximum dry density and optimum moisture content for evaluating relative compaction should be determined in accordance with ASTM D1557. Utility trench backfill beneath structures, pavements, and hardscape should be compacted to at least 95% relative compaction. The top 12 inches of subgrade beneath pavements should be compacted to at least 95%.

8.1.5 Imported Soil

Imported soil, if required, should consist of predominately granular soil, have an expansion index of less than 20, and be free of organic matter and rocks greater than 6 inches. Imported soil should be observed and, if appropriate, tested by SCST prior to transport to the site.

8.1.6 Excavation Characteristics

It is anticipated that excavations can be achieved with conventional earthwork equipment in good working order. Difficult excavation should be anticipated in cemented zones within the formational units. Gravel, cobbles, and boulders should also be anticipated. Contract documents should specify that the contractor mobilize equipment capable of excavating and compacting strongly cemented materials with gravel, cobbles, and boulders.

8.1.7 Oversized Material

Excavations will generate oversized material. Oversized material is defined as rocks or cemented clasts greater than 6 inches in largest dimension. Oversized material should be broken down to no greater than 6 inches in largest dimension for use in fill, used as landscape material, or disposed of off-site.

8.1.8 Temporary Excavations

Temporary excavations 3 feet deep or less can be made vertically. Deeper temporary excavations in fill should be laid back no steeper than 1½:1 (horizontal:vertical). The faces of temporary slopes should be inspected daily by the contractor’s Competent Person before personnel can enter the excavation. Zones of potential instability, sloughing, or raveling should be brought to the attention of the Engineer and corrective action implemented before personnel begin working in the excavation. Excavated soils should not be stockpiled behind temporary excavations within a distance equal to the depth of the excavation. SCST should be notified if other surcharge loads are anticipated so that lateral load criteria can be developed for the specific situation. If temporary slopes are to be maintained during the rainy season, berms are recommended along the tops of slopes to prevent runoff water from entering the excavation and eroding the slope faces.

Slopes steeper than those described above will require shoring. Additionally, temporary excavations that extend below a plane inclined at 1½:1 (horizontal:vertical) downward from the outside bottom edge of existing structures or improvements will require shoring. Soldier piles and lagging, internally braced shoring or trench boxes could be used. If trench boxes are used, the soil immediately adjacent to the trench box is not directly supported. Ground surface deformations immediately adjacent to the pit or trench could be greater where trench boxes are used compared to other methods of shoring.

As an alternative to shoring/underpinning, maximum 10-foot-wide slots can be excavated and immediately backfilled adjacent to existing improvements. Care should be taken to not undermine existing improvements. Slot excavations should be filled prior to performing adjacent excavations. Such excavation plans should be reviewed by SCST prior to excavation.

8.1.9 Temporary Shoring

For design of cantilevered shoring with level backfill, an active earth pressure equal to a fluid weighing 40 pounds per cubic foot (pcf) can be used. The surcharge loads from traffic and construction equipment adjacent to the shored excavation can be modeled by assuming an additional 2 feet of soil behind the shoring.

For design of soldier piles, an allowable passive pressure of 350 psf per foot of embedment over 2.5 times the pile diameter or the spacing of the piles, whichever is less, up to a maximum of 4,000 psf can be used for soil above the groundwater level. An allowable passive pressure of 150 psf per foot of embedment over 2.5 times the pile diameter or the spacing of the piles, whichever is less, up to a maximum of 2,000 psf can be used for soil below the groundwater level. Hydrostatic pressure should be applied below the groundwater level.

Soldier piles should be spaced at least three pile diameters, center to center. Continuous lagging will be required throughout. The soldier piles should be designed for the full-anticipated lateral pressure; however, the pressure on the lagging will be less due to arching in the soils. For design of lagging, the earth pressure can be limited to a maximum value of 400 psf.

Piles should be filled with concrete immediately after drilling. The concrete should be pumped to the bottom of the drilled holes using the tremie method. If casing is used, the casing should be removed as the concrete is placed, keeping the level of the concrete at least 5 feet above the bottom of the casing.

8.1.10 Temporary Dewatering

Temporary dewatering may be required in order to construct the proposed structures with subterranean levels. A specialty contractor should be retained to design and perform the dewatering. The design should incorporate measures to ensure the dewatering does not induce settlement of adjacent improvements. Generally, groundwater should be 3 feet or more below the planned temporary excavation bottom to provide a working surface.

8.1.11 Slopes

Permanent slopes should be constructed no steeper than 2:1 (horizontal:vertical). Faces of fill slopes should be compacted either by rolling with a sheepsfoot roller or other suitable equipment or by overfilling and cutting back to design grade. Fills should be benched into sloping ground inclined steeper than 5:1 (horizontal:vertical). In our opinion, slopes constructed no steeper than 2:1 (horizontal:vertical) will possess an adequate factor of safety. An engineering geologist should observe all cut slopes during grading to ascertain that no unforeseen adverse geologic conditions are encountered that require revised recommendations. Slopes are susceptible to surficial slope failure and erosion. Water should not be allowed to flow over the top of slope. Additionally, slopes should be planted with vegetation that will reduce the potential for erosion.

8.1.12 Surface Drainage

Final surface grades around structures should be designed to collect and direct surface water away from the structure and toward appropriate drainage facilities. The ground around the structure should be graded so that surface water flows rapidly away from the structure without ponding. In general, we recommend that the ground adjacent to the structure slope away at a gradient of at least 2%. Densely vegetated areas where runoff can be impaired should have a minimum gradient of at least 5% within the first 5 feet from the structure. Roof gutters with downspouts that discharge directly into a closed drainage system are recommended on structures. Drainage patterns established at the time of fine grading should be maintained throughout the life of the proposed structures. Site irrigation should be limited to the minimum necessary to sustain landscape growth. Should excessive irrigation, impaired drainage, or unusually high rainfall occur, saturated zones of perched groundwater can develop.

8.1.13 Grading Plan Review

SCST should review the grading plans and earthwork specifications to ascertain whether the intent of the recommendations contained in this report have been implemented and that no revised recommendations are needed due to changes in the development scheme.

8.2 FOUNDATIONS

8.2.1 Deep Foundations

Due to the underlying disturbed surficial fill soils and stabilized landslide deposits, deep foundations consisting of drilled, cast-in-place concrete piles are recommended to support the planned residence at 7248 Encelia Drive and the proposed infinity pool. The net allowable axial downward capacities of 24-inch, 30-inch, and 36-inch diameter piles were evaluated using the computer program All-Pile. Support would be obtained from both friction and end bearing into the Cabrillo Formation, using a factor of safety of 2.5. The pile capacities are based on the strength of the soils; the strength of the pile section itself should be checked to verify the structural capacity of the pile. Piles should be spaced at least three pile diameters, center to center, and embedded at least 10 feet into formational material. Recommended capacities are presented in the following table.

TABLE 3
Allowable Axial Downward Capacities of Piles, kips

Depth of Embedment into Formation, Feet*	Pile Diameter (inches)		
	24	**30**	**36**
10	20	25	45
15	30	40	70
20	45	60	100

*Piles should extend a minimum of 5 feet into formation at the pool, a minimum of 10 feet into formation at the proposed building, and 10 feet below the bottom of pile cap.

The uplift resistance will be obtained by friction and the weight of the pile. An allowable frictional uplift of 500 psf can be used. Lateral loads will be resisted by passive pressure on the drilled piles. An allowable passive pressure of 350 psf per foot of embedment acting on twice the pile diameter can be used based on a lateral deflection up to ½ inch.

The portion of the structure supported on deep foundations should incorporate a structural slab designed to span between the foundations without relying on support from the underlying soil.

Groundwater seepage should be anticipated. Contract documents should specify that the contractor mobilize equipment capable of penetrating hard, cemented material to reduce the potential that claims for delays or extra work will arise.

8.2.2 Shallow Spread Footings

The planned residence at 7231 Romero Drive, retaining walls, and other lightly loaded structures can be supported on shallow spread footings with bottom levels on compacted fill. To reduce distress due to soil movement, we recommend the footings be connected by grade beams or tie beams. Footings should extend at least 18 inches below lowest adjacent finished grade. Continuous footings should be at least 12 inches wide. Isolated or retaining wall footings should be at least 24 inches wide. An allowable bearing capacity of 2,500 psf can be used. The bearing capacity can be increased by 500 psf for each foot of depth below the minimum and 250 psf for each foot of width beyond the minimum up to a maximum of 4,000 psf. The bearing value can be increased by ⅓ when considering the total of all loads, including wind or seismic forces. Footings located adjacent to or within slopes should be extended to a depth such that a minimum horizontal distance of 7 feet exists between the lower outside footing edge and the face of the slope.

Lateral loads will be resisted by friction between the bottoms of footings and passive pressure on the faces of footings and other structural elements below grade. For non-seismic conditions, an allowable passive pressure of 350 psf per foot of depth can be used for the portion of the retaining walls above the groundwater level. An allowable passive pressure of 150 psf per foot of depth can be used for the portion below the groundwater level. An allowable coefficient of friction of 0.30 can be used. Passive pressure should not be relied on for seismic conditions for foundations located below the groundwater level. The passive pressure can be increased by ⅓ when considering the total of all loads, including wind or seismic forces. The upper 1 foot of soil should not be relied on for passive support unless the ground is covered with pavements or slabs.

8.2.3 Settlement Characteristics

Total static foundation settlements are estimated to be less than 1 inch. Differential settlements between adjacent columns and across continuous footings are estimated to be less than ¾ inch over a distance of 40 feet, or between columns. Settlements should be completed shortly after structural loads are applied.

8.2.4 Foundation Plan Review

SCST should review the foundation plans to ascertain that the intent of the recommendations in this report has been implemented and that revised recommendations are not necessary as a result of changes after this report was completed.

8.2.5 Foundation Excavation Observations

A representative from SCST should observe the foundation excavations prior to forming or placing reinforcing steel.

8.3 SLABS-ON-GRADE

8.3.1 Interior Slabs-on-Grade

To reduce the potential for slab cracking, we recommend that the building slab be underlain by at least 2 feet of material with an expansion index of 20 or less. The project structural engineer should design the concrete slab-on-grade floor. However, we recommend that the slab be at least 5 inches thick and be reinforced with at least No. 4 bars at 18-inch center each way and control joints.

Moisture protection should be installed beneath slabs where moisture sensitive floor coverings will be used. The project architect should review the tolerable moisture transmission rate of the proposed floor covering and specify an appropriate moisture protection system. As a minimum, a plastic vapor barrier consisting of a minimum 15-mil plastic underlain by 6 inches of clean crushed rock is recommended. The plastic should comply with ASTM E1745. The vapor barrier installation should comply with ASTM E1643. The slab can be placed directly on the vapor retarder/barrier.

8.3.2 Exterior Slabs-on-Grade

Exterior slabs not subjected to vehicular loads should be underlain by at least 2 feet of material with an expansion index of 20 or less. Exterior slabs should be at least 5 inches thick and reinforced with at least No. 4 bars at 18 inches on center each way. Slabs should be provided with weakened plane joints. Joints should be placed in accordance with the American Concrete Institute (ACI) guidelines. The project architect should select the final joint patterns. A 1-inch maximum size aggregate mix is recommended for concrete for exterior slabs. The corrosion potential of on-site soils with respect to reinforced concrete will need to be taken into account in concrete mix design. Coarse and fine aggregate in concrete should conform to the “Greenbook” Standard Specifications for Public Works Construction.

8.4 CONVENTIONAL RETAINING WALLS

8.4.1 Foundations

The recommendations provided in the shallow spread footings section of this report are applicable to conventional retaining walls.

8.4.2 Lateral Earth Pressures

The active earth pressure for the design of unrestrained retaining walls with level backfill can be taken as equivalent to the pressure of a fluid weighing 40 pcf. The at-rest earth pressure for the design of restrained retaining walls with level backfills can be taken as equivalent to the pressure of a fluid weighing 60 pcf. These values assume a granular and drained backfill condition. Higher lateral earth pressures would apply if walls retain expansive clay soils. An additional 25 pcf should be added to these values for walls with a 2:1 (horizontal:vertical) sloping backfill. An increase in earth pressure equivalent to an additional 2 feet of retained soil can be used to account for surcharge loads from light traffic. The above values do not include a factor of safety. Appropriate factors of safety should be incorporated into the design. If any other surcharge loads are anticipated, SCST should be contacted for the necessary increase in soil pressure.

Retaining walls should be designed to resist hydrostatic pressures or be provided with a backdrain to reduce the accumulation of hydrostatic pressures. Backdrains may consist of a 2-foot-wide zone of ¾-inch crushed rock. The backdrain should be separated from the adjacent soils using a non-woven filter fabric, such as Mirafi 140N or equivalent. Weep holes should be provided, or a perforated pipe should be installed at the base of the backdrain and sloped to discharge to a suitable and multiple storm drain facilities. As an alternative, a geocomposite drainage system such as Miradrain 6000 or equivalent placed behind the wall and connected to a suitable storm drain facility can be used. The project architect should provide waterproofing specifications and details. Figure 9 presents typical conventional retaining wall backdrain details.

8.4.3 Seismic Earth Pressure

If required, the seismic earth pressure can be taken as equivalent to the pressure of a fluid weighing 20 pcf. This value is for level backfill and does not include a factor of safety. Appropriate factors of safety should be incorporated into the design. This pressure is in addition to the un-factored, static active earth pressure. Lateral seismic earth pressures below the groundwater level may exceed those estimated above the groundwater level.

8.4.4 Backfill

Wall backfill should consist of granular, free-draining material having an expansion index of 20 or less. The backfill zone is defined by a 1:1 plane projected upward from the heel of the wall. Expansive or clayey soil should not be used. We anticipate that the on-site soils will not be suitable for wall backfill. Additionally, backfill within 3 feet from the back of the wall should not contain rocks greater than 3 inches in dimension. Backfill should be compacted to at least 95% relative compaction. Backfill should not be placed until walls have achieved adequate structural strength. Compaction of wall backfill will be necessary to minimize settlement of the backfill and overlying settlement sensitive improvements. However, some settlement should still be anticipated. Provisions should be made for some settlement of concrete slabs and pavements supported on backfill. Additionally, any utilities supported on backfill should be designed to tolerate differential settlement.

8.5 PIPELINES

8.5.1 Thrust Blocks

For level ground conditions, a passive earth pressure of 300 psf per foot of depth below the lowest adjacent final grade can be used to compute allowable thrust block resistance. A value of 150 psf per foot should be used below groundwater level if encountered.

8.5.2 Modulus of Soil Reaction

A modulus of soil reaction (E’) of 2,000 psi can be used to evaluate the deflection of buried flexible pipelines. This value assumes that granular bedding material is placed adjacent to the pipe and is compacted to at least 90% relative compaction.

8.5.3 Pipe Bedding

Pipe bedding as specified in the “Greenbook” Standard Specifications for Public Works Construction can be used. Bedding material should consist of clean sand having a sand equivalent not less than 30 and should extend to at least 12 inches above the top of pipe. Alternative materials meeting the intent of the bedding specifications are also acceptable. Samples of materials proposed for use as bedding should be provided to the engineer for inspection and testing before the material is imported for use on the project. The on-site materials are not expected to meet “Greenbook” bedding specifications. The pipe bedding material should be placed over the full width of the trench. After placement of the pipe, the bedding should be brought up uniformly on both sides of the pipe to reduce the potential for unbalanced loads. No voids or uncompacted areas should be left beneath the pipe haunches. Ponding or jetting the pipe bedding should not be allowed.

8.5.4 Cutoff Walls

Where pipeline inclinations exceed 15 percent, cutoff walls are recommended in trench excavations. Additionally, we do not recommend that open-graded rock be used for pipe bedding or backfill because of the potential for piping erosion. The recommended bedding is clean sand having a sand equivalent not less than 30 or 2-sack sand/cement slurry. If sand/cement slurry is used for pipe bedding to at least 1 foot over the top of the pipe, cutoff walls are not considered necessary. The need for cutoff walls should be further evaluated by the project civil engineer designing the pipeline.

8.6 SOIL CORROSIVITY

Representative samples of the on-site soil were tested to evaluate corrosion potential. The recent test results are presented in Appendix II. The project design engineer can use the sulfate results in conjunction with ACI 318 to specify the water/cement ratio, compressive strength, and cementitious material types for concrete exposed to soil. A corrosion engineer should be contacted to provide specific corrosion control recommendations.

9 GEOTECHNICAL ENGINEERING DURING CONSTRUCTION

The geotechnical engineer should review project plans and specifications prior to bidding and construction to check that the intent of the recommendations in this and previously prepared reports have been incorporated. Observations and tests should be performed during construction. If the conditions encountered during construction differ from those anticipated based on the subsurface exploration program, the presence of the geotechnical engineer during construction will enable an evaluation of the exposed conditions and modifications of the recommendations in this report or development of additional recommendations in a timely manner.

10 CLOSURE

SCST should be advised of any changes in the project scope so that the recommendations contained in this report can be evaluated with respect to the revised plans. Changes in recommendations will be verified in writing. The findings in this report are valid as of the date of this report. Changes in the condition of the site can, however, occur with the passage of time, whether they are due to natural processes or work on this or adjacent areas. In addition, changes in the standards of practice and government regulations can occur. Thus, the findings in this report may be invalidated wholly or in part by changes beyond our control. This report should not be relied upon after a period of two years without a review by us verifying the suitability of the conclusions and recommendations to site conditions at that time.

In the performance of our professional services, we comply with that level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the boring locations and that our data, interpretations, and recommendations are based solely on the information obtained by us. We will be responsible for those data, interpretations, and recommendations, but shall not be responsible for interpretations by others of the information developed. Our services consist of professional consultation and observation only, and no warranty of any kind whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

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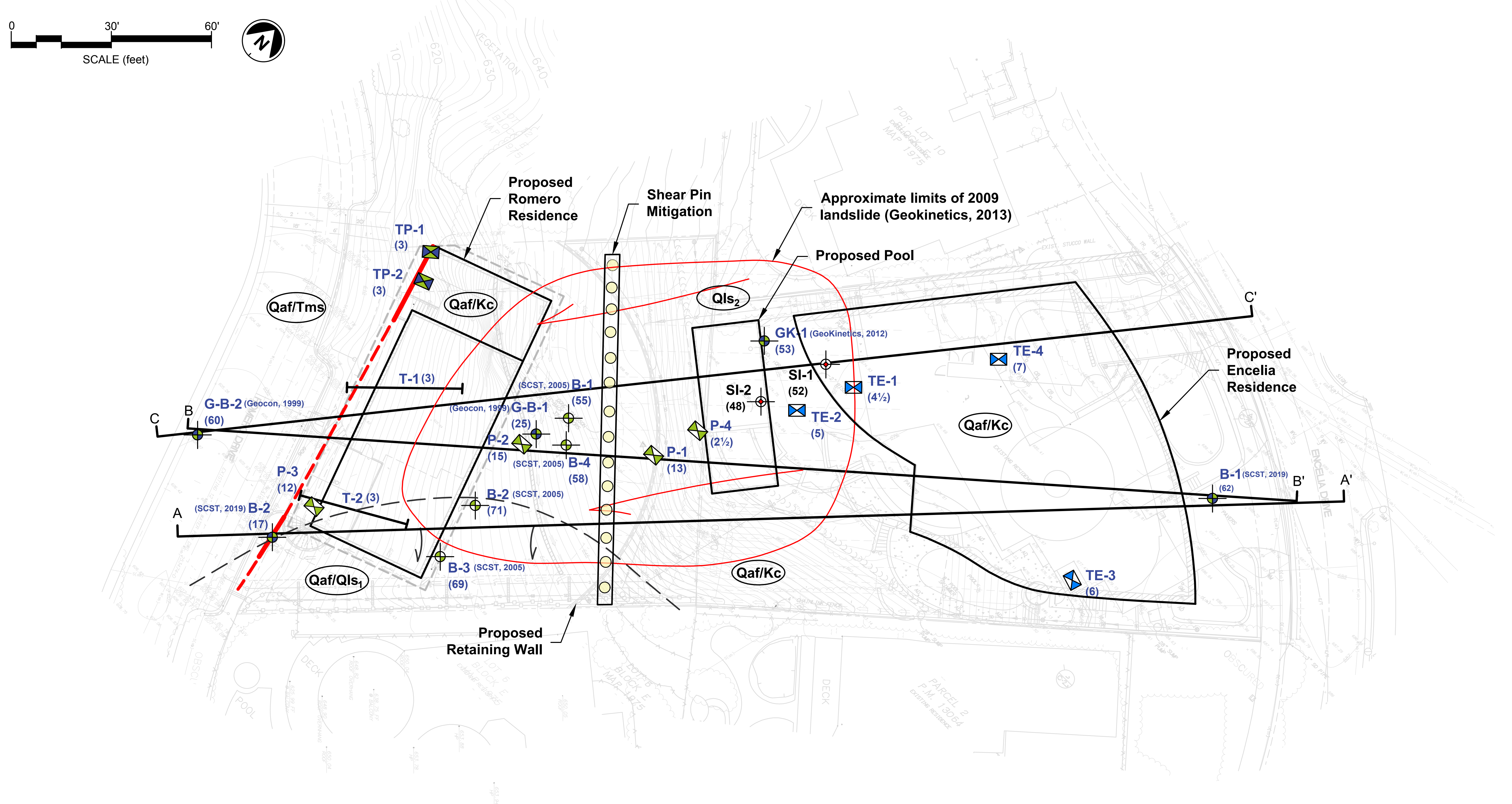
SCST, LLC

SITE VICINITY MAP

7231 Romero Drive & 7248 Encelia Drive
La Jolla, California

Date: June, 2019
By: DTC
Job No.: 180385N-04

Figure:
1



Landslide Source: GeoKinetics, (2013) Site Plan, Figure 4, dated March 25.
Basemap Source: Snipes-Dye Associates, (2018) Conceptual Grading Plan, C-2A and C-3A, dated December 6.

NOTE: All locations and depths are approximate

SCST LEGEND:

B-X (x) Boring (With notation indicating source, year, and depth)

TP-2 (3) Test Pit (SCST, 2019) (Depth in Feet)

SI-2 (48) Slope Inclinometer (GeoKinetics, 2012) (Depth in Feet)

P-4 (2½) Exploratory Pit (SCST, 2005) (Depth in Feet)

TE-4 (7) Exploratory Pit (C.W Lamonte, 2011) (Depth in Feet)

T-2 (3) Trench (SCST, 2019) (Depth in Feet)

C C' Geologic Cross-Section

Fault Zone (Average N15W) (Dashed where Inferred)

Geologic Contact (Dashed where Inferred)

Recommended Remedial Grading

GEOLOGIC UNITS:

Qaf/Qls$_1$ - Artificial Fill overlying Ancient landslide deposits

Qls$_2$ - 2009 Landslide deposits (Geokinetics, 2013)

Qaf/Tms - Artificial Fill overlying Mount Soledad Formation

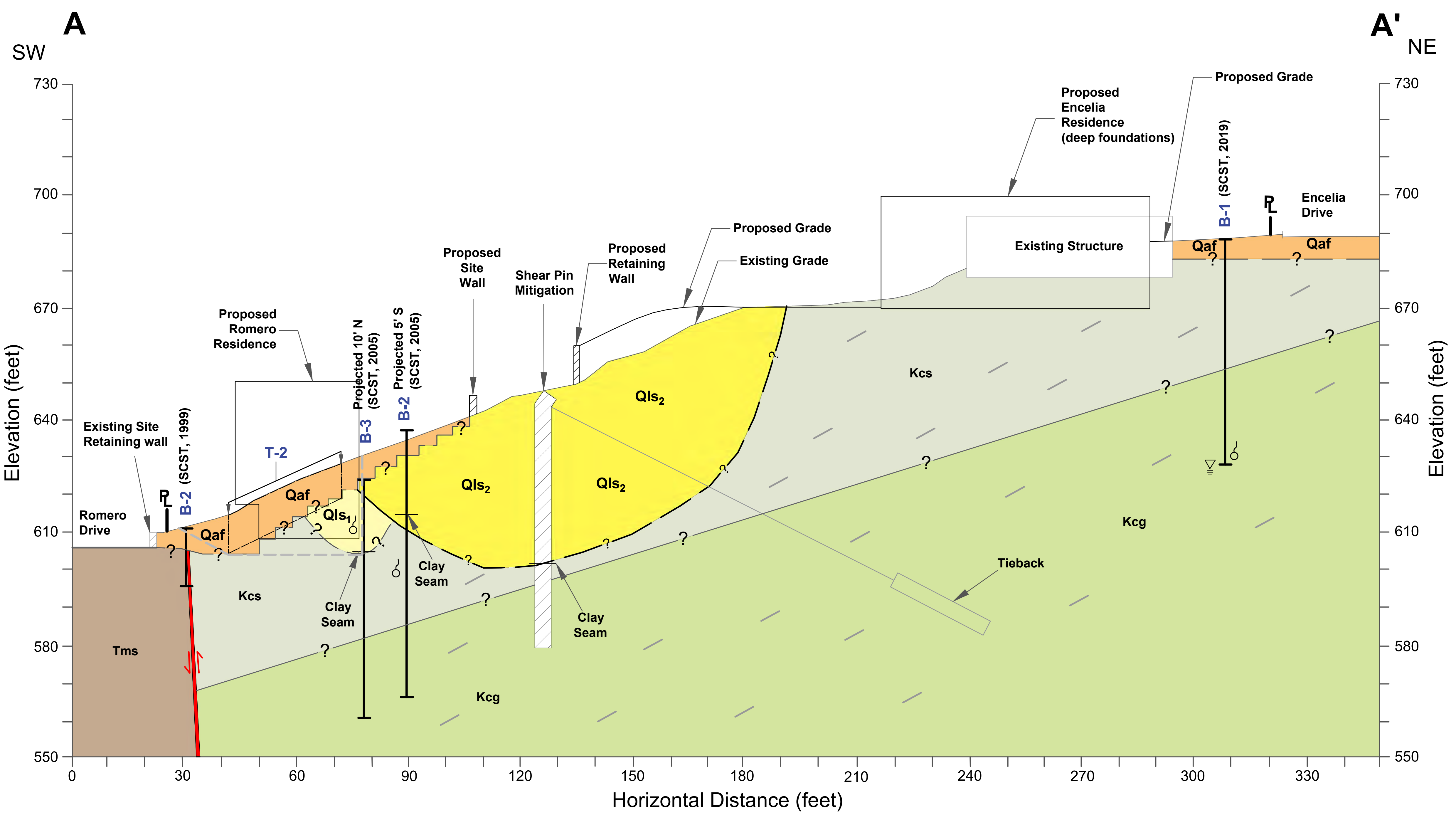
Qaf/Kc - Artificial Fill overlying Cabrillo Formation

Date: December, 2019
By: DTC/NDK/THC
Job No.: 180385N-07

GEOLOGY AND SUBSURFACE EXPLORATION MAP
Proposed Lys Residences
La Jolla, California

SCST, LLC

Figure:
2



Landslide Source: GeoKinetics, (2013) Site Plan, Figure 4, dated March 25.
Source of Topography: Snipes-Dye Associates, (2018) Conceptual Grading Plan, C-2A and C-3A, dated December 6.

SCST LEGEND:

B-X Boring (Consultant, Year)

T-2 Trench

—?— Geologic Contact, Queried Where Uncertain

⇌ Fault Showing Relative Motion

Qaf Artificial Fill (Qls)

Qls$_1$ Ancient landslide deposits (SCST, 2004)

Qls$_2$ 2009 Landslide deposits (GeoKinetics, 2012)

Tms Mt. Soledad Formation

Kcs Cabrillo Formation, (Generally Sandstone)

Kcg Cabrillo Formation, (Generally Conglomerate)

▽ Groundwater

Seepage

PL Property Line

// Bedding/ Internal Contacts

— — Recommended Remedial Grading

SCALE
1" = 30'

NOTE: All dimensions and locations are approximate

Date: December, 2019
By: NDK/THC
Job No.: 180385N-07

CROSS SECTION A-A'
Proposed Lys Residences
La Jolla, California

SCST, LLC

Figure:
3

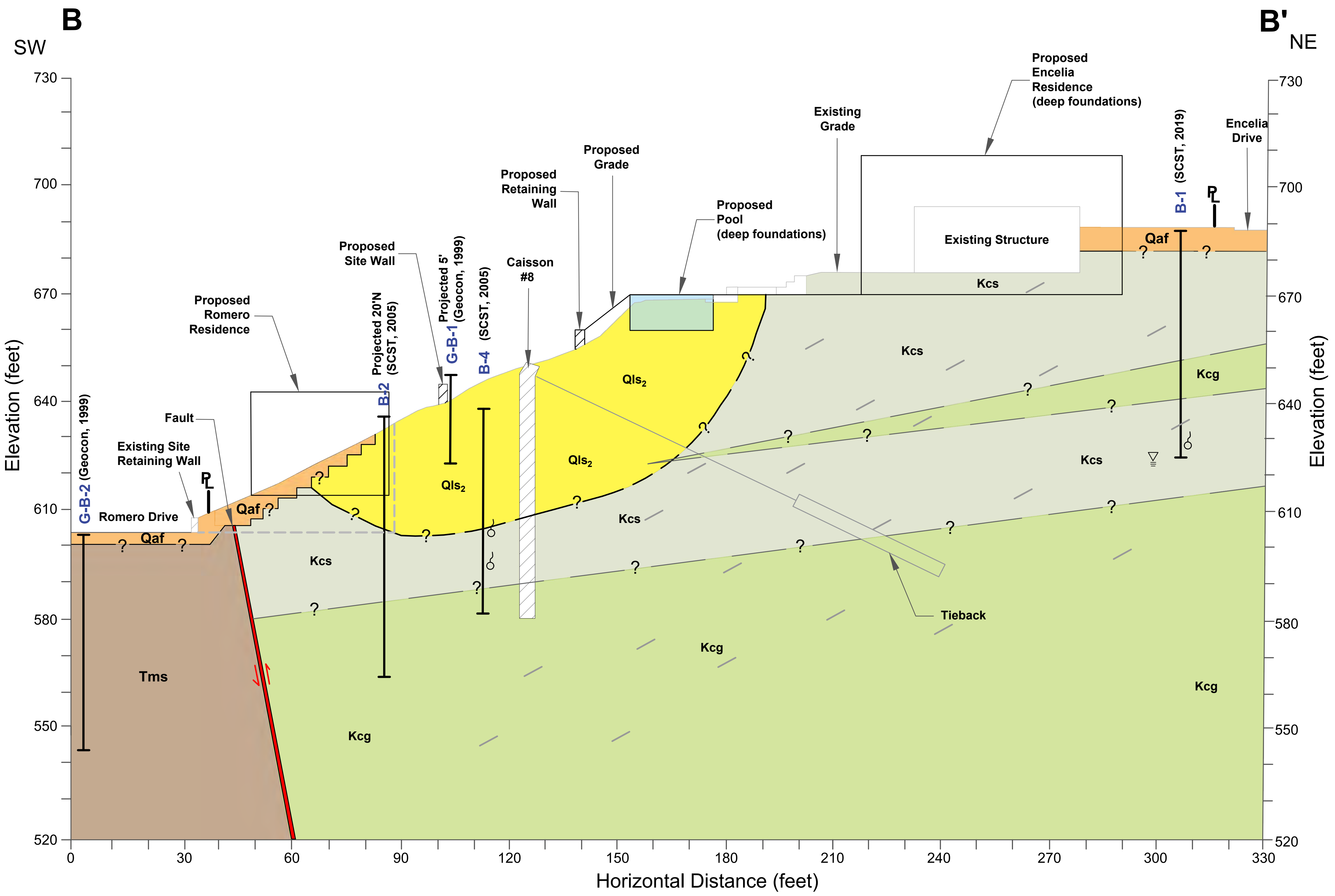
Date: December, 2019
By: NDK
Job No.: 180385N-07

CROSS SECTION B-B'

Proposed Lys Residences
La Jolla, California

SCST, LLC

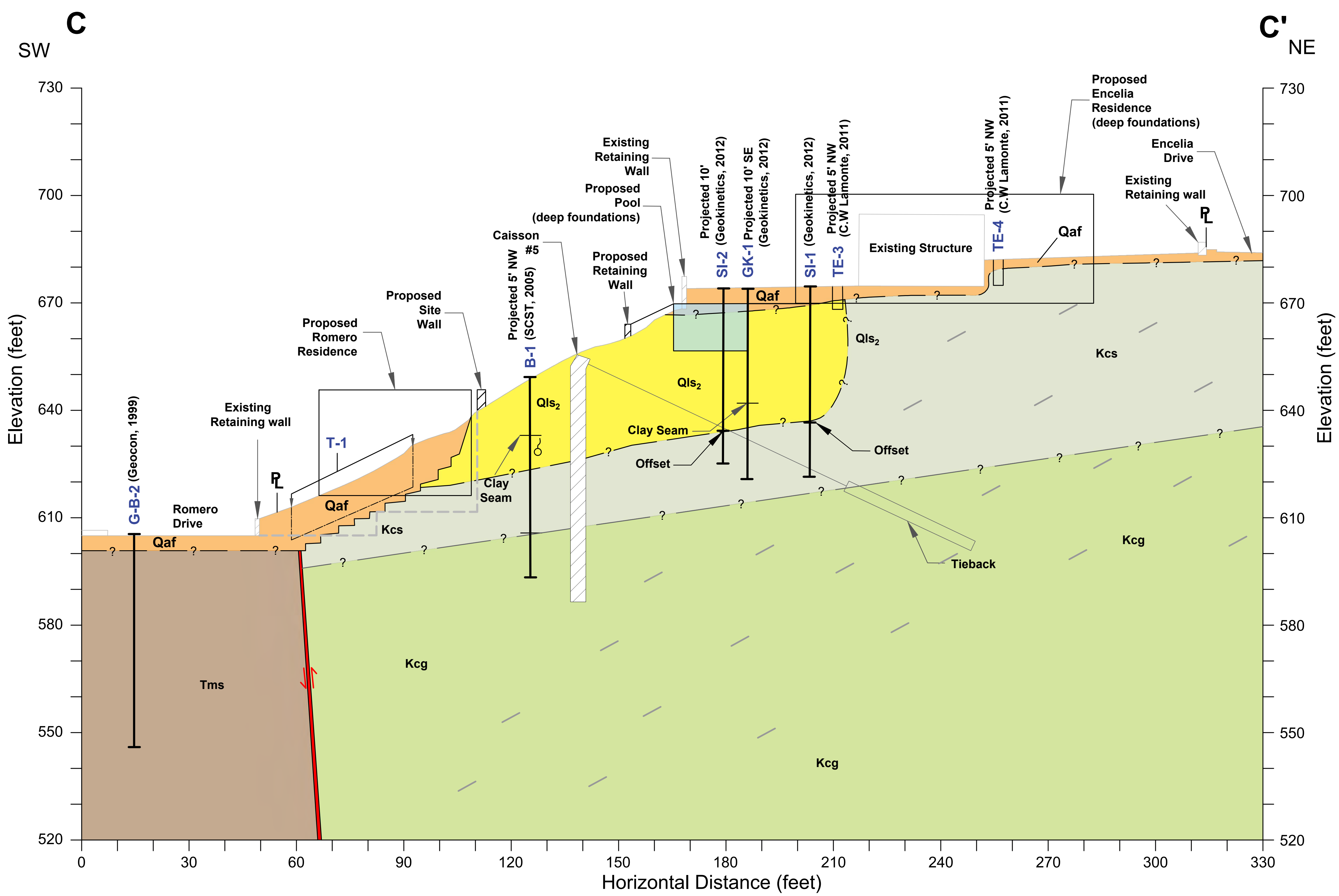
Figure:
4



REFER TO LEGEND ON FIGURE 3

Landslide Source: GeoKinetics, (2013) Site Plan, Figure 4, dated March 25.
Source of Topography: Snipes-Dye Associates, (2018) Conceptual Grading Plan, C-2A and C-3A, dated December 6.

SCALE
1" = 30'
NOTE: All locations are approximate



REFER TO LEGEND ON FIGURE 3

Landslide Source: GeoKinetics, (2013) Site Plan, Figure 4, dated March 25.

Source of Topography: Snipes-Dye Associates, (2018) Conceptual Grading Plan, C-2A and C-3A, dated December 6.

SCALE
1" = 30'

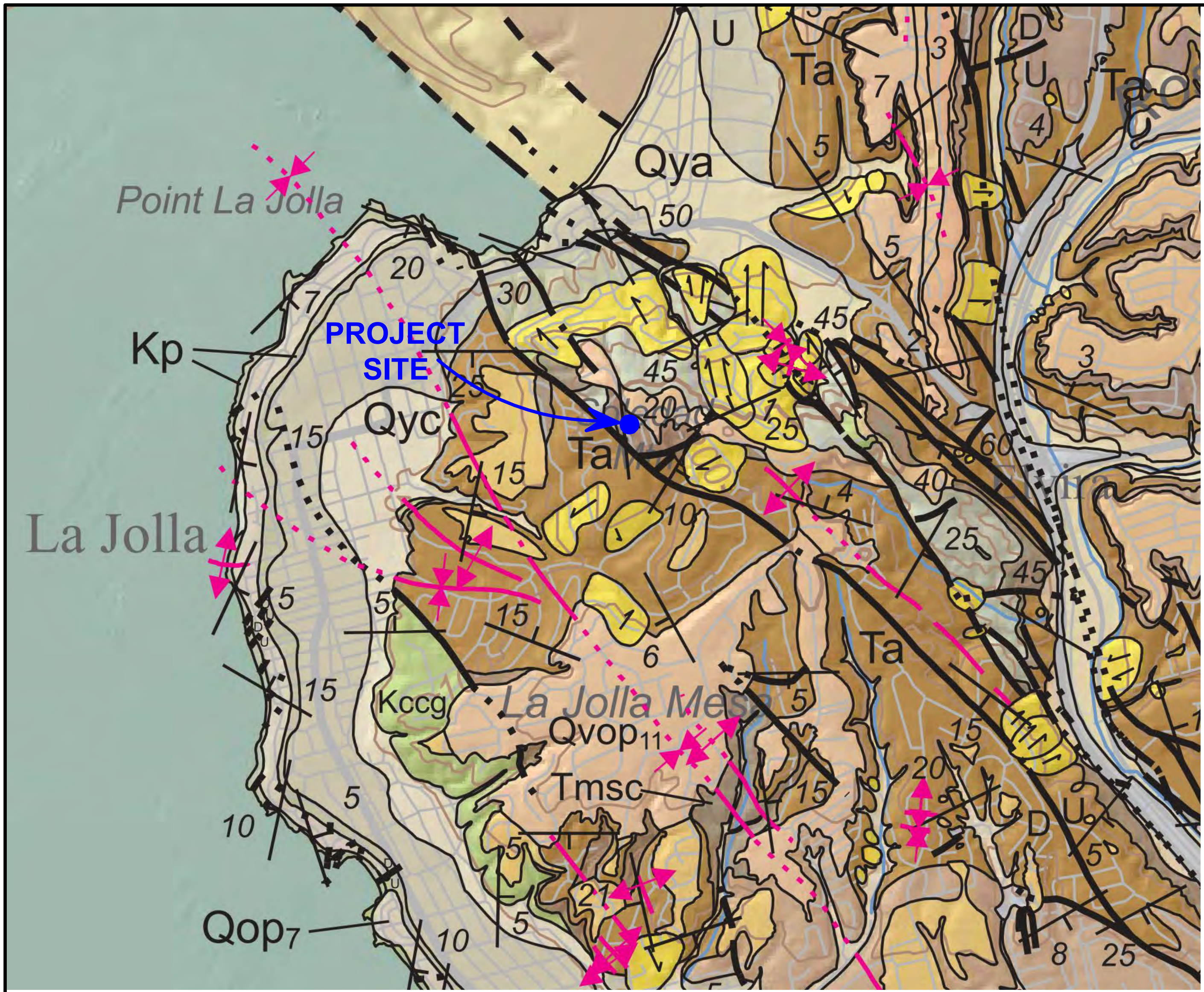
NOTE: All locations are approximate

Date: December, 2019
By: NDK
Job No.: 180385N-07

CROSS SECTION C-C'
Proposed Lys Residences
La Jolla, California

SCST, LLC

Figure:
5



EXPLANATION:

Qya	Young alluvial flood-plain deposits
Qyc	Young colluvial deposits
Qop	Old paralic deposits, undivided Unit 6, 7
Qvop	Very old paralic deposits, undivided Unit 7, 10, 11
QTso	Undivided sediments and sedimentary rocks in offshore region
Ta	Ardath Shale
Tmsc	Mount Soledad Formation, cobble conglomerate
Kccg	Cabrillo Formation, cobble conglomerate
Kp	Point Loma Formation
4	**Strike** and **dip** of beds Inclined
	Anticline Fold - Solid where well defined; short dash where inferred
	Syncline Fold - Solid where well defined; short dash where inferred
70 U D	**Fault** - Solid where accurately located; dashed where approximately located; dotted where concealed. U = upthrown block, D = downthrown block. Arrow and number indicate direction and angle of dip of fault plane.
Qls?	**Landslide** - Arrows indicate principal direction of movement. Queried where existence is questionable.

N

0 3,000' 6,000'
SCALE (feet)

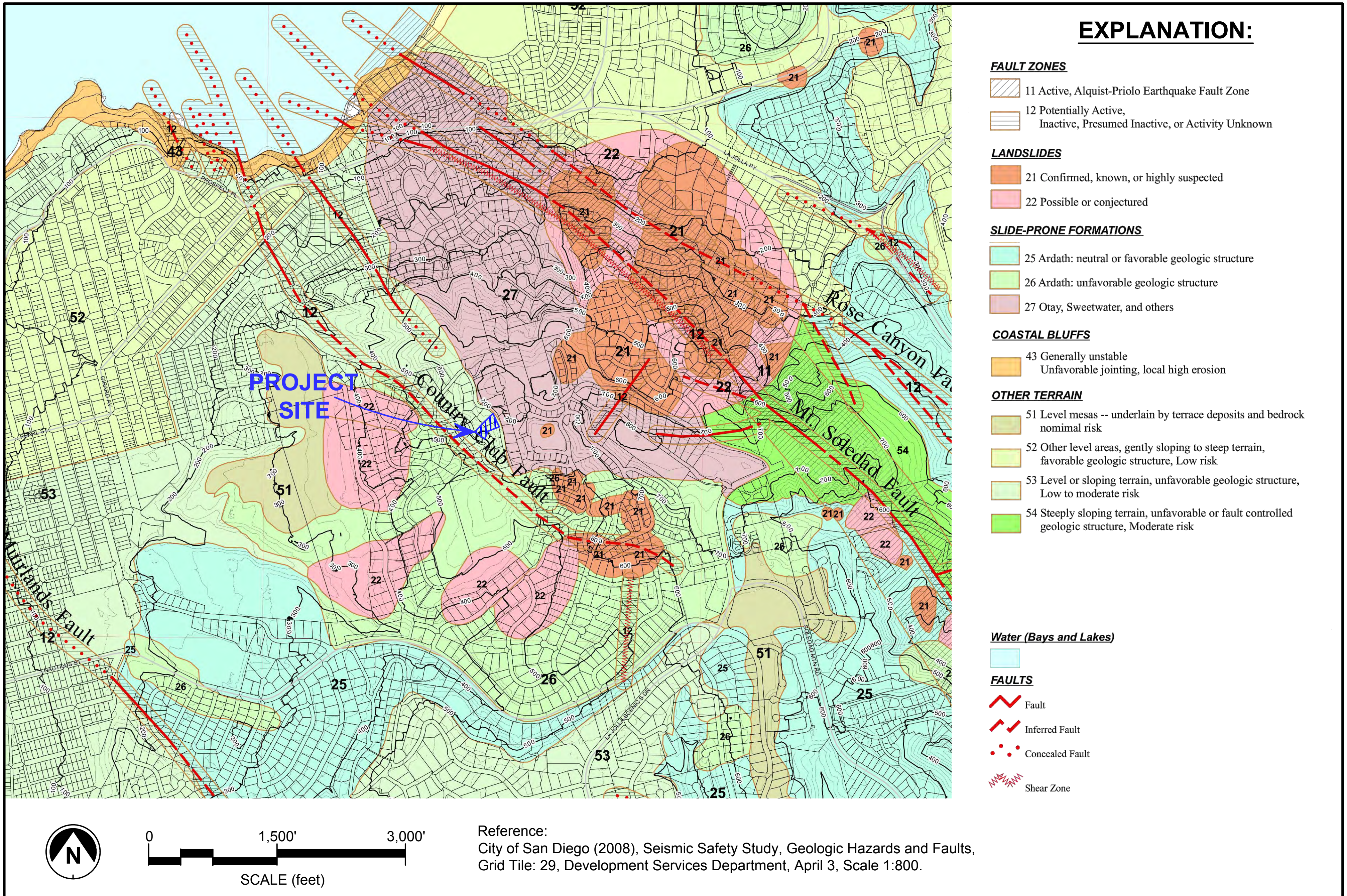
Reference:
Kennedy, M.P. and Tan, S.S. (2008), Geologic Map of the San Diego 30' x 60' Quadrangle, California, California Geological Survey, Scale 1:100,000

SCST, LLC

REGIONAL GEOLOGY MAP
Proposed Lys Residences
La Jolla, California

Date: June, 2019
By: NNW/THC
Job No.: 180385N-04

Figure:
6



Reference:
City of San Diego (2008), Seismic Safety Study, Geologic Hazards and Faults,
Grid Tile: 29, Development Services Department, April 3, Scale 1:800.

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AN ATLAS COMPANY

CITY OF SAN DIEGO SEISMIC SAFETY STUDY

Proposed Lys Residence
La Jolla, California

Date: June, 2019
By: THC\NNW
Job No.: 180385N-04

Figure:
7

N

0 5,000 10,000

SCALE (feet)

Reference:
http://www.sandiegogeologists.org/Faults_map.html

EXPLANATION:

Active Fault, dashed where uncertain

Potentially Active Fault, dashed where uncertain

State of California Earthquake Fault Zones (Alquist- Priolo Earthquake Fault Zoning Act)

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AN ATLAS COMPANY

USGS FAULT MAP

Proposed Lys Residence

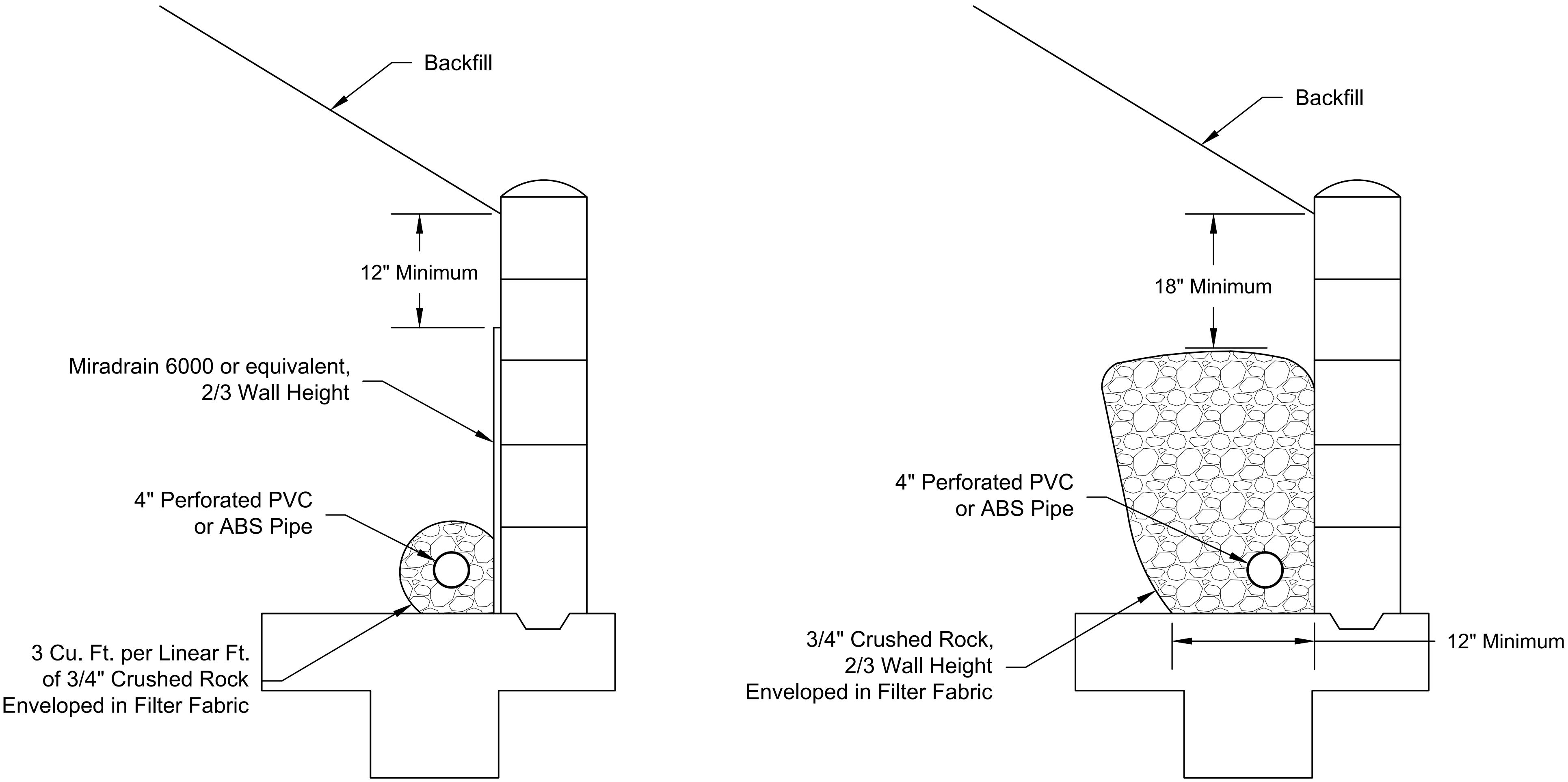
La Jolla, California

Date: June, 2019

By: THC\NNW

Job No.: 180385N-04

Figure: 8



NOT TO SCALE

NOTES:

1) Dampproof or waterproof back of wall following architect's specifications.
2) 4" minimum perforated pipe, SDR35 or equivalent, holes down, 1% fall to outlet. Provide solid outlet pipe at suitable locations.
3) Drain installation and outlet connection should be observed by the geotechnical consultant.

SCST, LLC

TYPICAL RETAINING WALL BACKDRAIN DETAILS
Proposed Lys Residence
La Jolla, California

Date: June, 2019
By: THC\NNW
Job No.: 180385N-04

Figure:
9

APPENDIX I
2019 BORING AND TEST PIT LOGS

Relatively undisturbed samples were obtained using a modified California (CAL) sampler, which is ring-lined split tube sampler with a 3-inch outer diameter and 2½-inch inner diameter. Standard Penetration Tests (SPT) were performed using a 2-inch outer diameter and 1⅜-inch inner diameter split tube sampler. The number of blows needed to drive the samplers the final 12 inches of an 18-inch drive is noted on the borings logs as “Driving Resistance (blows/ft of drive).” Disturbed bulk samples were obtained from the SPT sampler and the drill cuttings.

The soils are classified in accordance with the Unified Soil Classification System as illustrated on Figure I-1. Logs of the borings and test pits are presented on the following pages.

SUBSURFACE EXPLORATION LEGEND

UNIFIED SOIL CLASSIFICATION CHART

SOIL DESCRIPTION		GROUP SYMBOL	TYPICAL NAMES
I. COARSE GRAINED, more than 50% of material is larger than No. 200 sieve size.			
GRAVELS More than half of coarse fraction is larger than No. 4 sieve size but smaller than 3".	CLEAN GRAVELS	GW	Well graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels, gravel sand mixtures, little or no fines.
	GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, poorly graded gravel-sand-silt mixtures.
		GC	Clayey gravels, poorly graded gravel-sand, clay mixtures.
SANDS More than half of coarse fraction is smaller than No. 4 sieve size.	CLEAN SANDS	SW	Well graded sand, gravelly sands, little or no fines.
		SP	Poorly graded sands, gravelly sands, little or no fines.
		SM	Silty sands, poorly graded sand and silty mixtures.
		SC	Clayey sands, poorly graded sand and clay mixtures.
II. FINE GRAINED, more than 50% of material is smaller than No. 200 sieve size.			
	SILTS AND CLAYS (Liquid Limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, sandy silt or clayey-silt-sand mixtures with slight plasticity.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		OL	Organic silts and organic silty clays or low plasticity.
	SILTS AND CLAYS (Liquid Limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
		OH	Organic clays of medium to high plasticity.
III. HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils.

SAMPLE SYMBOLS

☒	- Bulk Sample
CAL	- Modified California Sampler
CK	- Undisturbed Chunk sample
MS	- Maximum Size of Particle
ST	- Shelby Tube
SPT	- Standard Penetration Test sampler

GROUNDWATER SYMBOLS

▽	- Water level at time of excavation or as indicated
≀≀	- Water seepage at time of excavation or as indicated

LABORATORY TEST SYMBOLS

AL	- Atterberg Limits
CON	- Consolidation
COR	- Corrosivity Tests (Resistivity, pH, Chloride, Sulfate)
DS	- Direct Shear
EI	- Expansion Index
MAX	- Maximum Density
RV	- R-Value
SA	- Sieve Analysis

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	I-1

LOG OF BORING B-1

Date Drilled: 4/22/2019 - 4/23/2019
Equipment: 30-inch bucket auger
Elevation (ft): 687

Logged by: EMW
Reviewed by: JG
Depth to Groundwater (ft): 62

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVEN	SAMPLES BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
		7 inches of Portland Cement Concrete							
1	SC	**FILL (Qaf):** CLAYEY SAND, medium dense to dense, yellowish brown, moist, fine to coarse grained, trace coarse gravel and cobbles.		☒					
2									SA AL EI COR
3									
4									
5		**CABRILLO FORMATION (Kc):** SILTY SANDSTONE, yellowish brown, moist, strongly cemented, trace gravel, weathered, micaceous.	CAL		3		10.7	106.9	DS
6									
7		COBBLE CONGLOMERATE, light brown with orange mottling, moist, strongly cemented, silty sand matrix, weathered.							
8									
9									
10		Clayey sand matrix. Calcite veins.							
11									
12									
13									
14		Gradational Contact: N40°W, 37°SW CLAYEY SANDSTONE, yellowish brown to light brown, moist, strongly cemented, trace gravel, weathered.							
15									
16									
17		Sandstone bedding approximately 1/16 to 5/64 inches thick.	CAL		4		15.0	108.8	DS
18		Few coarse gravel and cobbles.							
19									
20		Gradational Contact: N43°W, 39°							

BORING CONTINUED ON I-3

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	I-2

LOG OF BORING B-1 (continued)

Date Drilled: 4/22/2019
Equipment: 30-inch bucket auger
Elevation (ft): 687

Logged by: EMW
Reviewed by: JG
Depth to Groundwater (ft): 62

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVEN	SAMPLES BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
21		**CABRILLO FORMATION (Kc):** CLAYEY SANDSTONE, yellowish brown, moist, strongly cemented, few coarse gravel and cobble, weathered.							
22									
23		Light brown, calcified zone. Gradational Contact: N62°W, 28°SE							
24		CLAYSTONE, grayish brown, moist, well indurated, weathered.							
25			CAL		7		21.3	97.9	DS
26		Rip-up clasts of CLAYEY SANDSTONE, gravel.							
27									
28		Bedding Orientation: N14°W, 28°		☒					SA AL
29									
30		Gray. Bedding Orientation: N10°W, 26°SW							
31			CAL		6		19.0	100.4	DS
32		Gradational Contact: N25°W, 20°SW COBBLE CONGLOMERATE, yellowish brown, moist, strongly cemented, clayey sand matrix.							
33									
34									
35		Boulders.							
36									
37									
38		Gradational Contact: Due E-W, 20°S							
39		SANDY CLAYSTONE, grayish brown, moist, well indurated.							
40									

BORING CONTINUED ON I-4

LOG OF BORING B-1 (continued)

Date Drilled: 4/22/2019
Equipment: 30-inch bucket auger
Elevation (ft): 687

Logged by: EMW
Reviewed by: JG
Depth to Groundwater (ft): 62

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVEN	SAMPLES BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
		CABRILLO FORMATION (Kc): CLAYEY SANDSTONE, yellowish brown, moist, strongly cemented, trace gravel and cobbles.	CAL		10		10.6	114.4	DS
41									
42									
43									
44									
45		Rip-up clasts of gray SANDY CLAYSTONE.	CAL		8				SA AL
46		Gradational Contact							
47		COBBLE CONGLOMERATE, yellowish brown, moist, strongly cemented, clayey sand matrix.							
48									
49									
50		CLAYEY SANDSTONE, Reddish brown, moist, strongly cemented, rip-up clasts of gray CLAYSTONE.	CAL		10		4.7	98.7	DS
51									
52		COBBLE CONGLOMERATE, orange brown, moist, strongly cemented, clayey sand matrix.							
53									
54		CLAYEY SANDSTONE, Reddish brown, moist, strongly cemented, rip-up clasts of gray CLAYSTONE.							
55		SANDY CLAYSTONE, Reddish brown, moist, well indurated.	CAL		13				SA AL
56									
57		Heavy seepage @ 57'.							
58									
59									
60									

BORING CONTINUED ON I-5

SCST, LLC

Proposed Lys Residences
La Jolla, California

By: EMW
Date: June, 2019
Job Number: 180385N-04
Figure: I-4

LOG OF BORING B-1 (continued)

Date Drilled: 4/22/2019
Equipment: 30-inch bucket auger
Elevation (ft): 687

Logged by: EMW
Reviewed by: JG
Depth to Groundwater (ft): 62

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
			DRIVEN	BULK					
		CABRILLO FORMATION (Kc): CLAYEY SANDSTONE, light brown, moist, strongly cemented, trace gravel and cobbles.	CAL		15		4.7	98.7	DS
61									
62		**BORING TERMINATED AT 62 FEET**					▽		
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	I-5

LOG OF BORING B-2

Date Drilled: 5/14/2019 - 5/20/2019
Equipment: Rotor Hammer, Hand Tools
Elevation (ft): 611

Logged by: EMW
Reviewed by: JG
Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS		WEST		EAST		MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
				DRIVEN	BULK	DRIVEN	BULK			
	SC	**FILL (Qaf):** CLAYEY SAND, medium dense to dense, yellowish brown, moist, fine to coarse grained, trace gravel and cobbles.								
1										
2										
3										
4										
5		Fault in boring @ 5 feet; N10°W, 75°NW								
		WEST WALL	**EAST WALL**							
6		**MT. SOLEDAD FORMATION (Tm)**: SANDY CLAYSTONE, orange brown, moist, well indurated.	**CABRILLO FORMATION (Kc)**: CLAYEY SANDSTONE, light brown, moist, strongly cemented, trace gravel. Rip-up clasts of gray claystone.							
7					☒		☒			SA AL EI
8		Light orange brown.								
9		SILTY SANDSTONE, brown to light brown, moist, moderately cemented, fine to medium grained. Minor fractures and oxidation.								
10			SILTY SANDSTONE, light brown, strongly cemented, fine to coarse grained.		☒		☒			SA AL COR
11										
12		Fault @ 12 feet; N10°W, 85°SW								
13			Few coarse gravel and cobbles @ @13 feet. Calcified zones.							
14										
15										
16		SANDY SILTSTONE, gray, moist, strongly cemented.			☒					SA AL
17		**BORING TERMINATED AT 17 FEET**								
18										
19										
20										

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	I-6

LOG OF TEST PIT TP-1

Date Drilled:	4/2/2019	Logged by:	EMW
Equipment:	Backhoe	Reviewed by:	JG
Elevation (ft):	625	Depth to Groundwater (ft):	Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
			DRIVEN	BULK					
	SC	**COLLUVIUM (Qcol)**: CLAYEY SAND with GRAVEL, loose, light brown, moist, fine to coarse grained, trace cobbles.							
1		**FAULT ZONE:** CLAYEY SANDSTONE juxtaposed with SILTSTONE. 6-foot wide damage zone. Fault Orientation = Approx. N15°W, Dip = Approx. 85°NE							
2									
3									
		TEST PIT TERMINATED AT 3½ FEET							
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	I-7

LOG OF TEST PIT TP-2

Date Drilled: 4/3/2019
Equipment: Backhoe
Elevation (ft): 621

Logged by: EMW
Reviewed by: JG
Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
			DRIVEN	BULK					
	SC	**<u>FILL (Qaf):</u>** CLAYEY SAND, loose to medium dense, yellowish brown, moist, fine to coarse grained, gravel and cobbles.							
1									
2									
3		**TEST PIT TERMINATED AT 3 FEET**							
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Proposed Lys Residences
La Jolla, California

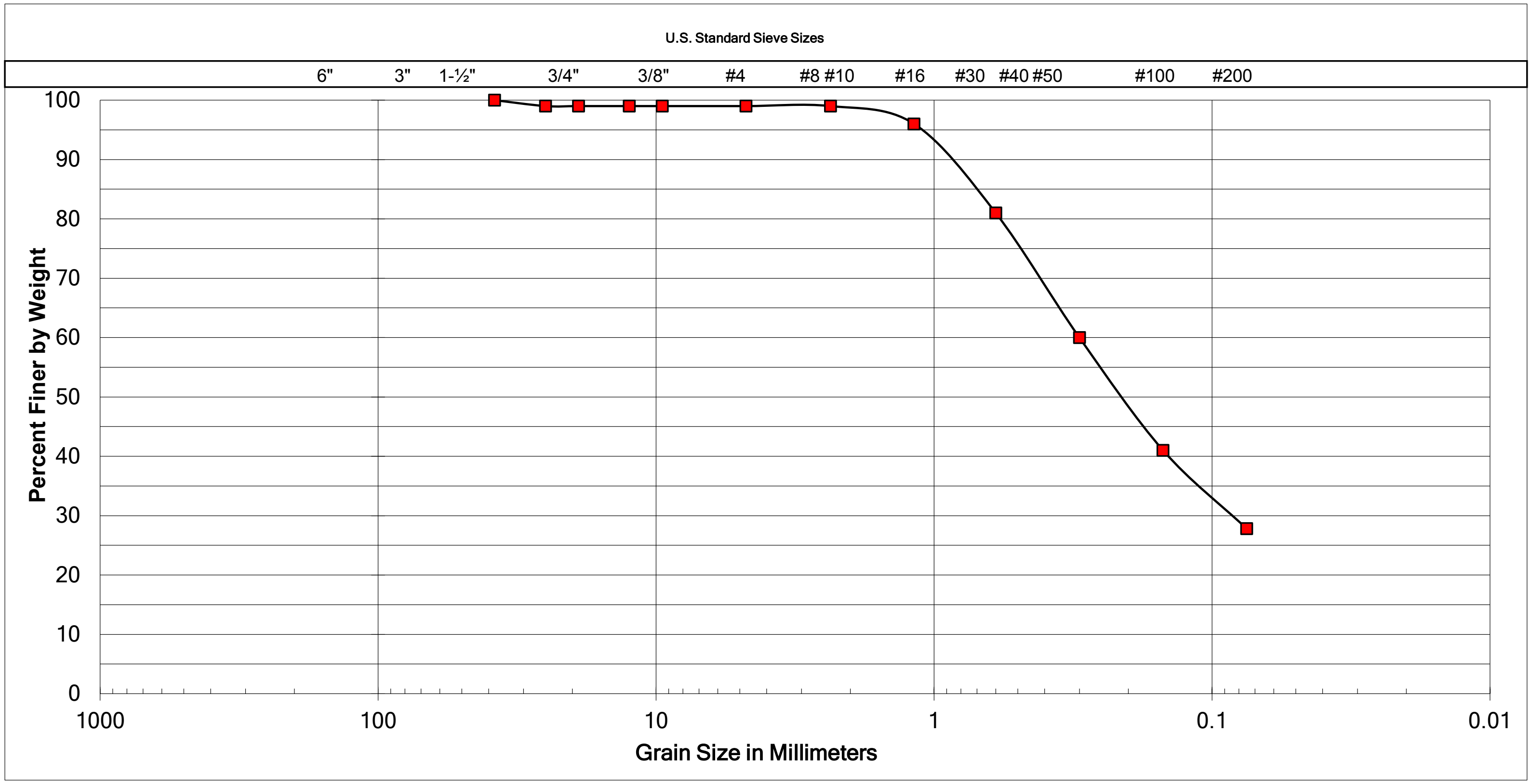
By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	I-8

APPENDIX II
2019 LABORATORY TESTING

Laboratory tests were performed to provide geotechnical parameters for engineering analyses. The following tests were performed:

- **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System
- **PARTICLE-SIZE DISTRIBUTION:** The particle-size distribution was evaluated on two soil samples in accordance with ASTM D422.
- **ATTERBERG LIMITS:** The Atterberg limits were evaluated on selected soil samples in accordance with ASTM D4318.
- **EXPANSION INDEX:** The expansion index was evaluated on selected soil samples in accordance with ASTM D4829.
- **CORROSIVITY:** Corrosivity tests were performed on one soil sample. The pH and minimum resistivity were evaluated in general accordance with California Test 643. The soluble sulfate content was evaluated in accordance with California Test 417. The total chloride ion content was evaluated in accordance with California Test 422.
- **DIRECT SHEAR:** Direct shear tests were performed on selected samples in accordance with ASTM D3080. The shear stress was applied at a constant rate of strain of 0.003 inch per minute.

Soil samples not tested are now stored in our laboratory for future reference and analysis, if needed. Unless notified to the contrary, all samples will be disposed of 30 days from the date of this report.



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-1 at ½ to 5 Feet
SAMPLE NUMBER
40466

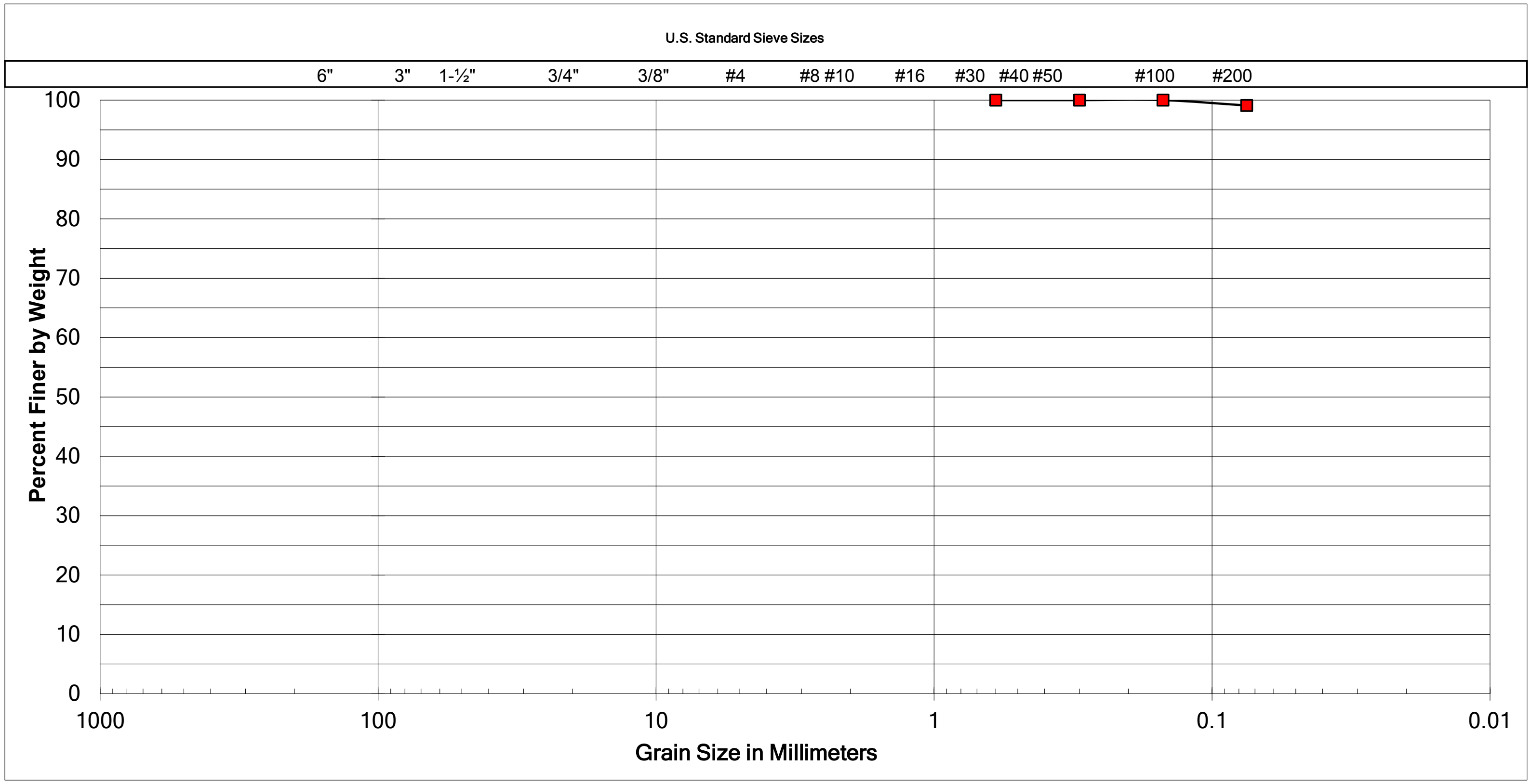
UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION	CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	41
PLASTIC LIMIT	25
PLASTICITY INDEX	16

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-1



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-1 at 28 Feet
SAMPLE NUMBER
40472

UNIFIED SOIL CLASSIFICATION:	CH
DESCRIPTION	FAT CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	90
PLASTIC LIMIT	36
PLASTICITY INDEX	54

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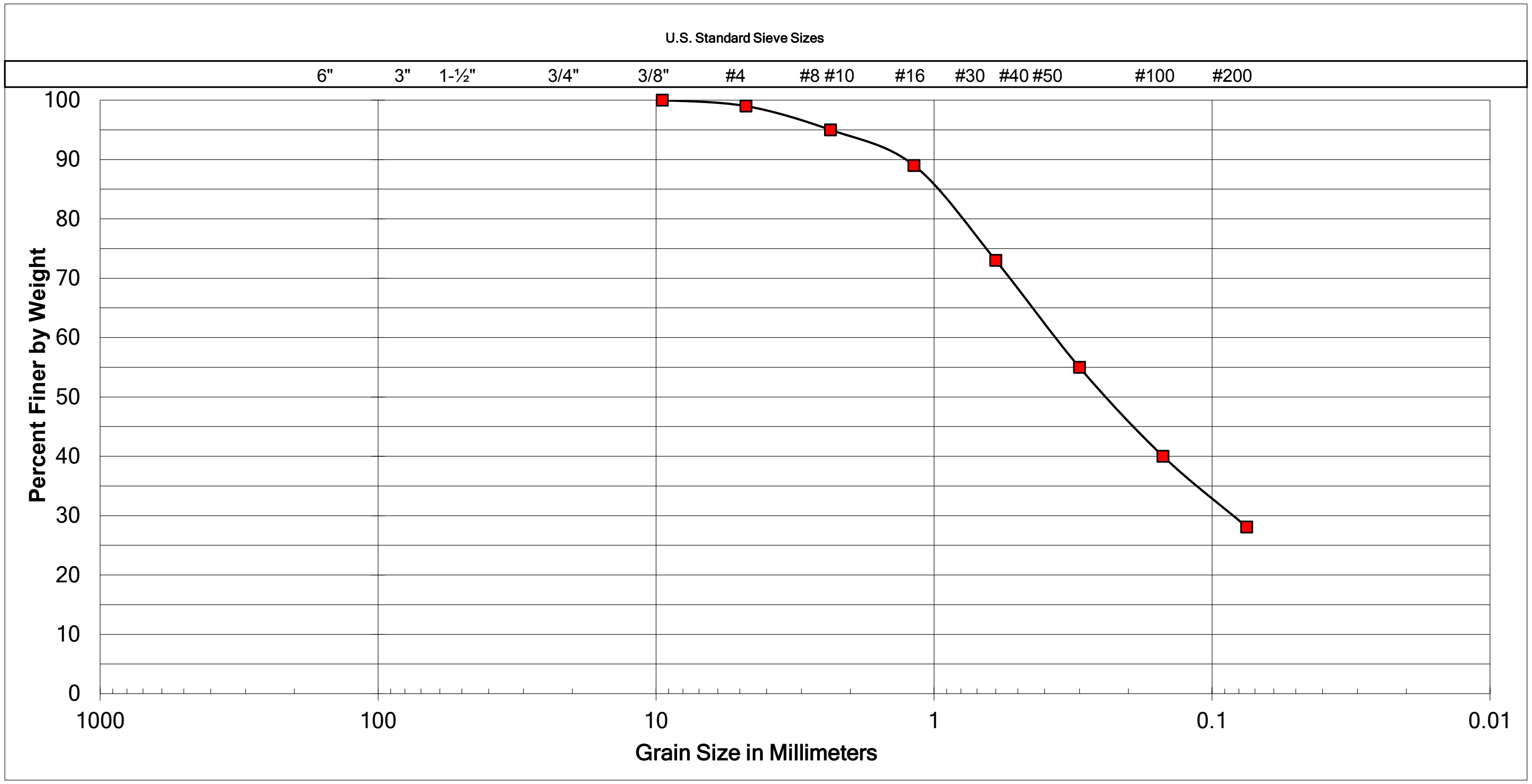
Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-2



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-1 at 45½ to 46 Feet
SAMPLE NUMBER
40475

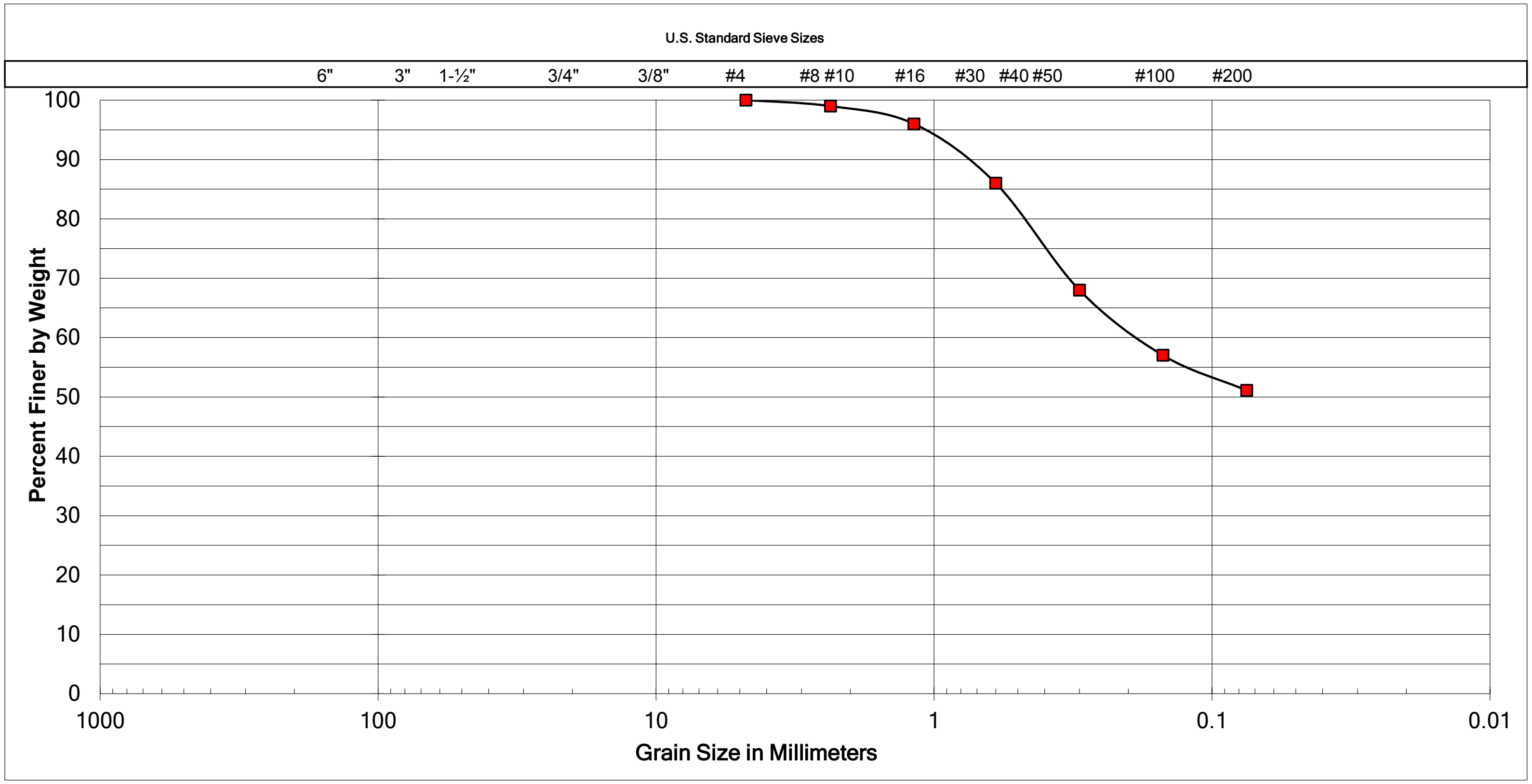
UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION	CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	50
PLASTIC LIMIT	25
PLASTICITY INDEX	25

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-3



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-1 at 55 to 55½ Feet
SAMPLE NUMBER
40477

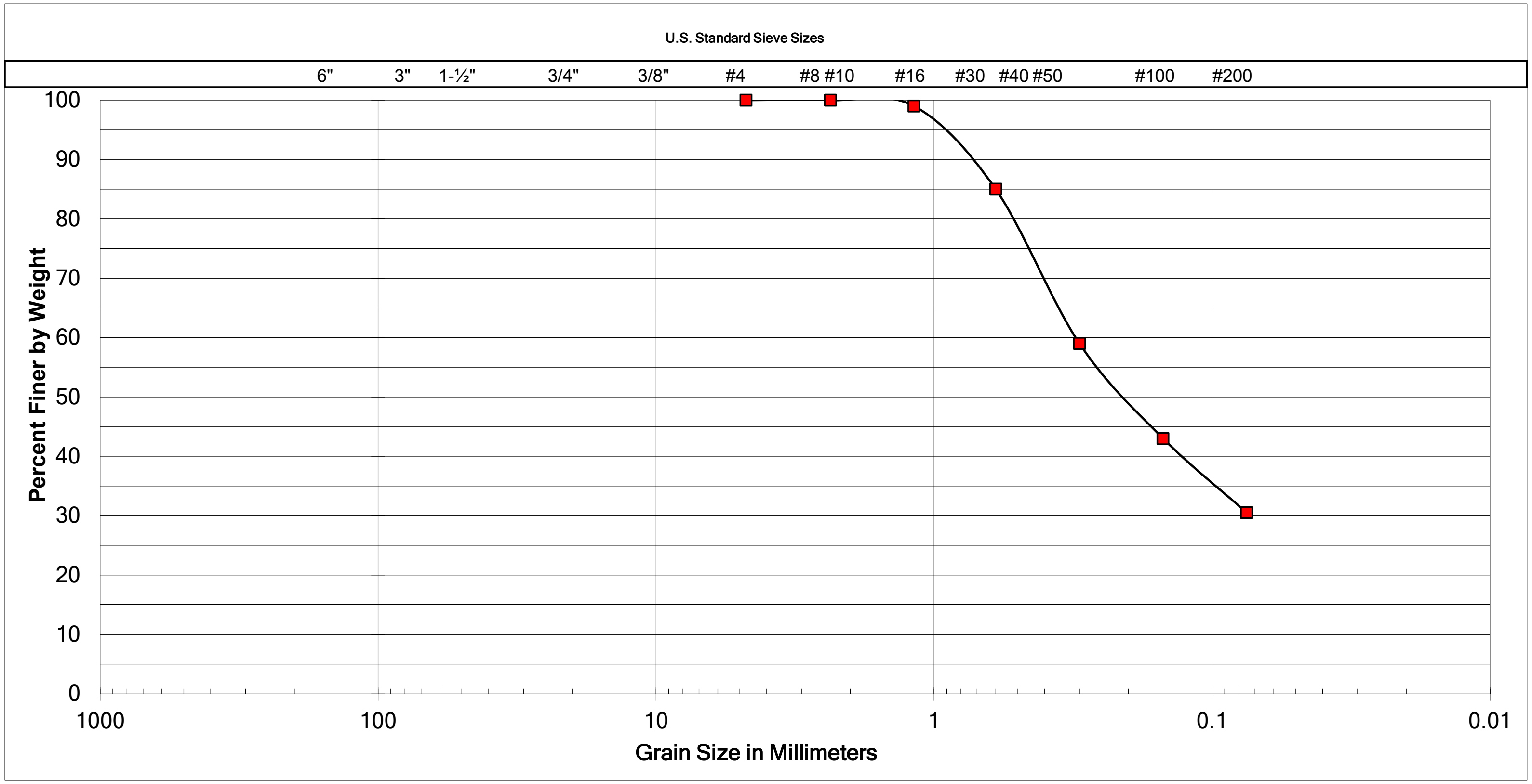
UNIFIED SOIL CLASSIFICATION:	CH
DESCRIPTION	SANDY FAT CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	50
PLASTIC LIMIT	28
PLASTICITY INDEX	22

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-4



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-2 at 7 to 7½ feet (east side)
SAMPLE NUMBER
41827

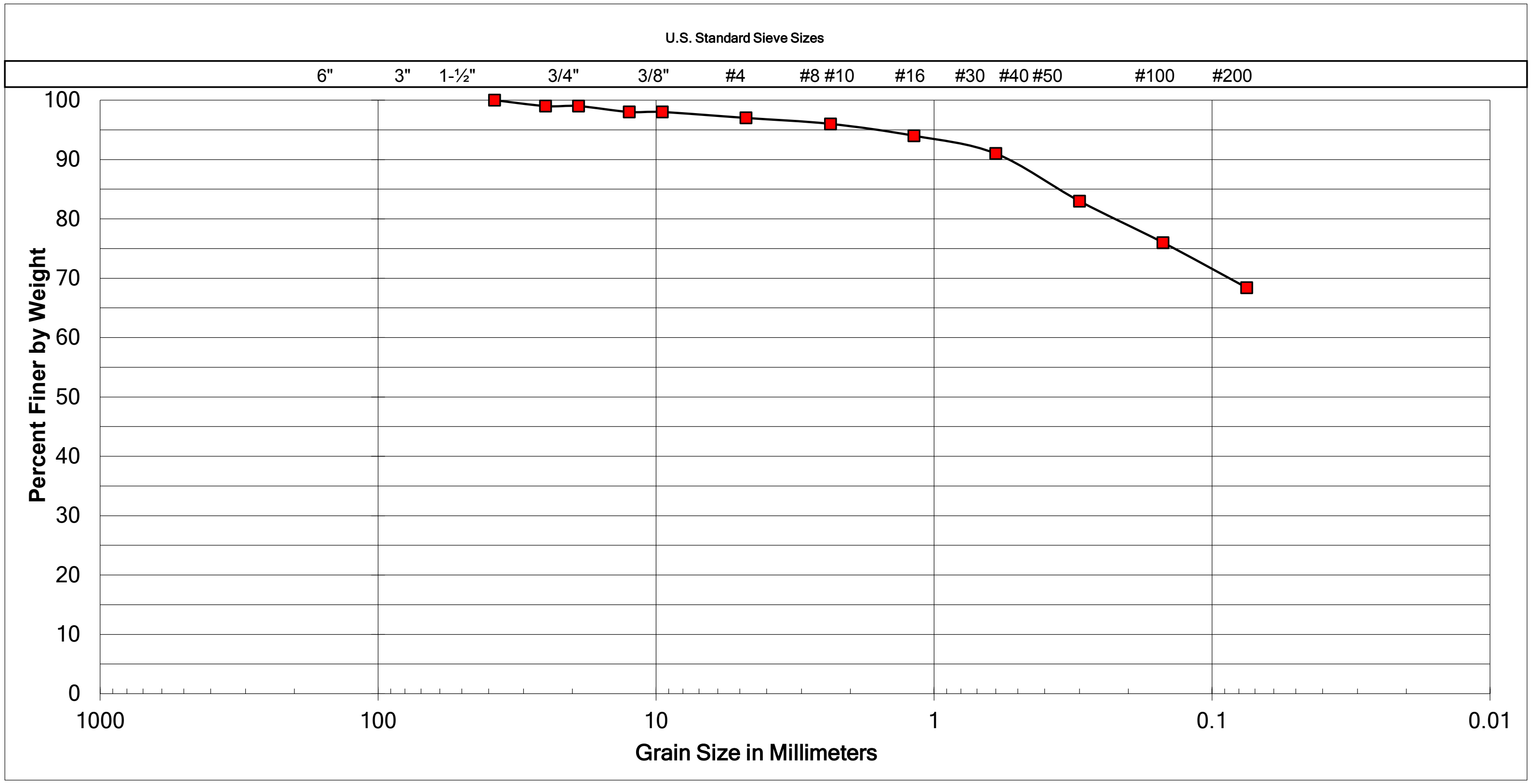
UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION	CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	42
PLASTIC LIMIT	19
PLASTICITY INDEX	23

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-5



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-2 at 7 to 7½ feet (west side)
SAMPLE NUMBER
41828

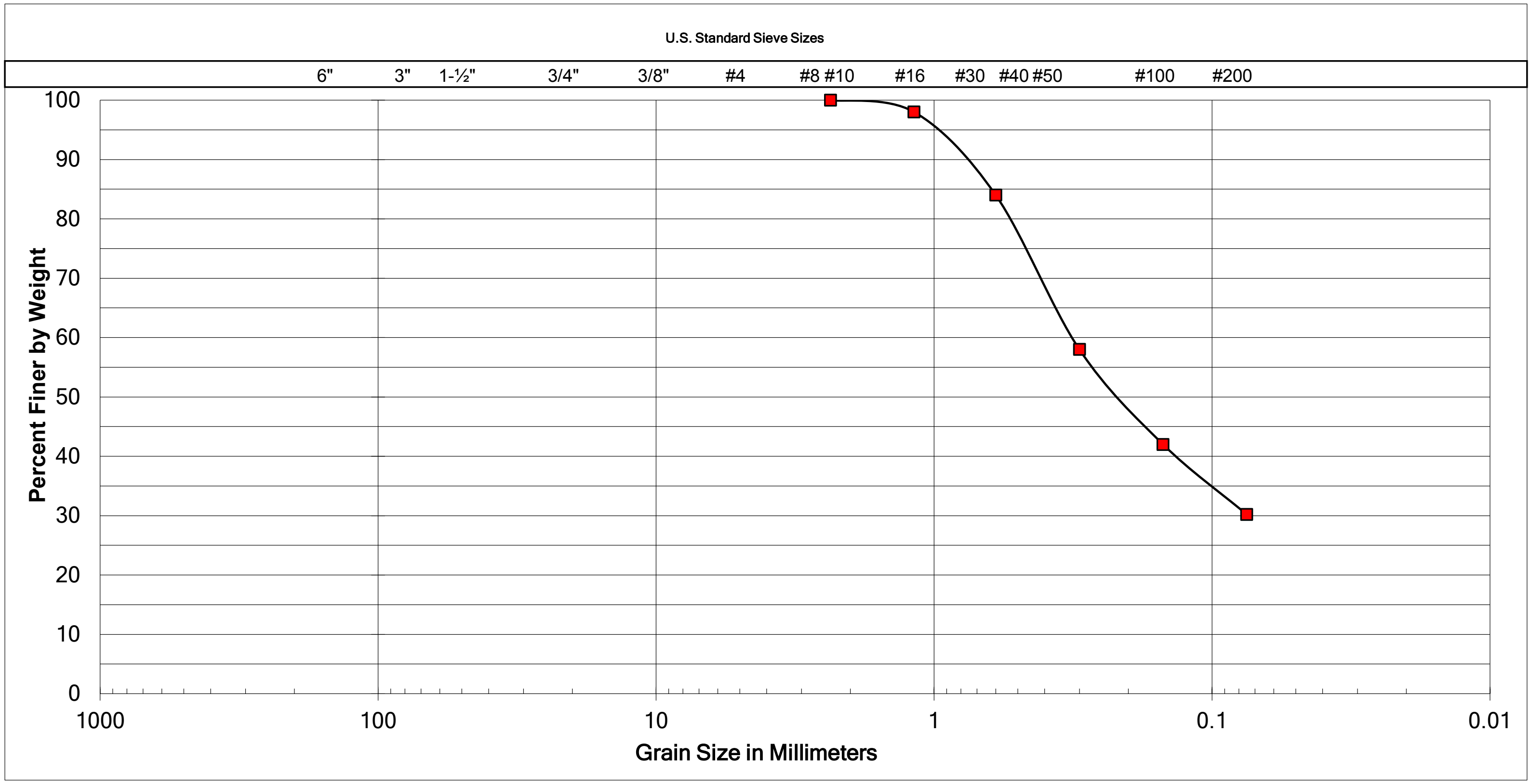
UNIFIED SOIL CLASSIFICATION:	CH
DESCRIPTION	SANDY FAT CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	62
PLASTIC LIMIT	16
PLASTICITY INDEX	46

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-6



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-2 at 10 to 10½ feet (east side)
SAMPLE NUMBER
41829

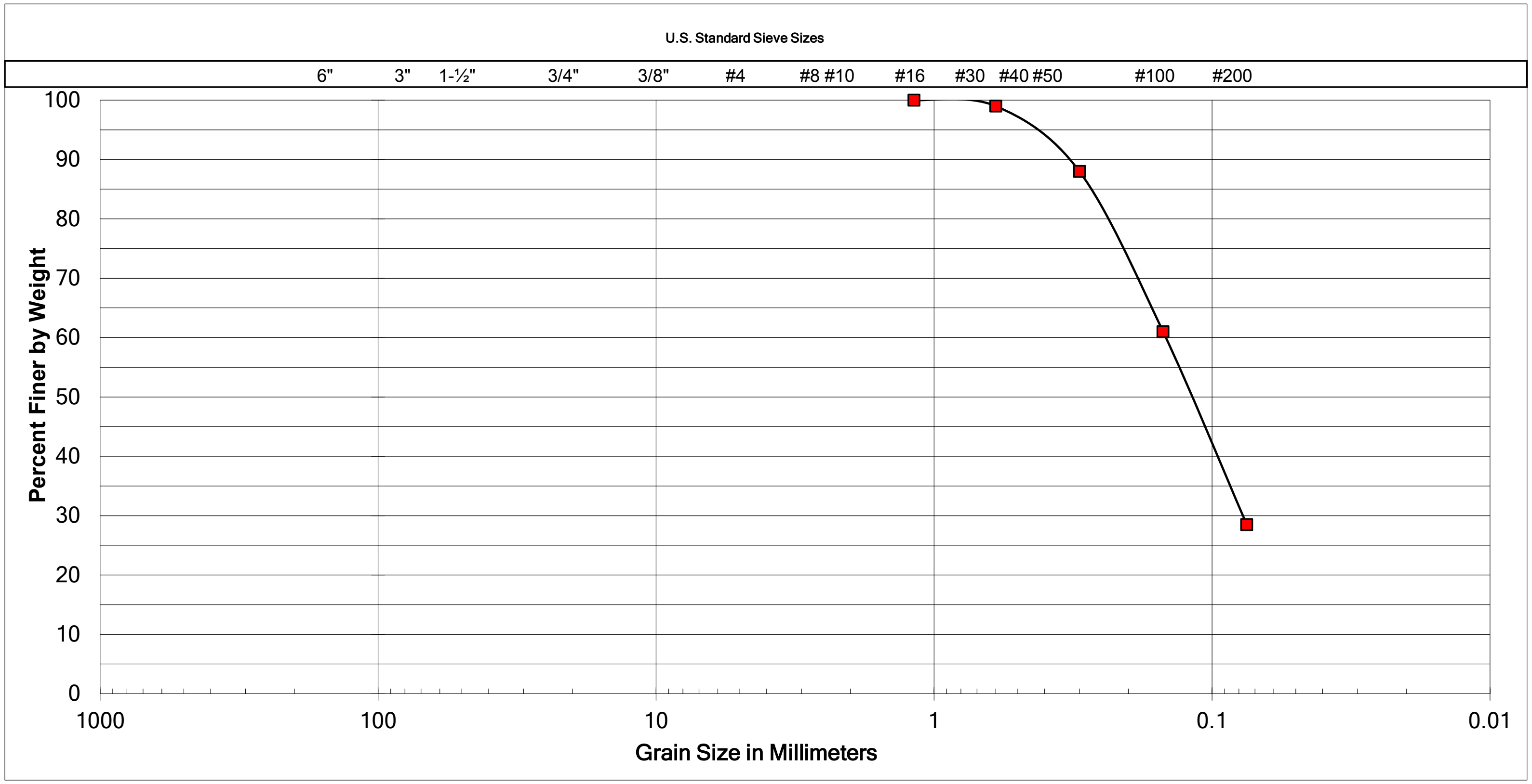
UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-7



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-2 at 10 to 10½ feet (west side)
SAMPLE NUMBER
41830

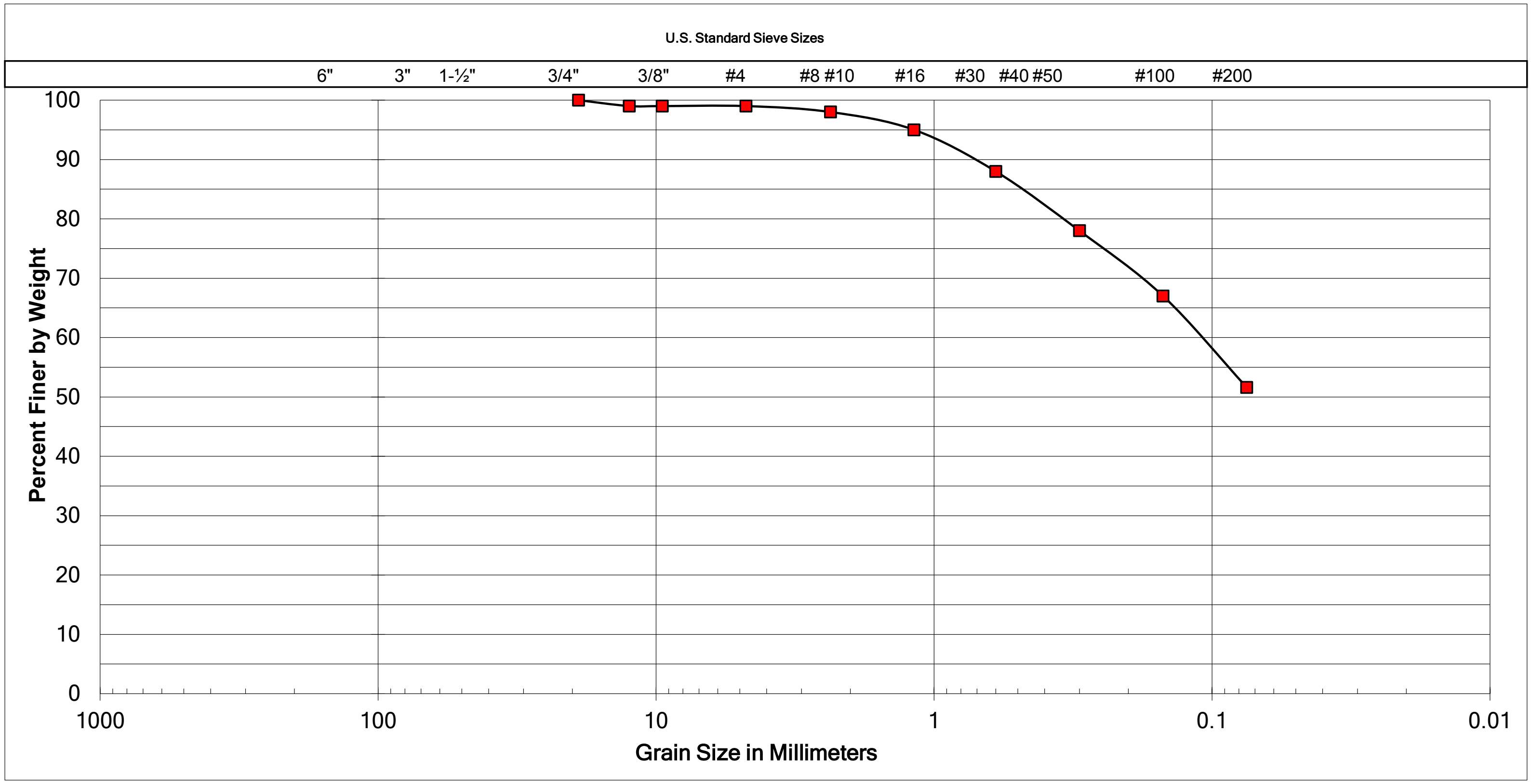
UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-8



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-2 at 16½ to 17 feet (fault zone)
SAMPLE NUMBER
41832

UNIFIED SOIL CLASSIFICATION:	CH
DESCRIPTION	SANDY FAT CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	51
PLASTIC LIMIT	27
PLASTICITY INDEX	24

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-9

EXPANSION INDEX

ASTM D4829

SAMPLE	DESCRIPTION	EI
B-1 at ½ to 5 feet	CLAYEY SAND	38
B-2 at 7 to 7½ feet (east)	CLAYEY SAND	65

Classification of Expansive Soil [1]

EXPANSIVE INDEX	POTENTIAL EXPANSION
1-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

1. ASTM - D4829

RESISTIVITY, pH, SOLUBLE CHLORIDE and SOLUBLE SULFATE

pH & Resistivity (Cal 643, ASTM G51)

Soluble Chlorides (Cal 422)

Soluble Sulfate (Cal 417)

SAMPLE	RESISTIVITY (Ω-cm)	pH	CHLORIDE (%)	SULFATE (%)
B-1 at ½ to 5 feet	775	7.88	0.002	0.001
B-2 at 10 to 10½ feet (east)	759	8.78	0.004	0.004

WATER-SOLUBLE SULFATE (SO_4^{2-}) EXPOSURE

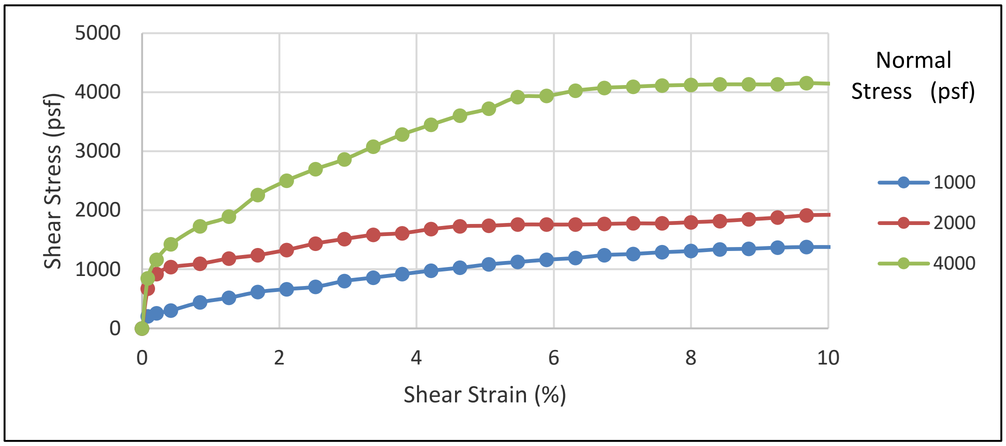
Modified from ACI 318-14 Table 19.3.1.1 and Table 19.3.2.1

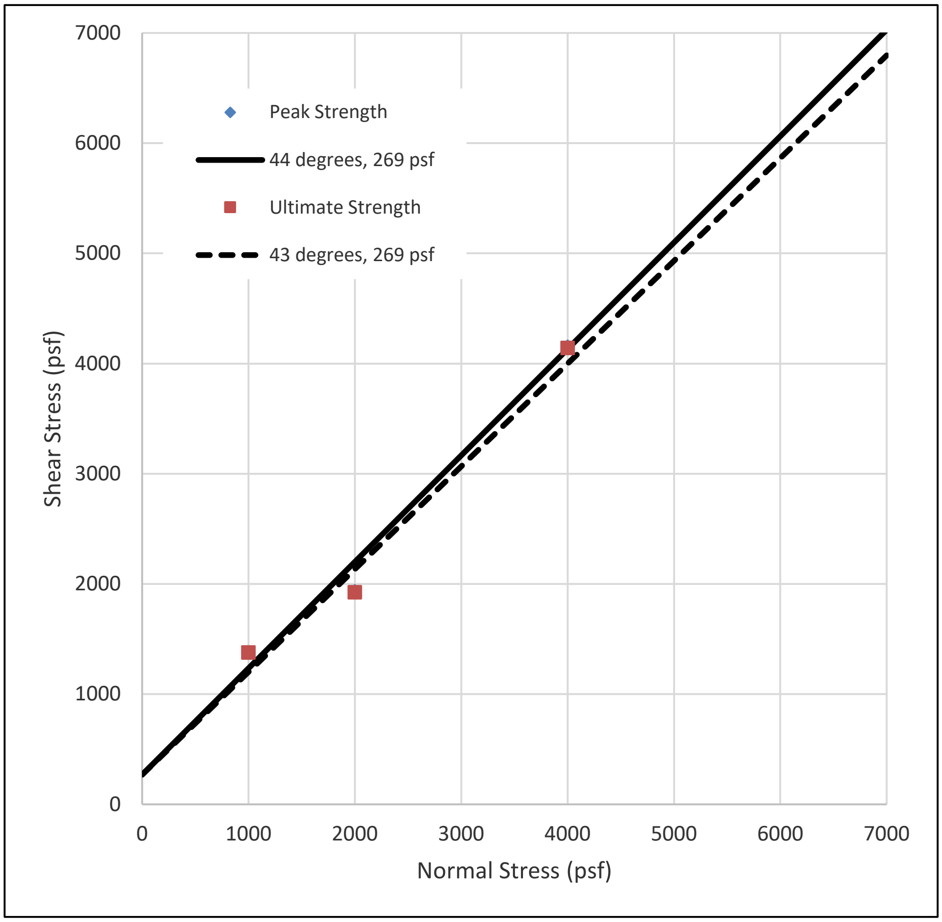
Water-soluble sulfate (SO_4^{2-}) in soil, percent by weight	**Exposure Severity**	**Exposure Class**	**Cement Type (ASTM C150)**	**Max. w/cm**	**Min. f_c' (psi)**
$SO_4^{2-} < 0.10$	Not applicable	S0	No type restriction	N/A	2,500
$0.10 \leq SO_4^{2-} < 0.20$	Moderate	S1	II	0.50	4,000
$0.20 \leq SO_4^{2-} < 2.00$	Severe	S2	V	0.45	4,500
$SO_4^{2-} > 2.00$	Very Severe	S3	V plus pozzolan or slag cement	0.45	4,500

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	EMW	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-10

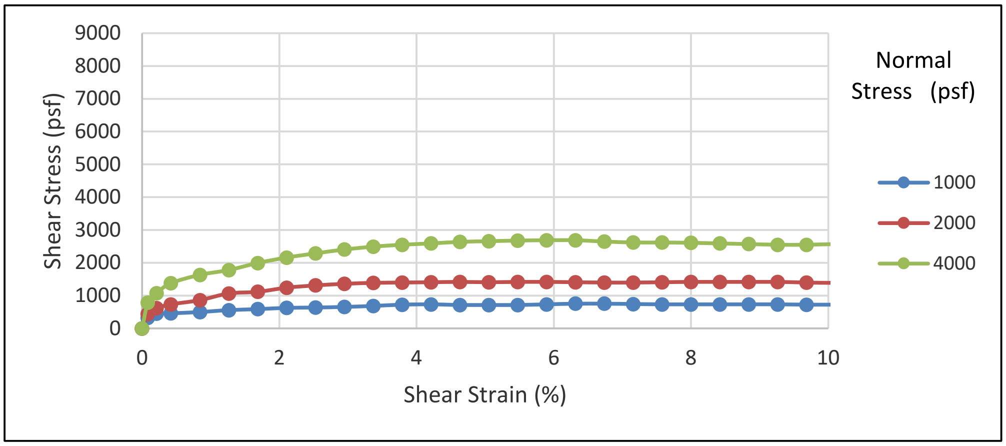


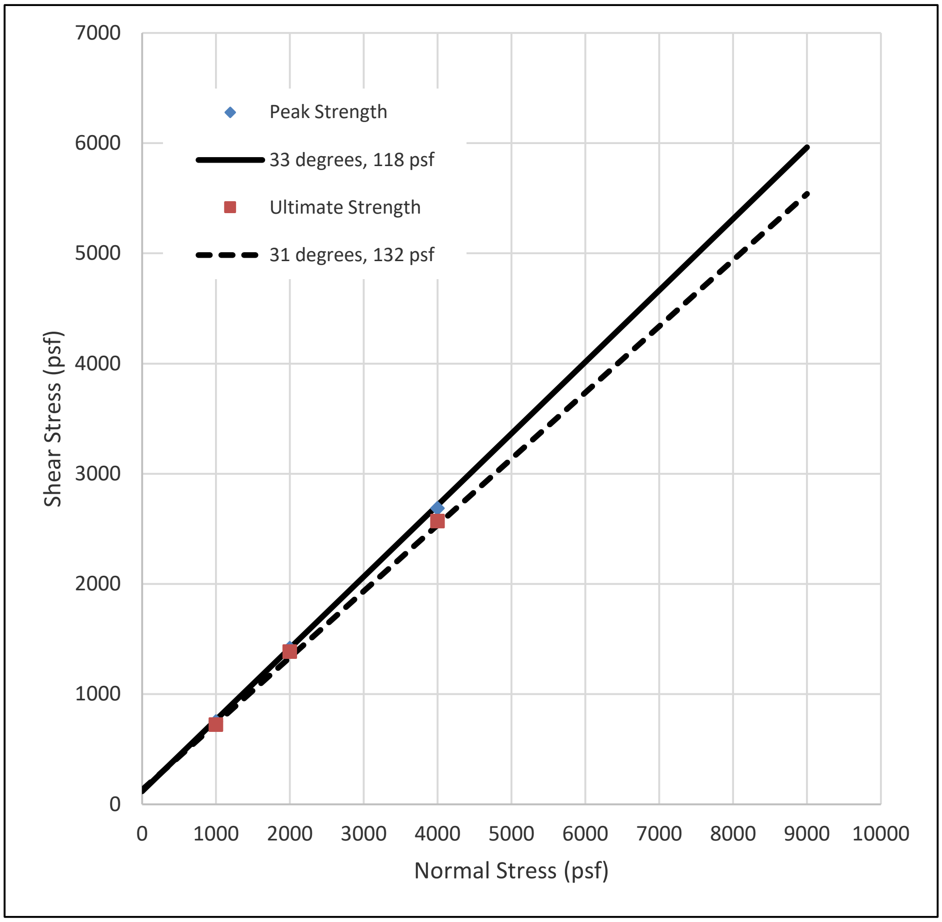


			Peak	Ultimate
SAMPLE ID:	B-1 at 6 to 6½ feet	Φ	44 °	43 °
		c	269 psf	269 psf
Silty Sandstone			Initial	Final
NOTES:	Insitu	γ_d	106.9 pcf	109.9 pcf
Strain Rate: 0.003 in/min		w_c	10.7 %	18.3 %
Sample was consolidated and drained		Saturation	51 %	87 %

SCST, LLC

Proposed Lys Residences La Jolla, California			
By:	SR	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-11





SAMPLE ID: B-1 at 17 to 17 ½ feet

Clayey Sandstone

NOTES: Insitu

Strain Rate: 0.003 in/min

Sample was consolidated and drained

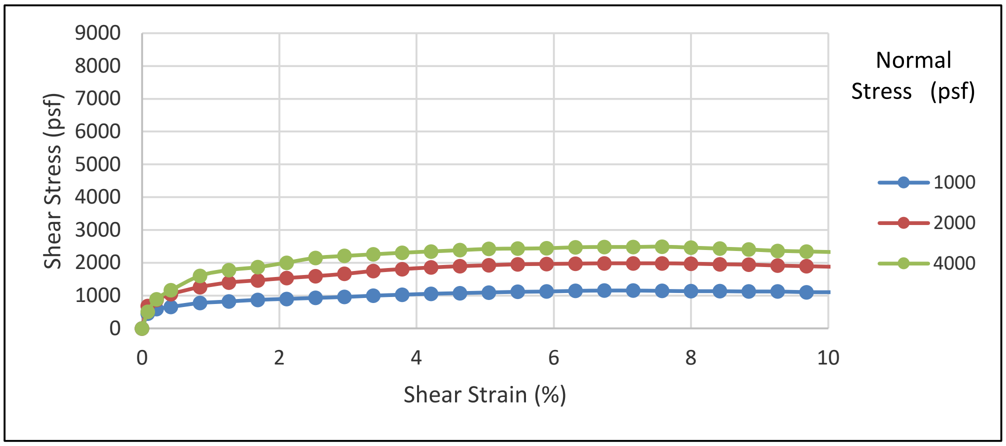
	Peak	Ultimate
Φ	33 °	31 °
c	118 psf	132 psf

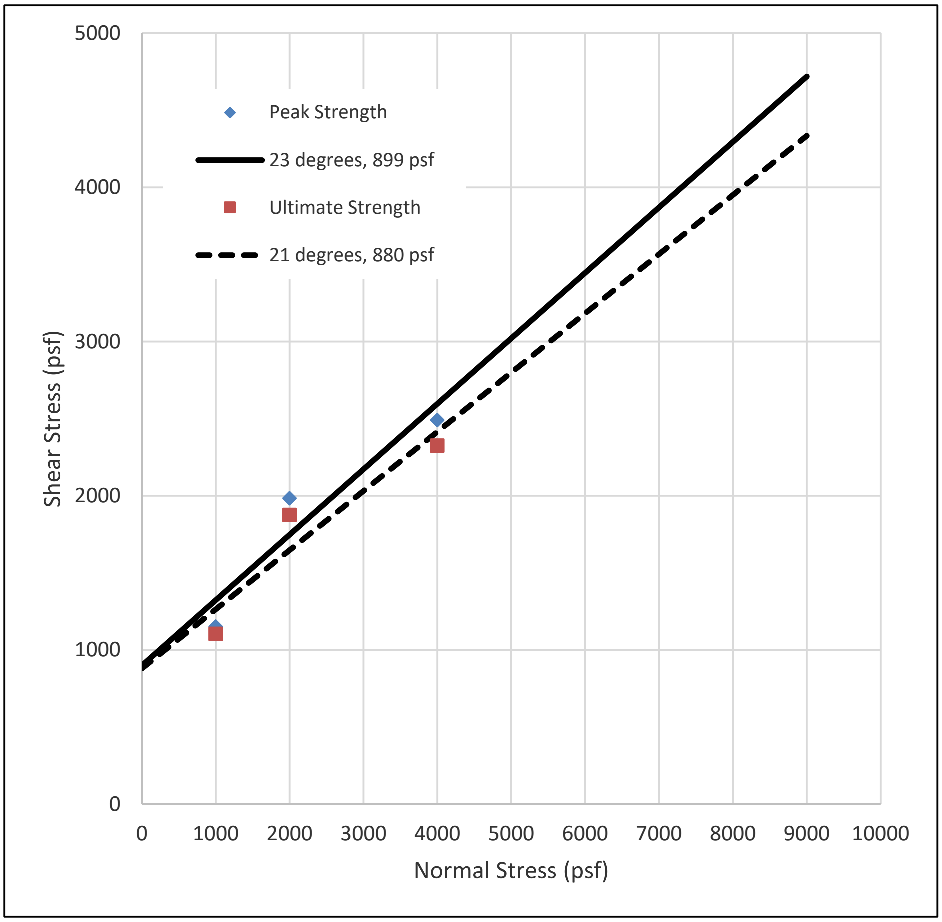
	Initial	Final
γ_d	108.8 pcf	111.8 pcf
w_c	15.0 %	20.0 %
Saturation	75 %	100 %

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	SR	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-12





SAMPLE ID: B-1 at 25 to 25½ feet

Claystone

NOTES: Insitu

Strain Rate: 0.003 in/min

Sample was consolidated and drained

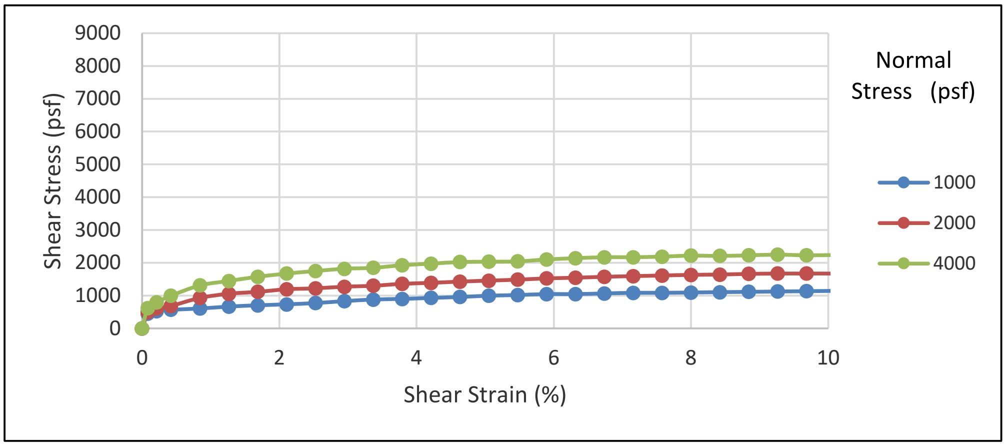
	Peak	Ultimate
Φ	23 °	21 °
c	899 psf	880 psf

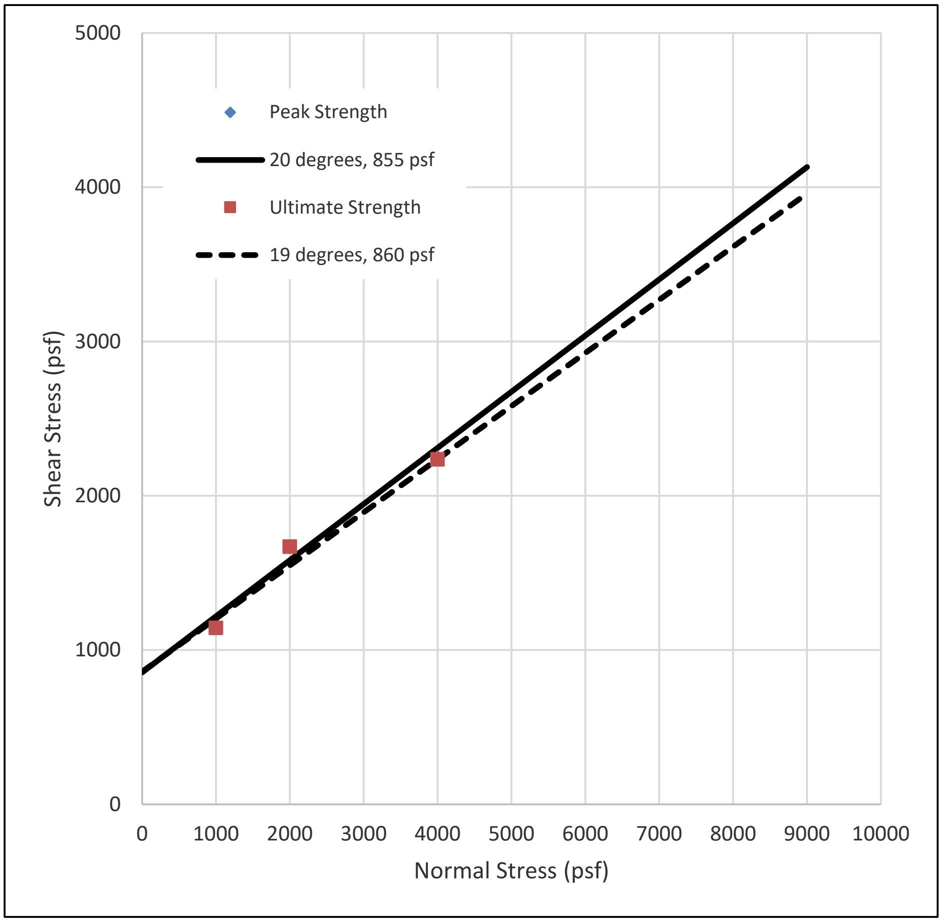
	Initial	Final
γ_d	97.9 pcf	100.6 pcf
w_c	21.3 %	29.0 %
Saturation	80 %	100 %

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	SR	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-13





SAMPLE ID: B-1 at 30½ to 31 feet

Claystone

NOTES: Insitu

Strain Rate: 0.003 in/min

Sample was consolidated and drained

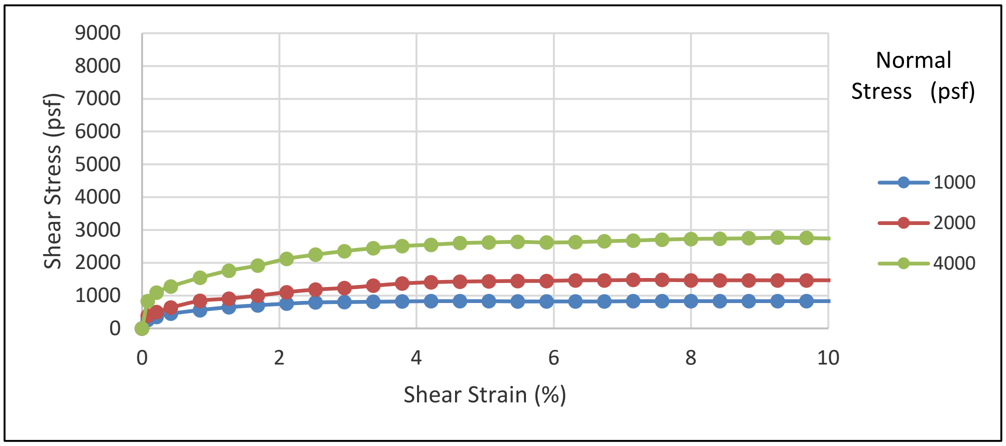
	Peak	Ultimate
Φ	20 °	19 °
c	855 psf	860 psf

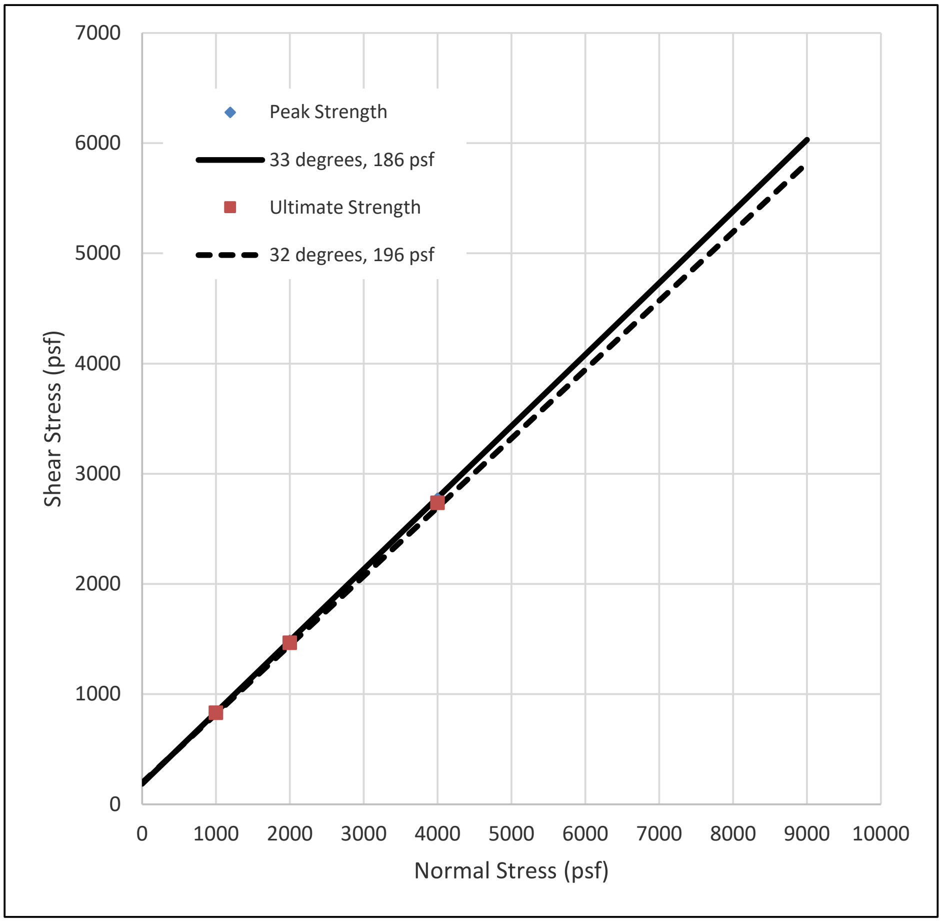
	Initial	Final
γ_d	100.4 pcf	103.2 pcf
w_c	19.0 %	30.3 %
Saturation	76 %	100 %

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	SR	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-14





SAMPLE ID: B-1 at 40½ to 41 feet

Sandy Claystone

NOTES: Insitu

Strain Rate: 0.003 in/min

Sample was consolidated and drained

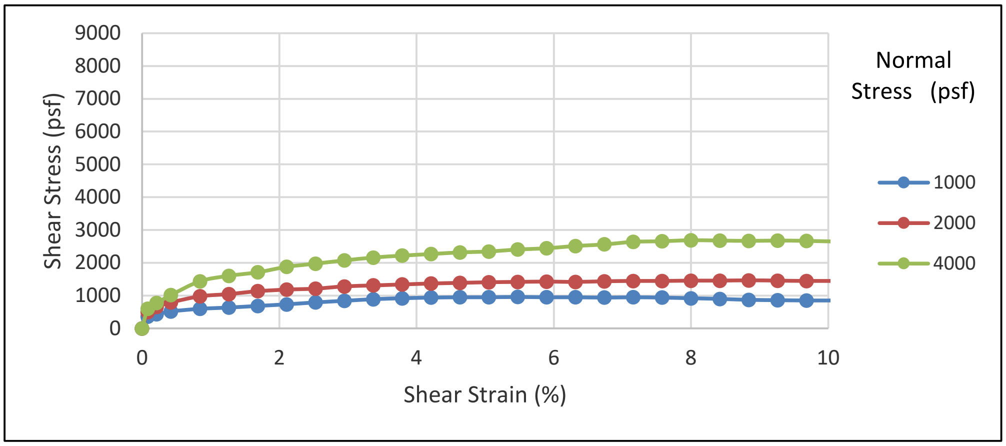
	Peak	Ultimate
Φ	33 °	32 °
c	186 psf	196 psf

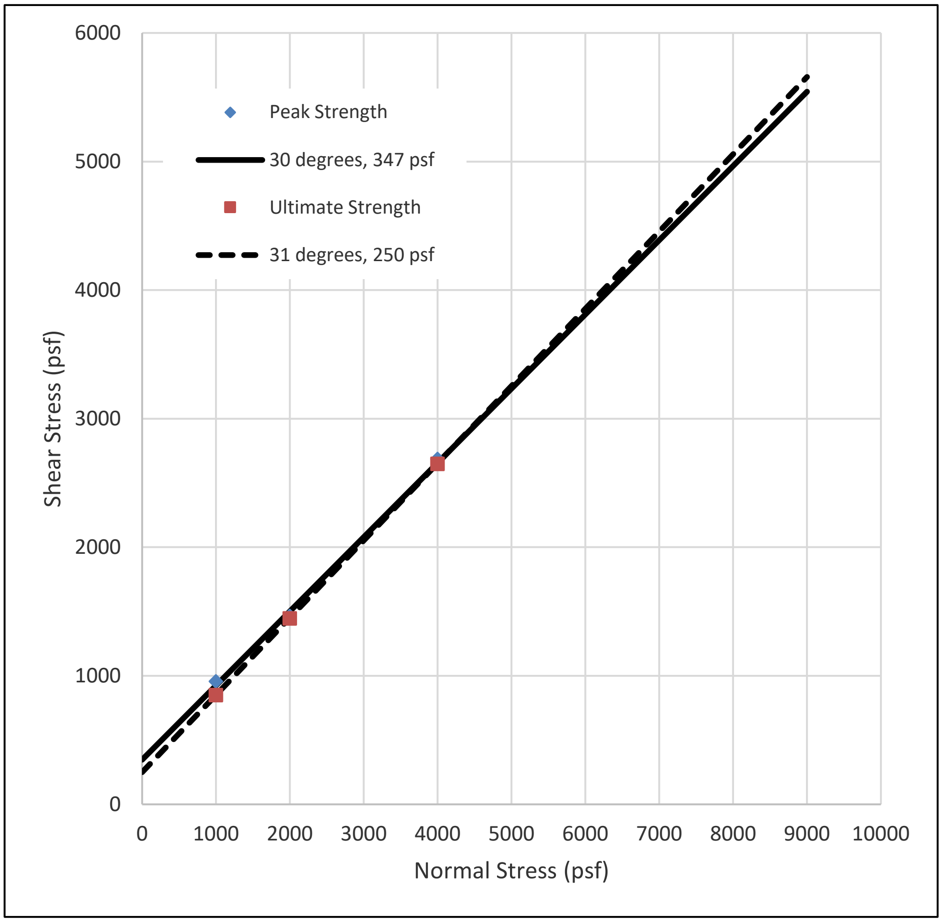
	Initial	Final
γ_d	114.4 pcf	117.5 pcf
w_c	10.6 %	15.2 %
Saturation	62 %	88 %

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	SR	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-15





SAMPLE ID: B-1 at 50 to 50½ feet

Clayey Sandstone

NOTES: Insitu

Strain Rate: 0.003 in/min

Sample was consolidated and drained

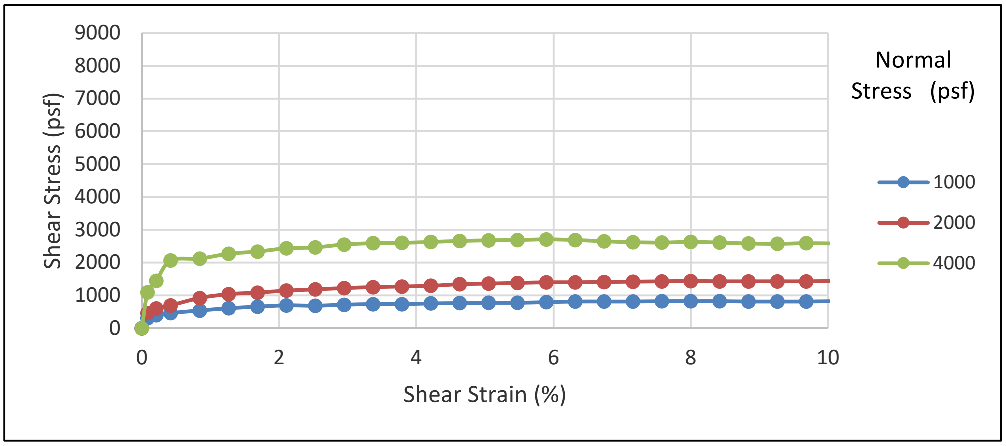
	Peak	Ultimate
Φ	30 °	31 °
c	347 psf	250 psf

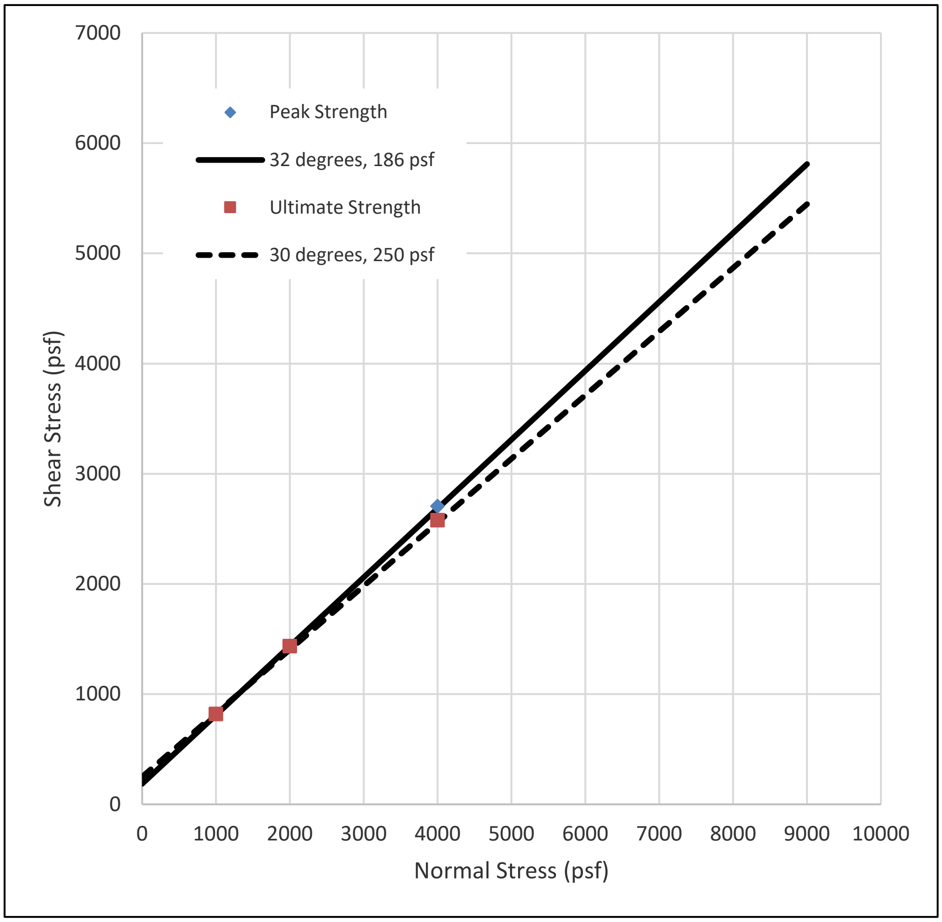
	Initial	Final
γ_d	98.7 pcf	101.4 pcf
w_c	4.7 %	10.3 %
Saturation	18 %	40 %

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	SR	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-16





SAMPLE ID: B-1 at 60 to 60½ feet

Sandy Claystone

NOTES: Insitu
Strain Rate: 0.003 in/min
Sample was consolidated and drained

	Peak	Ultimate
Φ	32 °	30 °
c	186 psf	250 psf

	Initial	Final
γ_d	98.7 pcf	101.4 pcf
w_c	4.7 %	10.3 %
Saturation	18 %	40 %

SCST, LLC

Proposed Lys Residences
La Jolla, California

By:	SR	Date:	June, 2019
Job Number:	180385N-04	Figure:	II-17

APPENDIX III

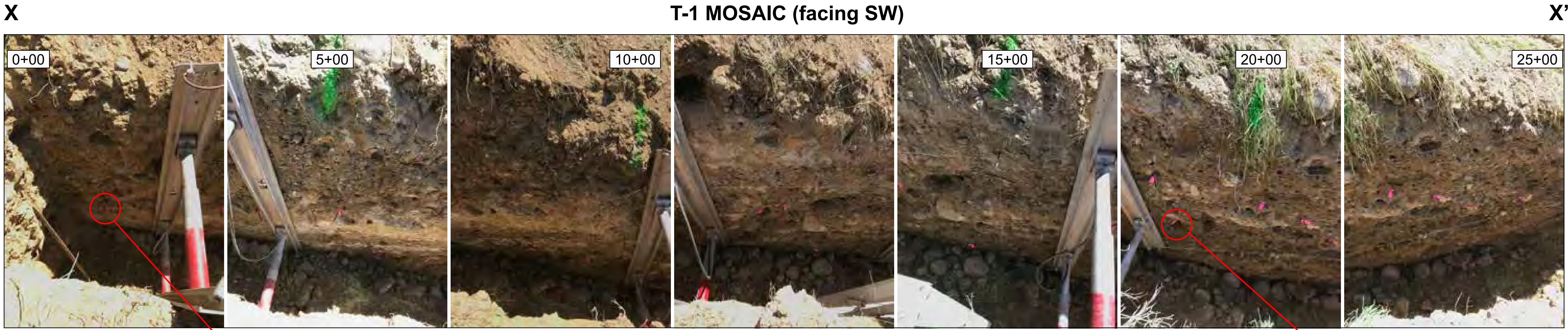
APPENDIX III
FAULT RUPTURE HAZARD ANALYSIS

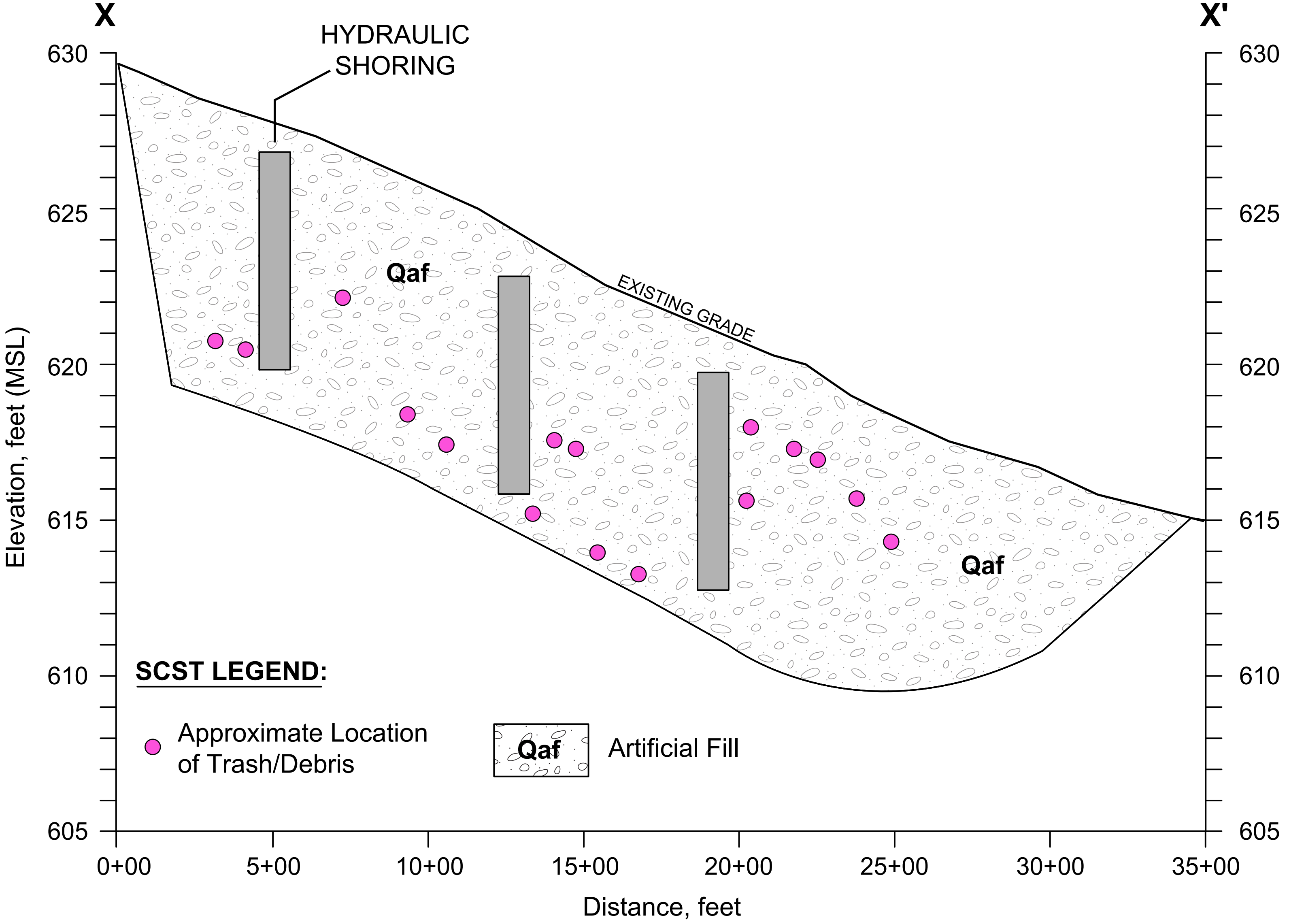
SCST evaluated the fault rupture hazard potential at the site on April 1 through April 4, 2019 by excavating a total of two exploratory trenches (T-1 and T-2) and two exploratory test pits (TP-1 and TP-2) across the site. The trenches and test pits were excavated using a rubber-tire backhoe with a 24-inch bucket. The trenches and test pits varied in length from approximately 5 to 35 feet, and in depth from approximately 3 to 10 feet below existing ground surface. The trenches were supported with hydraulic shoring prior to personnel entering the excavation. The fault was also observed in Boring B-2. The trenches were visually logged by our geologist. Graphic logs of the trenches, test pits, and SCST Boring B-2 (2019) are presented on Plates 1 through 4.

PLATES

Plate 1 .... Trench T-1 Log and Photographs
Plate 2 .... Trench T-2 Log and Photographs
Plate 3 .... Test Pit TP-1 Log and Photograph
Plate 4 .... Boring 2 Log and Photographs

T-1 MOSAIC (facing SW)



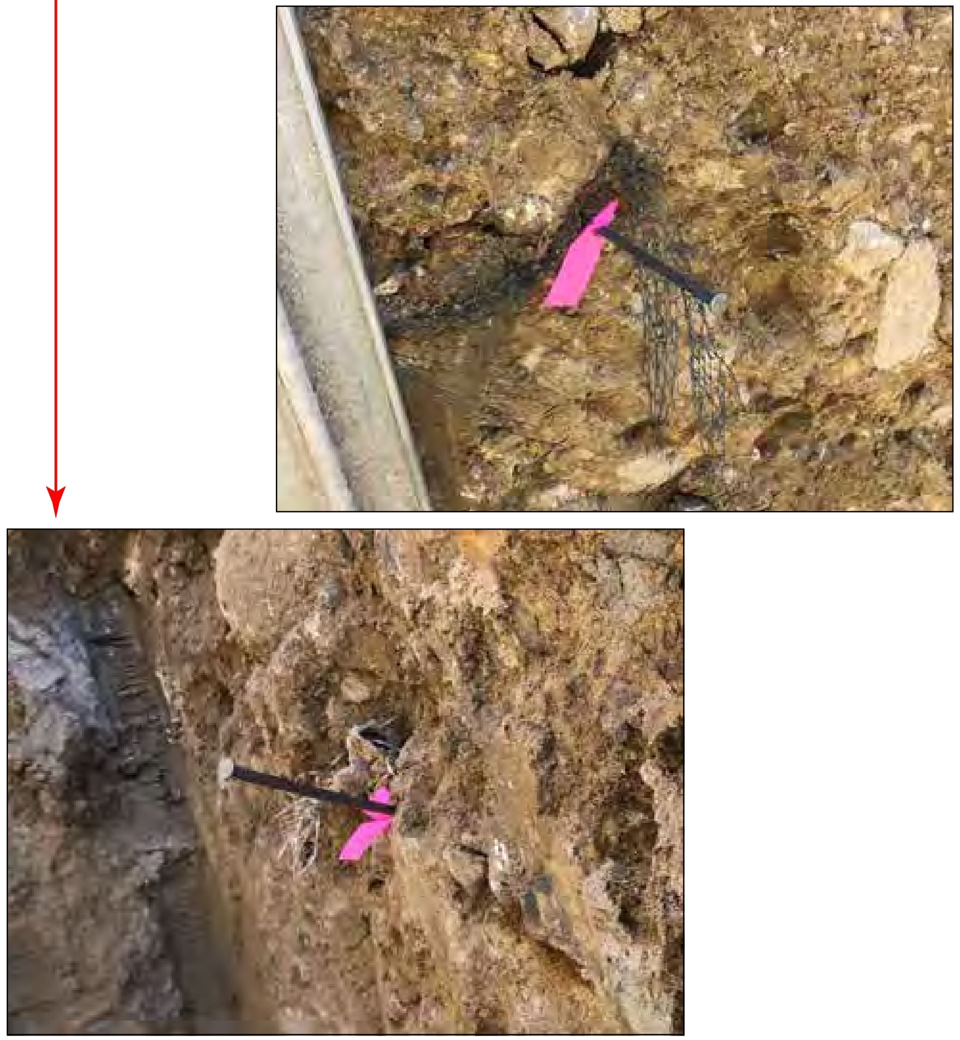


T-1 TRENCH LOG

SCALE

1" = 5'

NOTE: All Locations are Approximate



Examples of trash/debris in fill.

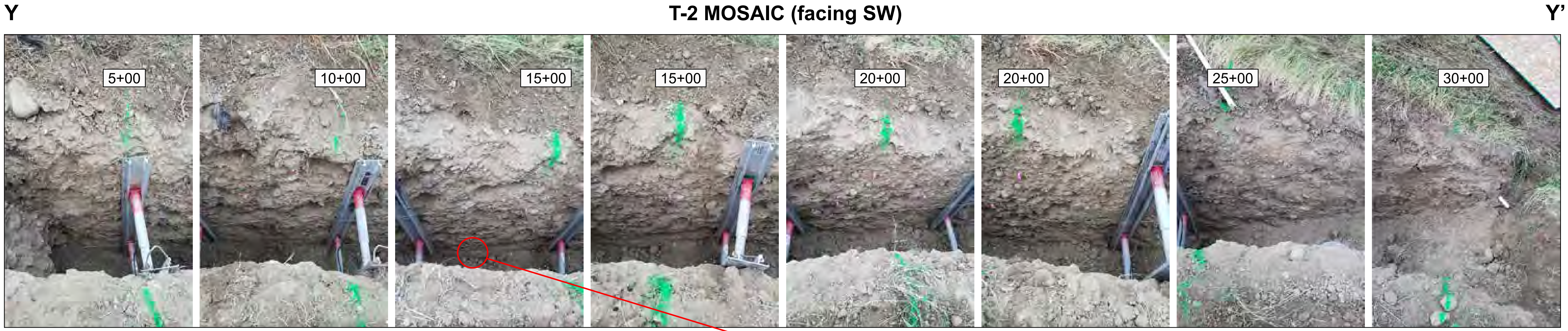
Date: June, 2019
By: EMW
Job No.: 180385N-04

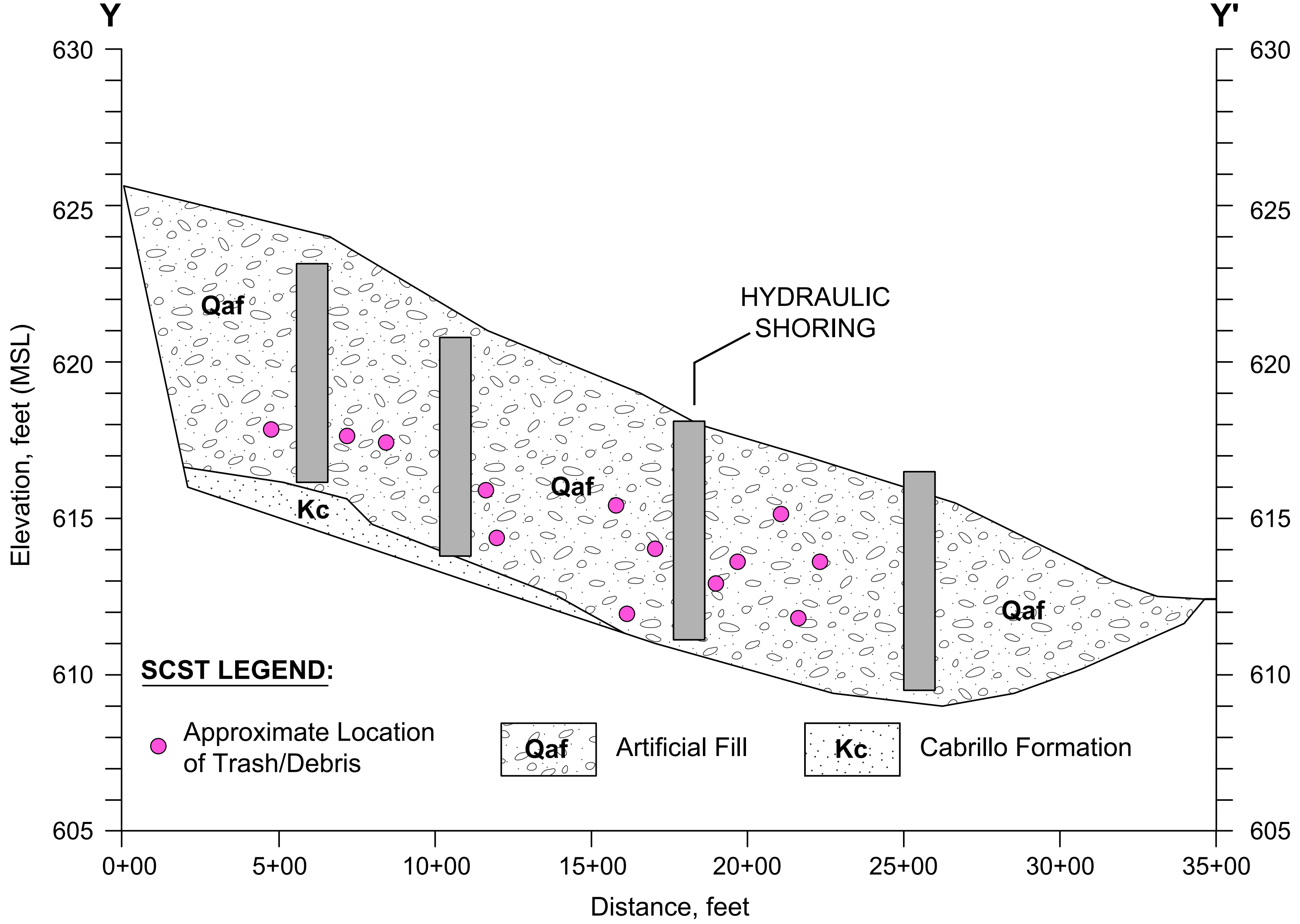
TRENCH T-1 LOG AND PHOTOGRAPHS
Proposed Lys Residences
La Jolla, California

SCST, LLC

Plate:
1

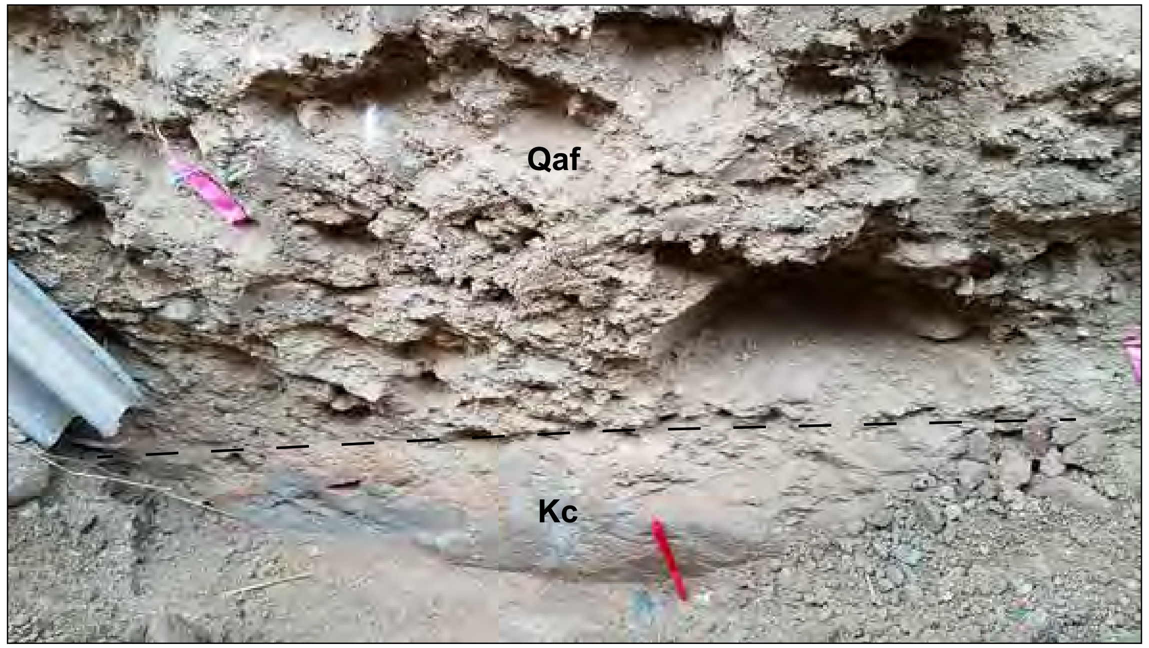
T-2 MOSAIC (facing SW)





T-2 TRENCH LOG

SCALE
1" = 5'



Contact between Fill and the Cabrillo Formation.

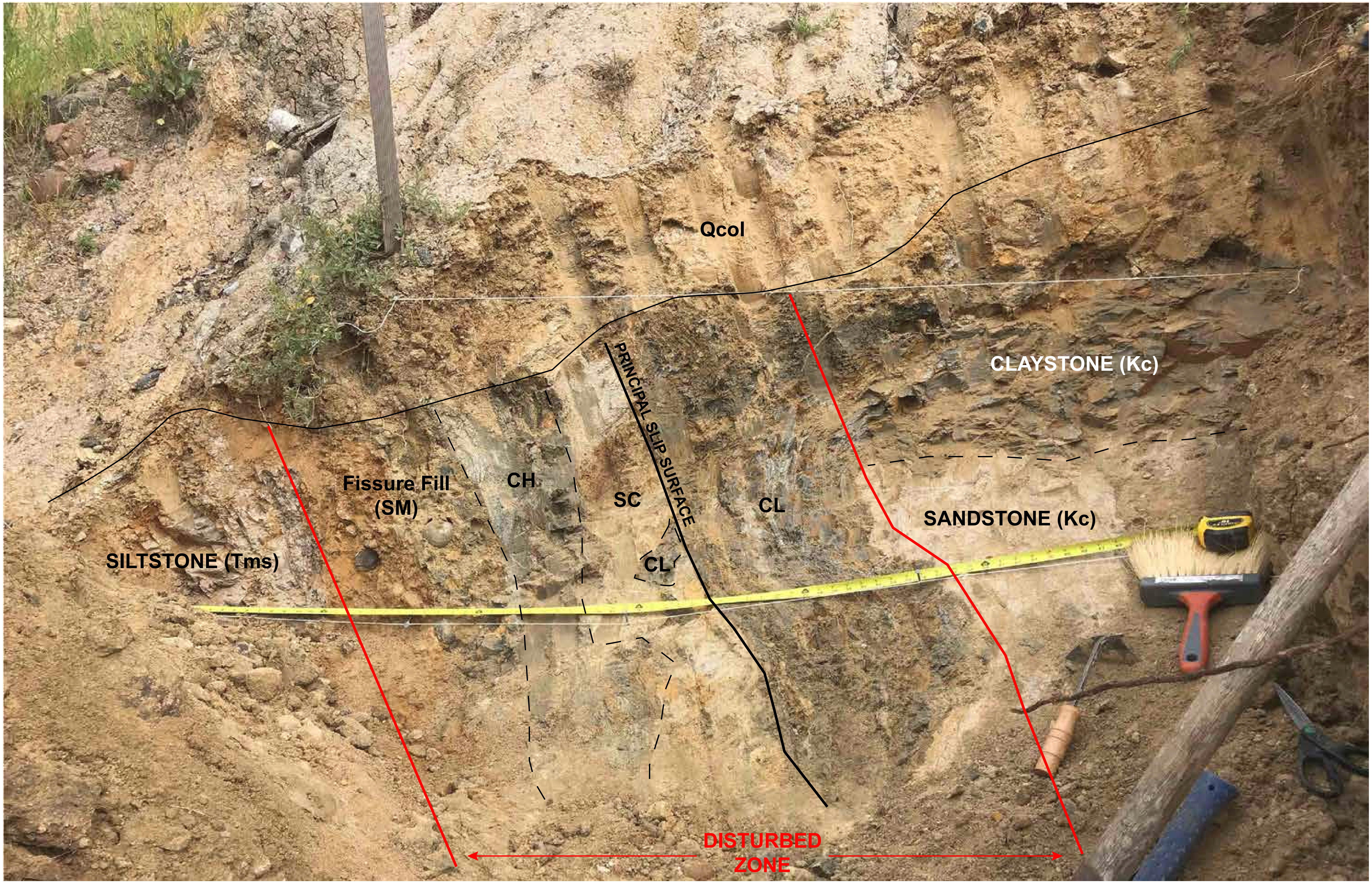
NOTE: All Locations are Approximate

Date: June, 2019
By: EMW
Job No.: 180385N-04

TRENCH T-2 LOG AND PHOTOGRAPHS
Proposed Lys Residences
La Jolla, California

SCST, LLC

Plate:
2



Legend as per Figure 4 in report.

Date: June, 2019
By: EMW
Job No.: 180385N-04

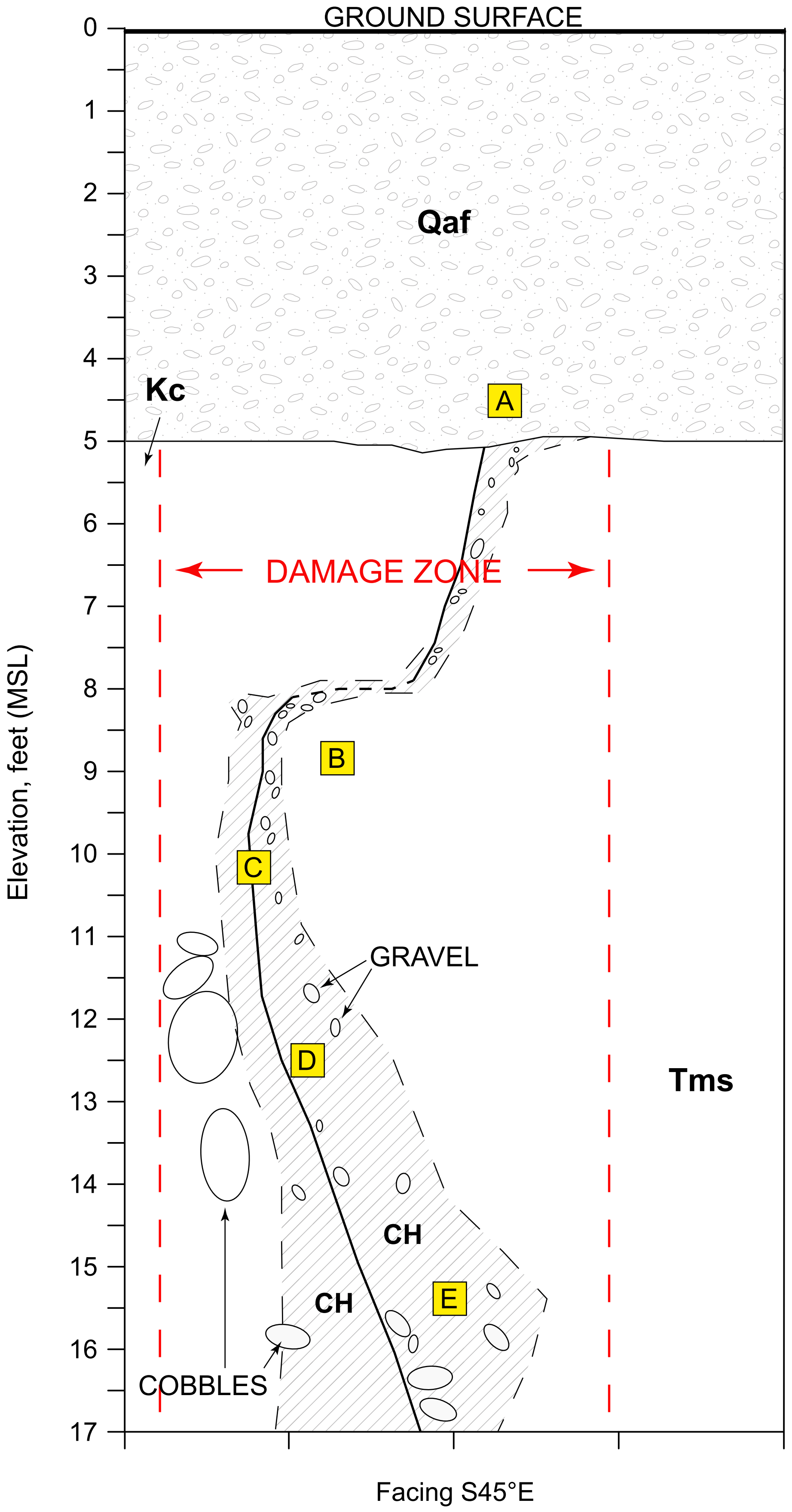
TEST PIT TP-1 LOG AND PHOTOGRAPH

Proposed Lys Residences
La Jolla, California

SCST, LLC

Plate:
3

B-2 GRAPHIC LOG



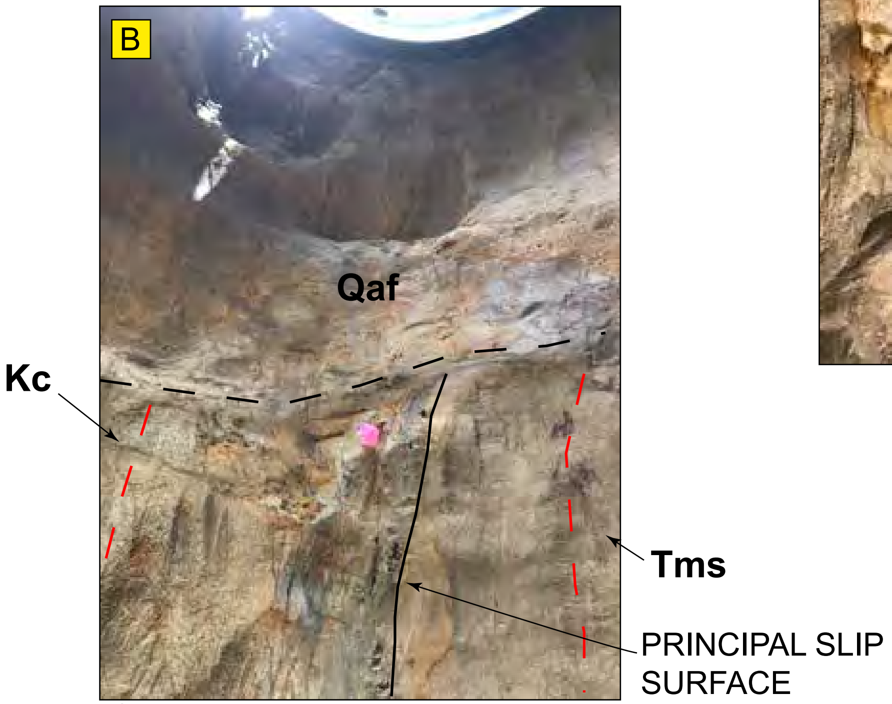
Legend as per Figure 4 in report.

NOTE: All Locations are Approximate

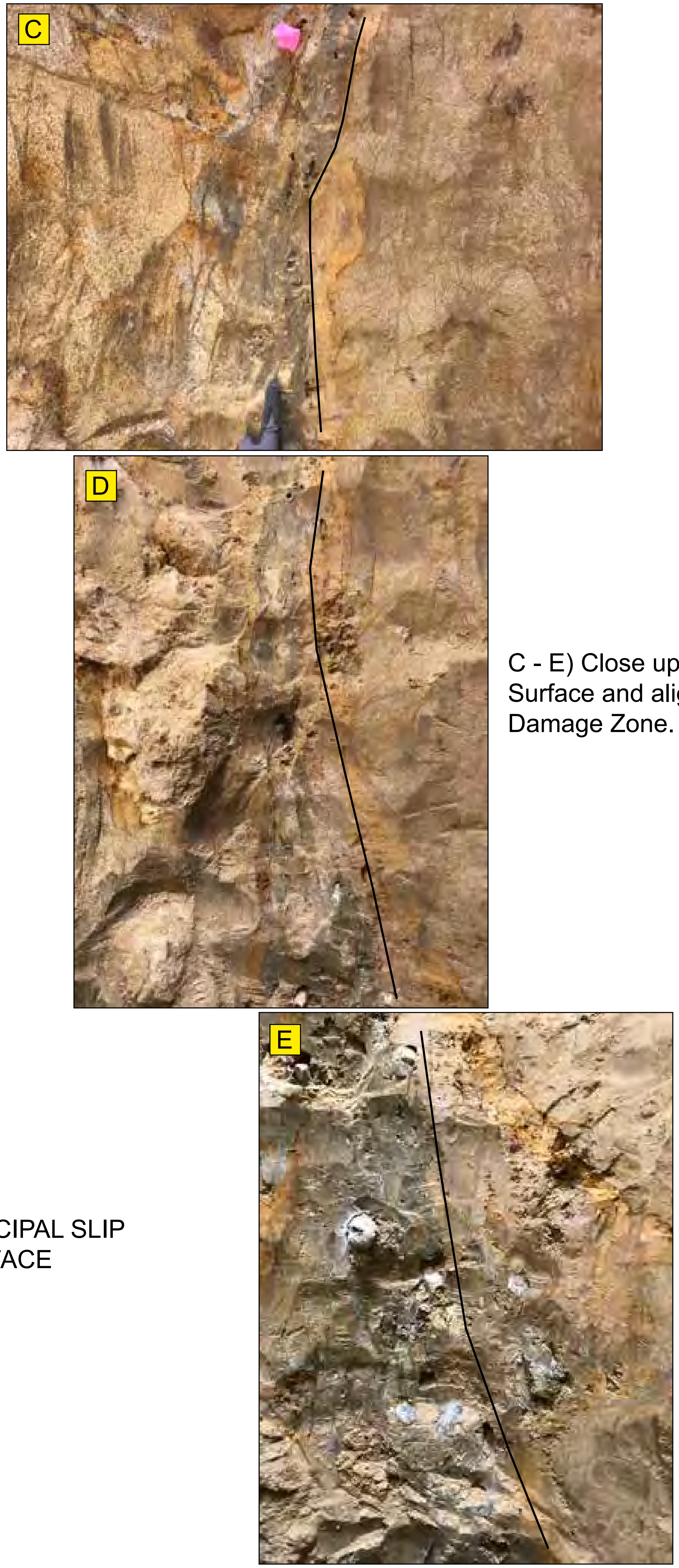
SCALE

1" = 2'

A) Looking downard towards Artificial Fill materials.



B) Looking upward towards contact beween Artificial Fill materials and Damage Zone.



C - E) Close up of the Principal Slip Surface and aligned gravels in the Damage Zone.

Date: June, 2019
By: EMW
Job No.: 180385N-03

BORING B-2 LOG AND PHOTOGRAPHS
Lys Residences
La Jolla, California

SCST, LLC

Plate:
4

APPENDIX IV
PREVIOUS GEOTECHNICAL REPORT DATA

Subdrainage

If wet subgrade condition persist after surface drainage improvements are in place, it may be necessary to install a subsurface "cutoff" drain at the high end of the property. The drain should consist of perforated pipe surrounded with gravel and be wrapped in filter cloth. Any cutoff drains should extend at least six inches into the formation. Our firm should review plans and details prior to installation of any subdrainage systems.

FIELD INVESTIGATION

Four manually excavated test excavations were placed on the site, specifically in areas where representative soil and foundation conditions were expected. Our investigation also included a visual site reconnaissance and performance of a floor survey within the residence interior.

The excavations were visually inspected and logged by our field geologist and samples were taken of the predominant soils throughout the field operation. Test excavation logs have been prepared on the basis of our inspection and the results have been summarized on Figure No. 3A through 3D. The predominant soils have been classified in conformance with the Unified Soil Classification System (refer to Appendix B).

LABORATORY TESTS AND SOIL INFORMATION

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. A brief description of the tests performed is presented below:

CLASSIFICATION: Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System.

EXPANSION INDEX: Expansion Index testing on a remolded sample was performed on a representative sample of the existing clayey subsoil. The test was performed on the portion of the sample passing the #4 standard sieve. The sample was brought to near optimum moisture content. The specimen was then compacted in a 4-inch-diameter mold in two equal layers by means of a tamper, then trimmed to a final height of 1 inch, and brought to a saturation of approximately 50 percent. The specimen was placed in a consolidometer with porous stones at the top and bottom; a total normal load of 12.63 pounds was placed (144.7 psf). The sample was saturated, and the change in vertical movement was recorded until the rate of expansion became nominal. The expansion index is reported below as the total vertical displacement.

EXPANSION INDEX TEST RESULTS

Sample Location:	TE 3 @ 1 to 3'
Initial Moisture Content:	12.5 %
Initial Dry Density:	108
Final Moisture Content:	25%
Expansion Index:	77
CBC Classification:	Medium

CONSTRUCTION NOTES

It is the responsibility of the Owner and/or Contractor to ensure that the recommendations summarized in this report are carried out in the field operations. This firm does not practice or consult in the field of safety engineering. We do not direct the Contractor's operations, and we cannot be responsible for the safety of Personnel other than our own on the site, the safety of others is the responsibility of the Contractor. The Contractor should notify the Owner if he considers any of the recommended actions presented herein to be unsafe.

LIMITATIONS

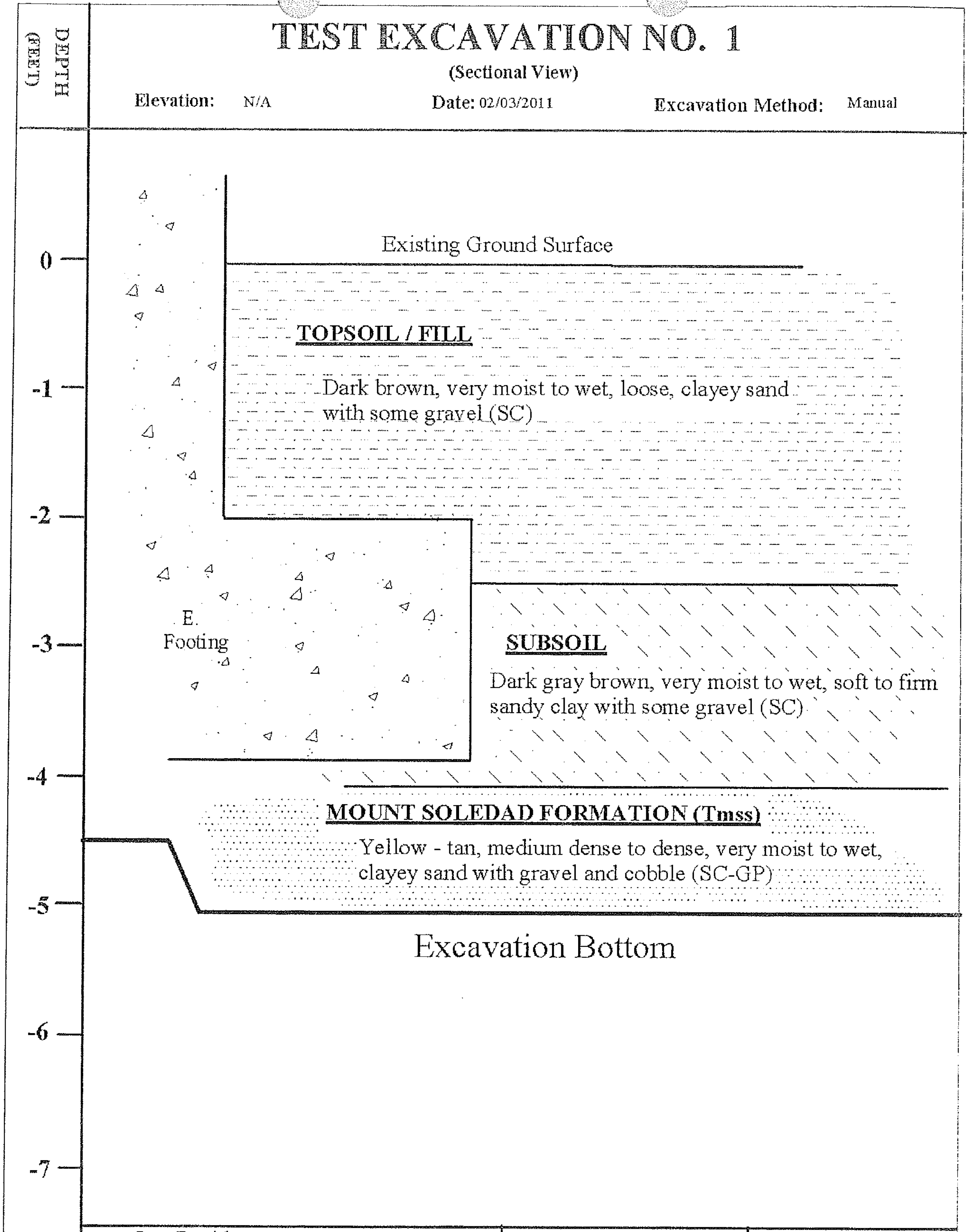
It is recommended that *C.W. La Monte Company Inc.* be retained to provide continuous soil engineering services during the construction operations. This is to verify compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

The recommendations and opinions expressed in this report reflect our best estimate of the project requirements based on an evaluation of the subsurface soil conditions encountered at the subsurface exploration locations and on the assumption that the soil conditions do not deviate appreciably from those encountered. It should be recognized that the performance of the foundations may be influenced by undisclosed or unforeseen variations in the soil conditions that may occur in the intermediate and unexplored areas. Any unusual conditions not covered in this report that may be encountered during site development should be brought to the attention of the Geotechnical Engineer so that he may make modifications if necessary.

TEST EXCAVATION NO. 1

(Sectional View)

Elevation: N/A **Date:** 02/03/2011 **Excavation Method:** Manual



TOPSOIL / FILL

Dark brown, very moist to wet, loose, clayey sand with some gravel (SC)

SUBSOIL

Dark gray brown, very moist to wet, soft to firm sandy clay with some gravel (SC)

MOUNT SOLEDAD FORMATION (Tmss)

Yellow - tan, medium dense to dense, very moist to wet, clayey sand with gravel and cobble (SC-GP)

Lys Residence,
7248 Celia Drive, La Jolla, CA

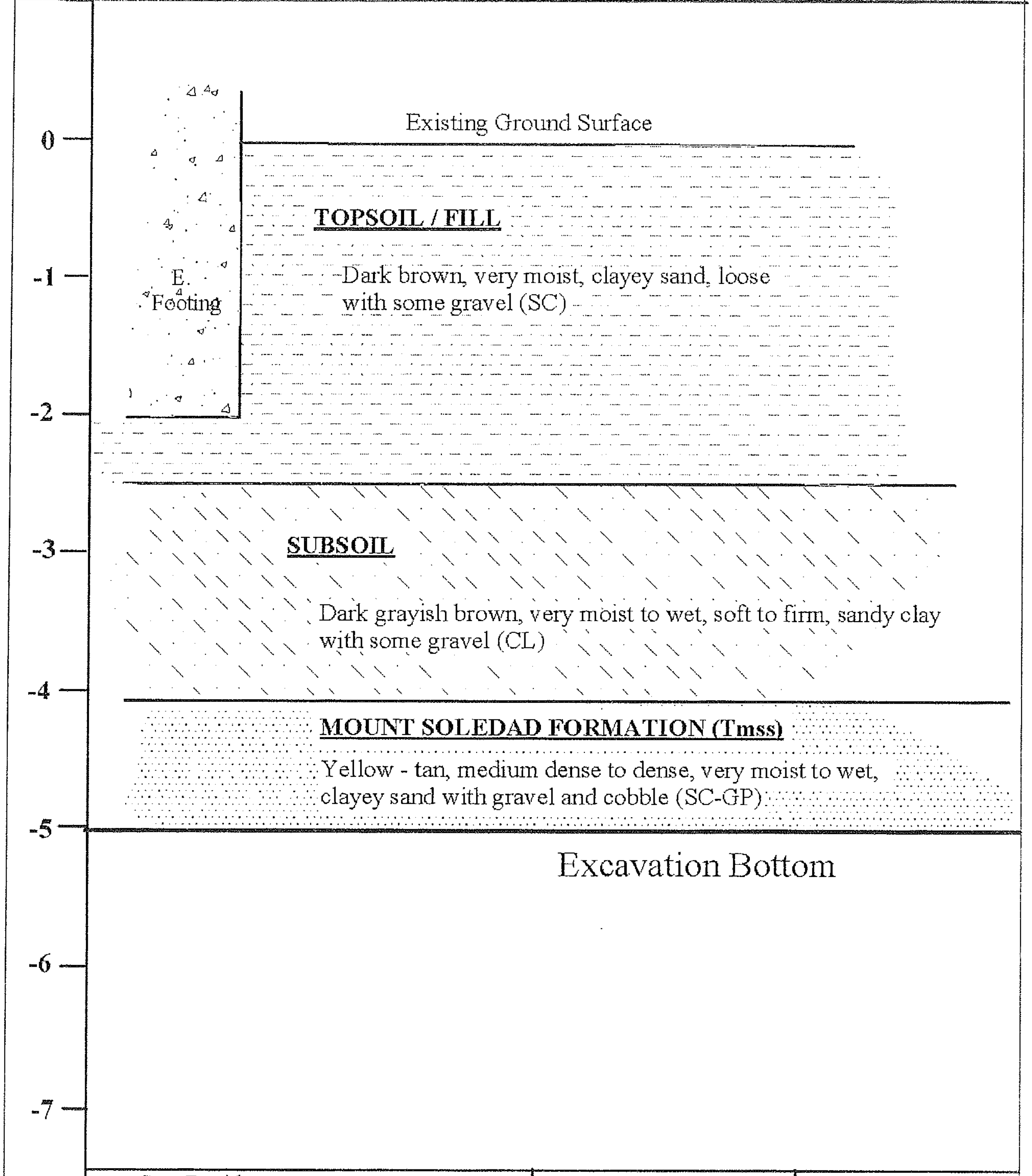
PROJECT NO. 115953

FIGURE NO. 3 A

TEST EXCAVATION NO. 2

(Sectional View)

Elevation: N/A **Date:** 02/03/2011 **Excavation Method:** Manual



TOPSOIL / FILL

Dark brown, very moist, clayey sand, loose with some gravel (SC)

SUBSOIL

Dark grayish brown, very moist to wet, soft to firm, sandy clay with some gravel (CL)

MOUNT SOLEDAD FORMATION (Tmss)

Yellow - tan, medium dense to dense, very moist to wet, clayey sand with gravel and cobble (SC-GP)

Lys Residence,
7248 Celia Drive, La Jolla, CA

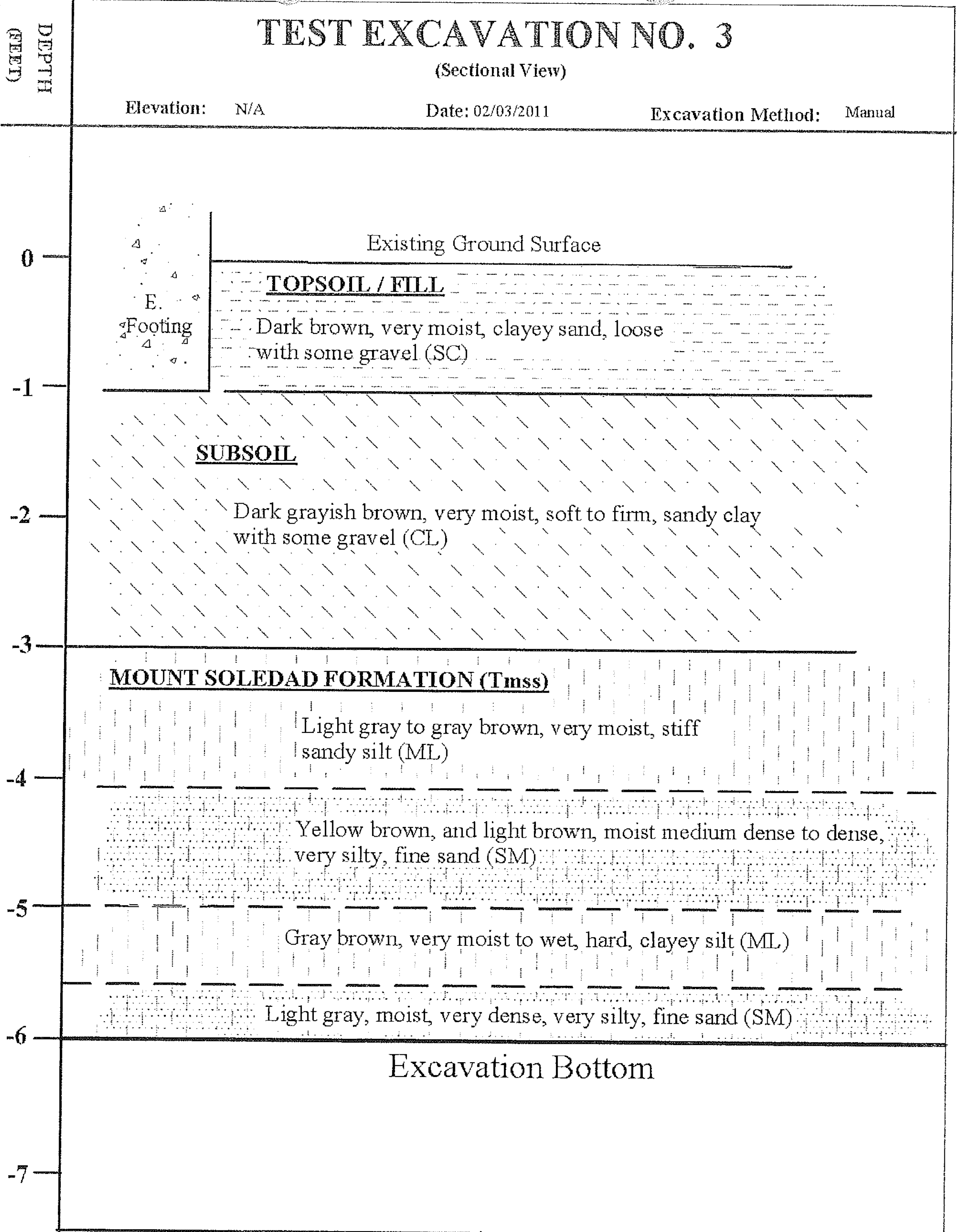
PROJECT NO. 115953

FIGURE NO. 3 B

TEST EXCAVATION NO. 3

(Sectional View)

Elevation: N/A **Date:** 02/03/2011 **Excavation Method:** Manual



TOPSOIL / FILL

Dark brown, very moist, clayey sand, loose with some gravel (SC)

SUBSOIL

Dark grayish brown, very moist, soft to firm, sandy clay with some gravel (CL)

MOUNT SOLEDAD FORMATION (Tmss)

Light gray to gray brown, very moist, stiff sandy silt (ML)

Yellow brown, and light brown, moist medium dense to dense, very silty, fine sand (SM)

Gray brown, very moist to wet, hard, clayey silt (ML)

Light gray, moist, very dense, very silty, fine sand (SM)

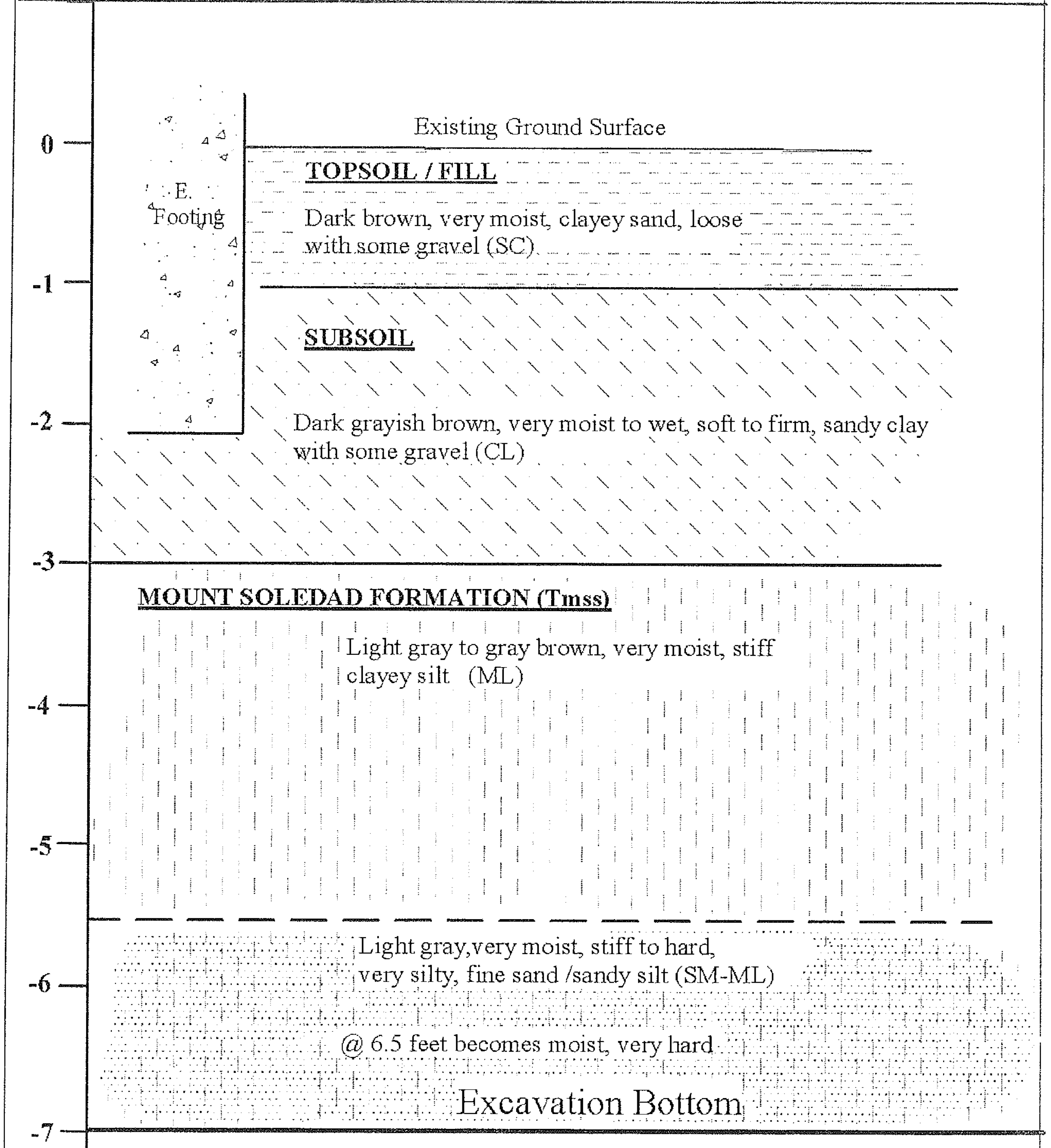
Excavation Bottom

Lys Residence, 7248 Celia Drive, La Jolla, CA	**PROJECT NO. 115953**	**FIGURE NO. 3 C**

TEST EXCAVATION NO. 4

(Sectional View)

Elevation: N/A **Date:** 02/03/2011 **Excavation Method:** Manual



TOPSOIL / FILL

Dark brown, very moist, clayey sand, loose with some gravel (SC)

SUBSOIL

Dark grayish brown, very moist to wet, soft to firm, sandy clay with some gravel (CL)

MOUNT SOLEDAD FORMATION (Tmss)

Light gray to gray brown, very moist, stiff clayey silt (ML)

Light gray,very moist, stiff to hard, very silty, fine sand /sandy silt (SM-ML)

@ 6.5 feet becomes moist, very hard

Excavation Bottom

Lys Residence, 7248 Celia Drive, La Jolla, CA	**PROJECT NO. 115953**	**FIGURE NO. 3 D**

PROJECT NO. 06102-21-01

BORING B 1

ELEV. (MSL.) 649 DATE COMPLETED 5/7/98

EQUIPMENT 30" BUCKET

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0 2				CL	**TOPSOIL** Very stiff, moist, brown, Sandy CLAY and cobbles			
4 6 8 10 12 14				SC	**CABRILLO FORMATION** Medium dense, moist brown, Clayey SAND matrix, Cobble and Pebble CONGLOMERATE			
					-2" thick, hard, brown, sandy siltstone bed, 540W, 15			
16 18	B1-1 ▨				**CABRILLO FORMATION** Dense, moist, light gray to orange brown, SANDSTONE (massive bedding)			
20					-Fracture S40E 65			
22	B1-2 ◪				-Rip up clasts, hard fractured claystone -Concretion			
24					-Possible minor fault or fracture, N25W, vertical			
					BORING TERMINATED AT 25 FEET No Groundwater encountered			

Figure A-1, Log of Boring B 1

ANDRS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL
▨ ... DISTURBED OR BAG SAMPLE
◧ ... STANDARD PENETRATION TEST
◪ ... CHUNK SAMPLE
■ ... DRIVE SAMPLE (UNDISTURBED)
▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 06102-21-01

BORING B 2

ELEV. (MSL.) 606 DATE COMPLETED 5/11/98

EQUIPMENT 30" BUCKET

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					ASPHALT CONCRETE			
					BASE MATERIAL			
2					**FILL** Loose, moist, fine SAND			
4					**MOUNT SOLEDAD FORMATION** Dense, damp, cemented, gray brown to light brown, interbedded, Sandy SILTSTONE and fine SANDSTONE			
6	B2-1			SM		3/6"		
	B2-2							
8					-B-dip S2W, 26			
					Dense, damp, light gray to orange brown, massive to thinly bedded SANDSTONE			
10	B2-3							
12								
14					-Gray siltstone, rip up clasts in well cemented sandstone			
16					-Interbedded at siltstone at 16 feet and few cobbles			
18								
					-B-dip S8E, 35 in sandstone			
20								
					-Contact, sandstone and few cobbles			
22								
24					-Sandstone interbed at 24 feet			
26								
28				ML	-Contact dip 24S15W, sharp and parallel to bedding in siltstone			
					Hard, damp, light gray to orange brown, Clayey SILTSTONE			
30	B2-4					7	115.9	7.8
					Very hard, cemented, gray to orange brown,			

Figure A-2, Log of Boring B 2

ANDRS

SAMPLE SYMBOLS
☐ ... SAMPLING UNSUCCESSFUL
◧ ... STANDARD PENETRATION TEST
■ ... DRIVE SAMPLE (UNDISTURBED)
▩ ... DISTURBED OR BAG SAMPLE
◪ ... CHUNK SAMPLE
▼ ... WATER TABLE OR SEEPAGE

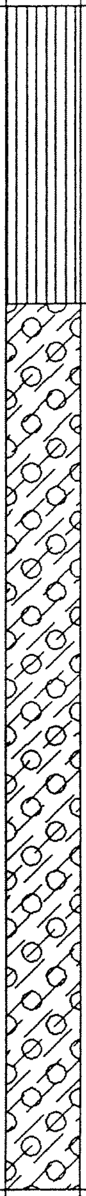
NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 06102-21-01

BORING B 2

ELEV. (MSL.) 606 DATE COMPLETED 5/11/98

EQUIPMENT 30" BUCKET



DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
32					SILTSTONE, thinly bedded -Bedding dip S5E, 2 degrees -Parallel bedding, surfaces on clayey siltstone			
34								
36								
38								
					-Contact siltstone and conglomerate			
40				SP	Dense, damp, light brown, highly cemented SAND and Cobbles -Siltstone clast in conglomerate			
42								
					-Medium well, cemented conglomerate (cobbles with light brown, medium grain matrix, biotite rich) -Contains numerous???? gray siltstone, rip up clasts			
44								
46								
					-Continued medium dense, damp, cobble conglomerate and light brown, micaceous, medium grained sand matrix			
48								
50								
52								
54								
					-Slight bedding at 55 feet			
56								
58								
					-Downhole logged to 58 feet, no caving, no groundwater or seepage			
60					BORING TERMINATED AT 60 FEET No Groundwater encountered			

Figure A-3, Log of Boring B 2

ANDRS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL
◧ ... STANDARD PENETRATION TEST
■ ... DRIVE SAMPLE (UNDISTURBED)
▨ ... DISTURBED OR BAG SAMPLE
◩ ... CHUNK SAMPLE
▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Selected soil samples were tested for their in-place dry density and moisture content, maximum dry density and optimum moisture content, expansion potential, consolidation and shear strength characteristics.

The results of our laboratory tests are presented below on Tables B-I through B-III. The in-place dry density and moisture content results are indicated on the boring logs.

TABLE B-I
SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS

Sample No.	Description	Maximum Dry Density (pcf)	Optimum Moisture Content (% dry wt.)
B1-1	Light gray to brown SAND	121.8	10.8

TABLE B-II
SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS

Sample No.	Dry Density (pcf)	Moisture Content (%)	Unit Cohesion (psf)	Angle of Shear Resistance (degrees)
B2-3	119.8	12.5	650	40

TABLE B-III
SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS

Sample No.	Moisture Content		Dry Density (pcf)	Expansion Index
	Before Test (%)	After Test (%)		
B1-1	8.9	24.9	112.0	30

Sheet: 1 of 2

BORING LOG NO.: GK-1

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/Foot)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	% Porosity	% Saturation	Void Ratio	Elevation (Feet)
						Fill (Af): Clayey sand (SC): medium brown; medium dense to dense; mostly fine to medium scattered fragments of clay brick at 3 feet.				
						Residual Soil/Colluvium Qrs/Colluvium (Qrs/Qcol) - Sandy clay (CL): brown; moist; stiff to very stiff; fine to medium sand.				
				5		Lean to fat clay (CL/CH); reddish brown; very stiff' some fine to medium sand.				
						Cabrillo Formation (Kc), Sandstone - Clayey Sand (SC) to poorly sorted Sand (SP); light gray to yellowish brown; moist; medium; dense to dense; fine to medium, C(@8'): N80 W 125, irregular contact.				
				10		Sandstone - Sandy Clay (CL) to Clayey Sand (SC) with gravel and cobbles; moist/stiff; dense; fine to medium with scattered fine to coarse gravel and cobbles to 10 inches; locally with boulders over 12 inches.				
				15						
						Clustered boulders in east side of borehole at 19 feet.				
				20						
						C(@24'): N80E 14S Sandstone - Clayey Sand (SC); gray to yellowish brown; moist; dense; fine to medium.				
				25						
						Zone of cobbles and small boulders in north side of borehole between 28 and 29 feet, pinches out to the south.				
				30						
						C(@31'-32'); N20E 18SE Siltstone/Claystone - Clayey Silt (ML/CL) to Silty Clay (CL/ML): light gray to dark gray; stiff to very stiff. B(@33'): N50E 16SE, 1 to 2 inch thick, medium gray clay bed, overlies 2 inch yellow siltstone bed. C(@34'): N75W 12S				
				35		Sandstone - Clayey Sand (SC): light gray to yellowish brown; medium dense to dense; very fine to fine.				
						S(@37'): N45E 70SE, 1/6 to 1/8 inch clay lining. Mostly light gray below 37.5 feet.				

GeoKinetics
Geotechnical &
Environmental Engineers

Project Name: Lys Slope Stabilization

Project No.:

Sample Types:
- B Bulk Sample
- C Rock Core
- R Ring Sample
- S Standard Split Spoon
- T Tube Sample

Location: Rear Yard - 7248 Encelia Drive, La Jolla, CA
Logged by: CEC
Date Drilled: 9/17/12-9/20/12
Equipment Used: Badger Ring
Ring Type:
Ground Elevation:
Notes:

C = Geologic Contact B = Bedding Plane S = Shear Plane

Sheet: 2 of 2

BORING LOG NO.: GK-1

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/Foot)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	% Porosity	% Saturation	Void Ratio	Elevation (Feet)
						Siltstone rip-up clasts between 42 & 43 feet, locally sheared, with some hard cemented sandstone. B(@42'):N35W 28SW, semi-discontinuous layer of clay with some polished parting surfaces. S(@43'):N50W 53SW, 1/16-inch clay lining.				
				45		C(@45'): N80W 15SW, irregular contact. Siltstone - Clayey Silt (ML/CL): dark gray; gray; moist; very stiff to hard; some polished parting surfaces; local thin beds of fine, very dense sand; mostly discontinuous.				
				50						
						Total Depth = 53 ft Visually logged to 47 feet. Borehole cleaned out to depth of 50 feet and set inclinometer casing. Pore pressure transducers attached to casing at depths of 10, 20, 30 and 50 feet. Borehole backfilled with two-sack sand/cement mix containing 1% bentonite.				
				55						
				60						
				65						
				70						
				75						

GeoKinetics
Geotechnical &
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Location: Rear Yard - 7248 Encelia Drive, La Jolla, CA Logged by: CEC

Date Drilled: 9/17/12-9/20/12 Equipment Used: Badger Ring Ring Type:

Ground Elevation: Notes:

C = Geologic Contact B = Bedding Plane S = Shear Plane

Attachment A

As-Built Grading Plan, Cross-Section & Caisson Depths

LEGEND

AS-GRADED CONDITIONS

ITEM	SYMBOL	ITEM	SYMBOL
Original Topographic Contour (Prior to Construction)	630	Approximate Location of Slope Inclinometer	⊙ SI-3
Existing Topographic Contour After Cut Slope Grading	658	Caisson Supported Reaction Wall (14 CaissonsTotal)	Caisson No. ② ①
Approximate Final Grading Contours	614	250 kip Capacity Tie-Back Anchor (13 Total)	Tie-Back No. 1
Existing Structure	▭	Property Line	— · — · —
Surveyed Spot Elevation	× 640.8	Keyway Excavation With Bottom Elevation	612
Approximate Location of Boring	GK-1	Density Test	17▲

Acf Compacted Fill

Kc Cabrillo Formation (Circled Where Buried)

0 10 20 40 Feet

N

GLENN D. TOFANI R.C.E. NO. 044229 EXPIRES: 6-30-15

4-25-14
DATE

GeoKinetics
Geotechnical & Environmental Engineers
77 Bunsen, Irvine, C.A. 92618
Tel 949.502.5353 Fax 949.502.5354
glenn@appliedgeokinetics.com

GLENN D. TOFANI No. 044229 Exp. 6-30-15 CIVIL

GLENN D. TOFANI No. GE 2496 Exp. 6-30-15 GEOTECHNICAL

PRIVATE CONTRACT

FINAL GRADING PLAN FOR:

7231 ROMERO DRIVE
LA JOLLA, CA 92037

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 5 OF 16 SHEETS

I.O. NO. 24003588
PROJECT NO. 313792

FOR CITY ENGINEER DATE

V.T.M.

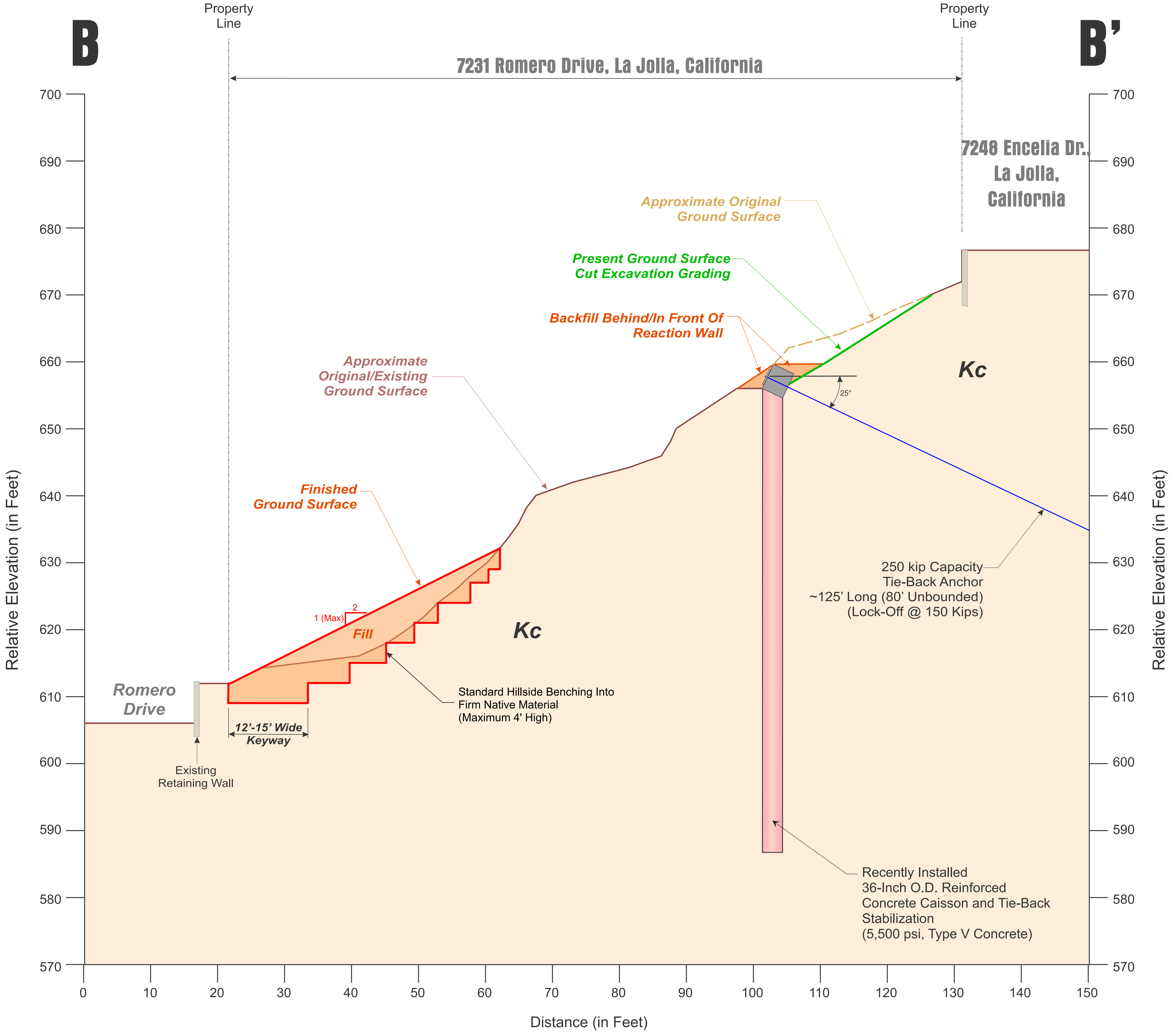
DESCRIPTION	BY	APPROVED	DATE	FILMED
Original	GK			
Rev. 1	GK			
AS–BUILTS				

1886-6249
NAD83 COORDINATES

246-1689
LAMBERT COORDINATES

CONTRACTOR DATE STARTED
INSPECTOR DATE COMPLETED

37406-5-D



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GeoKinetics
Geotechnical & Environmental Engineers
77 Bunsen, Irvine, C.A. 92618
Tel 949.502.5353 Fax 949.502.5354
glenn@appliedgeokinetics.com

No. 044229
Exp. 6-30-15
CIVIL

No. GE 2496
Exp. 6-30-15
GEOTECHNICAL

PRIVATE CONTRACT

CROSS SECTION FOR:

7231 ROMERO DRIVE
LA JOLLA, CA 92037

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 7 OF 16 SHEETS

I.O. NO. 24003588
PROJECT NO. 313792

FOR CITY ENGINEER DATE

V.T.M.

DESCRIPTION	BY	APPROVED	DATE	FILMED
Original	GK			
Rev. 1	GK			
AS–BUILTS				

1886-6249
NAD83 COORDINATES

246-1689
LAMBERT COORDINATES

CONTRACTOR DATE STARTED
INSPECTOR DATE COMPLETED

37406-7.1-D

EMERGENCY SLOPE STABILIZATION
7231 Romero Drive, La Jolla, California

SUMMARY OF CAISSON DRILLING

Caisson No.	Date Drilling Completed	Elevation at Top of Caisson	Minimum Tip Elevation Needed (Depth in Feet)	Actual Tip Elevation Achieved (Depth in Feet)
1	9/13/2013	656.2	598.0* (58.2)	596.0 (60.2)
2	10/21/2013	655.9	598.0* (57.9)	595.0 (60.9)
3	9/13/2013	655.5	598.0* (57.5)	596.5 (59.0)
4	10/21/2013	655.1	598.0* (57.1)	596.0 (59.1)
5	10/4/2013	654.9	589.0** (65.9)	588.5 (66.4)
6	10/21/2013	654.5	588.0** (66.5)	587.5 (67.0)
7	10/4/2013	652.9	587.9** (63.5)	586.0 (66.9)
8	10/22/2013	651.1	584.0** (67.1)	582.1 (69.0)
9	10/4/2013	647.0	583.5** (63.5)	582.5 (64.5)
10	10/22/2013	648.3	582.0** (66.3)	579.3 (69.0)
11	10/4/2013	647.0	580.0** (67.0)	579.5 (67.5)
12	10/22/2013	645.8	580.0** (65.8)	578.0 (67.8)
13	10/4/2013	645.4	580.0** (65.4)	579.5 (65.9)
14	10/23/2013	645.1	580.0** (65.1)	578.0 (67.1)

* per plan
** modified from plan based on geologic observation

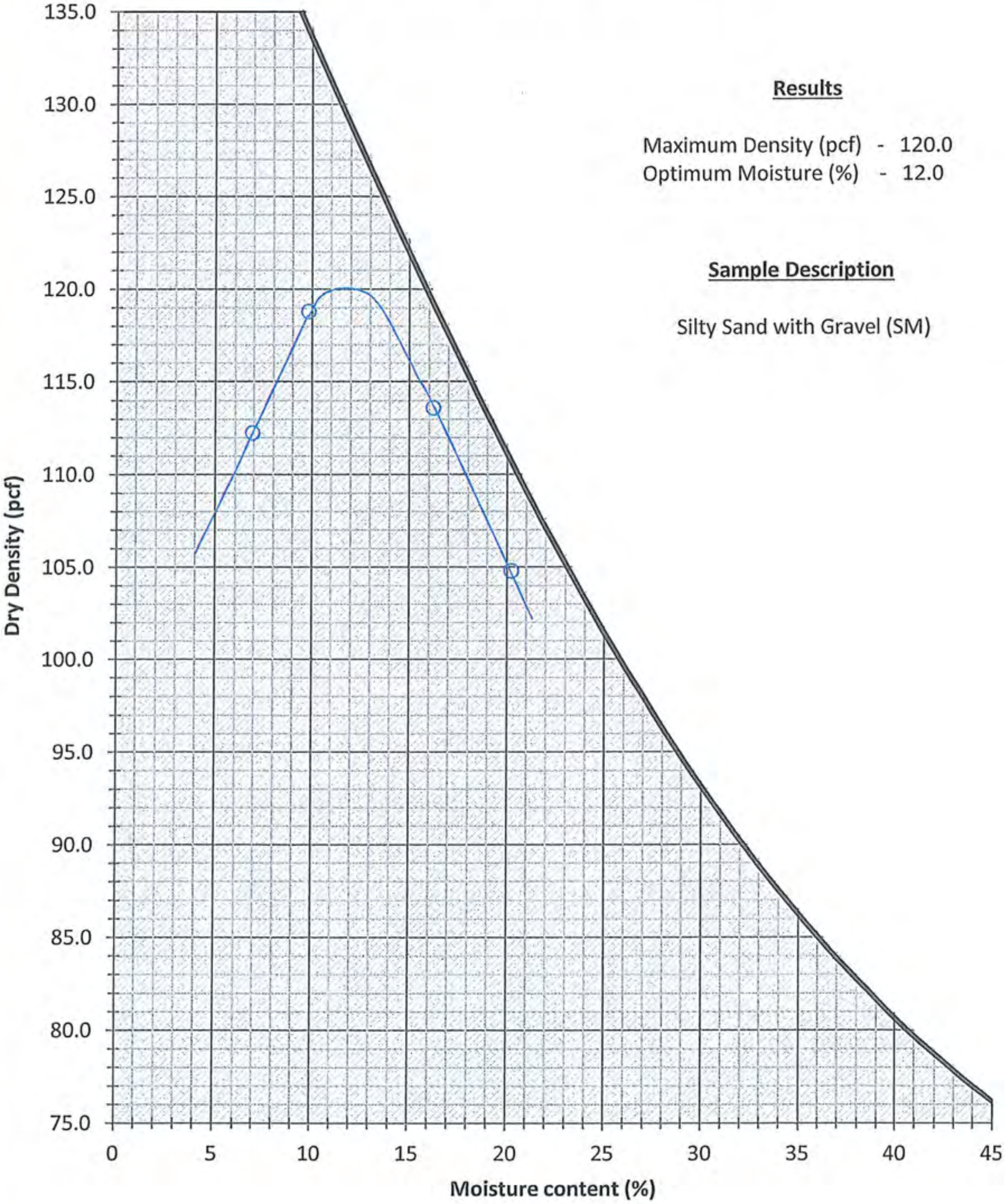
Attachment B

Soil Testing Results

EMERGENCY SLOPE STABILIZATION
7231 Romero Drive, La Jolla, California
SUMMARY OF FIELD DENSITY TESTS

Test No.	Date	Location	Test Depth/Elevation	Test Type	Wet Density (pcf)	Moisture Content (%)	Dry Density (pcf)	Soil Type	Maximum Density (pcf)	Optimum Moisture Content (%)	Compaction (%)	Pass /Fail
1	1/14/2014	Fill Slope	610.0	N	127.9	13.6	112.6	1	120.0	12.0	94	P
2	1/14/2014	Fill Slope	612.0	N	128.0	14.7	111.6	1	120.0	12.0	93	P
3	1/14/2014	Fill Slope	614.0	N	129.6	13.9	113.8	1	120.0	12.0	95	P
4	1/15/2014	Fill Slope	616.0	N	127.9	14.2	112.0	1	120.0	12.0	93	P
5	1/15/2014	Fill Slope	618.0	N	128.2	15.0	111.5	1	120.0	12.0	93	P
6	1/15/2014	Fill Slope	620.0	N	125.4	13.8	110.2	1	120.0	12.0	92	P
7	1/16/2014	Fill Slope	622.0	N	126.0	14.5	110.0	1	120.0	12.0	92	P
8	1/16/2014	Fill Slope	624.0	N	130.2	13.1	115.1	1	120.0	12.0	96	P
9	1/16/2014	Upper Slope Restoration	642.0	N	129.4	15.0	112.5	1	120.0	12.0	94	P
10	1/16/2014	Upper Slope Restoration	644.0	N	128.8	16.0	111.0	1	120.0	12.0	93	P
11	1/17/2014	Upper Slope Restoration	645.0	N	131.0	15.4	113.5	1	120.0	12.0	95	P
12	1/17/2014	Upper Slope Restoration	647.0	N	129.5	13.7	113.9	1	120.0	12.0	95	P
13	1/17/2014	Upper Slope Restoration	650.0	N	129.9	15.2	112.8	1	120.0	12.0	94	P
14	1/20/2014	Upper Slope Restoration	647.0	N	129.4	15.1	112.4	1	120.0	12.0	94	P
15	1/20/2014	Upper Slope Restoration	648.0	N	127.7	14.0	112.0	1	120.0	12.0	93	P
16	1/20/2014	Upper Slope Restoration	654.0	N	131.3	14.4	114.8	1	120.0	12.0	96	P
17	1/20/2014	Upper Slope Restoration	656.0	N	130.1	14.1	114.0	1	120.0	12.0	95	P

Maximum Density Graph



Results

Maximum Density (pcf) - 120.0
Optimum Moisture (%) - 12.0

Sample Description

Silty Sand with Gravel (SM)

SAMPLE:	Site excavations	7231 Romero Dr, La Jolla
DEPTH:	Stockpile	
DATE:	1/14/2014	
GeoKinetics		

Direct Shear Test Data

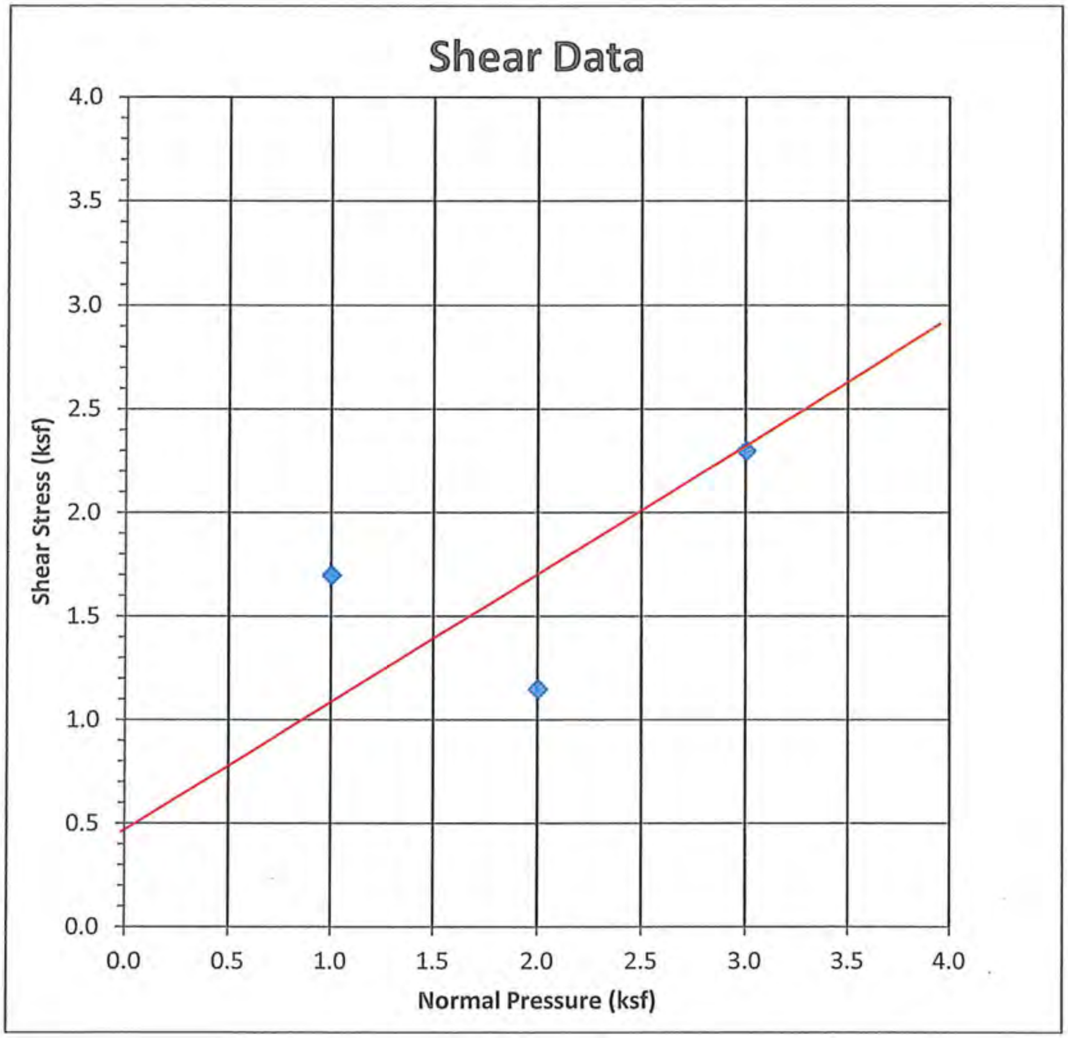
Job: Lys - La Jolla
Location: Slope re-compaction
Hole Number: slope backfill
Sample Depth: Surface
Date: 4/4/2014

Angle of Int.Friction: 31 Deg
Cohesion: 450 psf
Dry Density: 111.3 pcf
Initial Moisture: 0.1
Final Moisture:

[✓ Remolded] / Undisturbed

Notes:

Normal Pressure (ksf)	Peak (ksf)	Ultimate (ksf)	
1.0	2.20	1.70	
2.0	1.25	1.15	
3.0	2.40	2.30	
4.0			



Attachment C

Slope Stability Analyses

GeoKinetics
Geotechnical &
Environmental Engineers

77 Bunsen
Irvine, CA 92618

Tel 949.502.5353, Fax 949.502-5354
E-Mail: geokinetics@appliedgeokinetics.com

Evaluation of Surficial Stability
2:1 Fill Slope at 7231 Romero Drive
Emergency Slope Stabilization Project

The approximately 20-foot high, 2:1 (horizontal to vertical) fill slope at the base of the natural slope above Romero Drive was constructed to accommodate the soils generated during caisson drilling and cut slope excavation. The fill soils were conditioned to near optimum moisture content and compacted to a minimum of 90 percent relative compaction with respect to the maximum dry density determined by ASTM D1557.

Based upon the results of our laboratory testing of the soils used for compacted fill at the site, the following parameters were used in our surficial stability analysis:

Saturated Unit Weight (γ_{sat}) = 125 pcf

Buoyant Unit Weight (γ_{boy}) = 67.6 pcf

Friction Angle (□) = 31 degrees

Cohesion (C) = 250 psf (conservative)

Slope Gradient (β)= 2:1 = 26.6 degrees

Assumed Depth of Saturation (H) = 4 feet

Our surficial stability analysis was performed using the infinite slope method with a saturated zone parallel to the slope face as follows:

$$\text{F.S.} = F_{resist}/F_{drive}$$

$$= \{C + (\gamma_{boy}) * H * \text{Cos}^2 \beta * \text{Tan } \square\} / \{\gamma_{sat} * H * \text{Cos } \beta * \text{Sin } \beta\}$$

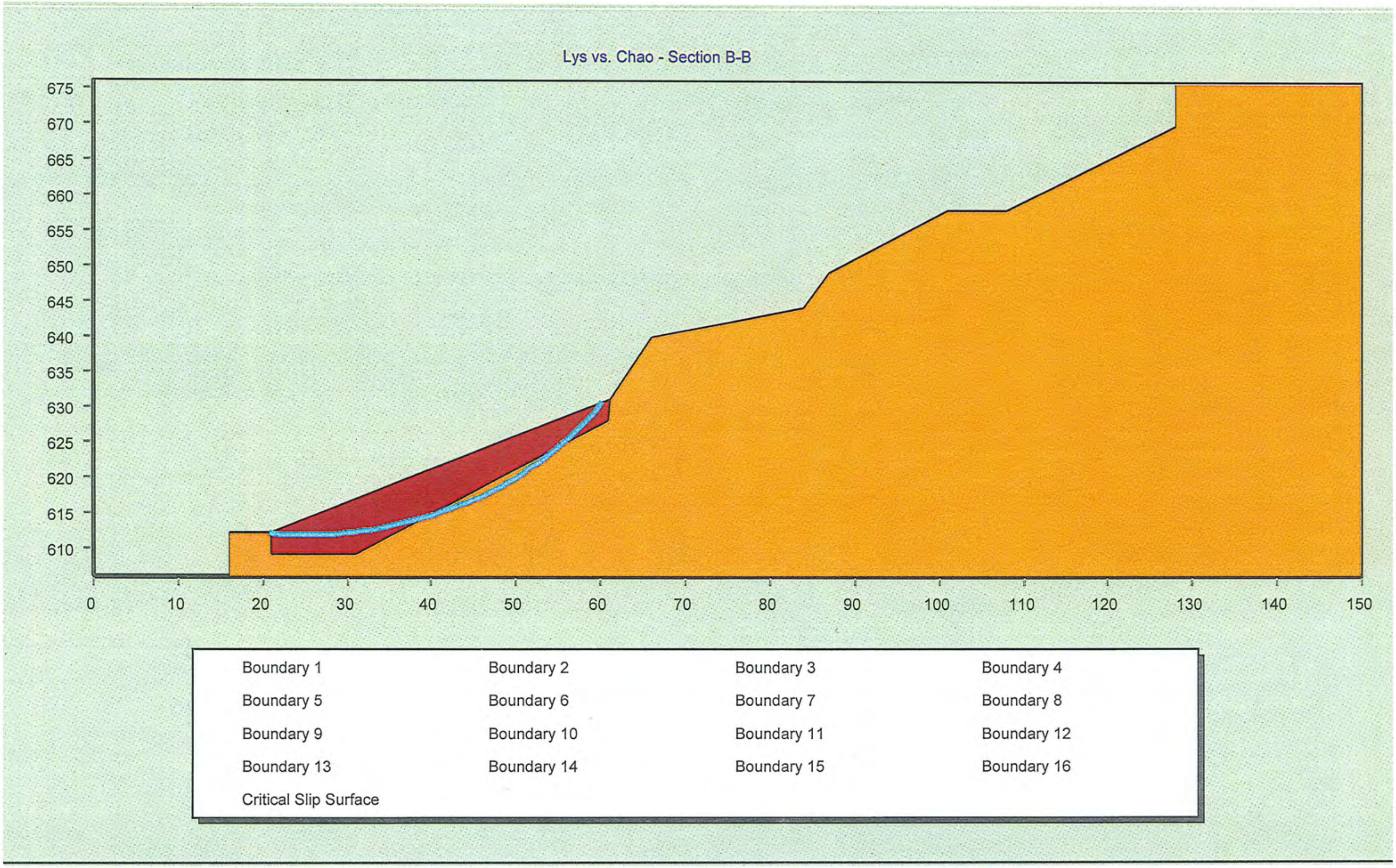
$$= \{250 + (67.6) * 4 * \text{Cos}^2 26.6 * \text{Tan } 31\} / \{125 * 4 * \text{Cos } 26.6 * \text{Sin } 26.6\}$$

$$= 380 / 200$$

$$= 1.9$$

As indicated in the above calculation, the compacted fill slope is considered surficially stable.

{ END }



Lys vs. Chao - Section B-B
675
670
665
660
655
650
645
640
635
630
625
620
615
610
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Boundary 1
Boundary 2
Boundary 3
Boundary 4
Boundary 5
Boundary 6
Boundary 7
Boundary 8
Boundary 9
Boundary 10
Boundary 11
Boundary 12
Boundary 13
Boundary 14
Boundary 15
Boundary 16
Critical Slip Surface

```
                         Section B-B (Final)
                        ** PCSTABL7 **

                              by
                       Purdue University
1

                  --Slope Stability Analysis--
                Simplified Janbu, Simplified Bishop
                  or Spencer`s Method of Slices

    Run Date:                   4
    Time of Run:                4:18
    Input Data Filename:        tempInpFile.in
    Output Filename:            outFileTemp
    Unit:                       ENGLISH


    PROBLEM DESCRIPTION   Lys vs. Chao - Section B-B



    BOUNDARY COORDINATES

       12 Top   Boundaries
       16 Total Boundaries

    Boundary     X-Left      Y-Left     X-Right     Y-Right     Soil Type
       No.        (ft)        (ft)        (ft)        (ft)      Below Bnd

        1          0.00      606.00       16.00      606.00         1
        2         16.00      606.00       16.01      612.00         1
        3         16.01      612.00       21.00      612.00         1
        4         21.00      612.00       61.01      631.00         2
        5         61.01      631.00       66.00      640.00         1
        6         66.00      640.00       84.00      644.00         1
        7         84.00      644.00       87.00      649.00         1
        8         87.00      649.00      101.00      658.00         1
        9        101.00      658.00      108.00      658.00         1
       10        108.00      658.00      128.00      670.00         1
       11        128.00      670.00      128.01      676.00         1
       12        128.01      676.00      150.00      676.00         1
       13         21.00      612.00       21.01      609.00         1
       14         21.01      609.00       31.00      609.00         1
       15         31.00      609.00       61.00      628.00         1
       16         61.00      628.00       61.01      631.00         1
1

   ISOTROPIC SOIL PARAMETERS


     2 Type(s) of Soil


    Soil  Total  Saturated  Cohesion Friction   Pore    Pressure   Piez.
    Type Unit Wt. Unit Wt. Intercept   Angle  Pressure Constant Surface
     No.  (pcf)    (pcf)     (psf)     (deg)   Param.    (psf)     No.
```

```
      1   125.0    125.0     495.0     34.0   0.00       0.0      1
      2   125.0    125.0     250.0     31.0   0.00       0.0      1
1


   A Critical Failure Surface Searching Method, Using A Random
   Technique For Generating Circular Surfaces, Has Been Specified.


 10000 Trial Surfaces Have Been Generated.


   100 Surfaces Initiate From Each Of100 Points Equally Spaced
   Along The Ground Surface Between  X =  20.00 ft.
                               and  X =  22.00 ft.


   Each Surface Terminates Between   X =  60.00 ft.
                              and   X =  62.00 ft.


   Unless Further Limitations Were Imposed, The Minimum Elevation
   At Which A Surface Extends Is  Y =  0.00 ft.


    1.00 ft. Line Segments Define Each Trial Failure Surface.

1

   Following Are Displayed The Ten Most Critical Of The Trial
   Failure Surfaces Examined.  They Are Ordered - Most Critical
   First.


   * * Safety Factors Are Calculated By The Modified Bishop Method * *


   Failure Surface Specified By 47 Coordinate Points


     Point       X-Surf       Y-Surf
      No.         (ft)         (ft)

       1          20.81       612.00
       2          21.80       611.91
       3          22.80       611.84
       4          23.80       611.80
       5          24.80       611.78
       6          25.80       611.79
       7          26.80       611.82
       8          27.80       611.87
       9          28.80       611.95
      10          29.79       612.05
      11          30.78       612.17
      12          31.77       612.32
      13          32.76       612.49
      14          33.74       612.68
      15          34.72       612.90
      16          35.69       613.14
      17          36.65       613.40
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     18          37.61      613.68
     19          38.56      613.99
     20          39.51      614.32
     21          40.44      614.68
     22          41.37      615.05
     23          42.29      615.45
     24          43.19      615.87
     25          44.09      616.31
     26          44.98      616.77
     27          45.86      617.25
     28          46.72      617.75
     29          47.57      618.27
     30          48.41      618.82
     31          49.24      619.38
     32          50.05      619.96
     33          50.85      620.56
     34          51.64      621.18
     35          52.41      621.82
     36          53.16      622.48
     37          53.90      623.15
     38          54.62      623.84
     39          55.33      624.55
     40          56.02      625.27
     41          56.69      626.01
     42          57.34      626.77
     43          57.98      627.54
     44          58.60      628.33
     45          59.20      629.13
     46          59.78      629.95
     47          60.24      630.64

    Circle Center At X =   25.1 ; Y =  654.0  and Radius,    42.2

        ***     3.372    ***


          Individual data on the    49  slices

                     Water  Water                       Earthquake
                     Force  Force   Force    Force        Force   Surcharge
Slice  Width  Weight  Top    Bot    Tnorm    Ttan     Hor     Ver     Load
 No.   (ft)   (lbs)  (lbs)  (lbs)   (lbs)    (lbs)   (lbs)   (lbs)   (lbs)
  1     0.2     0.2    0.0    0.0      0.0     0.0     0.0     0.0     0.0
  2     0.8    24.6    0.0    0.0      0.0     0.0     0.0     0.0     0.0
  3     1.0    92.5    0.0    0.0      0.0     0.0     0.0     0.0     0.0
  4     1.0   158.6    0.0    0.0      0.0     0.0     0.0     0.0     0.0
  5     1.0   221.8    0.0    0.0      0.0     0.0     0.0     0.0     0.0
  6     1.0   282.0    0.0    0.0      0.0     0.0     0.0     0.0     0.0
  7     1.0   339.1    0.0    0.0      0.0     0.0     0.0     0.0     0.0
  8     1.0   392.9    0.0    0.0      0.0     0.0     0.0     0.0     0.0
  9     1.0   443.3    0.0    0.0      0.0     0.0     0.0     0.0     0.0
 10     1.0   490.3    0.0    0.0      0.0     0.0     0.0     0.0     0.0
 11     1.0   533.7    0.0    0.0      0.0     0.0     0.0     0.0     0.0
 12     1.0   573.4    0.0    0.0      0.0     0.0     0.0     0.0     0.0
 13     1.0   609.5    0.0    0.0      0.0     0.0     0.0     0.0     0.0
 14     1.0   641.8    0.0    0.0      0.0     0.0     0.0     0.0     0.0
 15     1.0   670.3    0.0    0.0      0.0     0.0     0.0     0.0     0.0
 16     1.0   695.0    0.0    0.0      0.0     0.0     0.0     0.0     0.0
 17     1.0   715.9    0.0    0.0      0.0     0.0     0.0     0.0     0.0
```

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 18      1.0    733.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 19      1.0    746.2     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 20      0.7    575.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 21      0.2    180.8     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 22      0.9    761.5     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 23      0.9    763.6     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 24      0.9    762.1     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 25      0.9    757.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 26      0.9    748.5     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 27      0.9    736.7     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 28      0.9    721.7     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 29      0.9    703.6     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 30      0.9    682.6     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 31      0.8    658.7     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 32      0.8    632.2     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 33      0.8    603.3     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 34      0.8    572.1     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 35      0.8    538.7     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 36      0.8    503.5     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 37      0.8    466.6     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 38      0.7    428.1     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 39      0.7    388.5     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 40      0.3    165.1     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 41      0.4    182.6     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 42      0.7    306.2     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 43      0.7    264.1     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 44      0.7    221.7     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 45      0.6    179.1     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 46      0.6    136.8     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 47      0.6     94.8     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 48      0.6     53.5     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 49      0.5     13.7     0.0     0.0     0.0     0.0     0.0     0.0     0.0

         Failure Surface Specified By 48 Coordinate Points

           Point        X-Surf        Y-Surf
            No.          (ft)          (ft)

             1          20.75        612.00
             2          21.74        611.91
             3          22.74        611.84
             4          23.74        611.79
             5          24.74        611.77
             6          25.74        611.77
             7          26.74        611.80
             8          27.74        611.84
             9          28.74        611.92
            10          29.73        612.01
            11          30.72        612.13
            12          31.71        612.28
            13          32.70        612.44
            14          33.68        612.63
            15          34.66        612.85
            16          35.63        613.08
            17          36.60        613.34
            18          37.56        613.62
            19          38.51        613.93
            20          39.45        614.26
            21          40.39        614.61
            22          41.32        614.98
            23          42.24        615.37
            24          43.15        615.79
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    25          44.05       616.23
    26          44.93       616.68
    27          45.81       617.16
    28          46.68       617.66
    29          47.53       618.18
    30          48.37       618.72
    31          49.20       619.28
    32          50.02       619.86
    33          50.82       620.46
    34          51.60       621.08
    35          52.38       621.72
    36          53.13       622.37
    37          53.87       623.04
    38          54.60       623.73
    39          55.30       624.44
    40          56.00       625.16
    41          56.67       625.90
    42          57.33       626.65
    43          57.96       627.42
    44          58.58       628.21
    45          59.18       629.01
    46          59.76       629.82
    47          60.33       630.65
    48          60.35       630.69

 Circle Center At X =   25.2 ; Y =  653.9  and Radius,    42.2

       ***      3.378   ***


1

 Failure Surface Specified By 48 Coordinate Points

   Point        X-Surf       Y-Surf
    No.          (ft)         (ft)

     1          20.77       612.00
     2          21.76       611.91
     3          22.76       611.84
     4          23.76       611.80
     5          24.76       611.78
     6          25.76       611.78
     7          26.76       611.81
     8          27.76       611.86
     9          28.76       611.93
    10          29.75       612.02
    11          30.74       612.14
    12          31.73       612.29
    13          32.72       612.45
    14          33.70       612.64
    15          34.68       612.85
    16          35.65       613.09
    17          36.62       613.35
    18          37.58       613.63
    19          38.53       613.93
    20          39.48       614.25
    21          40.42       614.60
    22          41.35       614.97
    23          42.27       615.36
```

```
 24          43.18       615.77
 25          44.08       616.20
 26          44.97       616.65
 27          45.85       617.13
 28          46.72       617.62
 29          47.58       618.14
 30          48.42       618.67
 31          49.25       619.23
 32          50.07       619.80
 33          50.88       620.40
 34          51.67       621.01
 35          52.45       621.64
 36          53.21       622.28
 37          53.95       622.95
 38          54.68       623.63
 39          55.40       624.33
 40          56.10       625.05
 41          56.78       625.78
 42          57.44       626.53
 43          58.09       627.29
 44          58.71       628.07
 45          59.32       628.87
 46          59.91       629.67
 47          60.49       630.49
 48          60.73       630.87

Circle Center At X =   25.1 ; Y =  654.5  and Radius,    42.7

      ***     3.379    ***



Failure Surface Specified By 48 Coordinate Points


  Point      X-Surf       Y-Surf
   No.        (ft)         (ft)

  1          20.79       612.00
  2          21.78       611.91
  3          22.78       611.83
  4          23.78       611.79
  5          24.78       611.76
  6          25.78       611.76
  7          26.78       611.78
  8          27.78       611.83
  9          28.78       611.90
 10          29.77       612.00
 11          30.76       612.11
 12          31.75       612.25
 13          32.74       612.42
 14          33.72       612.60
 15          34.70       612.81
 16          35.67       613.05
 17          36.64       613.30
 18          37.60       613.58
 19          38.55       613.89
 20          39.50       614.21
 21          40.44       614.56
 22          41.37       614.92
 23          42.29       615.31
```

```
  24          43.20       615.73
  25          44.10       616.16
  26          44.99       616.61
  27          45.87       617.09
  28          46.74       617.59
  29          47.60       618.10
  30          48.44       618.64
  31          49.27       619.19
  32          50.09       619.77
  33          50.89       620.36
  34          51.68       620.98
  35          52.46       621.61
  36          53.22       622.26
  37          53.96       622.93
  38          54.69       623.61
  39          55.40       624.32
  40          56.10       625.04
  41          56.77       625.77
  42          57.43       626.52
  43          58.08       627.29
  44          58.70       628.07
  45          59.31       628.86
  46          59.89       629.67
  47          60.46       630.50
  48          60.69       630.85

Circle Center At X =   25.3 ; Y =  654.1  and Radius,   42.3

      ***     3.380   ***


1

Failure Surface Specified By 47 Coordinate Points


  Point       X-Surf       Y-Surf
   No.         (ft)         (ft)

   1          20.71       612.00
   2          21.70       611.90
   3          22.70       611.83
   4          23.70       611.78
   5          24.70       611.76
   6          25.70       611.76
   7          26.70       611.78
   8          27.70       611.83
   9          28.70       611.90
  10          29.69       612.00
  11          30.68       612.12
  12          31.67       612.26
  13          32.66       612.42
  14          33.64       612.61
  15          34.62       612.83
  16          35.59       613.06
  17          36.56       613.32
  18          37.51       613.61
  19          38.47       613.91
  20          39.41       614.24
  21          40.35       614.59
  22          41.28       614.96
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   23          42.20       615.36
   24          43.10       615.77
   25          44.00       616.21
   26          44.89       616.67
   27          45.77       617.15
   28          46.63       617.65
   29          47.49       618.17
   30          48.33       618.72
   31          49.15       619.28
   32          49.97       619.86
   33          50.77       620.46
   34          51.55       621.08
   35          52.32       621.72
   36          53.08       622.38
   37          53.81       623.05
   38          54.54       623.74
   39          55.24       624.45
   40          55.93       625.18
   41          56.60       625.92
   42          57.25       626.68
   43          57.89       627.45
   44          58.50       628.24
   45          59.10       629.04
   46          59.68       629.86
   47          60.18       630.61
Circle Center At X =   25.2 ; Y =  653.6  and Radius,   41.9

      ***      3.380   ***


Failure Surface Specified By 48 Coordinate Points

  Point        X-Surf       Y-Surf
   No.          (ft)         (ft)

    1          20.73       612.00
    2          21.72       611.91
    3          22.72       611.84
    4          23.72       611.80
    5          24.72       611.78
    6          25.72       611.79
    7          26.72       611.81
    8          27.72       611.86
    9          28.72       611.94
   10          29.71       612.03
   11          30.70       612.15
   12          31.69       612.30
   13          32.68       612.46
   14          33.66       612.65
   15          34.64       612.86
   16          35.61       613.10
   17          36.58       613.35
   18          37.54       613.63
   19          38.49       613.93
   20          39.44       614.26
   21          40.38       614.60
   22          41.31       614.97
   23          42.23       615.36
```

```
     24           43.14        615.77
     25           44.04        616.20
     26           44.93        616.65
     27           45.82        617.13
     28           46.69        617.62
     29           47.54        618.13
     30           48.39        618.67
     31           49.22        619.22
     32           50.04        619.79
     33           50.85        620.38
     34           51.64        620.99
     35           52.42        621.62
     36           53.18        622.26
     37           53.93        622.93
     38           54.67        623.61
     39           55.38        624.31
     40           56.08        625.02
     41           56.77        625.75
     42           57.43        626.49
     43           58.08        627.26
     44           58.71        628.03
     45           59.33        628.82
     46           59.92        629.63
     47           60.49        630.44
     48           60.80        630.90
  Circle Center At X =    25.1 ; Y =   654.7  and Radius,    43.0

        ***       3.380    ***

1

  Failure Surface Specified By 48 Coordinate Points

    Point         X-Surf       Y-Surf
     No.           (ft)         (ft)

      1           20.73        612.00
      2           21.72        611.90
      3           22.72        611.83
      4           23.72        611.78
      5           24.72        611.76
      6           25.72        611.76
      7           26.72        611.78
      8           27.72        611.83
      9           28.72        611.90
     10           29.71        611.99
     11           30.70        612.11
     12           31.69        612.25
     13           32.68        612.41
     14           33.66        612.60
     15           34.64        612.81
     16           35.61        613.05
     17           36.58        613.31
     18           37.54        613.59
     19           38.49        613.89
     20           39.44        614.21
     21           40.37        614.56
     22           41.30        614.93
```

```
   23          42.22       615.32
   24          43.13       615.74
   25          44.03       616.17
   26          44.92       616.63
   27          45.80       617.11
   28          46.67       617.61
   29          47.52       618.12
   30          48.37       618.66
   31          49.20       619.22
   32          50.01       619.80
   33          50.81       620.40
   34          51.60       621.01
   35          52.37       621.65
   36          53.13       622.30
   37          53.87       622.97
   38          54.60       623.66
   39          55.31       624.37
   40          56.00       625.09
   41          56.67       625.83
   42          57.33       626.58
   43          57.97       627.35
   44          58.59       628.14
   45          59.19       628.94
   46          59.77       629.75
   47          60.33       630.57
   48          60.43       630.73

Circle Center At X =   25.3 ; Y =  653.8  and Radius,    42.1

      ***      3.381   ***


Failure Surface Specified By 48 Coordinate Points

  Point        X-Surf      Y-Surf
   No.          (ft)        (ft)

    1          20.77       612.00
    2          21.76       611.90
    3          22.76       611.83
    4          23.76       611.78
    5          24.76       611.75
    6          25.76       611.75
    7          26.76       611.77
    8          27.76       611.81
    9          28.76       611.88
   10          29.75       611.97
   11          30.74       612.09
   12          31.73       612.22
   13          32.72       612.39
   14          33.70       612.57
   15          34.68       612.78
   16          35.65       613.01
   17          36.62       613.27
   18          37.58       613.55
   19          38.54       613.85
   20          39.48       614.17
   21          40.42       614.52
   22          41.35       614.89
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```
         23          42.27        615.28
         24          43.18        615.69
         25          44.08        616.13
         26          44.97        616.58
         27          45.85        617.06
         28          46.72        617.56
         29          47.57        618.07
         30          48.42        618.61
         31          49.25        619.17
         32          50.06        619.75
         33          50.87        620.34
         34          51.65        620.96
         35          52.43        621.59
         36          53.19        622.24
         37          53.93        622.92
         38          54.65        623.60
         39          55.36        624.31
         40          56.05        625.03
         41          56.73        625.77
         42          57.39        626.52
         43          58.03        627.29
         44          58.65        628.07
         45          59.25        628.87
         46          59.83        629.69
         47          60.39        630.51
         48          60.58        630.79

       Circle Center At X =   25.4 ; Y =  653.7  and Radius,   42.0

            ***      3.382   ***


1

       Failure Surface Specified By 48 Coordinate Points

        Point        X-Surf       Y-Surf
         No.          (ft)         (ft)

          1          20.69        612.00
          2          21.68        611.91
          3          22.68        611.85
          4          23.68        611.80
          5          24.68        611.79
          6          25.68        611.79
          7          26.68        611.82
          8          27.68        611.87
          9          28.68        611.94
         10          29.67        612.04
         11          30.66        612.16
         12          31.65        612.30
         13          32.64        612.47
         14          33.62        612.66
         15          34.60        612.87
         16          35.57        613.10
         17          36.54        613.36
         18          37.50        613.64
         19          38.45        613.94
         20          39.40        614.26
         21          40.34        614.61
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```
   22          41.27        614.98
   23          42.19        615.37
   24          43.10        615.78
   25          44.00        616.21
   26          44.89        616.66
   27          45.78        617.13
   28          46.65        617.62
   29          47.51        618.13
   30          48.35        618.67
   31          49.19        619.22
   32          50.01        619.79
   33          50.81        620.38
   34          51.61        620.99
   35          52.39        621.62
   36          53.15        622.26
   37          53.90        622.92
   38          54.63        623.60
   39          55.35        624.30
   40          56.05        625.01
   41          56.74        625.74
   42          57.41        626.48
   43          58.06        627.24
   44          58.69        628.02
   45          59.30        628.81
   46          59.90        629.61
   47          60.48        630.43
   48          60.79        630.90

Circle Center At X =   25.0 ; Y =  654.9  and Radius,    43.1

      ***      3.382   ***


Failure Surface Specified By 48 Coordinate Points

  Point        X-Surf       Y-Surf
   No.          (ft)         (ft)

    1          20.81        612.00
    2          21.80        611.90
    3          22.80        611.82
    4          23.80        611.77
    5          24.80        611.74
    6          25.80        611.73
    7          26.80        611.75
    8          27.80        611.79
    9          28.80        611.86
   10          29.79        611.95
   11          30.79        612.06
   12          31.78        612.20
   13          32.76        612.36
   14          33.75        612.54
   15          34.72        612.75
   16          35.70        612.98
   17          36.66        613.23
   18          37.63        613.51
   19          38.58        613.81
   20          39.53        614.13
   21          40.47        614.47
```

```
                                Section B-B (Final)
   22          41.40       614.84
   23          42.32       615.23
   24          43.23       615.64
   25          44.13       616.07
   26          45.02       616.53
   27          45.90       617.00
   28          46.77       617.50
   29          47.63       618.01
   30          48.47       618.55
   31          49.30       619.11
   32          50.12       619.68
   33          50.92       620.28
   34          51.71       620.89
   35          52.49       621.52
   36          53.24       622.18
   37          53.99       622.84
   38          54.71       623.53
   39          55.43       624.24
   40          56.12       624.96
   41          56.79       625.69
   42          57.45       626.45
   43          58.09       627.21
   44          58.72       628.00
   45          59.32       628.79
   46          59.90       629.61
   47          60.47       630.43
   48          60.76       630.88

Circle Center At X =   25.5 ; Y =  653.7  and Radius,   41.9

      ***      3.382   ***

1

           Y            A     X     I     S          F     T

           0.00    148.72    297.44    446.16    594.88    743.60

X       0.00 +---------+---------+---------+---------+*--------+
             -  ..                                    *
             -  .                                     1*.
             -  .                                      .*
             -                                           *
             -                                            *
      148.72 +                                            *
             -
             -
             -
             -
             -
A     297.44 +
             -
             -
             -
             -
             -
X     446.16 +
             -
             -
```

```
                               Section B-B (Final)
              -
              -
              -
 I    594.88 +
              -
              -
              -
              -
              -
 S    743.60 +
              -
              -
              -
              -
              -
      892.32 +
              -
              -
              -
              -
              -
 F   1041.04 +
              -
              -
              -
              -
              -
 T   1189.76 +
```

Attachment D

Concrete Testing Results

EMERGENCY SLOPE STABILIZATION
7231 Romero Drive, La Jolla, California

SUMMARY OF CAISSON 28-DAY STRENGTH

Caisson No.	Date Concrete Poured	Required 28-Day Strength (PSI)	Average Measured 28-Day Strength (PSI)
1	10/18/2013	5,500	6,187
2	10/24/2013	5,500	5,776
3	10/18/2013	5,500	6,131
4	10/24/2013	5,500	6,105
5	10/18/2013	5,500	5,555
6	10/24/2013	5,500	5,839
7	10/18/2013	5,500	6,192
8	10/24/2013	5,500	5,700
9	10/18/2013	5,500	6,030
10	10/24/2013	5,500	5,617
11	10/18/2013	5,500	5,521
12	10/24/2013	5,500	5,685
13	10/18/2013	5,500	5,837
14	10/24/2013	5,500	6,169

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, San Diego

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/18/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #1 truck # 1 and #2.

Batching Plant: Hanson **Mix Designation:** 6000-psi

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/18/2013					
45004	1	6.02	7	28.45	10/25/2013	123626	4345.57	6
	2	6.00	28	28.26	11/15/2013	179874	6364.97	6
	3	6.00	28	28.26	11/15/2013	169837	6009.80	3
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M.
LAB

**CIVIL ENGINEERING MATERIAL
LABORATORY CORPORATION**
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, San Diego

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/18/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #3 truck # 3 and #6.

Batching Plant: Hanson **Mix Designation:** 6000-psi

Project	Sample	Diameter	Sample Age	Area	Test Date	Applied	Calculated	Type of
Number	Number	(in.)	Cast	(in.sq.)		Load (lbf)	P.S.I.	Fracture
			10/18/2013					
45005	1	6.02	7	28.45	10/25/2013	118853	4177.80	3
	2	6.00	28	28.26	11/15/2013	176910	6260.08	3
	3	6.00	28	28.26	11/15/2013	169641	6002.87	6
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

REGISTERED PROFESSIONAL ENGINEER
SOHEIL BINAEI
No. C50028
Exp. 6/30/2015
CIVIL
STATE OF CALIFORNIA

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M. LAB

CIVIL ENGINEERING MATERIAL LABORATORY CORPORATION
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, San Diego

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/18/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #5 truck # 5 and #4.

Batching Plant: Hanson **Mix Designation:** 6000-psi

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/18/2013					
45006	1	6.02	7	28.45	10/25/2013	106363	3738.76	3
	2	6.00	28	28.26	11/15/2013	156071	5522.68	3
	3	6.00	28	28.26	11/15/2013	157922	5588.18	2
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M. LAB

CIVIL ENGINEERING MATERIAL LABORATORY CORPORATION
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, San Diego

Client Name and Address:
Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/18/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #7 truck # 7 and #8.

Batching Plant: Hanson **Mix Designation:** 6000-psi

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/18/2013					
45007	1	6.02	7	28.45	10/25/2013	122853	4318.40	3
	2	6.00	28	28.26	11/15/2013	175688	6216.84	3
	3	6.00	28	28.26	11/15/2013	174279	6166.99	6
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M. LAB

CIVIL ENGINEERING MATERIAL
LABORATORY CORPORATION
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, San Diego

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/18/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #9 truck # 9 and #11.

Batching Plant: Hanson **Mix Designation:** 6000-psi

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/18/2013					
45008	1	6.02	7	28.45	10/25/2013	130504	4587.34	2
	2	6.00	28	28.26	11/15/2013	171098	6054.42	6
	3	6.00	28	28.26	11/15/2013	169723	6005.77	3
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M. LAB

CIVIL ENGINEERING MATERIAL
LABORATORY CORPORATION
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, San Diego

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/18/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #11 truck # 10 and #11.

Batching Plant: Hanson **Mix Designation:** 6000-psi

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/18/2013					
45009	1	6.02	7	28.45	10/25/2013	110343	3878.66	3
	2	6.00	28	28.26	11/15/2013	154837	5479.02	6
	3	6.00	28	28.26	11/15/2013	157202	5562.70	3
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M.
LAB

CIVIL ENGINEERING MATERIAL
LABORATORY CORPORATION
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, San Diego

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/18/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #13 truck # 12 and #13.

Batching Plant: Hanson **Mix Designation:** 6000-psi

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/18/2013					
45010	1	6.02	7	28.45	10/25/2013	109043	3832.97	3
	2	6.00	28	28.26	11/15/2013	167710	5934.54	6
	3	6.00	28	28.26	11/15/2013	162181	5738.89	6
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

REGISTERED PROFESSIONAL ENGINEER
SOHEIL BINAEI
No. C50028
Exp. 6/30/2015
CIVIL
STATE OF CALIFORNIA

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M.
LAB

CIVIL ENGINEERING MATERIAL
LABORATORY CORPORATION
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COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, La Jolla

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/24/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #2, truck # 12 and 13.

Batching Plant: Hanson R.M. **Mix Designation:** 6000 Mix

Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture	
		10/24/2013						
1	6.02	7	28.45	10/31/2013	107700	3785.76	3	
2	6.01	28	28.35	11/21/2013	156879	5532.82	3	
3	6.01	28	28.35	11/21/2013	170669	6019.16	6	
4	Hold	Hold	Hold	Hold	Hold	Hold	Hold	

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M. LAB

CIVIL ENGINEERING MATERIAL
LABORATORY CORPORATION
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, La Jolla

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/24/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #4, Truck number 10 and 11.

Batching Plant: Hanson R.M. **Mix Designation:** 6000 Mix

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/24/2013					
45045	1	6.02	7	28.45	10/31/2013	109572	3851.56	3
	2	6.01	28	28.35	11/21/2013	179602	6334.21	3
	3	6.01	28	28.35	11/21/2013	166579	5874.92	3
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M.
LAB

CIVIL ENGINEERING MATERIAL
LABORATORY CORPORATION
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COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, La Jolla

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/24/13 **Temperature:** 75 F

Admixture: None **Slump:** **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #.

Batching Plant: Hanson R.M. **Mix Designation:** 6000 Mix

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/24/2013					
45044	1	6.02	7	28.45	10/31/2013	119383	4196.43	3
	2	6.01	28	28.35	11/21/2013	170688	6019.83	3
	3	6.01	28	28.35	11/21/2013	160459	5659.08	2
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M.
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**CIVIL ENGINEERING MATERIAL
LABORATORY CORPORATION**
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, La Jolla

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/24/13 **Temperature:** 75 F

Admixture: None **Slump:** ----- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #8, truck # 7 and 8.

Batching Plant: Hanson **Mix Designation:** 6000 Mix

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/24/2013					
45043	1	6.02	7	28.45	10/31/2013	122644	4311.06	3
	2	6.01	28	28.35	11/21/2013	160318	5654.10	3
	3	6.01	28	28.35	11/21/2013	162895	5744.99	6
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

REGISTERED PROFESSIONAL ENGINEER
SOHEIL BINAEI
No. C50028
Exp. 6/30/2015
CIVIL
STATE OF CALIFORNIA

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M. LAB

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LABORATORY CORPORATION
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, La Jolla

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/24/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #10, truck #5 and 6.

Batching Plant: Hanson R.M. **Mix Designation:** 6000 Mix

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/24/2013					
45042	1	6.02	7	28.45	10/31/2013	120883	4249.16	3
	2	6.01	28	28.35	11/21/2013	163437	5764.10	3
	3	6.01	28	28.35	11/21/2013	155113	5470.53	3
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

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No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M.
LAB

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COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, La Jolla

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/24/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #12, truck #3 and 4.

Batching Plant: Hanson R.M. **Mix Designation:** 6000 Mix

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/24/2013					
45041	1	6.02	7	28.45	10/31/2013	117719	4137.94	2
	2	6.01	28	28.35	11/21/2013	161494	5695.58	6
	3	6.01	28	28.35	11/21/2013	160889	5674.24	3
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

REGISTERED PROFESSIONAL ENGINEER
SOHEIL BINAEI
No. C50028
Exp. 6/30/2015
CIVIL
STATE OF CALIFORNIA

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

45 Post, Irvine CA 92618
Telephone: (949) 502-4130 Fax: (949) 502-4131
Visit us @ cemlabcorp.com

C.E.M. LAB

CIVIL ENGINEERING MATERIAL LABORATORY CORPORATION

Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, La Jolla

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: BDJ **Cast Date:** 10/24/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at caisson #14, truck #1 and 2.

Batching Plant: Hanson R.M. **Mix Designation:** 6000 Mix

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			10/24/2013					
45040	1	6.02	7	28.45	10/31/2013	109106	3835.18	3
	2	6.01	28	28.35	11/21/2013	170344	6007.70	3
	3	6.01	28	28.35	11/21/2013	179468	6329.49	3
	4	Hold	Hold	Hold	Hold	Hold	Hold	Hold

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

EMERGENCY SLOPE STABILIZATION
7231 Romero Drive, La Jolla, California

SUMMARY OF REACTION WALL 28-DAY STRENGTH

Sample Set No.	Date Concrete Poured	Required 28-Day Strength (PSI)	Average 28-Day Strength (PSI)
45109	11/9/2013	5,500	7,024
45110	11/9/2013	5,500	7,462

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, La Jolla, Set 1

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: --- **Cast Date:** 11/09/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at reaction wall.

Batching Plant: --- **Mix Designation:** 6000-psi

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			11/9/2013					
45109	1	6.01	9	28.35	11/18/2013	156832	5531.16	3
	2	6.02	28	28.45	12/7/2013	201697	7089.85	3
	3	6.02	28	28.45	12/7/2013	206671	7264.69	3
	4	6.02	28	28.45	12/7/2013	191108	6717.63	3

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

SOHEIL BINAEI
No. C50028
Exp. 6/30/2015

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

C.E.M.
LAB

CIVIL ENGINEERING MATERIAL
LABORATORY CORPORATION
Engineering - Material Testing - Inspection

COMPRESSION TEST RESULTS

Project Address: 7231 Romero Drive, La Jolla, Set 2

Client Name and Address:

Geo Kinetics
77 Busen
Irvine, CA 92618

Type of Specimen: Concrete **Required 28 Days Strength:** 6000

Cast By: --- **Cast Date:** 11/09/13 **Temperature:** 75 F

Admixture: None **Slump:** --- **Cement Type:** II/V

Location of Structure: Placement of concrete at reaction wall.

Batching Plant: --- **Mix Designation:** 6000-psi

Project Number	Sample Number	Diameter (in.)	Sample Age Cast	Area (in.sq.)	Test Date	Applied Load (lbf)	Calculated P.S.I.	Type of Fracture
			11/9/2013					
45110	1	6.01	9	28.35	11/18/2013	173832	6130.71	3
	2	6.02	28	28.45	12/7/2013	207653	7299.21	3
	3	6.02	28	28.45	12/7/2013	215280	7567.30	3
	4	6.02	28	28.45	12/7/2013	213914	7519.29	3

☒ Compression test results were satisfactory and confirms to the specifications of ASTM C31, C39, C143, C172 & C1231.
☐ Compression test results were not satisfactory

REGISTERED PROFESSIONAL ENGINEER
SOHEIL BINAEI
No. C50028
Exp. 6/30/2015
CIVIL
STATE OF CALIFORNIA

Soheil A. Binaei

Soheil Anthony Binaei, Principal Engineer RCE50028
City of Los Angeles Material Control Section License Number 10111

Attachment E

Tie-Back Anchor Testing Results

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/23/2013 Time:

Type of Test ( ) Proof (X) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 1

# of Strands: 7

Max. Allowable Load: 328.09 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 300 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.260	-0.004
3050	250	2	9.258	-0.006
3050	250	3	9.230	-0.034
3050	250	4	9.216	-0.048
3050	250	5	9.216	-0.048
3050	250	6	9.204	-0.060
3050	250	15	9.203	-0.061

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/24/2013 Time:

Type of Test ( ) Proof (X) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 4

# of Strands: 7

Max. Allowable Load: 328.09 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 300 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	8.965	0.000
3050	250	2	8.961	-0.004
3050	250	3	8.961	-0.004
3050	250	4	8.959	-0.006
3050	250	5	8.958	-0.007
3050	250	6	8.958	-0.007
3050	250	15	8.946	-0.019

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/26/2013 Time:

Type of Test ( ) Proof (X) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 7

# of Strands: 7

Max. Allowable Load: 328.09 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 300 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	8.782	-0.004
3050	250	2	8.775	-0.009
3050	250	3	8.775	-0.009
3050	250	4	8.792	0.006
3050	250	5	8.788	0.002
3050	250	6	8.790	0.004
3050	250	15	8.791	0.005

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/21/2013 Time:

Type of Test ( ) Proof (X) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 10

# of Strands: 7

Max. Allowable Load: 328.09 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 300 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.394	-0.021
3050	250	2	9.404	-0.011
3050	250	3	9.402	-0.013
3050	250	4	9.408	-0.007
3050	250	5	9.408	-0.007
3050	250	6	9.409	-0.006
3050	250	15	9.415	0.000

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/20/2013

Time:

Type of Test ( ) Proof (X) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 13

# of Strands: 7

Max. Allowable Load: 328.09 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 300 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.268	-0.006
3050	250	2	9.267	-0.007
3050	250	3	9.266	-0.008
3050	250	4	9.265	-0.009
3050	250	5	9.265	-0.009
3050	250	6	9.265	-0.009
3050	250	15	9.264	-0.010

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/23/2013 Time:

Type of Test (X) Proof ( ) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 2

# of Strands: 6

Max. Allowable Load: 281.22 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 250 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.418	-0.011
3050	250	2	9.415	-0.014
3050	250	3	9.429	0.000
3050	250	4	9.435	0.006
3050	250	5	9.433	0.004
3050	250	6	9.434	0.005
3050	250	15	9.439	0.010

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/23/2013 Time:

Type of Test (X) Proof ( ) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 3

# of Strands: 6

Max. Allowable Load: 281.22 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 250 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.712	-0.004
3050	250	2	9.712	-0.004
3050	250	3	9.725	0.009
3050	250	4	9.724	0.008
3050	250	5	9.725	0.009
3050	250	6	9.725	0.009
3050	250	15	9.735	0.019

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys
Address: 7231 Romero Dr. la Jolla, CA
Date: 12/24/2013
Time:
Type of Test (X) Proof ( ) Performance
Gauge I. D.: 6-30582
Manufacturer:
Gauge Factor: .083
Range (PSI): 3380
Gauge Calibration Date: 11/27/2013
Jack I.D.: 800223
Anchor #: 5
# of Strands: 6
Max. Allowable Load: 281.22 Kips
Design Ultimate Load:
Design Working Load: 150 Kips
Max. Test Load: 250 Kips
Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.009	-0.001
3050	250	2	9.009	-0.001
3050	250	3	9.007	-0.003
3050	250	4	9.007	-0.003
3050	250	5	9.007	-0.003
3050	250	6	9.007	-0.003
3050	250	15	9.006	-0.004

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/24/2013

Time:

Type of Test (X) Proof ( ) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 6

# of Strands: 6

Max. Allowable Load: 281.22 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 250 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.082	-0.001
3050	250	2	9.080	-0.003
3050	250	3	9.079	-0.004
3050	250	4	9.079	-0.004
3050	250	5	9.079	-0.004
3050	250	6	9.078	-0.005
3050	250	15	9.074	-0.009

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/26/2013 Time:

Type of Test (X) Proof ( ) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 8

# of Strands: 6

Max. Allowable Load: 281.22 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 250 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	8.847	-0.001
3050	250	2	8.847	-0.001
3050	250	3	8.841	-0.007
3050	250	4	8.840	-0.008
3050	250	5	8.839	-0.009
3050	250	6	8.839	-0.009
3050	250	15	8.837	-0.011

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/26/2013

Time:

Type of Test (X) Proof ( ) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 9

# of Strands: 6

Max. Allowable Load: 281.22 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 250 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.145	-0.004
3050	250	2	9.142	-0.007
3050	250	3	9.141	-0.008
3050	250	4	9.139	-0.010
3050	250	5	9.139	-0.010
3050	250	6	9.138	-0.011
3050	250	15	9.137	-0.012

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/21/2013

Time:

Type of Test (X) Proof ( ) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 11

# of Strands: 6

Max. Allowable Load: 281.22 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 250 Kips

Lock Off Load: 150 Kips

Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.168	0.003
3050	250	2	9.172	0.007
3050	250	3	9.171	0.006
3050	250	4	9.174	0.009
3050	250	5	9.171	0.006
3050	250	6	9.175	0.010
3050	250	15	9.182	0.017

Results: (X) Pass ( ) fail By: OCR

Tie- Back Anchor Test Record

Project: Lys

Address: 7231 Romero Dr. la Jolla, CA

Date: 12/20/2013 Time:

Type of Test (X) Proof ( ) Performance

Gauge I. D.: 6-30582

Manufacturer:

Gauge Factor: .083

Range (PSI): 3380

Gauge Calibration Date: 11/27/2013

Jack I.D.: 800223

Anchor #: 12

# of Strands: 6

Max. Allowable Load: 281.22 Kips

Design Ultimate Load:

Design Working Load: 150 Kips

Max. Test Load: 250 Kips

Lock Off Load: 150 Kips

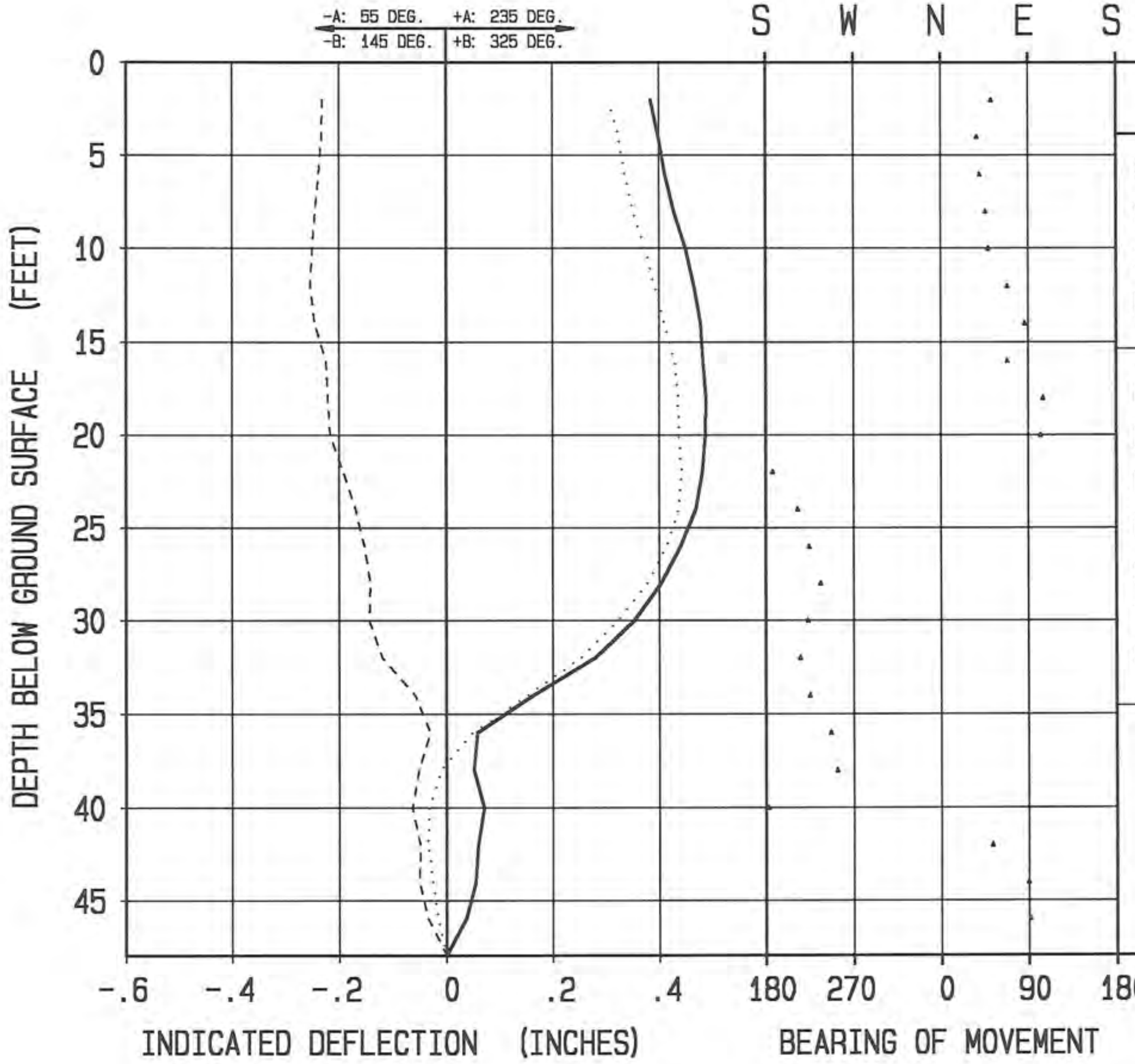
Creep Test Results:

Gauge Pressure (PSI)	Anchor Load (Kips)	Elapsed Time (Minutes)	Dial Gauge (Inches)	Displacement (Inches)
3050	250	1	9.532	0.000
3050	250	2	9.535	0.003
3050	250	3	9.535	0.003
3050	250	4	9.534	0.002
3050	250	5	9.536	0.004
3050	250	6	9.536	0.004
3050	250	15	9.539	0.007

Results: (X) Pass ( ) fail By: OCR

Attachment F

Slope Inclinometer Monitoring Results



EXPLANATION

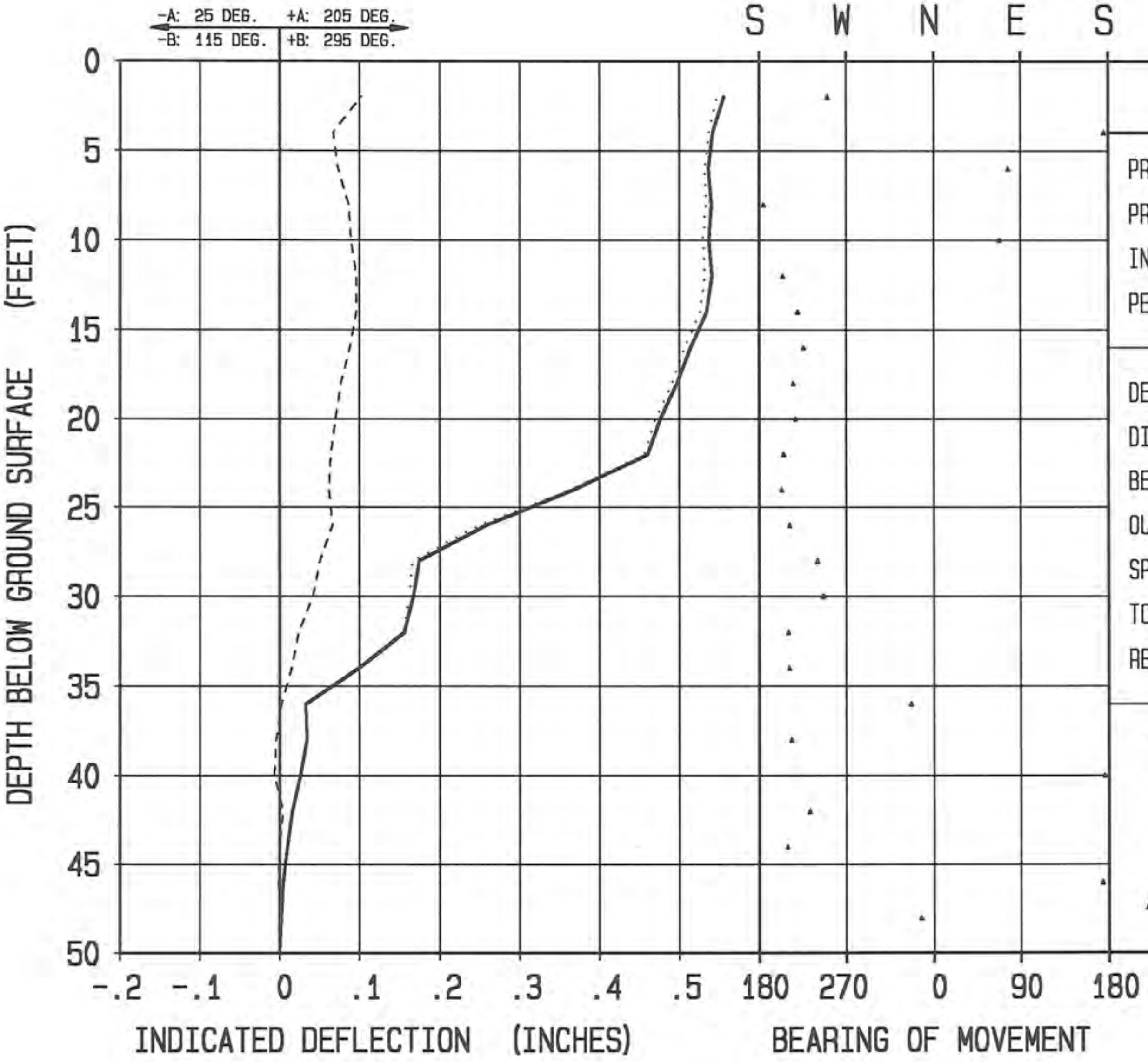
PROJECT: Lys Slope Repair
PROJECT NO.: GK-1775
INDICATOR NO.: GK-1
PERIOD: 09-26-2012 to 12-23-2013

DEPTH MONITORED: 48 FT.
DIST. BETWEEN READINGS: 2 FT.
BEARING OF +A AXIS: s55w
OUT-OF-PLUMB: 48 IN./100 FT.
SPIRAL CORRECTION: NONE
TOTAL DISPLACEMENT: .38 IN.
RESULTANT BEARING: -148 DEG.

.... +A AXIS
------------ +B AXIS
———————— RESULTANT
△ INCREMENTAL BEARING

0/0

PROJECT # GK-1775	Slope Inclinometer Monitoring Results for Lys Slope Repair.	GEOKINETICS INC.



EXPLANATION

PROJECT: Lys Slope Repair

PROJECT NO.: GK-1775

INDICATOR NO.: SI-1

PERIOD: 09-26-2012 to 12-23-2013

DEPTH MONITORED: 50 FT.

DIST. BETWEEN READINGS: 2 FT.

BEARING OF +A AXIS: s25w

OUT-OF-PLUMB: 27 IN./100 FT.

SPIRAL CORRECTION: NONE

TOTAL DISPLACEMENT: .55 IN.

RESULTANT BEARING: -149 DEG.

············ +A AXIS

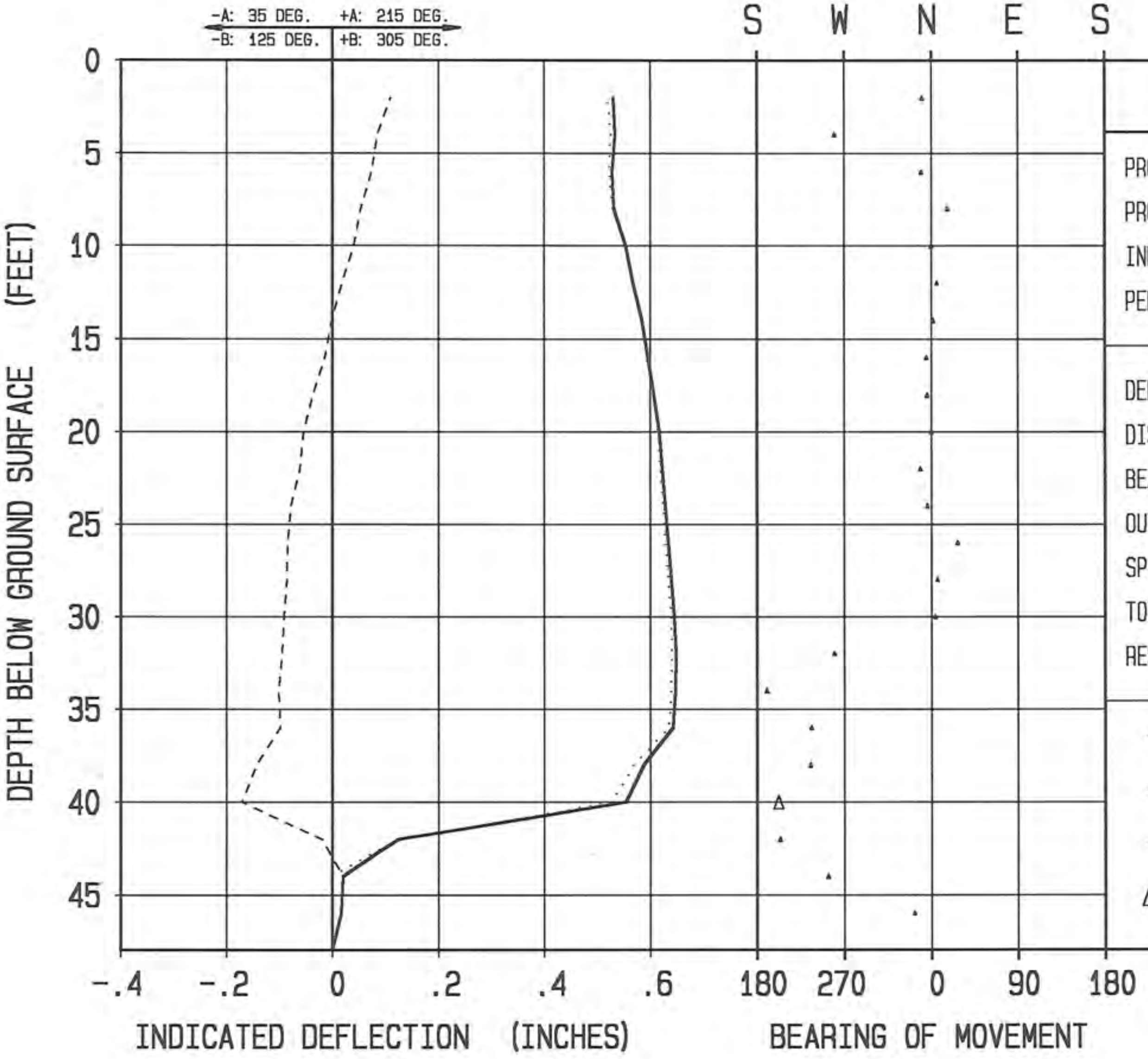
- - - - - - - - +B AXIS

———— RESULTANT

△ INCREMENTAL BEARING

0/0

PROJECT # GK-1775	Slope Inclinometer Monitoring Results for Lys Slope Repair.	GEOKINETICS INC.



EXPLANATION

PROJECT: Lys Slope Repair
PROJECT NO.: GK-1775
INDICATOR NO.: SI-2
PERIOD: 09-26-2012 to 12-23-2013

DEPTH MONITORED: 48 FT.
DIST. BETWEEN READINGS: 2 FT.
BEARING OF +A AXIS: s35w
OUT-OF-PLUMB: 36 IN./100 FT.
SPIRAL CORRECTION: NONE
TOTAL DISPLACEMENT: .53 IN.
RESULTANT BEARING: -138 DEG.

.... +A AXIS
----------- +B AXIS
———— RESULTANT
△ INCREMENTAL BEARING

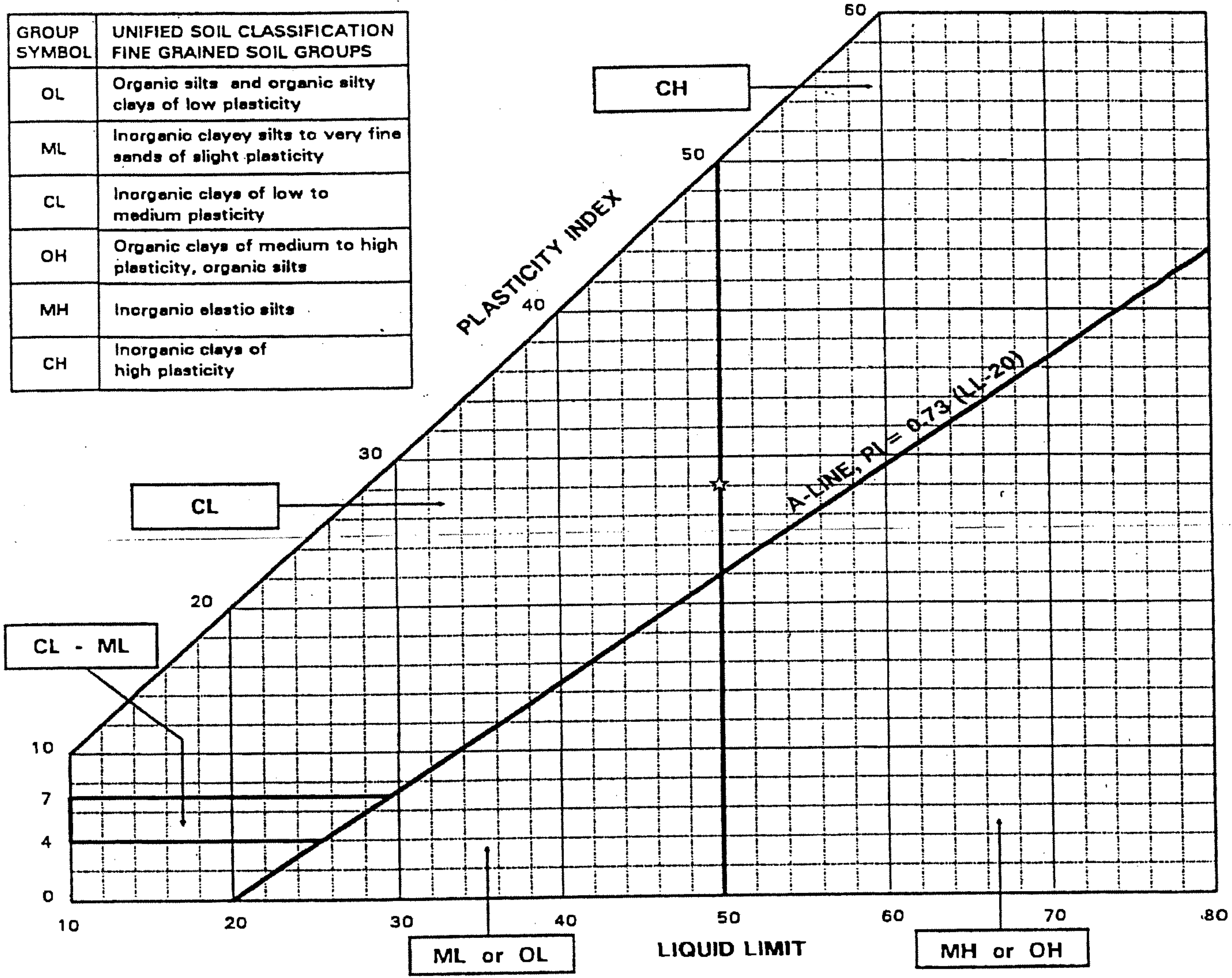
0 / 0

PROJECT # GK-1775

Slope Inclinometer Monitoring Results for Lys Slope Repair.

GEOKINETICS INC.

GROUP SYMBOL	UNIFIED SOIL CLASSIFICATION FINE GRAINED SOIL GROUPS
OL	Organic silts and organic silty clays of low plasticity
ML	Inorganic clayey silts to very fine sands of slight plasticity
CL	Inorganic clays of low to medium plasticity
OH	Organic clays of medium to high plasticity, organic silts
MH	Inorganic elastic silts
CH	Inorganic clays of high plasticity



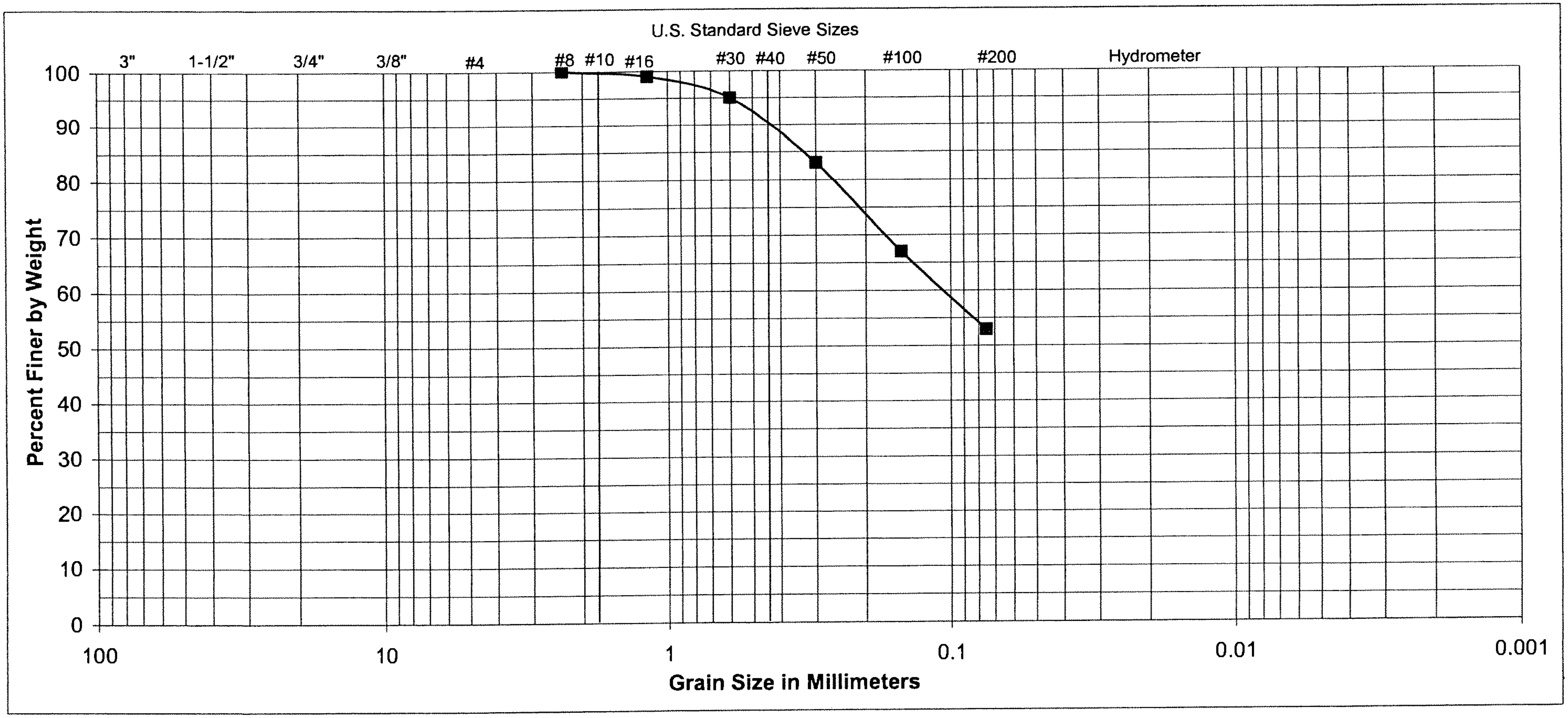
TEST SYMBOL	SAMPLE NUMBER	DEPTH	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI) *	CLASSIFICATION
☆	S-1	618'	50	22	28	CL

* PI = LL - PL

ATTERBERG LIMITS TEST RESULTS (ASTM D4318)

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

Romero Drive Residential	
BY: DBA/KMS	DATE: 03/04/03
JOB NUMBER: 0211197-1	PLATE No. : 3



COARSE	FINE	FINE	MEDIUM	COARSE	FINES

SAMPLE

EXPLORATION NUMBER: S-1

SAMPLE LOCATION: 618'

UNIFIED SOIL CLASSIFICATION: CL

DESCRIPTION: VERY SANDY CLAY WITH SILT
(Cabrillo Formation)

ATTERBERG LIMITS

LIQUID LIMIT:

PLASTIC LIMIT:

PLASTICITY INDEX:

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

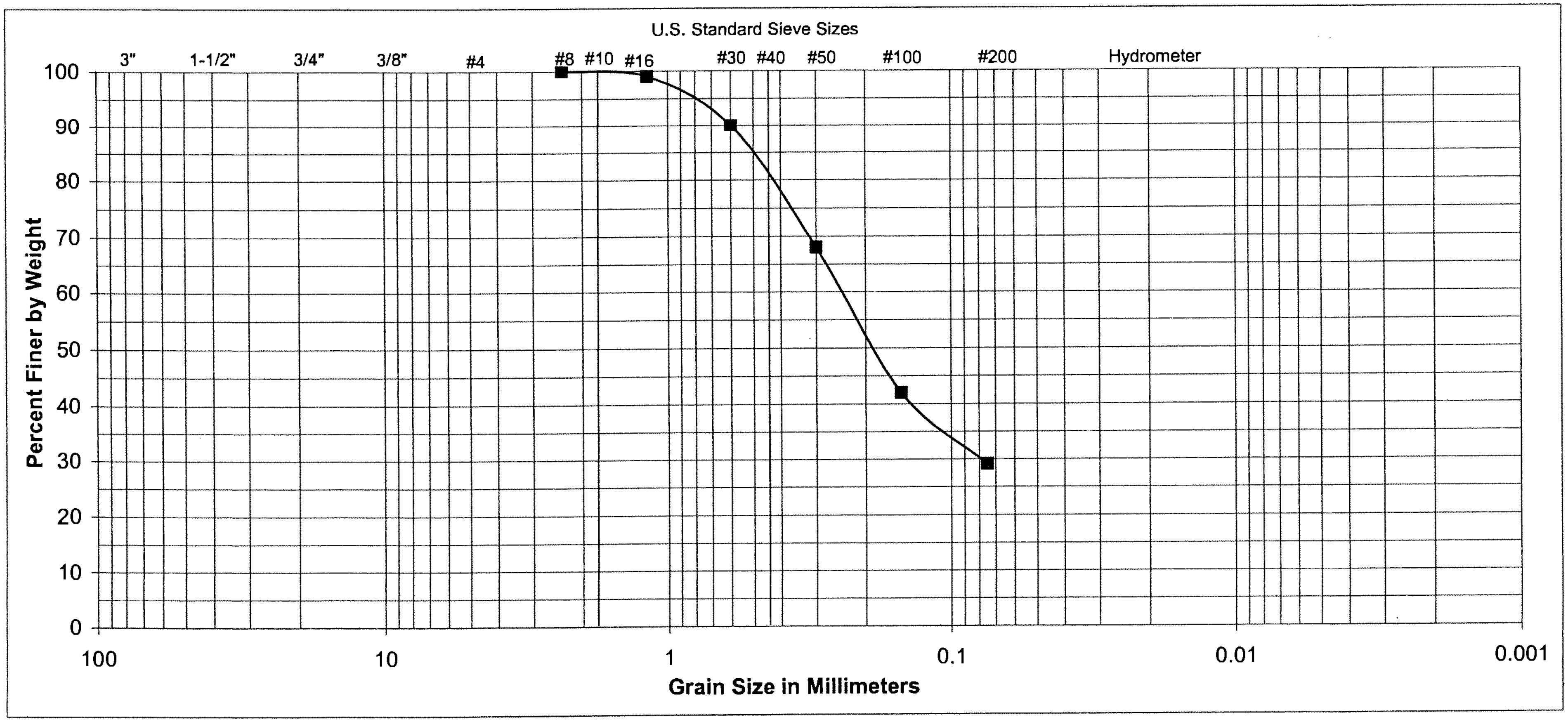
ROMERO DRIVE RESIDENTIAL

BY: DBA/SD

DATE: 3/27/2003

JOB NUMBER: 0211197-1

PLATE NO: 4



COARSE	FINE	FINE	MEDIUM	COARSE	FINES

SAMPLE

EXPLORATION NUMBER: S-2

SAMPLE LOCATION: 617'

UNIFIED SOIL CLASSIFICATION: SM

DESCRIPTION: SILTY SAND WITH CLAY
(Cabrillo Formation)

ATTERBERG LIMITS

LIQUID LIMIT:

PLASTIC LIMIT:

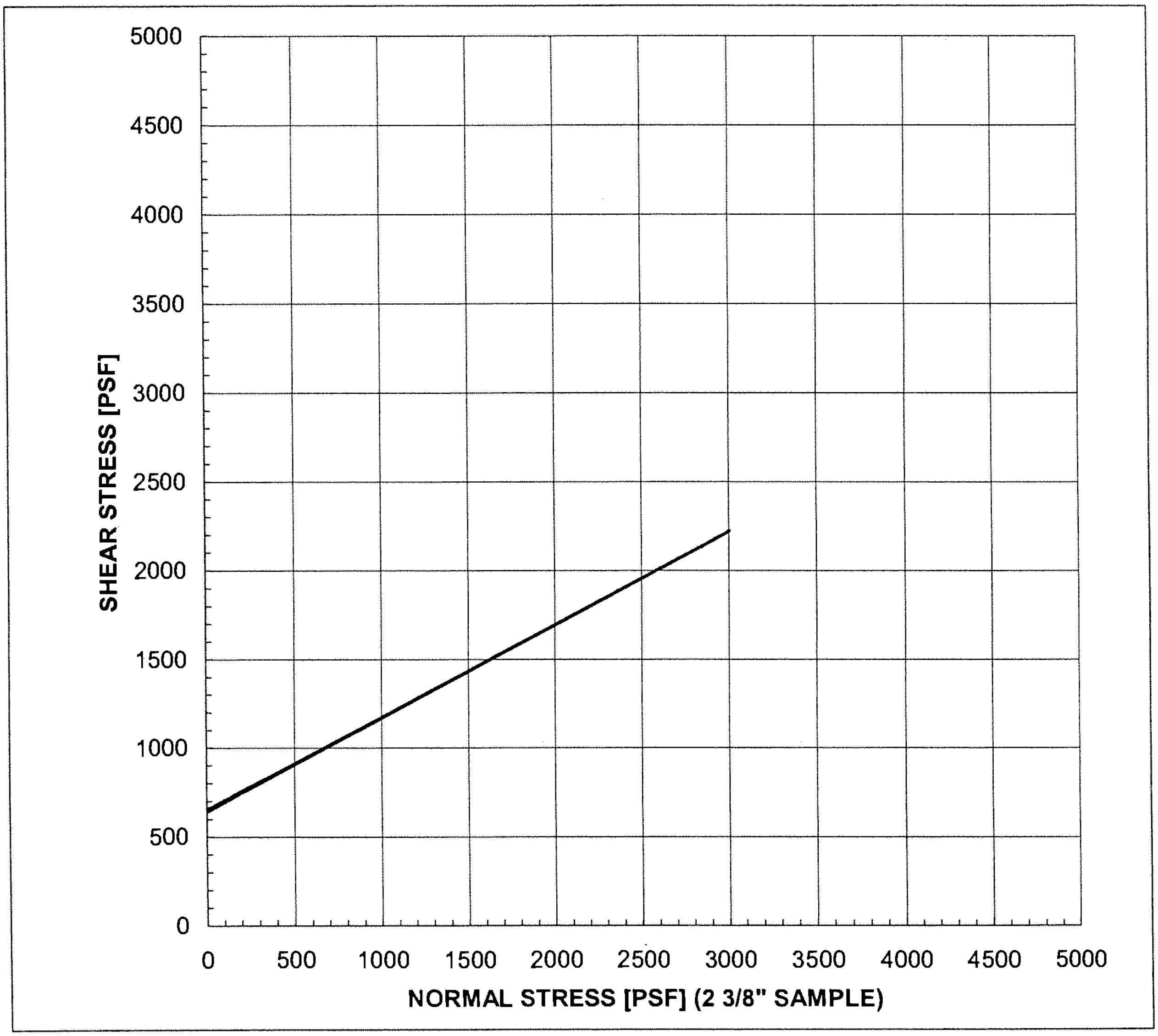
PLASTICITY INDEX:

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

ROMERO DRIVE RESIDENTIAL

BY:	DBA/SD	DATE:	3/27/2003
JOB NUMBER:	0211197-1	PLATE NO:	5

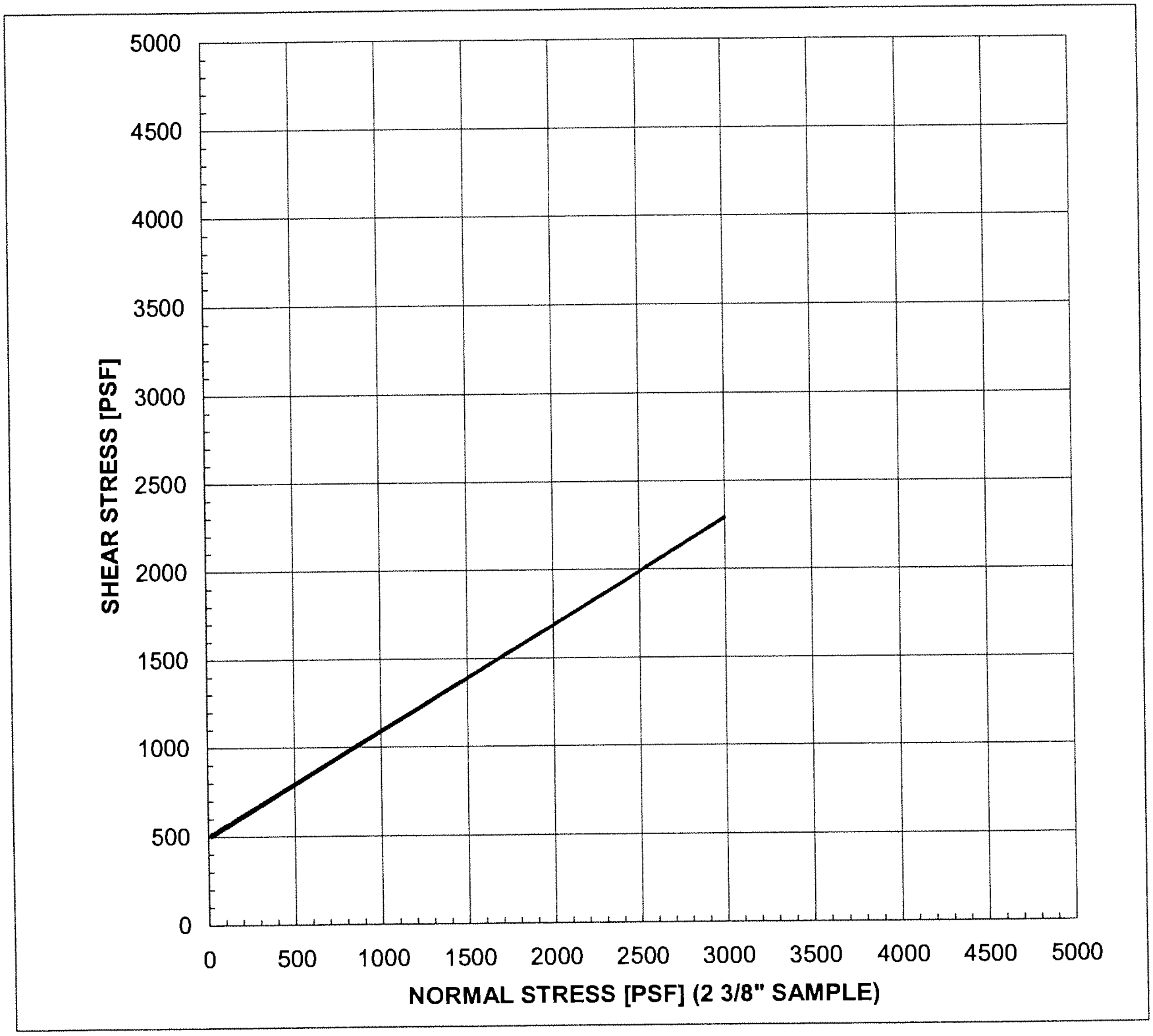
DIRECT SHEAR SUMMARY



SAMPLE	DESCRIPTION	ANGLE OF INTERNAL FRICTION (°)	COHESION INTERCEPT (PSF)
S-1 @ 618'	Remolded to In-Situ Dry Density and Optimum Moisture Content (121.0 pcf @ 5.5%)	28 °	650

SOUTHERN CALIFORNIA SOIL & TESTING, INC.	ROMERO DRIVE RESIDENTIAL		
	BY: DBA/SD	DATE:	3/27/2003
	JOB NUMBER: 0211197-1	PLATE NO.:	6

DIRECT SHEAR SUMMARY



SAMPLE	DESCRIPTION	ANGLE OF INTERNAL FRICTION (°)	COHESION INTERCEPT (PSF)
S-2 @ 617'	Undisturbed Dry Density = 112.4 pcf Moisture Content = 7.1%	31 °	500

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

ROMERO DRIVE RESIDENTIAL

BY: DBA/SD

DATE: 3/27/2003

JOB NUMBER: 0211197-1

PLATE NO.: 7

APPENDIX I
FIELD INVESTIGATION

Four test borings were drilled at the locations indicated on Figure 2 between December 20, 2004 and January 20, 2005. Additionally, 4 test pits were dug on September 21, 2004. The fieldwork was performed under the observation of our geology personnel, who also logged the borings and obtained samples of the materials encountered. Relatively undisturbed samples were obtained with a 2.5-inch inner diameter sampler driven with a 140-pound weight falling 30 inches. Disturbed samples were obtained from drill cuttings and during Standard Penetration Testing. Standard Penetration Tests were performed by driving a 1.4-inch inner diameter sampler with a 140-pound weight falling 30 inches. The number of blows required to drive the sampler the final 12 inches of an 18-inch drive are noted on the borings logs as "Penetration (blows/ft. of drive)."

The boring and test pit logs are presented on pages I-2 through I-19. Soils are described in accordance with the Unified Soil Classification System illustrated on page I-1.

SUBSURFACE EXPLORATION LEGEND

UNIFIED SOIL CLASSIFICATION CHART

SOIL DESCRIPTION		GROUP SYMBOL	TYPICAL NAMES
I. COARSE GRAINED, more than half of material is larger than No. 200 sieve size.			
GRAVELS More than half of coarse fraction is larger than No. 4 sieve size but smaller than 3".	CLEAN GRAVELS	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
		GP	Poorly graded gravels, gravel sand mixtures, little or no fines.
	GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, poorly graded gravel-sand-silt mixtures.
		GC	Clayey gravels, poorly graded gravel-sand, clay mixtures.
SANDS More than half of coarse fraction is smaller than No. 4 sieve size.	CLEAN SANDS	SW	Well graded sand, gravelly sands, little or no fines.
		SP	Poorly graded sands, gravelly sands, little or no fines.
	SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, poorly graded sand and silty mixtures.
		SC	Clayey sands, poorly graded sand and clay mixtures.
II. FINE GRAINED, more than half of material is smaller than No. 200 sieve size.			
	SILTS AND CLAYS Liquid Limit less than 50	ML	Inorganic silts and very fine sands, rock flour, sandy silt or clayey-silt-sand mixtures with slight plasticity.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		OL	Organic silts and organic silty clays or low plasticity.
	SILTS AND CLAYS Liquid Limit greater than 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
		OH	Organic clays of medium to high plasticity.
III. HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils.

∇ - Water level at time of excavation or as indicated
US - Undisturbed, driven ring sample or tube sample
SC - Sand Cone
CON - Consolidation
EI - Expansion Index
MS - Maximum Size of Particle
MAX - Maximum Density
ST - Shelby Tube
SPT - Standard Penetration Sample
pH - pH & Resistivity
SF/CL - Sulfate & Chloride

CK - Undisturbed chunk sample
☒ - Bulk Sample
SP - Standard penetration sample
DS - Direct Shear
SA - Sieve Analysis
PI - Plastic Index
RC - Relative Compaction
UC - Unconfined Compression
TX - Triaxial Compression
RS - Ring Shear
AL - Atterberg Limits

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

7231 ROMERO DRIVE

BY: JRH
DATE: 2/26/2010
JOB NUMBER: 1011003-1
FIGURE I-1

LOG OF EXPLORATORY BORING NUMBER B-1

Date Excavated: 12-20-04 to 12-23-04
Equipment: Limited Access Rig; 30" Auger
Surface Elevation (ft): 649
Logged by: DT/JRH
Project Manager: JRH
Depth to Water (ft):

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
	GC	**COLLUVIUM/TOPSOIL:** Reddish-brown, moist, loose, COBBLE CONGLOMERATE with CLAYEY SAND matrix						
2	GM	CABRILLO FORMATION (Kc): Yellowish-brown to yellowish-tan, humid to moist, very dense, SANDY CONGLOMERATE						
4								
6		Contact gradational						
8	GM/ SM	Light gray, yellowish-tan, humid to moist, very dense, SILTY SAND with COBBLE, grades to SILTY SAND						
	SM			☒				
10			☒		47	11.8	110.7	SA
12								
14		Contact: N70°/15°S						
16	ML	1" to 2" layer dark gray to gray, moist, hard, SANDY SILT with CLAY						
18	SM	Light gray, yellowish-tan, moist, SILTY SAND	☒		74	10.3	116.1	
20								

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

7231 ROMERO DRIVE

BY: JRH

DATE: 2/26/2010

JOB NUMBER: 1011003-1

FIGURE I-2

LOG OF EXPLORATORY BORING NUMBER B-1 (continued)

Date Excavated: 12-20-04 to 12-23-04
Equipment: Limited Access Rig; 30" Auger
Surface Elevation (ft): 649
Logged by: DT/JRH
Project Manager: JRH
Depth to Water (ft):

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
		Continued	☒		57			DS
		Contact: N75°W/18°S						
22	ML & SM	Dark gray and yellowish-tan and light gray, moist to saturated, interbedded hard, CLAYEY SILT and very dense, SILTY SAND						
24		@23': Seepage from sand layers	☒		23			DS
	SM	@ 23½: Contact: N75°W/16°S						
26		Yellowish-tan, light gray, wet, very dense, SILTY SAND		☒				
	CL/ SC	Rusty, yellowish-tan, wet to saturated, very dense, CLAYEY SAND to hard SANDY CLAY						SA
28			☒		82	12.7	112	
	SM	Tan to reddish-tan, moist, very dense, SILTY SAND		☒				
30		Contact: E-W/10°S-SE						
	ML	Dark gray, moist, hard, CLAYEY SILT						
32	SM	Light gray, yellowish-tan, moist, very dense, SILTY SANDSTONE						
34		Brownish-gray	☒		44	13.2	115.4	
36								
38								
40								

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

7231 ROMERO DRIVE

BY: JRH
DATE: 2/26/2010
JOB NUMBER: 1011003-1
FIGURE I-3

LOG OF EXPLORATORY BORING NUMBER B-1 (Continued)

Date Excavated: 12-20-04 and 12-
Equipment: Limited Access Rig; 30" Auger
Surface Elevation (ft): 649

Logged by: DT/JRH
Project Manager: JRH
Depth to Water (ft):

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
		SANDSTONE CONCRETION		☒				
42	SM & ML & GM	Grayish-brown to brownish-gray, moist, very dense, SILTY SAND interbedded with SILT and CONGLOMERATE						
44								
46								
48								
50			☒		50/6"	12.8	110.8	
52								
54		@ 55': Sampler bouncing on cobble or concretion						
56		Bottom at 55 feet						
58		Note: Due to drilling difficulties boring was downhole logged to a depth of only 32'						
60								

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

7231 ROMERO DRIVE
BY: JRH
DATE: 2/26/2010
JOB NUMBER: 1011003-1
FIGURE I-4

LOG OF EXPLORATORY BORING NUMBER B-2

Date Excavated:	01-17-05	Logged by:	DT/JRH
Equipment:	Watson 3000; 30" Auger	Project Manager:	JRH
Surface Elevation (ft):	638	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
	GC	**LANDSLIDE (Qls):** Brown, moist, dense, COBBLE CONGLOMERATE with CLAYEY SAND						
2								
4								
6								
8								
		Gradational contact						
10	SM	Grayish-brown to light gray, moist to wet, SILTY SAND with COBBLE and GRAVEL						
12								
14		Light gray, cobble and gravel content decreases with depth Backscarp of landslide noted at 14'						
16		Backscarp dips about 75° toward south						
18								
20								

SOUTHERN CALIFORNIA SOIL & TESTING, INC.	7231 ROMERO DRIVE	
	BY: JRH	DATE: 2/26/2010
	JOB NUMBER: 1011003-1	FIGURE I-5

LOG OF EXPLORATORY BORING NUMBER B-2 (continued)

Date Excavated:	01-17-05	Logged by:	DT/JRH
Equipment:	Watson 3000; 30" Auger	Project Manager:	JRH
Surface Elevation (ft):	638	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			UNDISTURBED	BULK				
		Rupture: N80°W/22°S						
22	CL ML	**RUPTURE PLANE:** Dark gray, saturated to moist, very stiff to hard, SILTY CLAY and CLAYEY to SANDY SILT. Bedding: N80 °W/18°S						
24	SM	**CABRILLO FORMATION (Kc):** Yellowish-tan and light gray, moist to wet, very dense, SILTY SAND with GRAVEL and COBBLE						
26	ML	@ 26': 1"-2" layer dark gray, moist, hard, CLAYEY to SANDY SILT. N60°W/16^{oS}						
28								
30								
	ML	Dark gray, moist, hard, SANDY to CLAYEY SILT interbedded with lenses of SILTY SAND						
32								
34		Saturated Heavy seepage above concretion						
		SANDSTONE CONCRETION						
36	SM	Yellowish-tan, rusty tan and light gray, moist, very dense, SILTY SAND						
38								
40								

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

7231 ROMERO DRIVE

BY: JRH	DATE: 2/26/2010
JOB NUMBER: 1011003-1	FIGURE I-6

LOG OF EXPLORATORY BORING NUMBER B-2 (Continued)

Date Excavated: 01-17-05
Equipment: Watson 3000; 30" Auger
Surface Elevation (ft): 638
Logged by: DT/JRH
Project Manager: JRH
Depth to Water (ft):

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
	SM & ML	Dark gray and tan, interbedded very dense SILTY SAND and hard SANDY to CLAYEY SILT						
42								
44								
46								
48								
	GM	Tan, moist, very dense, SANDY CONGLOMERATE, probably interbedded with SILTY SAND and SANDY to CLAYEY SILTS						
50								
52								
54								
56								
58								
	ML							
60								

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

7231 ROMERO DRIVE

BY: JRH
DATE: 2/26/2010
JOB NUMBER: 1011003-1
FIGURE I-7

LOG OF EXPLORATORY BORING NUMBER B-2 (Continued)

Date Excavated:	01-17-05	Logged by:	DT/JRH
Equipment:	Watson 3000; 30" Auger	Project Manager:	JRH
Surface Elevation (ft):	638	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			UNDISTURBED	BULK				
	ML & SM	Dark gray, moist, very hard, SANDY to CLAYEY SILT, tan, reddish-brown, very moist, very dense, SILTY SAND						
62	GM/ SM/ ML	Dark gray to gray, moist, very dense, interbedded CONGLOMERATE, SILTY SAND and very hard SANDY SILT	☒			11.8	121.6	
64								
66								
68								
70								
		Bottom at 71 feet						
72								
74		Note: Downhole logging terminated about 38' due to heavy seepage above concretion at 35'						
76								
78								
80								

SOUTHERN CALIFORNIA SOIL & TESTING, INC.	7231 ROMERO DRIVE	
	BY: JRH	DATE: 2/26/2010
	JOB NUMBER: 1011003-1	FIGURE I-8

LOG OF EXPLORATORY BORING NUMBER B-3

Date Excavated:	01-18-05	Logged by:	JRH
Equipment:	Watson 3000; 30" Auger	Project Manager:	JRH
Surface Elevation (ft):	629	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			UNDISTURBED	BULK				
	GC	**TOPSOIL:** Brown, reddish-brown, moist, loose, CLAYEY CONGLOMERATE						
2	GC	**LANDSLIDE (Qls):** Brown, moist, dense, COBBLE CONGLOMERATE with CLAYEY SAND matrix						
4								
6	GC/ SC	Gradational contact Grayish-brown to brownish-gray, moist, dense, COBBLE CONGLOMERATE grades to CLAYEY SAND with COBBLE						
8								
10	SC	Light gray to grayish-brown, moist, dense, CLAYEY SAND with COBBLE and GRAVEL, grades to SILTY SAND with COBBLE and GRAVEL						
	SM	Decreasing GRAVEL and COBBLE						
12								
14		Saturated, trace of GRAVEL and COBBLE						
16								
18								
20								

SOUTHERN CALIFORNIA SOIL & TESTING, INC.	7231 ROMERO DRIVE	
	BY: JRH	DATE: 2/26/2010
	JOB NUMBER: 1011003-1	FIGURE I-9

LOG OF EXPLORATORY BORING NUMBER B-3 (continued)

Date Excavated:	01-17-05	Logged by:	JRH
Equipment:	Watson 3000; 30" Auger	Project Manager:	JRH
Surface Elevation (ft):	629	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
	SM	Continued						
22		Heavy seepage @ 19'; caving of saturated sandy soil above 24'						
		Contact strike: E-W/16°S						
24	CH	**RUPTURE PLANE:** Dark gray, saturated to moist, stiff to hard, SILTY CLAY and CLAYEY to SANDY SILT		☒				SA,DS
26	SM& ML	**CABRILLO FORMATION (Kc):** Rusty brown to yellowish-tan, moist, dense, SILTY SAND interbedded with dark gray, moist, hard, SANDY to CLAYEY SILT and SILTY SAND	CK					DS
28	SM	Yellowish-tan to tan, moist, very dense, SILTY SAND						
30			☒			12.4	117.7	
32		Light to dark gray						
34		Reddish-tan to light gray						
36								
		SANDSTONE CONCRETION						
38	GM/ SM	Reddish-tan to reddish-brown and light gray, moist, very dense, SANDY CONGLOMERATE to SILTY SAND with COBBLE						
40								

SOUTHERN CALIFORNIA SOIL & TESTING, INC.	7231 ROMERO DRIVE	
	BY: JRH	DATE: 2/26/2010
	JOB NUMBER: 1011003-1	FIGURE I-10

LOG OF EXPLORATORY BORING NUMBER B-3 (Continued)

Date Excavated:	01-18-05	Logged by:	JRH
Equipment:	Watson 3000; 30" Auger	Project Manager:	JRH
Surface Elevation (ft):	629	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
42 44	GM/ SM	Continued						
46	ML SM	Dark gray, moist, very hard, SANDY to CLAYEY SILT interbedded with yellowish-tan, moist, very dense, cemented SILTY SAND	☒			18.8	107.4	
48	GM	Yellowish-tan to reddish-brown, moist, very dense, cemented CONGLOMERATE						
50 52 54 56	SM	Light gray, moist, very dense, SILTY SAND Light reddish-tan to light grayish-tan Very hard and slow drilling	☒			19.3	107.8	
58 60	SM & ML	Reddish-tan, very dense, SILTY SAND with GRAVEL and COBBLE, interbedded with dark gray, very hard, SANDY SILT						

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

7231 ROMERO DRIVE

BY: JRH	DATE: 2/26/2010
JOB NUMBER: 1011003-1	FIGURE I-11

LOG OF EXPLORATORY BORING NUMBER B-3 (Continued)

Date Excavated: 01-18-05
Equipment: Watson 3000; 30" Auger
Surface Elevation (ft): 629
Logged by: JRH
Project Manager: JRH
Depth to Water (ft):

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			UNDISTURBED	BULK				
		@ 61': Very hard drilling						
62	GM & SM	Yellowish- to reddish-tan and light gray, moist, very dense, interbedded SANDY CONGLOMERATE and SILTY SAND with GRAVEL and COBBLE						
64								
66								
68								
70		Bottom at 69 feet						
72		Note: Downhole logging terminated at about 25' due to caving soil above 24'						
74								
76								
78								
80								

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

7231 ROMERO DRIVE

BY: JRH
DATE: 2/26/2010
JOB NUMBER: 1011003-1
FIGURE I-12

LOG OF EXPLORATORY BORING NUMBER B-4

Date Excavated: 01-19-05
Equipment: Watson 3000; 30" Auger
Surface Elevation (ft): 639
Logged by: DT/JRH
Project Manager: JRH
Depth to Water (ft):

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
	GM	**CABRILLO FORMATION (Kc):** Yellowish-tan, humid to moist, very dense, SANDY CONGLOMERATE						
2	SM	Tan, moist, very dense, SILTY SAND with GRAVEL and COBBLE						
4		Light gray, SILTY SAND with trace of GRAVEL and COBBLE						
	ML	@ 4½': 2" layer gray, moist, hard, CLAYEY SILT, N70°W/18°S						
6	SM	Yellowish-tan, light gray, moist, very dense, SILTY SAND with trace of GRAVEL and COBBLE						
8		@ 5': Minor fault N35°E/78°NW dies out about 3'. See detail, Plate No. 4						
10		SANDSTONE CONCRETION CONTACT: N75°W/14°S						
12	SM	Yellowish-tan, light gray, moist, very dense, SILTY SAND with trace of GRAVEL and COBBLE Contact: Strike E-W/17°S						
	ML	Dark gray, moist, hard, CLAYEY SILT, approx. 10" thick						
14	SM	Light gray, moist, very dense, SILTY SAND with SILTSTONE rip-up clast (1" dia.±)						
16								
	CL	Dark gray, wet to saturated, very stiff, CLAY		☒				SA
18	SM	Yellowish-tan, light gray and tan, moist to wet, dense, SILTY SAND with SILTSTONE rip-up clast						
20		Moist, rip-up clast increase in size with depth						

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

7231 ROMERO DRIVE
BY: JRH
DATE: 2/26/2010
JOB NUMBER: 1011003-1
FIGURE I-13

LOG OF EXPLORATORY BORING NUMBER B-4 (continued)

Date Excavated:	01-19-05	Logged by:	DT/JRH
Equipment:	Watson 3000; 30" Auger	Project Manager:	JRH
Surface Elevation (ft):	639	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
		Trace of COBBLE and GRAVEL						
22								
24			☒			21.5	111.7	
26		Contact: N70°W/16°S						
28	ML/CL	3"-4" layer dark gray, very moist, hard, CLAYEY SILT to SANDY CLAY						
	SM	Light gray, rusty tan, very moist, very dense, cemented SANDSTONE (concretion grades to non-cemented SANDSTONE)						
30	SM/SW	Reddish-tan, SILTY SAND						
	SM	Tan, SILTY SAND with trace COBBLE						
32								
34	GM	Yellowish- to reddish-tan, moist, very dense, SANDY CONGLOMERATE, cemented Contact: N40°W/20°SW						
	CL	Dark gray, moist, humid, SANDY CLAY with lenses of SAND						
36	SM	Reddish-tan to reddish-brown, very moist to wet, very dense, SILTY SAND with GRAVEL and trace of COBBLE Seepage above concretion						
38		GRAVEL and COBBLE CONGLOMERATE CONCRETION grades to SANDSTONE CONCRETION						
40	SM	Light gray, saturated, very dense, SILTY SAND with CLAYSTONE rip-up clast (10" dia.)	☒			19.4	114.1	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

7231 ROMERO DRIVE	
BY: JRH	DATE: 2/26/2010
JOB NUMBER: 1011003-1	FIGURE I-14

LOG OF EXPLORATORY BORING NUMBER B-4 (Continued)

Date Excavated:	01-18-05	Logged by:	DT/JRH
Equipment:	Watson 3000; 30" Auger	Project Manager:	JRH
Surface Elevation (ft):	639	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			UNDISTURBED	BULK				
		Light gray, rusty tan to reddish-tan, wet	☒			12.4	117.7	
42		Tan, wet to saturated Contact: N80oE/18oS Heavy seepage						
44	ML/ CL& SM	Dark gray, tan, wet to moist, hard, CLAYEY SILTSTONE to SANDY CLAY transitions to SANDY SILT transitions to SILTY SAND	☒			18.8	107.4	
		@ 44½': Bedding: N75°W/15°S	☒			19.3	107.8	DS
46	SM	Mottled yellowish-tan, moist to wet, very dense, silty sand						
		@ 46': Cemented SANDSTONE	☒			21.5	105.7	
48	ML/ CL	Dark gray, moist to wet, hard, SANDY to CLAYEY SILT to SANDY CLAY @ 48': Bedding: N10°W/20°SW						
50	GM	Yellowish-tan to rusty tan, moist to wet, very dense, SAND CONGLOMERATE with CLAYSTONE rip-up clast (2' dia.)						
52	SM/ SP	Yellowish-tan to brown, moist to wet, very dense, SILTY SAND with GRAVEL and small COBBLE @ 50': Contact N85°W/13°S						
54	GM/ SP	Brown to dark tan, moist, very dense, SANDY GRAVEL CONGLOMERATE with COBBLE to GRAVELLY SAND with COBBLE						
56								
58		Bottom at 58 feet Note: Ground surface cut down 10' for drilling pad						
60								

SOUTHERN CALIFORNIA SOIL & TESTING, INC.	7231 ROMERO DRIVE
BY: JRH	DATE: 2/26/2010
JOB NUMBER: 1011003-1	FIGURE I-15

LOG OF TEST PIT NUMBER P-1

Date Excavated:	09-21-04	Logged by:	JRH
Equipment:	Man-X	Project Manager:	DBA
Surface Elevation (ft):	658	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			UNDISTURBED	BULK			
	SM	**FILL:** Brown, humid, loose, SILTY SAND with GRAVEL					
2	SM	**COLLUVIUM:** Brown, humid, loose, SILTY SAND with COBBLES and GRAVEL					
4 6 8 10 12	GM	**CABRILLO FORMATION:** Tan-yellowish-tan, humid, very dense, COBBLE CONGLOMERATE with SAND					
14 16 18 20		Bottom of test pit at 13 feet					

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

7231 ROMERO DRIVE			
BY:	JRH	DATE:	2/26/2010
JOB NUMBER:	1011003-16	FIGURE I-16	

LOG OF TEST PIT NUMBER P-2

Date Excavated:	09-21-04	Logged by:	JRH
Equipment:	Man-X	Project Manager:	DBA
Surface Elevation (ft):	647	Depth to Water (ft):	

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			UNDISTURBED	BULK			
	GM	**COLLUVIUM:** Brown, humid, loose, COBBLE CONGLOMERATE with SAND					
2	GM	**CABRILLO FORMATION:** Tan to yellowish-tan, humid, very dense, COBBLE CONGLOMERATE with SAND, massive					
4							
6							
8							
10							
12		N30°E/20°S Contact dips 20° toward S60°E					
	SM	Light gray, humid/moist, very dense, sandstone with some sandstone rip-up clast, massive (no bedding noted)	CK	☒			DS
14							
16		Bottom of test pit at 15 feet					
18							
20							

SOUTHERN CALIFORNIA SOIL & TESTING, INC.	7231 ROMERO DRIVE	
	BY: JRH	DATE: 2/26/2010
	JOB NUMBER: 1011003-1	FIGURE I-17

LOG OF TEST PIT NUMBER P-3

Date Excavated: 09-21-04
Equipment: Man-X
Surface Elevation (ft): 615

Logged by: JRH
Project Manager: DBA
Depth to Water (ft):

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES UNDISTURBED	SAMPLES BULK	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
	SM	**CABRILLO FORMATION:** Tan-yellowish-tan and light gray, humid, dense, SILTY SAND, some depositional rip-up clast in upper 2 feet					
2	SM	Light gray, moist, very dense, massive sandstone with occasional rip-up clast of cemented sandstone					
4			CK	☒			DS
6							
8							
10	CH	Yellowish-tan to yellowish-brown and rusty brown, moist, very hard, CLAYEY SANDSTONE	CK	☒			SA, DS
12		Bottom of test pit at 12 feet					
14							
16							
18							
20							

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

7231 ROMERO DRIVE
BY: JRH
DATE: 2/26/2010
JOB NUMBER: 1011003-1
FIGURE I-18

LOG OF TEST PIT NUMBER P-4

Date Excavated: 09-21-04
Equipment: Man-X
Surface Elevation (ft): 665
Logged by: JRH
Project Manager: DBA
Depth to Water (ft):

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			UNDISTURBED	BULK			
	SM	**FILL:** Brown, saturated, loose, SILTY SAND with some GRAVEL, decayed vegetation at contact					
2	SM	**COLLUVIUM:** Dark brown, saturated, loose, SILTY SAND with some GRAVEL					
4		Bottom of test pit at 2.5 feet					
6							
8							
10							
12							
14							
16							
18							
20							

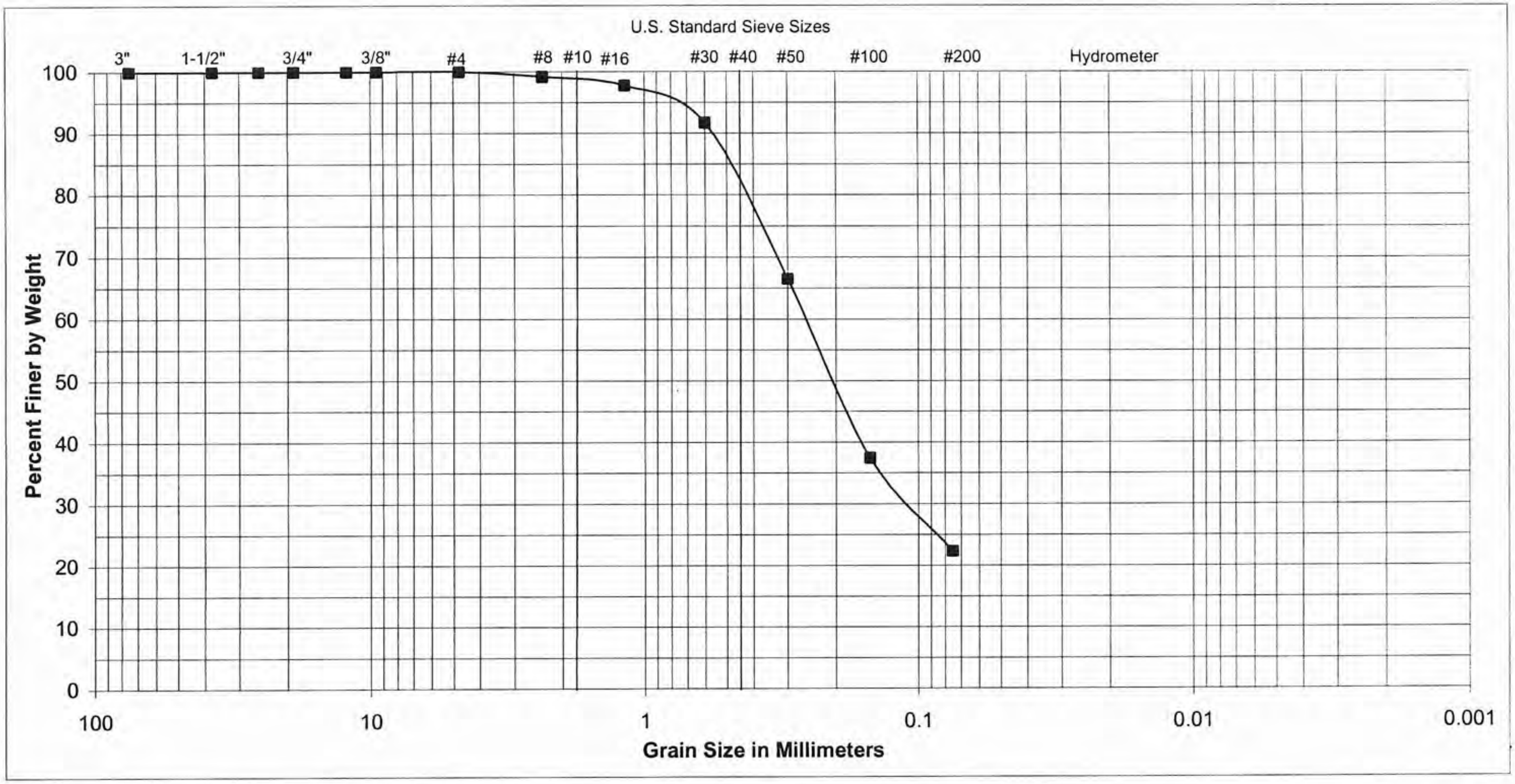
SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

7231 ROMERO DRIVE
BY: JRH
DATE: 2/26/2010
JOB NUMBER: 1011003-1
FIGURE I-19

APPENDIX II
LABORATORY TEST RESULTS

Laboratory tests were performed to provide geotechnical parameters for engineering analyses. The following tests were conducted:

- **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System.
- **GRAIN SIZE DISTRIBUTION:** Grain size distributions were determined for 9 samples in accordance with ASTM D 422. The results of these tests are presented on Figures II-1 through II-9.
- **DIRECT SHEAR:** Direct shear tests were performed in accordance with ASTM D 3080. The shear stress was applied at a constant rate of strain of approximately 0.003 inch per minute. The results of these tests are presented on Figures II-10 through II-19.
- **IN-SITU MOISTURE CONTENT AND DENSITY:** The in-situ moisture content and density of chunk samples was determined in accordance with ASTM D 7263. The results of these tests are presented on the boring logs.



		SAND			FINES
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE

EXPLORATION NUMBER: B-1

SAMPLE LOCATION: 9½' - 11'

UNIFIED SOIL CLASSIFICATION: SM

DESCRIPTION: LIGHT GRAY SILTY SAND

ATTERBERG LIMITS

LIQUID LIMIT: N/A

PLASTIC LIMIT: N/A

PLASTICITY INDEX: N/A

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

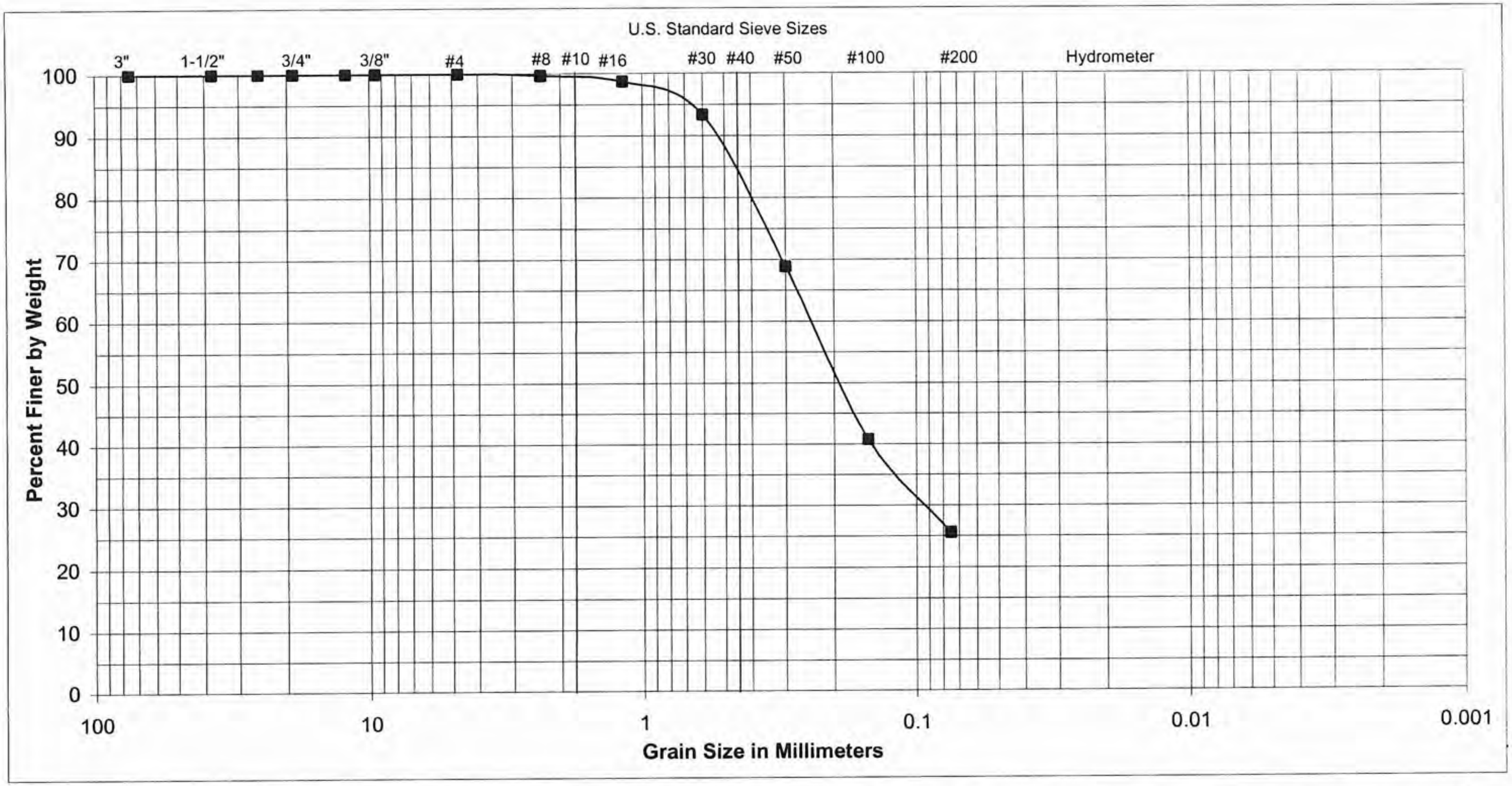
7231 ROMERO DRIVE

BY: GF

DATE: 2/26/2010

JOB NUMBER: 1011003-1

FIGURE II-1



		SAND			FINES
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE

EXPLORATION NUMBER: B-1

SAMPLE LOCATION: 26' - 29'

UNIFIED SOIL CLASSIFICATION: SM

DESCRIPTION: REDDISH-TAN SILTY SAND

ATTERBERG LIMITS

LIQUID LIMIT: N/A

PLASTIC LIMIT: N/A

PLASTICITY INDEX: N/A

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

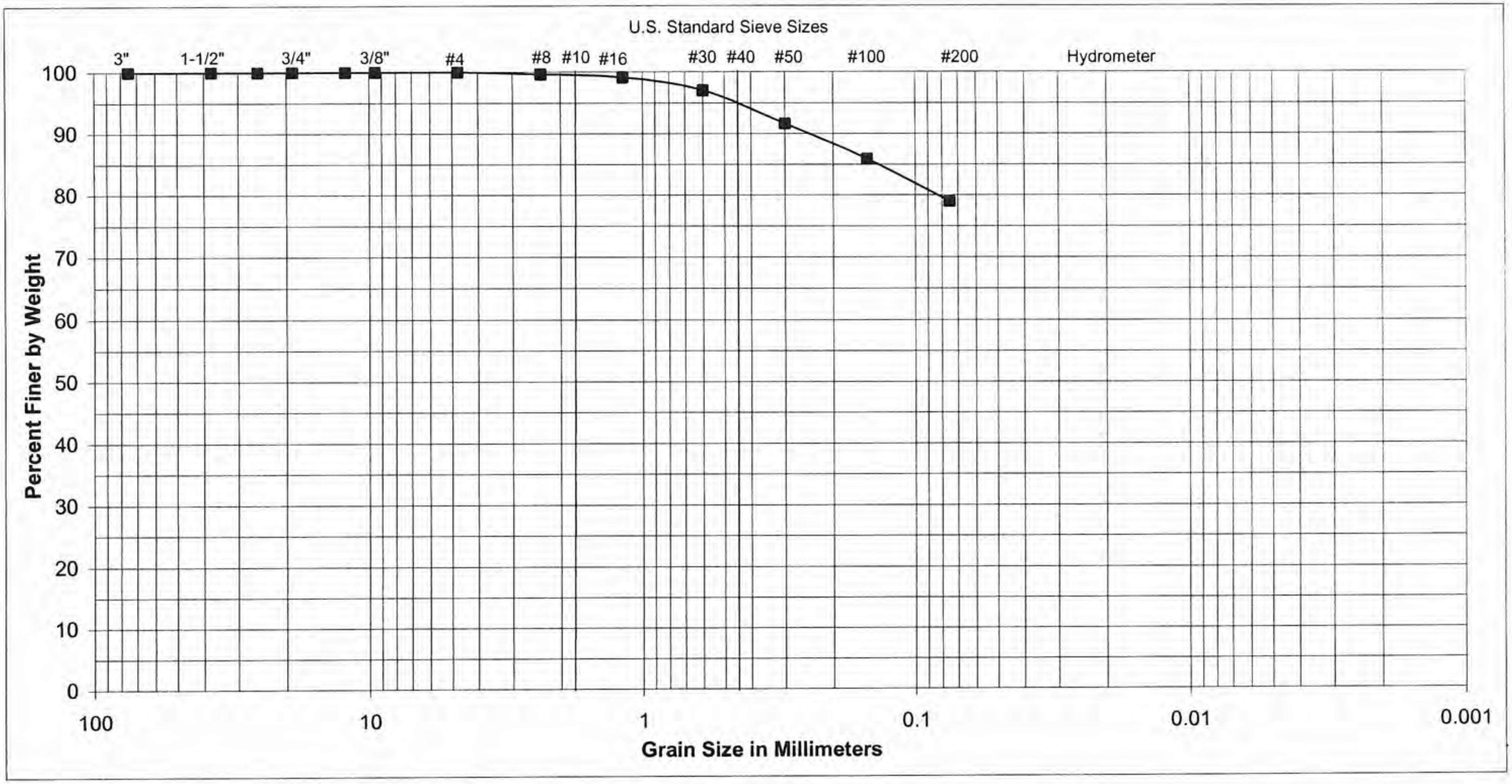
7231 ROMERO DRIVE

BY: GF

DATE: 2/26/2010

JOB NUMBER: 1011003-1

FIGURE II-2



		SAND			FINES
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE

EXPLORATION NUMBER: B-3
SAMPLE LOCATION: 24'

UNIFIED SOIL CLASSIFICATION: CH

DESCRIPTION: DARK GRAY FAT CLAY WITH SAND

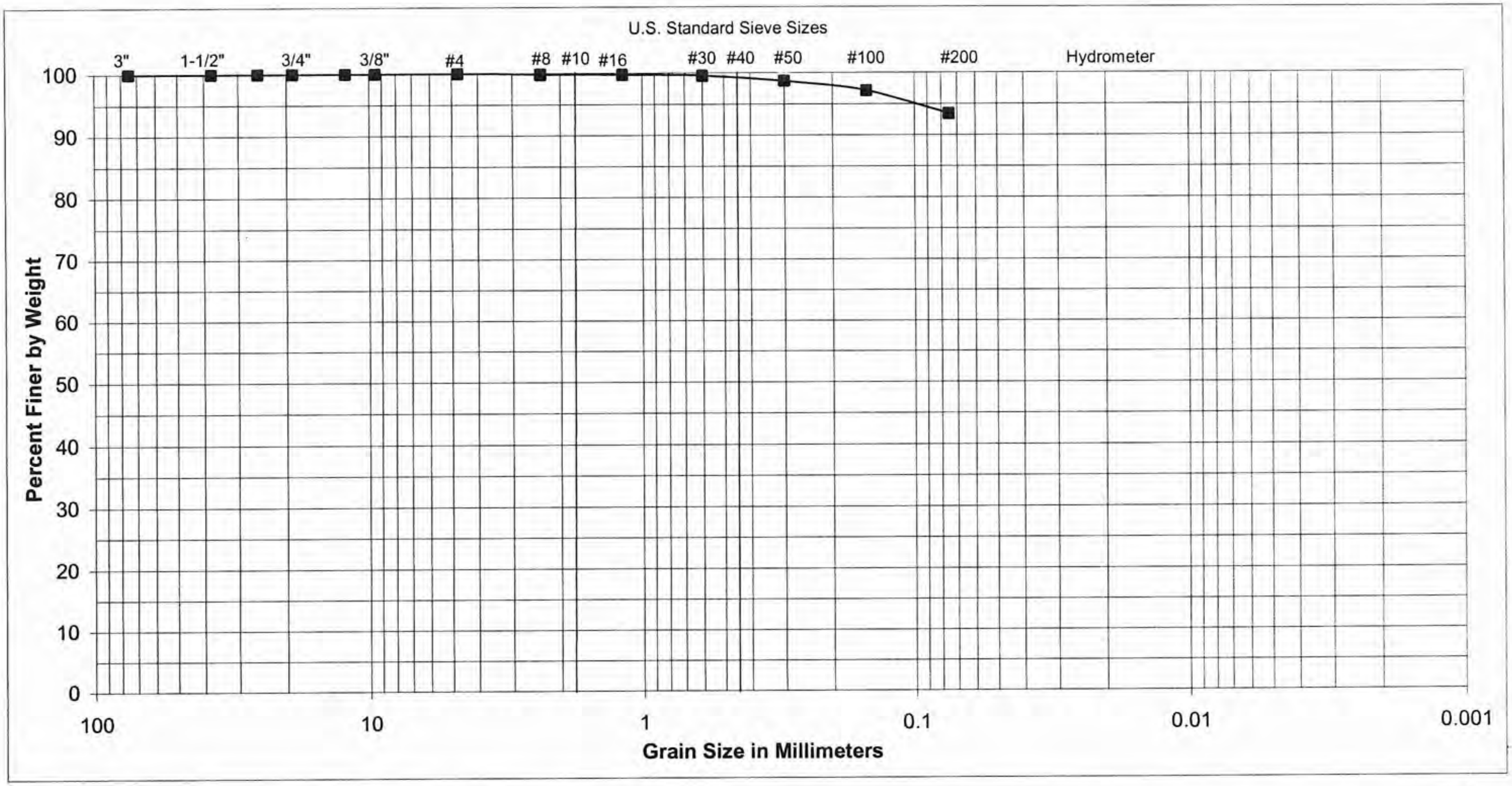
ATTERBERG LIMITS

LIQUID LIMIT: 65
PLASTIC LIMIT: 27
PLASTICITY INDEX: 38

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

7231 ROMERO DRIVE

BY: GF
JOB NUMBER: 1011003-1
DATE: 2/26/2010
FIGURE II-3



		SAND			FINES
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE

EXPLORATION NUMBER: B-4

SAMPLE LOCATION: 17'

UNIFIED SOIL CLASSIFICATION: CL

DESCRIPTION: DARK GRAY CLAY

ATTERBERG LIMITS

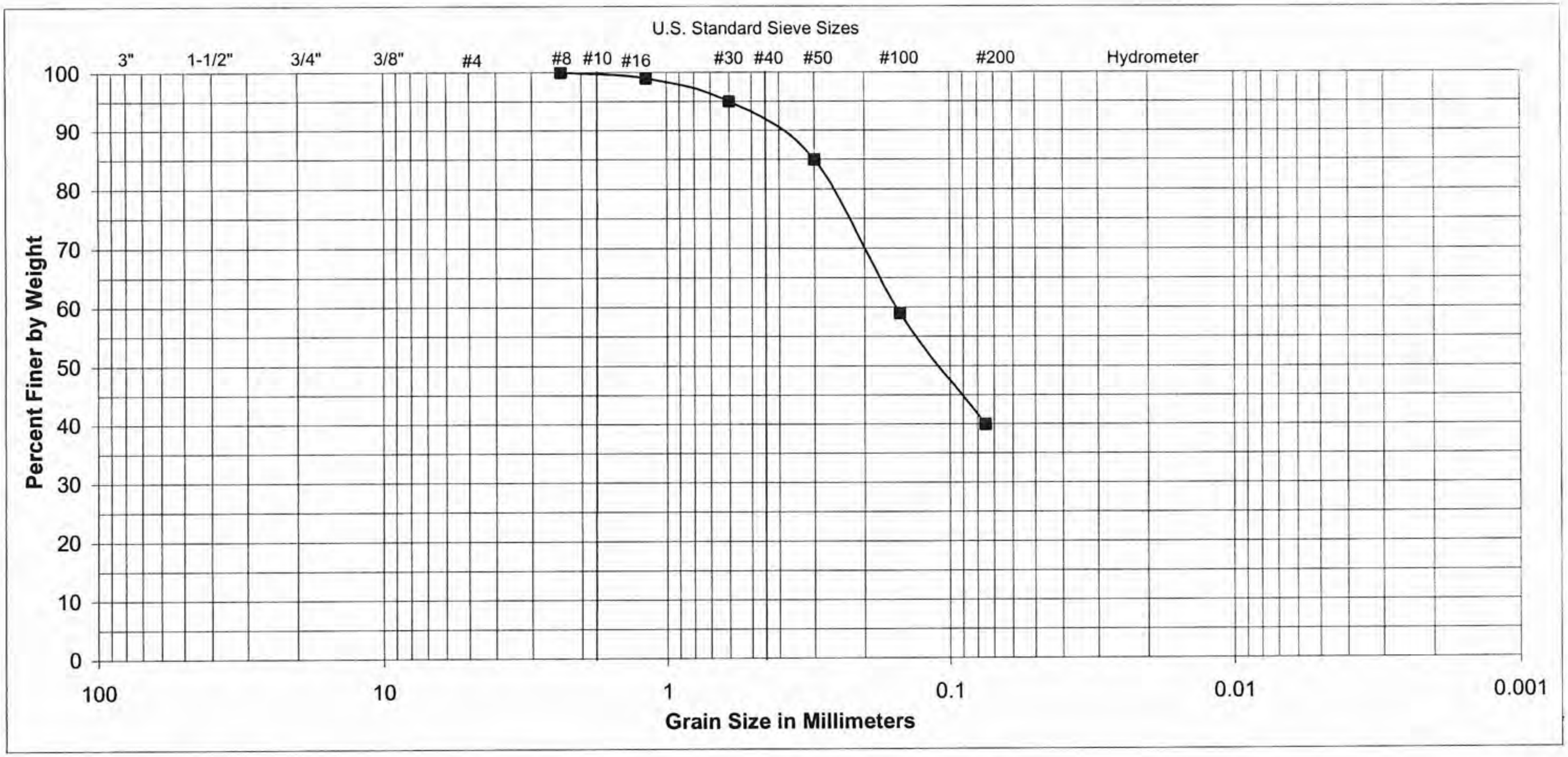
LIQUID LIMIT:	N/A
PLASTIC LIMIT:	N/A
PLASTICITY INDEX:	N/A

SOUTHERN CALIFORNIA

SOIL & TESTING, INC.

7231 ROMERO DRIVE

BY:	GF	DATE:	2/26/2010
JOB NUMBER:	1011003-1	FIGURE II-4	



GRAVEL		SAND			FINES
COARSE	FINE	COARSE	MEDIUM	FINE	

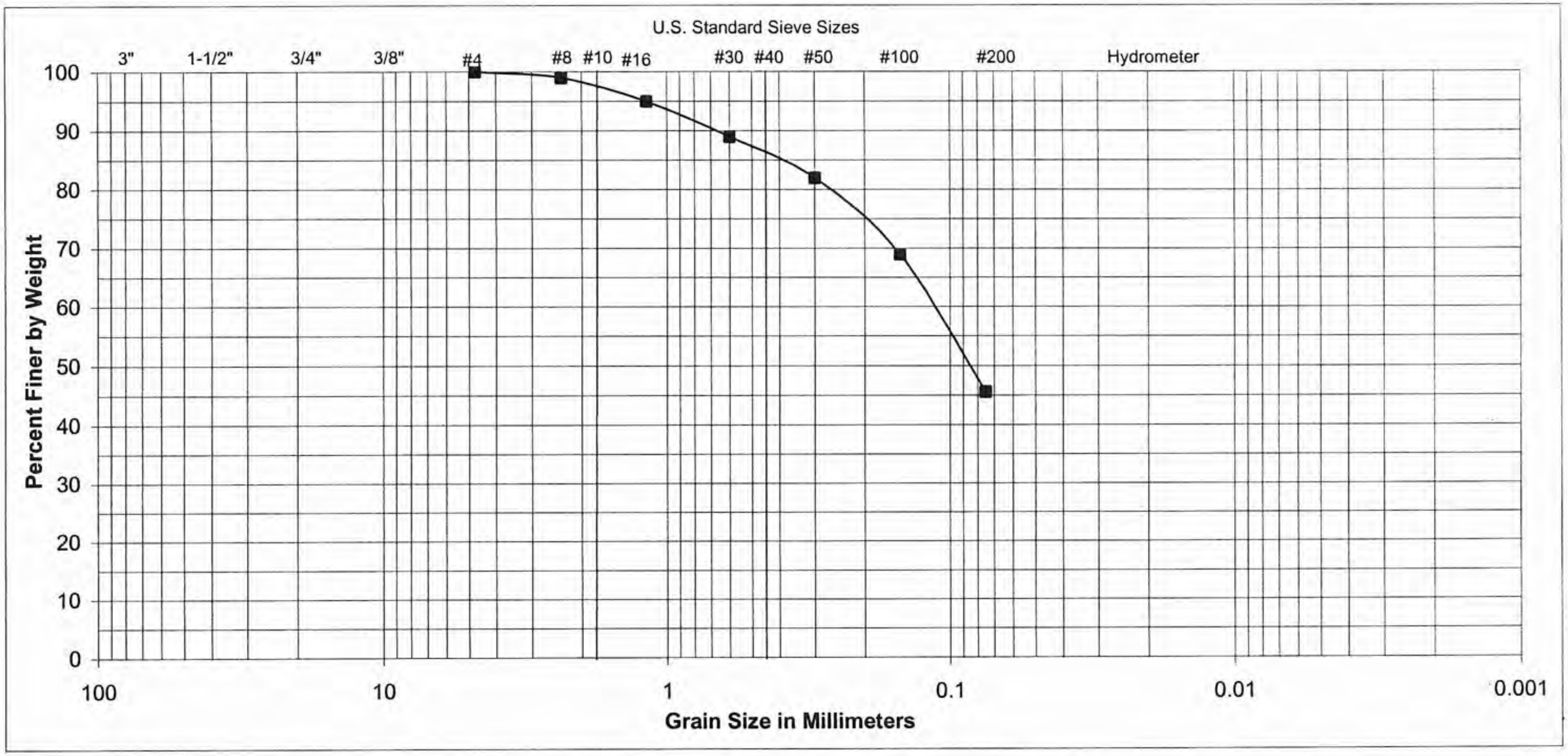
SAMPLE
EXPLORATION NUMBER: P2
SAMPLE LOCATION: 12½-13½

UNIFIED SOIL CLASSIFICATION: SM
DESCRIPTION: SILTY SAND

ATTERBERG LIMITS
LIQUID LIMIT: N/A
PLASTIC LIMIT: N/A
PLASTICITY INDEX: N/A

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

7231 ROMERO DRIVE
BY: DBA/SD
DATE: 2/26/2010
JOB NUMBER: 1011003-1
FIGURE II-5



GRAVEL		SAND			FINES
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE

EXPLORATION NUMBER: P3

SAMPLE LOCATION: 5'

UNIFIED SOIL CLASSIFICATION: SM

DESCRIPTION: SILTY SAND

ATTERBERG LIMITS

LIQUID LIMIT:	N/A
PLASTIC LIMIT:	N/A
PLASTICITY INDEX:	N/A

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

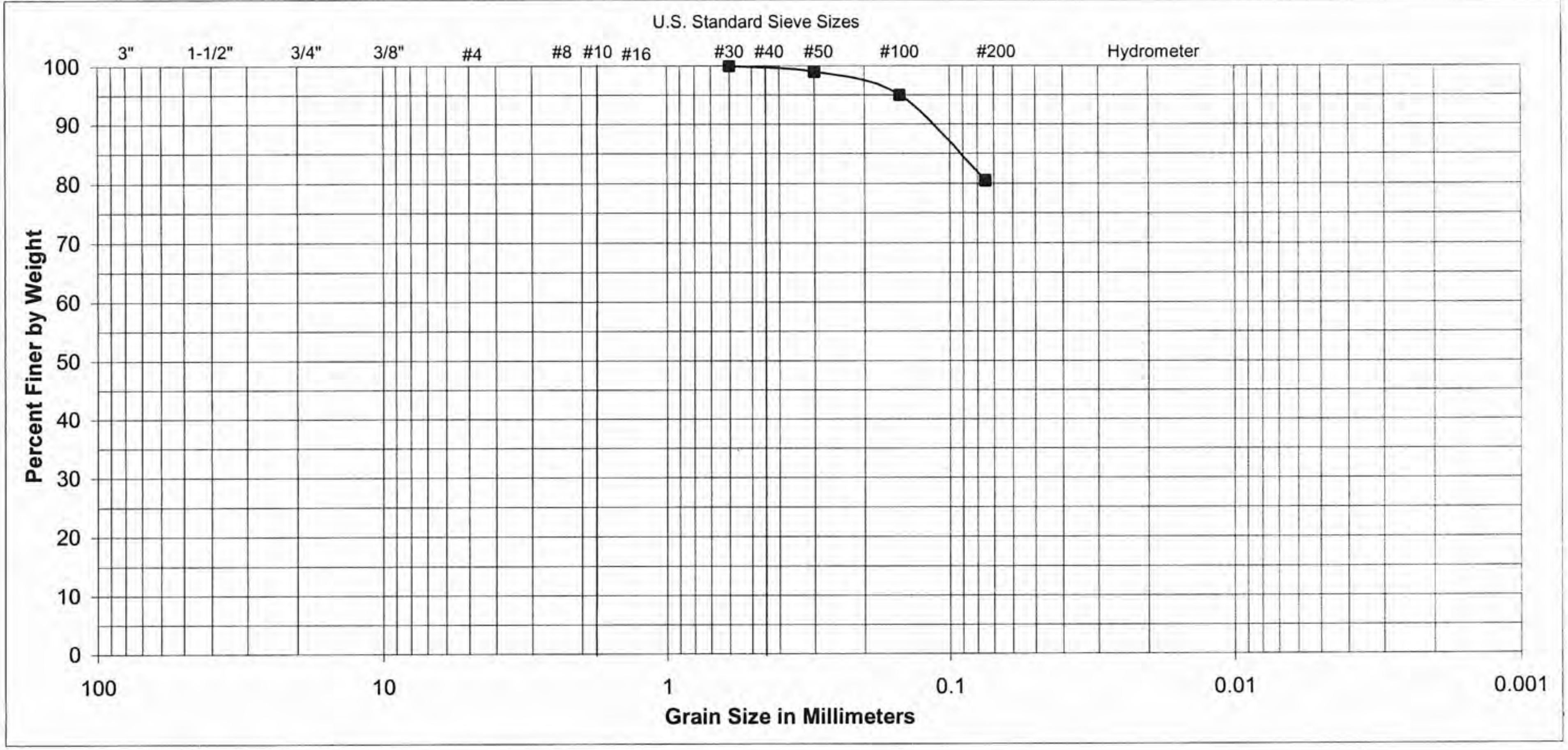
ROMERO DRIVE RESIDENTIAL

BY: DBA/SD

DATE: 2/26/2010

JOB NUMBER: 1011003-1

FIGURE II-6



GRAVEL		SAND			FINES
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE

EXPLORATION NUMBER: P3

SAMPLE LOCATION: 9½' - 10½'

UNIFIED SOIL CLASSIFICATION: CH

DESCRIPTION: CLAY WITH SAND

ATTERBERG LIMITS

LIQUID LIMIT:	52
PLASTIC LIMIT:	30
PLASTICITY INDEX:	22

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

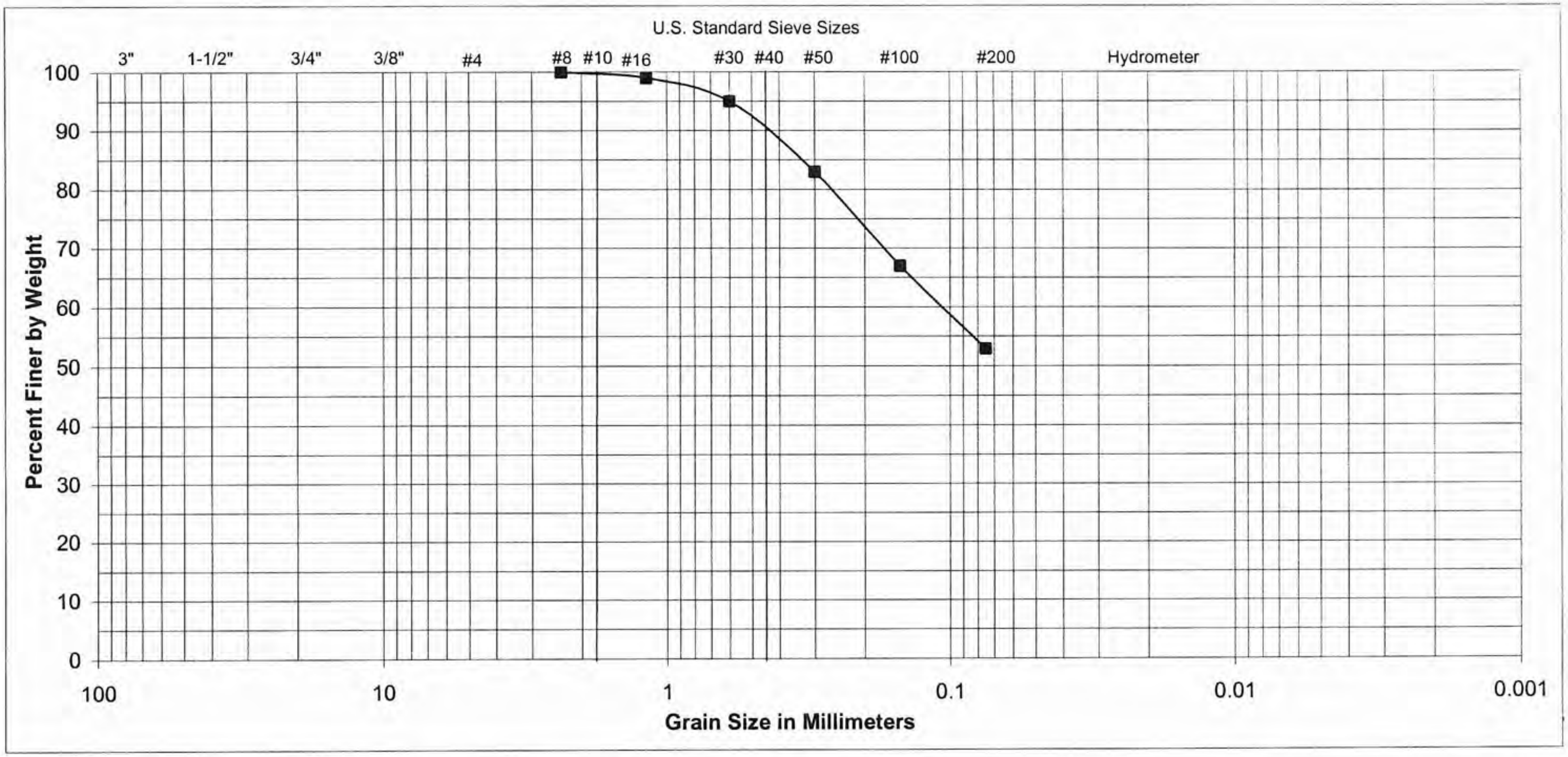
ROMERO DRIVE RESIDENTIAL

BY: DBA/SD

DATE: 2/26/2010

JOB NUMBER: 1011003-1

FIGURE II-7



		SAND			FINES
COARSE	FINE	FINE	MEDIUM	COARSE	

SAMPLE	
EXPLORATION NUMBER:	S-1
SAMPLE LOCATION:	618'

UNIFIED SOIL CLASSIFICATION: CL

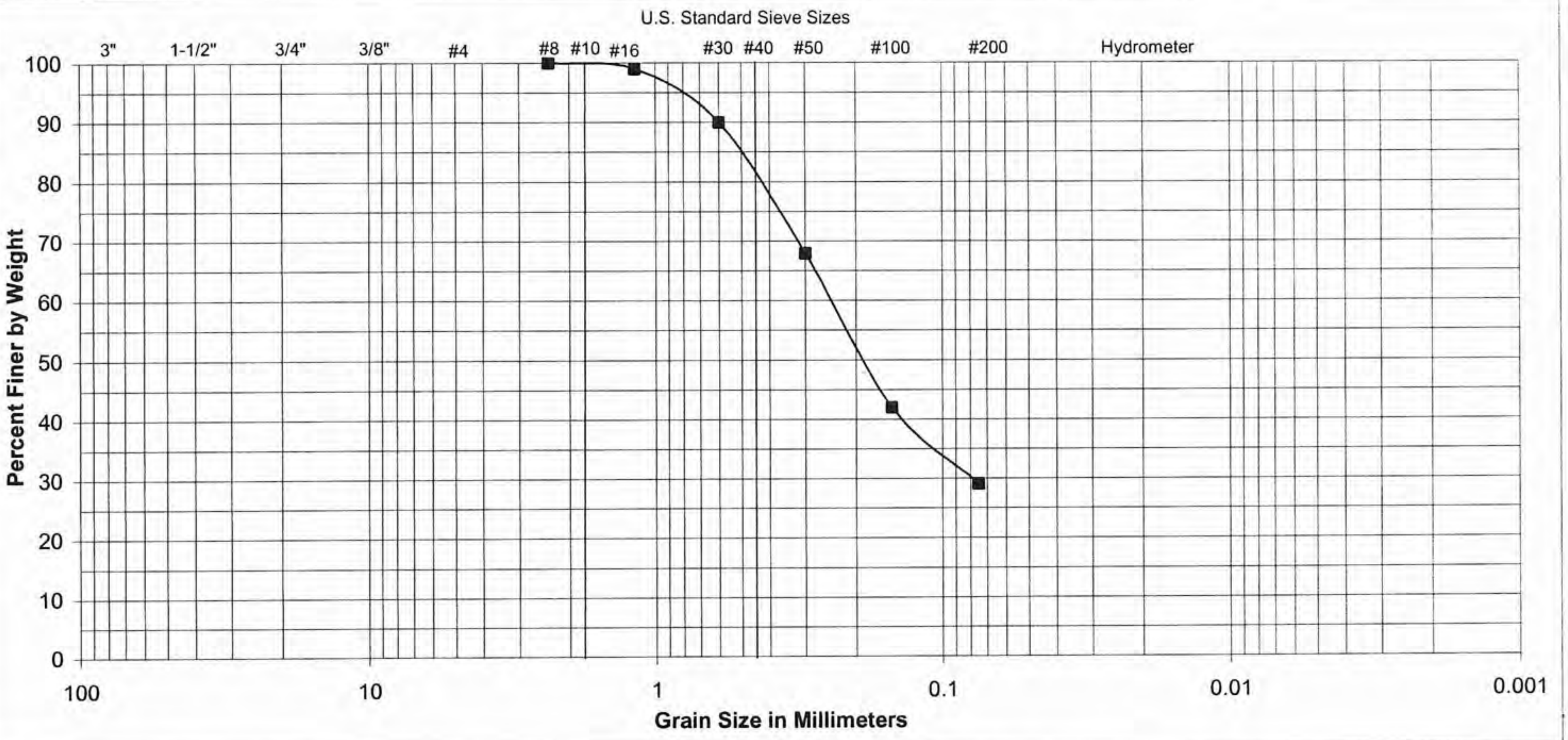
DESCRIPTION: SANDY CLAY
(Cabrillo Formation)

ATTERBERG LIMITS	
LIQUID LIMIT:	50
PLASTIC LIMIT:	22
PLASTICITY INDEX:	28

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

ROMERO DRIVE RESIDENTIAL

BY:	DBA/SD	DATE:	2/26/2010
JOB NUMBER:	1011003-1	FIGURE II-8	



		SAND			FINES
COARSE	FINE	FINE	MEDIUM	COARSE	

SAMPLE

EXPLORATION NUMBER: S-2

SAMPLE LOCATION: 617'

UNIFIED SOIL CLASSIFICATION: SM

DESCRIPTION: SILTY SAND
(Cabrillo Formation)

ATTERBERG LIMITS

LIQUID LIMIT: N/A

PLASTIC LIMIT: N/A

PLASTICITY INDEX: N/A

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

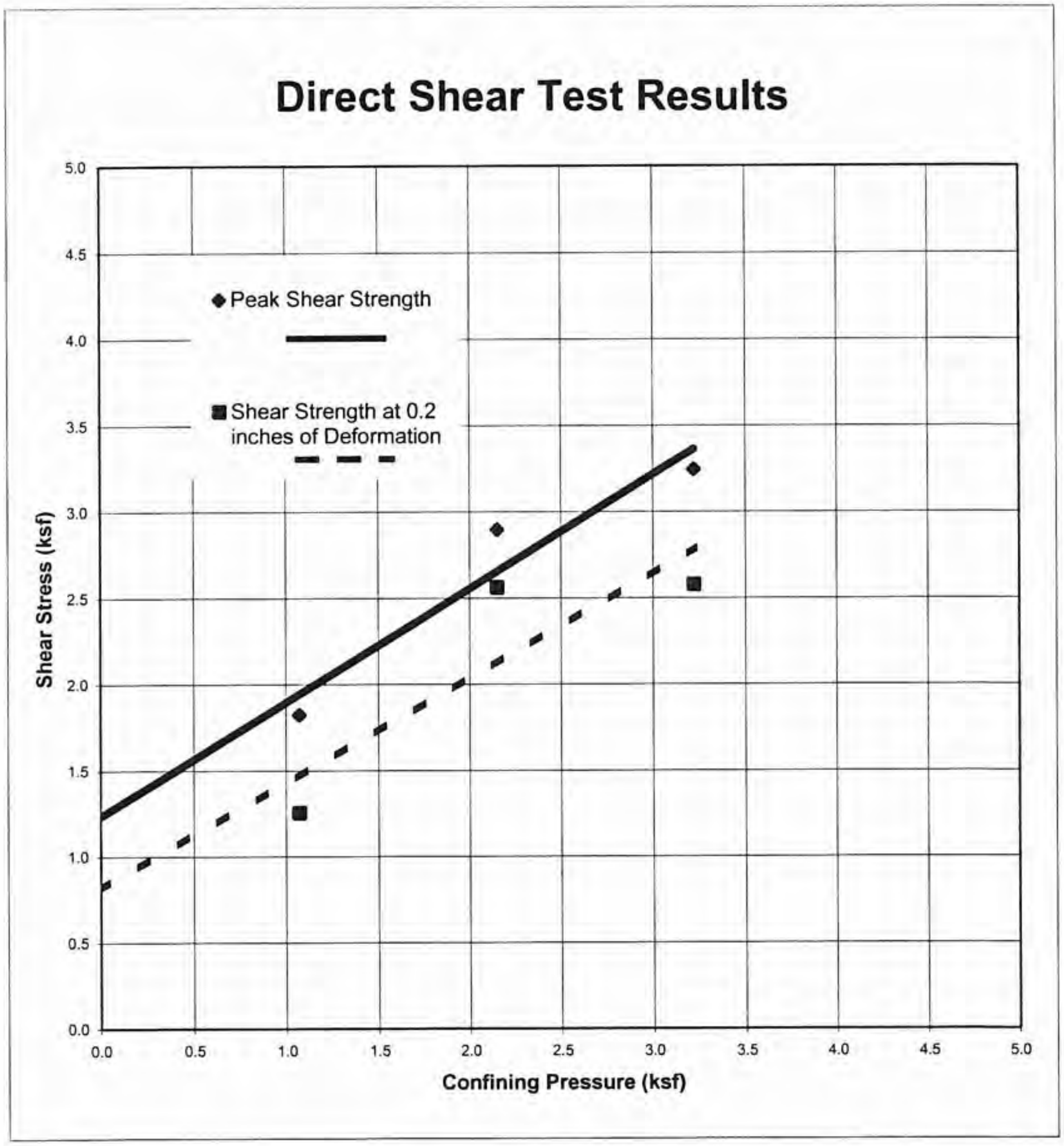
ROMERO DRIVE RESIDENTIAL

BY: DBA/SD

DATE: 2/26/2010

JOB NUMBER: 1011003-1

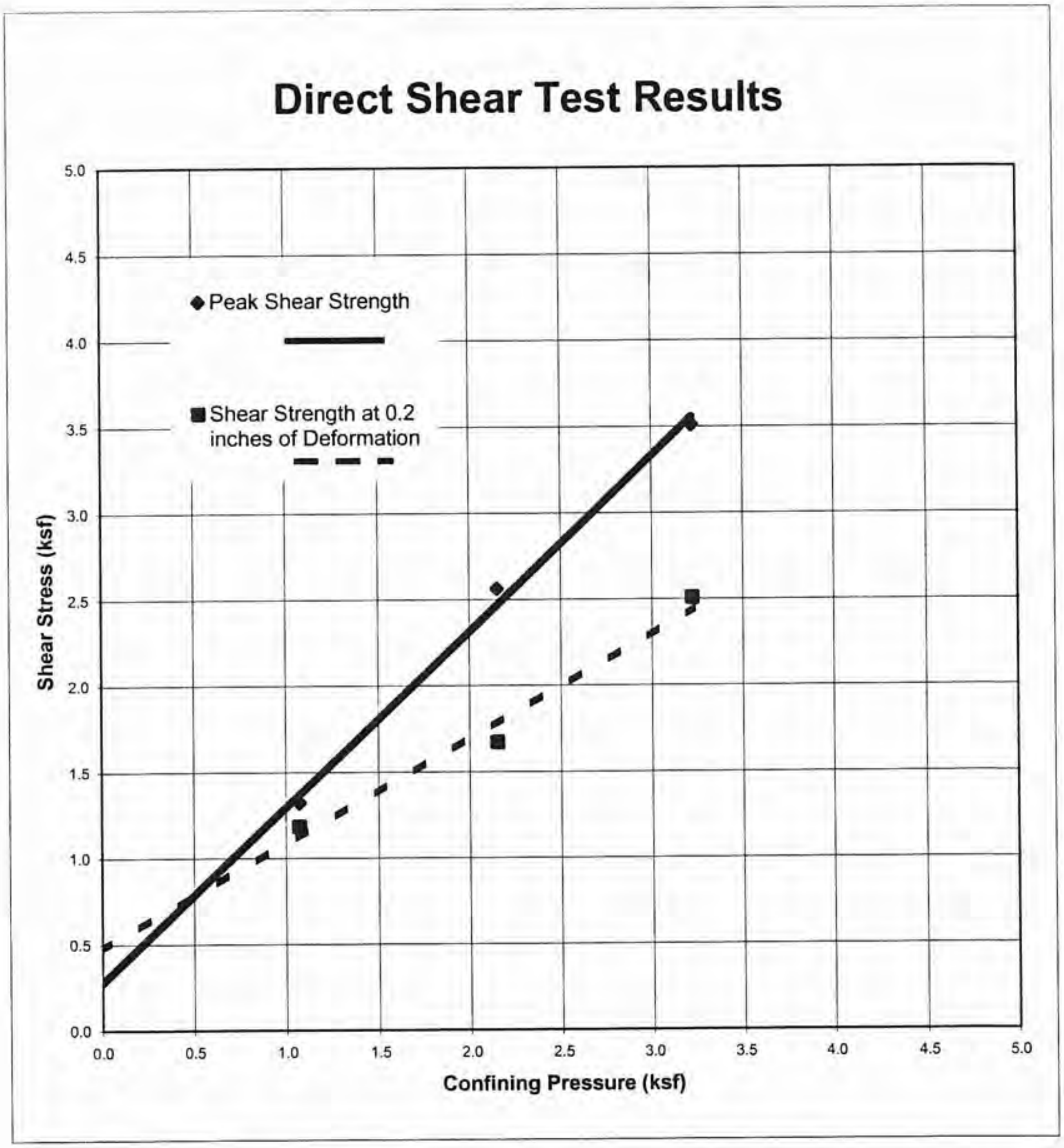
FIGURE II-9



SAMPLE	DESCRIPTION	INTERNAL FRICTION ANGLE(DEG.)	COHESION INTERCEPT (PSF)
B-1 @ 20½'	silty sand		
Peak		33	1235
Shear Strength at 0.2 inches of Deformation		32	807

SOUTHERN CALIFORNIA
SOIL & TESTING

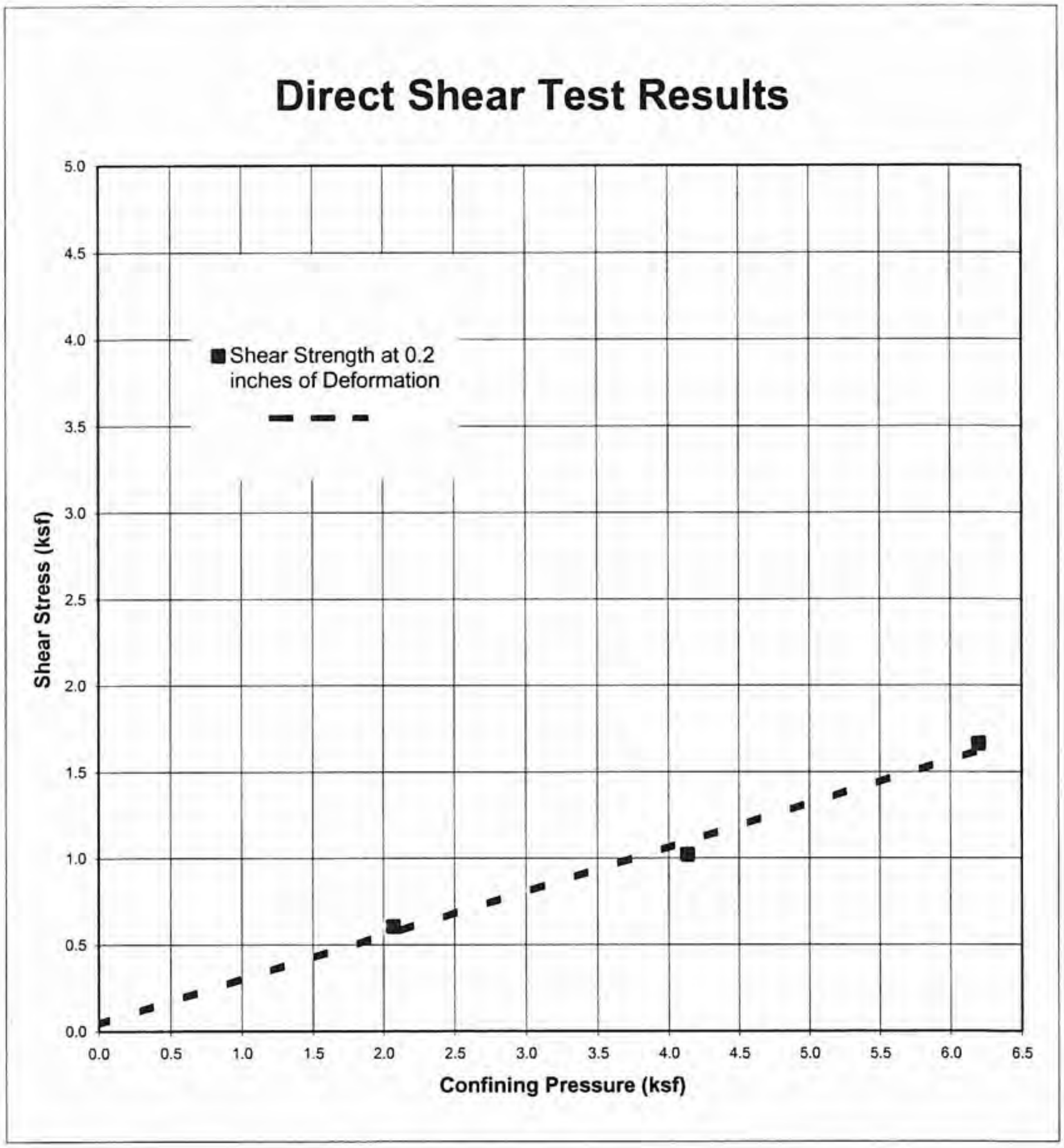
7231 ROMERO DRIVE			
BY:	JJS/GBF	DATE:	2/26/2010
JOB NUMBER:	1011003-1	FIGURE II-10	



SAMPLE	DESCRIPTION	INTERNAL FRICTION ANGLE(DEG.)	COHESION INTERCEPT (PSF)
B-1 @ 25½	silty sand		
Peak		46	279
Shear Strength at 0.2 inches of Deformation		32	466

SOUTHERN CALIFORNIA
SOIL & TESTING

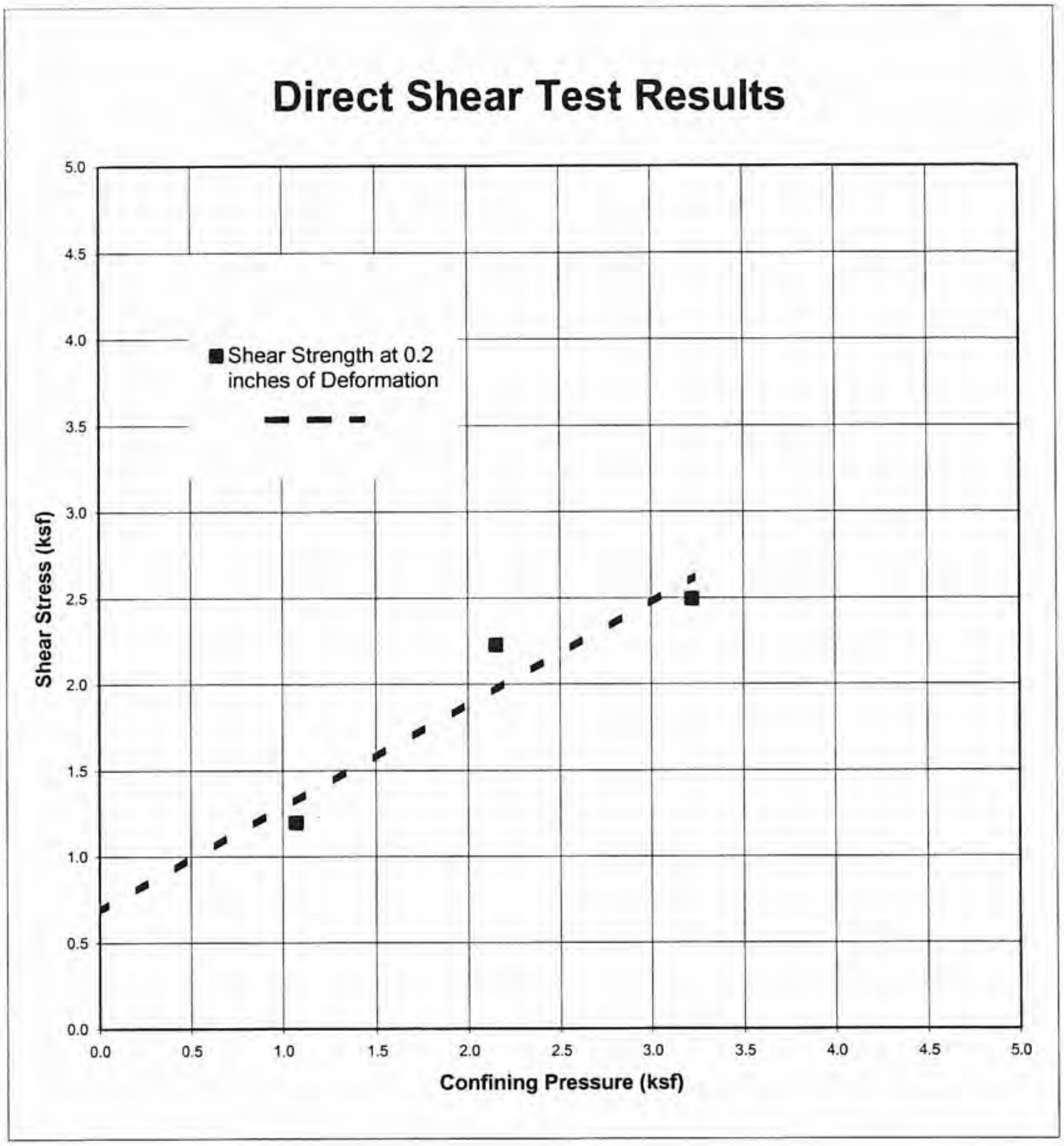
7231 ROMERO DRIVE			
BY:	JJS/GBF	DATE:	2/26/2010
JOB NUMBER:	1011003-1	FIGURE II-11	



SAMPLE	DESCRIPTION	INTERNAL FRICTION ANGLE(DEG.)	COHESION INTERCEPT (PSF)
B-3 @ 24'	Remolded/Clay		
Shear Strength at 0.2 inches of Deformation		13	38

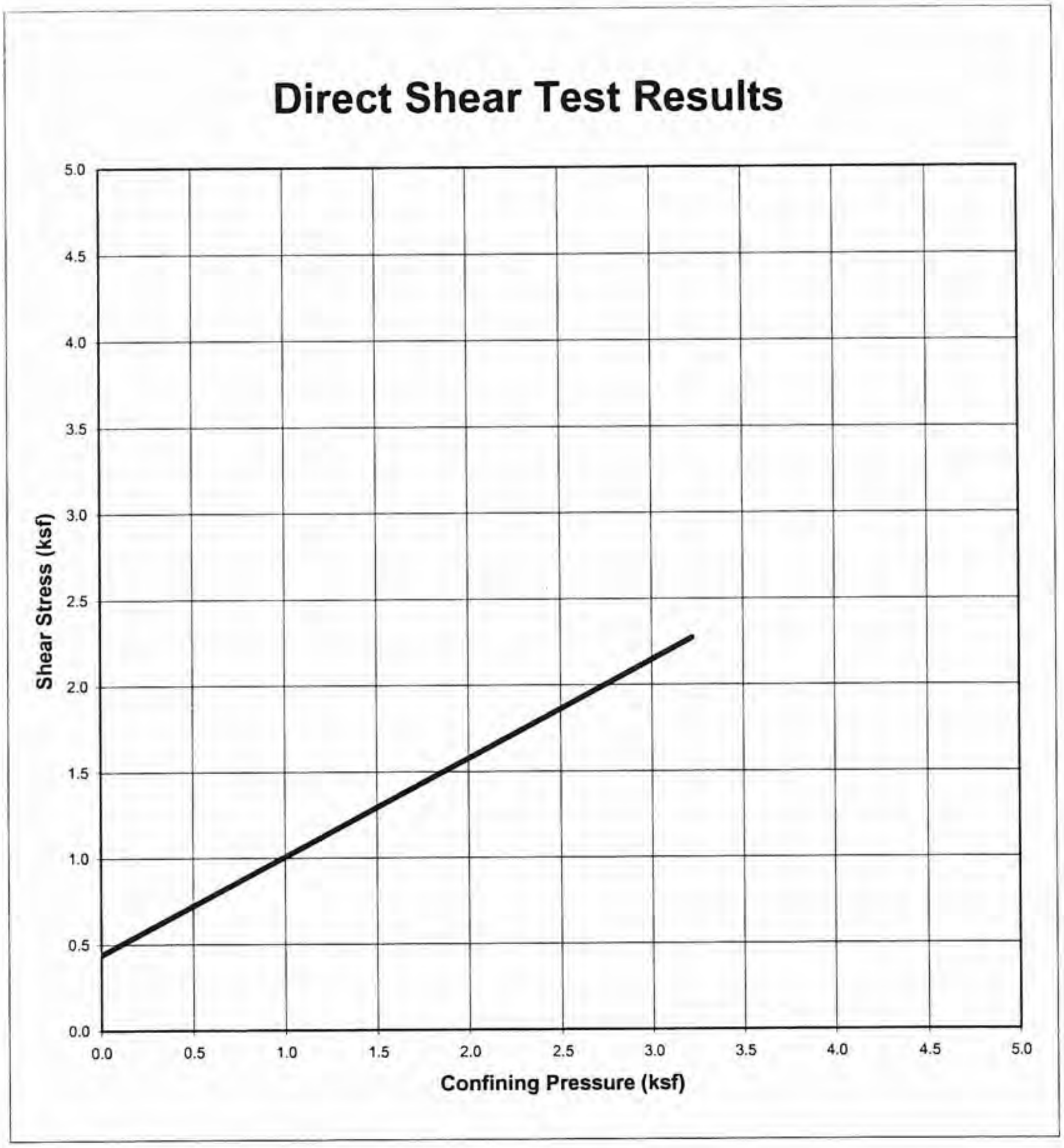
SOUTHERN CALIFORNIA SOIL & TESTING

7231 ROMERO DRIVE			
BY:	JJS/GBF	DATE:	2/26/2010
JOB NUMBER:	1011003-1	FIGURE II-12	



SAMPLE	DESCRIPTION	INTERNAL FRICTION ANGLE(DEG.)	COHESION INTERCEPT (PSF)
B-3 @ 26½' ***Peak*** ***Shear Strength at*** ***0.2 inches of Deformation***	SILTY SAND TO CLAYEY SILT	31	676

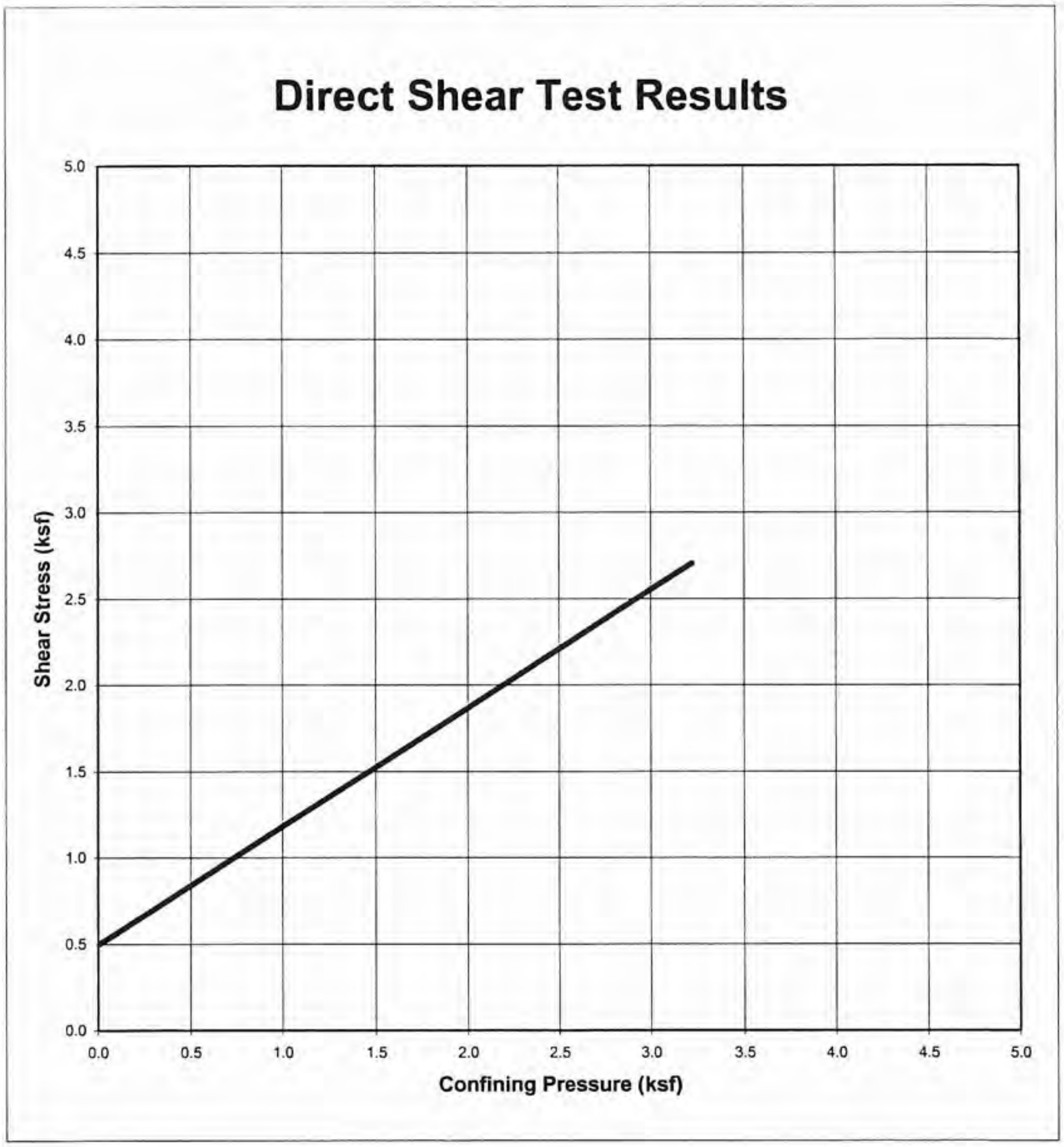
SOUTHERN CALIFORNIA SOIL & TESTING	7231 ROMERO DRIVE		
	BY: JJS/GBF	DATE: 2/26/2010	
	JOB NUMBER: 1011003-1	FIGURE II-13	



SAMPLE	DESCRIPTION	INTERNAL FRICTION ANGLE(DEG.)	COHESION INTERCEPT (PSF)
B-4 @ 43½'	REMOLDED CLAYEY SAND		
Shear Strength at 0.2 inches of Deformation		30	438

SOUTHERN CALIFORNIA
SOIL & TESTING

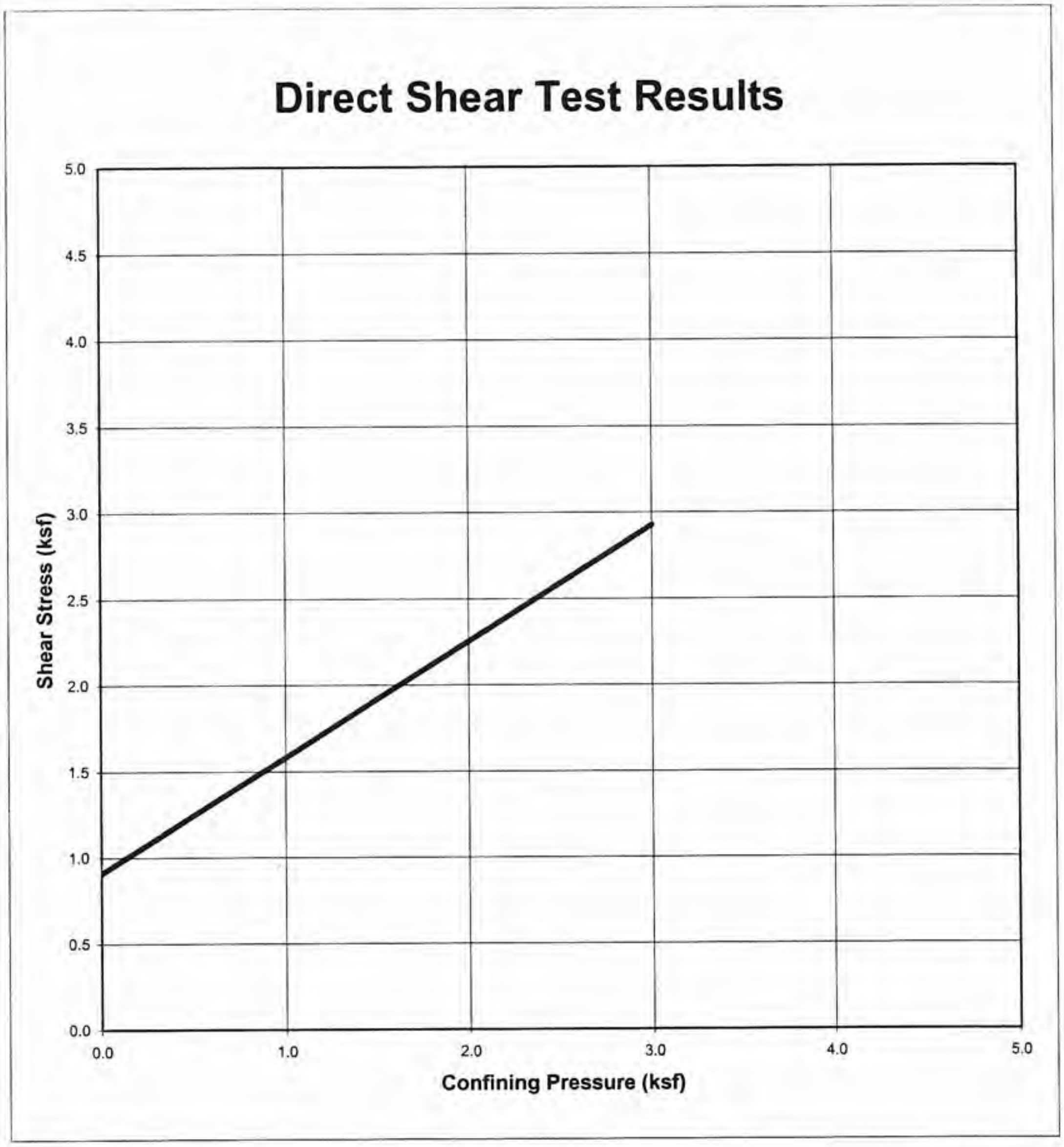
7231 ROMERO DRIVE			
BY:	JJS/GBF	DATE:	2/26/2010
JOB NUMBER:	1011003-1	FIGURE II-14	



SAMPLE	DESCRIPTION	INTERNAL FRICTION ANGLE(DEG.)	COHESION INTERCEPT (PSF)
P2 @ 12½'	Undistubed		
Shear Strength at 0.2 inches of Deformation		34	495

SOUTHERN CALIFORNIA
SOIL & TESTING

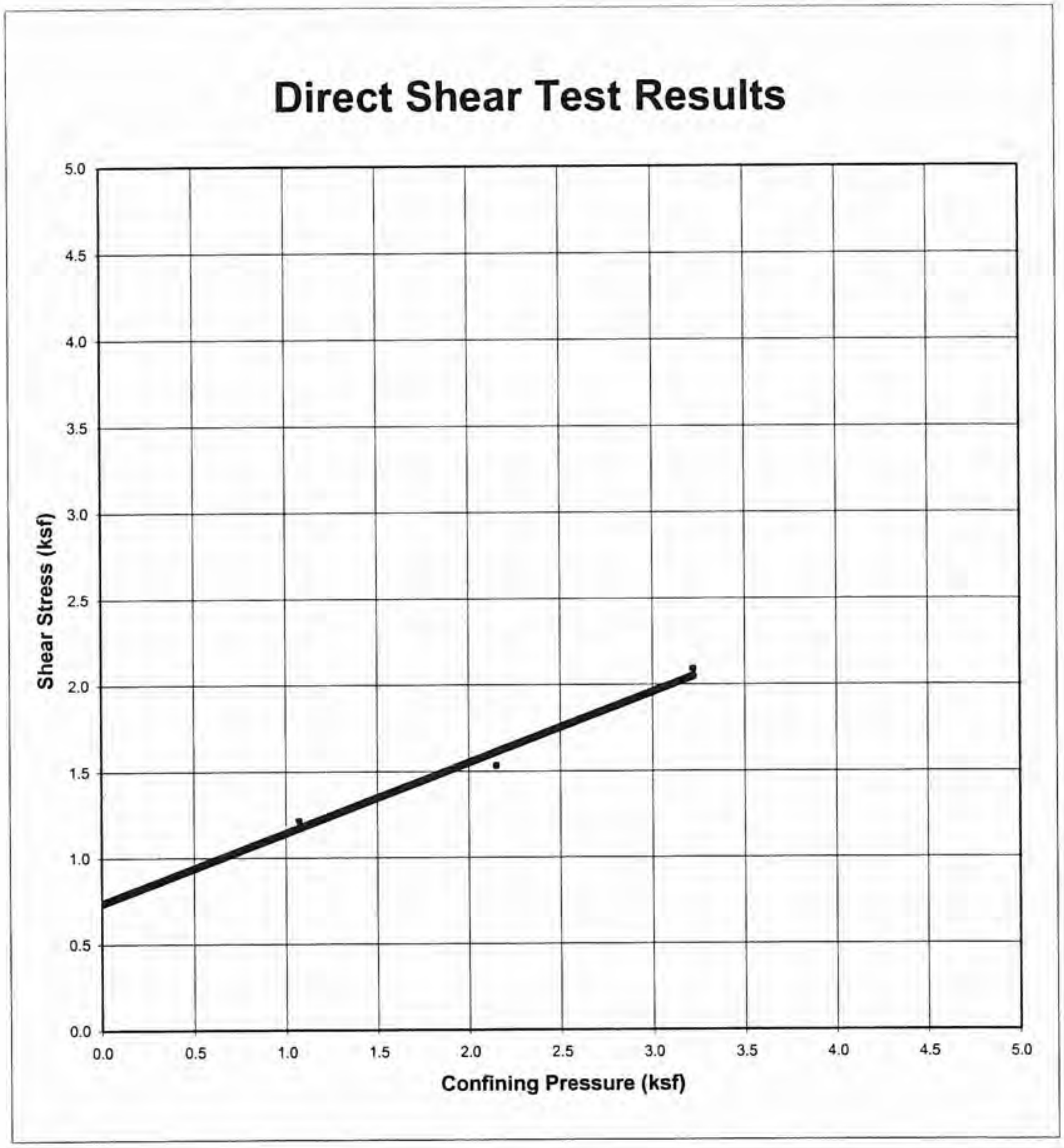
7231 REMORO DRIVE			
BY:	JJS/GBF	DATE:	2/26/2010
JOB NUMBER:	1011003-1	FIGURE II-15	



SAMPLE	DESCRIPTION	INTERNAL FRICTION ANGLE(DEG.)	COHESION INTERCEPT (PSF)
P3 @ 5'	Undisturbed		
Shear Strength at 0.2 inches of Deformation		34	1000

SOUTHERN CALIFORNIA
SOIL & TESTING

7231 ROMERO DRIVE			
BY:	JJS/GBF	DATE:	2/26/2010
JOB NUMBER:	1011003-1	FIGURE II-16	

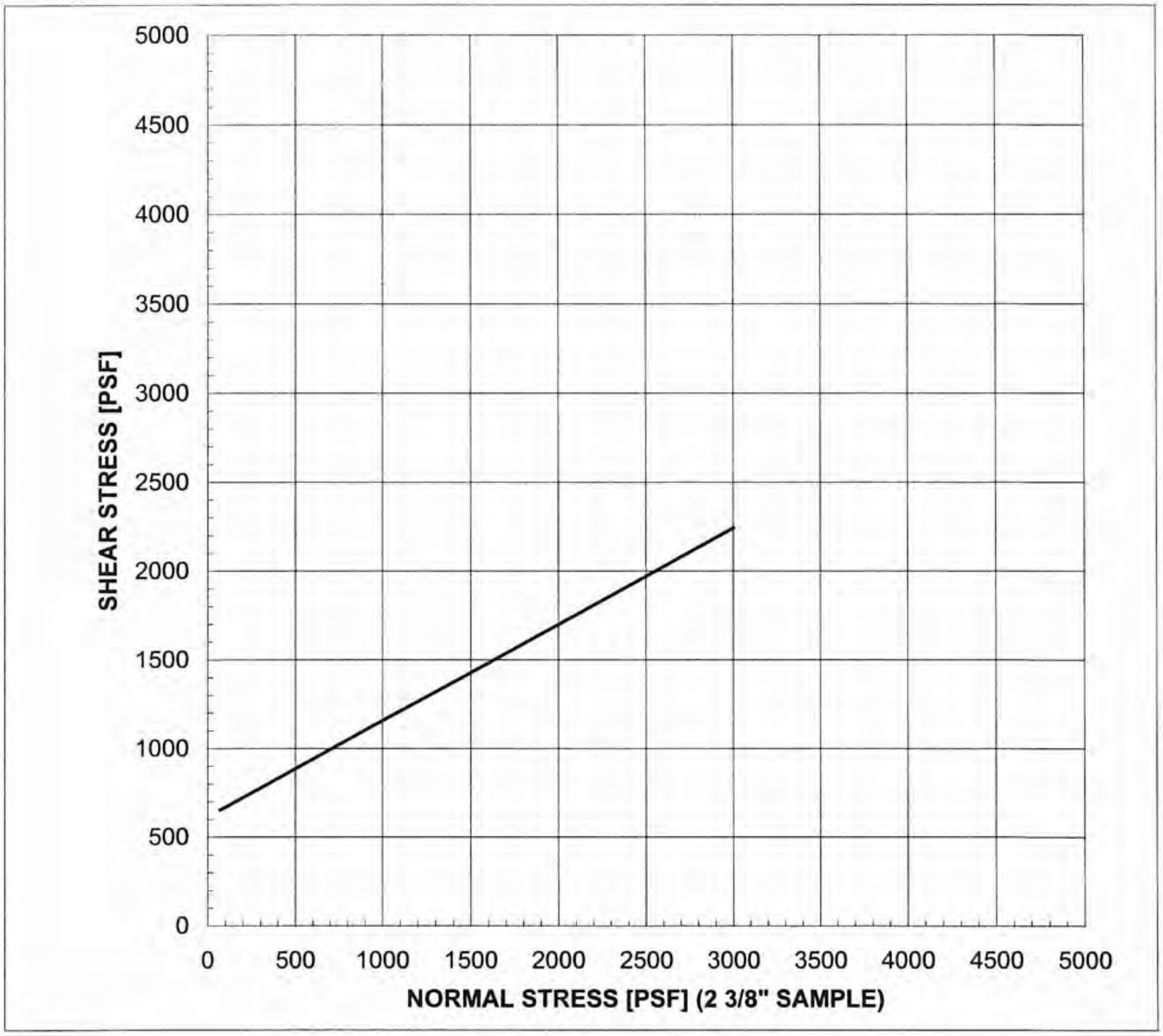


SAMPLE	DESCRIPTION	INTERNAL FRICTION ANGLE(DEG.)	COHESION INTERCEPT (PSF)
P3 @ 9½' - 10½' ***Peak*** ***Shear Strength at*** ***0.2 inches of Deformation***	Remold to In-Situ Density and Moisture Content	22	740

SOUTHERN CALIFORNIA
SOIL & TESTING

7231 ROMERO DRIVE			
BY:	JJS/GBF	DATE:	2/26/2010
JOB NUMBER:	1011003-1	FIGURE II-17	

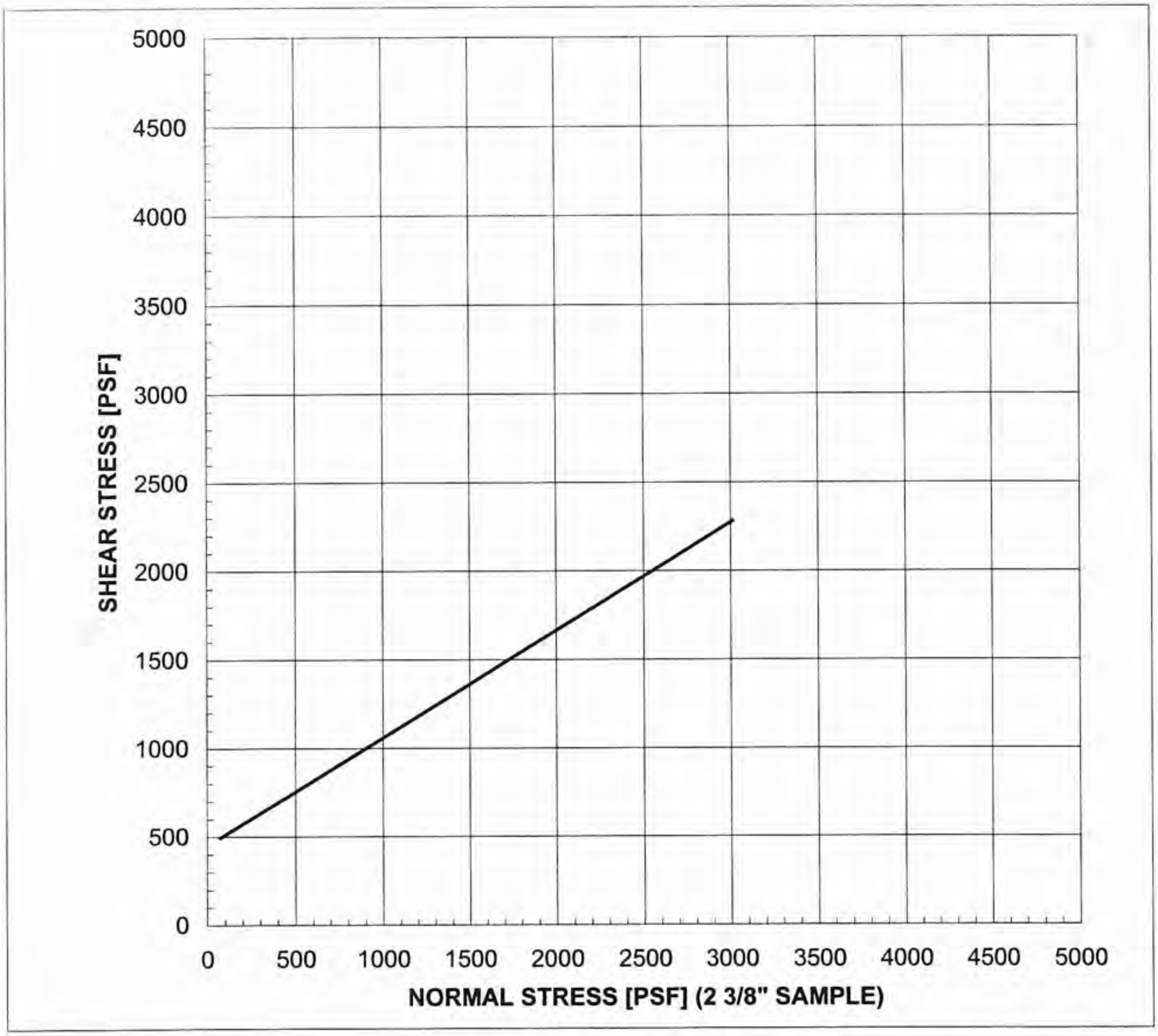
DIRECT SHEAR SUMMARY



SAMPLE	DESCRIPTION	ANGLE OF INTERNAL FRICTION (°)	COHESION INTERCEPT (PSF)
S-1 @ 618'	Remolded to In-Situ Dry Density and Optimum Moisture Content (121.0 pcf @ 5.5%)	28 °	650

SOUTHERN CALIFORNIA SOIL & TESTING, INC.	7231 ROMERO DRIVE		
	BY: DBA/SD	DATE:	2/26/2010
	JOB NUMBER: 1011003-1	FIGURE II-18	

DIRECT SHEAR SUMMARY



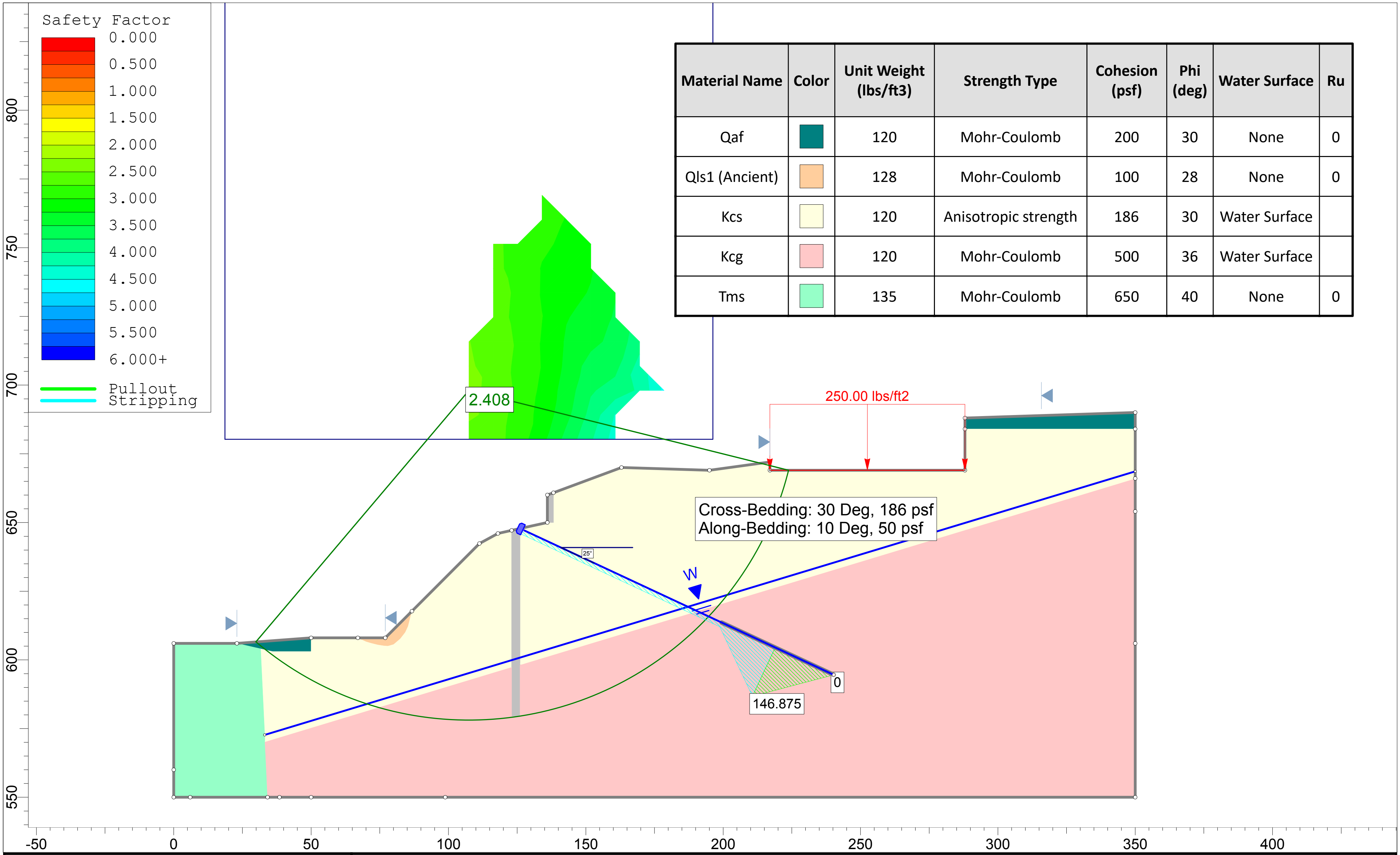
SAMPLE	DESCRIPTION	ANGLE OF INTERNAL FRICTION (°)	COHESION INTERCEPT (PSF)
S-2 @ 617'	Undisturbed Dry Density = 112.4 pcf Moisture Content = 7.1%	31 °	500

SOUTHERN CALIFORNIA SOIL & TESTING, INC.	7231 ROMERO DRIVE		
	BY: DBA/SD	DATE:	2/26/2010
	JOB NUMBER: 1011003-1	FIGURE II-19	

APPENDIX V

APPENDIX V
SLOPE STABILITY ANALYSIS

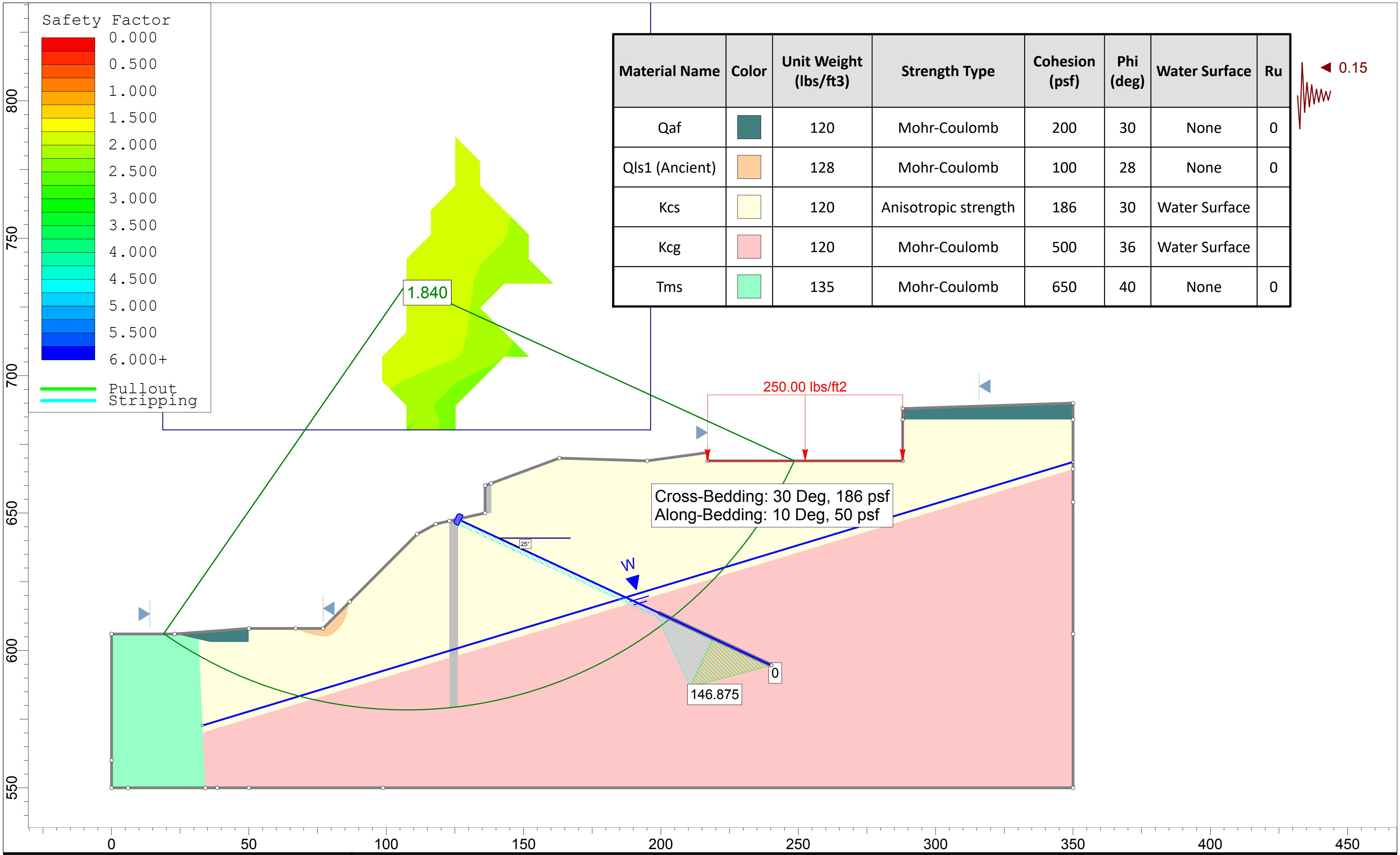
The slope stability analysis was performed with SLIDE v. 6.0, a product of Rocscience, Inc. It is a two-dimensional, limit equilibrium slope stability program, which can evaluate the factor of safety of soil and rock slopes against both circular and non-circular failure surfaces. The Spencer's method was used to evaluate the factor of safety against failure surfaces. This method of analysis provides the factor of safety based on both force and moment equilibrium. The analysis was performed under static and pseudostatic conditions. A horizontal seismic load coefficient of 0.15 was used for pseudostatic analyses. Our analysis was conducted on Cross-Sections A-A', B-B, and C-C' (Figures 3 through 5).



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟦	120	Mohr-Coulomb	200	30	None	0
Qls1 (Ancient)	🟧	128	Mohr-Coulomb	100	28	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	120	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

SCST

Project: Lys Residence
Address: La Jolla, California
Analysis Method: Static Analysis - Cross Section A-A'
Client: Dr. Ihor Lys
Date: June 2019
Analysis By: GLC
Job No.: 180385N
Figure No.:



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟦	120	Mohr-Coulomb	200	30	None	0
Qls1 (Ancient)	🟧	128	Mohr-Coulomb	100	28	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	120	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

SCST

Project: Lys Residence

Address: La Jolla, California

Analysis Method: Pseudostatic Analysis - Cross Section A-A'

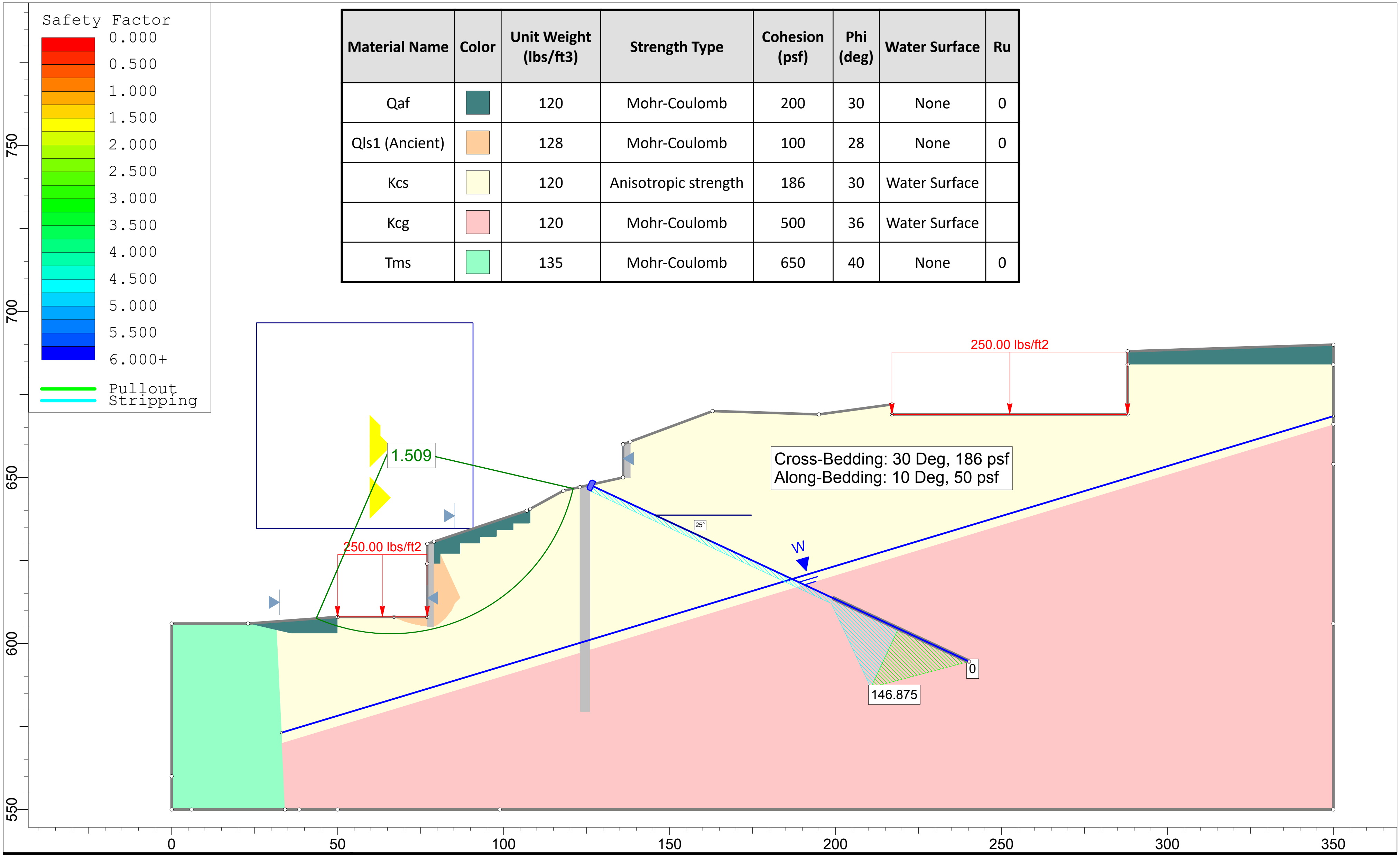
Client: Dr. Ihor Lys

Date: June 2019

Analysis By: GLC

Job No.: 180385N

Figure No.:

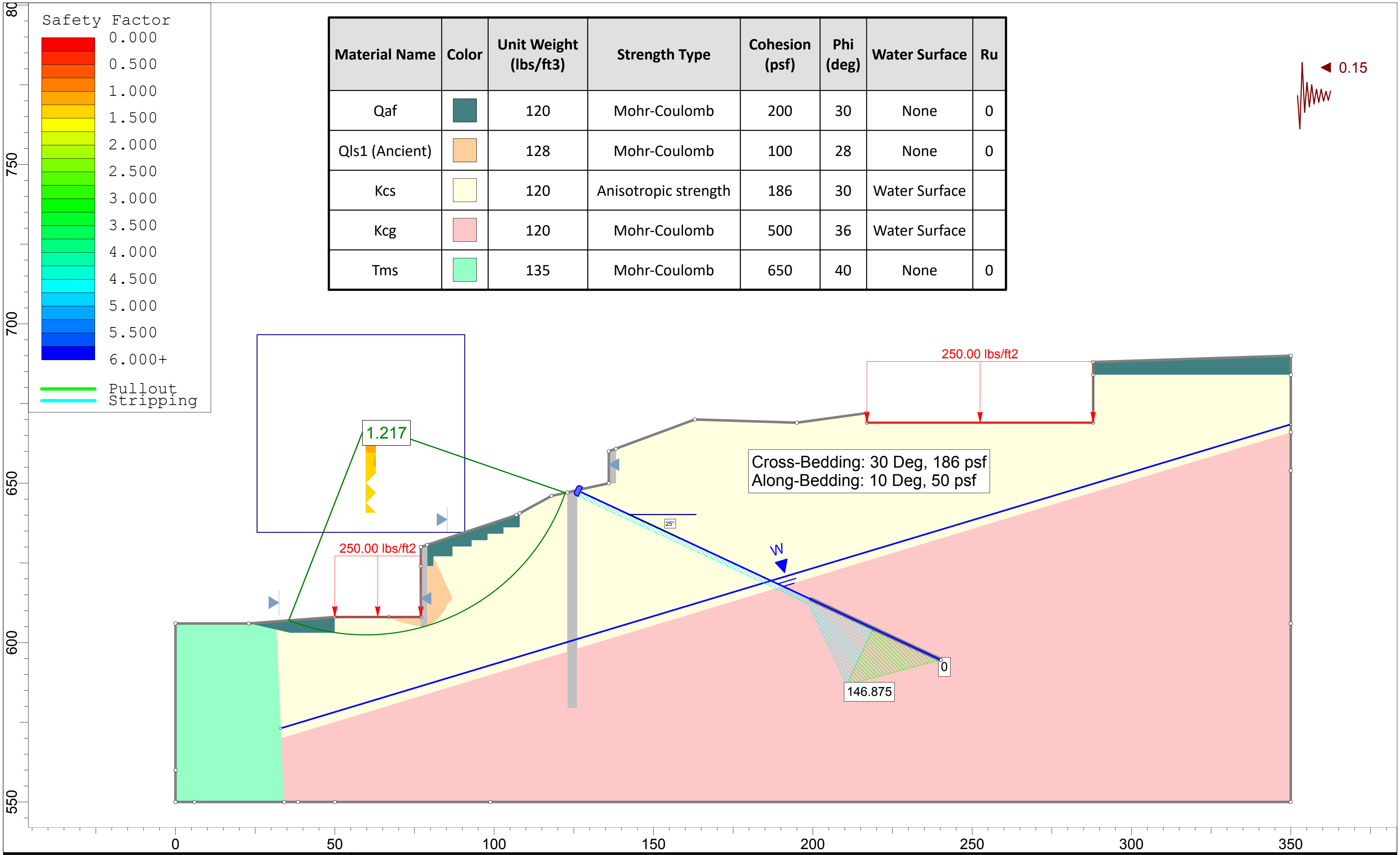


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟦	120	Mohr-Coulomb	200	30	None	0
Qls1 (Ancient)	🟧	128	Mohr-Coulomb	100	28	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	120	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

Cross-Bedding: 30 Deg, 186 psf
Along-Bedding: 10 Deg, 50 psf

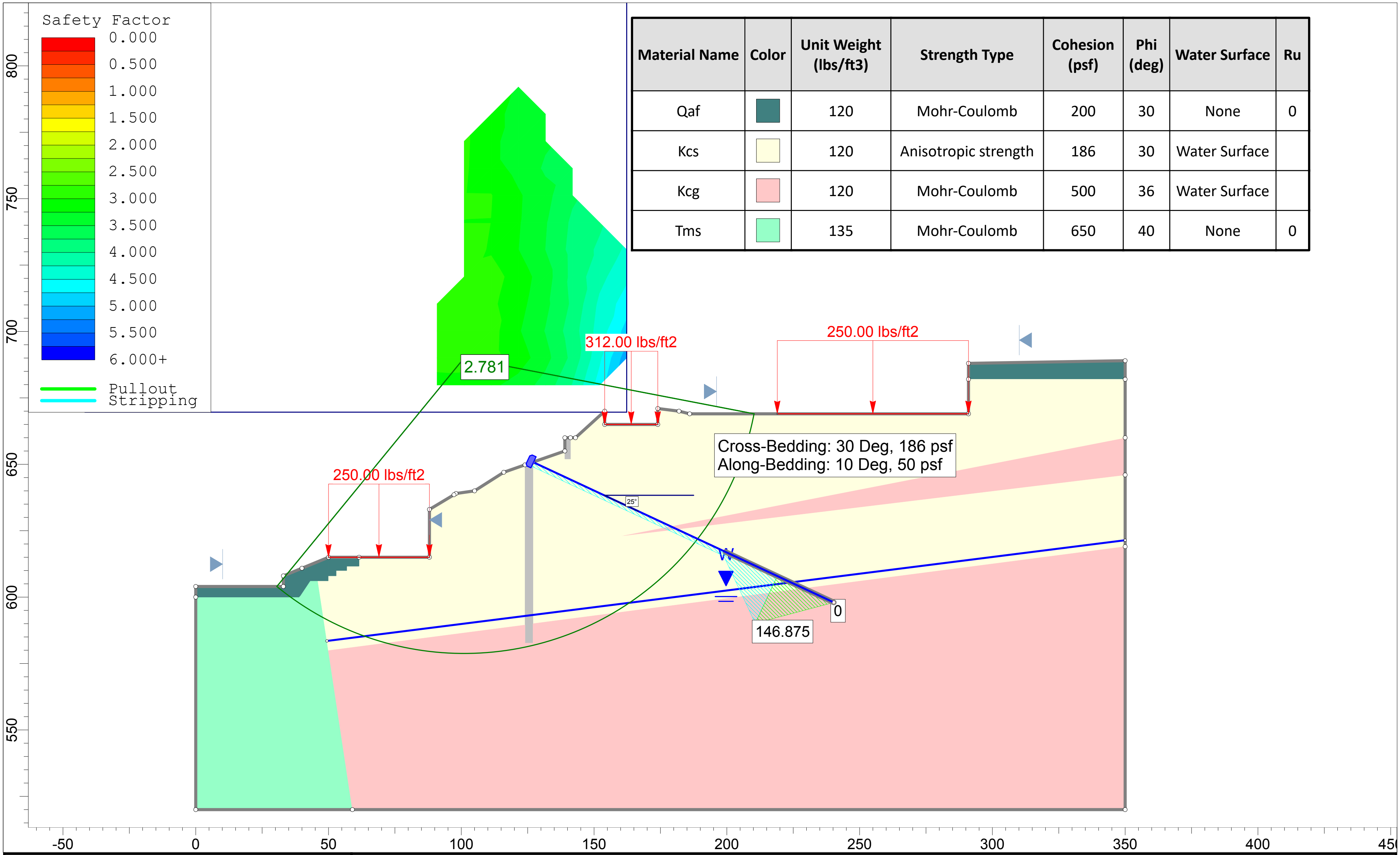
SCST

Project: Lys Residence
Address: La Jolla, California
Analysis Method: Static Analysis - Cross Section A'-A'
Client: Dr. Ihor Lys
Date: June 2019
Analysis By: GLC
Job No.: 180385N
Figure No.:



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟦	120	Mohr-Coulomb	200	30	None	0
Qls1 (Ancient)	🟧	128	Mohr-Coulomb	100	28	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	120	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

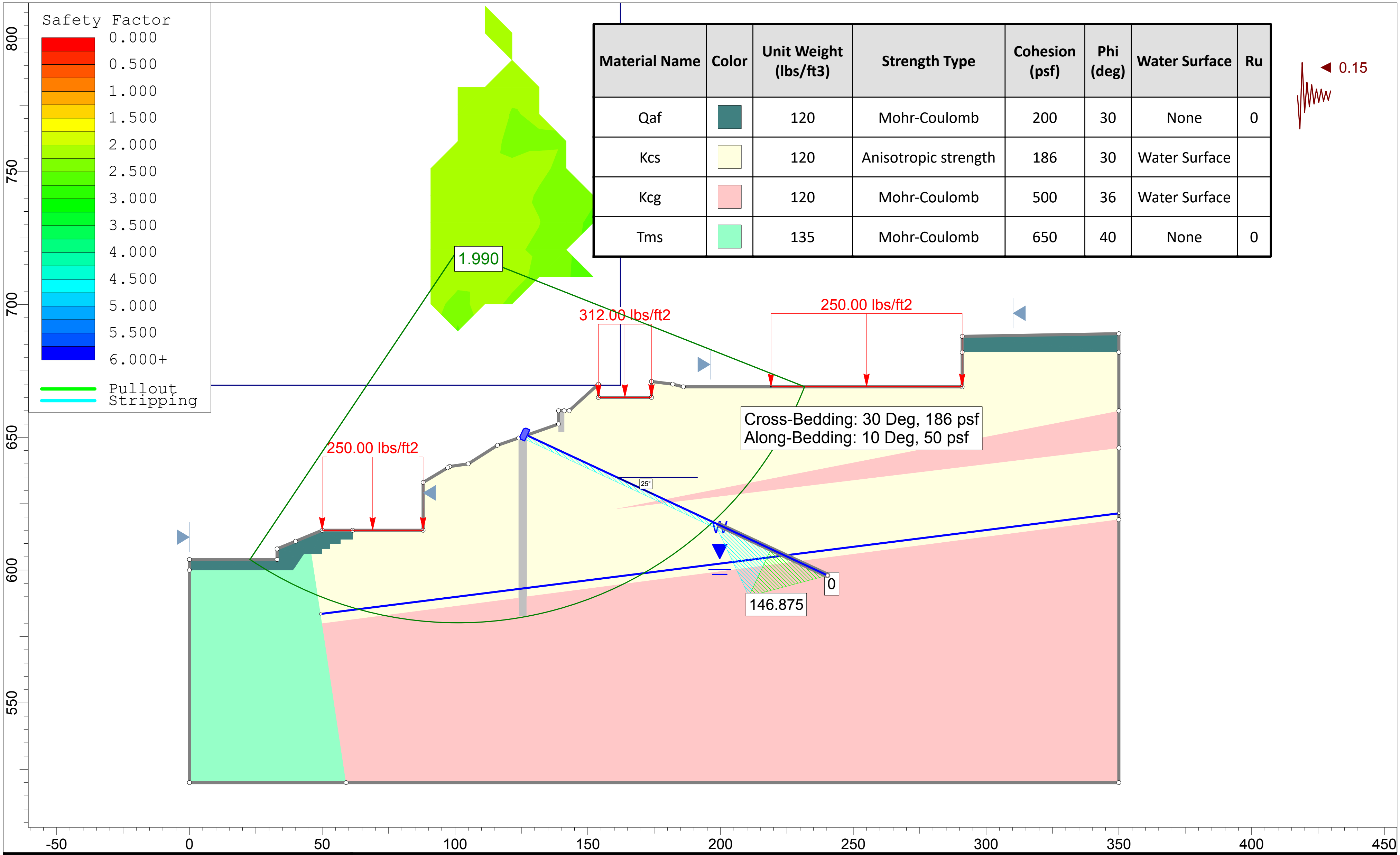
Project: Lys Residence
Address: La Jolla, California
Analysis Method: Pseudostatic Analysis - Cross Section A'-A'
Client: Dr. Ihor Lys
Date: June 2019
Analysis By: GLC
Job No.: 180385N
Figure No.:



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟦	120	Mohr-Coulomb	200	30	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	120	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

SCST

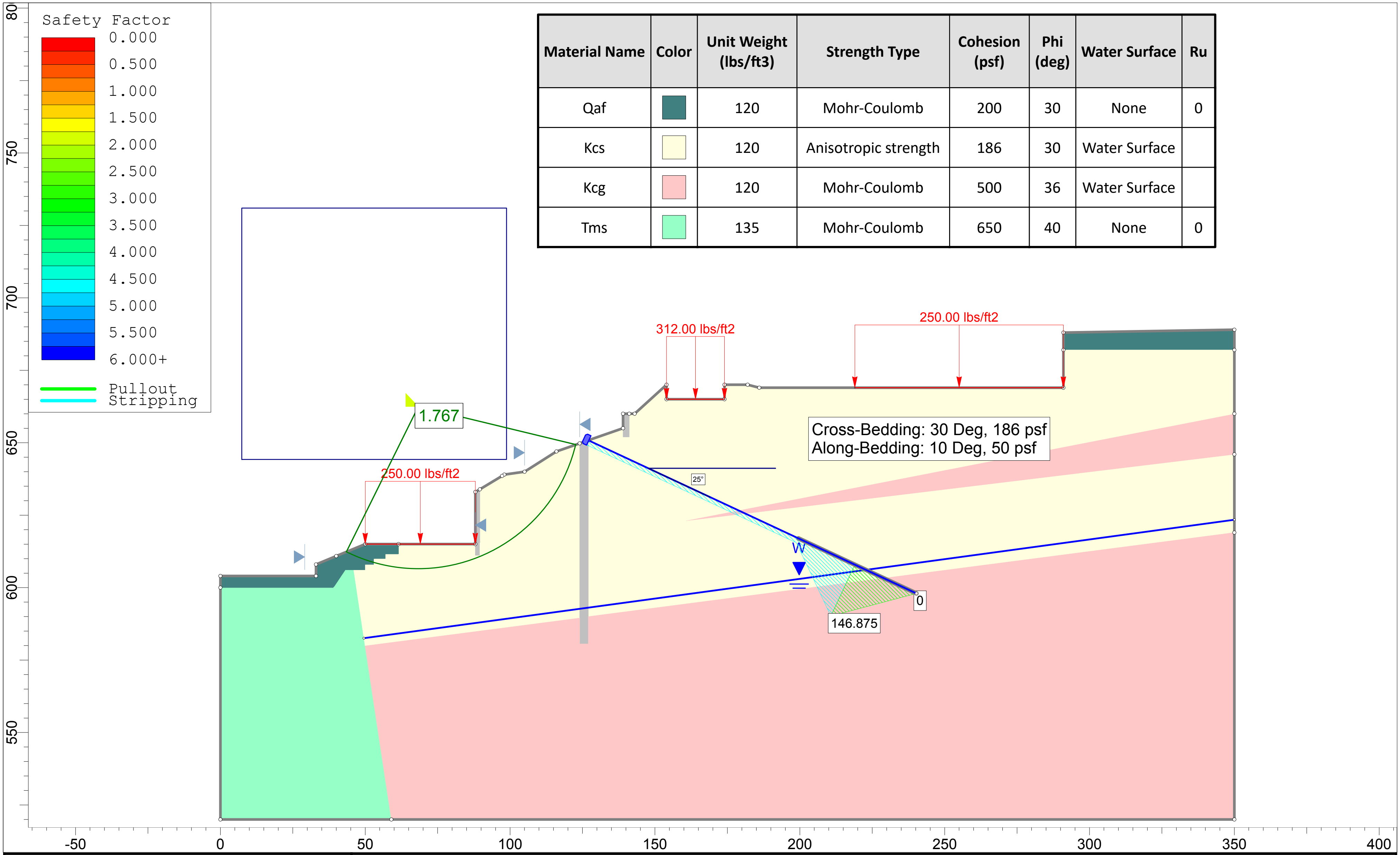
Project: Lys Residence		Address: La Jolla, California	
Analysis Method: Static Analysis - Cross Section B-B'		Client: Dr. Ihor Lys	
Date: June 2019	Analysis By: GLC	Job No.: 180385N	Figure No.:



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟩	120	Mohr-Coulomb	200	30	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	120	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

SCST

Project: Lys Residence		Address: La Jolla, California	
Analysis Method: Pseudostatic Analysis - Cross Section B-B'		Client: Dr. Ihor Lys	
Date: June 2019	Analysis By: GLC	Job No.: 180385N	Figure No.:



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟦	120	Mohr-Coulomb	200	30	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	120	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

SCST

Project: Lys Residence

Address: La Jolla, California

Analysis Method: Static Analysis - Cross Section B-B'

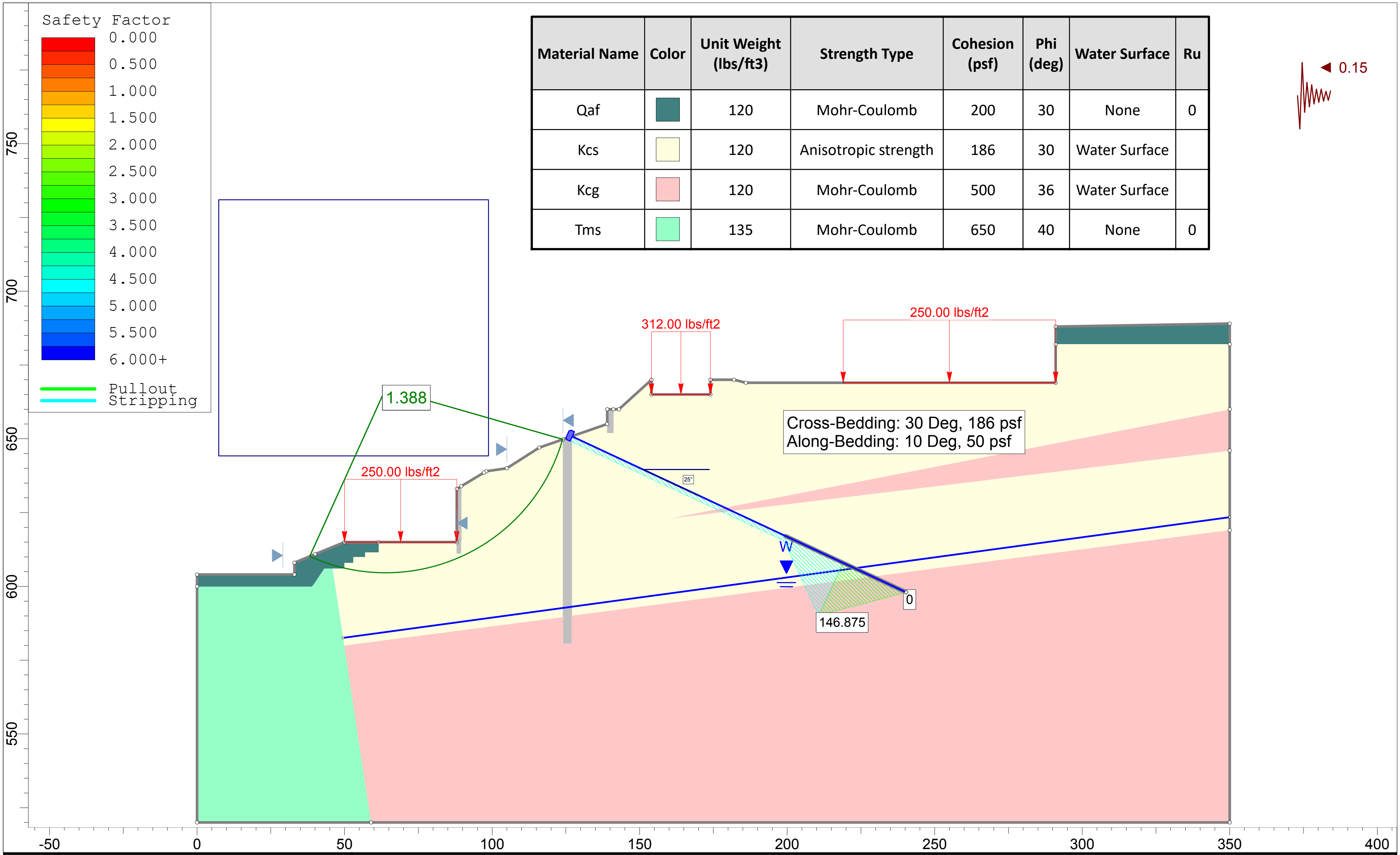
Client: Dr. Ihor Lys

Date: June 2019

Analysis By: GLC

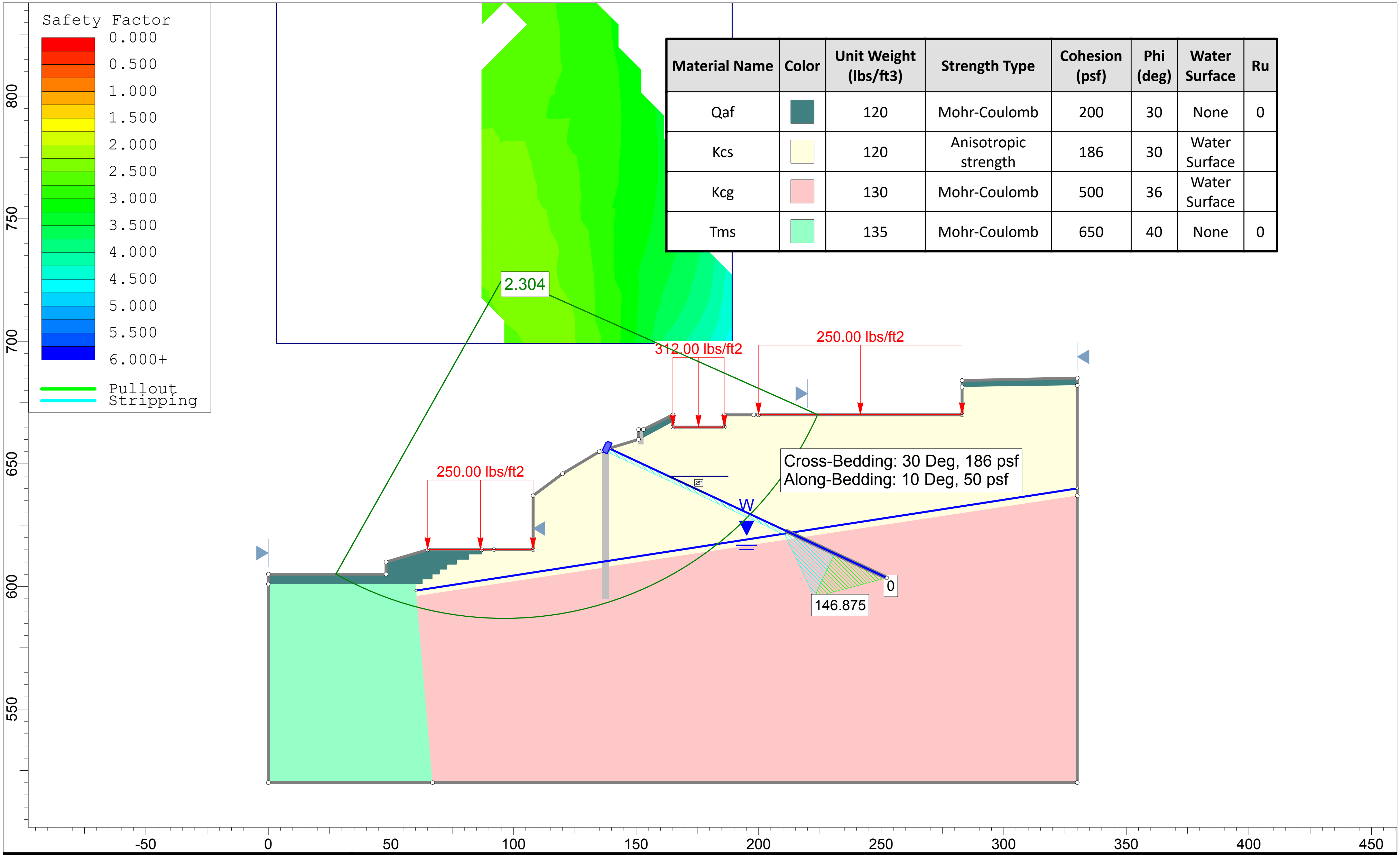
Job No.: 180385N

Figure No.:



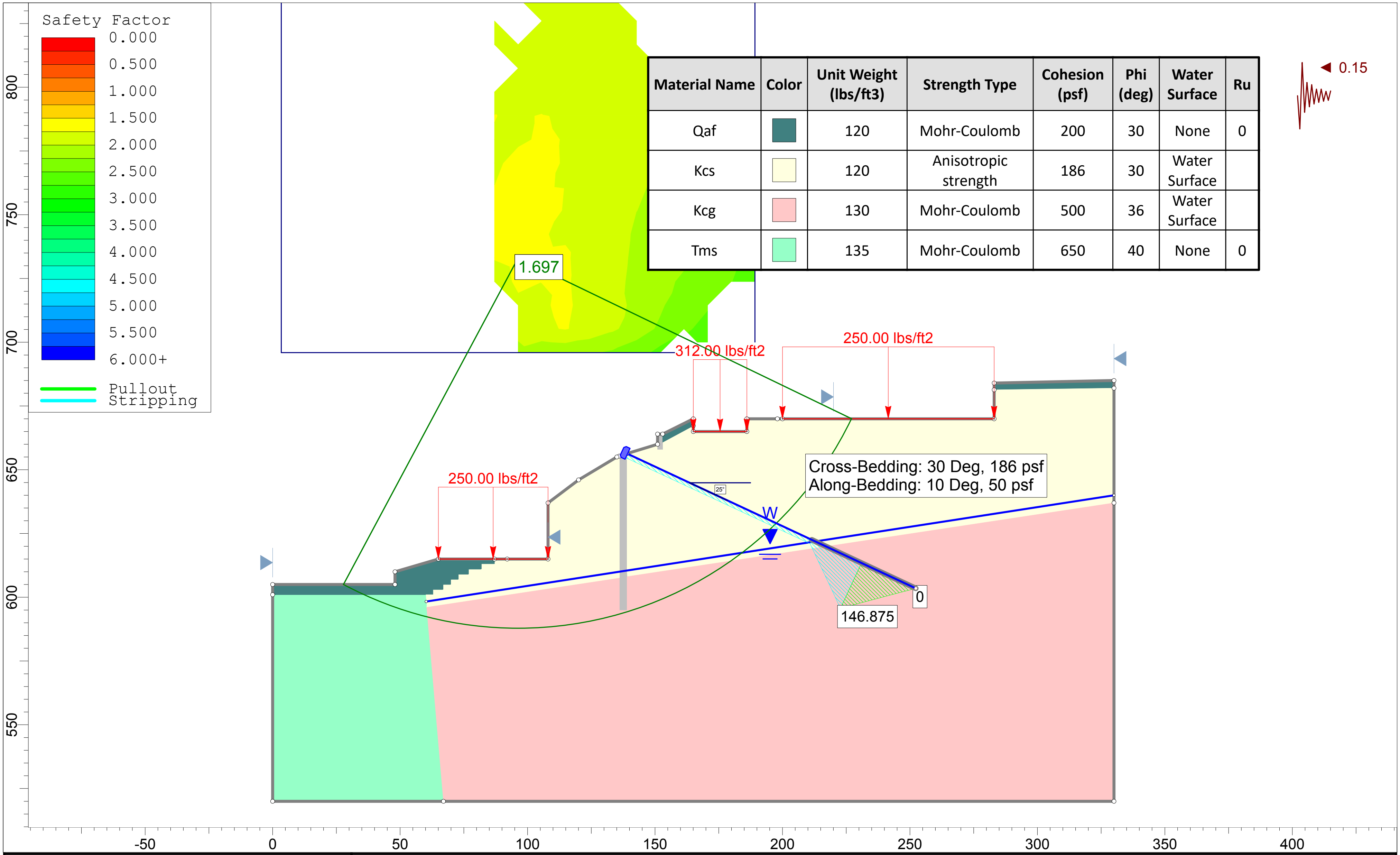
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟦	120	Mohr-Coulomb	200	30	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	120	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

Project: Lys Residence	Address: La Jolla, California
Analysis Method: Pseudostatic Analysis - Cross Section B-B'	Client: Dr. Ihor Lys
Date: June 2019	Analysis By: GLC
Job No.: 180385N	Figure No.:



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟦	120	Mohr-Coulomb	200	30	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	130	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

Project: Lys Residence
Address: La Jolla, California
Analysis Method: Static Analysis - Cross Section C-C'
Client: Dr. Ihor Lys
Date: June 2019
Analysis By: GLC
Job No.: 180385N
Figure No.:



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟦	120	Mohr-Coulomb	200	30	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	130	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

Project: Lys Residence

Address: La Jolla, California

Analysis Method: Pseudostatic Analysis - Cross Section C-C'

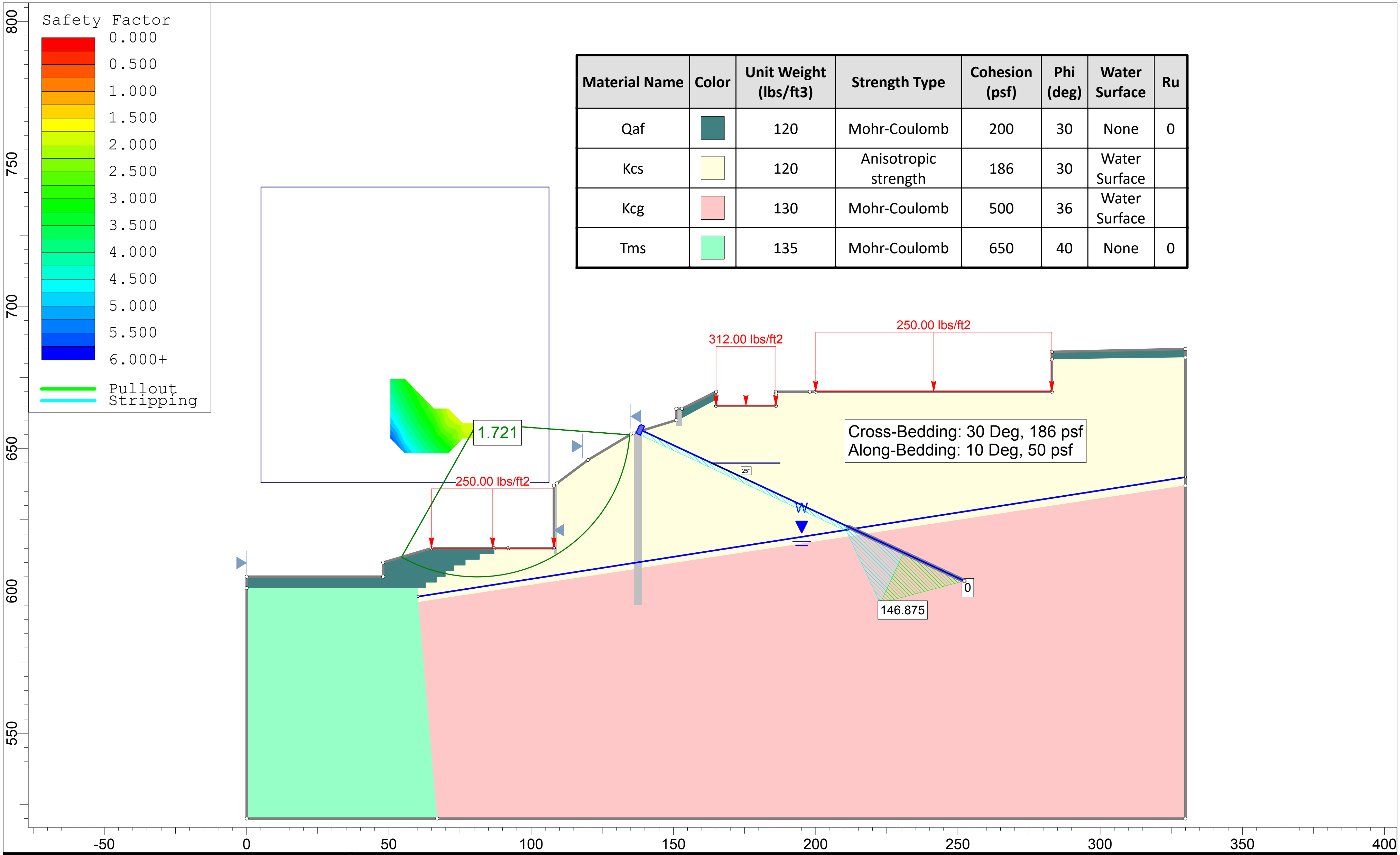
Client: Dr. Ihor Lys

Date: June 2019

Analysis By: GLC

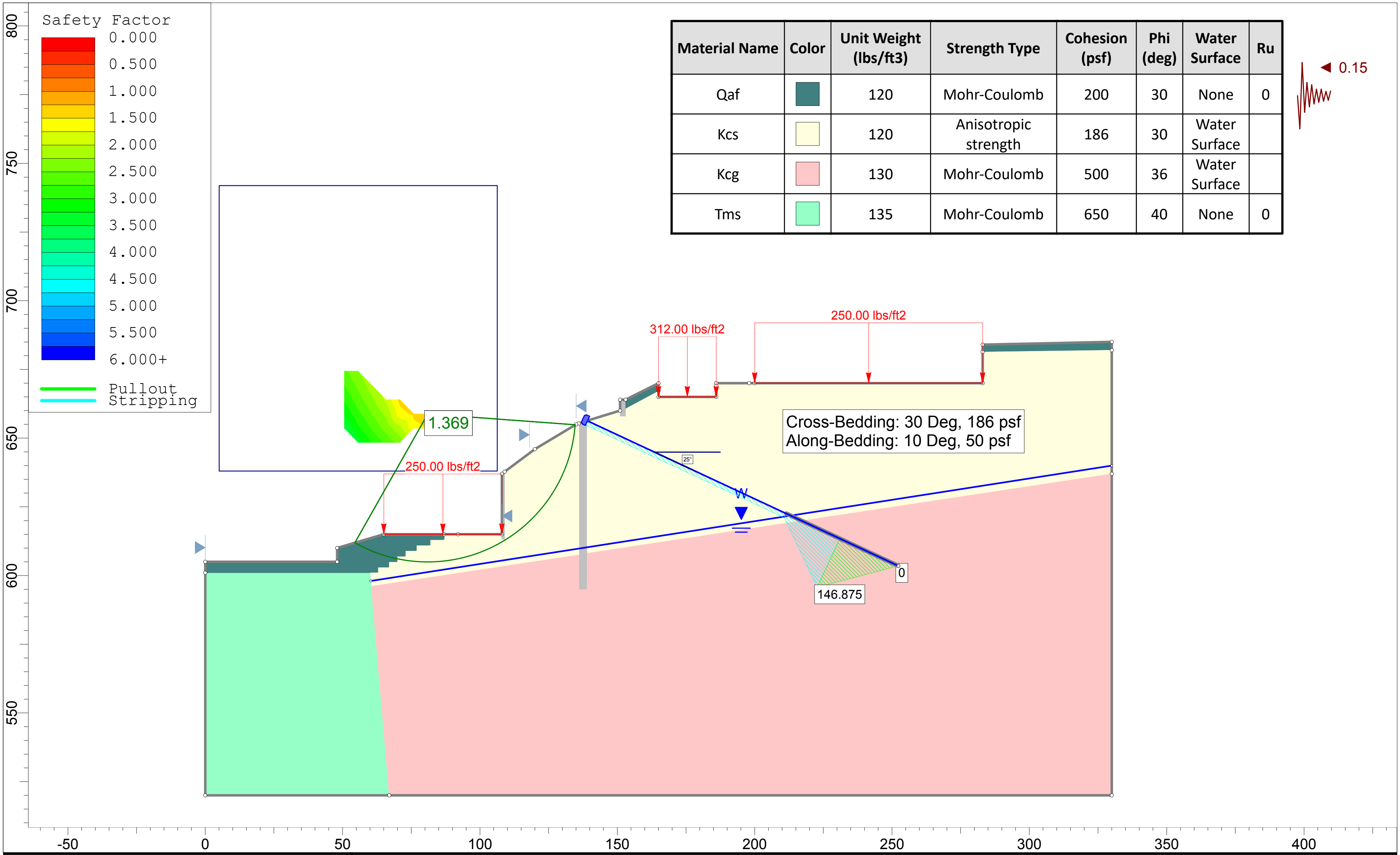
Job No.: 180385N

Figure No.:



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	🟩	120	Mohr-Coulomb	200	30	None	0
Kcs	🟨	120	Anisotropic strength	186	30	Water Surface	
Kcg	🟥	130	Mohr-Coulomb	500	36	Water Surface	
Tms	🟩	135	Mohr-Coulomb	650	40	None	0

Project: Lys Residence
Address: La Jolla, California
Analysis Method: Static Analysis - Cross Section C-C'
Client: Dr. Ihor Lys
Date: June 2019
Analysis By: GLC
Job No.: 180385N
Figure No.:



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Qaf	■	120	Mohr-Coulomb	200	30	None	0
Kcs	■	120	Anisotropic strength	186	30	Water Surface	
Kcg	■	130	Mohr-Coulomb	500	36	Water Surface	
Tms	■	135	Mohr-Coulomb	650	40	None	0

Project: Lys Residence
Address: La Jolla, California
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Figure No.: