Appendix E

Geotechnical Reports

GEOTECHNICAL EXPLORATION

SAN JUAN OAKS

DEL WEBB RESIDENTIAL DEVELOPMENT
SAN BENITO COUNTY, CALIFORNIA

Submitted to:
Mr. Tim Fisher
San Juan Oaks, LLC
℅ Pulte Home Corporation
210 Stoneridge Mall Road, 5th Floor
Pleasanton, California

Prepared by:
ENGEO Incorporated

August 6, 2013

Project No.
9901.000.000

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Mr. Tim Fisher
San Juan Oaks LLC
℅ Pulte Homes Corporation
210 Stoneridge Mall Road, 5th Floor
Pleasanton, CA 94588

Subject: San Juan Oaks – Del Webb Residential Development
San Benito County, California

GEOTECHNICAL EXPLORATION

Dear Mr. Fisher:

With your authorization, we completed this geotechnical exploration report for the proposed San Juan Oaks – Del Webb Residential Development project located in San Benito County, California. The accompanying geotechnical exploration report presents our field exploration and laboratory testing together with our conclusions and recommendations regarding residential development at the site.

Our findings indicate that the project site is suitable for the proposed development provided the recommendations of this report are incorporated into project design and implemented during construction. We are pleased to have been of service to you on this project and are prepared to consult further with you and your design team as the project progresses.

Sincerely,

ENGEO Incorporated

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this geotechnical report is to supplement our preliminary study prepared in March 2013 and to provide conclusions and recommendations for the proposed residential development. This design-level study included the following scope of services:

- Reviewed published geologic maps and literature pertinent to the site.
- Advanced 20 additional borings (1-BH1 through 1-BH20) to characterize the site soils and to further evaluate the susceptibility of the alluvial deposits to soft soil settlement, earthquake-induced liquefaction, and landsliding.
- Excavated and logged nine additional exploratory test pits (2TP-1 through 2TP-9) to characterize areas of planned cut slopes adjacent to the southern open space.
- Excavated and logged one additional exploratory trench (T-2) to evaluate a previously mapped trace of the Morse fault crossing the site.
- Performed laboratory testing of samples collected from the boring and test pit locations.
- Prepared this design-level geotechnical report presenting recommendations for grading, drainage, and foundation design for planned residences, utilities, streets, and retaining walls.

We prepared this report exclusively for San Juan Oaks LLC, % Pulte Home Corporation and their design team consultants. ENGEO should review any changes made in the character, design or layout of the development to modify the conclusions and recommendations contained in this report, as necessary. This document may not be reproduced in whole or in part by any means whatsoever, nor may it be quoted or excerpted without the express written consent of ENGEO.

1.2 SITE LOCATION AND DESCRIPTION

The roughly 356-acre study site is located west of San Juan Oaks Golf Course (3825 Union Road), and approximately 1 mile south of San Juan Road (Highway 156) in San Benito County, California (Figures 1 and 2). The study site is part of the larger San Juan Oaks Golf Course property and is bounded by agricultural land to the west and north, San Juan Oaks Golf Course to the east, and undeveloped foothills to the south.

Based on our site visits and a topographic map of the site, prepared by Whitson Engineers dated June 26, 2013, the site consists of foothills along the southern boundary transitioning to and relatively flat ground towards the north. The highest topographic area within the development boundary is the southeastern foothill at approximately 460 feet above mean sea level (msl) while the site typically slopes towards the north/northwest to the lowest topographic area in the northwestern corner of the site at approximately 220 feet above msl.

The site generally consists of undeveloped grazing (pasture) land with sparsely spaced mature trees. A cattle corral is located along the central northern boundary and a protected wetlands area situated in the northwestern corner. During our site visits, we also observed two water wells in the northern portion of the site. Based on the findings of our concurrent environmental study, the water wells are identified by the San Benito County Water District (SBCWD) as SBCWD #1652 and SBCWD #1746. Well #1652 was supported on a concrete slab and a mound of vegetated soil material was located in the vicinity of the pump. The SBCWD indicated that Well #1652 had a 16-inch casing and #1746 was a District Blue Valve. Two storm drain manholes and a single concrete pad were also observed in the northeastern portion of the site, as well as an enclosed concrete-block trash enclosure structure located near the northern site boundary.

Existing site drainage channels include a small drainage channel located along the northern boundary of the site, typically an estimated 5 feet deep, with vegetated side slopes at approximately 2½:1 (horizontal:vertical) or flatter. A second seasonal drainage channel extends from the southeastern corner of the site and trends north across the site in which it bisects a second drainage channel. The channel varied in size from 20 to 30 feet wide and 5 to 10 feet deep with vegetated side slopes generally 1½:1 or flatter while sections of approximately 15 feet deep typically comprised slopes at 1:1. Vegetation within the channel consists primarily of small trees and other woody vegetation, reeds, and seasonal grasses. In addition, two small swales trend north onto the site along the eastern and western sides of the southwestern foothill. Overall, the observed drainage channels were dry at the time of our site reconnaissance.

In addition, a reported leach field, approximately 34,000 square feet in area, is present along the eastern site boundary bordering the existing San Juan Oaks Road. We understand the leach field is associated with two septic tanks (approximately 5,000 gallons) which are located on the neighboring San Juan Oaks Golf Course property. Two monitoring wells are located in the vicinity of the leach field and we understand the wells are measured/sampled annually as part of the conditions of approval by the California Regional Water Quality Control Board.

1.3 PROPOSED DEVELOPMENT

Based on discussions with you, and the conceptual site plan prepared by Whitson Engineers and dated June 26, 2013, we understand the development will comprise roughly 1,000 single-family homes, an approximately 25,000-square-foot community clubhouse and amenity center with indoor and outdoor pools, sport courts, three approximately 2-acre landscaped parks, and four open-space parks. Access to the development will be provided by new streets and proposed bridges. We understand a water tank is proposed to be situated on the north-facing southern foothill at approximate elevation 452 above mean sea level (msl).

We understand the homes and clubhouse will be single-story and we anticipate wood-framed construction with light building loads. Figure 3 shows the currently proposed development plan superimposed on the site geology map.

Preliminary grading plans are not available at this stage of design, however, we anticipated cuts and fills up to 10 feet. We understand cut slopes, if any, will be limited to 10 feet or less with slope gradients no steeper than 2:1.

1.4 SITE HISTORY AND PREVIOUS EXPLORATIONS

We reviewed both historical topographic maps and aerial photographs of the site dated 1939, 1949, 1953, 1960, 1971, 1981, 1987, 1998, 2005, and 2006 provided by Environmental Data Resources (EDR). Review of the photographs indicates the site has remained undeveloped land, primarily utilized for cattle grazing, since at least 1939.

In March 2013, ENGEO performed a geotechnical/geological feasibility assessment for the project site. Our scope included a review of published geologic maps; a geologic reconnaissance performed by an ENGEO geologist; a review of aerial photographs to identify geomorphic features that may be related to faulting, landsliding, and other geologic conditions; advancement of 11 cone penetration tests; excavation and logging of eight exploratory test pits and one exploratory trench; and preparation of the referenced report (ENGEO, 2013). Our report included preliminary geotechnical recommendations for grading, drainage, and foundation design. The approximate locations of the March 2013 CPTs, test pits, and trench are depicted on Figures 2 and 3. The test pit logs and laboratory testing is presented in Appendix C and the CPT logs are presented in Appendix D.

In 2000, Earth Systems Consultants provided a Regional Geologic Study for the San Juan Oaks Golf Course Expansion. The study area encompassed the San Juan Oaks property and included our current study area. The referenced report (Earth Systems Consultants, 2000) provided a review of geologic hazards and preliminary recommendations for Vesting Tentative Map process. The report has been reviewed and pertinent information has been considered in our current study.

2.0 GEOLOGY AND SEISMICITY

2.1 SITE SOILS AND GEOLOGY

The site is located in the Coast Range geomorphic province in the San Juan Valley, on the south end of the Santa Clara Valley with the Gabilan Range situated to the west. The site is predominantly located in an alluvial valley with the southern portion of the site located on the foothills of a northwest trending ridge situated east of the San Andreas Rift Zone.

As depicted on Figure 4, regional geologic mapping by Wagner (2002) maps the site as underlain by Pliocene unnamed continental mudstone in the foothills and Holocene alluvium in the low-lying portion of the site. Dibblee (2006) describes bedrock units at the site as weakly lithified terrestrial valley and lacustrine deposits, predominantly mudstone with fine grained sandy layers. Regional bedrock orientation is generally shown as striking northwest and dipping approximately 50 degrees southwest.

Regional landslide mapping by Majmundar (1994) depicts several small earthflows and debris flows in the foothills on the southern portion of the site.

Site-specific geologic and landslide mapping based on aerial photo review, field exploration and site reconnaissance mapping is depicted on Figure 3. A brief discussion of the geologic units and mapped locations follows:

- *Colluvial Deposits* (Qc) were mapped as overlying bedrock on slopes in the southern portion of the property. Typically, colluvium encountered during our exploration consists of stiff clays and sandy clays and generally have gradational contacts with the underlying bedrock.

- *Alluvial Deposits* (Qa) were mapped as underlying the majority of the northern portion of the property, typically in low-lying areas. Typically, the alluvial deposits encountered at the site consist of interlayered stiff clays, silts and dense sands.

- *Unnamed Pliocene Bedrock (Puc)* were mapped in the foothills on the southern portion of the site. Bedrock encountered during our exploration generally consists of weak interbedded sandstone, siltstone, shale and claystone. Bedding attitudes were measured striking 36 to 60 degrees northwest and northeast and dipping relatively steeply southwest 30 to 61 degrees.

- *Landslide Deposits (Qls)* were identified in the foothills on the southern portion of the property and generally consist of silty clay materials. The landslides encountered are generally relatively shallow slumps or earthflows.

2.2 FAULTING AND SITE SEISMICITY

2.2.1 Fault Mapping

The San Andreas rift zone is located southwest of the project site and represents the structural divide between Pliocene terrestrial bedrock on the northeast and Salinian block granitic rocks to the southwest. Regional mapping at the site by Majmundar (1994), Wagner (2002) and Rogers (1993) show two northwest-trending, concealed faults crossing the project site, the Morse fault in the northeastern portion of the site and the Nutting fault crossing the southern portion of the site. The Morse fault is queried crossing the site, indicating that the existence of the fault is doubtful. Earth Systems Consultants previously described both faults as high-angle reverse with the down dropped block on the northeast. Additionally, the Nutting and Morse faults are described as offsetting Quaternary and older sediments but not Holocene in the area.

The USGS Quaternary Fold and Fault Database (QFFD) is a nationwide GIS-based database that identifies fault locations and classifies faults based on estimated age. In California, the QFFD is jointly maintained by the USGS and the California Geological Survey (CGS). The QFFD does not recognize the Nutting and Morse faults as Quaternary active. In conjunction with our previous preliminary study (ENGEO, 2013), an exploratory trench was excavated across the mapped trace of the Nutting fault. Our current study included excavation of an exploratory trench crossing the mapped trace of the Morse fault as described in subsequent sections of this report.

2.2.2 Site Seismicity

The site is not located within a State of California Earthquake Fault Zone (1982), and no known active faults cross the site. The nearest known active[1] fault surface trace is the San Andreas fault, mapped about 2,900 feet southwest of the as shown on Figure 5. Other nearby active faults include the Sargent fault, mapped about 3.2 miles north of the site; the Calaveras fault, mapped about 3.5 miles northeast of the site; and the Hayward Fault, mapped approximately 33 miles northwest of the site.

Because of the presence of nearby active faults, including the San Andreas Fault Zone, the region is considered seismically active. Numerous small earthquakes occur every year in the region, and large (>M7) earthquakes have been recorded and can be expected to occur in the future. Figure 5 shows the approximate locations of these faults and significant historic earthquakes recorded within the Greater Bay Area Region.

The Uniform California Earthquake Rupture Forecast (UCERF, 2008) evaluated the 30-year probability of a M6.7 or greater earthquake occurring on the known active fault systems in the Bay Area, including the San Andreas fault. The UCERF generated an overall probability of 63 percent for the Bay Area as a whole, and a probability of 59 percent for the south San Andreas fault, and 31 percent for the Hayward-Rodgers Creek fault, and 7 percent for the Calaveras fault.

3.0 FIELD EXPLORATION

The field exploration for this study was conducted on June 17 through 26, 2013, and consisted of drilling 20 exploratory borings and excavating nine exploratory test pits and one exploratory trench at the approximate locations shown on Figures 2 and 3. The field exploration locations were obtained by taping or pacing from existing features; therefore, they should be considered accurately located only to the degree implied by the method used.

3.1 AUGER TEST BORINGS

The test borings were drilled using a track-mounted drill rig equipped with 8-inch-diameter hollow-stem augers and 4-inch-diameter solid-flight augers, an automatic-trip safety hammer, and drill rods. The borings ranged in depth between 13½ and 51½ feet below ground surface. An ENGEO engineer logged the borings in the field and collected soil samples using either a 2½-inch inside diameter (I.D.) California-type split-spoon sampler fitted with 6-inch-long stainless steel liners or a 2 inch outside diameter (O.D.) Standard Penetration Test split-spoon sampler. The samplers were driven with a 140-pound safety hammer falling a distance of 30 inches employing an automatic trip system.

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[1] An active fault is defined by the State Mining and Geology Board as one that has had surface displacement within Holocene time (about the last 11,000 years). The State of California has prepared maps designating zones for special studies that contain these active earthquake faults.

We recorded the penetration of the samplers into the native materials as the number of blows needed to drive the sampler 18 inches in 6-inch increments. The boring logs record blow count results as the actual number of blows required for the last one foot of penetration; no conversion factors have been applied. We used the field logs to develop the report boring logs, which are presented in Appendix A.

The logs depict subsurface conditions within the borings at the time the exploration was conducted. Subsurface conditions at other locations may differ from conditions occurring at these boring locations. The passage of time may result in altered subsurface conditions. In addition, stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.

3.2 TEST PITS AND TRENCHING

The exploratory trench and nine test pits were excavated to observe and provide additional assessment of the geologic conditions and possible faulting at the study site. The excavations were made using a track-mounted excavator equipped with a 30-inch-wide bucket. The exploratory trench extended approximately 180 feet long and had an average depth of 9 to 11 feet. The exploratory test pits (2-TP1 through 2-TP9) were excavated to depths of up to 13 feet below grades.

An ENGEO Geologist logged the test pits and trench. The field logs for the test pits and trench were used to develop the report logs, which are located in Appendix A and exploratory trench log, Figure 6. The logs depict subsurface conditions within the pits for the date of site activities; however, subsurface conditions may vary with time.

Once completed, the test pits and trench were backfilled following field exploration activities using nominal compactive effort by the excavator bucket and trackwalking the surface. Depending on future grading activities in these areas, it should be anticipated that the test pit/trench spoils will need to be removed and replaced as engineered fill.

3.3 FAULT EXPLORATION

As discussed in previous sections, regional mapping at the site by Majmundar (1994), Wagner (2002) and Rogers (1993) show two northwest-trending concealed faults crossing the project site, the Morse fault in the northeastern portion of the site and the Nutting fault crossing the southern portion of the site. The Morse is queried crossing the site indicating that the existence of the fault is doubtful.

The Nutting fault is depicted as trending parallel with the mapped bedrock and alluvium contact at the front of the foothills on the southern portion of the property. An exploratory trench (Trench T-1) was excavated as part of our previous study, in which no evidence of faulting was observed and it is, therefore, our opinion that the Nutting fault, mapped by others, does not require land planning setbacks or design constraints.

Our current study included an exploratory trench (Trench T-2), totaling approximately 180 lineal feet, was excavated crossing relatively perpendicular to the Morse Fault at the location shown on Figures 2 and 3. The trench was located in the field by tape measuring from existing features and handheld GPS. The log of the trench is included, Figure 6. The Morse fault is mapped as a queried concealed reverse fault with no apparent surface expression observed crossing the project site; therefore, the location of the trench was established based on regional mapping and the likely hood of encountering thicker deposits of soil that could demonstrate the presence or absence of Holocene faulting.

The depth of the trench averaged 9 to 11 feet below the adjacent ground surface. The southeast wall of the trench was cleaned with hand tools and examined by ENGEO geologists. The exposure was logged at a horizontal and vertical scale of 1 inch to 5 feet. A level line was established in the trench and measurements were referenced to this line.

Based on logging of the trench, soil stratigraphy encountered is believed to represent at least 10,000 years. Continuous across the length of the trench, Units 1 and 2 represent relatively young modern A-horizon soil deposits with black and very dark gray sandy clay and some course blocky soil structure. Unit 3 represents a Bk-horizon with very well developed blocky soil structure, clay film development on gravels and abundant calcium carbonate as masses, filaments and lining ped surfaces within the entire length of the unit observed. Unit 3 is believed to represent up to 7,000 years and was continuous across a majority of the trench, pinching out at Station 1+20. Unit 6 appears to represent a buried Bk-horizon with well-developed blocky structure, very thick clay film development on gravels and pedogenic surfaces and pervasive carbonate filaments throughout. In addition to Units 1 and 2, Units 5, 6 and 7 were continuous along the length of the trench. Unit 4 terminated at Station 0+85 as the result of erosional and depositional processes. Unit 8 terminated at Station 0+95 into the bottom of the trench. Unit 9 was first encountered at Station 1+00 and appears to be depositional and dividing Unit 5 and Unit 6. Unit 9 is predominantly coarse grained, consisting of silty sand with fine to coarse gravel. Unit 1A was encountered at Station 0+95 and terminates at Station 1+62. Unit 1A represents relatively young rapidly deposited alluvial channel deposits consisting of silty sand with gravel, near horizontal lenses of gravel were observed as well as fining upwards sequences of sand and silt. The unit scoured out Units 1 and 2 and a portion of Unit 5. No offset or shearing or other features indicative of faulting were observed in the area of Unit 1A. In addition, continuous units were logged underlying the channel. Gravel sized rock fragments encountered within the alluvium were observed to be consistent with bedrock formations in the vicinity. Bedrock was not encountered within the trench.

In addition to no evidence of faulting observed in Trench T1, no evidence of faulting was observed in Trench T-2. Several Units in T-2 were laterally extensive across the length of the trench with no observed features indicative of fault related movement. Discontinuities within the Units appear to be related to depositional and erosional processes. It is therefore, our opinion, that the Nutting and Morse faults, mapped by others, do not require land planning setbacks or design constraints.

3.4 LABORATORY TESTING

Select samples recovered during drilling activities were tested to determine the following soil characteristics:

TABLE 3.4-1
Soil Characteristics

Soil Characteristic	Testing Method	Location of Results
Natural Unit Weight and Moisture Content	ASTM D-2216	Appendix B
Atterberg Limits	ASTM D-4318	Appendix B
Grain Size Distribution	ASTM D-422	Appendix B
Fines Content (Finer than No. 200 Sieve)	ASTM D-1140	Appendix B
Unconfined Compression	ASTM D-2166	Appendix B
Triaxial Compression – Consolidated Undrained	ASTM D-4767	Appendix B
Resistance-Value	Cal Test 301	Appendix B
Soluble Sulfate Content	Caltrans 417	Appendix B

The laboratory test results are shown on the borelogs (Appendix A), with individual test results presented in Appendix B.

3.5 SURFACE CONDITIONS

As previously mentioned, the site is primarily utilized as grazing land. At the time of our field exploration, the eastern portion of the site consisted of tilled topsoil while the northwestern portion of the site consisted of seasonal weeds. The depth of loose/compressible organic surface material observed during the subsurface exploration was roughly 6 to 12 inches.

3.6 SUBSURFACE CONDITIONS

Figures 2 and 3 shows exploration locations and depth to bedrock, as applicable, and the exploration logs are presented in Appendix A and Figure 6. The logs describe the soil type, color, consistency, and visual classification in general accordance with the Unified Soil Classification System (USCS) of the subsurface conditions encountered at the time of the exploration.

Five near-surface samples were recovered from Borings 1-BH2, 1-BH4, 1-BH17 and 1-BH20 and tested for Plasticity Index (PI). The testing yielded PI values ranging from 19 to 35. Similarly, in our March 2013 study, four near-surface samples were collected from CPT locations 1-CPT01, 1-CPT04, 1-CPT06, and 1-CPT10 and resulted in PI values ranging from 19 to 33. This is an indication that the near-surface alluvial soils tested have moderate to high expansion potential.

Alluvium

In general, within the proposed development area, the valley floor subsurface conditions predominately consist of very stiff to hard silty lean clay, lean clay, and silt in the upper 10 to 20 feet.

As anticipated with alluvial soils, the central portion of the site encountered the greatest variability in subsurface conditions at the site with the upper 10 feet generally consisting of hard silt, clayey silt, sandy silt, and lean clay. Subsurface conditions from 10 to at least 30½ feet varied from very stiff to hard clayey silt and silt to hard lean clay, and sandy silts. Dense silty sand and sand layers were encountered from 25 to 31½ feet bgs in 1-BH5 and medium dense to hard silty sand was encountered from 23½ to at least 26 feet bgs in 1-BH12. Near-surface fat clay was encountered in 1-BH17 below the topsoil to 3½ feet bgs.

Along the northern portion of the site, the upper 20 feet typically consists of hard lean clay, silt, and sandy silt. In Borehole 1-BH1, medium dense silty sand was encountered from approximately 17 to 19 feet bgs and a loose sand lense was encountered from approximately 5 to 7½ feet bgs in Boreholes 1-BH16 and 1-BH18 interbedded between hard lean clay. Very stiff to hard lean clay was generally encountered from 20 to at least 51½ feet bgs with medium dense silty sand and sand encountered in 1-BH16 from 30 to 33 feet bgs. In 1-BH1, very stiff sandy silt was encountered from approximately 25 to 41½ feet with overlying and interbedded lenses, approximately 1½ to 2 feet thick, of loose to medium dense silty sand. Dissimilar to neighboring boreholes, stiff to very stiff clayey silt was encountered in 1-BH11 from 30 to 42 feet below existing grade.

Along the eastern portion of the site, the upper 10 feet generally comprises hard lean clay underlain by hard sandy silt. The sandy silt layer is typically underlain by hard silty lean clay and very stiff to hard sandy silt and silt to the maximum explored depth. Interbedded lenses of loose to medium dense silty sand, approximately 1½ to 2 feet thick, were encountered below 20 feet bgs.

Along the western portion of the site, the boreholes generally encountered very stiff to hard lean clay and clayey silt with a lense of dense clayey silty sand from 34 to 36 feet bgs encountered in 1-BH18.

Along the toe of the southeastern foothills, the boreholes generally encountered very stiff to hard lean clay and clayey silt in the upper 20 feet with an interbedded layer, approximately 5 to 7 feet thick, of hard sandy silt. In 1-BH13, claystone and sandstone with sitlsone interbeds were encountered from approximately 10 to 31 feet bgs.

Trench T-2 encountered similar interlayered alluvial deposits to the depth explored.

Landslide Debris

As described in Appendix A and shown on Figures 2 and 3, Test Pits 2-TP1 and 2-TP3 were excavated within mapped and landslide areas. The general subsurface conditions encountered are described below.

Test Pit 2-TP1 encountered landslide deposits approximately 3 feet thick consisting of silty clay, with a discrete polished shear plane observed at 3 feet striking 44 degrees northwest and dipping 40 degrees south. In addition, Test Pit 2-TP3 encountered landslide deposits approximately 2 feet thick consisting of silty clay. Based on visual examination, the landslide debris generally appears to have low to moderate plasticity and moderate expansion potential.

Colluvium

Colluvium was encountered at the site as infilling natural swales and draws at the southern portion of the site. Test Pits 2-TP2 and 2-TP5 were excavated in colluvial-filled swales containing approximately 8 feet (2-TP2) and 6 feet (2-TP5) of stiff to very stiff silty clay and sandy clay overlying bedrock. Based on visual examination, the colluvium generally appears to have low to moderate plasticity and moderate expansion potential.

Bedrock

Bedrock was encountered in each test pit with the exception of 2-TP8. Weak thinly bedded sandstone was encountered in Test Pits 2-TP6 and 2-TP9. Moderately expansive extremely weak claystone was observed in 2-TP7. Test Pits 2-TP1, 2-TP2, 2-TP3, 2-TP4 and 2-TP5 encountered bedrock consisting of extremely weak to weak thinly interbedded claystone, sandstone, siltstone or shale. Bedrock structure, as observed in exploratory test pits, is generally striking northwest and dipping 35 to 61 degrees southwest. Bedding near the proposed tank site strikes northeast, dipping 36 to 50 degrees southeast.

3.7 GROUNDWATER

We provide the following information regarding depth to groundwater at the site and within the site vicinity.

- Groundwater was encountered at depths ranging from 22 to 30 feet bgs in Boreholes 1-BH1, 1-BH11, and 1-BH16 (generally along northern area of the site).

- Groundwater was encountered at depths ranging from 20 to 32 feet bgs in Probes 1-CPT01, 1-CPT02, and 1-CPT10 (generally northeastern and southeastern areas of the site).

- Two monitoring wells are located in the vicinity of the existing leach field located along the eastern site boundary. As reported by Questa Engineering Corporation in their 2012-2013 Self-Monitoring Report, dated May 30, 2013, the measured depth to groundwater in the two monitoring wells was reported to range from 36.25 feet to 42.95 feet below the well casings.

- Well Number USGS3220665 situated at elevation 220.20 (NGVD 1929) is mapped approximately ¼ mile north of the site. Groundwater level measurements ranging from 31.0 and 69.5 feet bgs are recorded between 1949 and 1988.

Fluctuations in groundwater levels occur seasonally and over a period of years because of variations in precipitation, temperature, irrigation, or other factors. A design groundwater level of 20 feet below the existing ground surface has been selected for analysis purposes.

4.0 DISCUSSION AND CONCLUSIONS

The site was evaluated with respect to known geologic hazards common to the greater San Francisco Bay Region. The primary hazards and the risks associated with these hazards with respect to the planned development are discussed in the following sections of this report.

4.1 SEISMIC HAZARDS

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, ground lurching, soil liquefaction, lateral spreading and landsliding. The following sections present a discussion of these hazards as they apply to the site.

Based on topographic and lithologic data, risk from earthquake-induced regional subsidence/uplift, tsunamis and seiches is considered low to negligible at the site.

4.1.1 Ground Rupture

The site is not located within a State of California Earthquake Fault Hazard Zone and no known active faults cross the site. As discussed in previous sections, two concealed faults are mapped crossing the project site; however based on our exploratory trench and document review, we have concluded that the risk of surface fault rupture within the planned residential development is low to unlikely.

To assess site faulting, a second fault exploration was completed by ENGEO concurrent with this study, to evaluate the possible existence of the Morse fault trace as depicted on regional geologic maps. Based on the findings of the fault trenching performed across the Morse fault trace, and previously the Nutting fault trace, we conclude that the risk of surface fault rupture within the planned residential lots at the site is low.

4.1.2 Ground Shaking

An earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the site, similar to that which has occurred in the past. To mitigate the shaking effects, all structures should be designed using sound engineering judgment and the latest California Building Code (CBC) requirements, as a minimum.

Seismic design provisions of current building codes generally prescribe minimum lateral forces, applied statically to the structure, combined with the gravity forces of dead-and-live loads. The code-prescribed lateral forces are generally considered to be substantially smaller than the comparable forces that would be associated with a major earthquake. Therefore, structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse but with some structural as well as nonstructural damage. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake; however, it is reasonable to expect that a well-designed and well-constructed structure will not collapse or cause loss of life in a major earthquake (SEAOC, 1996).

4.1.3 Ground Lurching

Ground lurching is a result of the rolling motion imparted to the ground surface during energy released by an earthquake. Such rolling motion can cause ground cracks to form in weaker soils. The potential for the formation of these cracks is considered greater at contacts between deep alluvium and bedrock. Such an occurrence is possible at the site as in other locations in the Bay Area; but based on the site location, it is our opinion that the offset is expected to be minor. Recommendations for site preparation and grading are provided in this report that are intended to reduce the potential for lurch cracking.

4.1.4 Liquefaction

Soil liquefaction is a phenomenon in which saturated, loose or medium dense, cohesionless soils are subject to a temporary, but essentially total, loss of shear strength because of pore pressure build-up under the reversing cyclic shear stresses associated with earthquakes.

Historically, standard geotechnical engineering practices for liquefaction assessment have determined that layers of loose to medium dense and saturated sandy deposits as being potentially liquefiable. However, empirical evidence from recent major earthquakes and published research projects at major universities indicate that some fine-grained soils (including low plasticity silts and clays) can also liquefy.

To assess liquefaction potential, we advanced 11 CPTs (ENGEO, March 2013) and drilled 20 borings. Considering SPT blow counts for saturated samples from auger borings are sometimes unreliable, we utilized the continuous soil profiles of the CPTs. Visual classification and laboratory testing of samples allowed for correlation between the CPTs and borings, where appropriate. As described in prior sections, we encountered loose to dense silty sands and sands above and below the design groundwater level. In addition, we assessed the liquefaction potential of the silt-based layers below the design groundwater level.

For the purpose of our analysis, we utilized a design groundwater level of 20 feet below the existing ground surface, a PGA of 0.57g, and an earthquake magnitude (Mw) of 7.9. Our analyses were based on guidelines provided in DMG Special Publication 117A (2008) and methods developed by Youd et al. (2001) (NCEER 1998), Moss et al. (2006), Seed (2003), and Bray and Sancio (2006).

The analyses generally indicated that the thin layers (½ to 2 feet thick) of loose to medium dense silty sand and sand below the design groundwater level were potentially liquefiable. In addition, select clayey silt and sandy silt layers, between 1½ and 7 feet thick, in Borings 1-BH1, 1-BH2 and 1-BH11 and CPTs 1-CPT01 through 1-CPT04 are potentially susceptible to liquefaction based on currently available methods. The potentially liquefiable silt-based layers are located along the northern portion of the site at depths ranging from 25½ to 40 feet bgs.

4.1.4.1 Liquefaction-Induced Ground Settlement

Potentially liquefiable soils are commonly susceptible to earthquake-induced ground settlement. Based on the liquefaction analysis described above, we estimate up to approximately 1 inch of total (½-inch differential) liquefaction-induced settlement may occur based on existing conditions.

4.1.4.2 Liquefaction-Induced Surface Rupture

Potentially liquefiable soils may also be susceptible to earthquake-induced surface rupture (sand boils). In order for liquefaction-induced ground failure to occur, the pore water pressure generated within the liquefied strata must exert a force sufficient to break through the overlying soil and vent to the surface resulting in sand boils or fissures. As a result, we also evaluated the capping effect of overlying non-liquefiable soils.

In 1985, Ishihara presented preliminary empirical criteria to assess the potential for ground surface disruption at liquefiable sites based on the relationship between thickness of liquefiable sediments and thickness of overlying non-liquefiable soil. A more recent study by Youd and Garris (1995) expanded on the work of Ishihara to include data from over 300 exploratory borings, 15 different earthquakes, and several ranges of recorded peak ground acceleration.

Based on our review, the project site currently has a thick non-liquefiable soil cap and the risk of liquefaction-induced surface rupture is considered low. However, if finished site grades are lowered by more than 10 feet, the risk of liquefaction-induced surface rupture increases and should be reevaluated once finished site grades are further refined.

4.1.5 Lateral Spreading

Lateral spreading is a failure within a nearly horizontal soil zone (possibly due to liquefaction) that causes the overlying soil mass to move toward a free face or down a gentle slope. Generally, effects of lateral spreading are most significant at the free face or the crest of a slope and diminish with distance from the slope.

Based on our site visits and review of available topography of the site, the majority of the site is relatively flat with exception to the southern foothills and the seasonal drainage channel extending from the southeastern corner of the site. The channel varies in size from 20 to 25 feet wide and 5 to 10 feet deep with vegetated side slopes generally 1½:1 or flatter while sections of approximately 15 feet deep typically comprised slopes at 1:1.

Based on review of the preliminary proposed development, some proposed residential lots will overly the current drainage channel and some will abut a portion of the drainage channel that may remain. Although we anticipate a low potential for lateral spreading, the proposed residential lots located in the vicinity of the drainage channel may undergo slope deformation depending on proposed finished grades unless mitigated. Mitigation measures can include common remedial grading practices such as construction of a toe shear keyway that extends below the flow line elevation of the adjacent drainage channel. Additional lateral spreading and slope deformation analyses, as applicable, are recommended once 40-scale grading plans are available.

4.1.6 Seismically Induced Landsliding

Common to the greater San Francisco Bay area, the risk of instability is greater during major earthquakes than during other time periods. The majority of the site, planned for development is relatively flat and is not subject to seismically induced landsliding. There are mapped landslides within the foothills on the southern portion of the site; however, based on our field exploration the landslides observed are relatively shallow slumps or earthflows and the impact to development can be mitigated through avoidance (setback) or corrective grading as recommended in this report.

4.2 LANDSLIDES

As described above, there are mapped landslides within the foothills in the southern portion of the site; however, based on our field exploration the landslides observed are relatively shallow slumps or earthflows and the impact to development can be mitigated through avoidance (setback) or corrective grading. When grading plans for the project have been prepared, we should be given the opportunity to provide supplemental recommendations regarding landslide setbacks or corrective grading measures.

Cut slopes that are made in landslides areas or in colluvial swales can reduce slope stability in these areas and cause landslide movement to occur. If cut slopes are planned in landslide areas of colluvial swales, we anticipate that corrective grading such as buttressing of the slope with engineered fill will be needed.

Soil on slopes will experience creep over the long term. Improvements that will be located in the hillsides portion of the site such as the water tank, pipelines and access roads will need to be designed to mitigate the potential for adverse impacts from soil creep. Recommendations provided in subsequent sections of this report are intended to address this concern.

4.3 LOOSE SURFACE SOILS

As discussed previously, the site is primarily utilized as grazing land and surface soils were recently tilled at the time of our field exploration activities. Based on our site observations, at least 6 to 12 inches of surficial soils were found to be loose in consistency from tilling operations. This layer is not suitable to receive engineered fills or improvements unless mitigated as described in a later section of this report.

4.4 EXPANSIVE SOILS

Near-surface soil samples tested indicate moderate to high expansion potential (PIs of 19 to 35). Expansive soils shrink and swell as a result of moisture changes. This can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Structures can be adequately supported on structural reinforced mat foundations that are designed to accommodate shrinking and swelling subgrade soils.

Successful construction on expansive soils requires special attention during grading. It is imperative to keep exposed soils moist by occasional sprinkling. If the soils dry, it is extremely difficult to remoisturize the soils (because of their clayey nature) without excavation, moisture conditioning, and recompaction.

Conventional grading operations, incorporating fill placement specifications tailored to the expansive characteristics of the soil, and use of a mat foundation (either post-tensioned or conventionally reinforced) are common, generally cost-effective measures to address the expansive potential of the foundation soils. Based upon our initial findings, the effects of expansive soils are expected to pose a low impact when mitigated.

4.5 EXISTING FILLS

Considering the site has been predominantly undeveloped land since at least 1939 and evidence of existing fills was not readily apparent in the exploration locations, we do not anticipate the presence of extensive existing fills across the site. However, we observed two water wells, one of which supported on a concrete slab and a single concrete pad and two storm drain manholes located in the northeastern portion of the site. In addition, existing fill should be anticipated in the leach field and associated monitoring wells. Existing fills may be associated with the above-mentioned site improvements or in other isolated areas.

Existing fills not documented as engineered could undergo vertical movement that is not easily characterized and could ultimately be inadequate to effectively support the proposed building loads. Where documentation on placement of fill is not available, the fill materials should be considered undocumented and removed during grading activities and replaced as engineered soil fill.

As noted in prior sections the test pits and fault trenches by ENGEO from the current study and March 2013 study were loosely backfilled and not suitable to support future loads. The depth of the test pits and trenching is up to 13 feet below existing grades. Site grading will require removal and replacement of the pit/trench backfill if located within the limits of proposed buildings or site improvements.

Common mitigation techniques for non-engineered fills, if within or at the margin of the grading limits, include removal and replacement as engineered fill, provided the material is deemed suitable for reuse by the Geotechnical Engineer at the time of grading. We do not anticipate the material will be unsuitable for reuse.

4.6 DIFFERENTIAL FILL THICKNESS

Depending upon the depths of excavations required for removal of existing foundations, underground facilities (wells, leach fields) and undocumented fill encroaching under future building pads, a differential fill condition may arise that could adversely impact the performance of the residential foundations. Recommendations to address this potential condition are presented in a subsequent section.

4.7 FLOODING/INUNDATION HAZARDS

The project Civil Engineer should review pertinent information relating to possible flood levels for the subject site based on final pad elevations and provide appropriate design measures for development of the project, if necessary. The project Civil Engineer should assess if the site is located above or below the 100-year flood elevation.

4.8 CBC SEISMIC DESIGN CRITERIA

The following table presents both the 2010 CBC and 2013 CBC seismic parameters for your use and comparison. The 2013 CBC is scheduled to be adopted for implementation in January 2014. The seismic design parameters presented in the 2013 CBC seismic parameters will be based upon the 2012 International Building Code and the ASCE standard "Minimum Design Loads for Buildings and Other Structures" (ASCE 7-10) published in 2010. As an estimate of 2013 CBC seismic parameters, we used recently developed USGS Seismic Design Map online tool to develop ASCE 7-10 seismic design parameters.

TABLE 4.8-1
2010 CBC and 2013 CBC
Seismic Design Parameters

Parameter	2010 CBC	2013 CBC
Site Soil Classification	D	D
0.2 second Spectral Response Acceleration, S_S	2.16	2.44
1.0 second Spectral Response Acceleration, S_1	1.22	1.17
Site Coefficient, F_A	1.0	1.0
Site Coefficient, F_V	1.5	1.5
Maximum considered earthquake spectral response accelerations for short periods, S_{MS}	2.16	2.44
Maximum considered earthquake spectral response accelerations for 1-second periods, S_{M1}	1.82	1.76
Design spectral response acceleration at short periods, S_{DS}	1.44	1.63
Design spectral response acceleration at 1-second periods, S_{D1}	1.22	1.17
Long period transition-period, T_L	12 seconds	12 seconds

Latitude: 36.8229; Longitude = -121.4793

4.9 CORROSIVITY CONSIDERATIONS

A background evaluation of possible corrosion impacts to buried metal improvements has been conducted on two selected soil samples. The samples were transported under a chain-of-custody to Cerco Analytical, Inc. (Cerco) for laboratory testing, including soluble sulfate concentrations, chloride ion concentration, resistivity, and pH. These tests provide an indication of the corrosion potential of the soil environment on buried concrete structures and metal pipes. A detailed description of the laboratory results is contained in the Cerco laboratory letter (Appendix E). A summary of the results are presented below.

TABLE 4.9-1
Soil Corrosivity Test Results

Sample Number	Soluble Sulfate (mg/kg)	Chloride Ion (ppm)	Resistivity (Ohm-cm)	pH	Redox (mV)
1-BH1 @ 2’	11	--	--	--	--
1-BH3 @ 2’	ND	59	1,200	7.6	410
1-BH9 @ 2’	4	--	--	--	--
1-BH15 @ 2’	ND	ND	4,300	7.2	370
1-BH16 @ 3’	5	--	--	--	--

ND – None Detected

As indicated in the Cerco brief report included in Appendix E, based on the resistivity measurements, 1-BH3 @ 2 feet is classified as “corrosive” and 1-BH15 @ 2 feet is classified as “moderately corrosive.” We recommend retaining a corrosion consultant to provide specific design recommendations for corrosion protection for buried metals and concrete elements.

In addition, three sulfate samples were collected of near-surface soils and tested in ENGEO’s laboratory for soluble sulfate concentration. The 2010 CBC references 2008 American Concrete Institute Manual, ACI 318 (Chapter 4, Sections 4.2 and 4.3) for concrete requirements. ACI Tables 4.2.1 and 4.3.1 (reproduced below as Tables 4.9-2 and 4.9-3) provide the following sulfate exposure categories and classes and concrete requirements in contact with soil based upon the exposure risk.

TABLE 4.9-2
Sulfate Exposure Categories and Classes

Sulfate Exposure Category S	Exposure Class	Water- Soluble Sulfate in Soil % by Weight	Dissolved Sulfate in Water mg/kg (ppm)
Not Applicable	S0	$SO_4 < 0.10$	$SO_4 < 150$
Moderate	S1	$0.10 \leq SO_4 < 0.20$	$150 \leq SO_4 \leq 1,500$ seawater
Severe	S2	$0.20 \leq SO_4 \leq 2.00$	$1,500 \leq SO_4 \leq 10,000$
Very Severe	S3	$SO_4 > 2.00$	$SO_4 > 10,000$

TABLE 4.9-3
Requirements for Concrete by Exposure Class

Exposure Class	Max w/cm	Min f'c (psi)	Cement Type			Calcium Chloride Admixture
			ASTM C150	ASTM C595	ASTM C1157	
S0	N/A	2500	No Type restriction	No Type restriction	No Type restriction	No restriction
S1	0.5	4000	II†‡	IP(MS), IS(<70), (MS)	MS	No restriction
S2	0.45	4500	V‡	IP(HS), IS(<70), (HS)	HS	Not permitted
S3	0.45	4500	V + pozzolan or slag§	IP(HS) + pozzolan or slag or IS(<70) (HS) + pozzolan or slag§	HS + pozzolan or slag§	Not permitted

Notes:
† For seawater exposure, other types of portland cements with tricalcium aluminate (C_3A) contents up to 10 percent are permitted if the w/cm does not exceed 0.40.
‡ Other available types of cement such as Type III or Type I are permitted in Exposure Classes S1 or S2 if the C_3A contents are less than 8 or 5 percent, respectively.
§ The amount of the specific source of the pozzolan or slag to be used shall not be less than the amount that has been determined by service record to improve sulfate resistance when used in concrete containing Type V cement. Alternatively, the amount of the specific source of the pozzolan or slag to be used shall not be less than the amount tested in accordance with ASTM C1012 and meeting the criteria in ACI 4.5.1.

In accordance with the criteria presented in the tables above, the test results are classified in the "not applicable" sulfate exposure range. Cement type and water-cement ratio are not specified by the CBC for this range but the minimum concrete strength is specified to be 2,500 psi. We recommend that Type II cement and a concrete mix design that incorporates a maximum water-cement ratio of 0.5 and a minimum compressive strength of 3,000 psi be used in foundation concrete for structures at the project site. It should be noted, however, that the structural engineering design requirements for concrete may result in more stringent concrete specifications.

As indicated above, testing was not completed for all soil types or depths of potential embedment across the entire site. If requested, we can provide additional testing and/or guidance regarding the exposure risk for corrosion and sulfates. It is recommended that additional chemical tests be conducted on the subgrade soils after grading of the pads is completed, but prior to building and utility construction. In addition, PG&E may require soil sampling and testing at vault locations to determine if underground vaults are acceptable. However, based on the corrosion test results, where critical metal pipelines and other related site improvements are in contact with the onsite soils, a corrosion specialist should be consulted for corrosivity design and protection.

4.10 CONCLUSIONS

It is our opinion, based on this exploration and laboratory test results and previous explorations at the site, that the proposed development is feasible from a geotechnical standpoint provided the site is prepared in accordance with the recommendations contained herein. The recommendations included in this report, along with other sound engineering practices, should be incorporated in the design and construction of the project.

Due to the hillside topography and anticipated cut and fill slopes, a corrective grading plan should be prepared as 40-scale grading plans are developed. Slope stability and other additional analysis will be performed at that time to guide the corrective grading measures necessary. This will be important to clarify our geotechnical recommendations related to keyways, benches, subdrains, cut/fill transition subexcavations and slope rebuilds, cut slope rebuilds, and to assess slope stability as applicable.

5.0 RECOMMENDATIONS

5.1 GRADING

The grading recommendations provided in this report are appropriate for planning purposes for the development area. Development of the grading plans should be coordinated with the Geotechnical Engineer and Engineering Geologist in order to tailor the plans to accommodate known soil and geologic hazards and to improve the overall stability of the site. The final 40-scale grading plans for the project should be reviewed by ENGEO. Detailed locations of keyways, subdrains and subexcavation areas will be outlined on these plans during our review, as applicable.

ENGEO should be notified at least three days prior to grading in order to coordinate its schedule with the grading contractor. Grading operations should meet the requirements of the Guide Contract Specifications included in Appendix F and should be observed and tested by ENGEO's field representative.

Ponding of stormwater must not be allowed at the site except in engineered water collection areas, such as desilting basins or the planned post-construction stormwater basins. If water is allowed to pond on the building pads, additional pad preparation may be required prior to foundation construction. Before the grading is halted by rain, we recommend that positive slopes be provided to carry surface runoff water in a controlled manner.

5.2 GENERAL SITE CLEARING

Site development should commence with removal of any existing foundations, utilities, surface and subsurface improvements, and vegetation (trees and shrubs not planned to remain). All debris or soft compressible soils should be removed from any location to be graded, from areas to receive fill or structures, or those areas to serve as borrow. The depth of removal of such materials should be determined by the Geotechnical Engineer or qualified representative in the field at the time of grading.

Existing vegetation should be removed from areas to receive fill, or structures, or those areas to serve for borrow. Tree roots should be removed down to a depth of at least 3 feet below existing grade. The actual depths of tree root removal should be determined by the Geotechnical Engineer's representative in the field. Strippings may be reserved for placement on graded slopes prior to installation of erosion control measures. After placement on graded slopes, any remaining strippings and organically contaminated soils which are not suitable for use as engineered may be used in approved open space areas or landscape areas subject to approval by the Landscape Architect. Otherwise, such soils should be removed from the project site or may selectively be blended with soil and placed in engineered fills outside street and pad areas. Any topsoil that will be retained for future use in landscape areas should be stockpiled in areas where it will not interfere with grading operations.

5.3 SELECTION OF MATERIALS

With the exception of construction debris (wood, brick, asphalt, concrete, metal, etc.), trees, organically contaminated materials (soil which contains more than 3 percent organic content by weight), and environmentally impacted soils (if any), we anticipate the site soils are suitable for use as engineered fill provided they are broken down to 6 inches or less in size. Other materials and debris, including trees with their root balls, should be removed from the project site.

The Geotechnical Engineer should be informed when import materials are planned for the site. Import materials should be submitted to, and approved by, the Geotechnical Engineer prior to delivery at the site and should conform to the requirements provided in the Guide Contract Specifications (Appendix F).

5.4 EXISTING FILLS/LOOSE SURFACE SOILS

Existing fills, utility trench backfill, and existing foundation backfill are considered undocumented and should be removed and recompacted. In addition, backfill material in exploratory geologic test pits and trenches shown on Figure 2 and 3 are considered undocumented. Depending upon the limits of grading and planned civil cuts, existing fills should be subexcavated to expose underlying competent native soils that are approved by the Geotechnical Engineer and backfilled as engineered fill.

In addition, due to the historic and recent tilling at the site, we recommend the upper 12 inches of site soils should be subexcavated to expose a non-desiccated native surface. The subexcavated soil materials can be reused as engineered fill if deemed suitable and placed in accordance with the Fill Placement section of this report and under the observation and testing of a representative from ENGEO. The subexcavated soil will be assessed for organic content prior to reuse. It should be noted that portions of the removed soil may be deemed unsuitable for reuse as engineered fill due to high organic content from historic tilling.

5.5 EXPANSIVE SOILS

Near-surface soil samples tested indicate moderate to high expansion potential (PIs of 19 to 35). Expansive soils shrink and swell as a result of moisture changes. This can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Structures can be adequately supported on structural reinforced mat foundations that are designed to accommodate shrinking and swelling subgrade soils.

Successful construction on expansive soils requires special attention during construction. It is imperative to keep exposed soils moist. It is extremely difficult to remoisturize dry soil (because of its clayey nature) without excavation, moisture conditioning and recompaction. Fill placement specifications tailored to the expansive characteristics of the soil are addressed in later sections.

5.6 GRADED SLOPES

In general and for preliminary purposes, graded slopes up to 20 feet high should be no steeper than 2:1 (horizontal:vertical). Graded slopes over 20 feet high should be no steeper than 3:1 (horizontal:vertical). Cut-fill transition slopes should be overexcavated and reconstructed as fill slopes. All fill slopes should be adequately keyed into firm natural materials unaffected by shrinkage cracks.

Planned slopes will be reviewed and analyzed with respect to slope stability as part of future 40-scale grading plan review(s), at which time we will prepare applicable remedial grading plans showing locations of keyways and subdrains to support select slopes.

5.6.1 Slope Stability

Slope stability analysis, as applicable, is recommended once 40-scale grading plans are available. The analysis will assess landslide stability in proximity to grading limits, cut slopes, slope rebuilds and planned taller fill slopes.

Common mitigation measures for shallow landslides and slope instability include avoiding placement of structures in or downslope of slide areas, removing the landslide debris to bedrock and replacing it with engineered fill, buttressing the toes of landslides with engineered fill, and constructing keyways, debris benches, and/or landslide buffer/catchment areas with surface and subsurface drainage.

5.6.2 Slope Setbacks and Debris Benches

Wall and building slope setbacks are variable depending on slope height and soil conditions and should follow CBC requirements as a minimum. Additional slope setbacks are prudent if nearby natural drainage channels could create slope instabilities unless repaired/mitigated. In general, for existing drainage channels, we recommend non-habitable improvements (streets and utilities) be set back at least 10 feet from the top of slope, or at least a 2:1 (horizontal:vertical) line of projection extending upwards from the toe of slope, whichever is farther. For habitable improvements (backyards and houses), a 15-foot setback or 3:1 (horizontal:vertical) line of projection extending upwards from the toe of slope whichever is farther. These minimums will be revisited as the land plan is further refined based on site-specific slope stability analyses for static and seismic loading conditions.

Debris benches are recommended at the interface between the open space hillside and the residential lots. A minimum debris bench of 50 feet is recommended below hillside areas containing unmitigated landslides. A minimum debris bench of 25 feet is recommended below hillside areas with no mapped landslides or for mitigated landslide areas. From a geotechnical standpoint, a road may be considered part of the debris bench, but a backyard should not. These recommendations will be further assessed during future planning phases for the project.

5.7 TOE KEYWAYS

Depending upon the type and heights of graded slopes, toe keyways may be recommended. Typical keyways will be required at the toe of fill slopes and reconstructed cut and cut-fill transition slopes. We anticipate that typical keyway designs will consist of minimum keyway width of 24 feet and a minimum keyway depth of 5 feet for interior and northern perimeter slopes. Keyway(s) along the southern perimeter, if needed, would likely be wider and deeper. Typical keyway and subdrain details are presented in Figures 8 and 9; however, keyway dimensions and locations will be shown on remedial grading plans to be developed during review of the final grading plan.

Actual subsurface mitigation configurations (size and depths) will be shown on the final 40-scale remedial grading plans and after detailed slope stability analyses have been performed, as applicable.

5.8 SUBSURFACE DRAINAGE FACILITIES

Unless otherwise approved by the Geotechnical Engineer, subsurface drainage systems should be anticipated for keyways, debris benches, and at the base of removal areas. In addition, observed seepage areas or suspected spring areas should be controlled in development areas through the use of subdrains. The recommended locations of subdrains will be developed by ENGEO and presented on future remedial grading plans used during site grading once final 40-scale plans are developed. General details of subdrains are presented on Figure 9.

Subdrain systems should consist of a minimum 6-inch-diameter perforated pipe encased in Caltrans Class 2 permeable material, or crushed rock wrapped in filter fabric. As an alternative, prefabricated geocomposite drainage material (such as SKAPS TNS 220-6) could be considered in lieu of the granular medium above the subdrain zone. A minimum fall of 1 percent is recommended, although in some instances ½ percent fall may be geotechnically approved.

Discharge from the subdrains will generally be low but in some instances may be continuous. Subdrains should outlet into the storm drain system or other approved outlets, and their locations should be surveyed and documented by the project Civil Engineer for future maintenance. Subdrains should gravity flow to the approved outlet. If gravity flow is not feasible and if no other options are readily apparent, granular engineered fill may be used below the subdrain system to achieve gravity fall.

Not all sources of seepage are evident during the time of field work because of the intermittent nature of some of these conditions and their dependence on long-term climatic conditions. Furthermore, new sources of seepage may be created by a combination of changed topography, manmade irrigation patterns and potential utility leakage. Since uncontrolled water movements are one of the major causes of detrimental soil movements, it is of utmost importance that a Geotechnical Engineer be advised of any seepage conditions so that remedial action may be initiated, if necessary.

5.9 DIFFERENTIAL FILL THICKNESS

Where topography or subexcavation activities create a differential fill thickness across individual building pads, mitigation to achieve a similar fill thickness across the pad is beneficial for the performance of a shallow foundation system. A differential fill thickness of up to 5 feet is recommended across individual building pads. For a differential fill thickness exceeding 5 feet across an individual pad, subexcavation activities to bring this vertical distance to within the 5-foot tolerance would be needed. As a minimum, the subexcavation area would include the entire structure footprint plus 5 feet beyond the edges of the building footprint.

5.10 SURFICIAL PAD TREATMENT

We recommend that the upper 2 feet of pad subgrade soils for cut lots and the upper 3 feet of cut-fill transition lots and shallow fill lots be made uniform by subexcavating and replacing as engineered fill. Figure 7 presents general surficial pad treatment details. This requirement will provide a relatively uniform, moisture conditioned state for the foundation subgrade soils. Moisture and compaction recommendations are provided in a subsequent section of this report.

5.11 FILL PLACEMENT

Once a suitable firm base is achieved for general fill areas, the exposed non-yielding surface should be scarified to a depth of 10 inches, moisture conditioned, and recompacted to provide adequate bonding with the initial lift of fill. Reaching a firm base prior to fill placement will require excavations that extend through soils that have been disturbed by tilling activities (roughly 1 foot anticipated). At the on-set of grading, test pits could be performed to confirm the actual depth. All fills should be placed in thin lifts, with the lift thickness not to exceed 10 inches or the depth of penetration of the compaction equipment used, whichever is less.

We recommend the following compaction control requirements apply.

<u>Keyway backfill and Deep Fills (greater than 30 feet):</u>

Test Procedures:	ASTM D-1557.
Required Moisture Content:	Not less than 2 percentage points above optimum moisture content.
Minimum Relative Compaction:	Not less than 95 percent.

<u>General Fill Areas (Less than 30 feet deep):</u>

Test Procedures:	ASTM D-1557.
Required Moisture Content:	Not less than 3 percentage points above optimum moisture content.
Minimum Relative Compaction:	Not less than 90 percent.

Surficial Pad Treatment (Upper 2 or 3 feet depending upon lot type):

Test Procedures:	ASTM D-1557.
Required Moisture Content:	At least 4 percentage points above optimum moisture content.
Minimum Relative Compaction:	Not less than 88 percent and not more than 92 percent.

Relative compaction refers to in-place dry density of the fill material expressed as a percentage of the maximum dry density based on ASTM D-1557. Optimum moisture is the moisture content corresponding to the maximum dry density.

5.12 MONITORING AND TESTING

It is important that all site preparations for site grading be done under the observation of the Geotechnical Engineer's field representative. The Geotechnical Engineer's field representative should observe all graded area preparation, including demolition and stripping, following the recommendations contained in the Guide Contract Specifications in Appendix F. The final grading plans should be submitted to the Geotechnical Engineer for review.

5.13 RESIDENTIAL FOUNDATION DESIGN

Provided that the site is prepared in accordance with the recommendations provided herein, it is our opinion that a structural mat foundation (post-tensioned or conventionally reinforced) would be well suited to support the residential structures.

5.13.1 Post-Tensioned Mat Foundation Design

We anticipate that a structural mat, such as a post-tensioned mat, is the desired foundation system for the residential building pads. A structural mat constructed on swelling soils will typically move differentially and, therefore, may require stiffening to reduce differential movements due to swelling/shrinkage to a value compatible with the type of structure that will be constructed.

For a post-tensioned mat design, considering the site soil conditions, and using the 2004 (Third Edition) Post-Tensioning Institute, "Design of Post-Tensioned Slabs-On-Ground" manual to develop our soil parameters, we recommend the following soil criteria for use in residential foundation design.

Center Lift Condition:

Edge Moisture Variation Distance, e_m = 8.5 feet
Differential Soil Movement, y_m = 0.6 inches

Edge Lift Condition:

Edge Moisture Variation Distance, e_m = 4.3 feet
Differential Soil Movement, y_m = 0.7 inches

In addition, the mats should be designed to impose a maximum average bearing pressure of 1,500 psf for dead-plus-live loads. Allowable bearing pressures of 2,000 psf can be used for concentrated line or column dead-plus-live loads. These values may be increased by one-third when considering total loads including wind or seismic.

5.13.2 Subgrade Treatment for Structural Mat Foundations

The subgrade material under structural mat foundations should be uniform. The pad subgrade should be moisture conditioned to a moisture content of at least 4 percentage points above optimum. The subgrade should be thoroughly soaked and approved by the Geotechnical Engineer prior to placing the reinforcement or tendons. The subgrade should not be allowed to dry prior to concrete placement.

A 2-inch-thick sand cushion (Section 2.03, Part I of Guide Contract Specifications) could be utilized under the mat if desired by the structural engineer. In addition, a tough, water vapor retarding membrane (Section 2.05D, Part I of Guide Contract Specifications) should be provided to reduce moisture condensation under the floor coverings. The vapor retarder under the slabs should meet ASTM E 1745 – 97 Class A requirements for water vapor permeance, tensile strength, and puncture resistance. Vapor transmission through the mat foundations can also be reduced by using high strength concrete with a low water-cement ratio.

5.13.3 Settlement Design Considerations

Foundation design should consider 1 inch of total settlement due to liquefaction-induced settlement. A differential value of ½ inch may be considered and should be assumed to act between adjacent column supports or over a 40-foot distance.

5.14 SECONDARY SLABS-ON-GRADE

This section provides guidelines for secondary slabs such as walkways, driveways and steps. Secondary slabs-on-grade should be constructed structurally independent of the foundation system. This allows slab movement to occur with a minimum of foundation distress. Where secondary slab-on-grade construction is anticipated, care must be exercised in attaining a near-saturation condition of the subgrade soil before concrete placement.

Secondary slabs-on-grade should be designed by the Structural Engineer specifically for their intended use and loading requirements. Some of the site soils have a high expansion potential; therefore, cracking of conventional slabs should be expected. Frequent control joints should be provided to control the cracking.

Secondary slabs-on-grade should have a minimum thickness of 4 inches. Although reinforcement should be designed by the structural engineer, we recommend a minimum reinforcement of No. 3 bars spaced 18 inches on-center each way. In our experience, welded wire mesh may not be sufficient to control slab cracking. A 4-inch-thick layer of clean, crushed rock should be placed under slabs. Slabs (surface and subgrade) should slope away from the buildings to prevent water from flowing toward the building. Expansion and control joints should be constructed, as necessary, per current code standards.

5.15 PRELIMINARY BRIDGE DESIGN CONSIDERATIONS

We understand at least one vehicle/pedestrian bridge is proposed to span the southeastern drainage channel to provide access to the site from the existing offsite San Juan Oaks Road. As the proposed bridge structure is in the early planning stage at this time, proposed designs and loads were not available at publication of this report.

One boring, 1-BH3, was drilled approximately 10 feet from the top of existing drainage channel in the vicinity of the proposed bridge crossing along the eastern side of the site. The boring generally comprised very stiff to hard silty lean clay to approximately 12 feet bgs and very dense clayey sand from approximately 12 to 14 feet bgs. This was further underlain by very stiff to hard lean clay to approximately 20 feet bgs. Very dense silty sand and very stiff silty lean clay were encountered to the maximum explored depth of 31 feet bgs. Groundwater was not encountered at the time of drilling. One sample was recovered at approximately 2 feet bgs from 1-BH3 and was classified as “corrosive” based upon resistivity measurements as previously discussed.

For preliminary planning purposes, spread footings or drilled piers appear to be suitable foundations for the proposed bridge. Specific design recommendations can be provided once preliminary proposed design plans and loads are complete. Additional exploration may be warranted at proposed bridge locations depending on the finalized bridge design.

5.16 PRELIMINARY WATER TANK DESIGN CONSIDERATIONS

We understand a proposed water tank is planned to be located on the southeastern foothill. As the proposed water tank is in the early planning stage at this time, proposed designs and loads were not available at publication of this report. Generally, the tank location depicted on Figure 3 should be relocated to the west along the ridgeline to minimize design and corrective grading impacts. Grading associated with the tank pad is anticipated to involve cuts as deep as 50 to 70 feet deep to provide a level pad elevation at the proposed elevation 452 (msl). Design should also anticipate construction of the tank entirely on bedrock cut, avoiding a cut-fill transition condition.

Subsurface exploration of this general area was conducted including drilling one boring to a depth of 21½ feet in which 2½ feet of residual soil was encountered overlying weak sandstone with shale interbeds to the depth of exploration. Test Pits 2-TP3 and 2-TP4 encountered 2 to 4 feet of stiff silty clay overlying extremely weak to weak interbedded sandstone, shale and claystone.

We recommend a supplemental subsurface exploration be performed and report prepared for the tank site once the pad location and footprint have been determined, to provide design-level recommendations and assess slope stability and bedrock rippability. Remedial and/or structural measures will be shown on the final 40-scale plans and after detailed slope stability analyses have been performed. We will work with you and your design team as the project moves forward to establish a tank pad location and review plans for the water tank pad grading and foundation design.

5.17 SITE RETAINING WALLS

5.17.1 Active Earth Pressures

Unrestrained drained retaining walls up to 10 feet in height and constructed on level ground may be designed for active lateral equivalent fluid pressures determined as follows:

TABLE 5.17-1

Backfill Slope Condition (horizontal:vertical)	Active Pressure (pounds per cubic foot)
Level	50
3.1	60
2.1	70

In addition to static lateral earth pressures, retaining walls should be design to resist seismic soil pressures. A seismic soil pressure acting on the retaining portion of walls can be taken as:

$$\Delta p = 10*H$$

This additional seismic soil pressure (Δp) due to seismic shaking should be applied as a uniform pressure (in units of pounds per square foot) over the height (H in feet) of the wall. The value of Δp should be added to the active soil pressure in combination to obtain the total pressure on the wall.

If houses or streets are located within 10 feet from the top of nearby retaining walls, surcharge loads associated with buildings and vehicles may need to be incorporated into the design. The Geotechnical Engineer could be contacted to assess and provide surcharge loads. Additionally, to reduce special design and increased construction costs, walls should not be placed on downsloping terrain, rather, we recommend they be placed at the base/toe of slope. If a downsloping condition exists, the above earth pressures should extend down to those depths necessary to achieve 10 horizontal feet to the nearest free face. The earth pressures should act over the entire wall if supported on a footing, or over the tributary width between piers if supported on drilled piers.

5.17.2 CMU/CIP Wall Foundations

The site retaining walls can be supported on continuous spread footings bearing in competent native soil or compacted fill or pier foundations. Appropriate safety factors against overturning and sliding should be incorporated into the design calculations. The Geotechnical Engineer should be consulted on design values where surcharge loads, such as from automobiles, are expected or where a downhill slope exists below a proposed wall.

5.17.2.1 Continuous Footings

The structural engineer should design the footing layout and steel reinforcement using the criteria presented below:

Minimum Depth with Level Foreground (1) .... 18 inches
Allowable Bearing Capacity (dead-plus-live loads) (2)......................... 2,500 psf
Lateral Passive Resistance (3)... 250 pcf
Base Friction Coefficient 0.30

(1) Deepen as necessary to achieve at least 10 horizontal feet to nearest slope face.
(2) May be increased by ⅓ for total loads including wind and seismic.
(3) Ignore upper 12 inches unless confined by pavement or slab.

5.17.2.2 Drilled Piers

Site retaining walls can be supported on a pier-and-grade-beam foundation system based on the following design and construction criteria:

Pier diameter:	Minimum 12 inches.
Pier depth:	Minimum 6 feet deep.
Maximum allowable skin friction:	500 pounds per square foot (psf). This value may be increased by one-third when considering seismic or wind loads. For pier load capacity computations, exclude the upper 3 feet.
Minimum pier spacing:	3 pier diameters, center-to-center.

An equivalent fluid weight of 250 pounds per cubic foot acting on 1½ times the pier diameter may be used to evaluate passive resistance. The passive pressure may be increased by one-third for transient loads such as wind or seismic. The passive earth pressure should start at a depth of 12 inches or where there is 10 feet horizontal distance to daylight in sloping areas.

Expansive soils may exert upward pressure on the base of pier caps or precast panels. As a result, a minimum 1-inch void form of degradable material should utilized under pier caps or precast panels.

The pier reinforcement should be designed by the Structural Engineer, but as a minimum, at least two No. 4 rebars should extend the full length of each pier. Where applicable, the pier reinforcement should be tied to the grade beam as recommended by the Structural Engineer.

5.17.3 Mechanically Stabilized Earth (MSE) Wall

Based on the soil information and site conditions, the following soil criteria may be utilized in MSE block wall design for drained, unrestrained walls up to 10 feet high.

TABLE 5.17.3-1

Material Type	Cohesion (c') (pcf)	Friction Angle (ϕ') (degrees)	Unit Weight (γ) (pcf)
Reinforced Fill	0	28	120
Retained Soil	0	28	120
Foundation Fill	0	28	120

The minimum safety factors listed below should also be incorporated into the design calculations:

External Stability:

	Safety Factor
Sliding	1.5
Bearing Capacity	2.0
Overturning	2.0

Internal Stability:

	Safety Factor
Pull-out Resistance	1.5

Standard (21.5-inch) MSE block with fiberglass pins is recommended. The minimum wall embedment should be 12 inches below lowest adjacent pad grade to bottom of lowest block for a level foreground condition. For a downsloping foreground condition, a horizontal distance of at least 10 feet should be provided between the base of the lowest block to the nearest slope face. For example, a minimum embedment depth of up to 5 feet may result in order to satisfy downsloping foreground criterion considering a 2:1 downslope.

5.17.4 Wall Backdrain and Backfill

All retaining walls should be provided with drainage facilities to prevent the build-up of hydrostatic pressures behind the walls. Wall drainage should consist of a 4-inch-diameter perforated pipe encapsulated in free-draining crushed rock surrounded by synthetic filter fabric or Class 2 permeable material. The width of the drain blanket should be at least 12 inches and the drain blanket should extend to about 1 foot below the pad grades. As an alternative, prefabricated synthetic wall drain panels could be considered if preapproved by the Geotechnical Engineer. The upper one foot of wall backfill should consist of compacted site soil. Drainage should be collected by pipes and directed to an outlet approved by the Civil Engineer.

All backfill should be placed in accordance with the recommendations provided above for engineered fill. Light equipment should be used during backfill compaction within 5 feet of the wall face to reduce the potential for overstressing of the walls. If heavy compaction equipment is used, the walls should be temporarily braced to avoid excessive wall movement. The foundation plans and structural calculations for the walls should be submitted to ENGEO for review prior to construction.

5.18 EXCAVATIONS AND TEMPORARY SHORING SYSTEMS

Excavations, including utility trenches, should be properly excavated and shored, as applicable, to create a stable and safe condition. It is the responsibility of the Contractor to provide such stable, safe trench and construction slope conditions and to follow OSHA safety requirements. Since excavation procedures may be very dangerous, it is also the responsibility of the Contractor to provide a trained "competent person" as defined by OSHA to supervise all excavation operations, ensure that all personnel are working in safe conditions, and have thorough knowledge of OSHA excavation safety requirements.

While not anticipated at this time, recommendations for shoring design can be provided upon request. The contractor should be responsible for the design and construction of all shoring and underpinning systems and the safety of all workers within excavations.

5.19 PRELIMINARY PAVEMENT DESIGN

We collected a bulk sample of clay from the upper 10 feet of Borehole 1-BH15 (located in the central portion of the site) to provide data for preliminary pavement design. The results of the test are included in Appendix B and indicate a Resistance Value (R-value) of 5. For planning purposes, the following preliminary pavement sections have been determined for Traffic Indices of 5 and 6, an assumed R-value of 5, and in accordance with the design methods contained in Chapter 610 of Highway Design Manual by CALTRANS (2012).

TABLE 5.19-1
Preliminary Pavement Sections

Traffic Index	AC (inches)	AB (inches)
5.0	3.0	10.0
6.0	3.5	13.0

Notes: AC – Asphalt Concrete
AB – Caltrans Class 2 aggregate base (R-value of 78 or greater)

The Traffic Index should be determined by the Civil Engineer or appropriate public agency. These sections are for estimating purposes only. Actual sections to be used should be based on R-value tests performed on samples of actual subgrade materials recovered at the time of grading. Pavement construction and all materials should comply with the requirements of the Standard Specifications of the State of California Division of Highways, City of Hollister requirements and the following minimum requirements.

- Subgrade soils should be compacted to at least 90 percent relative compaction at a moisture content of at least 3 percentage points above optimum. The subgrade should be in a stable, non-pumping condition at the time aggregate baserock materials are placed and compacted. Proof-rolling with a heavy wheel-loaded piece of construction equipment should be implemented. Yielding materials should be appropriately mitigated, with suitable mitigation measures developed in coordination with the client, contractor and Geotechnical Engineer.

- Adequate provisions must be made such that the subgrade soils and aggregate baserock materials are not allowed to become saturated.

- Aggregate baserock materials should meet current Caltrans specifications for Class 2 aggregate baserock and should be compacted to at least 95 percent of maximum dry density at a moisture content of at least optimum.

- Asphaltic concrete paving materials should meet current Caltrans specifications for asphalt concrete.

- All concrete curbs separating pavement and irrigated landscaped areas should extend into the subgrade and below the bottom of adjacent aggregate baserock materials. An undercurb drain could also be considered to help collect and transport subsurface seepage.

5.20 DRAINAGE

The building pads should be positively graded at all times to provide for rapid removal of surface water runoff away from the foundation systems and to prevent ponding of water under foundations or seepage toward the foundation systems at any time during or after construction. Ponded water may cause undesirable soil swell and loss of strength. As a minimum requirement, finished grades should have slopes of at least 3 percent within 5 feet from the exterior walls and at right angles to allow surface water to drain positively away from the structure. For paved areas, the slope gradient can be reduced to 2 percent.

All surface water should be collected and discharged into outlets approved by the Civil Engineer. Landscape mounds must not interfere with this requirement.

All roof stormwater should be collected and directed to downspouts. Stormwater from roof downspouts should not be allowed to discharge directly onto the ground surface in close proximity to the foundation system, such as through the use of spashblocks. Rather, stormwater from roof downspouts should be directed to a solid pipe that discharges into the street or to an outlet approved by the Civil Engineer. If this is not acceptable, we recommend downspouts discharge at least 5 feet away from foundations and the minimum gradient within 5 feet from the foundation should be increased from 3 to 5 percent. Alternatively, engineered stormwater systems can be developed under the guidance of ENGEO.

5.21 STORMWATER TREATMENT

Due to the anticipated high clay content and density of the underlying soils, the near-surface site soils are not expected to have adequate permeability values to handle stormwater infiltration in grassy swales or permeable pavers. Therefore, best management practices should assume that little stormwater infiltration will occur at the site.

5.21.1 Stormwater Detention Basin and Water Quality Bioretention Area

If planned, we recommend detention basins have 3:1 side slopes around the perimeter. In addition, to avoid saturating the soils below, a minimum 30- or 40-mil liner may be recommended to line the base with a subdrainage system installed below the liner.

5.21.2 Bioretention Cells and Bioswales

We anticipate in-tract bioretention cell or bioswale areas may be constructed at the site for stormwater treatment. To minimize undermining adjacent foundations or pavements, earthen-sided bioretention systems should be situated entirely outside a 1:1 (horizontal:vertical) line of projection extending downwards from adjacent curbs, hardscape/pavements, and foundations. Alternatively, the bioretention systems should have 2:1 or flatter sloping excavations above and below the exposed surface.

A structural solution comprising bioretention retaining side walls could also be considered where the bioretention areas are located within a 1:1 line of projection of planned or existing improvements. The bioretention retaining walls should be designed for the full height of the bioretention area excavation considering at-rest earth pressures (drained or undrained, whichever condition is required). Surcharges from vehicular traffic and buildings should also be incorporated if within a 1:1 line of projection extending upward from the bottom of the outer edge of the excavation.

We recommend that planned bioretention areas within 10 feet from an onsite or offsite building, street, or site retaining wall incorporate a minimum 10-mil vapor retarder lining for the bioswale excavations. The vapor retarder should line the entire excavation. If the bioretention area is constructed with concrete side walls and bottom, the vapor retarder lining may be omitted unless there are instances where the building walls and bioretention retaining walls are combined.

We also recommend the permeable material and sandy loam material receive moderate compaction effort during construction to achieve at least 85 percent relative compaction, but not more than 90 percent.

5.22 REQUIREMENTS FOR LANDSCAPING IRRIGATION

The geotechnical foundation design parameters contained in this report have considered the swelling potential of some of the site soils; however, it is important to recognize that swell in excess of that anticipated is possible under adverse drainage or irrigation conditions. Therefore, planted areas should be avoided immediately adjacent to the buildings. When planting adjacent to the building is desired, we recommend using plants that require very little moisture with drip irrigation systems. Similarly, sprinkler systems should not be installed where they may cause ponding or saturation of foundation soils within 5 feet of the walls or under the structure as ponding or saturation of foundation soils may cause loss of soil strength, and movements of the foundation and slabs.

Irrigation of landscaped areas should be strictly limited to that necessary to sustain vegetation. Excessive irrigation could result in saturating and weakening of foundation soils.

5.23 UTILITIES

It is recommended that utility trench backfilling be done under the observation of a Geotechnical Engineer. Ideally, pipe zone backfill (i.e. material beneath and immediately surrounding the pipe) should consist of native material less than ¾-inch in maximum dimension compacted in accordance with recommendations provided above for engineered fill. Trench zone backfill (i.e. material placed between the pipe zone backfill and the ground surface) should also consist of native soil compacted in accordance with recommendations for engineered fill.

If required by local agencies, where import material is used for pipe zone backfill, we recommend it consist of quarry fines, fine- to medium-grained sand, or a well-graded mixture of sand and gravel and that this material not be used within 2 feet of finish subgrades. This material should be compacted to at least 90 percent relative compaction at a moisture content of not less than optimum.

In general, uniformly graded gravel should not be used for pipe or trench zone backfill due to the potential for migration of soil into the relatively large void spaces present in this type of material and for movement of water along trenches backfilled with this type of material. If uniformly graded gravel is used, we recommend that it be encapsulated in 6-ounce filter fabric. Providing outlet locations into manholes or catch basins for water collected in granular trench backfill should also be considered.

The presence of boulders and cobbles should be considered in buried utility construction at the site. Trenches walls may slough or become irregular as boulders and cobbles are extracted from trenches. Agency or City requirements may limit the use of boulders or cobbles in backfill.

All utility trenches entering building or paved areas should be provided with an impervious seal where the trenches pass under or through the building perimeter or curb lines. The impervious plug should extend at least 3 feet to either side of the crossing and should be placed below, around, and above the utility pipe such that it is entirely in contact with the trench walls and pipe. This is to prevent surface water percolation into the import sand or gravel pipe zone backfill under foundations and pavements where such water would remain trapped in a perched condition.

Care should be exercised where utility trenches are located beside foundation areas. Utility trenches constructed parallel to foundations should be located entirely above a plane extending down from the lower edge of the footing at an angle of 45 degrees. Utility companies and Landscape Architects should be made aware of this information.

Utility trenches in areas to be paved should be constructed in accordance with the City of Hollister requirements or approved alternatives. Compaction of backfill by jetting should not be allowed at this site. If there appears to be a conflict between the City or other Agency requirements and the recommendations contained in this report, this should be brought to the Owner's attention for resolution prior to submitting bids.

6.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report is issued with the understanding that it is the responsibility of the owner to transmit the information and recommendations of this report to developers, owners, buyers, architects, engineers, and designers for the project so that the necessary steps can be taken by the contractors and subcontractors to carry out such recommendations in the field. The conclusions and recommendations contained in this preliminary report are solely professional opinions.

The professional staff of ENGEO strives to perform its services in a proper and professional manner with reasonable care and competence but is not infallible. There are risks of earth movement and property damages inherent in land development. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our services.

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LIST OF FIGURES

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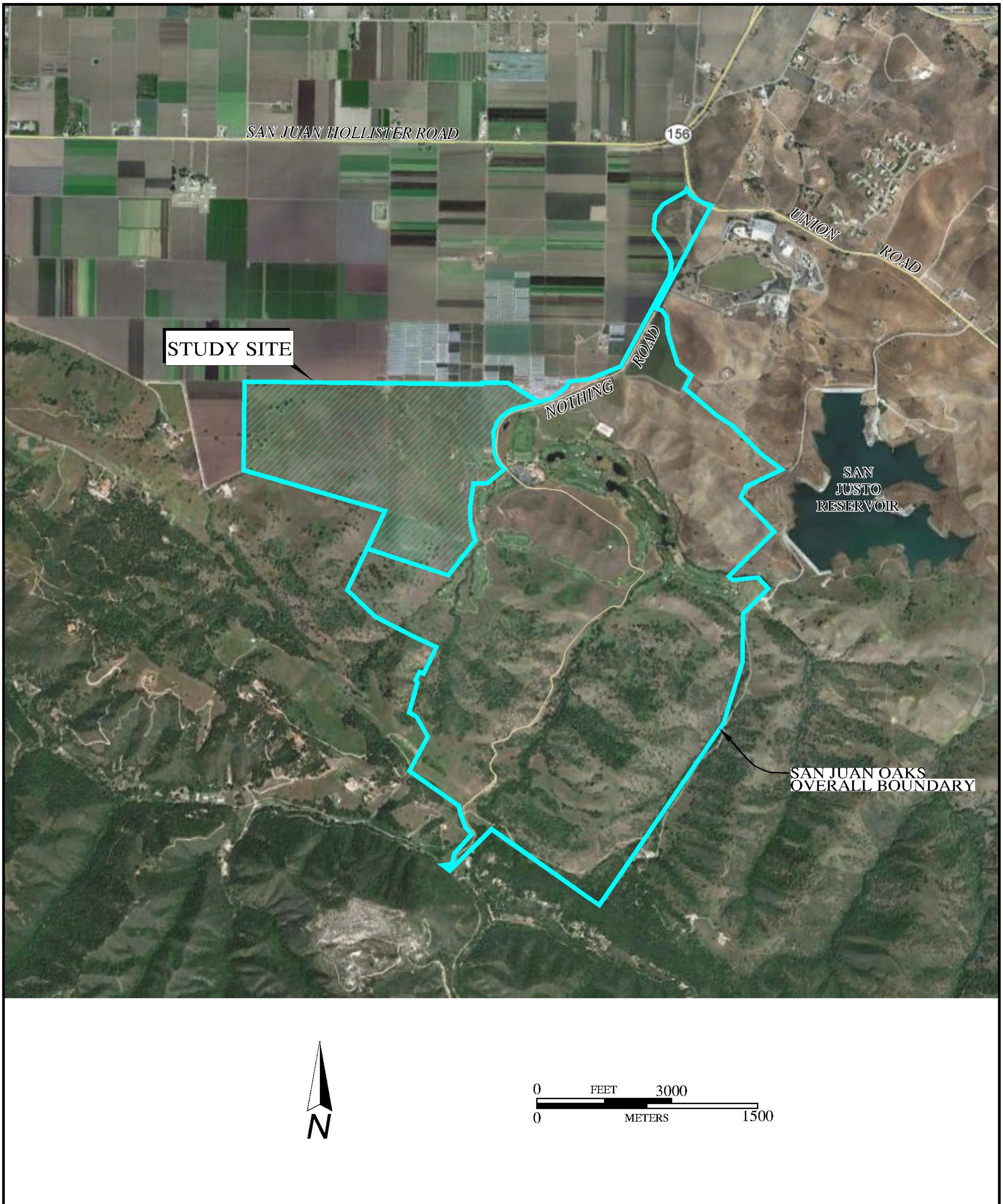

BASE MAP SOURCE: GOOGLE EARTH PRO, 2012

ENGEO Expect Excellence	VICINITY MAP SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT HOLLISTER, CALIFORNIA	PROJECT NO.: 9901.000.000 SCALE: AS SHOWN DRAWN BY: SRP CHECKED BY: JAM	FIGURE NO. 1

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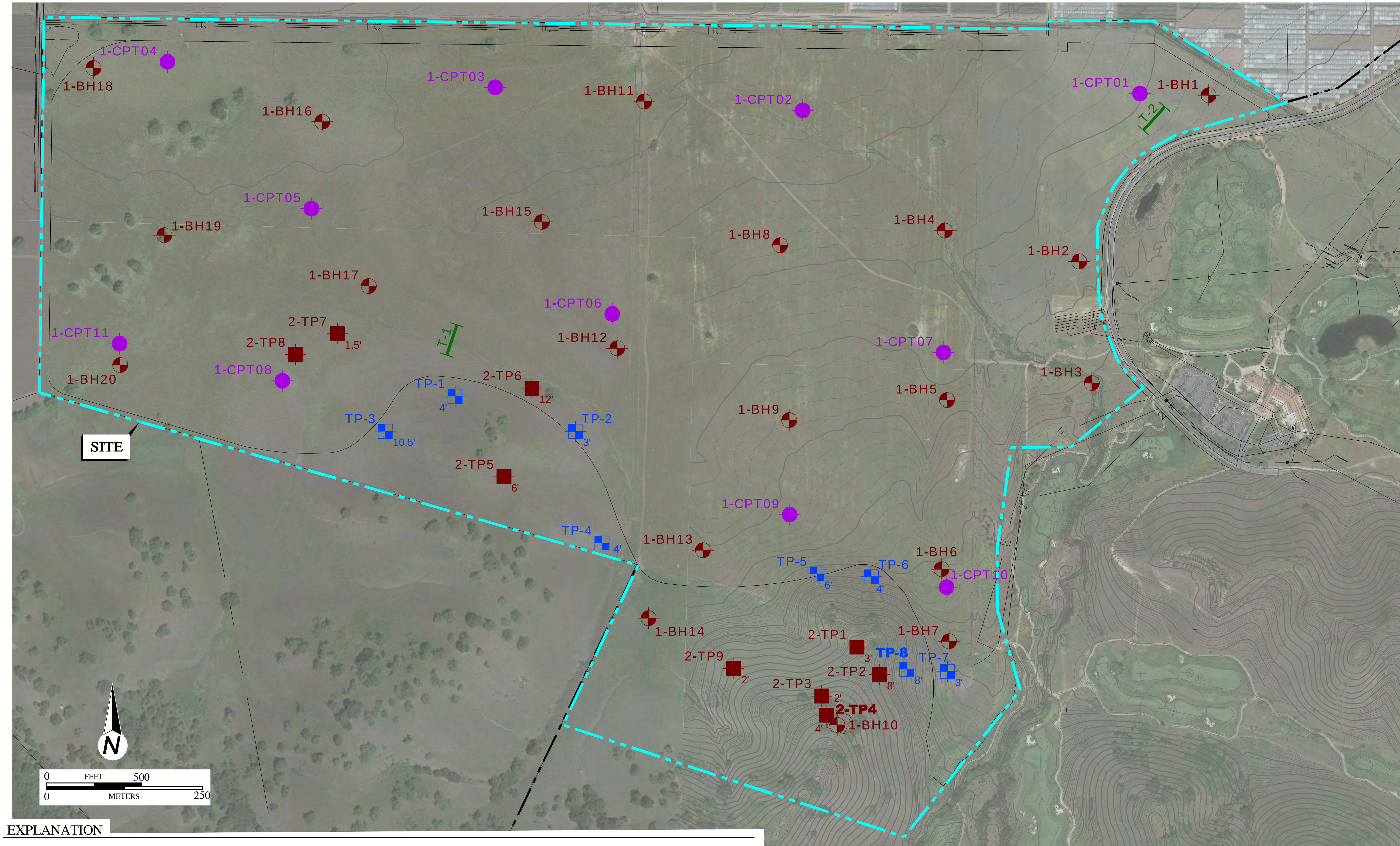

EXPLANATION

1-BH20 — APPROXIMATE LOCATION OF BORING

TP-8 (8') — APPROXIMATE LOCATION OF TEST PIT SHOWING DEPTH TO BEDROCK

2-TP9 (2') — APPROXIMATE LOCATION OF TEST PIT SHOWING DEPTH TO BEDROCK (JUNE, 2013)

1-CPT11 — APPROXIMATE LOCATION OF CONE PENETRATION TEST

T-2 — APPROXIMATE LOCATION OF TRENCH

BASE MAP SOURCE: GOOGLE EARTH PRO 2012, WHITSON ENGINEERS

ENGEO Expect Excellence

SITE EXPLORATION MAP

SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT

HOLLISTER, CALIFORNIA

PROJECT NO.: 9901.000.000	FIGURE NO
SCALE: AS SHOWN	2
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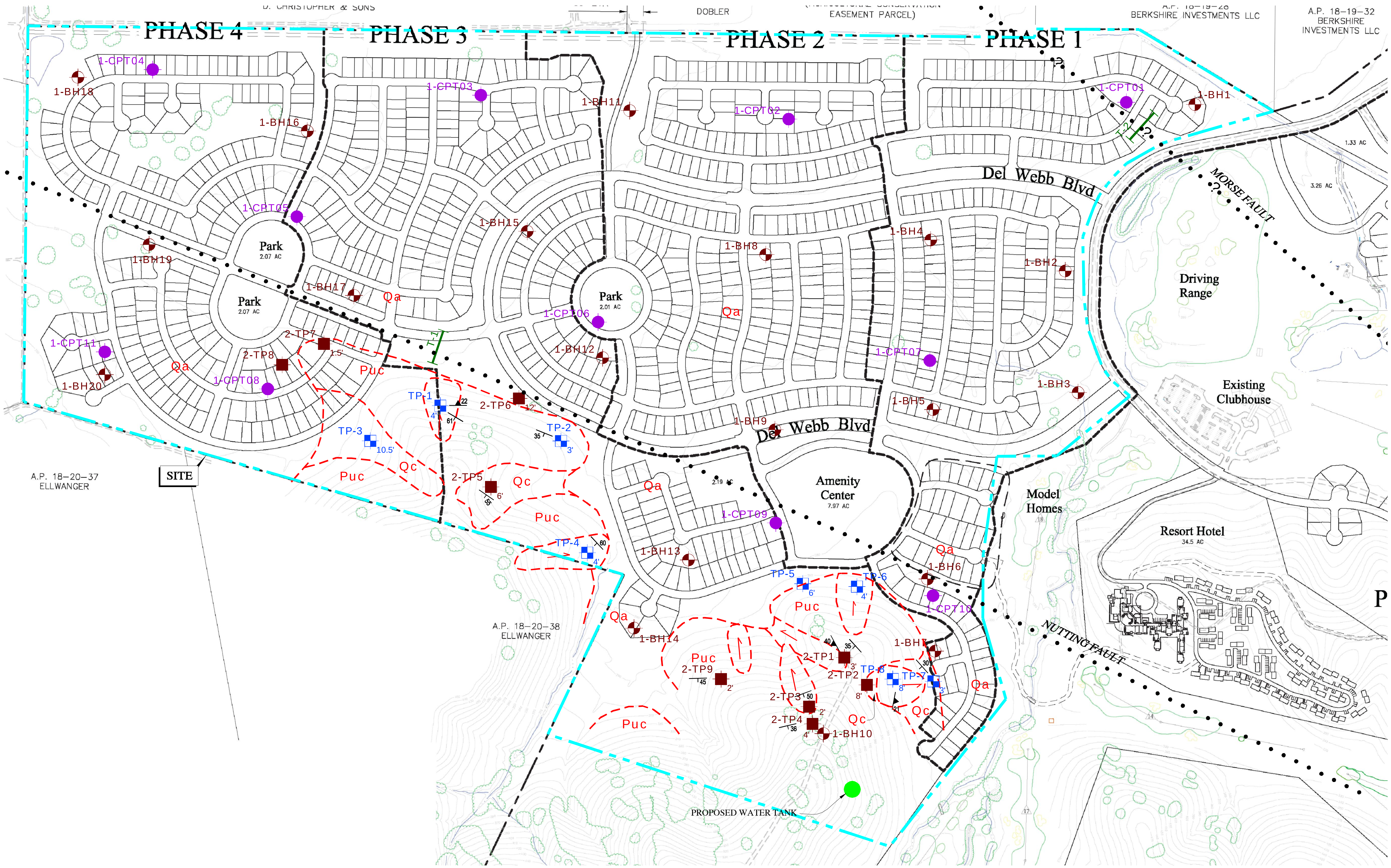

EXPLANATION

1-BH20	APPROXIMATE LOCATION OF BORING (JUNE, 2013)
TP-8 8'	APPROXIMATE LOCATION OF TEST PIT SHOWING DEPTH TO BEDROCK
2-TP9 2'	APPROXIMATE LOCATION OF TEST PIT SHOWING DEPTH TO BEDROCK (JUNE, 2013)
1-CPT11	APPROXIMATE LOCATION OF CONE PENETRATION TEST
T-2	APPROXIMATE LOCATION OF TRENCH
	APPROXIMATE GEOLOGIC CONTACT
	LANDSLIDE
Qa	ALLUVIUM
Qc	COLLUVIUM
Puc	UNNAMED PLIOCENE CONTINENTAL MUDSTONE
30	STRIKE AND DIP OF BEDDING
22	TREND AND PLUNGE OF SHEAR
?	FAULT, MAJMUNDAR 1994 DOTTED WHERE CONCEALED, QUERIED WHERE EXISTENCE DOUBTFUL

BASE MAP SOURCE: UNKNOWN

ENGEO
Expect Excellence

SITE GEOLOGIC MAP
SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT
HOLLISTER, CALIFORNIA

PROJECT NO.: 9901.000.000		FIGURE NO. 3
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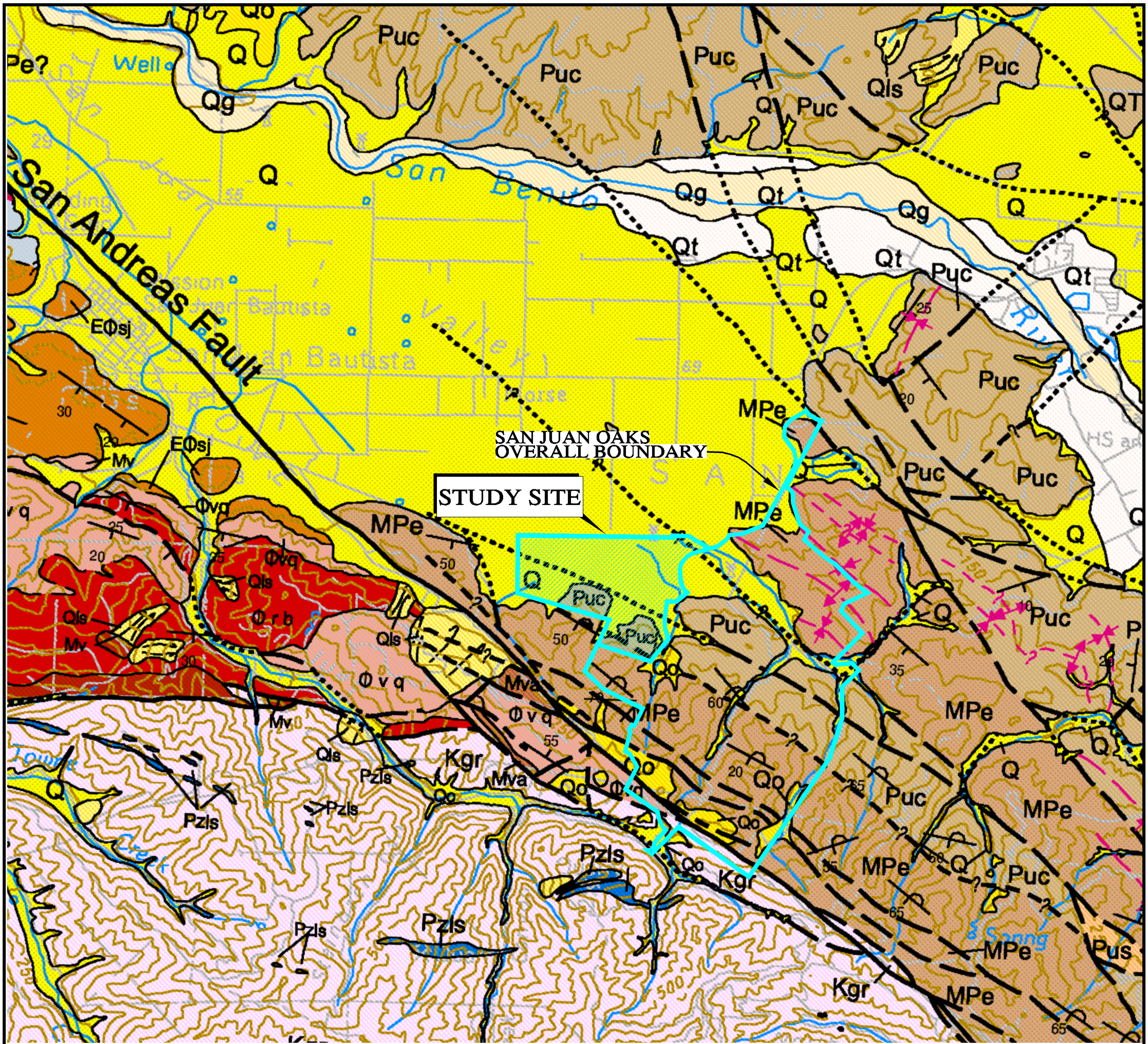

N

0 MILES 1
0 KILOMETERS 2

EXPLANATION

Q	ALLUVIUM
Puc	UNNAMED PLIOCENE CONTINENTAL MUDSTONE
Mpe	ETCHEGOIN FORMATION

BASE MAP SOURCE: WAGNER, 2002

ENGEO
Expect Excellence

REGIONAL GEOLOGIC MAP
SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT
HOLLISTER, CALIFORNIA

PROJECT NO.: 9901.000.000		FIGURE NO. 4
SCALE: AS SHOWN		
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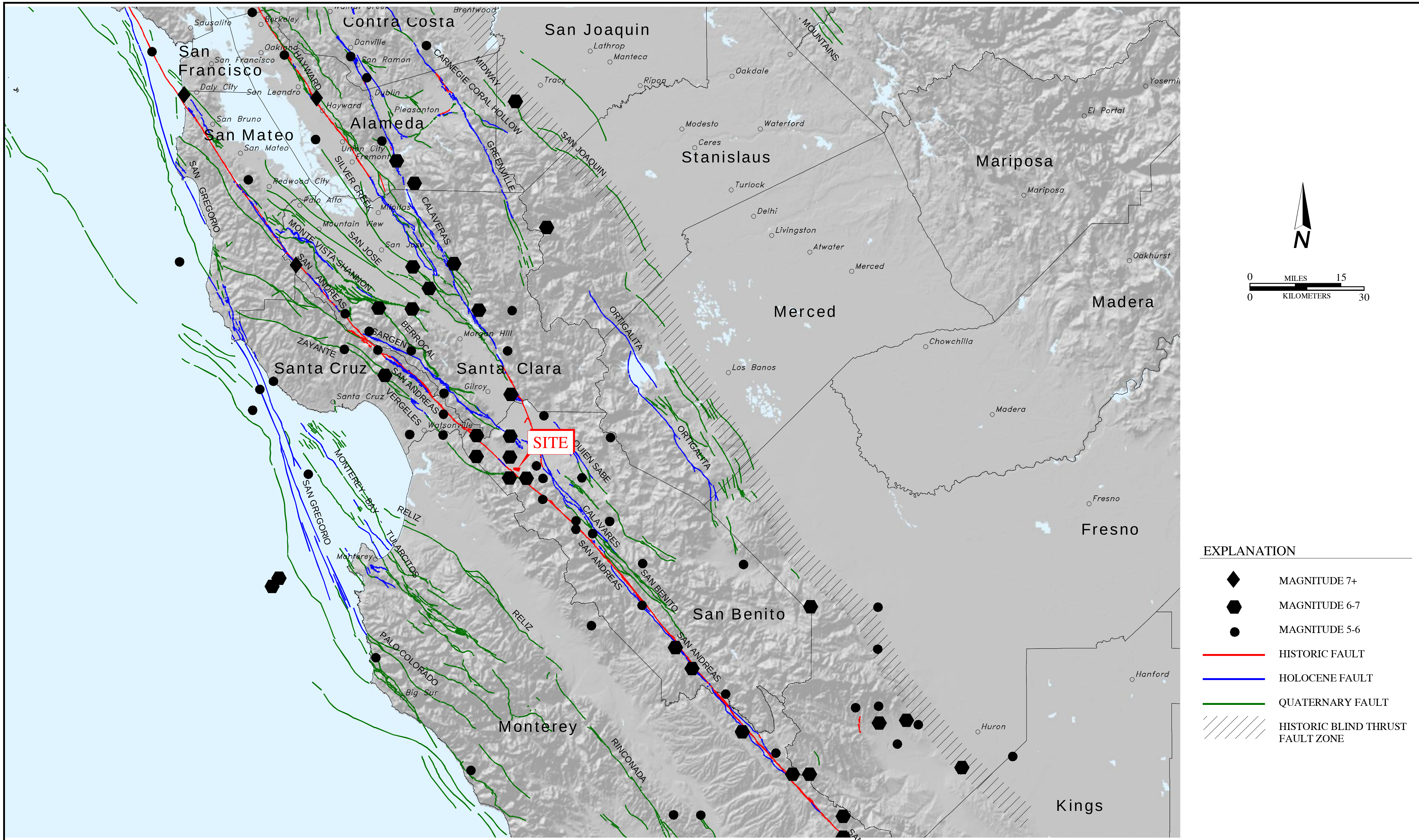
G:\Drafting\DRAFTING2_Dwg\9901\000\GEX\9901000000-GEX-4-RegGeoMap-0713.dwg Plot Date: 7-18-13 SPATTERS

ORIGINAL FIGURE PRINTED IN COLOR



BASE MAP SOURCE:
U.S.G.S. 1-ARC SECOND S.R.T.M. DATABASE
U.S.G.S. QUATERNARY FAULT DATABASE, MARCH, 2006
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800-2000)

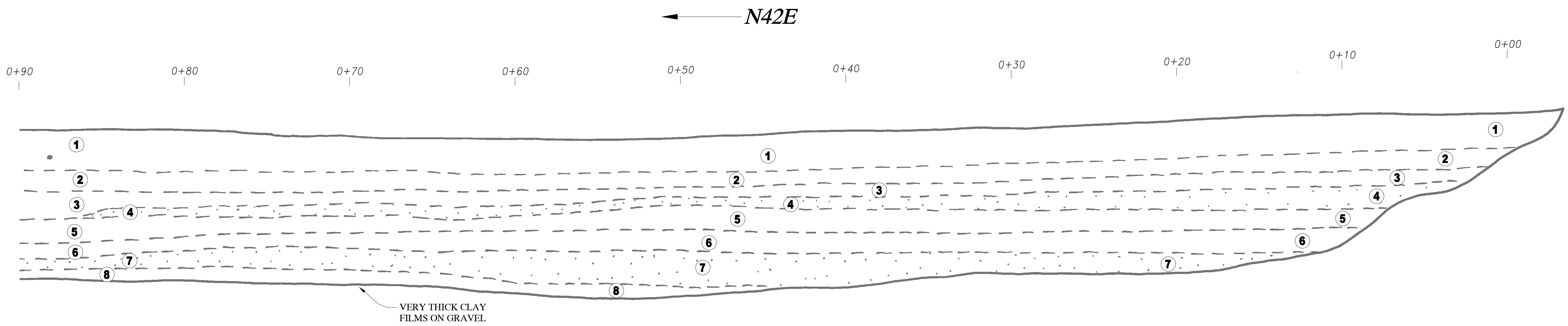
ENGEO Expect Excellence

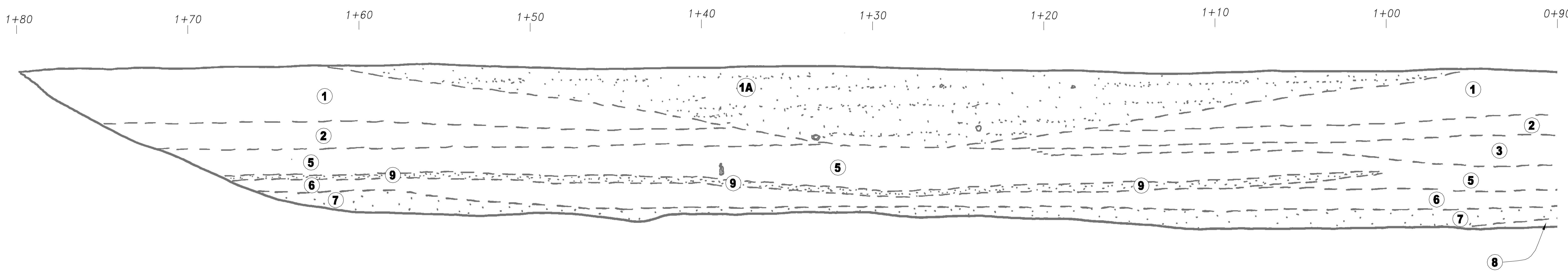
REGIONAL FAULTING AND SEISMICITY
SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT
HOLLISTER, CALIFORNIA

PROJECT NO.: 9901.000.000	FIGURE NO. 5
SCALE: AS SHOWN	
DRAWN BY: DLB	CHECKED BY: JAM

G:\Drafting\DRAFTING2_Dwg\9901\000\GEX\9901000000-GEX-5-RegFltSeis-0713.dwg Plot Date: 7-12-13 spatters

ORIGINAL FIGURE PRINTED IN COLOR





(1A) Silty SAND with gravel (SM), yellowish brown (10YR 5/4), loose to medium dense, moist, near horizontal lenses of sand and gravel throughout, some areas of finely laminated silts and fining upwards sequences, rootlets near surface, channel deposits

(1) Sandy CLAY (CL), black (7.5YR 2.5/1), very stiff, moist, fine to medium grained sand, few fine gravels, rootlets throughout, coarse angular blocky structure, upper 6 inches is disked

(2) Sandy CLAY (CL), very dark gray (10YR 3/1), very stiff, moist, fine grained sand, few fine gravels, well developed medium angular blocky structure, some black (7.5YR 2.5/1) mottling at unit 1 and 2 contact

(3) Silty CLAY (CL), brown (10YR 4/3), very stiff, moist, with fine grained sand, few fine gravels, very well developed medium angular blocky structure, thin clay films on pedogenic surfaces and gravels, carbonate filaments, increasing sand content at station 00+40

(4) Sandy CLAY (CL), dark grayish brown (10YR 4/2), very stiff, moist, fine grained sand, well developed fine angular blocky structure, clay films on pedogenic surfaces, thin clay films on gravels

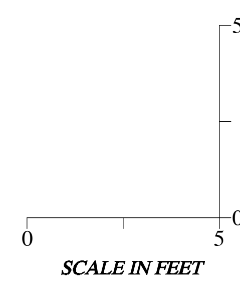
(5) Silty CLAY (CL), dark brown (10YR 3/3), very stiff, moist, with fine grained sand, well developed angular to prismatic blocky structure, thick clay films on gravels and pedogenic surfaces, very well developed clay films on gravel starting at station 1+10

(6) Silty CLAY (CL), dark brown (10YR 3/3), very stiff, moist, with fine grained sand, few fine gravels, well developed prismatic structure, thick clay films on gravels and pedogenic surfaces, pervasive carbonate filaments throughout, very well developed clay films on gravel starting at 1+10

(7) Clayey SAND (SC), dark yellowish brown (10YR 3/4), very dense, moist, fine to medium grained sand, fine angular blocky structure, thick clay films on gravels, few rock fragments and fine gravel

(8) Sandy CLAY (CL), dark brown (10YR 3/3), very stiff, moist, fine grained sand, few fine gravels, well developed fine angular blocky structure, thick clay films on pedogenic surfaces and gravels

(9) Silty SAND (SM), yellowish brown (10YR 5/4), very dense, moist, with fine to coarse gravel, fine angular blocky structure

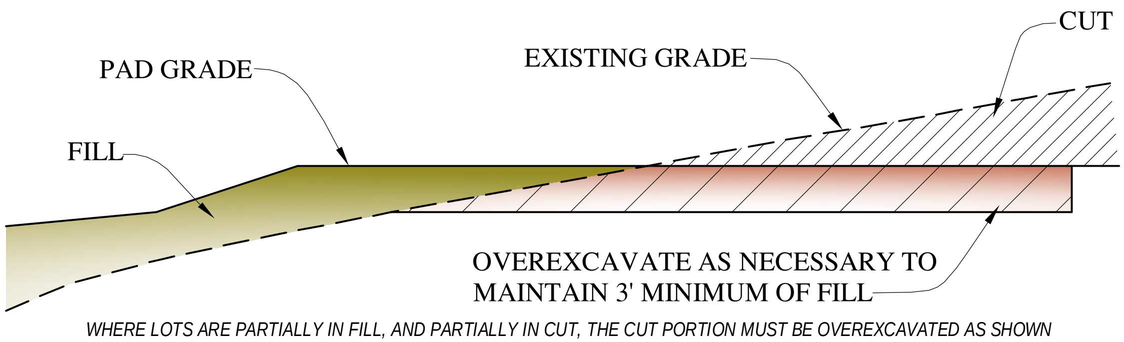


ENGEO
Expect Excellence

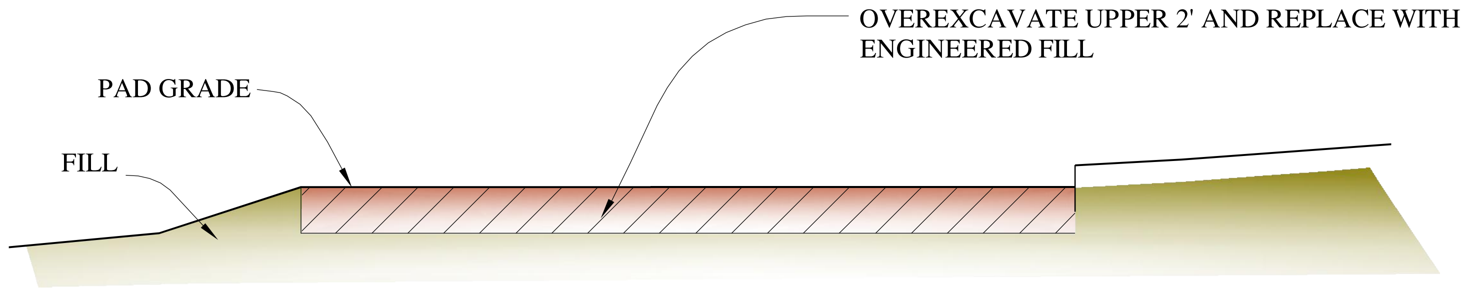
TRENCH LOG T-2
SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT
HOLLISTER, CALIFORNIA

PROJECT NO.: 9901.000.000	FIGURE NO. 6
SCALE: AS SHOWN	
DRAWN BY: DLB	CHECKED BY: JAM

G:\Drafting\DRAFTING2_Dwg\9901\000\GEX\9901000000-GEX-7-CutFillDetail-0713.dwg Plot Date:7-18-13 SPATTERS



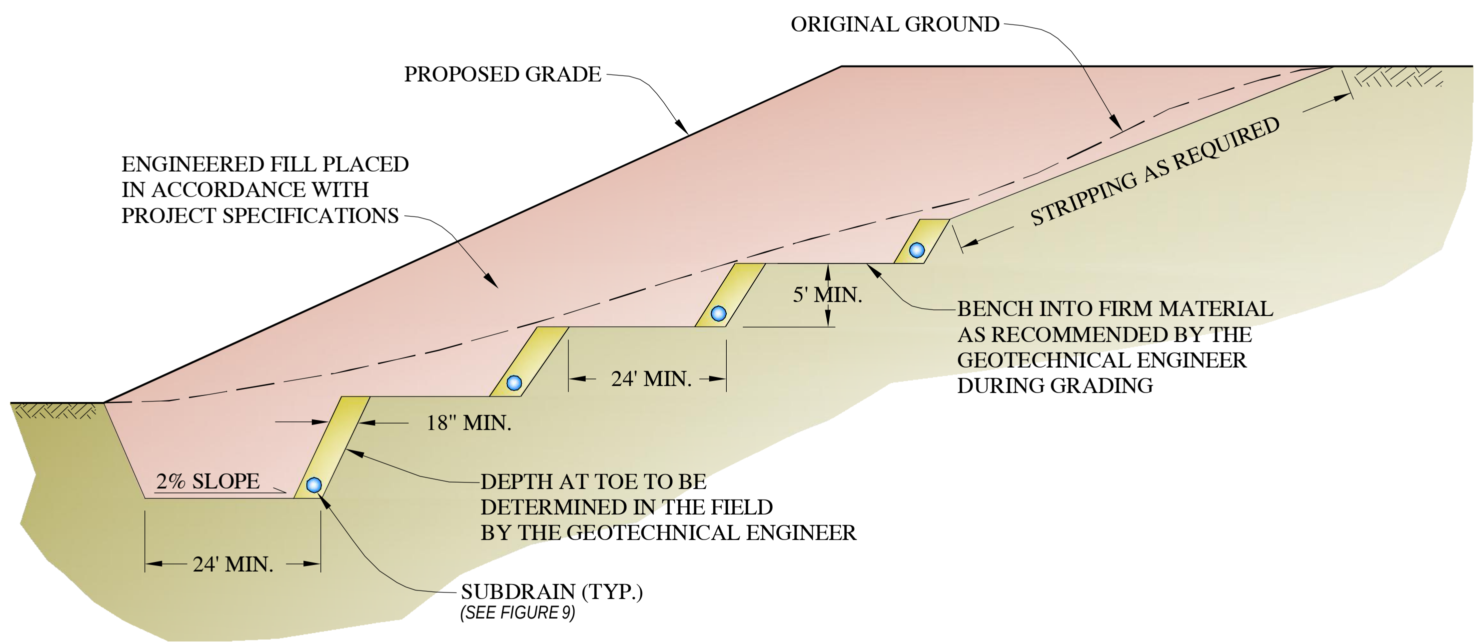
TYPICAL CUT- FILL TRANSISTION PAD DETAIL



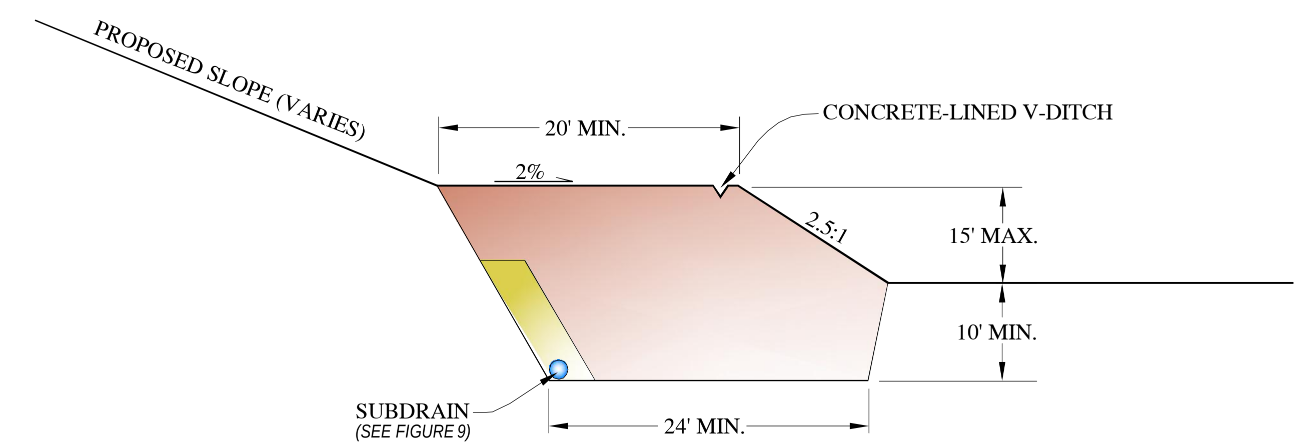
TYPICAL CUT PAD OVEREXCAVATION DETAIL

ENGEO Expect Excellence	SURFICIAL PAD TREATMENT DETAILS SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT HOLLISTER, CALIFORNIA	PROJECT NO.: 9901.000.000 SCALE: NO SCALE DRAWN BY: SRP / CHECKED BY: JAM	FIGURE NO. 7

ORIGINAL FIGURE PRINTED IN COLOR

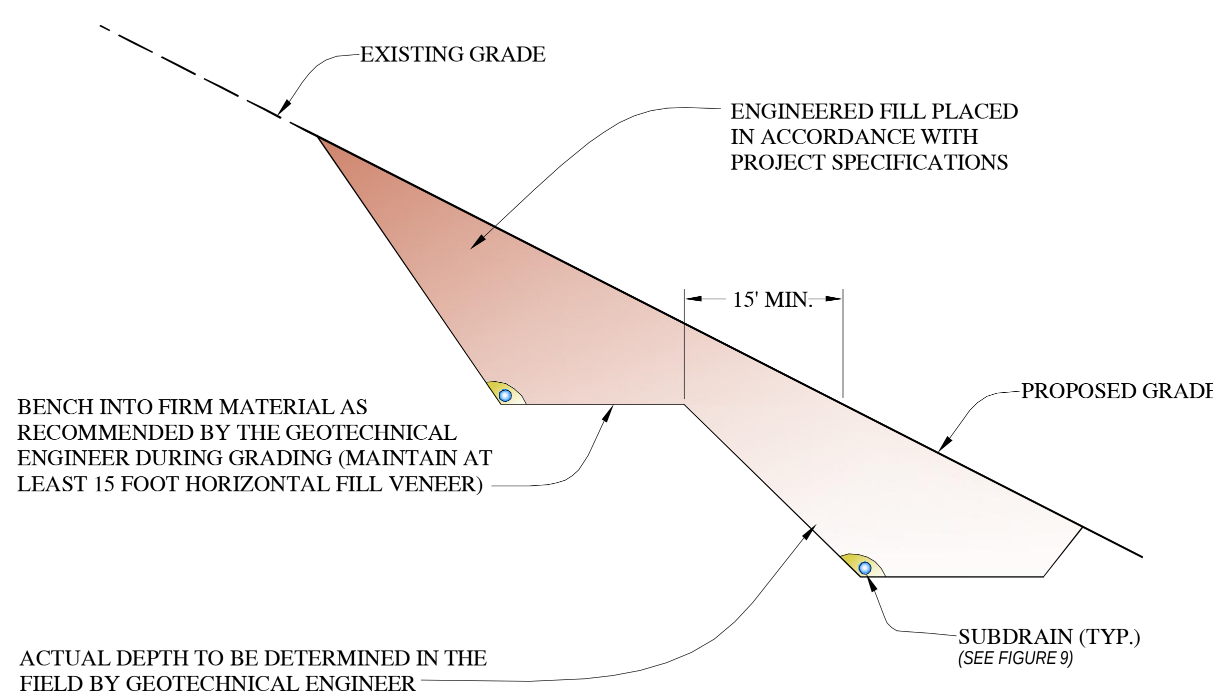


TYPICAL FILL SLOPE KEYWAY DETAIL



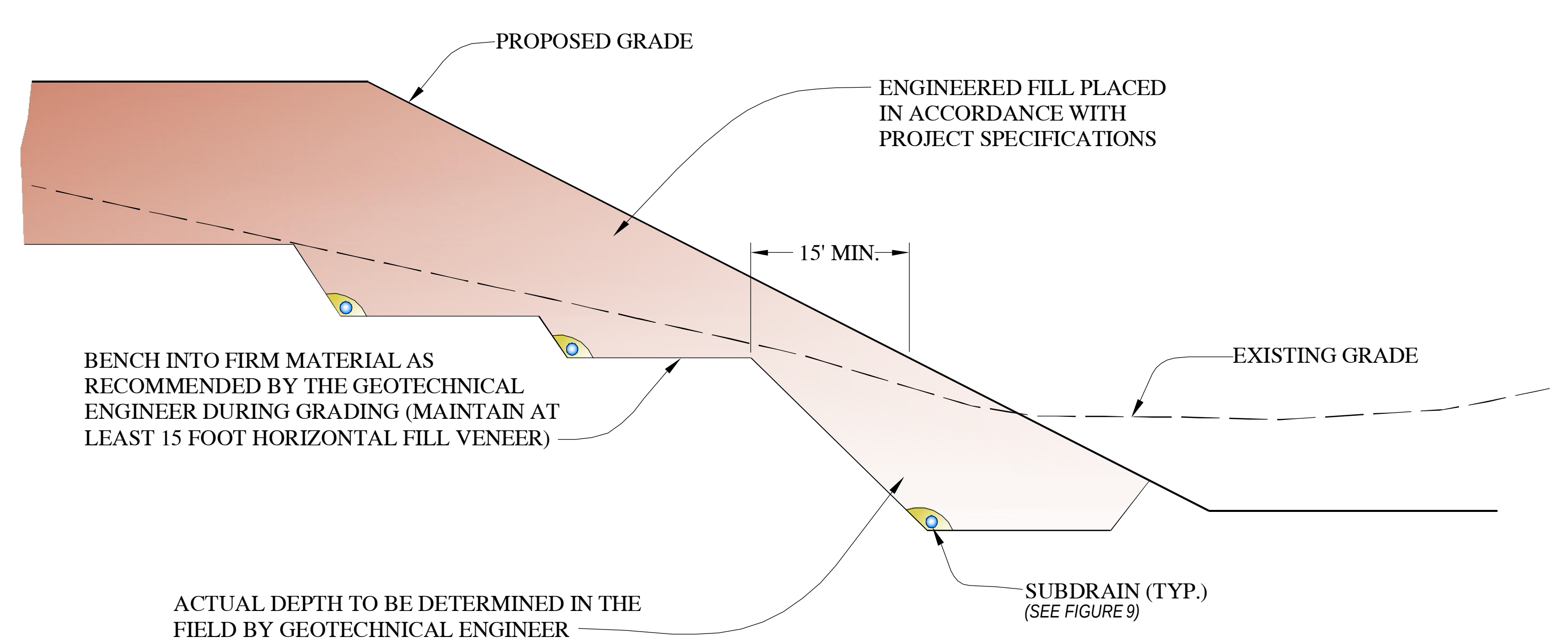
ACTUAL SIZE AND DEPTH OF KEYWAY TO BE DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER

TYPICAL DEBRIS BENCH DETAIL



ALL SLOPES WILL BE CAPPED WITH APPROXIMATELY 6 INCHES OF ORGANICALLY-RICH SOIL, PLACED ON A ROUGHENED, MOISTURE CONDITIONED SURFACE

CUT SLOPE REBUILD



ALL SLOPES WILL BE CAPPED WITH APPROXIMATELY 6 INCHES OF ORGANICALLY-RICH SOIL, PLACED ON A ROUGHENED, MOISTURE CONDITIONED SURFACE

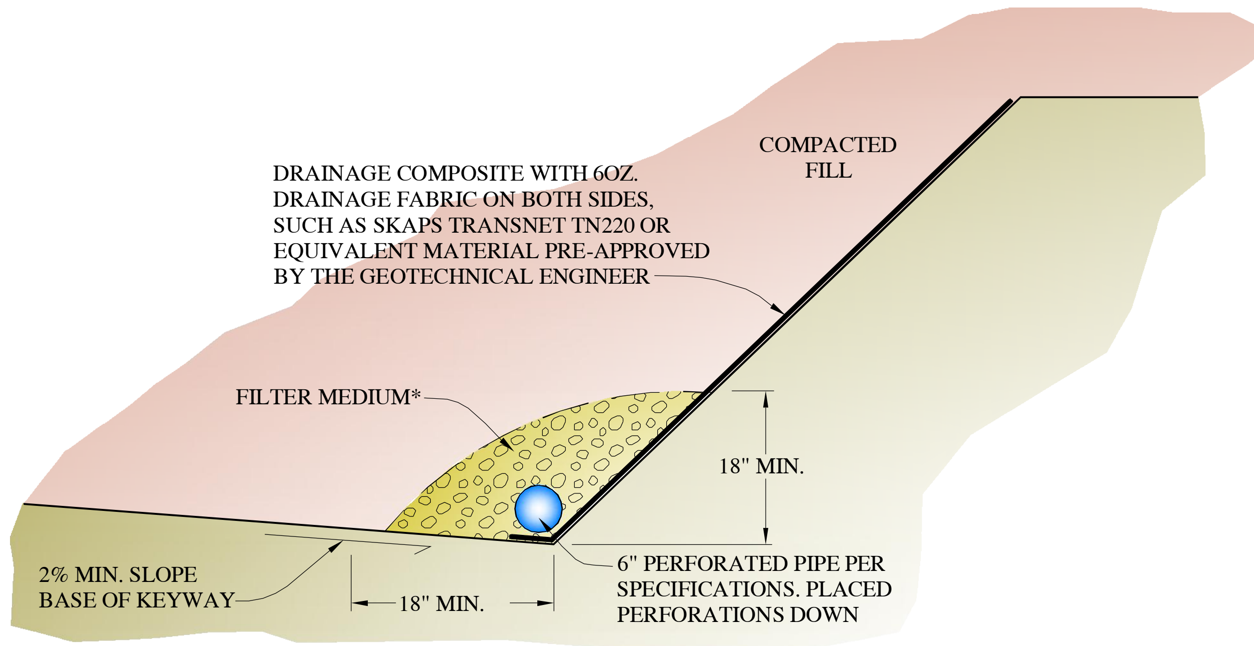
CUT-FILL TRANSITION SLOPE REBUILD

BASE MAP SOURCE: UNKNOWN

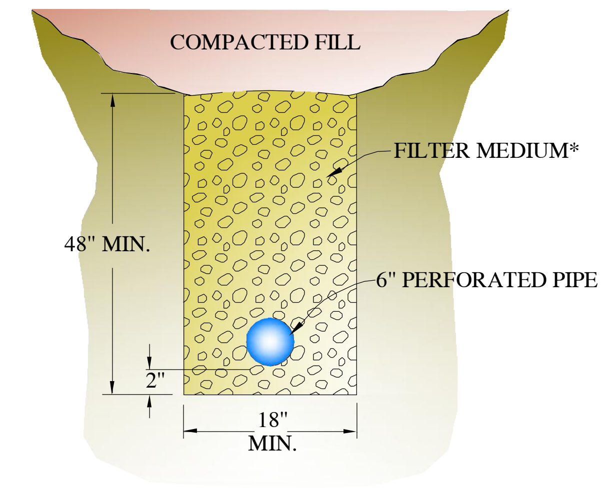
ENGEO Expect Excellence	TYPICAL SLOPE REMEDIATION DETAILS SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT HOLLISTER, CALIFORNIA	PROJECT NO.: 9901.000.000 SCALE: NO SCALE DRAWN BY: SRP CHECKED BY: JAM	FIGURE NO. 8

ORIGINAL FIGURE PRINTED IN COLOR

G:\Drafting\DRAFTING2_Dwg\9901\000\GEX\9901000000-GEX-8-KeywayDetail-0713.dwg Plot Date: 7-18-13 SPATTERS



KEYWAY SUBDRAIN - OPTION 1



SWALE SUBDRAIN

*FILTER MEDIUM

ALTERNATIVE A

CLASS 2 PERMEABLE MATERIAL

MATERIAL SHALL CONSIST OF CLEAN, COARSE SAND AND GRAVEL OR CRUSHED STONE, CONFORMING TO THE FOLLOWING GRADING REQUIREMENTS:

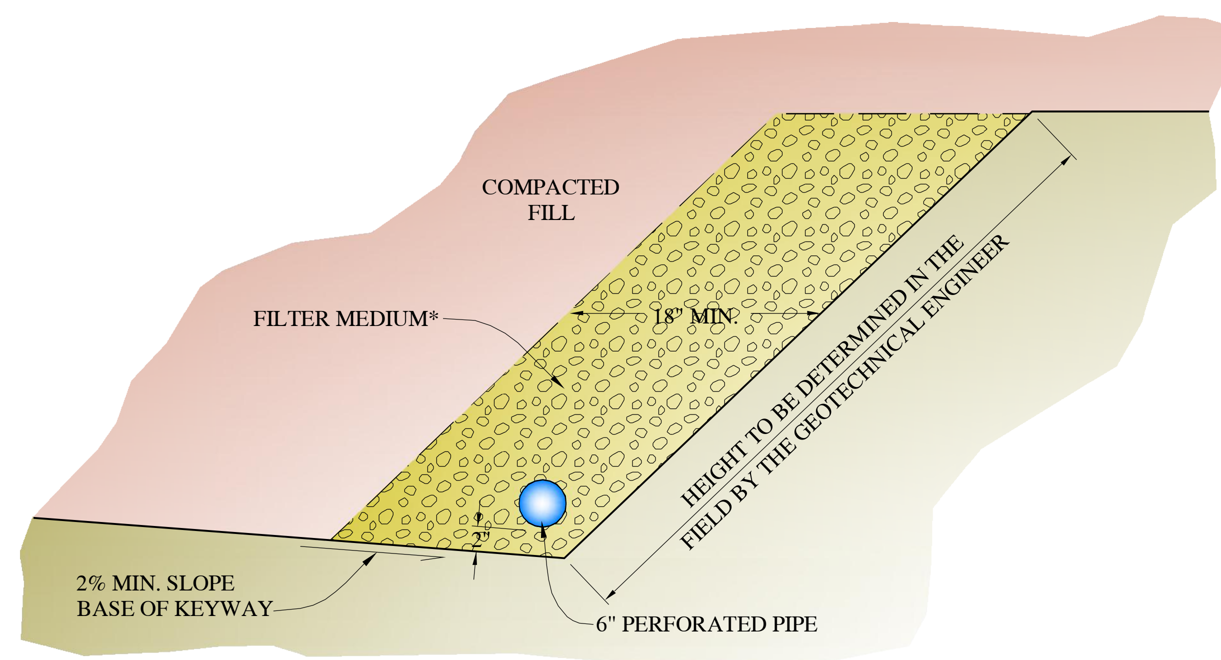
SIEVE SIZE	% PASSING SIEVE
1"	100
3/4"	90–100
3/8"	40–100
#4	25–40
#8	18–33
#30	5–15
#50	0–7
#200	0–3

ALTERNATIVE B

CLEAN CRUSHED ROCK OR GRAVEL WRAPPED IN FILTER FABRIC

ALL FILTER FABRIC SHALL MEET THE FOLLOWING MINIMUM AVERAGE ROLL VALUES UNLESS OTHERWISE SPECIFIED BY ENGEO:

GRAB STRENGTH (ASTM D-4632)	180 lbs
MASS PER UNIT AREA (ASTM D-4751)	6 oz/yd^2
APPARENT OPENING SIZE (ASTM D-4751)	70-100 U.S. STD. SIEVE
FLOW RATE (ASTM D-4491)	80 gal/min/ft
PUNCTURE STRENGTH (ASTM D-4833)	80 lbs



KEYWAY SUBDRAIN - OPTION 2

NOTES:

1. *ALL PIPE JOINTS SHALL BE GLUED*
2. *ALL PERFORATED PIPE PLACED PERFORATIONS DOWN*
3. *1% FALL (MINIMUM) ON ALL TRENCHES AND DRAIN LINES*

ENGEO Expect Excellence	TYPICAL SUBDRAIN DETAIL SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT HOLLISTER, CALIFORNIA	PROJECT NO.: 9901.000.000 SCALE: NO SCALE DRAWN BY: SRP CHECKED BY: JAM	FIGURE NO. 9

APPENDIX A

Boring Logs, Test Pit Logs
(June 2013)

APPENDIX A

KEY TO BORING LOGS

MAJOR TYPES			DESCRIPTION
COARSE-GRAINED SOILS MORE THAN HALF OF MAT'L LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LESS THAN 5% FINES	GW - Well graded gravels or gravel-sand mixtures
			GP - Poorly graded gravels or gravel-sand mixtures
		GRAVELS WITH OVER 12 % FINES	GM - Silty gravels, gravel-sand and silt mixtures
			GC - Clayey gravels, gravel-sand and clay mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 5% FINES	SW - Well graded sands, or gravelly sand mixtures
			SP - Poorly graded sands or gravelly sand mixtures
		SANDS WITH OVER 12 % FINES	SM - Silty sand, sand-silt mixtures
			SC - Clayey sand, sand-clay mixtures
FINE-GRAINED SOILS MORE THAN HALF OF MAT'L SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50 % OR LESS		ML - Inorganic silt with low to medium plasticity
			CL - Inorganic clay with low to medium plasticity
			OL - Low plasticity organic silts and clays
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50 %		MH - Elastic silt with high plasticity
			CH - Fat clay with high plasticity
			OH - Highly plastic organic silts and clays
	HIGHLY ORGANIC SOILS		PT - Peat and other highly organic soils

For fine-grained soils with 15 to 29% retained on the #200 sieve, the words "with sand" or "with gravel" (whichever is predominant) are added to the group name.

For fine-grained soil with >30% retained on the #200 sieve, the words "sandy" or "gravelly" (whichever is predominant) are added to the group name.

GRAIN SIZES

U.S. STANDARD SERIES SIEVE SIZE: 200 – 40 – 10 – 4 | CLEAR SQUARE SIEVE OPENINGS: 3/4 " – 3" – 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FOOT (S.P.T.)
VERY LOOSE	0-4
LOOSE	4-10
MEDIUM DENSE	10-30
DENSE	30-50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH*
VERY SOFT	0-1/4
SOFT	1/4-1/2
MEDIUM STIFF	1/2-1
STIFF	1-2
VERY STIFF	2-4
HARD	OVER 4

MOISTURE CONDITION

DRY	Dusty, dry to touch
MOIST	Damp but no visible water
WET	Visible freewater

SAMPLER SYMBOLS

- Modified California (3" O.D.) sampler
- California (2.5" O.D.) sampler
- S.P.T. - Split spoon sampler
- Shelby Tube
- Continuous Core
- Bag Samples
- Grab Samples
- NR No Recovery

LINE TYPES

- Solid - Layer Break
- Dashed - Gradational or approximate layer break

GROUND-WATER SYMBOLS

- Groundwater level during drilling
- Stabilized groundwater level

(S.P.T.) Number of blows of 140 lb. hammer falling 30" to drive a 2-inch O.D. (1-3/8 inch I.D.) sampler

* Unconfined compressive strength in tons/sq. ft., asterisk on log means determined by pocket penetrometer

ENGEO Expect Excellence

ENGEO INCORPORATED

LOG OF BORING 1-BH1

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 41½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (msl): Approx. 253 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
			SILTY LEAN CLAY (CL), black, hard, moist, 15% fine- to medium-grained sand, 5% fine gravel, trace rootlets Sulfate = 11 mg/kg			25							4.5+*
5	1		SANDY SILT (SM), yellowish brown to olive brown, hard, moist, fine- to coarse-grained sand			27							4.5*
10	2, 3		LEAN CLAY (CL), dark brown, hard, moist			40					15.4	108.4	4.5+*
						37							
	4		LEAN CLAY (CL), light brown, hard, moist, 5-10% fine- to medium-grained sand, 5% fine gravel										4.5*
15	5		LEAN CLAY (CL), dark yellowish brown, hard, moist										
			SILTY SAND (SM), dark yellowish brown, medium dense, moist, fine- to medium-grained sand			19							3.5*
20	6		LEAN CLAY (CL), dark brown to dark yellowish brown, very stiff, moist										

LOG OF BORING 1-BH1

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 41½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (msl): Approx. 253 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet: 25, 30, 35, 40
Depth in Meters: 7, 8, 9, 10, 11, 12

DESCRIPTION	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
LEAN CLAY (CL), dark brown to dark yellowish brown, very stiff, moist								
SILTY SAND (SM), dark yellowish brown, medium dense, moist								
SANDY SILT (SM), dark yellowish brown to dark reddish brown, very stiff, moist, fine- to coarse-grained sand, 5% fine gravel	15							2.5*
SANDY SILT (SM), dark yellowish brown, moist, fine- to medium-grained sand	16				56			
SILTY SAND (SM), dark yellowish brown to dark olive brown, loose, moist, fine- to medium-grained sand	8	25	18	7	29			
SANDY SILT (SM), yellowish brown, hard, moist, fine- to medium-grained sand								

Water Level: ▽ (approx. 30 ft)

LOG OF BORING 1-BH1

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 41½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (msl): Approx. 253 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			SANDY SILT (SM), yellowish brown, hard, moist, fine- to medium-grained sand			35							4.5*
			Bottom of boring at approximately 41.5 feet below existing grade. Groundwater encountered at approximately 30 feet below existing grade after drilling.										

LOG OF BORING 1-BH2

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 31½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 257 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
			SANDY LEAN CLAY (CL), very dark brown, hard, moist, 35% fine- to medium-grained sand										
						21	38	12	26	63	11	102.9	4.5+*
	1												
5						41					10.8	107	4.88
			SANDY SILT (SM), reddish brown, hard, moist, 30-40% fine- to coarse-grained sand, 5-10% fine gravel										
	2												
						50+					10.3	115	4.5+*
10	3												
			SILTY LEAN CLAY (CL), yellowish brown, hard, moist, 5% coarse-grained sand										
	4												
15													
						50+							4.5+*
	5												
	6												
20													

LOG OF BORING 1-BH2

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 31½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 257 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			SILTY LEAN CLAY (CL), yellowish brown, hard, moist, 5% coarse-grained sand			30							4.5+*
	7		SANDY SILT (SM), light reddish brown to yellowish brown, hard, moist, fine-grained sand										
25	8		SILTY SAND (SM), light reddish brown to yellowish brown, hard, moist, fine-grained sand			13				25			
30	9		CLAYEY SILT (ML), reddish brown, moist			13					8.6		
			Bottom of boring at approximately 31.5 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH3

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 31 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 273 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	DESCRIPTION	Blow Count/Foot	Liquid Limit	Plastic Limit	Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
		Seasonal weeds and soil surface								
		SILTY LEAN CLAY (CL), dark reddish brown, hard, moist, 10-15% fine- to coarse-grained sand, <5% fine gravel	17							4.5+*
	1									
5		SILTY LEAN CLAY WITH SAND (CL), light reddish brown, hard, moist, 20% fine- to medium-grained sand	50					9.85	109.4	2.48
	2									
		SILTY LEAN CLAY WITH SAND (CL), yellowish brown, hard, moist, 10-15% fine- to coarse-grained sand	38					17.3	105.7	4.5+*
10	3									
		SILTY LEAN CLAY (CL), light yellowish brown with whiteish yellow, hard, moist, 5% fine-grained sand, <5% fine gravel	50							4.5+*
	4	CLAYEY SAND (SC), light yellowish brown, dense, moist, fine-grained sand, 10% silt, <5% fine gravel	50							4.5+*
15		LEAN CLAY WITH SAND (CL), olive brown, very stiff, moist, 20% fine- to medium-grained sand, 10-15% silt, <5% fine gravel	32				33			4.5+*
	5									
20	6									

LOG OF BORING 1-BH3

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 31 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 273 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			SILTY SAND (SM), yellowish brown, dense, moist, fine-to medium-grained sand			50							4.5+*
						50							
	7		SILTY LEAN CLAY (CL), light yellowish brown, moist										
25													
	8												
			SILTY SAND (SM), yellowish brown, dense, moist, fine-to medium-grained sand			50							
	9		SILTY LEAN CLAY (CL), light yellowish brown, moist										
30						30							4.5+*

Bottom of boring at approximately 31 feet below existing grade.
Groundwater not encountered during drilling.

ENGEO INCORPORATED

LOG OF BORING 1-BH4

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 19½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 254 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

DESCRIPTION	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
6- to 12-inches of tilled soil surface								
SILTY LEAN CLAY WITH SAND (CL), very dark brown, hard, moist, 20% fine-grained sand, <5% fine gravel, trace rootlets	22	42	14	28	75	14.5	108.7	4.5+*
LEAN CLAY (CL), very dark brown, hard, moist, 5% coarse-grained sand to fine gravel	40							4.5+*
SILT (ML), yellowish brown to reddish brown								
POORLY GRADED SAND (SP), dark yellowish brown, medium dense, moist, fine- to medium-grained sand, 5-10% fines, <5% fine gravel	14							
SILT (ML), reddish brown, medium stiff to stiff, moist, 5-10% fine-grained sand								1.0*
LEAN CLAY (CL), dark reddish brown to dark yellowish brown, hard, moist, 10-15% silt	30				74			4.5*
SANDY SILT (SM), dark reddish brown to dark yellowish brown, hard, moist, fine- to medium-grained sand	41							4.5+*
Bottom of boring at approximately 19.5 feet below existing								

LOG OF BORING 1-BH4

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 19½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 254 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH5

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 31½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 266 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

DESCRIPTION	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
6- to 12-inches of tilled soil surface								
SILTY LEAN CLAY (CL), dark yellowish brown, hard, moist, 20-25% fine-grained sand, 5% fine gravel								
	31							4.5+*
GRAVELLY SILT (ML), reddish brown, hard, moist, 25% fine gravel, 5-10% fine- to coarse-grained sand								
	31					8.6	112.4	4.5+*
CLAYEY SILT WITH SAND (ML), light reddish brown to light brown, hard, moist, 15% fine- to coarse-grained sand, 5% fine gravel								
CLAYEY SILT (ML), light reddish brown, hard, moist, 5% fine-grained sand, <5% fine gravel	50+							4.5+*
SANDY SILT (SM), light brown, hard, moist, 30% fine- to coarse-grained sand								
	37					8.9	96.3	4.0*
SANDY SILT (SM), yellowish brown, hard, moist, 20% fine- to coarse-grained sand	24							

LOG OF BORING 1-BH5

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 31½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 266 ft.
LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
	7		SANDY SILT (SM), light brown, hard, moist, 30% fine- to coarse-grained sand										
25	8		SILTY SAND (SM), dark reddish brown, moist, fine- to medium-grained sand			50+							
						39							
	9		POORLY GRADED SAND (SP), yellowish brown to reddish brown, dense, moist, fine- to medium-grained sand										
30			SILTY SAND (SM), yellowish brown to reddish brown, dense, moist, fine- to medium-grained sand, <5% fine gravel			39							
			Bottom of boring at approximately 31.5 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH6

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 293 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
			SILTY LEAN CLAY (CL), very dark grayish brown, hard, moist, 10% fine gravel, 5% fine-grained sand			14							4.5*
	1		SILT WITH GRAVEL (ML), reddish brown, hard, moist, 20% fine gravel, 5-10% fine- to coarse-grained sand			50+							4.5*
5	2		CLAYEY SILT (ML), reddish brown, hard, moist, 10% fine gravel, 5% fine- to coarse-grained sand										
10	3		CLAYEY SILT (ML), light reddish brown to light yellowish brown, hard, moist, 5% fine gravel			43					10.9	111.9	4.5+*
15	4, 5		SILT WITH SAND (ML), light reddish brown to yellowish brown, hard, moist, 15% fine gravel, 10-15% fine- to coarse-grained sand			50+							4.5+*
20	6		CLAYEY SILT (ML), dark reddish brown, hard, moist, 5% fine grained sand and fine gravel										

ENGEO INCORPORATED

LOG OF BORING 1-BH6

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 293 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			CLAYEY SILT (ML), dark reddish brown, hard, moist, 5% fine grained sand and fine gravel			50+							4.5+*
			Bottom of boring at approximately 21.5 feet below existing grade. Groundwater not encountered during drilling.										

ENGEO INCORPORATED

LOG OF BORING 1-BH7

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 303 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
			SILTY LEAN CLAY (CL), very dark brown, hard, moist, <5% fine gravel and trace rootlets										
						21					12.29	107.3	6.75
	1		CLAYEY SILT WITH SAND (ML), dark reddish brown, hard, moist, 20-25% fine-grained sand, 5-10% fine gravel										
5						50					11.13	110.9	4.86
	2		SANDY SILT (SM), reddish brown, hard, moist, fine- to medium-grained sand, 5-10% fine gravel										
						45					10.53	104.3	2.76
						21							
10	3												
			SILTY LEAN CLAY (CL), dark reddish brown, hard, moist, 5% fine-grained sand										
	4												
15											23.1	102.5	4.5*
						35							
	5												
	6												
20													

LOG OF BORING 1-BH7

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 303 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			LEAN CLAY (CL), olive brown, very stiff, moist, 5% fine gravel			29							3.5-4.0*
			Bottom of boring at approximately 21.5 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH8

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 14½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 247 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
			SILTY LEAN CLAY (CL), very dark brown, hard, moist, <5% fine gravel and trace rootlets			50+							4.5+*
			SILT WITH GRAVEL (ML), reddish brown, hard, moist, 20% fine gravel, 5% fine-grained sand										
5	1		SILT (ML), light yellowish brown to light reddish black, hard, moist, 5% fine gravel			47					12.3	103.8	4.5+*
	2		SILT (ML), yellowish brown, hard, moist			30							4.5+*
10	3, 4		SILTY LEAN CLAY (CL), yellowish brown, hard, moist			32							4.5+*
			SILT (ML), yellowish brown, hard, moist										

Bottom of boring at approximately 14.5 feet below existing grade.
Groundwater not encountered during drilling.

ENGEO INCORPORATED

LOG OF BORING 1-BH9

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 18½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 267 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

DESCRIPTION	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
6- to 12-inches of tilled soil surface									
SILT (ML), light grayish brown, very stiff, moist, trace rootlets Sulfate = 4 mg/kg		19							4.0*
CLAYEY SILT WITH GRAVEL (ML), reddish brown, hard, moist, 15-20% fine gravel, 5% fine- to medium-grained sand		50+							4.5+*
CLAYEY SILT (ML), reddish brown, hard, moist, 5-10% fine gravel									
SILT (ML), reddish brown, hard, moist, 10-15% fine-grained sand, 5% fine gravel		35					8.8	100.9	4.5+*
CLAYEY SILT (ML), yellowish brown, hard, moist, 5% fine-grained sand		23							4.5+*
SANDY SILT (SM), yellowish brown to reddish black, hard, moist, 5% fine-grained sand		50							4.5*
Bottom of boring at approximately 18.5 feet below existing grade. Groundwater not encountered during drilling.									

LOG OF BORING 1-BH10

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 460 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	DESCRIPTION	Blow Count/Foot	Liquid Limit	Plastic Limit	Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
		6- to 12-inches of tilled soil surface								
		LEAN CLAY (CL), very dark brown, stiff, moist, < 5% fine-grained sand								
			26					32.7	89	1.51
	1	SANDSTONE, dark olive gray, extremely weak (R0), very closely fractured, moderately weathered (WM), very fine grained								
5			50+					18.54	89.1	1.14
	2		31							
10	3	SANDSTONE WITH SHALE INTERBEDS, yellowish brown, extremely weak (R0), very closely fractured, very thin bedding, moderately weathered (WM)								
			25							
	4									
15										
	5		50+							
20	6									

Column headings also include: Sample Type, Log Symbol, Water Level; Atterberg Limits (Liquid Limit, Plastic Limit, Plasticity Index).

LOG - GEOTECHNICAL 9901.000.000 GINT.GPJ ENGEO INC.GDT 7/28/13

ENGEO INCORPORATED

LOG OF BORING 1-BH10

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 460 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			SANDSTONE WITH SHALE INTERBEDS, yellowish brown, extremely weak (R0), very closely fractured, very thin bedding, moderately weathered (WM)			49							
			Bottom of boring at approximately 21.5 feet below existing grade. Groundwater not encountered during drilling.										

LOG - GEOTECHNICAL 9901.000.000 GINT.GPJ ENGEO INC.GDT 7/28/13

ENGEO INCORPORATED

LOG OF BORING 1-BH11

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED:	6/26/2013	LOGGED / REVIEWED BY:	J. Ruffoni / JAM
HOLE DEPTH:	Approx. 42 ft.	DRILLING CONTRACTOR:	Britton Exploration
HOLE DIAMETER:	8.0 in.	DRILLING METHOD:	Hollow Stem Auger
SURF ELEV (msl):	Approx. 229 ft.	HAMMER TYPE:	140 lb. Auto Trip

Depth in Feet: 5, 10, 15, 20
Depth in Meters: 1, 2, 3, 4, 5, 6

DESCRIPTION	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
6- to 12-inches of tilled soil surface								
SILTY LEAN CLAY (CL), light grayish brown, hard, moist, 5-10% fine-grained sand, 5% fine gravel, trace rootlets	16					8.9	90.5	4.5+*
SILT WITH SAND (ML), yellowish brown, moist, 20% fine-grained sand								
SILTY LEAN CLAY (CL), dark brown mottled with yellowish black, very stiff, moist, 5-10% fine- to medium-grained sand	15							2.5-3.0*
SILT WITH GRAVEL (ML), dark reddish brown, hard, moist, 20% fine gravel, 5% fine- to coarse-grained sand	22					13.4	117.2	4.5+*
SILT WITH GRAVEL (ML), dark reddish brown, hard, moist, 25-30% fine gravel, 10% fine- to coarse-grained sand	18							3.0-3.5*
LEAN CLAY (CL), light reddish brown to yellowish brown, very stiff, moist								
LEAN CLAY (CL), dark reddish brown, stiff to very stiff, moist, 5% fine-grained sand, <5% fine gravel	19							2.0-2.5*

LOG OF BORING 1-BH11

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/26/2013
HOLE DEPTH: Approx. 42 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (msl): Approx. 229 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			LEAN CLAY (CL), light reddish brown to yellowish brown, very stiff, moist										
	7		LEAN CLAY (CL), light reddish brown to yellowish brown, stiff			28							2.0*
25	8												
30	9		CLAYEY SILT (ML), yellowish brown, stiff, wet		▽	11	37	18	19	97			1.0*
35	10, 11												
40	12		CLAYEY SILT WITH SAND (ML), dark yellowish brown, very stiff, wet, 20% fine-grained sand			19	29	13	16				2.0-2.5*

LOG OF BORING 1-BH11

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED:	6/26/2013	LOGGED / REVIEWED BY:	J. Ruffoni / JAM
HOLE DEPTH:	Approx. 42 ft.	DRILLING CONTRACTOR:	Britton Exploration
HOLE DIAMETER:	8.0 in.	DRILLING METHOD:	Hollow Stem Auger
SURF ELEV (msl):	Approx. 229 ft.	HAMMER TYPE:	140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			CLAYEY SILT WITH SAND (ML), dark yellowish brown, very stiff, wet, 20% fine-grained sand SILT WITH GRAVEL (ML), yellowish brown to reddish brown, wet, fine to coarse gravel			29							
			Bottom of boring at approximately 42 feet below existing grade. Groundwater encountered at 30 feet below existing grade during drilling.										

LOG OF BORING 1-BH12

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 26 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 249 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
			SILTY LEAN CLAY (CL), dark reddish brown, hard, moist, 10-15% fine gravel, trace rootlets			34							4.5+*
	1		CLAYEY SILT (ML), light reddish brown, hard, moist, 5-10% fine-grained sand, 5% fine gravel										
5						50+					9.3	104.2	4.5+*
	2												
10	3												
			POORLY GRADED SAND (SP), dark yellowish brown, medium dense, moist, fine- to medium-grained sand, 5% fines, <5% fine gravel			41							
			SANDY SILT (SM), light reddish brown, hard, moist, fine- to coarse-grained sand			23							
	4												
15													
	5					46							
			WELL GRADED SAND (SW), yellowish brown, medium dense, moist, fine- to coarse-grained sand, 10% fines										
			CLAYEY SILT (ML), reddish brown, moist, 5-10% fine-grained sand			26							
20	6												

ENGEO INCORPORATED

LOG OF BORING 1-BH12

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 26 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 249 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
	7		CLAYEY SILT (ML), reddish brown, moist, 5-10% fine-grained sand										
			SILTY SAND (SM), light reddish brown, medium dense to hard, moist, fine- to medium-grained sand			50				37			4.0-4.5*
25						22							
			Bottom of boring at approximately 26 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH13

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 31½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 275 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
			SILTY LEAN CLAY WITH SAND (CL), reddish brown, very stiff, moist, fine- to medium-grained sand										
	1					34							4.0*
			SANDY SILT (SM), light reddish brown, hard, moist, fine- to medium-grained sand										
5						45							4.5+*
	2												
			LEAN CLAY (CL), olive brown mottled with orange, hard, moist										
						35					21.6 28.9	101.6 95	4.5+*
10	3												
	4		CLAYSTONE, light olive brown, extremely weak, very closely fractured, moderately weathered			33					38	84.3	4.5+*
15	5												
			SANDSTONE WITH SILTSTONE INTERBEDS, extremely weak, very closely fractured, thinly bedded, highly weathered			50/6"							
	6					50+							
20													

LOG - GEOTECHNICAL 9901.000.000 GINT.GPJ ENGEO INC.GDT 7/28/13

LOG OF BORING 1-BH13

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 31½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 275 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
	7		SANDSTONE WITH SILTSTONE INTERBEDS, extremely weak, very closely fractured, thinly bedded, highly weathered										
25	8					22							
			CLAYSTONE, dark olive brown, extremely weak, very closely fractured, moderately weathered										
30	9					29							4.5+*
			Bottom of boring at approximately 31 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH14

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 23 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 282 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
			LEAN CLAY (CL), light brown, very stiff, moist, 10-15% fine-grained sand, trace rootlets			24					13.2	106.9	6.8
			SILTY LEAN CLAY (CL), very dark brown, hard, moist, <5% fine gravel, trace rootlets										
	1												
5			SILTY LEAN CLAY (CL), very dark brown, hard, moist, 5% fine-grained sand			26					19	107.6	4.5*
	2					37							4.5+*
10	3												
			SANDY SILT (SM), reddish brown, hard, moist, fine- to medium-grained sand, <5% fine gravel			40					15.7	113.1	4.5+*
	4												
15						39							
	5		LEAN CLAY (CL), dark brown mottled with orange, hard, moist, 5-10% silt, <5% fine gravel										4.5+*
20	6												

LOG OF BORING 1-BH14

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 23 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 282 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			SILTY SAND (SM), reddish brown, medium dense, moist, fine- to medium-grained sand, <5% fine gravel			36							
			SILT WITH SAND (ML), olive brown, very stiff, moist, 10-15% fine-grained sand, 10% clay			29							
	7		Bottom of boring at approximately 23 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH15

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED:	6/25/2013	LOGGED / REVIEWED BY:	J. Ruffoni / JAM
HOLE DEPTH:	Approx. 20 ft.	DRILLING CONTRACTOR:	Britton Exploration
HOLE DIAMETER:	4.0 in.	DRILLING METHOD:	Solid Flight Auger
SURF ELEV (msl):	Approx. 234 ft.	HAMMER TYPE:	140 lb. Auto Trip

DESCRIPTION	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
6- to 12-inches of tilled soil surface									
CLAYEY SILT WITH GRAVEL (ML), grayish brown, hard, moist, 20% fine gravel, 5% fine-grained sand Sulfate = 5 mg/kg		34							4.5+*
SANDY SILT (SM), reddish brown, moist, 30% fine- to medium-grained sand, 5-10% fine gravel		23							
SILT WITH SAND (ML), reddish brown, hard, moist, 20% fine- to medium-grained sand, 5% fine gravel		48					9.4	109.3	4.5+*
SILTY LEAN CLAY (CL), dark reddish brown, hard, moist, 5% fine- to coarse-grained sand, <5% fine gravel		50+							4.5+*
SANDY SILT (SM), yellowish brown, very stiff, moist, 20-25% fine- to medium-grained sand, <5% fine gravel									4.0*
SILTY SAND (SM), yellowish brown, medium dense, moist, fine- to medium-grained sand, 15% silt, 5% fine gravel		42							
CLAYEY SILT (ML), reddish brown, moist, 5-10% fine-grained sand		21							

Depth in Feet: 5, 10, 15, 20
Depth in Meters: 1, 2, 3, 4, 5, 6

LOG OF BORING 1-BH15

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 20 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 234 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			Bottom of boring at approximately 20 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH16

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED:	6/25/2013	LOGGED / REVIEWED BY:	J. Ruffoni / JAM
HOLE DEPTH:	Approx. 33 ft.	DRILLING CONTRACTOR:	Britton Exploration
HOLE DIAMETER:	4.0 in.	DRILLING METHOD:	Solid Flight Auger
SURF ELEV (msl):	Approx. 219 ft.	HAMMER TYPE:	140 lb. Auto Trip

Depth in Feet	DESCRIPTION	Blow Count/Foot	Liquid Limit	Plastic Limit	Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	6- to 12-inches of tilled soil surface								
0.5	SILTY LEAN CLAY (CL), dark brown mottled with olive, hard, moist								
~3.5		34							4.5+*
5	POORLY GRADED SAND (SP), dark yellowish brown, loose, moist, fine- to medium-grained sand								
~6		11							
~7.5		4							
7.5	SILTY LEAN CLAY (CL), dark reddish brown, moist, 15-20% fine- to medium-grained sand								
~13.5	SILTY LEAN CLAY WITH GRAVEL (CL), dark red, very stiff, moist, 20% fine gravel, 5% fine- to coarse-grained sand	34							4.0-4.5*
15									
~19	SILT (ML), reddish brown, very stiff, moist, 10-15% fine-grained sand, <5% fine gravel	33							3.0-3.5*
20									

LOG OF BORING 1-BH16

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 33 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 219 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
	7				▽								
25	8		SILTY LEAN CLAY (CL), light reddish brown, stiff, wet, 5-10% fine-grained sand			18	35	14	21				1.5-2.0*
30	9		SILTY SAND (SM), dark yellowish brown, medium dense, saturated, fine- to medium-grained sand, 15-20% silt			20							
	10		WELL GRADED SAND WITH CLAY (SW), dark yellowish brown, medium dense, saturated, fine- to coarse-grained sand			25	NP	NP	NP	11			

Bottom of boring at approximately 33 feet below existing grade.
Groundwater encountered at approximately 22 feet below existing grade during and after drilling.

ENGEO INCORPORATED

LOG OF BORING 1-BH17

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 30½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 230 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
	1		FAT CLAY WITH SAND (CH), dark gray, hard, moist, 20% silt, 20% fine- to medium-grained sand			21	50	15	35	79	15.6	99.4	4.5+*
5	2		CLAYEY SILT WITH GRAVEL (ML), light reddish brown, hard, moist, 20% fine gravel, 5% fine-grained sand			50+							4.5+*
10	3		CLAYEY SILT WITH GRAVEL (ML), dark red, hard, moist, 20% fine gravel, <5% fine-grained sand			37							4.5+*
	4												
15	5		CLAYEY SILT (ML), light reddish brown, hard, moist, 10-15% fine gravel, 5% fine-grained sand			50+							4.5+*
20	6												

LOG OF BORING 1-BH17

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 30½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 230 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			SILT (ML), yellowish brown, hard, moist			32							4.5*
	7												
25													
	8												
	9		GRAVELLY CLAY (CL), reddish brown, hard, moist, 30% fine gravel, 10% fine- to coarse-grained sand			39	36	12	24				4.5*
30			LEAN CLAY (CL), yellowish brown, hard, moist										
			Bottom of boring at approximately 30.5 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH18

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 51½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (msl): Approx. 215 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	DESCRIPTION	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
		6- to 12-inches of tilled soil surface								
		LEAN CLAY (CL), very dark brown, hard, moist, 5% fine gravel, trace rootlets	18					19.5	84.7	4.5+*
5	1		13							
	2	POORLY GRADED SAND (SP), yellowish brown, loose, moist, fine- to medium-grained sand, 5% fines	7							
10	3	SILTY LEAN CLAY (CL), dark brown, stiff to very stiff, moist, 5-10% fine-grained sand, <5% fine gravel	18					18.2	112.1	3.0*
15	4, 5	CLAYEY SILT WITH SAND (ML), reddish brown, very stiff, moist, 15% fine-grained sand	22	26	13	13		14.6	118.4	3.0*
20	6									

LOG OF BORING 1-BH18

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 51½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (msl): Approx. 215 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
						21							3.75*
			SILTY LEAN CLAY (CL), reddish brown, very stiff, moist, <5% fine gravel										
	7												
25			SILTY LEAN CLAY (CL), reddish brown, very stiff, moist, 10-15% fine-grained sand, <5% fine gravel			19							3.0*
	8												
	9												
30						34							4.5+*
	10												
			CLAYEY SILTY SAND (SC), reddish brown, very stiff, moist, fine-grained sand, 5% fine gravel			32				49			
35	11												
	12												
40													

LOG OF BORING 1-BH18

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/24/2013
HOLE DEPTH: Approx. 51½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (msl): Approx. 215 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			SILTY LEAN CLAY (CL), reddish brown, stiff to very stiff, moist, 10-15% fine-grained sand, <5% fine gravel			36							4.5+*
	13												
45			SILTY LEAN CLAY (CL), light yellowish brown, very stiff, moist, 10-15% fine-grained sand			42							4.5+*
	14												
	15												
50			LEAN CLAY (CL), yellowish brown, very stiff, moist, <5% fine gravel			45							4.5+*
			Bottom of boring at approximately 51.5 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH19

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 13½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 224 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
	1		SILTY LEAN CLAY (CL), very dark brown, hard, moist, <5% fine gravel, trace rootlets			17							4.5+*
5	2		CLAYEY SILT (ML), light reddish brown, hard, moist, 10-15% fine-grained sand, 5% fine gravel			44							4.5+*
10	3		CLAYEY SILT WITH GRAVEL (ML), dark red, hard, moist, 10-15% fine-grained sand, 20% fine gravel			50+					8	106.6	4.5+*
	4		SILTY LEAN CLAY (CL), dark reddish brown, hard, moist, 5-10% fine- to medium-grained sand, 10% fine gravel			50							4.5+*
			Bottom of boring at approximately 13.5 feet below existing grade. Groundwater not encountered during drilling.										

LOG OF BORING 1-BH20

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 241 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			6- to 12-inches of tilled soil surface										
			CLAYEY SILT WITH SAND (ML), yellowish brown, moist, 30% fine- to medium-grained sand, trace rootlets			11	35	16	19	69			4.0*
	1		SILTY LEAN CLAY (CL), very dark brown mottled with yellowish brown, very stiff, moist, 5-10% fine gravel										
5			SILTY LEAN CLAY (CL), dark reddish brown, hard, moist, 5-10% fine-grained sand			19					12.1	108.5	4.0*
	2												
			CLAYEY SILT WITH GRAVEL (ML), dark red, hard, moist, 20% fine gravel, 5-10% fine- to coarse-grained sand, <5% fine gravel			38							4.5*
10	3					35							4.5+*
	4												
15	5		SILTY LEAN CLAY (CL), red, very stiff, moist, 5-10% fine gravel			22							3.0-3.5*
20	6												

LOG OF BORING 1-BH20

ENGEO INCORPORATED

Geotechnical Exploration
San Juan Oaks - Del Webb
Hollister, CA
9901.000.000

DATE DRILLED: 6/25/2013
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 241 ft.

LOGGED / REVIEWED BY: J. Ruffoni / JAM
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			SILTY LEAN CLAY (CL), red, very stiff, moist, 5-10% fine gravel SILTY LEAN CLAY WITH GRAVEL (CL), reddish brown, hard, moist, 20# fine gravel, 5% fine- to coasrse-grained sand			42							4.5*
			Bottom of boring at approximately 21.5 feet below existing grade. Groundwater not encountered during drilling.										

LOG - GEOTECHNICAL 9901.000.000 GINT.GPJ ENGEO INC.GDT 7/28/13

ENGEO INCORPORATED	# Test Pit Logs
San Juan Oaks – Retirement Community Hollister, California 9901.000.000	Logged By: J. White Logged Date: 6/18/2013

Test Pit Number	Depth (Feet)	Description
2-TP1	0 – 3	SILTY LEAN CLAY (CL), very dark brown, very stiff, moist, few fine gravels, abundant carbonate nodules. (Qls)
	3 – 5	Interbedded CLAYSTONE and SHALE, extremely weak, very closely fractured, very thinly bedded to laminated, highly weathered, Bedding N52W/ 40S, shear at 3 feet, N44W/ 35S. (Puc)
2-TP2	0 – 2	SILTY LEAN CLAY (CL), black, very stiff, moist, few rootlets. (Qc)
	2 – 6	SILTY LEAN CLAY (CL), dark brown, very stiff, moist, few fine gravels and carbonates, blocky structure. (Qc)
	6 – 8	SANDY CLAY (CL), dark brown, very stiff, moist, fine grained sand. (Qc)
	8 – 9	Interbedded SILTSTONE and SANDSTONE, yellowish brown and grayish brown, weak, closely fractured, thinly bedded, moderately weathered, fine grained sand. (Puc)
2-TP3	0 – 2	SILTY LEAN CLAY (CL), very dark brown, very stiff, moist, carbonate nodules. (Qls)
	2 – 5	Interbedded SANDSTONE and SHALE, weak, closely fractured, thinly bedded, highly weathered, iron staining along fracture surfaces, Bedding N70E/ 50S. (Puc)
2-TP4	0 – 4	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels, carbonate nodules. (Qc)
	4 – 7	Interbedded SANDSTONE and CLAYSTONE, extremely weak, very closely fractured, thinly bedded, highly weathered, Bedding N75E/ 36S. (Puc)

Test Pit Logs

ENGEO INCORPORATED

San Juan Oaks – Retirement Community
Hollister, California
9901.000.000

Logged By: J. White
Logged Date: 6/18/2013

Test Pit Number	Depth (Feet)	Description
2-TP5	0 – 2	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels, carbonate nodules. (Qc)
	2 – 6	SILTY LEAN CLAY (CL), dark brown, very stiff, moist, few fine gravels, blocky structure. (Qc)
	6 – 8	SILTSTONE with SHALE interbeds, light yellowish brown, weak, closely fractured, thinly bedded, moderately weathered, Bedding N55W/ 55S. (Puc)
2-TP6	0 – 3	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels. (Qc)
	3 – 6	SILTY LEAN CLAY (CL), dark brown, very stiff, moist, few fine gravels, blocky structure. (Qc)
	6 – 10	SANDY CLAY (CL), dark brown, very stiff, moist, with fine gravel, fine grained sand. (Qc)
	10 – 12	CLAYEY SAND (SC), brown, very dense, moist, with fine gravel. (Qc)
	12 – 13	SANDSTONE, light yellowish brown, weak, closely fractured, highly weathered, fine grained. (Puc)
2-TP7	0 – 1.5	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels. (Qc)
	1.5 – 5	CLAYSTONE, dark olive brown, extremely weak, closely fractured, thickly bedded, moderately weathered, some iron staining. (Puc)
2-TP8	0 – 1	LEAN SILT (ML), very dark brown, very stiff, moist, rootlets. (Qa)
	1 – 3	SANDY CLAY (CL), dark brown, stiff, moist, few gravels, medium grained sand. (Qa)
	3 – 10	SILTY SAND (SM), brown, dense, moist, with fine to coarse gravels, lenses of gravel. (Qa)

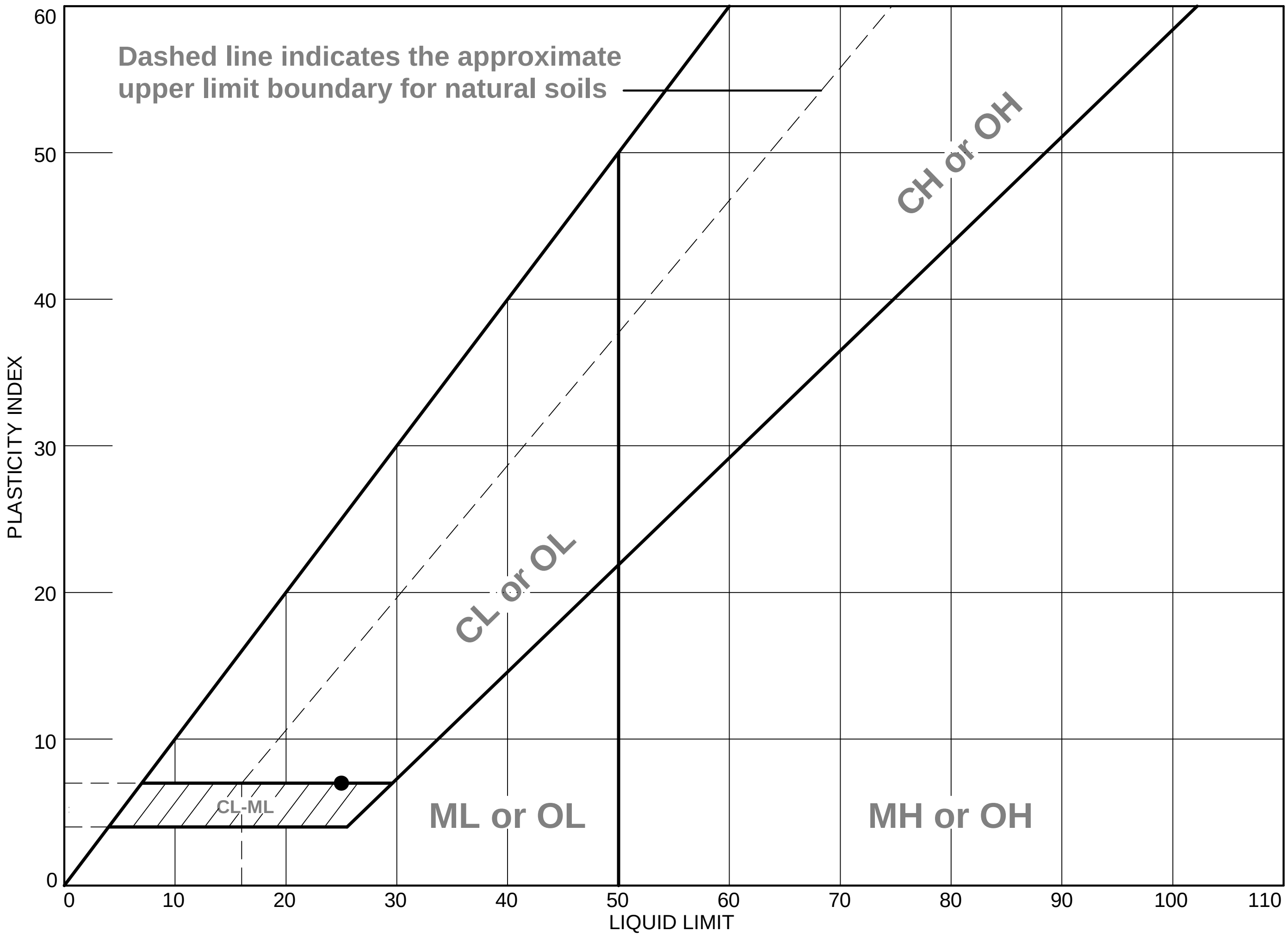
ENGEO INCORPORATED	Test Pit Logs	
San Juan Oaks – Retirement Community Hollister, California 9901.000.000	Logged By: J. White Logged Date: 6/18/2013	
Test Pit Number	**Depth (Feet)**	**Description**
2-TP9	0 – 2	SILTY LEAN CLAY (CL), very dark brown, very stiff, moist, few fine gravels, carbonate nodules. (Qc)
	2 – 6	SANDSTONE, brown, weak, closely fractured, thinly bedded, fine to coarse grained, fine to coarse gravel, poorly cemented, Bedding N88E/ 45S.

APPENDIX B

Laboratory Test Results
(June 2013)

APPENDIX B

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	25	18	7		28.6	

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

● **Source:** 1-BH **Depth:** 32.5 feet **Sample No.:** 1-BH1 @ 32.5

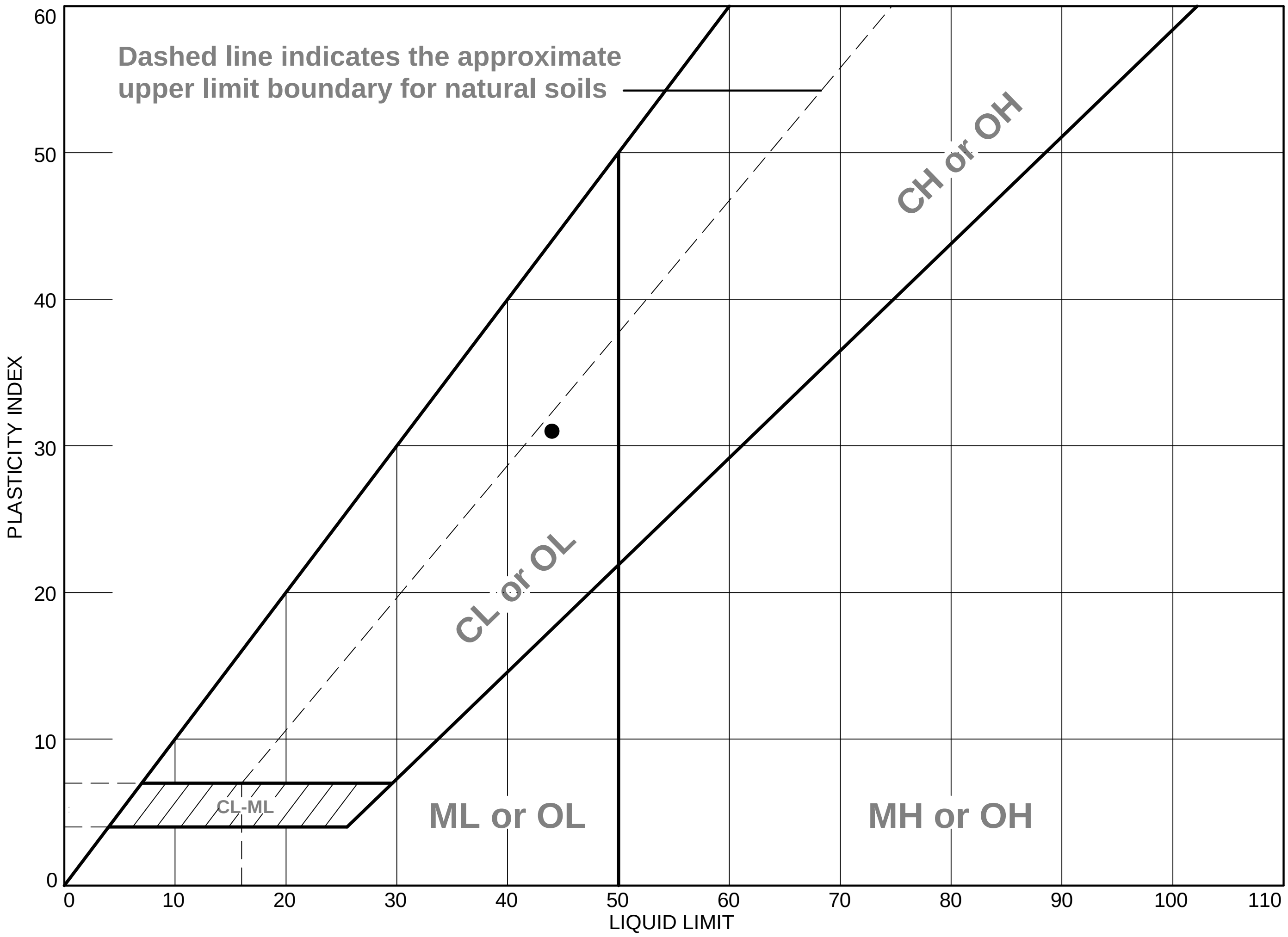
Remarks:

● PI: ASTM D4318,
GS: ASTM D1140

ENGEO INCORPORATED

Tested By: GC **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	44	13	31	92.0	59.7	CL

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

● **Source:** 1-BH **Depth:** 2.0 feet **Sample No.:** 1-BH11 @ 2

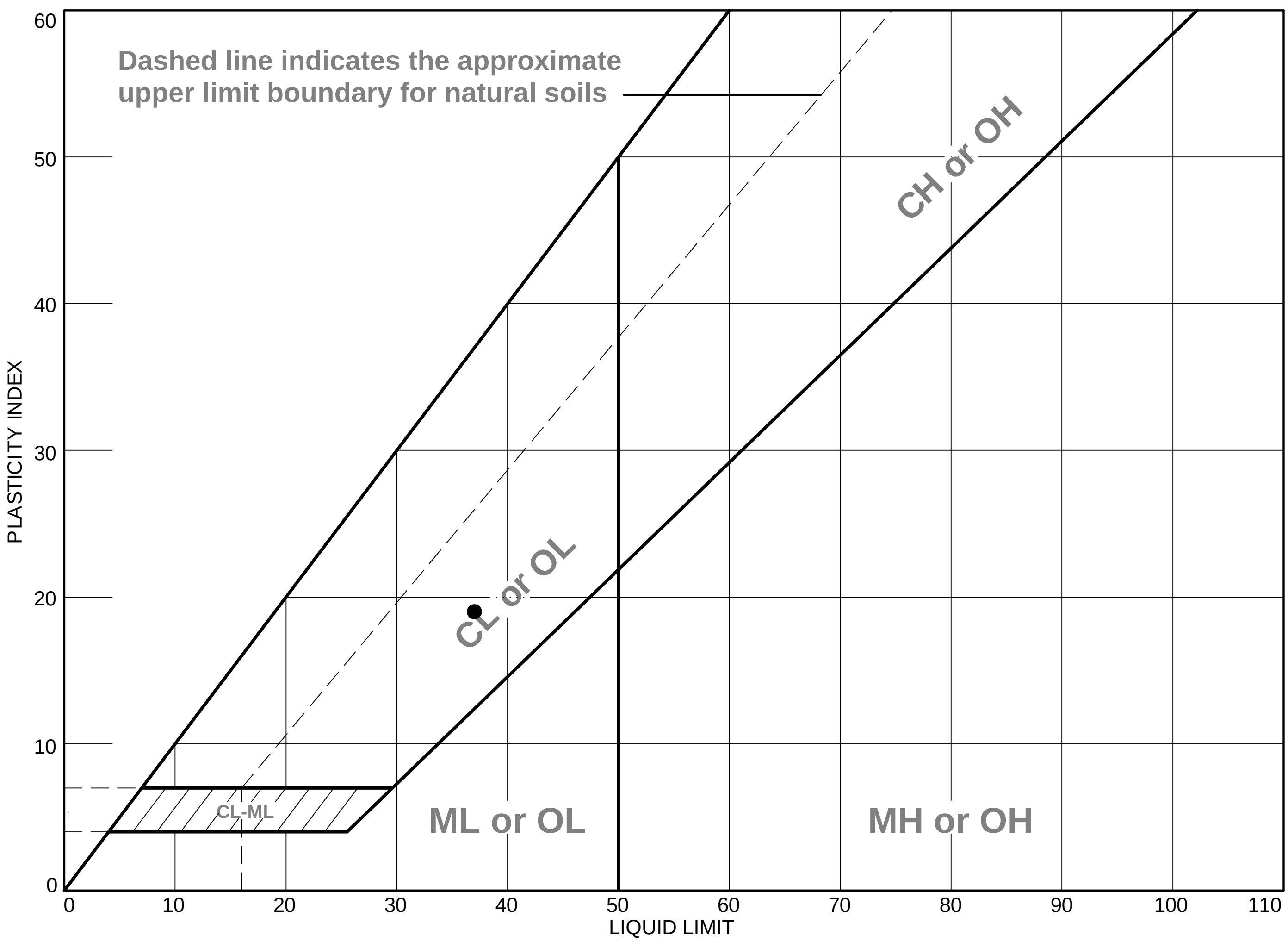
Remarks:

● PI: ASTM D4318,
GS: ASTM D422,
USCS: ASTM D2487

ENGEO INCORPORATED

Tested By: KZ **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	37	18	19	99.9	96.9	CL

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

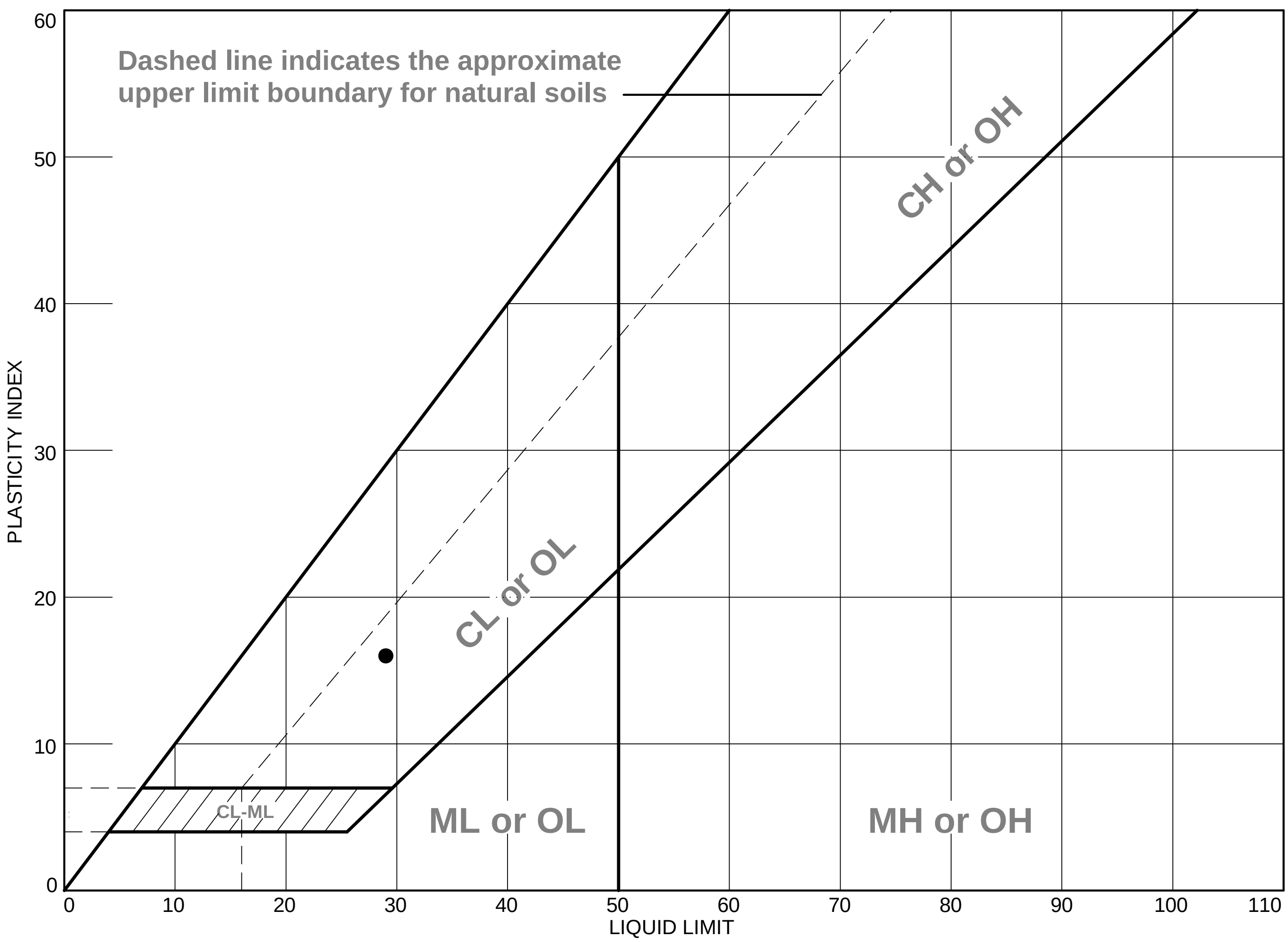
● **Source:** 1-BH **Depth:** 31.0 feet **Sample No.:** 1-BH11 @ 31

Remarks:
●PI: ASTM D4318,
GS: ASTM D422,
USCS: ASTM D2487

ENGEO INCORPORATED

Tested By: KZ **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	29	13	16			

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

●**Source:** 1-BH **Depth:** 40.0 feet **Sample No.:** 1-BH1 @ 40

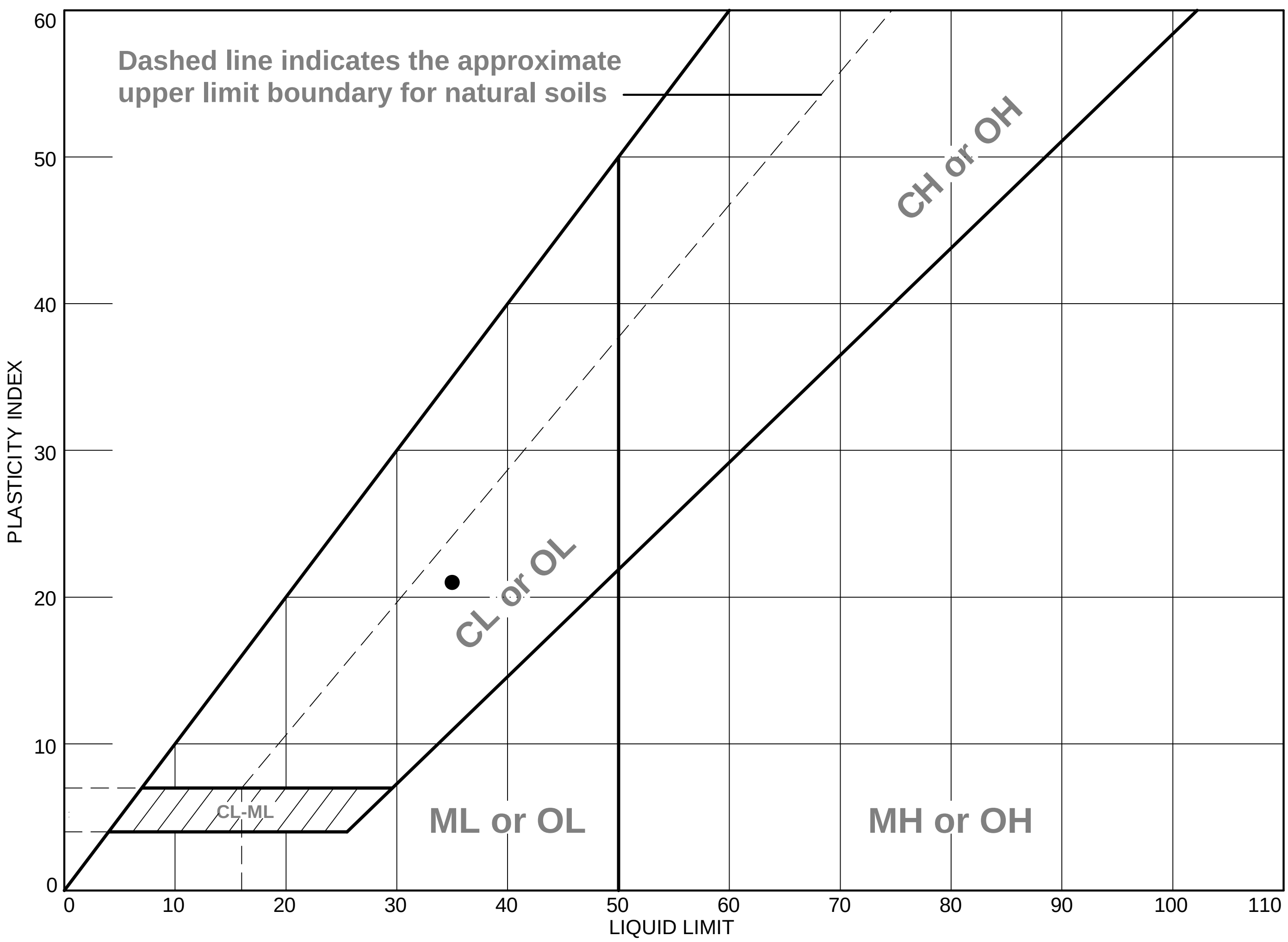
Remarks:

●PI: ASTM D4318; Method A

ENGEO INCORPORATED

Tested By: GC **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	35	14	21			

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

● **Source:** 1-BH **Depth:** 26.0 feet **Sample No.:** 1-BH16 @ 26

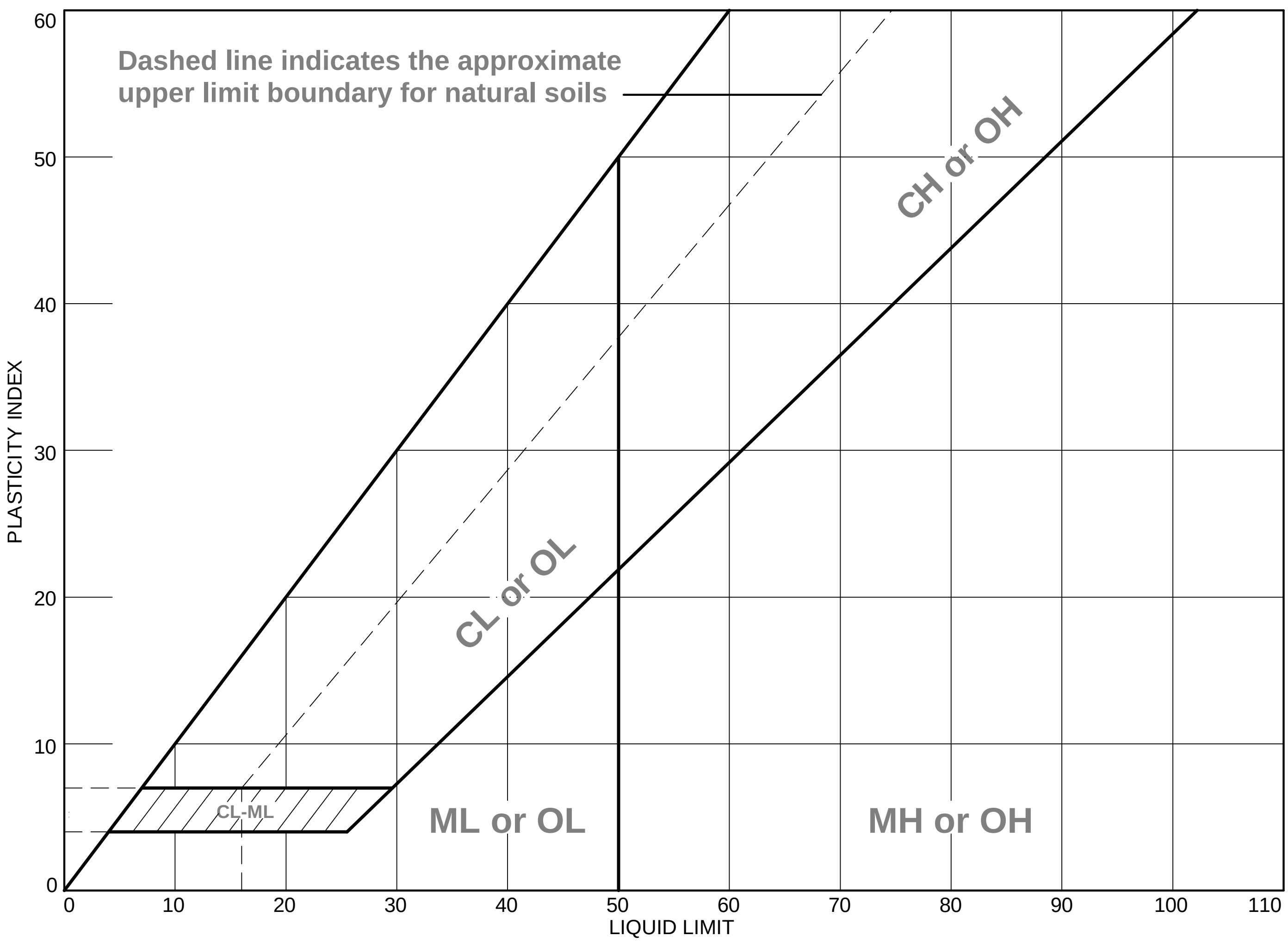
Remarks:

● PI: ASTM D4318

ENGEO INCORPORATED

Tested By: KZ **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	NV	NP	NP		10.6	

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

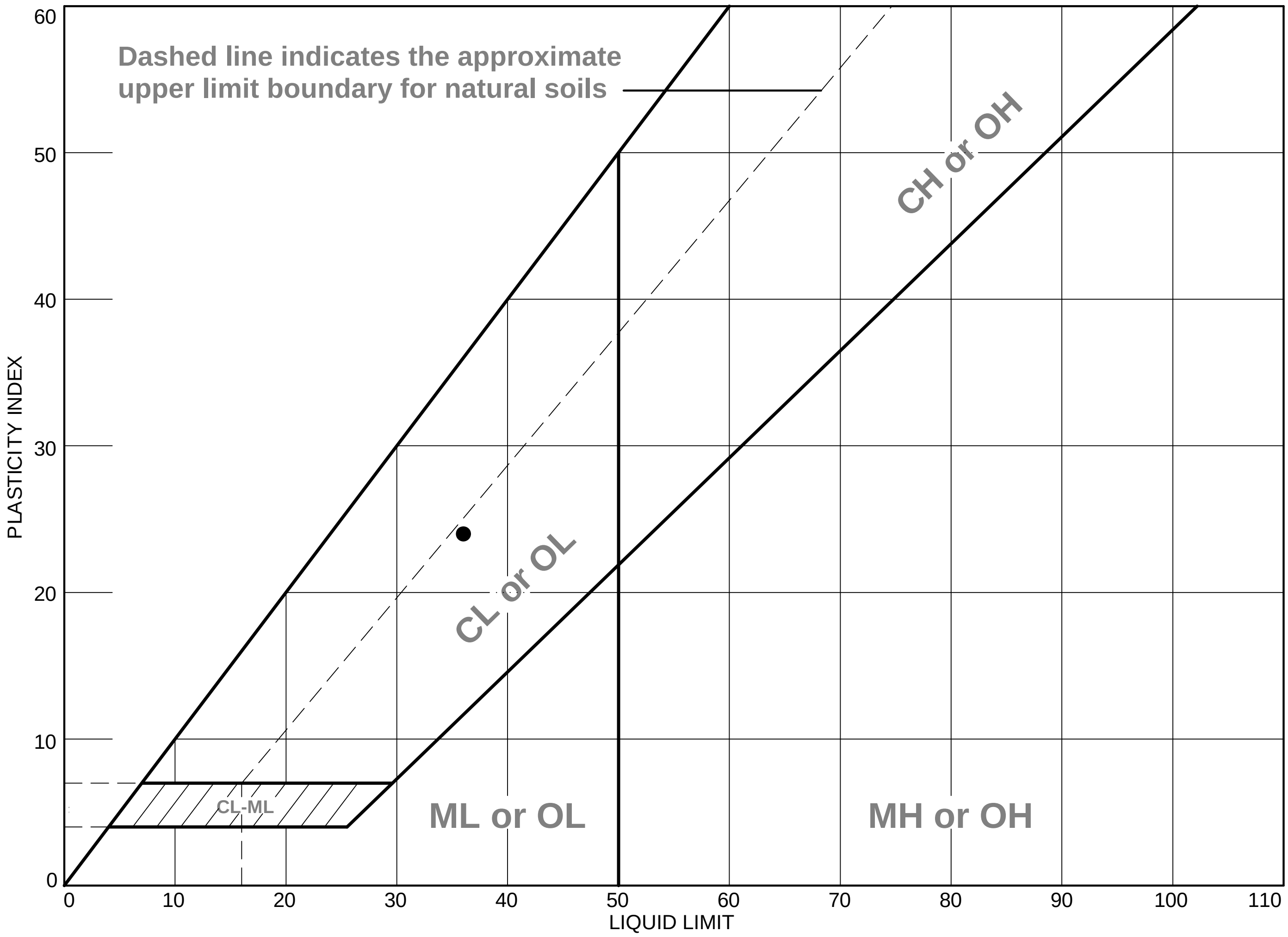
●**Source:** 1-BH **Depth:** 32.0 feet **Sample No.:** 1-BH16 @ 32

ENGEO INCORPORATED

Remarks:
●PI: ASTM D4318,
GS: ASTM D1140

Tested By: GC **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	36	12	24			

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

● **Source:** 1-BH **Depth:** 29.5 feet **Sample No.:** 1-BH17 @ 29.5

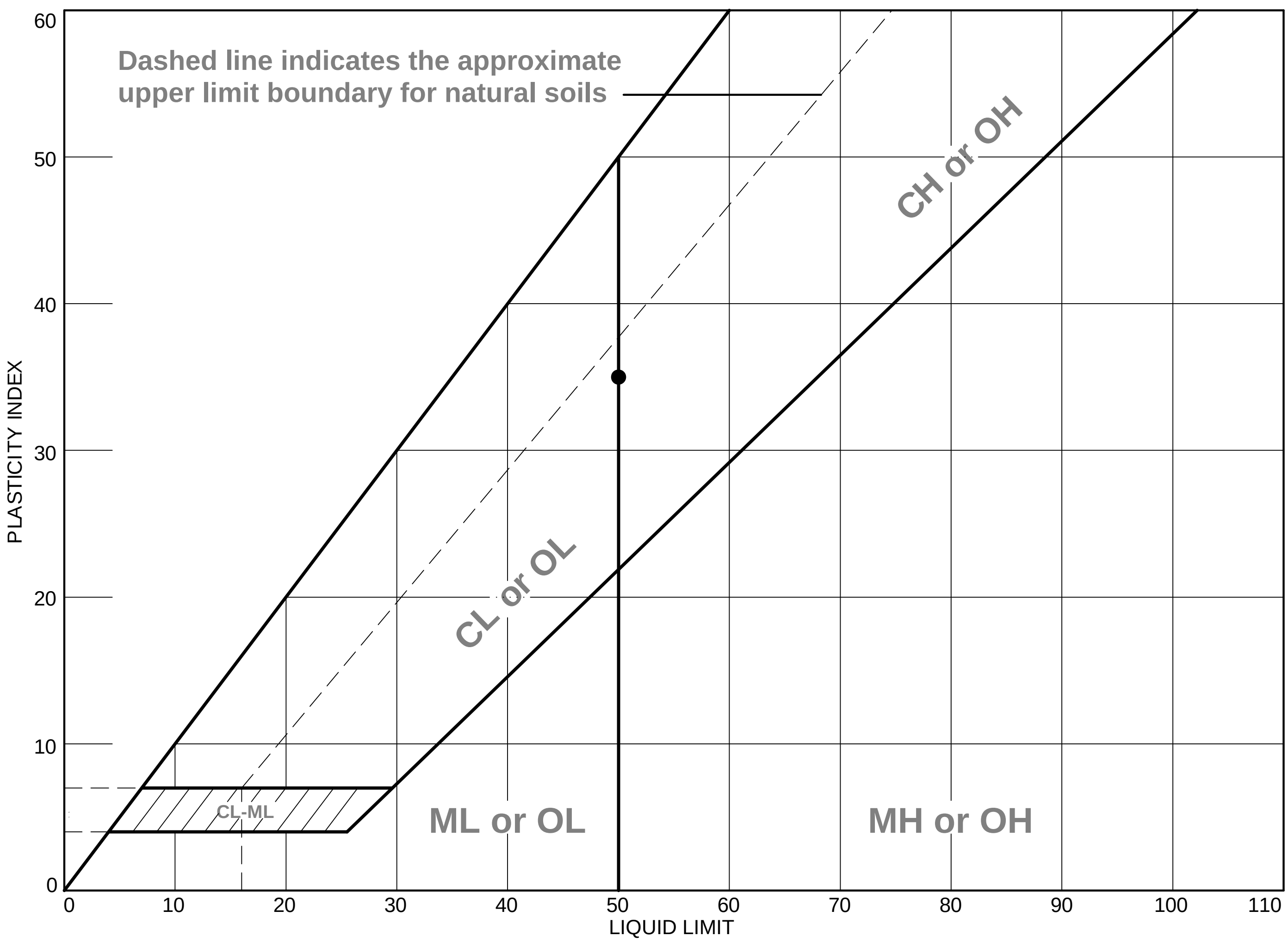
Remarks:

● PI: ASTM D4318; Method A

ENGEO INCORPORATED

Tested By: GC **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	50	15	35	95.0	79.0	CH

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

● **Source:** 1-BH **Depth:** 3.0 feet **Sample No.:** 1-BH17 @ 3

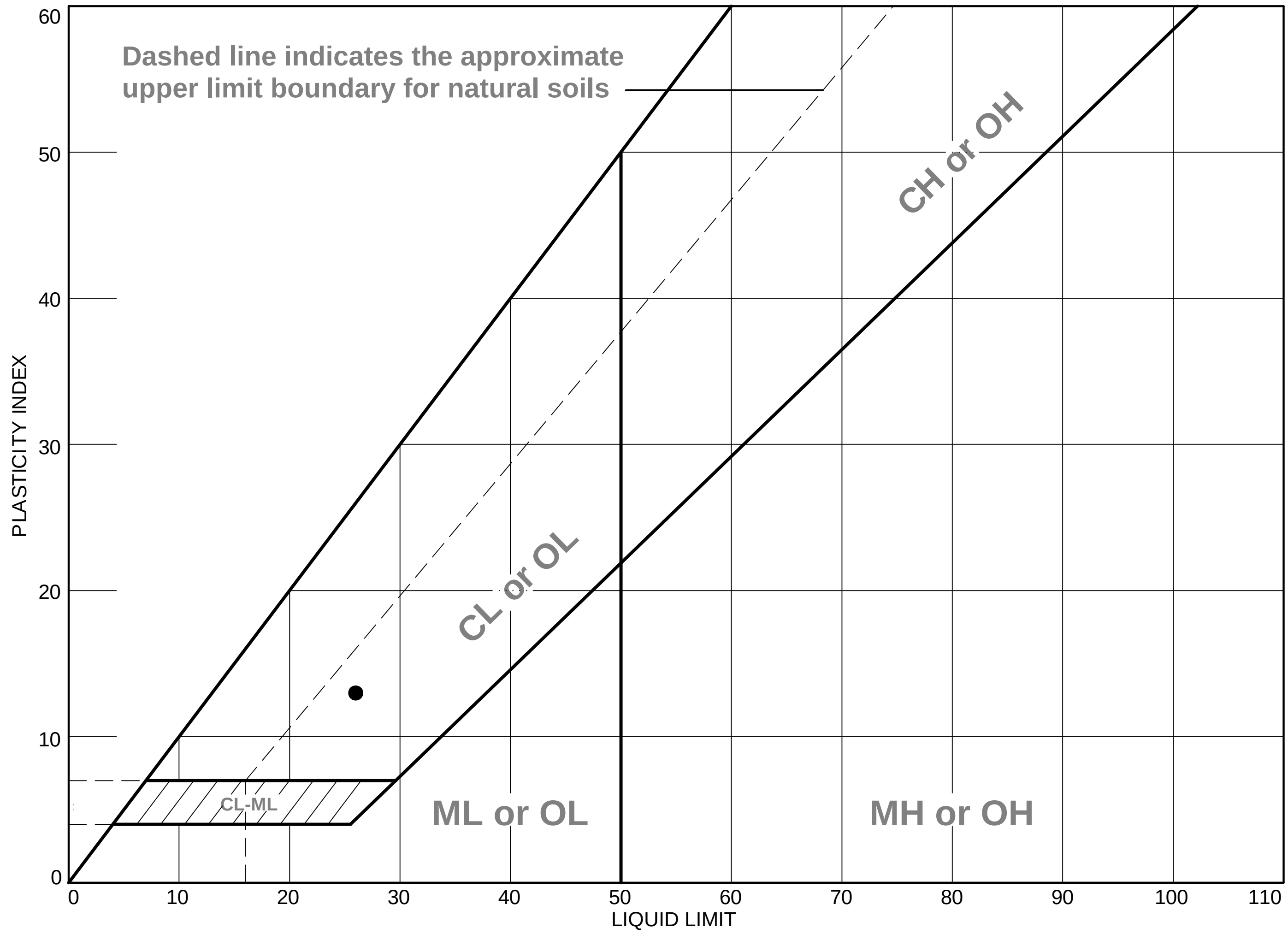
Remarks:

● PI: ASTM D4318,
GS: ASTM D422,
USCS: ASTM D2487

ENGEO INCORPORATED

Tested By: KZ **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	26	13	13			

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

● **Source:** 1-BH **Depth:** 16.0 feet **Sample No.:** 1-BH18 @ 16

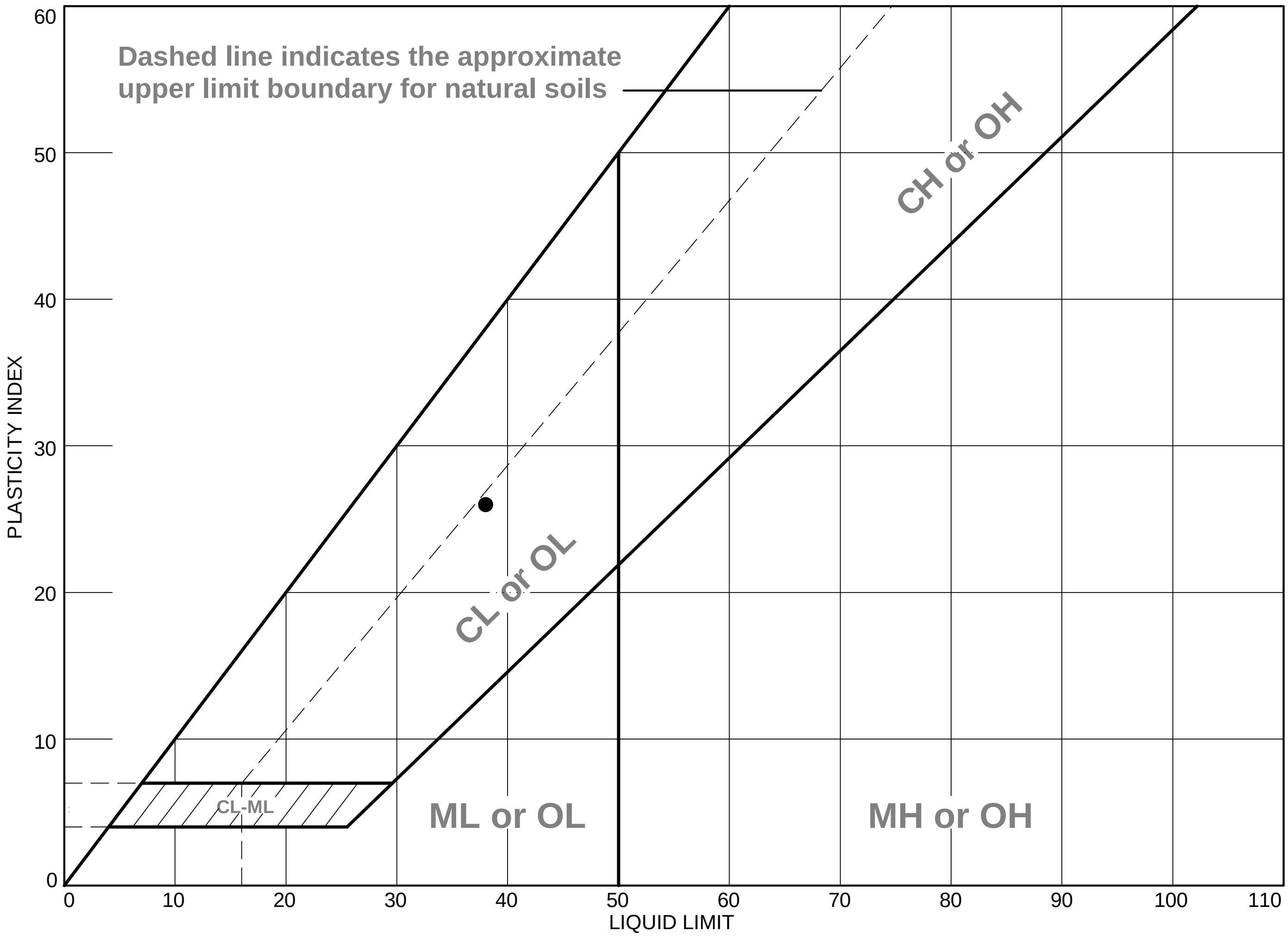
Remarks:

● PI: ASTM D4318

ENGEO INCORPORATED

Tested By: JL **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	38	12	26	96.3	63.3	CL

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

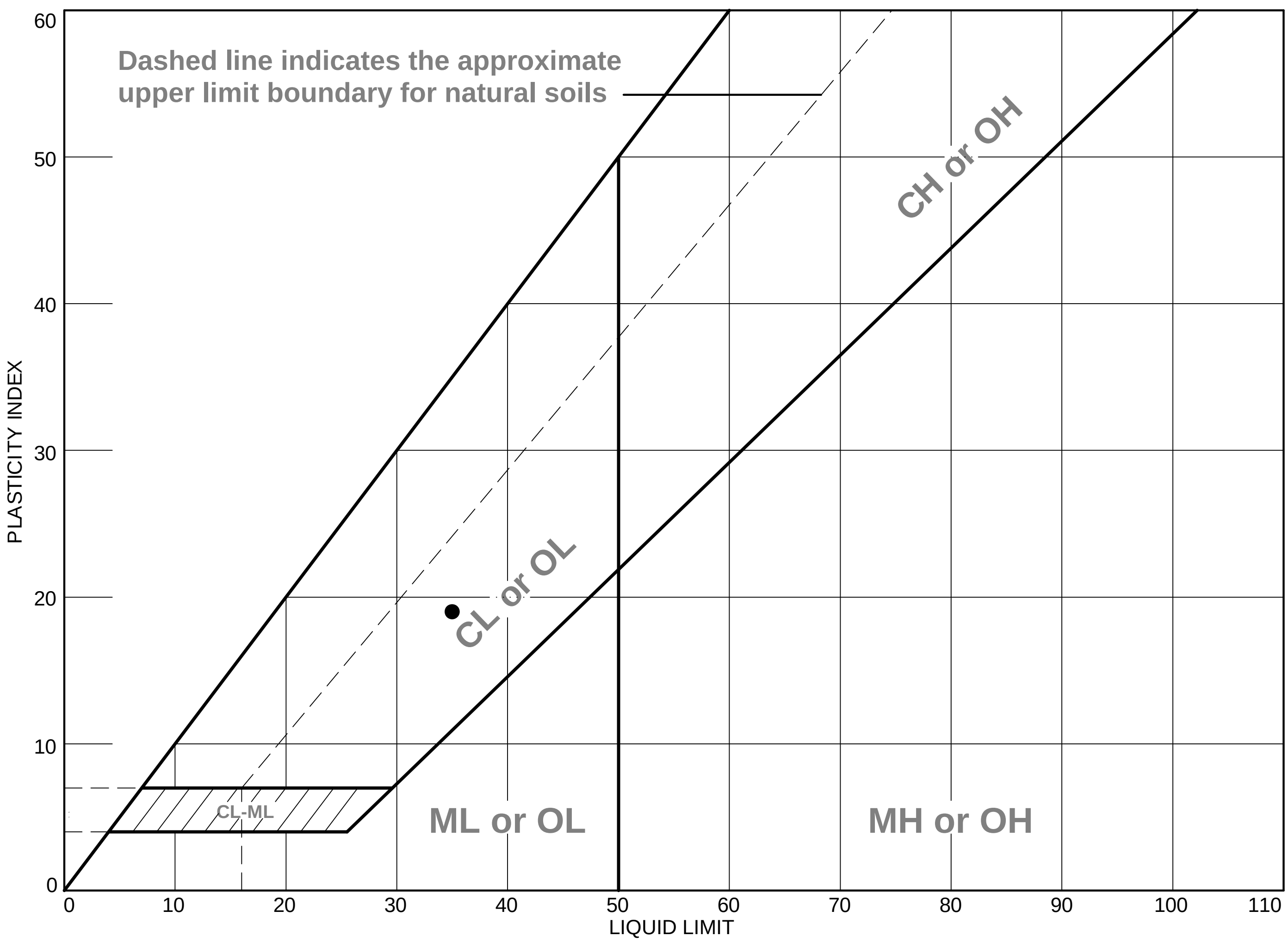
● **Source of Sample:** 1-BH **Depth:** 2.0 feet **Sample Number:** 1-BH2 @ 2

Remarks:

ENGEO INCORPORATED

Tested By: KZ

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	35	16	19	90.7	68.9	CL

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

●**Source:** 1-BH **Depth:** 2.0 feet **Sample No.:** 1-BH20 @ 2

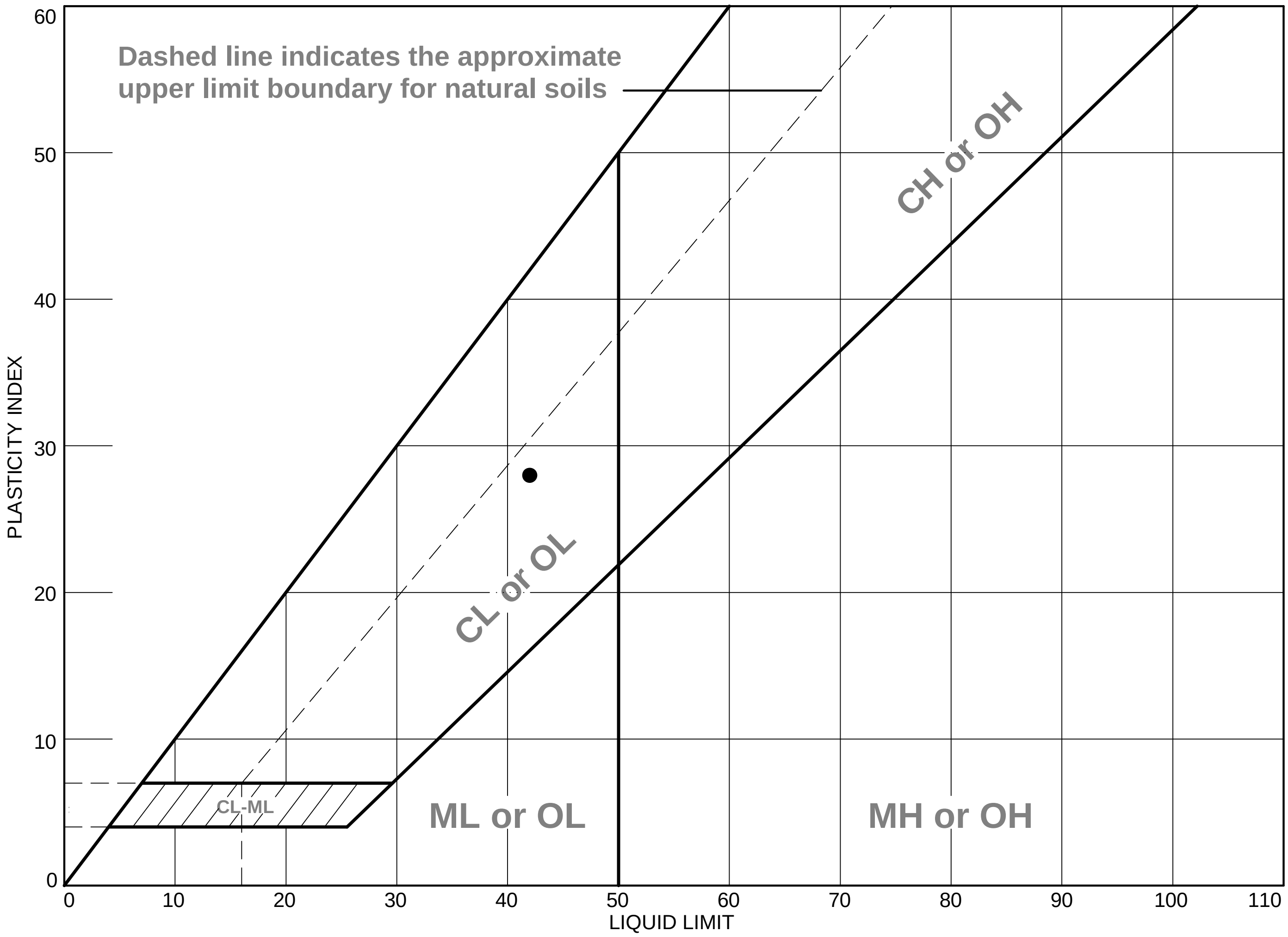
Remarks:

●PI: ASTM D4318,
GS: ASTM D422,
USCS: ASTM D2487

ENGEO INCORPORATED

Tested By: JL **Checked By:** DS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	42	14	28	94.9	74.7	CL

Project No. 9901.000.000 **Client:** Pulte Group - 2009

Project: San Juan Oaks - Retirement Community

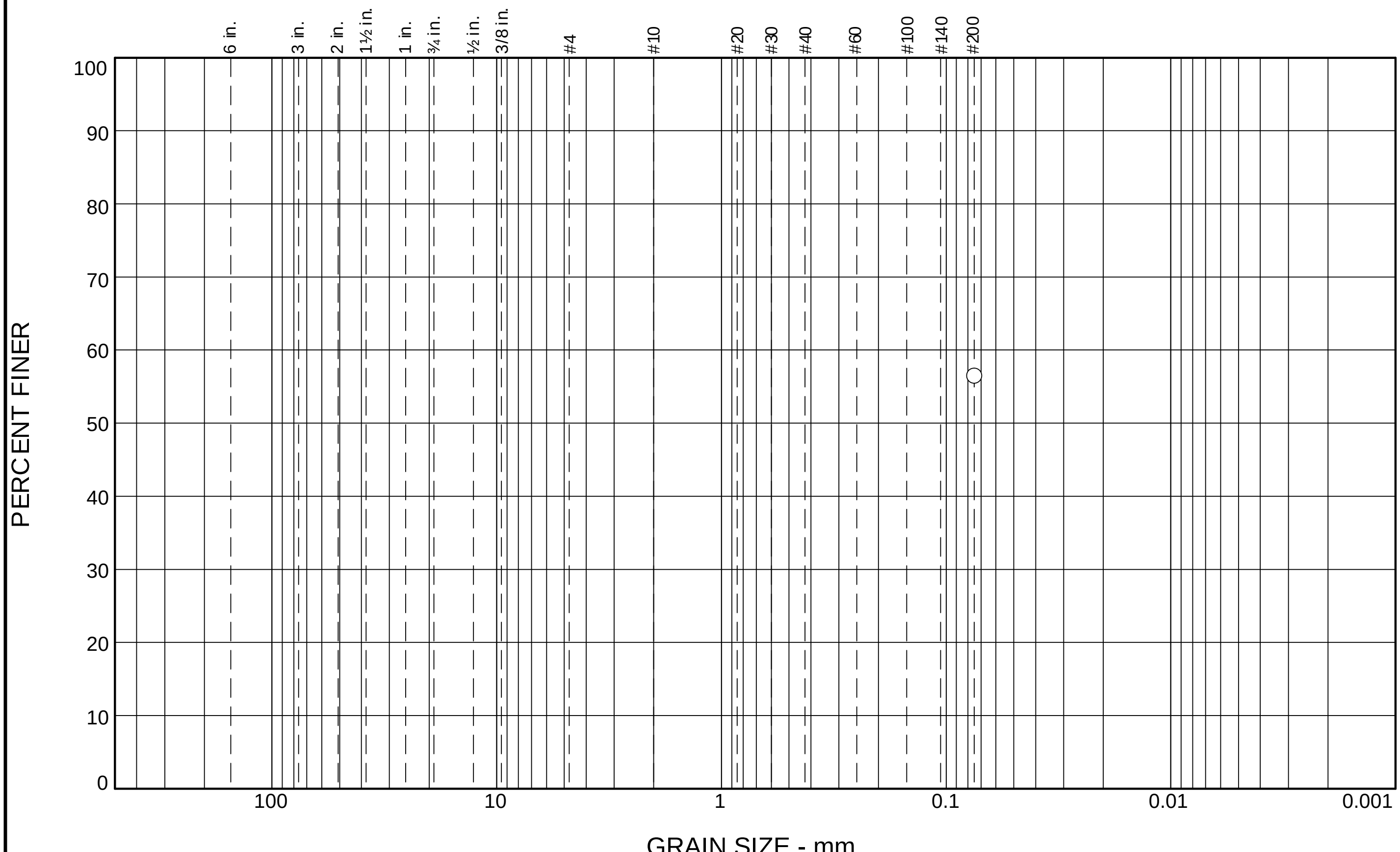
● **Source of Sample:** 1-BH **Depth:** 3.0 feet **Sample Number:** 1-BH4 @ 3

ENGEO INCORPORATED

Remarks:
● PI: ASTM D4318,
GS: ASTM D422,
USCS: ASTM D2487

Tested By: JL **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						56.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	56.5		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D1140

Source of Sample: 1-BH **Depth:** 27.0 feet
Sample Number: 1-BH1 @ 27 **Date:** 7.18.13

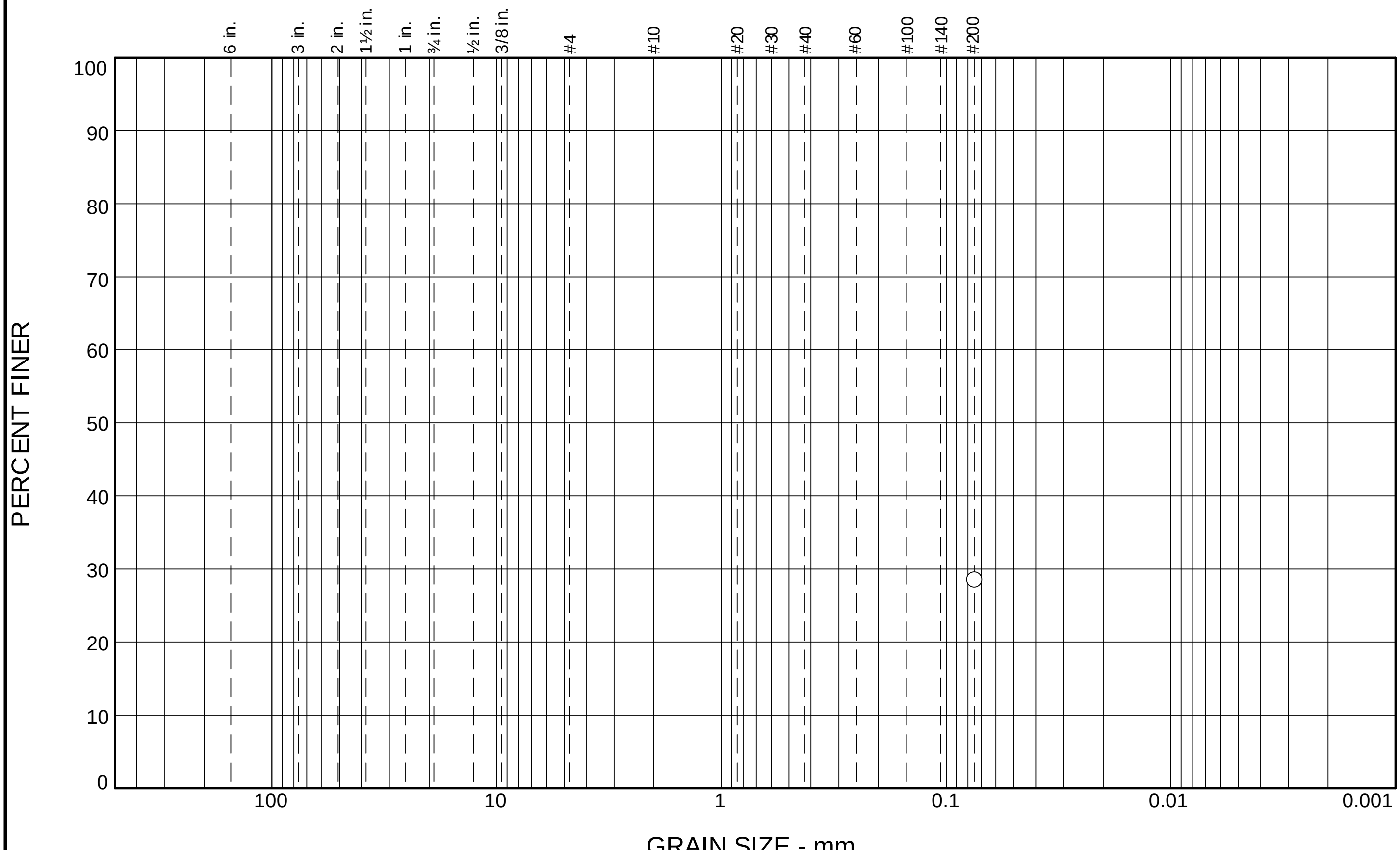
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						28.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	28.6		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 18 LL= 25 PI= 7

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D1140, PI: ASTM D4318

Source of Sample: 1-BH **Depth:** 32.5 feet
Sample Number: 1-BH1 @ 32.5 **Date:** 7.18.13

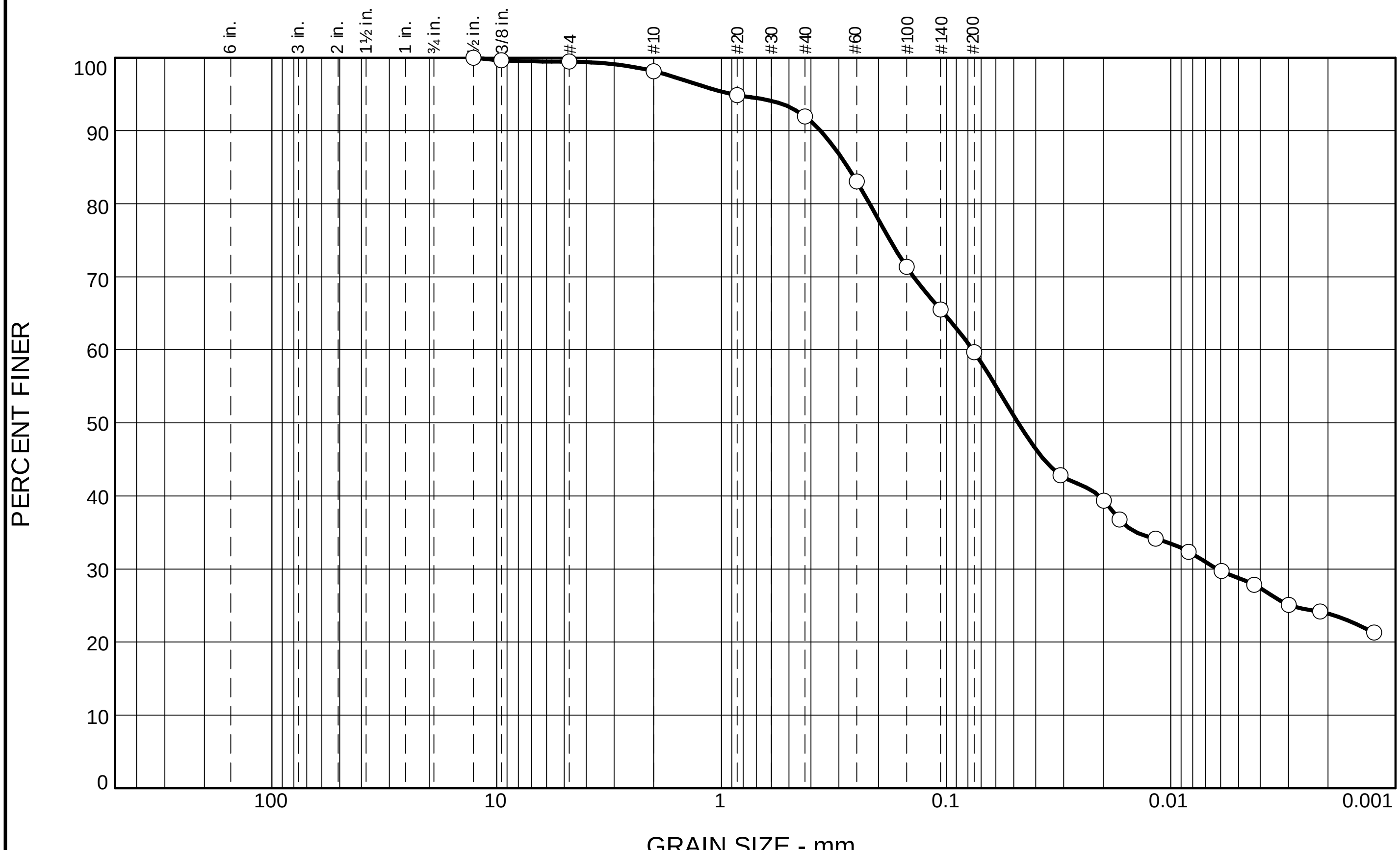
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	1.4	6.1	32.3	30.9	28.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2	100.0		
3/8	99.6		
#4	99.5		
#10	98.1		
#20	94.9		
#40	92.0		
#60	83.0		
#100	71.4		
#140	65.5		
#200	59.7		
0.0309 mm.	42.8		
0.0198 mm.	39.4		
0.0169 mm.	36.8		
0.0117 mm.	34.1		
0.0083 mm.	32.4		
0.0060 mm.	29.7		
0.0043 mm.	27.8		
0.0030 mm.	25.1		
0.0022 mm.	24.2		
0.0012 mm.	21.3		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 13 LL= 44 PI= 31

Coefficients

D_{90}= 0.3628 D_{85}= 0.2739 D_{60}= 0.0762
D_{50}= 0.0478 D_{30}= 0.0062 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(15)

Remarks

GS: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

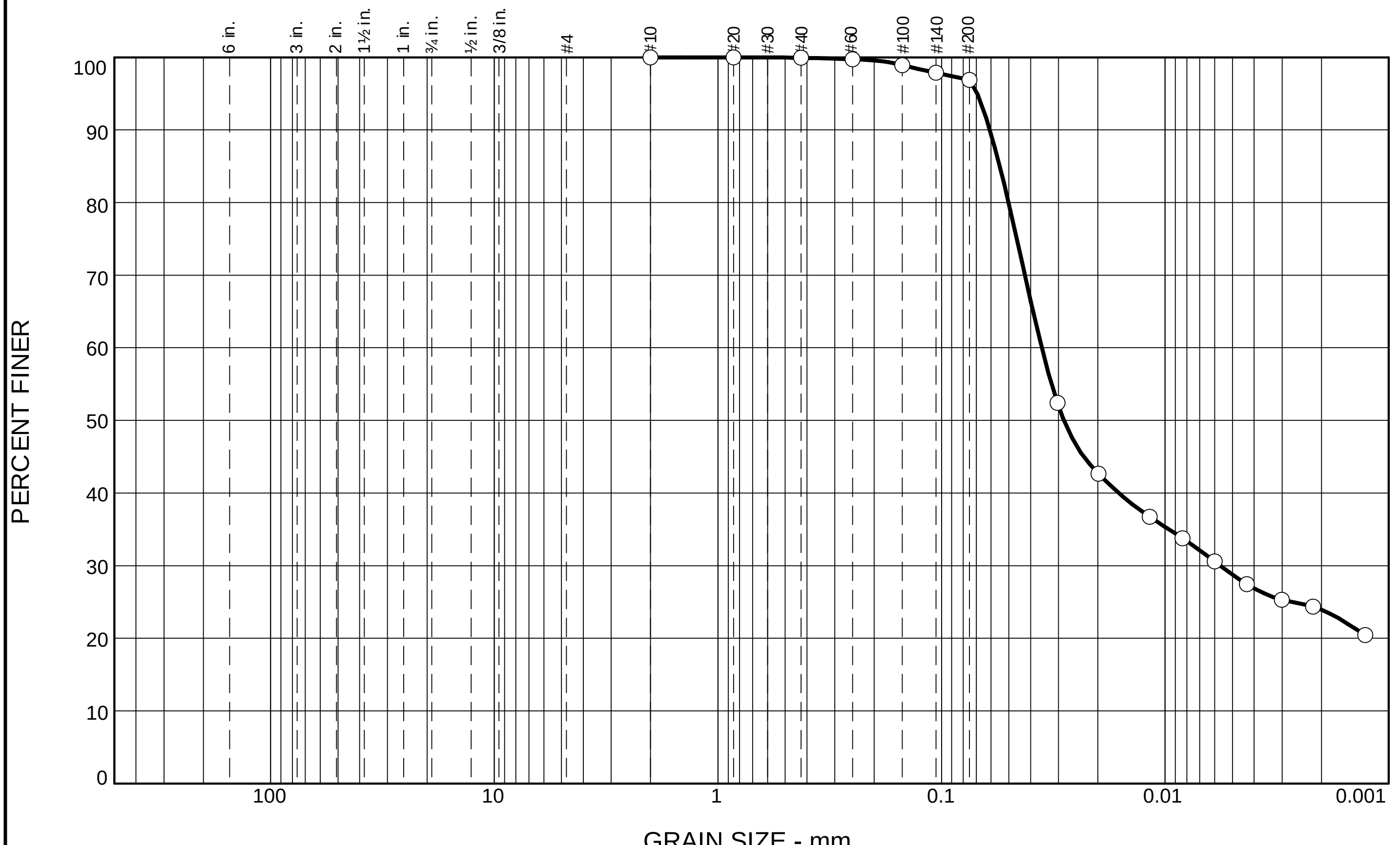
Source of Sample: 1-BH **Depth:** 2.0 feet
Sample Number: 1-BH11 @ 2 **Date:** 7.19.13

ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community
Project No: 9901.000.000

Tested By: GC/TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	3.0	68.1	28.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	100.0		
#40	99.9		
#60	99.7		
#100	98.9		
#140	97.9		
#200	96.9		
0.0303 mm.	52.4		
0.0199 mm.	42.6		
0.0117 mm.	36.7		
0.0084 mm.	33.8		
0.0060 mm.	30.6		
0.0043 mm.	27.4		
0.0030 mm.	25.3		
0.0022 mm.	24.3		
0.0013 mm.	20.4		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 18 LL= 37 PI= 19

Coefficients

D_{90}= 0.0608 D_{85}= 0.0549 D_{60}= 0.0356
D_{50}= 0.0283 D_{30}= 0.0057 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(19)

Remarks

GS: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Source of Sample: 1-BH **Depth:** 31.0 feet
Sample Number: 1-BH11 @ 31

Date: 7.18.13

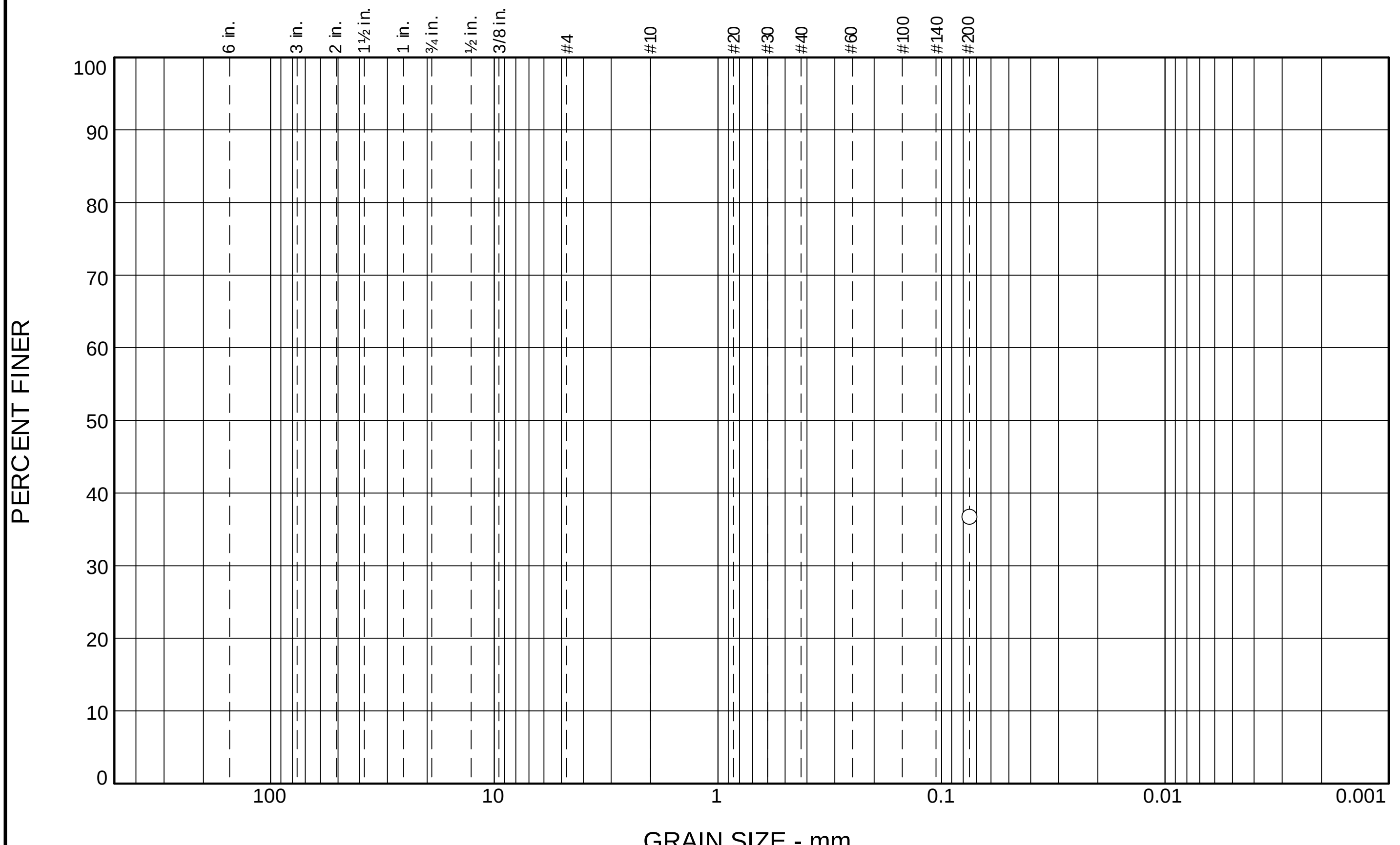
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: GC **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						36.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	36.8		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D1140

Source of Sample: 1-BH **Depth:** 25.0 feet
Sample Number: 1-BH12 @ 25 **Date:** 7.16.13

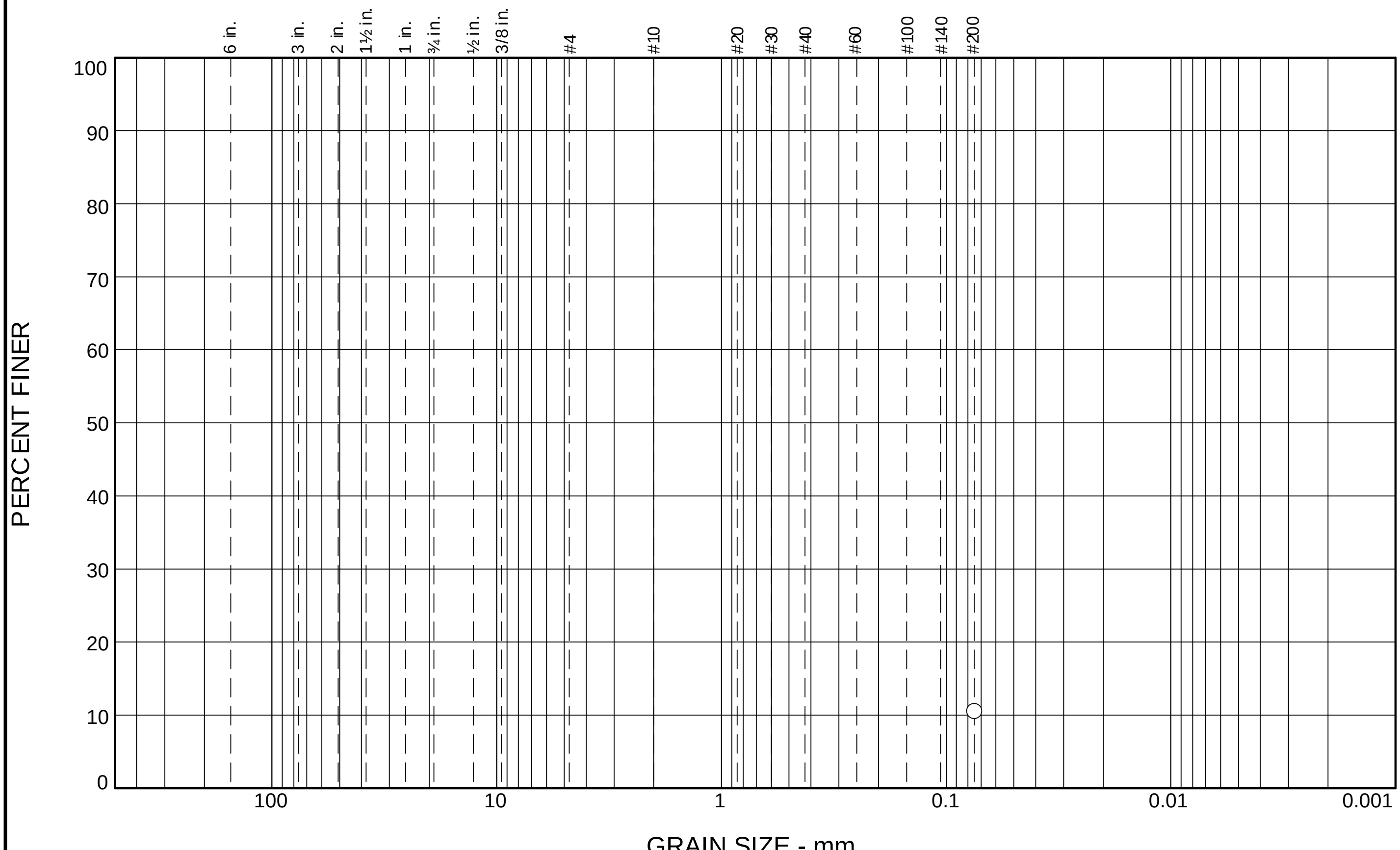
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						10.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	10.6		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D1140

Source of Sample: 1-BH **Depth:** 32.0 feet
Sample Number: 1-BH16 @ 32 **Date:** 7.17.13

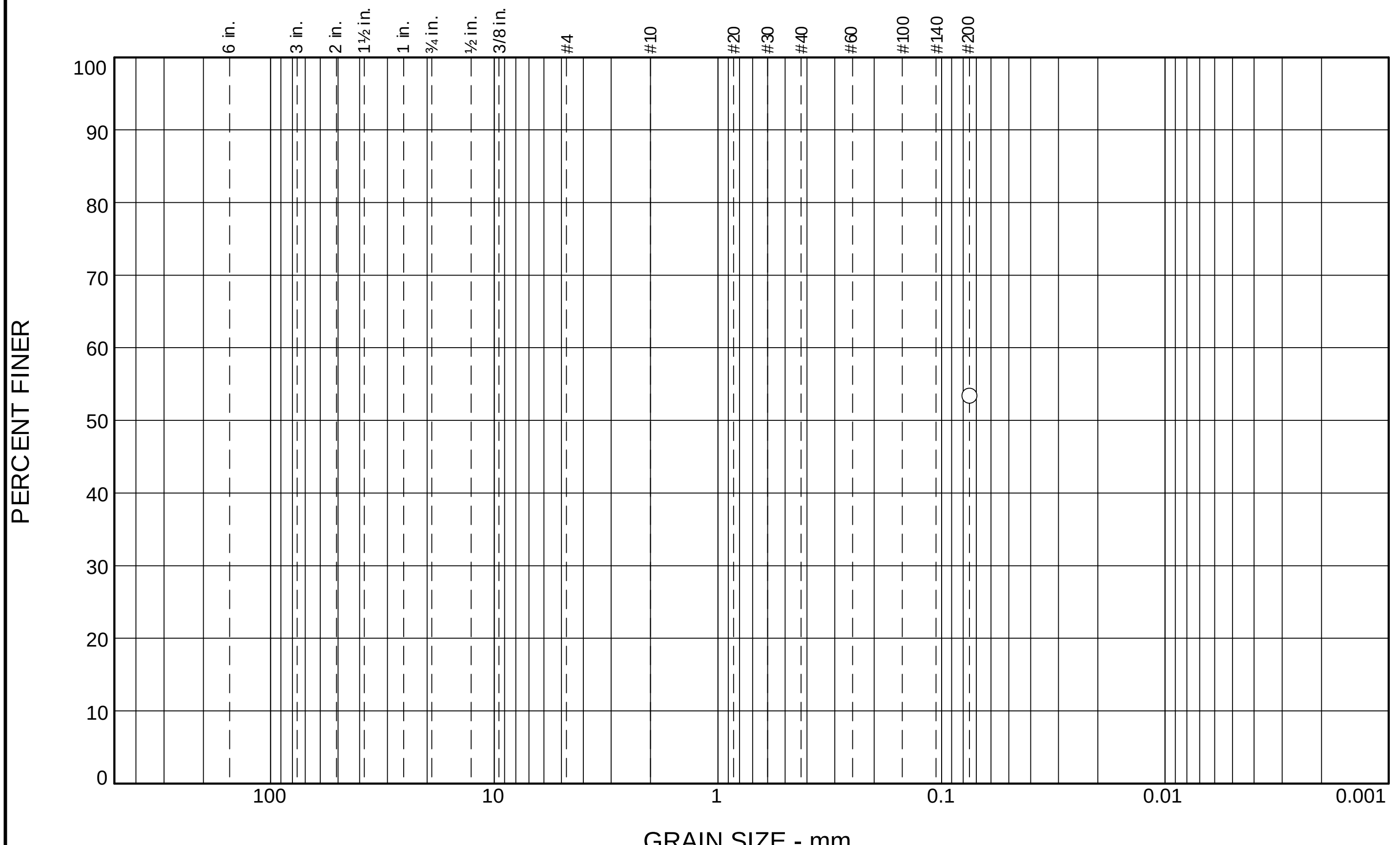
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						53.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	53.4		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D1140

Source of Sample: 1-BH **Depth:** 21.0 feet
Sample Number: 1-BH17 @ 21 **Date:** 7.16.13

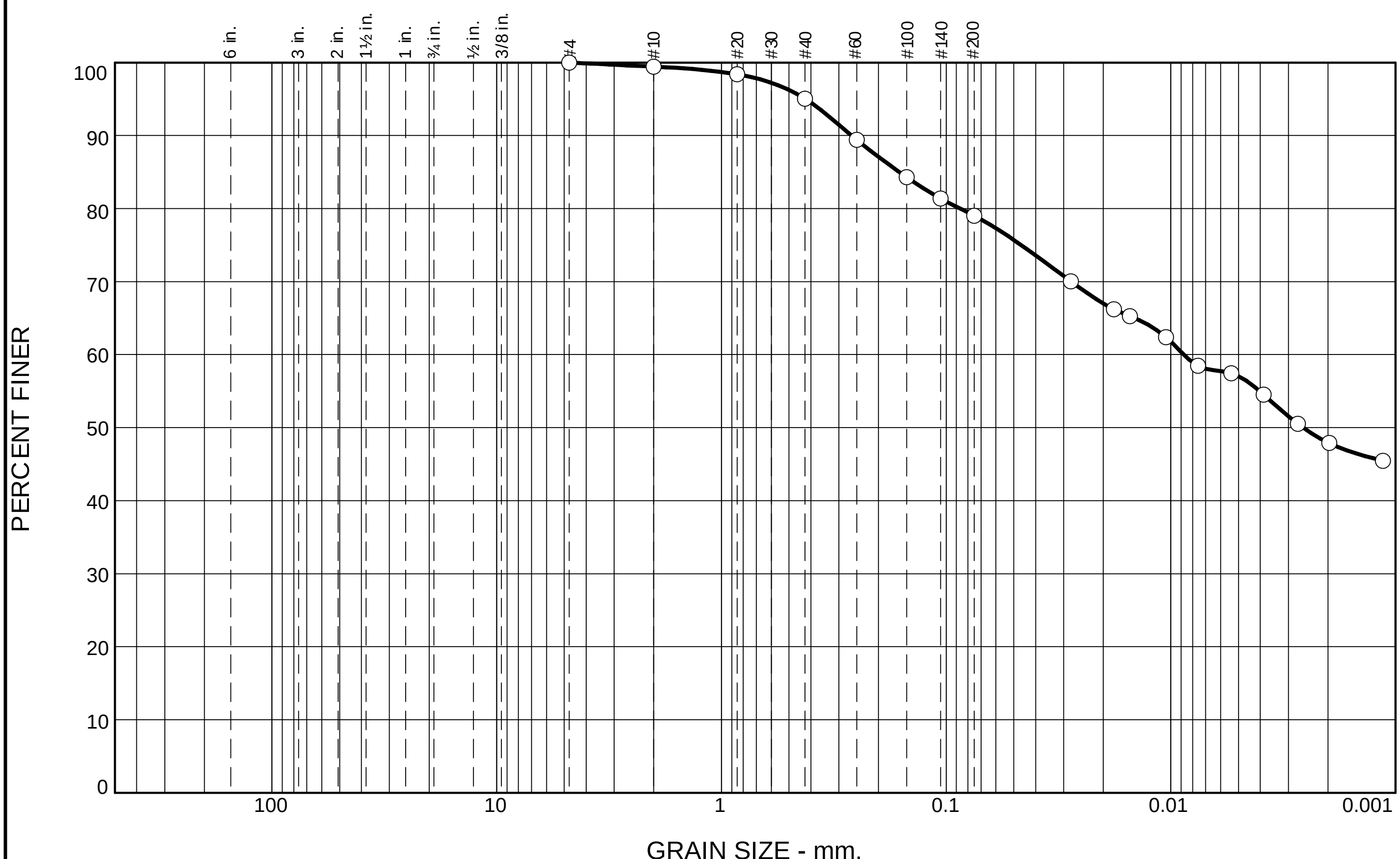
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	4.4	16.0	21.9	57.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.4		
#20	98.4		
#40	95.0		
#60	89.4		
#100	84.3		
#140	81.4		
#200	79.0		
0.0278 mm.	70.0		
0.0179 mm.	66.2		
0.0152 mm.	65.3		
0.0105 mm.	62.4		
0.0076 mm.	58.5		
0.0054 mm.	57.5		
0.0039 mm.	54.5		
0.0027 mm.	50.5		
0.0020 mm.	47.9		
0.0011 mm.	45.5		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 15 LL= 50 PI= 35

Coefficients

D_{90}= 0.2631 D_{85}= 0.1616 D_{60}= 0.0088
D_{50}= 0.0026 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(27)

Remarks

GS: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Source of Sample: 1-BH **Depth:** 3.0 feet
Sample Number: 1-BH17 @ 3 **Date:** 7.18.13

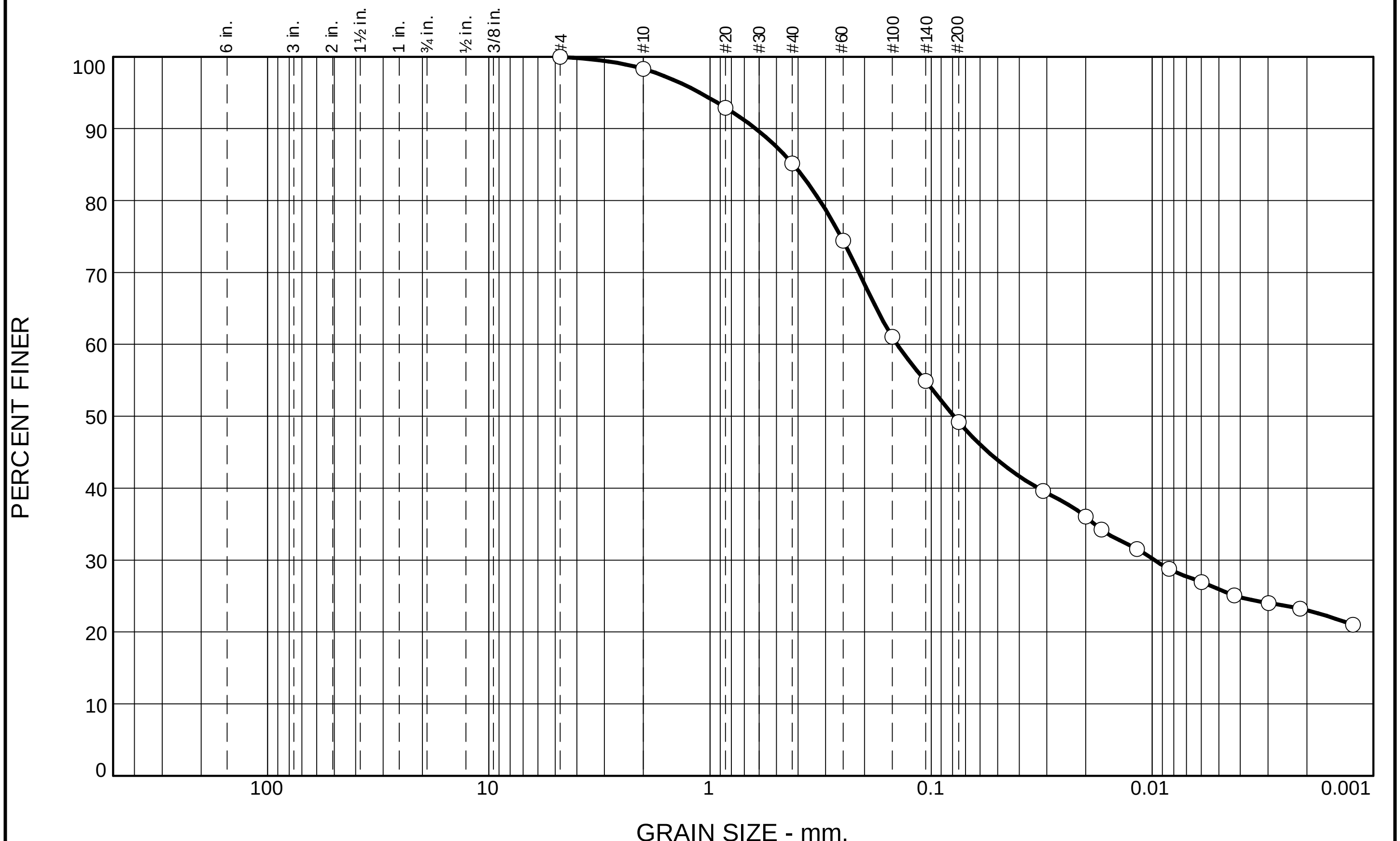
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.7	13.1	36.0	23.3	25.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	98.3		
#20	92.9		
#40	85.2		
#60	74.4		
#100	61.0		
#140	54.9		
#200	49.2		
0.0312 mm.	39.6		
0.0200 mm.	36.0		
0.0170 mm.	34.2		
0.0117 mm.	31.5		
0.0084 mm.	28.8		
0.0060 mm.	26.9		
0.0043 mm.	25.1		
0.0030 mm.	24.0		
0.0021 mm.	23.3		
0.0012 mm.	21.0		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.6213 D_{85}= 0.4202 D_{60}= 0.1426
D_{50}= 0.0789 D_{30}= 0.0098 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D422

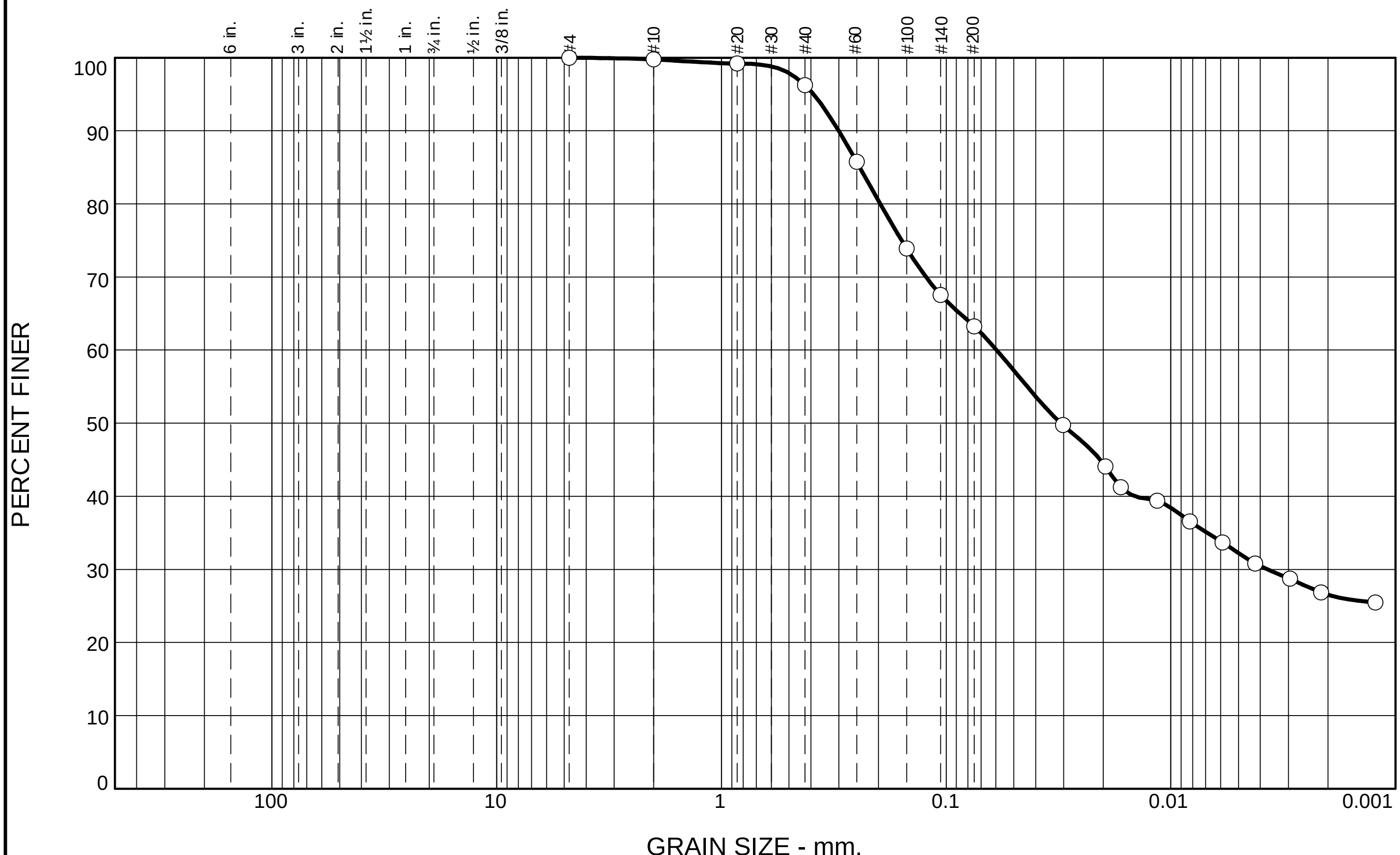
Source of Sample: 1-BH **Depth:** 35.0 feet
Sample Number: 1-BH18 @ 35 **Date:** 7.19.13

ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community
Project No: 9901.000.000

Tested By: GC **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	3.5	33.0	31.1	32.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#20	99.2		
#40	96.3		
#60	85.7		
#100	73.9		
#140	67.6		
#200	63.3		
0.0302 mm.	49.7		
0.0196 mm.	44.1		
0.0167 mm.	41.3		
0.0115 mm.	39.4		
0.0082 mm.	36.5		
0.0059 mm.	33.7		
0.0042 mm.	30.8		
0.0030 mm.	28.7		
0.0021 mm.	26.9		
0.0012 mm.	25.5		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 12 LL= 38 PI= 26

Coefficients

D_{90}= 0.3007 D_{85}= 0.2423 D_{60}= 0.0596
D_{50}= 0.0309 D_{30}= 0.0037 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(13)

Remarks

GS: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Source of Sample: 1-BH **Depth:** 2.0 feet
Sample Number: 1-BH2 @ 2 **Date:** 7.17.13

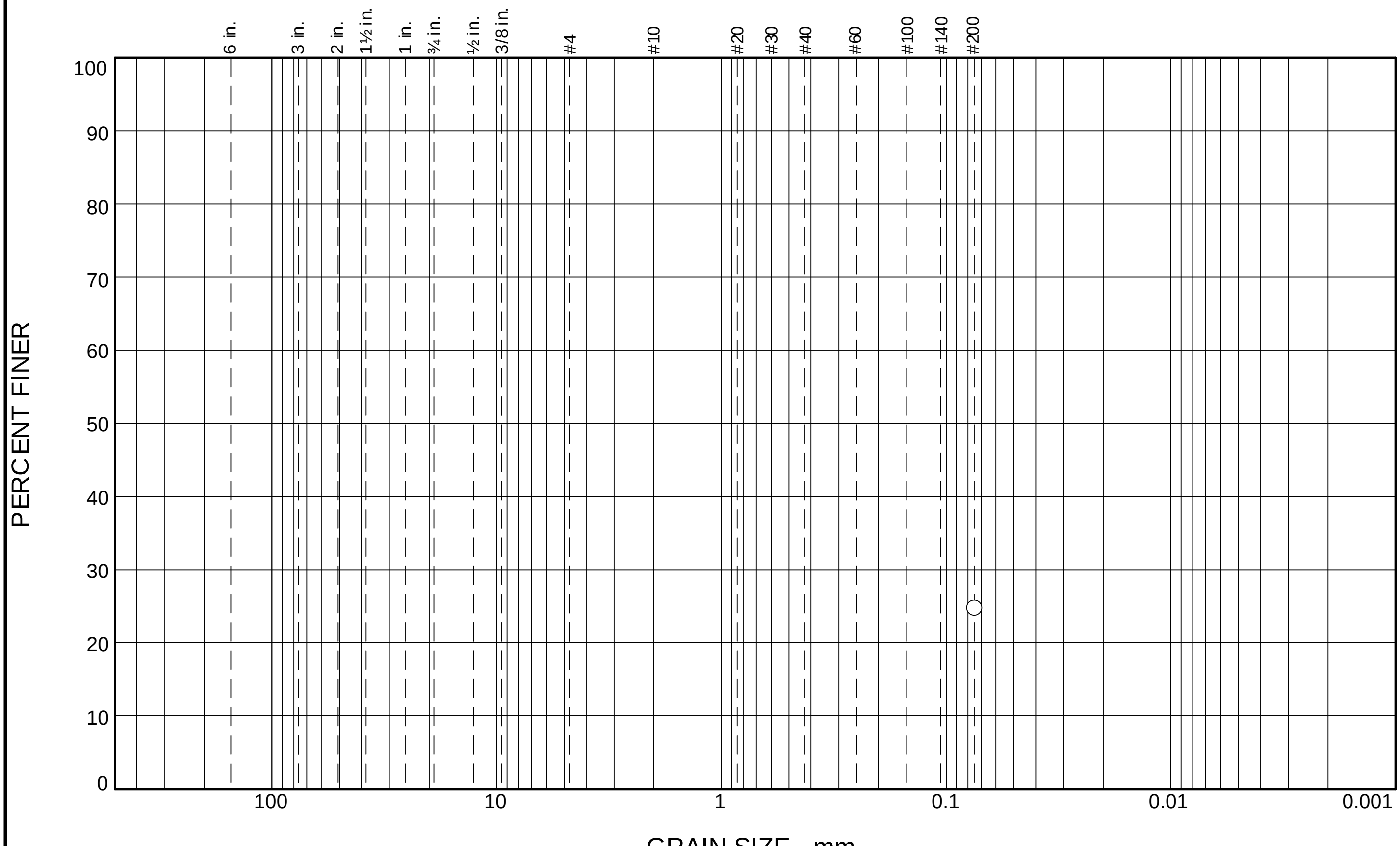
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						24.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	24.8		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D1140

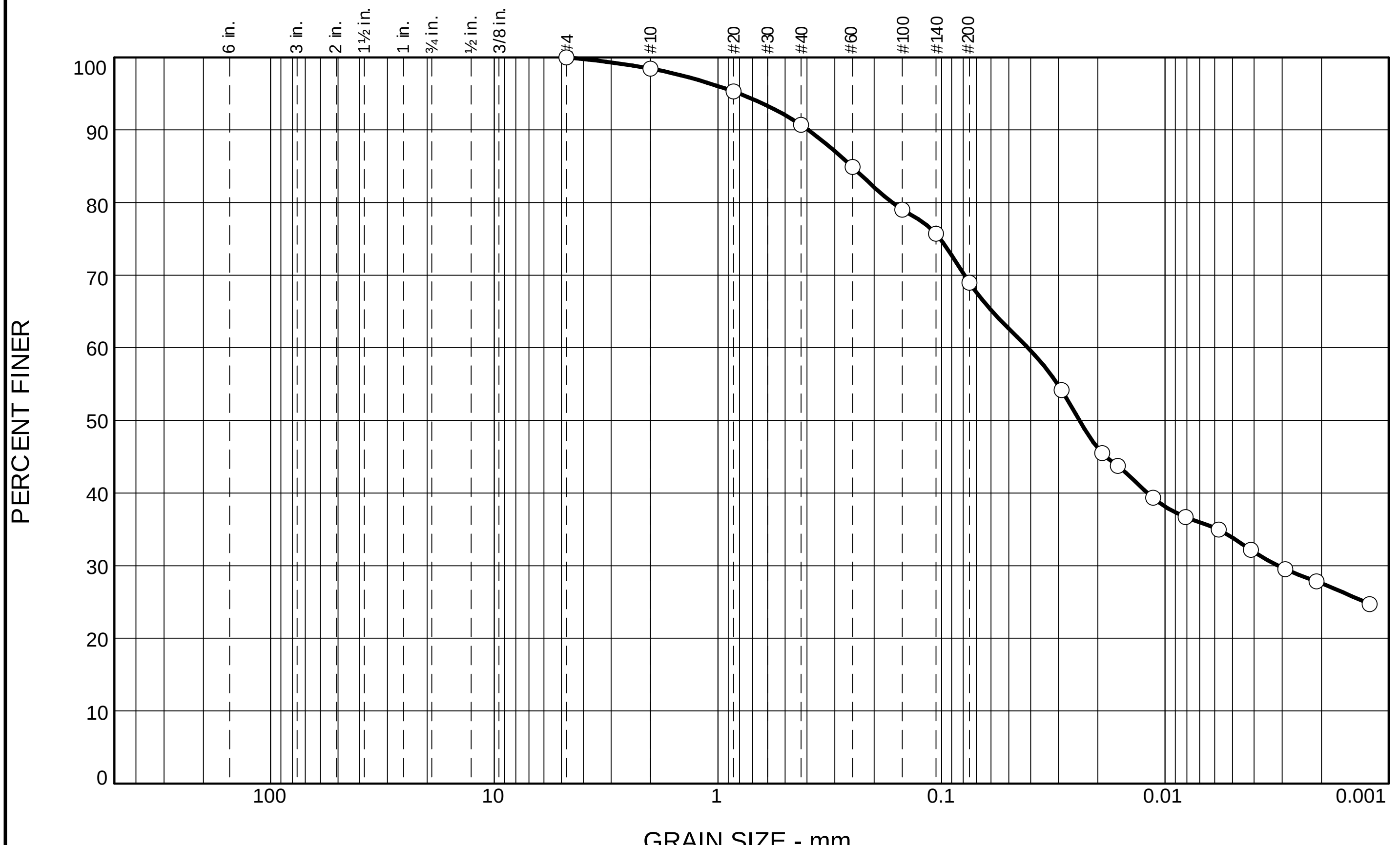
Source of Sample: 1-BH **Depth:** 25.5 feet
Sample Number: 1-BH2 @ 25.5 **Date:** 7.18.13

ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community
Project No: 9901.000.000

Tested By: TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.6	7.7	21.8	35.1	33.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	98.4		
#20	95.3		
#40	90.7		
#60	84.9		
#100	79.0		
#140	75.7		
#200	68.9		
0.0291 mm.	54.2		
0.0191 mm.	45.5		
0.0163 mm.	43.7		
0.0113 mm.	39.3		
0.0081 mm.	36.7		
0.0058 mm.	34.9		
0.0041 mm.	32.2		
0.0029 mm.	29.5		
0.0021 mm.	27.8		
0.0012 mm.	24.7		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 16 LL= 35 PI= 19

Coefficients

D_{90}= 0.3951 D_{85}= 0.2523 D_{60}= 0.0410
D_{50}= 0.0242 D_{30}= 0.0031 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(11)

Remarks

GS: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Source of Sample: 1-BH **Depth:** 2.0 feet
Sample Number: 1-BH20 @ 2 **Date:** 7.18.13

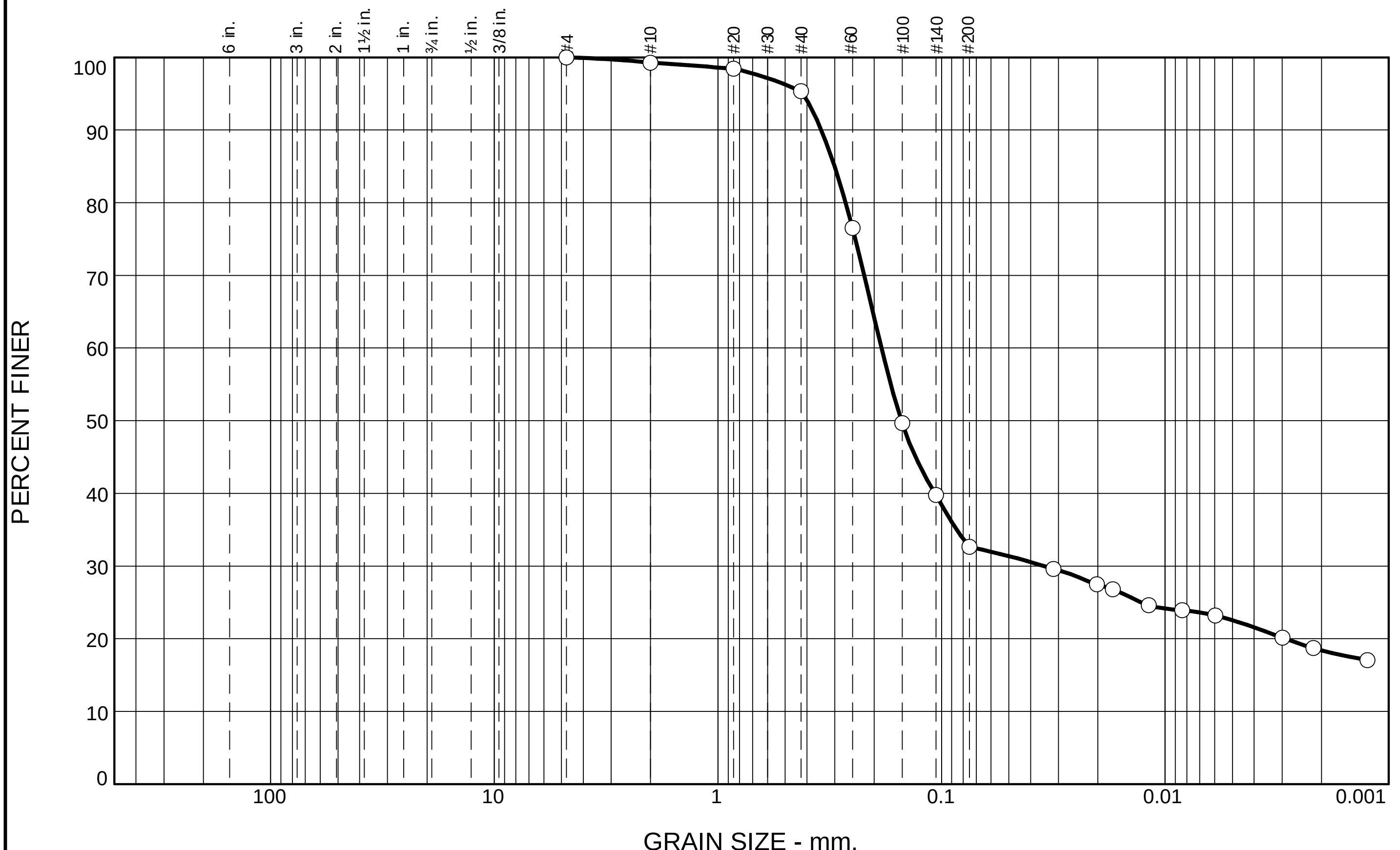
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: GC **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.7	4.0	62.6	10.1	22.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.3		
#20	98.4		
#40	95.3		
#60	76.5		
#100	49.7		
#140	39.8		
#200	32.7		
0.0316 mm.	29.6		
0.0202 mm.	27.5		
0.0171 mm.	26.8		
0.0118 mm.	24.6		
0.0084 mm.	23.9		
0.0060 mm.	23.2		
0.0030 mm.	20.1		
0.0022 mm.	18.7		
0.0012 mm.	17.1		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3448 D_{85}= 0.3006 D_{60}= 0.1855
D_{50}= 0.1512 D_{30}= 0.0349 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D422

Source of Sample: 1-BH **Depth:** 13.5 feet
Sample Number: 1-BH3 @ 13.5

Date: 7.17.13

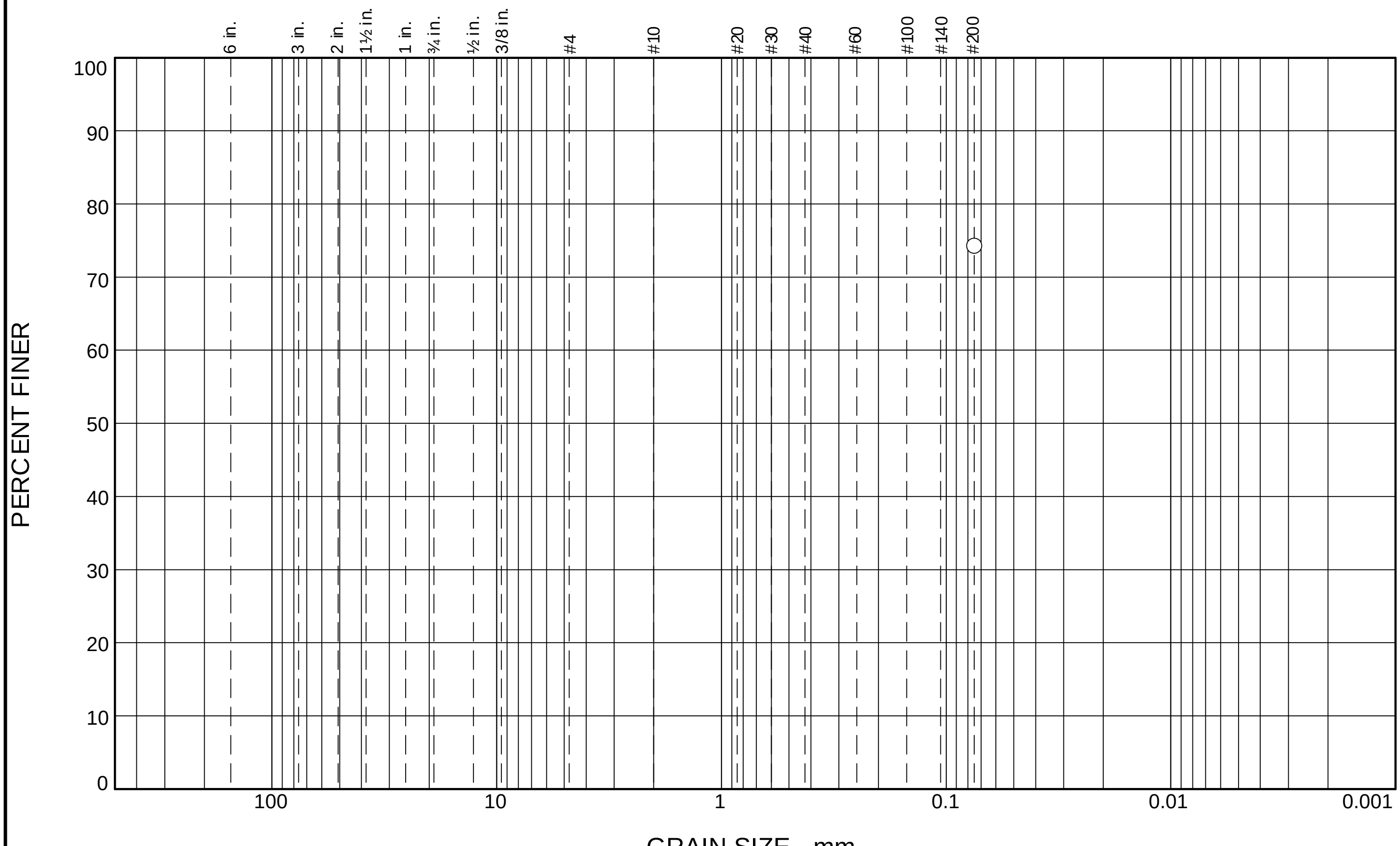
ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community

Project No: 9901.000.000

Tested By: GC **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						74.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	74.3		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D1140

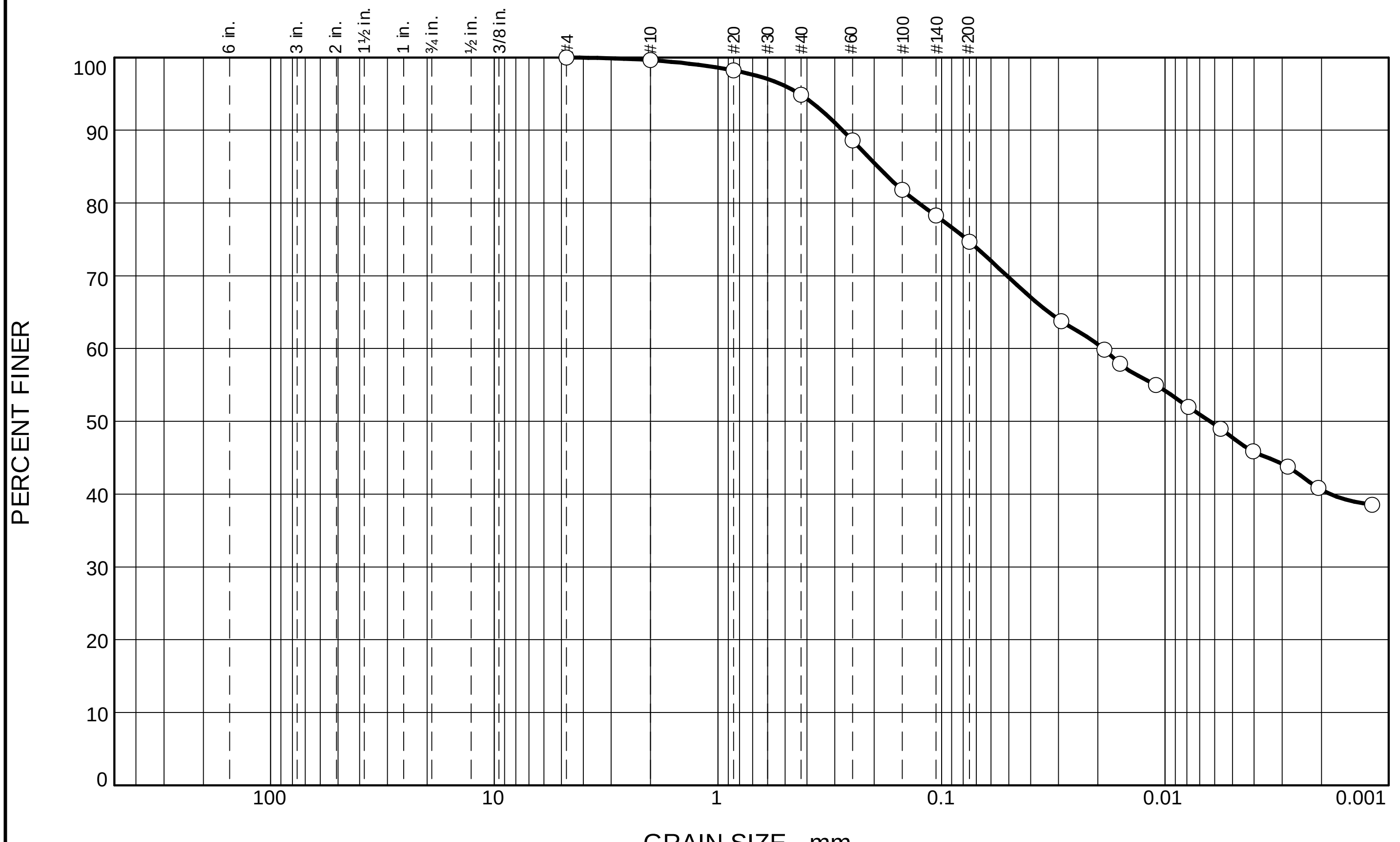
Source of Sample: 1-BH4 **Depth:** 14.0 feet
Sample Number: 1-BH4 @ 14 **Date:** 7.15.13

ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community
Project No: 9901.000.000

Tested By: TB **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	4.7	20.2	26.9	47.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.6		
#20	98.2		
#40	94.9		
#60	88.6		
#100	81.8		
#140	78.3		
#200	74.7		
0.0291 mm.	63.8		
0.0187 mm.	59.9		
0.0159 mm.	57.9		
0.0110 mm.	55.0		
0.0079 mm.	52.0		
0.0056 mm.	49.0		
0.0040 mm.	45.9		
0.0028 mm.	43.8		
0.0021 mm.	40.8		
0.0012 mm.	38.5		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 14 LL= 42 PI= 28

Coefficients

D_{90}= 0.2770 D_{85}= 0.1929 D_{60}= 0.0189
D_{50}= 0.0063 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(19)

Remarks

GS: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

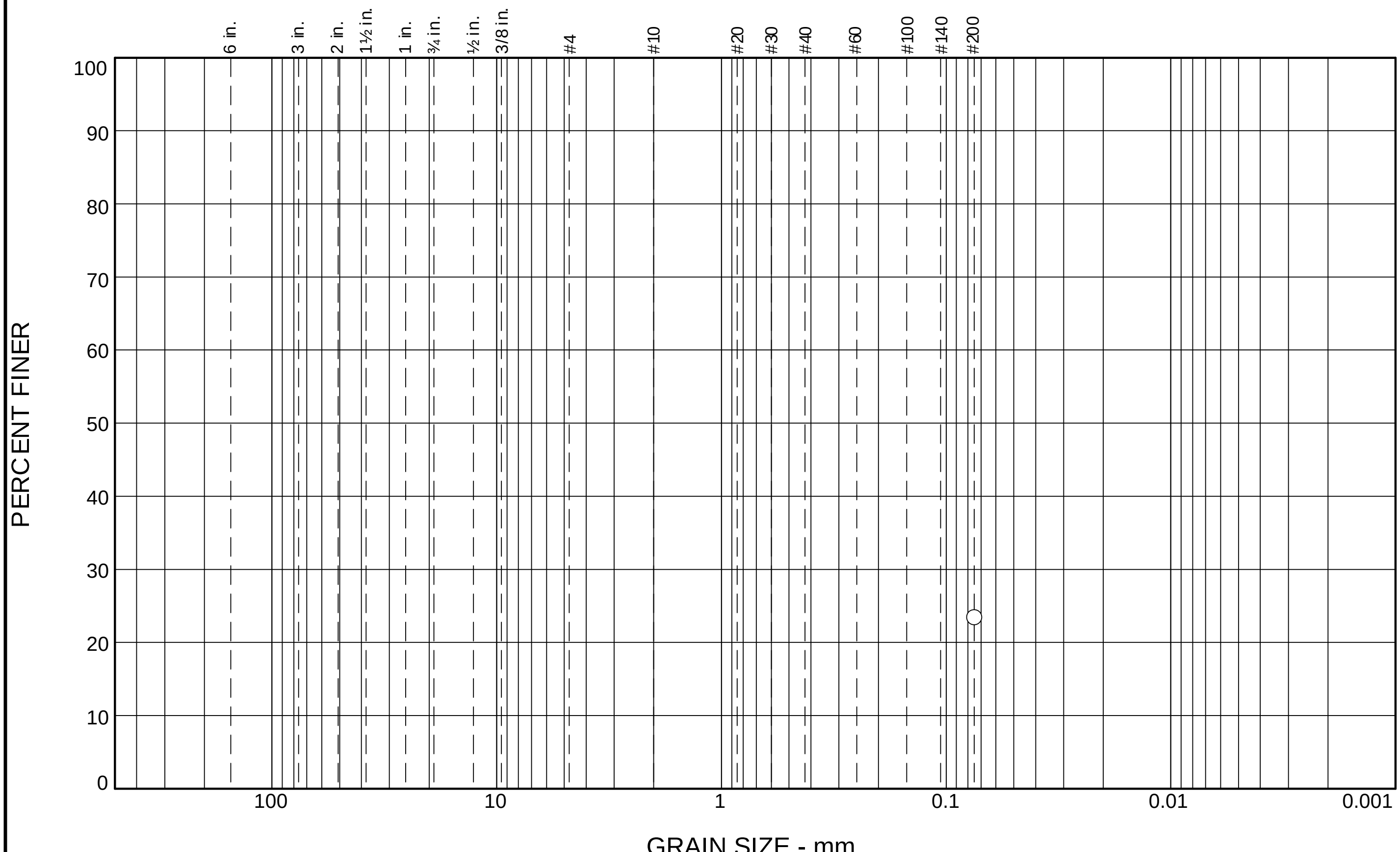
Source of Sample: 1-BH **Depth:** 3.0 feet
Sample Number: 1-BH4 @ 3 **Date:** 7.18.13

ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community
Project No: 9901.000.000

Tested By: GC **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						23.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	23.4		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

GS: ASTM D1140

Source of Sample: 1-BH5 **Depth:** 26.0 feet
Sample Number: 1-BH5 @ 26 **Date:** 7.15.13

ENGEO INCORPORATED

Client: Pulte Group - 2009
Project: San Juan Oaks - Retirement Community
Project No: 9901.000.000

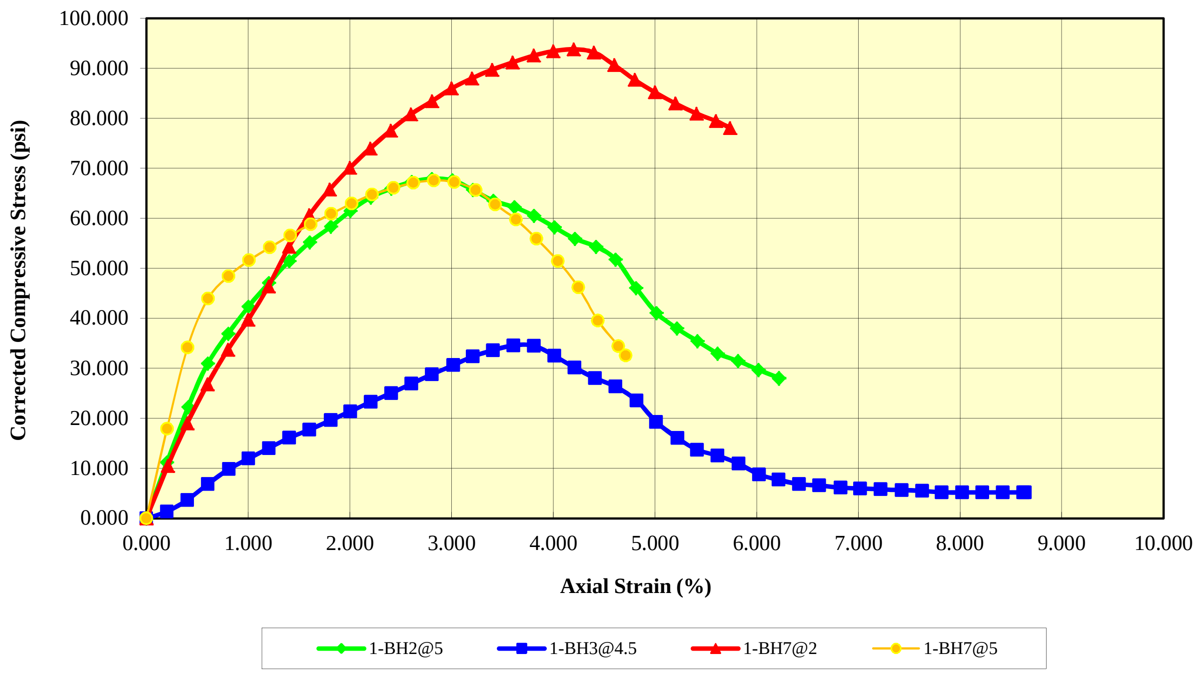
Tested By: TB **Checked By:** DS

ENGEO

Unconfined Compression Test Report (ASTM D2166)

Date 07/10/13
Checked By D. Seibold
Date 07/10/13
Computed By G. Criste
Date 07/09/13
Tested By G. Criste

Compressive Stress Axial Strain Curve



Before Test	Specimen			
	1-BH2@5	1-BH3@4.5	1-BH7@2	1-BH7@5
Water Content (%)	10.81	9.85	12.29	11.13
Dry Density (pcf)	107.000	109.400	107.300	110.900
Saturation (%)	52.45	50.97	60.18	60.00
Void Ratio	0.55	0.51	0.54	0.49
Diameter (in)	2.343	2.332	2.333	2.354
Height (in)	5.029	5.031	5.044	4.998
Test Data	**1-BH2@5**	**1-BH3@4.5**	**1-BH7@2**	**1-BH7@5**
Unconfined Compressive Strength (psi)	67.921	34.588	93.832	67.567
Unconfined Compressive Strength (tsf)	4.886	2.488	6.750	4.861
Undrained Shear Strength (psi)	33.960	17.294	46.916	33.783
Rate of Strain (in/min)	0.050000	0.050000	0.050000	0.050000
Strain at Failure (%)	2.81	3.61	4.20	2.83
Height-to-Diameter Ratio	2.146	2.157	2.162	2.123

Project Information		Sample ID	Description
Project Number	9901.000.000	1-BH2@5	See exploration logs
Project Name	San Juan Oaks - Retirement	1-BH3@4.5	See exploration logs
Test Date	07/09/13	1-BH7@2	See exploration logs
Location		1-BH7@5	See exploration logs
Client	Pulte Group - 2009		

Index Properties	1-BH2@5	1-BH3@4.5	1-BH7@2	1-BH7@5
Specific Gravity:	2.65	2.65	2.65	2.65
Liquid Limit:				
Plastic Limit:				

Remarks: Specific gravity values were assumed; 1-BH3@4.5 was substituted for 1-BH3@2

EN GEO

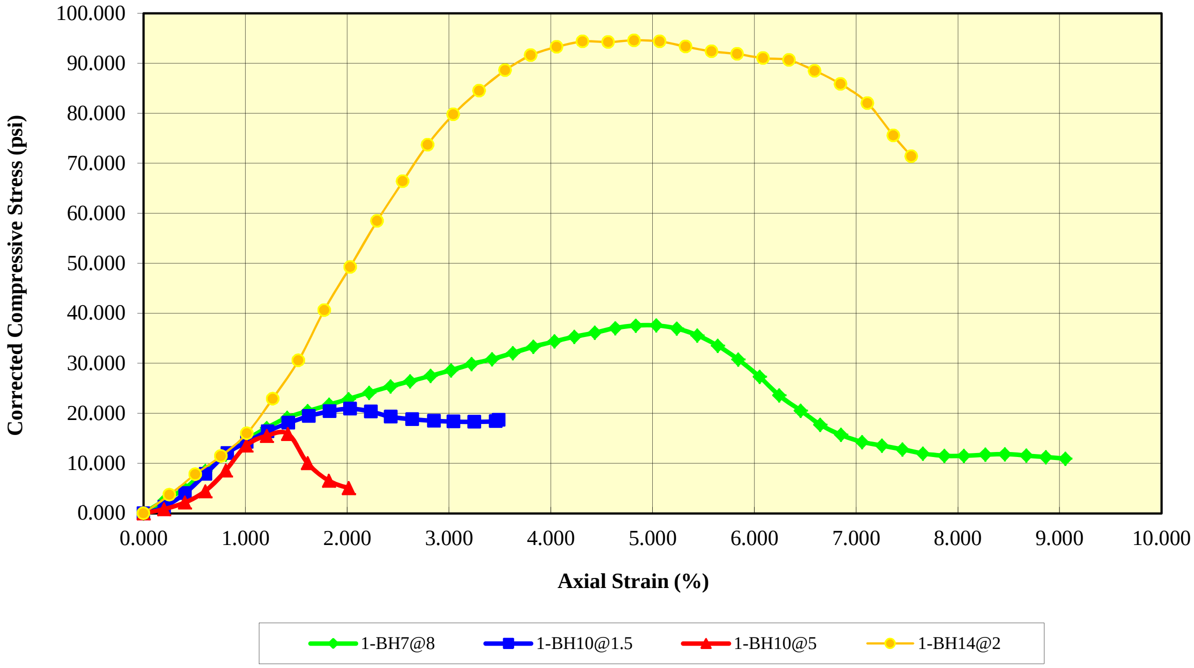
Unconfined Compression Test Report (ASTM D2166)

Date 07/11/13 | Checked By D. Seibold

Date 07/11/13 | Computed By G. Criste

Date 07/10/13 | Tested By G. Criste

Compressive Stress Axial Strain Curve



Before Test	Specimen			
	1-BH7@8	**1-BH10@1.5**	**1-BH10@5**	**1-BH14@2**
Water Content (%)	10.53	32.07	18.54	13.20
Dry Density (pcf)	104.500	89.000	89.100	106.900
Saturation (%)	47.89	98.90	57.33	63.93
Void Ratio	0.58	0.86	0.86	0.55
Diameter (in)	2.348	2.398	2.402	2.323
Height (in)	5.007	4.966	5.010	3.977
Test Data	**1-BH7@8**	**1-BH10@1.5**	**1-BH10@5**	**1-BH14@2**
Unconfined Compressive Strength (psi)	37.618	20.938	15.891	94.615
Unconfined Compressive Strength (tsf)	2.706	1.506	1.143	6.807
Undrained Shear Strength (psi)	18.809	10.469	7.945	47.308
Rate of Strain (in/min)	0.050000	0.050000	0.050000	0.050000
Strain at Failure (%)	5.04	2.03	1.42	4.82
Height-to-Diameter Ratio	2.132	2.071	2.086	1.712

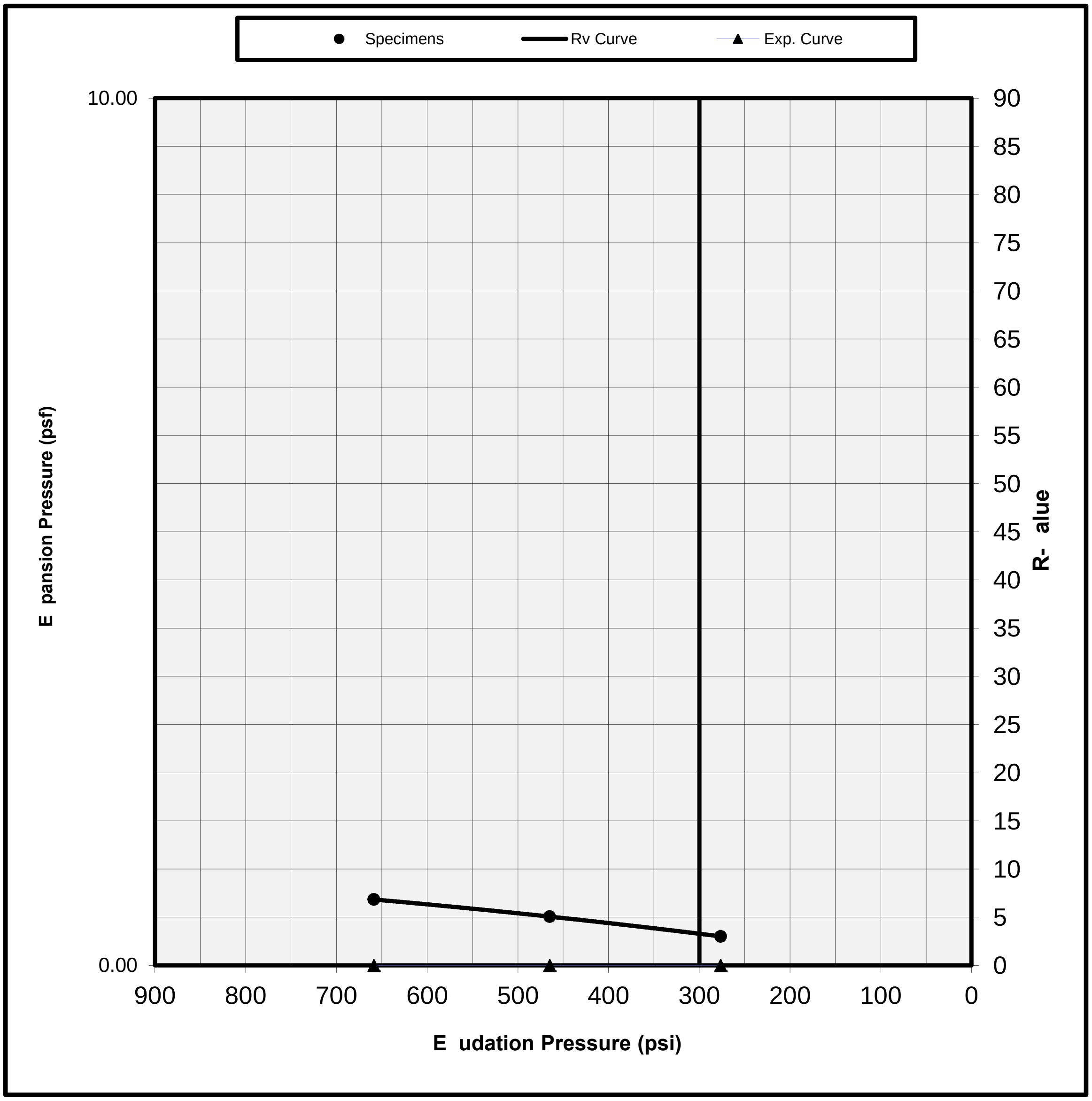
Project Information		Sample ID	Description
Project Number	9901.000.000	1-BH7@8	See exploration logs
Project Name	San Juan Oak - Retirement	1-BH10@1.5	See exploration logs
Test Date	07/10/13	1-BH10@5	See exploration logs
Location		1-BH14@2	See exploration logs

Client	Pulte Group - 2009

Index Properties	1-BH7@8	1-BH10@1.5	1-BH10@5	1-BH14@2
Specific Gravity:	2.65	2.65	2.65	2.65
Liquid Limit:				
Plastic Limit:				

Remarks	Specific gravity values were assumed.

R VALUE TEST REPORT
CTM-301



Date: 07/18/13
Project Name: San Jaun Oaks- Retirement Community Center
Project Number: 9901.000.000 Ph001 Task003
Sample location: 1-BH15 (1-7)
Material description: Dark olive brown CLAY
Tested by: DB,JL **Reviewed by:**

Specimen	Specimen 1	Specimen 2	Specimen 3
Exudation Pressure (p.s.i.)	659	465	277
Expansion dial (0.0001")	0	0	0
Expansion Pressure (p.s.f.)	0	0	0
Resistance Value, "R"	7	5	3
% Moisture at Test	20.4	23.2	26.0
Dry Density at Test, p.c.f.	102.2	97.1	92.8
"R" Value at Exudation Pressure of 300 psi.	< 5		
Expansion Pressure (psf) at Exudation Pressure of 300 psi.	0		

SULFATE CONTENT IN SOILS
CALTRANS TEST METHOD 417

Sample Number	Sample ID	Matrix	Water soluble sulfate in soil	
			% by weight	mg/kg
1	1-BH1 @ 2	soil	0.001	11
2	1-BH9 @ 2	soil	0.000	4
3	1-BH16 @ 3	soil	0.001	5

Project Name: San Juan Oaks - Retirement Community **Date:** 07/17/13
Client: Pulte Group - 2009
Project Number: 9901.000.000
Phase Number: 001

Tested by: TB
Reviewed by: DS

ENGEO INCORPORATED

ENGEO Incorporated 2010 Crow Canyon Place Suite 250 San Ramon, CA 94583
Laboratory Address: 2057 San Ramon Valley Blvd San Ramon, CA 94583 (925)837-2973

EN GEO

Consolidated Undrained Triaxial Test (ASTM D4767)

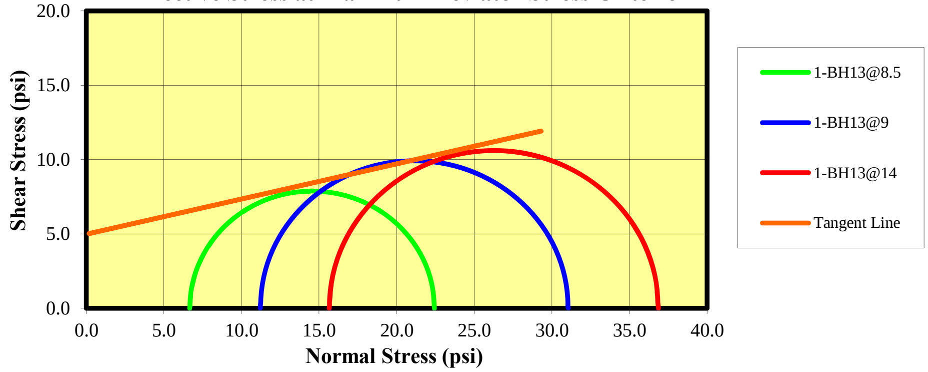
Date: 7.22.13

Checked By: J. Fippin

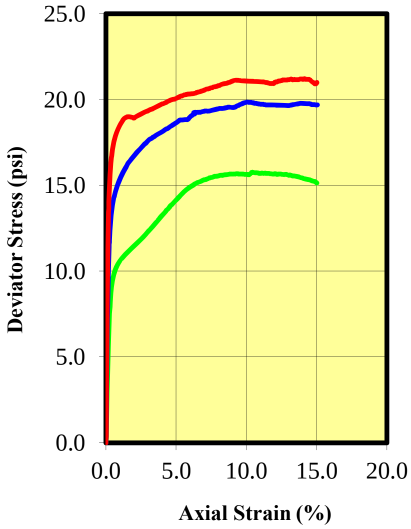
Date : 7.22.13

Tested By: D. Seibold

Effective Stress at Maximum Deviator Stress Criterion



Deviator Stress Vs. Axial Strain



Initial	B13@8.5	B13@8.5	B13@14	
Height-to-Diameter Ratio	2.088	2.096	2.092	
Water Content (%)	21.6	28.9	38.0	
Dry Density (pcf)	101.6	95.0	84.3	
Saturation (%)	96.90	99.73	99.86	
Void Ratio	0.568	0.785	1.055	
Diameter (in)	2.390	2.385	2.390	
Height (in)	4.990	5.000	5.000	
Specific Gravity	2.557	2.720	2.780	
Liquid Limit	70	86	108	
Plastic Limit	17	22	27	
After Consolidation	**B13@8.5**	**B13@8.5**	**B13@14**	
B-Value	0.94	0.95	0.94	
Water Content (%)	32.97	34.30	43.23	
Dry Density (pcf)	99.14	94.59	84.45	
Saturation (%)	100.00	100.00	100.00	
Void Ratio	0.610	0.795	0.852	
Effective Stress (psi)	6.9	10.4	17.4	
Back Press. (psi)	88.7	90.0	92.5	
Rate of Strain	0.00075	0.00075	0.00075	
Height-to-Diameter Ratio	2.093	2.098	2.099	
After Shear	**B13@8.5**	**B13@8.5**	**B13@14**	
σ'1 at Failure (psi)	22.42	31.05	36.86	
σ'3 at Failure (psi)	6.66	11.20	15.64	
t_{50}(min)	N/A	N/A	N/A	
t_0(min)	N/A	N/A	N/A	

Maximum Deviator Stress Criterion	
C (psi)	5.3
C' (psi)	4.8
Ø (deg)	11.5
Ø' (deg)	13.3

Project:	San Juan Oaks Drive
Location:	Hollister, California
Project Number:	9901.000.000, Ph 001
Boring Number:	1-BH13
Sample Number:	Multiple
Depth:	Various
Sample Type:	In-Situ site material
Description:	See exploration logs
Test Type	Consolidated Undrained
Remarks	Consolidation data was indeterminant. Used ASTM default strain rate of 1% strain per hour.

N/A	N/A	N/A	N/A
Failure Photographs			

ENGEO

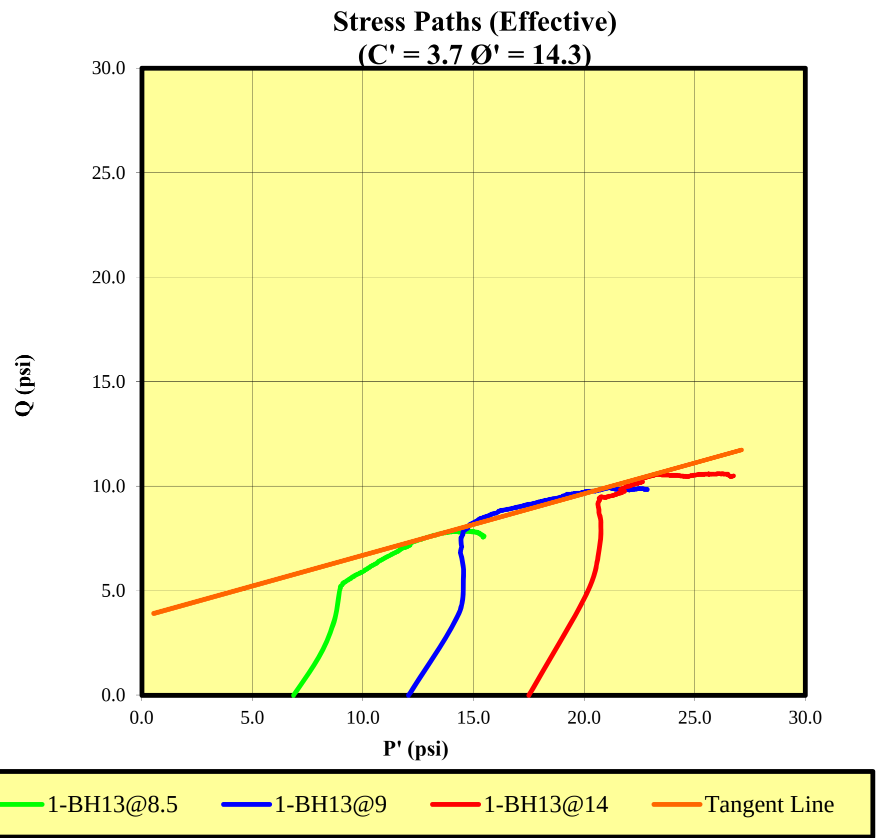
Consolidated Undrained Triaxial Test (ASTM D4767)

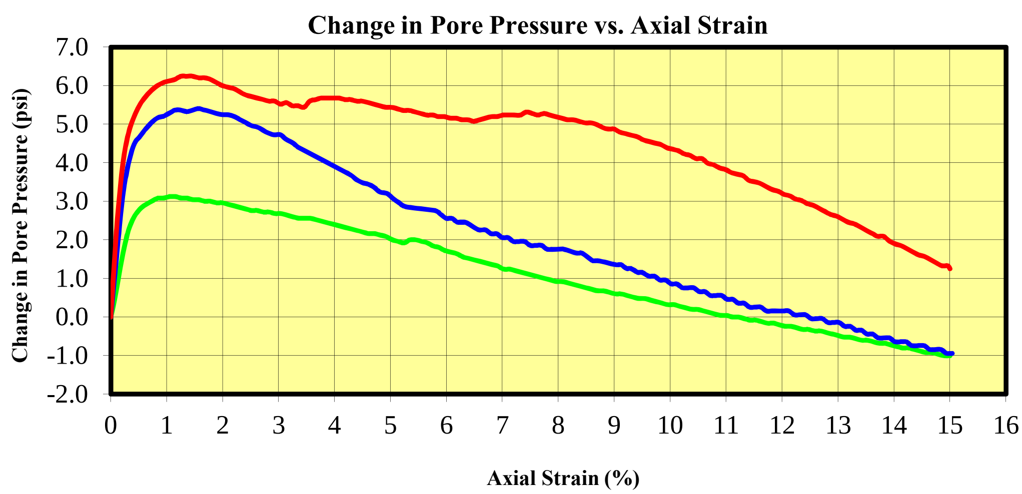
Tested By: D. Seibold

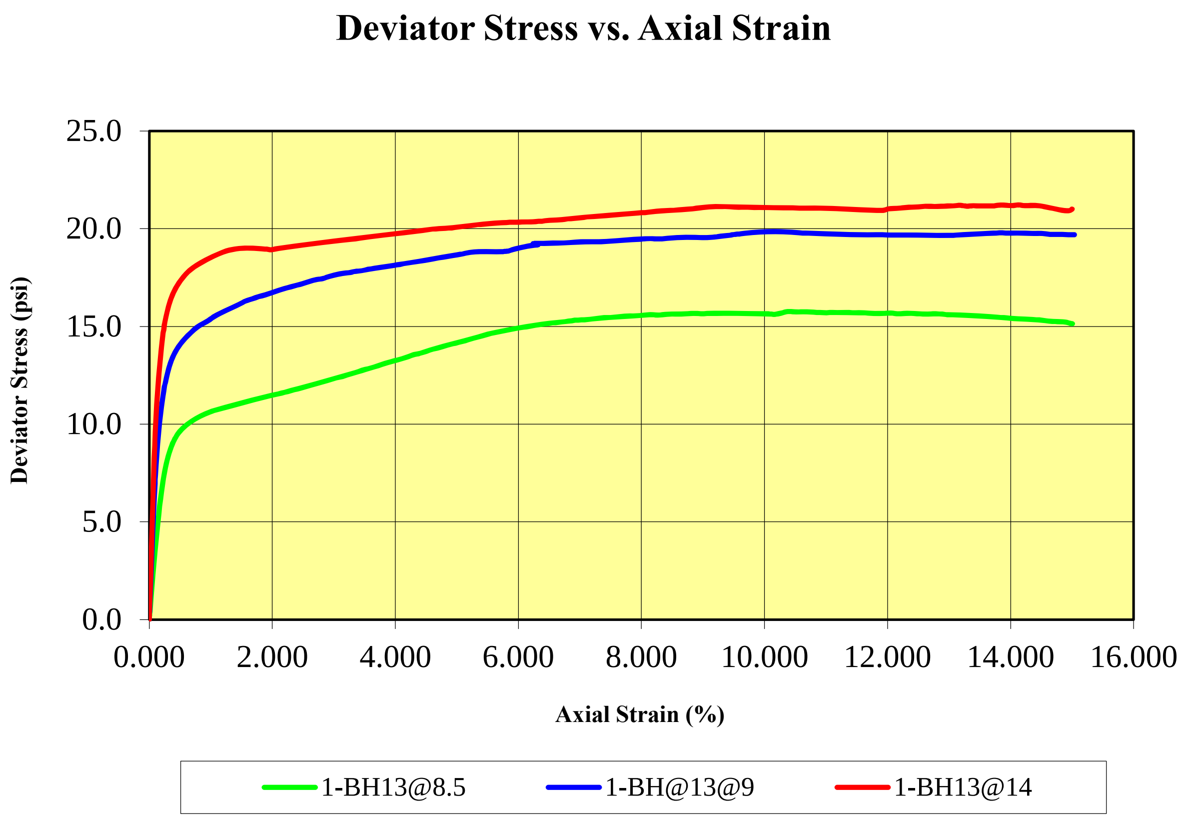
Date: 7.22.13

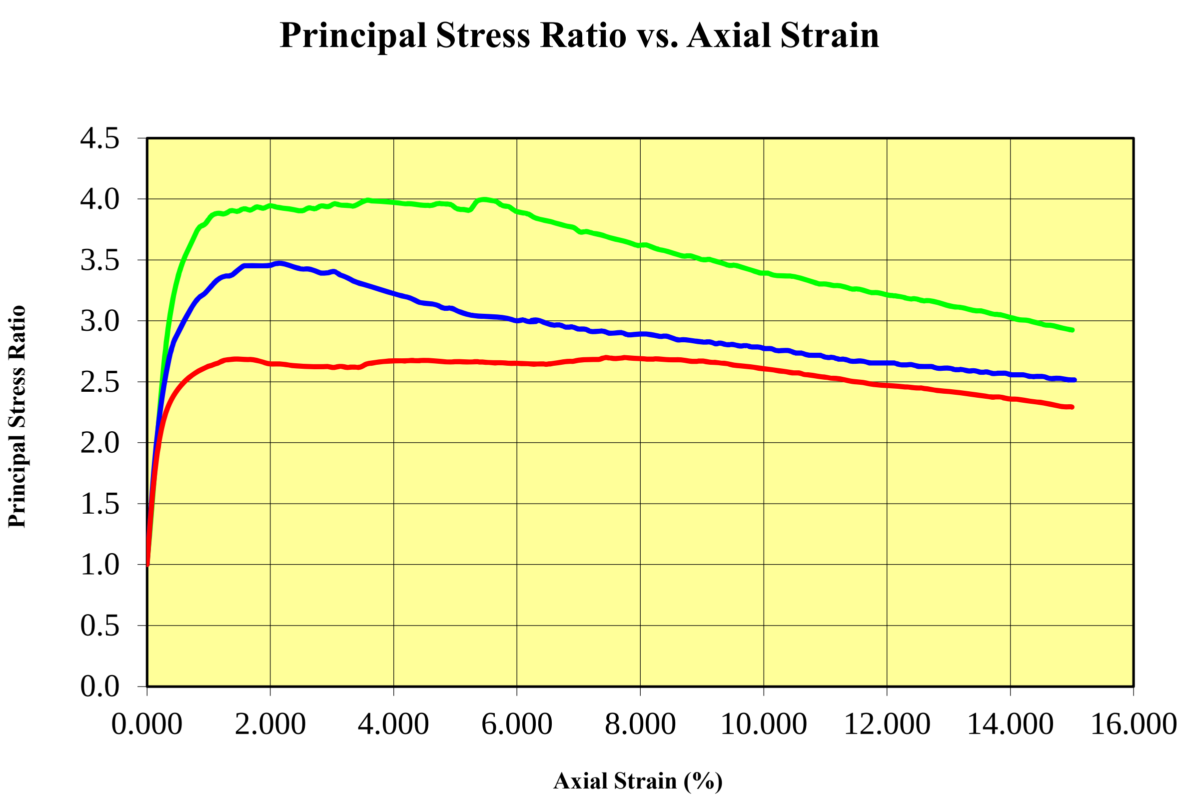
Checked By:

Date:

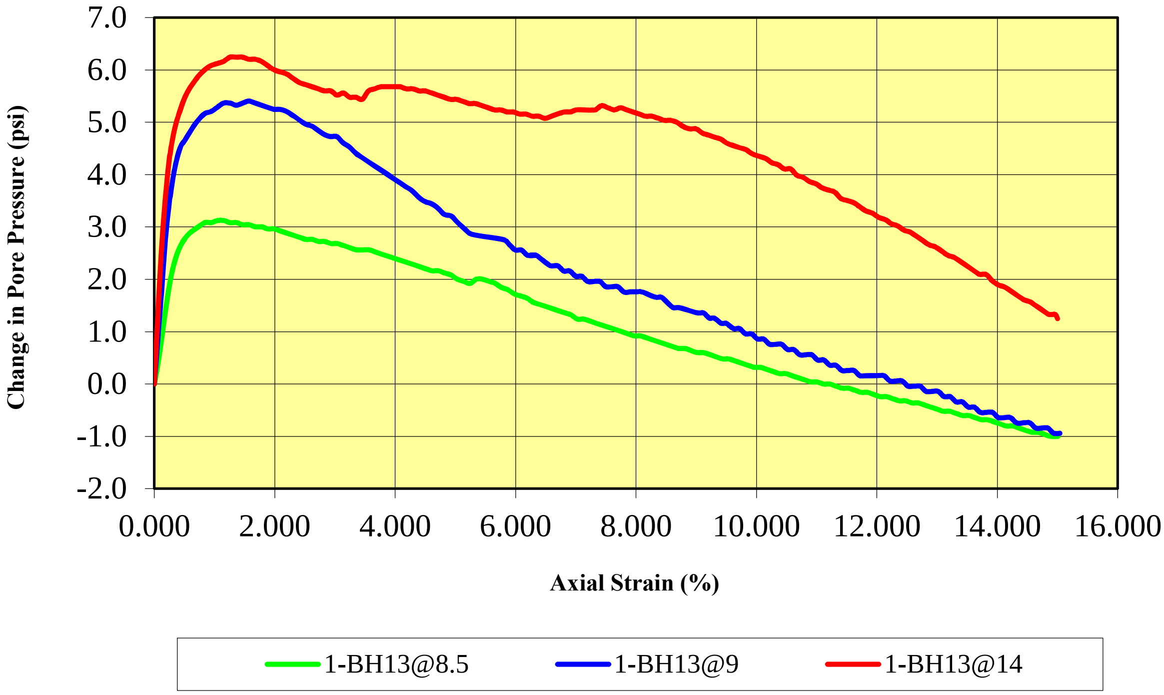





Deviator Stress vs. Axial Strain
25.0
20.0
15.0
10.0
5.0
0.0
Deviator Stress (psi)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
Axial Strain (%)
1-BH13@8.5
1-BH@13@9
1-BH13@14

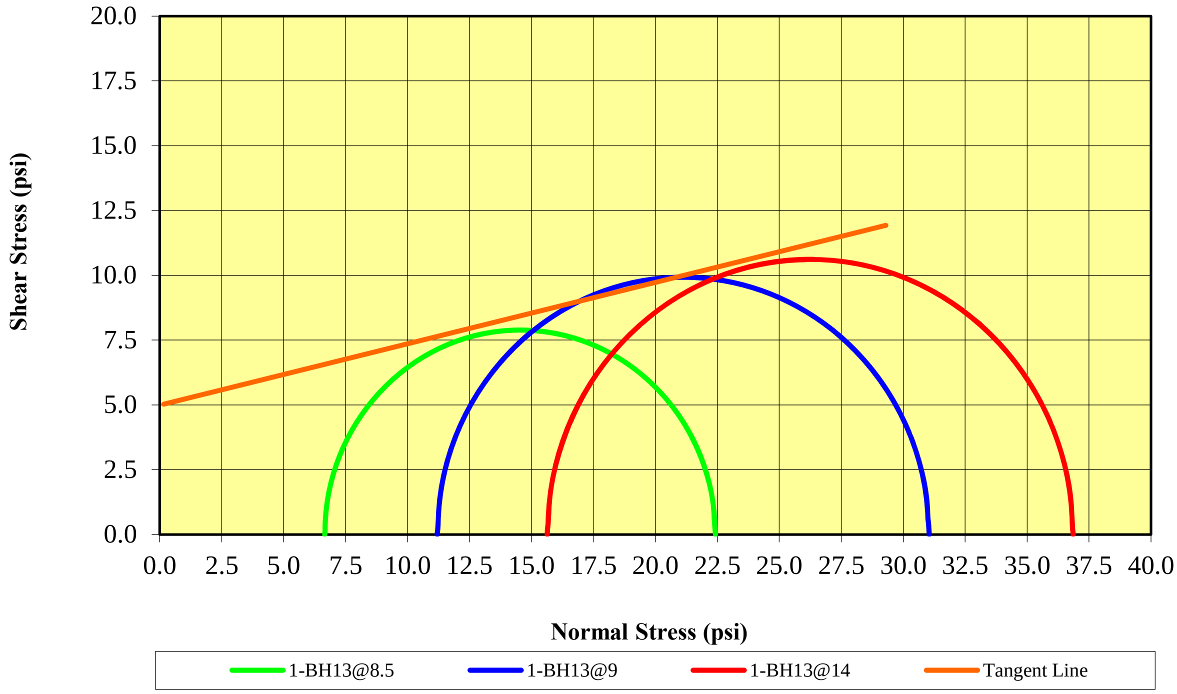

Principal Stress Ratio vs. Axial Strain
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Principal Stress Ratio
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
Axial Strain (%)

Change in Pore Pressure vs. Axial Strain

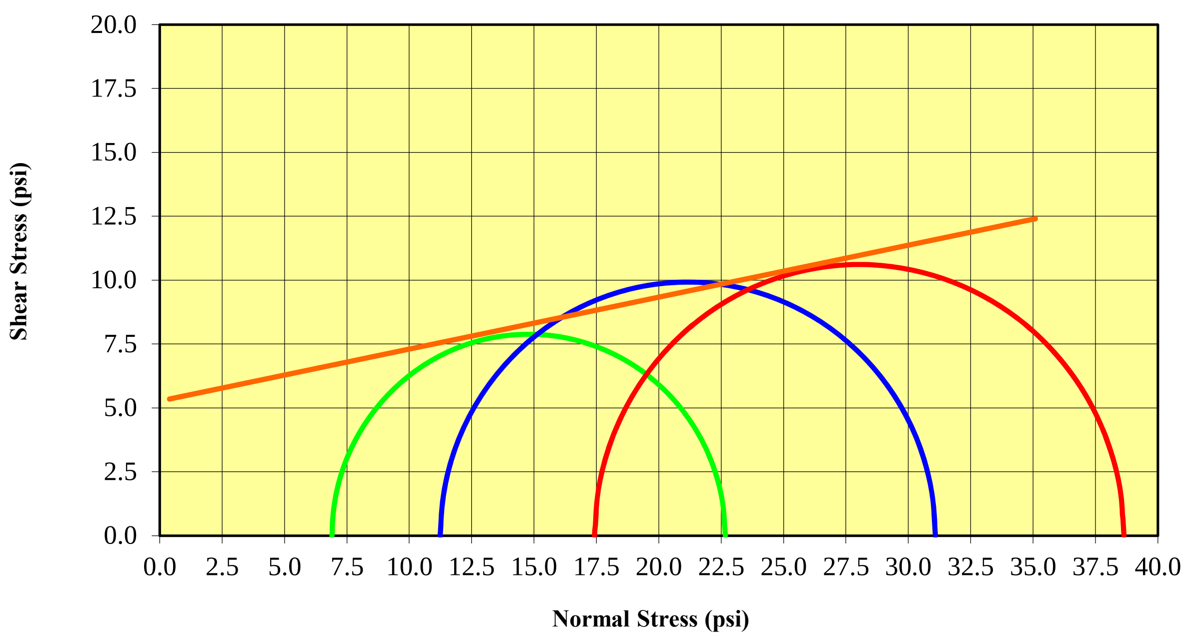


Mohr Stress Circles at Maximum Deviator Stress Criterion

Effective Stress
(C' = 5.0 Ø' = 13.3)

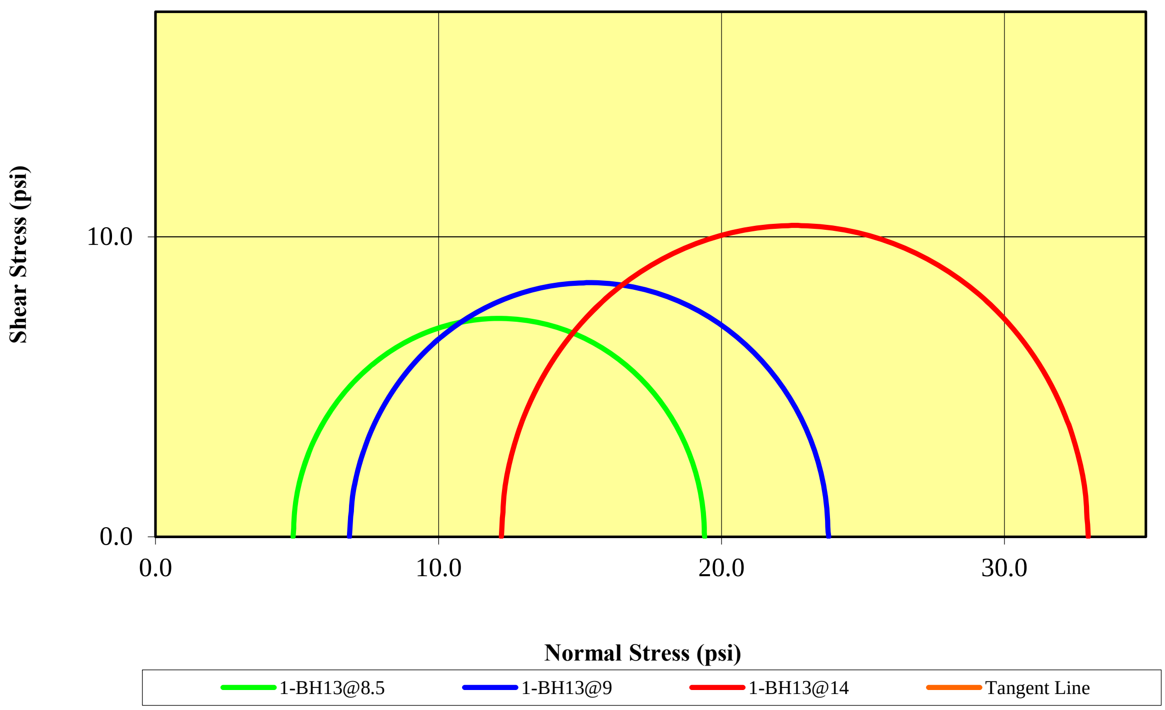


Total Stress
(C = 5.2 Ø = 11.5)

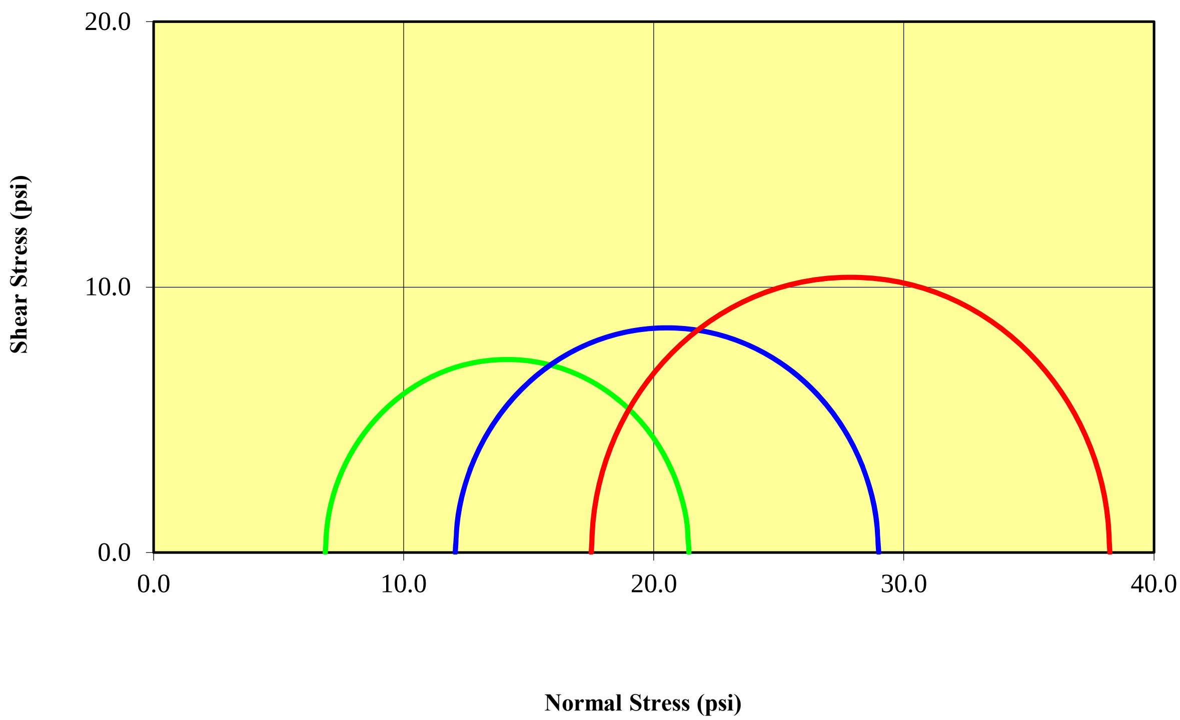


Mohr Stress Circles at Maximum Principal Stress Ratio Criterion

Effective Stress
(C' = 0.0 Ø' = 0.0)

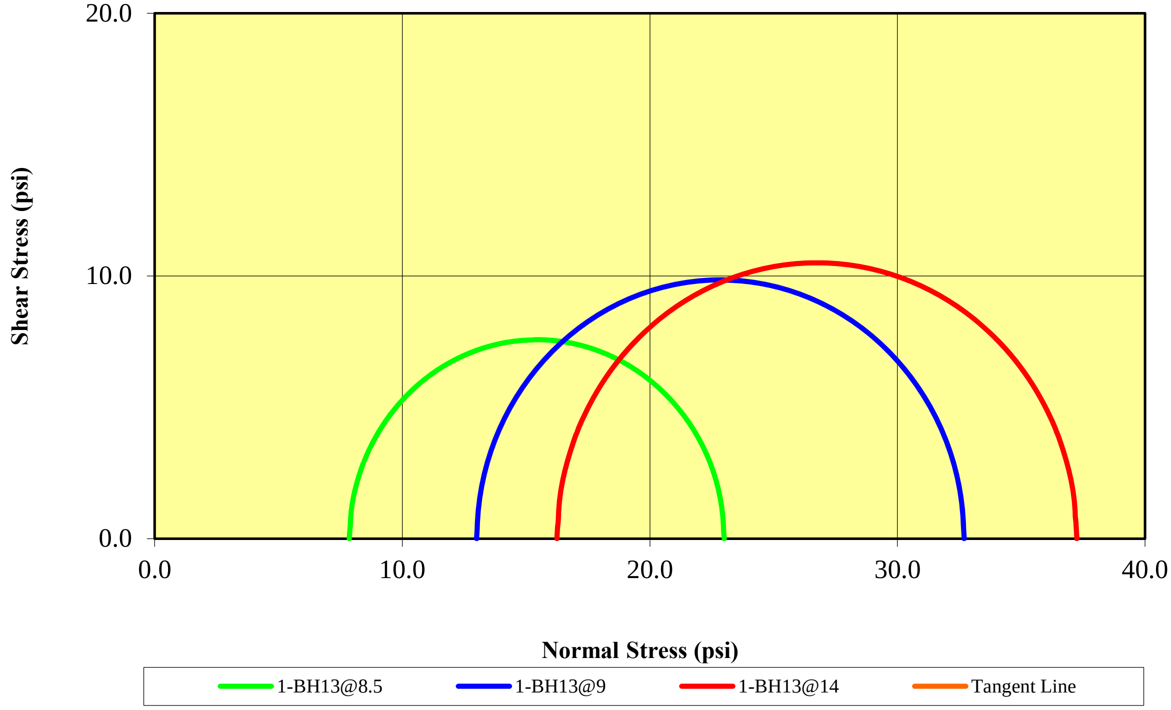


Total Stress
(C = 0.0 Ø = 0.0)

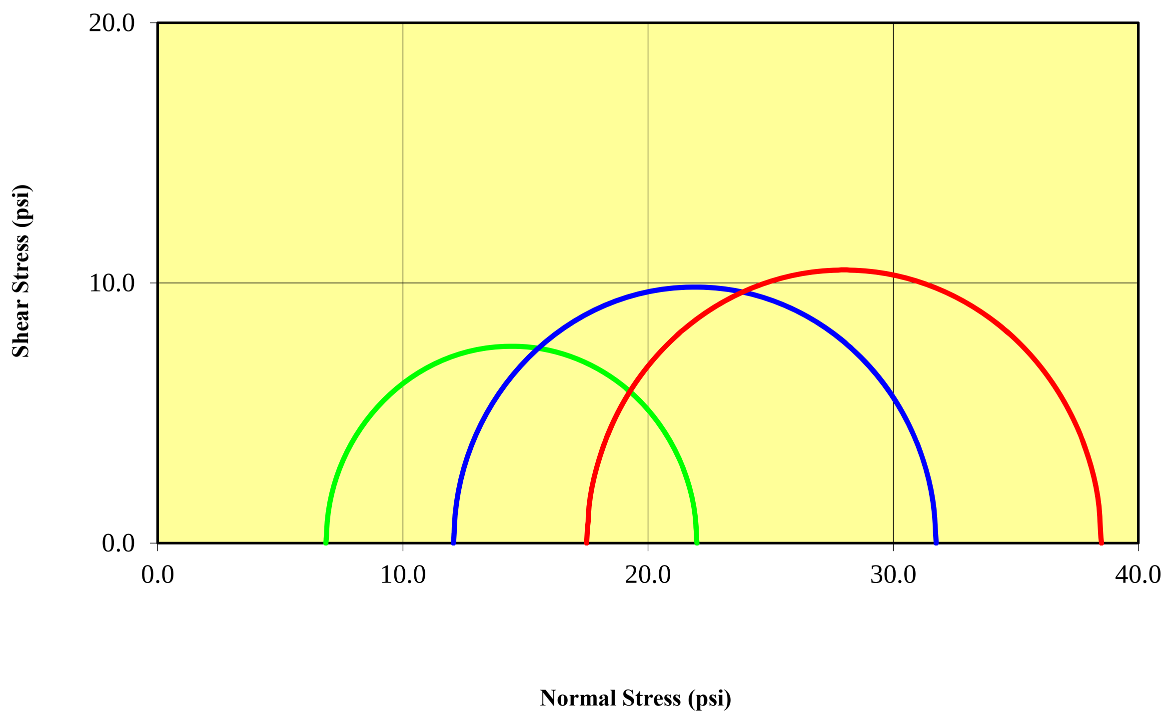


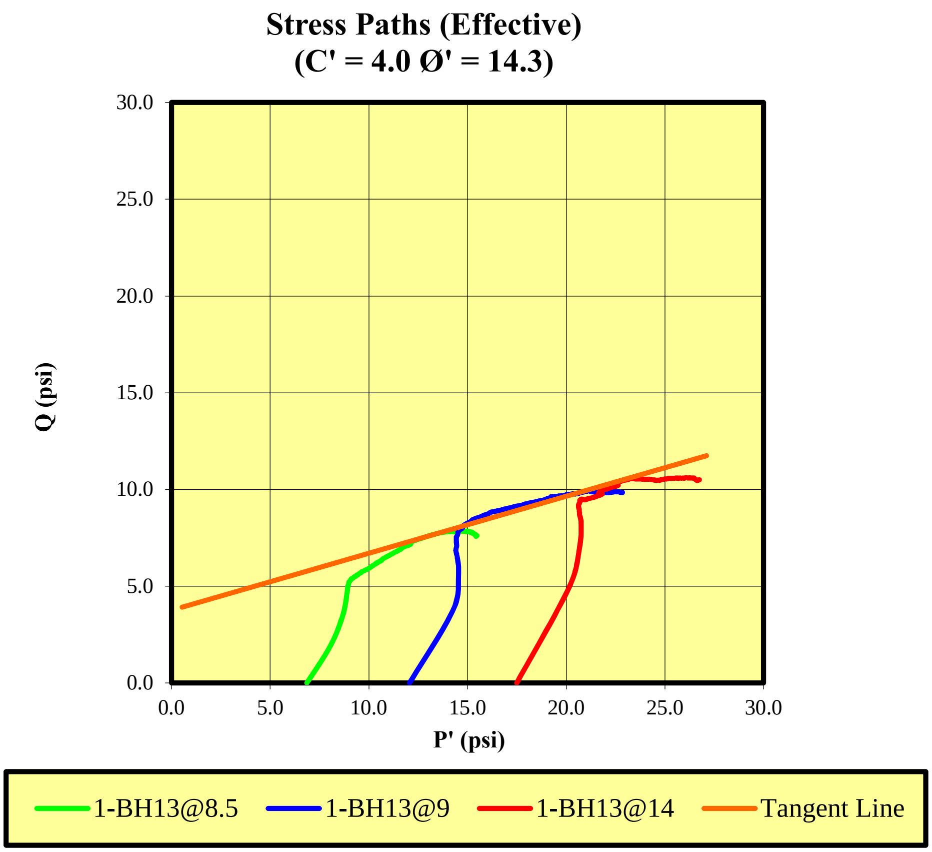
Mohr Stress Circles at 15% Axial Strain Criterion

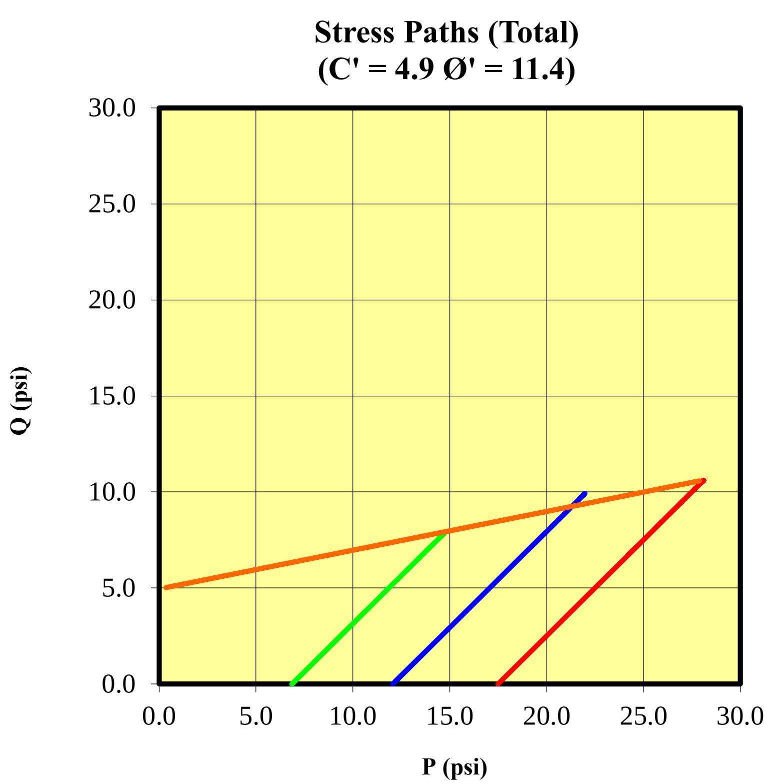
Effective Stress
(C' = 0.0 Ø' = 0.0)



Total Stress
(C = 0.0 Ø = 0.0)



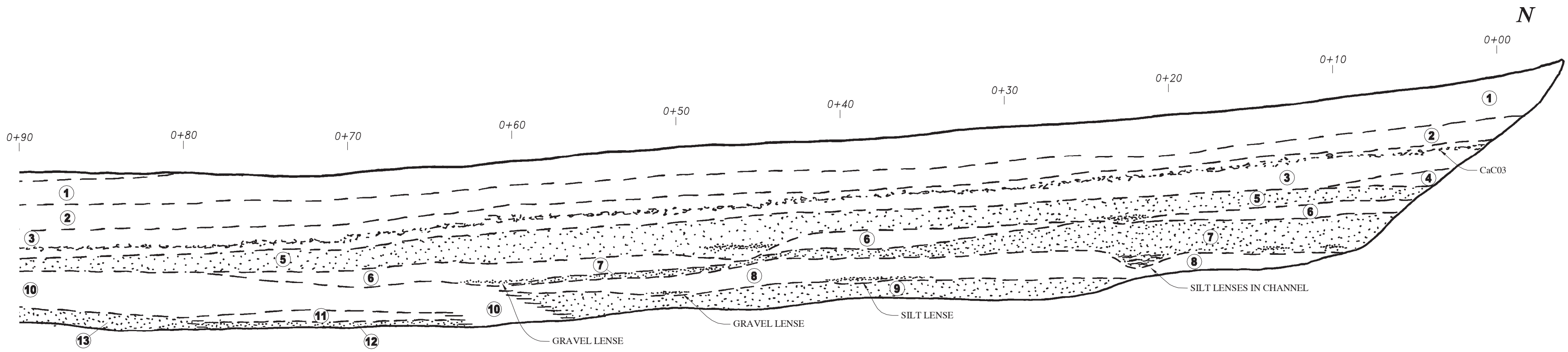

Stress Paths (Effective)
(C' = 4.0 Ø' = 14.3)
Q (psi)
P' (psi)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1-BH13@8.5
1-BH13@9
1-BH13@14
Tangent Line

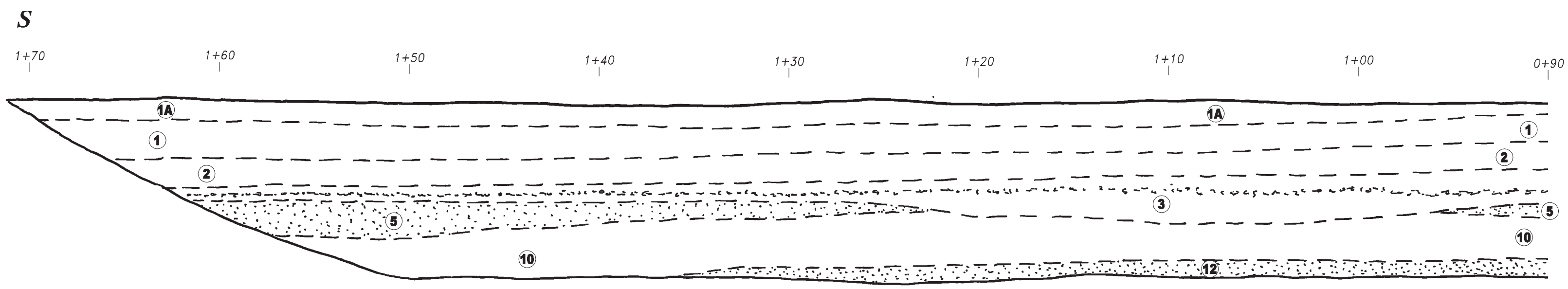

Stress Paths (Total)
(C' = 4.9 Ø' = 11.4)
Q (psi)
P (psi)
30.0
25.0
20.0
15.0
10.0
5.0
0.0

APPENDIX C

Previous Test Pit Logs and Laboratory Test Results
(ENGEO, March 2013)

APPENDIX C





1. Silty CLAY (CL), black (10YR 2/1), upper 12 inches soft from discing, becomes stiff below 12 inches, very moist to moist with depth, with fine gravel, rootlets, few krotovina

1A. Silty CLAY (CL), brown, soft, moist, with fine grained sand, completely disced, overlies unit 1 starting at Station 0+80

2. Silty CLAY (CL), very dark gray (2.5Y 3/1), very stiff, moist, few carbonate nodules, moderately developed coarse blocky pedogenic structure, few fine gravels, polished ped surfaces

3. Silty CLAY (CL), dark brown (10YR 3/3), very stiff, moist, few fine gravels, well developed blocky pedogenic structure, thin clay films on gravel, abundant carbonates as nodules and lining ped surfaces near unit 2 and unit 3 contact, after Station 0+45 carbonates are concentrated in middle of unit 3, well-polished ped surfaces-Bk horizon

4. Sandy CLAY (CL), very dark grayish brown (2.5Y 3/2), very stiff, moist, few fine gravels, fine grained sand, well developed medium blocky pedogenic structure, few rootlets and root pores 1/32-inch to 1/16- inch, krotovina, bioturbated, pinches out by Station 0+10

5. Clayey SAND (SC), very dark grayish brown (10YR 3/2) and dark yellowish brown (10YR 4/6), very dense, moist, with fine gravel, few clay lined tubular pores, medium angular blocky pedogenic structure, few carbonate nodules, thick clay films on gravels, becomes olive brown (2.5Y 4/3) and dark yellowish brown (10YR 4/6) at Station 0+15, grades to Silty SAND (SM)

6. Sandy CLAY (CL), dark grayish brown (2.5Y 4/2), very stiff, moist, fine grained sand, few fine gravels, fine blocky pedogenic structure, translocated clays lining ped surfaces, few tubular pores with translocated clays, some yellowish brown staining, some charcoal, unit pinches out by Station 0+77

7. Silty SAND (SM), dark yellowish brown (10YR 3/4), very dense, moist, with very fine gravel, clay lined root/tubular pores throughout, clay lined ped surfaces, clay films on gravel, several relatively horizontal gravel (rock fragments) lenses, at Station 0+22 several horizontal silt lenses light yellowish brown (10YR 6/4), some charcoal, pinches out at Station 0+60

8. Sandy CLAY (CL), dark brown (10YR 3/3) mottled with brown (10YR 4/3), very stiff, moist, with fine gravel, root pores and krotovina throughout, well developed medium blocky pedogenic structure, pinches out at Station 0+60

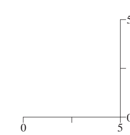
9. Clayey SAND (SC), dark yellowish brown (10YR 3/4), very dense, moist, with very fine gravel, fine to medium grained sand, clay lined tubular pores, well developed fine angular blocky pedogenic structure, thick clay films on gravels, unit terminates at Station 0+60, gradational contact with unit 10

10. Sandy CLAY (CL), dark yellowish brown (10YR 3/4) and dark brown (10YR 3/3), hard, moist, well developed medium angular blocky pedogenic structure, thick clay films on gravel, clay lined tubular pores

11. Sandy CLAY (CL) dark yellowish brown (10YR 3/6), hard, moist, well developed medium blocky pedogenic structure, thick clay films on gravels, translocated clays lining ped surfaces and tubular pores

12. Clayey SAND (SC), dark yellowish brown (10YR 4/4), very dense, moist, with gravel, thick clay films on gravel, dark brown translocated clay filled tubular pores, angular blocky pedogenic structure

13. Clayey SAND (SC), dark yellowish brown (10YR 3/6), very dense, moist, with fine gravel, medium angular blocky pedogenic structure, thick clay films on gravels, clay film on ped surfaces



SCALE IN FEET

ENGEO Expect Excellence	TRENCH LOG T-1 SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT HOLLISTER, CALIFORNIA	PROJECT NO.: 9901.000.000 SCALE: AS SHOWN DRAWN BY: DLB CHECKED BY: JAM	FIGURE NO. 6

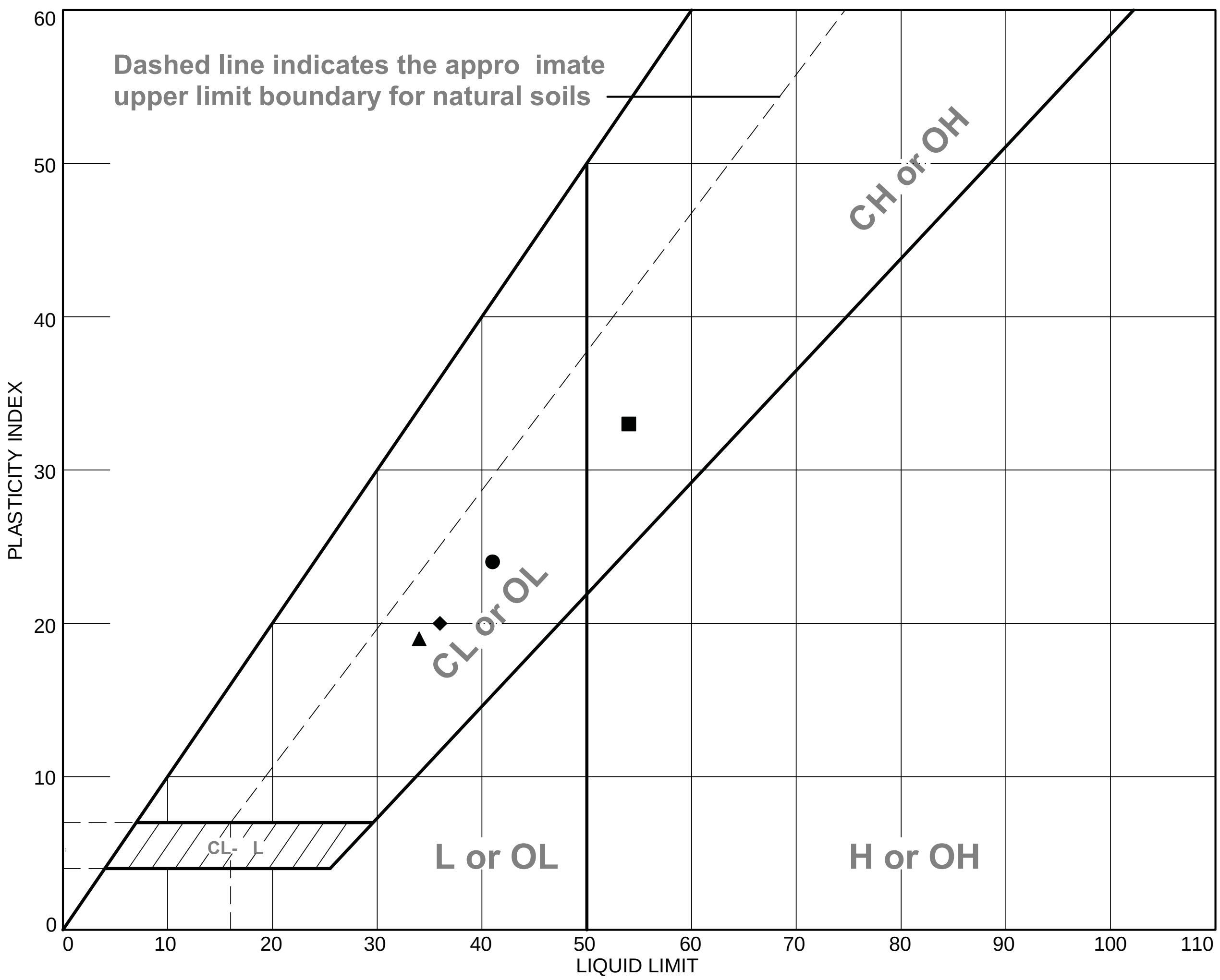
G:\Drafting\DRAFTING2_Dwg\9901\000\PGEX\9901000000-PGEX-6-TrenchLog-0213.dwg Plot Date: 2-27-13 dborde

ENGEO INCORPORATED	Test Pit Logs	
San Juan Oaks – Retirement Community Hollister, California 9901.000.000	Logged By: J. White Logged Date: 2/7/2013	

Test Pit Number	Depth (Feet)	Description
TP-1	0 – 4	SILTY LEAN CLAY (CL), very dark brown, stiff, very moist, few fine gravels, paper thin polished shear surfaces at 4 feet, N89W/ 22N. (Qls)
	4 – 6	Interbedded SANDSTONE and SHALE, brown and tan, extremely weak, very closely fractured, moderately weathered, thinly bedded to laminated, bedding N60W/ 61S, fine to medium grained sand. (Puc)
TP-2	0 – 3	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels. (Qc)
	3 – 6	CLAYSTONE, olive brown, extremely weak, very closely fractured, moderately weathered, thinly bedded N70W/ 35S, iron staining along fracture surfaces. (Puc)
TP-3	0 – 3.5	SILTY LEAN CLAY (CL), very dark brown, medium stiff, very moist, few fine gravels. (Qc)
	3.5 – 6	SANDY LEAN CLAY (CL), dark brown, stiff, moist, few fine gravels, coarse blocky structure, PP=2. (Qc)
	6 – 10.5	CLAYEY SAND (SC), dark brown, dense, moist, fine grained sand, few fine gravels. (Qc)
	10.5 - 12	Interbedded SANDSTONE and SHALE, brown and tan, extremely weak, very closely fractured, moderately weathered, thinly to thickly bedded and laminated. (Puc)
TP-4	0 – 4	SILTY LEAN CLAY (CL), dark brown, stiff, moist, few fine gravels, few carbonates. (Qls?)
	4 – 7	Interbedded SANDSTONE and SHALE, brown and tan, extremely weak, closely fractured, thinly bedded to laminated, medium grained sand, iron staining. (Puc)

ENGEO INCORPORATED	Test Pit Logs	
San Juan Oaks – Retirement Community Hollister, California 9901.000.000	Logged By: J. White Logged Date: 2/7/2013	
Test Pit Number	**Depth (Feet)**	**Description**
TP-5	0 – 4	SILTY LEAN CLAY (CL), very dark brown, medium stiff, very moist, few fine gravels. (Qc)
	4 – 6	SANDY LEAN CLAY (CL), very dark reddish brown, stiff, moist, few fine gravels, coarse blocky structure. (Qc)
	6 – 8	CLAYSTONE, olive brown, extremely weak, very closely fractured, moderately weathered, thickly bedded, iron staining along fracture surfaces. (Puc)
TP-6	0 – 4	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels. (Qls?)
	4 – 7	CLAYSTONE, olive brown, extremely weak, very closely fractured, moderately weathered, thickly bedded, iron staining along fracture surfaces. (Puc)
TP-7	0 – 3	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels. (Qls?)
	3 – 7	SANDSTONE, brown, weak, poorly cemented, closely fractured, moderately weathered, thinly bedded N42W/ 30S, iron staining along fracture surfaces. (Puc)
TP-8	0 – 4	SILTY LEAN CLAY (CL), very dark brown, very stiff, very moist, few fine gravels. (Qls)
	4 – 6	SANDY LEAN CLAY (CL), dark reddish brown, very stiff, moist, with fine gravels, coarse blocky structure. (Qls)
	6 – 8	SILTY LEAN CLAY (CL), very dark olive brown, very stiff, moist, few fine gravels, polished shear surface at 8 feet N5E/ 21E. (Qls)
	8 – 10	CLAYSTONE, olive brown, extremely weak, very closely fractured, moderately weathered, thickly bedded, iron staining along fracture surfaces. (Puc)

LI UID AND PLASTIC LI ITS TEST REPORT



	ATERIAL DESCRIPTION	LL	PL	PI	40	200	USCS
●	See exploration logs	41	17	24	95.5	69.6	CL
■	See exploration logs	54	21	33	96.9	84.7	CH
▲	See exploration logs	34	15	19	93.9	67.9	CL
◆	See exploration logs	36	16	20	90.9	64.2	CL

Pro ect No 9901.000.000 **Client:** Pulte Group

Pro ect: San Juan Oaks - Retirement Community

●**Depth:** 6.0 inches **Sample Number:** 1-CPT01 @ 6

■**Depth:** 6.0 inches **Sample Number:** 1-CPT04 @ 6

▲**Depth:** 6.0 inches **Sample Number:** 1-CPT06 @ 6

◆**Depth:** 6.0 inches **Sample Number:** 1-CPT10 @ 6

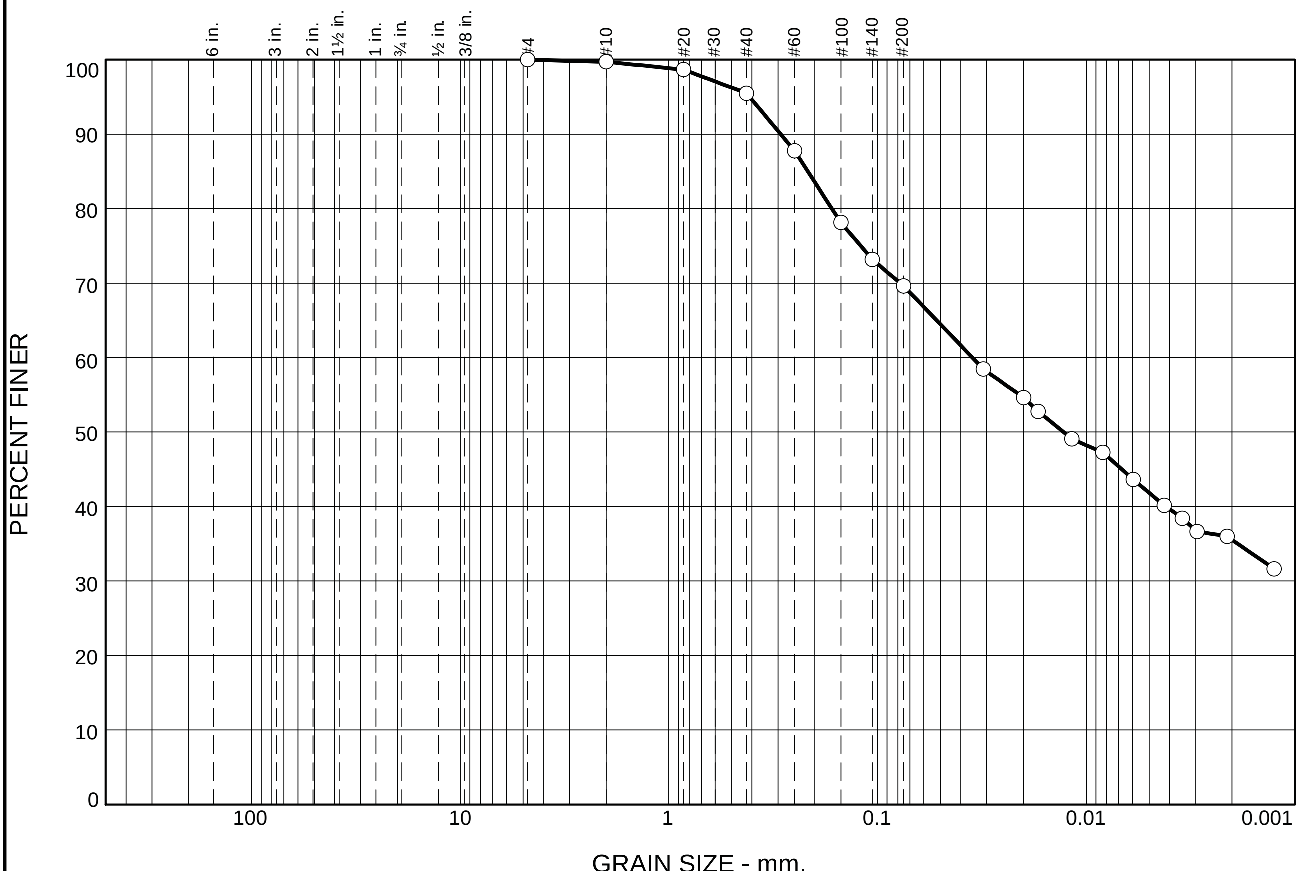
ENGEO INCORPORATED

Remar s:

●PI: ASTM D4318, Grain Size: ASTM D422, USCS: ASTM D2487

Tested By: AV **Chec ed By:** DS

Particle Si e Distribution Report



3	Gravel		Sand			Fines	
	Coarse	Fine	Coarse	edium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	4.2	25.9	27.7	41.9

SIE E SI E	PERCENT FINER	SPEC * PERCENT	PASS (X NO)
#4	100.0		
#10	99.7		
#20	98.7		
#40	95.5		
#60	87.8		
#100	78.1		
#140	73.2		
#200	69.6		
0.0311 mm.	58.5		
0.0200 mm.	54.6		
0.0170 mm.	52.8		
0.0117 mm.	49.1		
0.0083 mm.	47.3		
0.0060 mm.	43.6		
0.0042 mm.	40.1		
0.0035 mm.	38.4		
0.0029 mm.	36.7		
0.0021 mm.	36.0		
0.0013 mm.	31.6		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 17 LL= 41 PI= 24

Coefficients

D_{90}= 0.2913 D_{85}= 0.2158 D_{60}= 0.0351
D_{50}= 0.0129 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(15)

Remar s

Grain Size: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Sample Number: 1-CPT01 @ 6" **Depth:** 6.0 inches

Date: 2.11.13

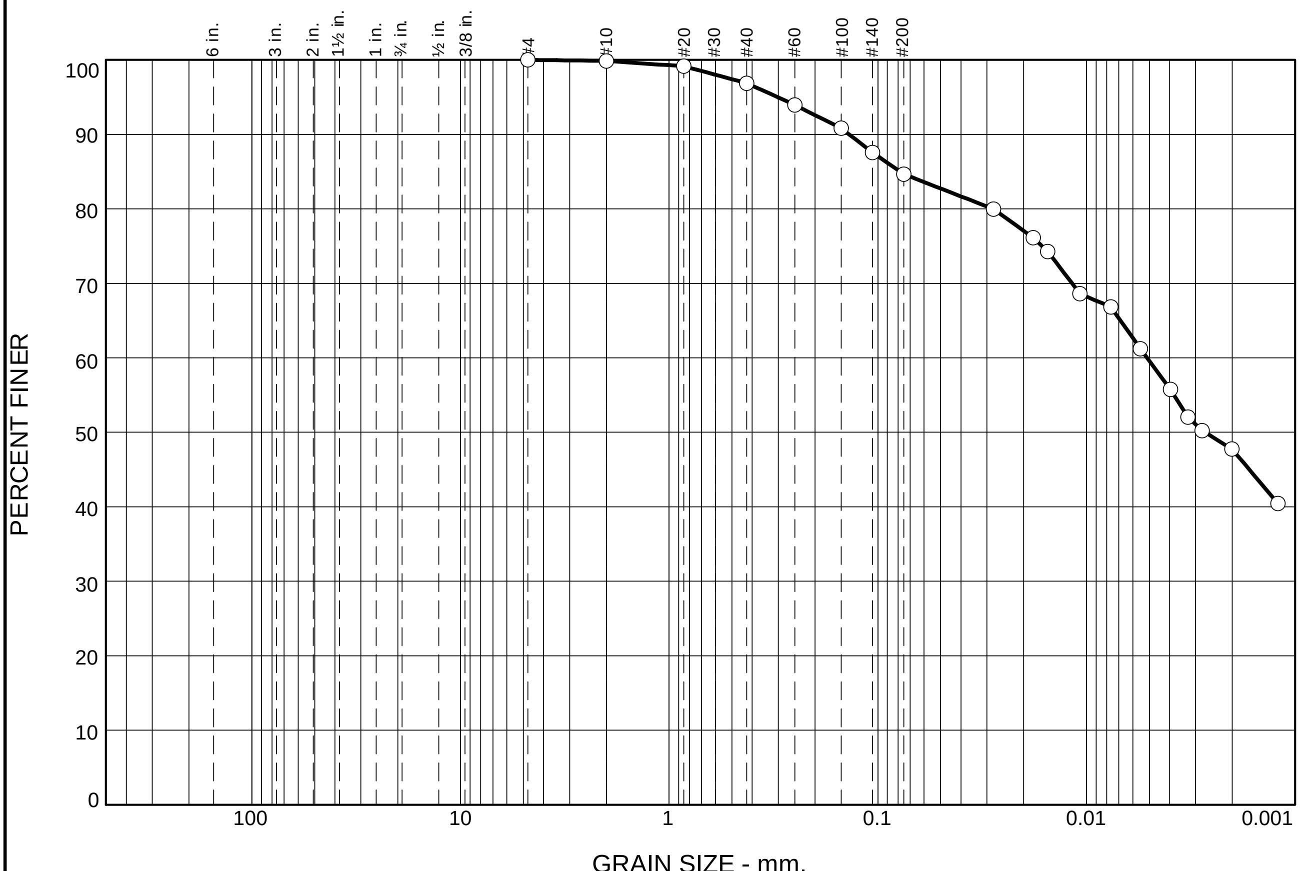
ENGEO INCORPORATED

Client: Pulte Group
Pro ect: San Juan Oaks - Del Webb Residential Development

Pro ect No: 9901.000.000

Tested By: AV **Chec ed By:** DS

Particle Si e Distribution Report



3	Gravel		Sand			Fines	
	Coarse	Fine	Coarse	edium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	3.0	12.2	25.1	59.6

SIE E SI E	PERCENT FINER	SPEC * PERCENT	PASS (X NO)
#4	100.0		
#10	99.9		
#20	99.2		
#40	96.9		
#60	94.0		
#100	90.8		
#140	87.6		
#200	84.7		
0.0279 mm.	80.0		
0.0180 mm.	76.1		
0.0153 mm.	74.3		
0.0107 mm.	68.6		
0.0076 mm.	66.8		
0.0055 mm.	61.2		
0.0040 mm.	55.8		
0.0033 mm.	52.1		
0.0028 mm.	50.2		
0.0020 mm.	47.8		
0.0012 mm.	40.5		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 21 LL= 54 PI= 33

Coefficients

D_{90}= 0.1374 D_{85}= 0.0781 D_{60}= 0.0051
D_{50}= 0.0027 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(30)

Remar s

Grain Size: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Sample Number: 1-CPT04 @ 6" **Depth:** 6.0 inches

Date: 2.11.13

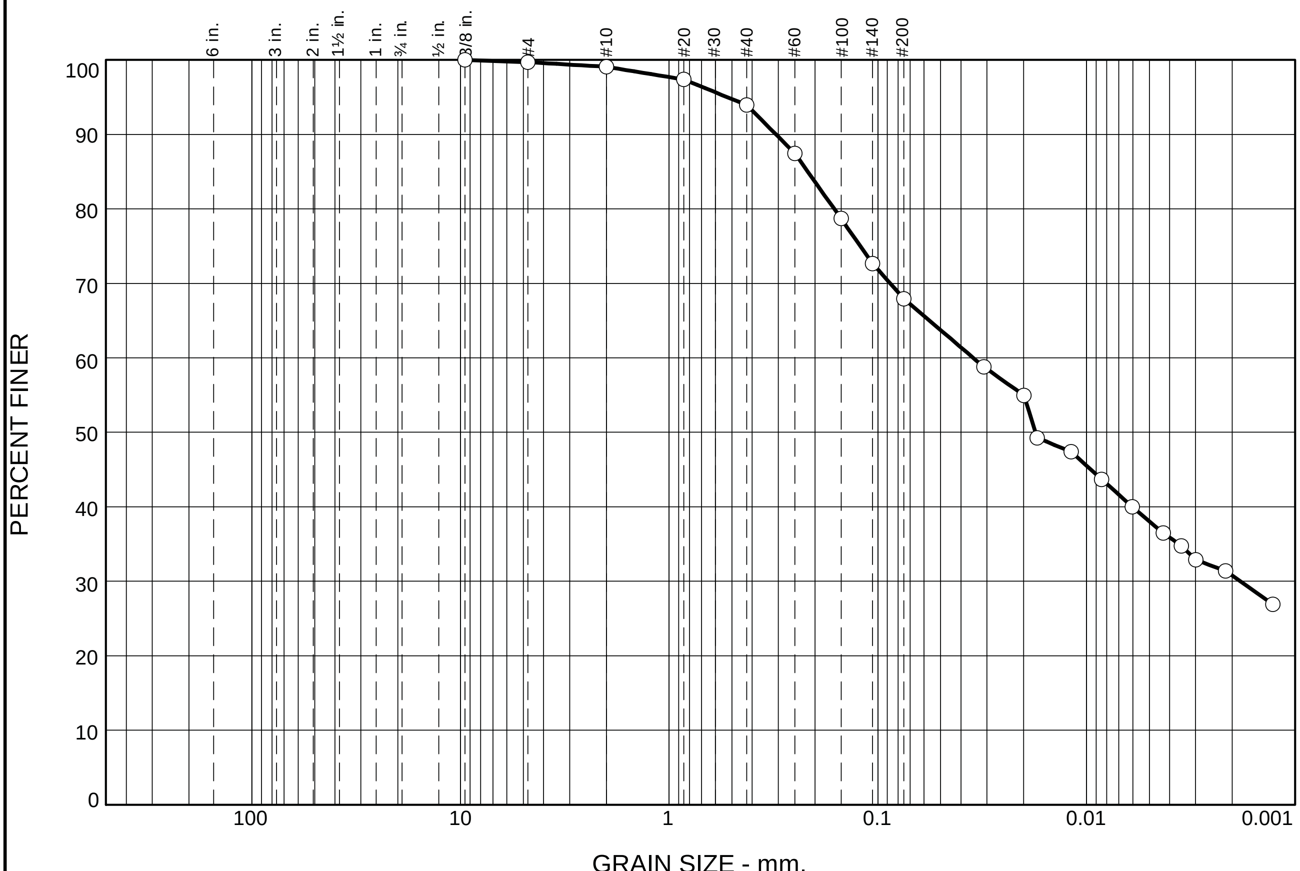
ENGEO INCORPORATED

Client: Pulte Group
Pro ect: San Juan Oaks - Del Webb Residential Development

Pro ect No: 9901.000.000

Tested By: AV **Chec ed By:** DS

Particle Si e Distribution Report



3	Gravel		Sand			Fines	
	Coarse	Fine	Coarse	edium	Fine	Silt	Clay
0.0	0.0	0.3	0.6	5.2	26.0	29.8	38.1

SIE E SI E	PERCENT FINER	SPEC * PERCENT	PASS (X NO)
3/8	100.0		
#4	99.7		
#10	99.1		
#20	97.4		
#40	93.9		
#60	87.5		
#100	78.7		
#140	72.6		
#200	67.9		
0.0310 mm.	58.8		
0.0199 mm.	55.0		
0.0172 mm.	49.3		
0.0118 mm.	47.4		
0.0085 mm.	43.7		
0.0060 mm.	40.0		
0.0043 mm.	36.5		
0.0035 mm.	34.8		
0.0030 mm.	32.9		
0.0022 mm.	31.4		
0.0013 mm.	26.9		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 15 LL= 34 PI= 19

Coefficients

D_{90}= 0.3078 D_{85}= 0.2166 D_{60}= 0.0349
D_{50}= 0.0175 D_{30}= 0.0018 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(10)

Remar s

Grain Size: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Sample Number: 1-CPT06 @ 6" **Depth:** 6.0 inches

Date: 2.11.13

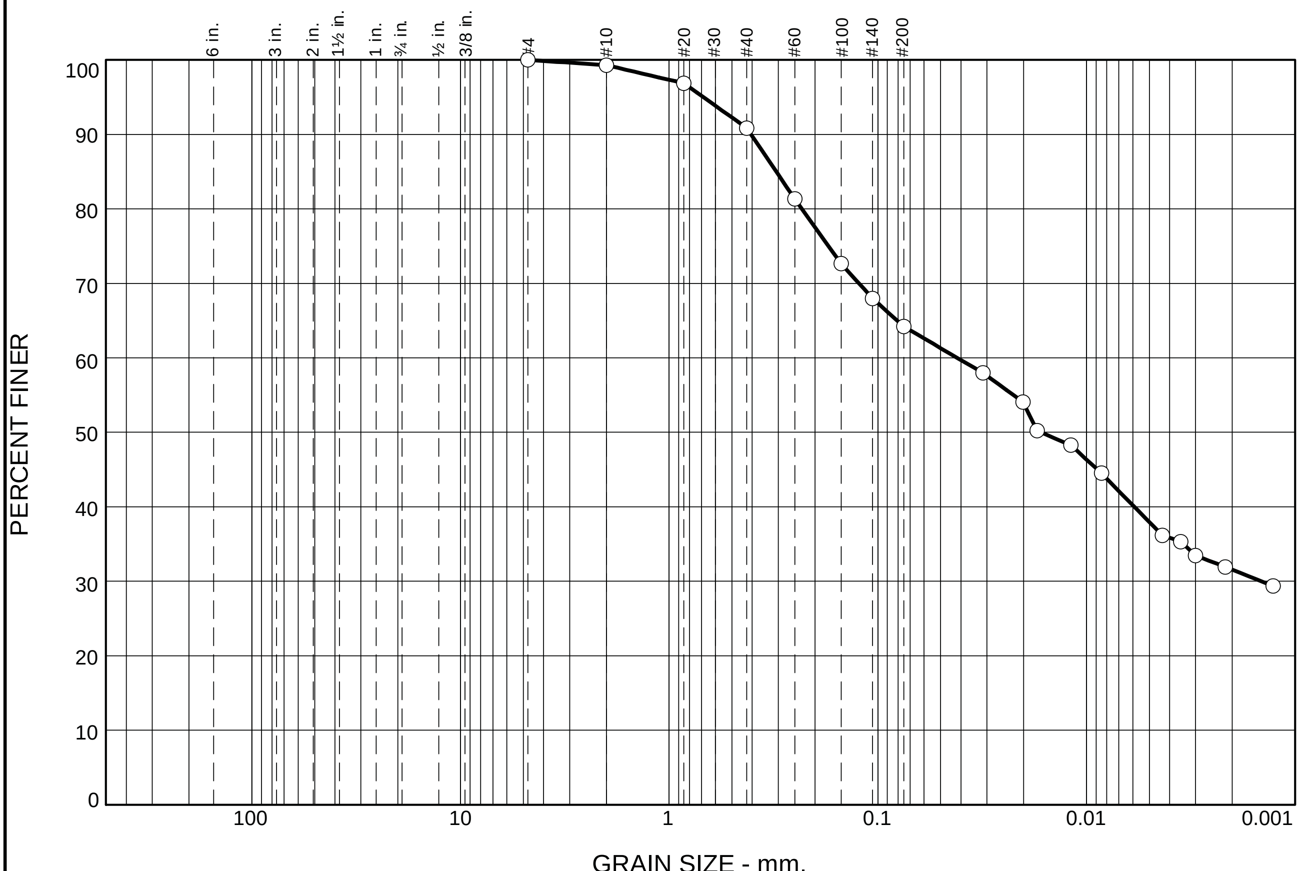
ENGEO INCORPORATED

Client: Pulte Group
Pro ect: San Juan Oaks - Del Webb Residential Development

Pro ect No: 9901.000.000

Tested By: AV **Chec ed By:** DS

Particle Si e Distribution Report



3	Gravel		Sand			Fines	
	Coarse	Fine	Coarse	edium	Fine	Silt	Clay
0.0	0.0	0.0	0.7	8.4	26.7	26.2	38.0

SIE E SI E	PERCENT FINER	SPEC * PERCENT	PASS (X NO)
#4	100.0		
#10	99.3		
#20	96.9		
#40	90.9		
#60	81.3		
#100	72.6		
#140	68.0		
#200	64.2		
0.0313 mm.	58.0		
0.0201 mm.	54.1		
0.0172 mm.	50.2		
0.0119 mm.	48.3		
0.0085 mm.	44.5		
0.0043 mm.	36.2		
0.0035 mm.	35.3		
0.0030 mm.	33.5		
0.0022 mm.	31.9		
0.0013 mm.	29.4		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 16 LL= 36 PI= 20

Coefficients

D_{90}= 0.4053 D_{85}= 0.3068 D_{60}= 0.0417
D_{50}= 0.0166 D_{30}= 0.0014 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(10)

Remar s

Grain Size: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Sample Number: 1-CPT10 @ 6" **Depth:** 6.0 inches

Date: 2.11.13

ENGEO INCORPORATED

Client: Pulte Group
Pro ect: San Juan Oaks - Del Webb Residential Development

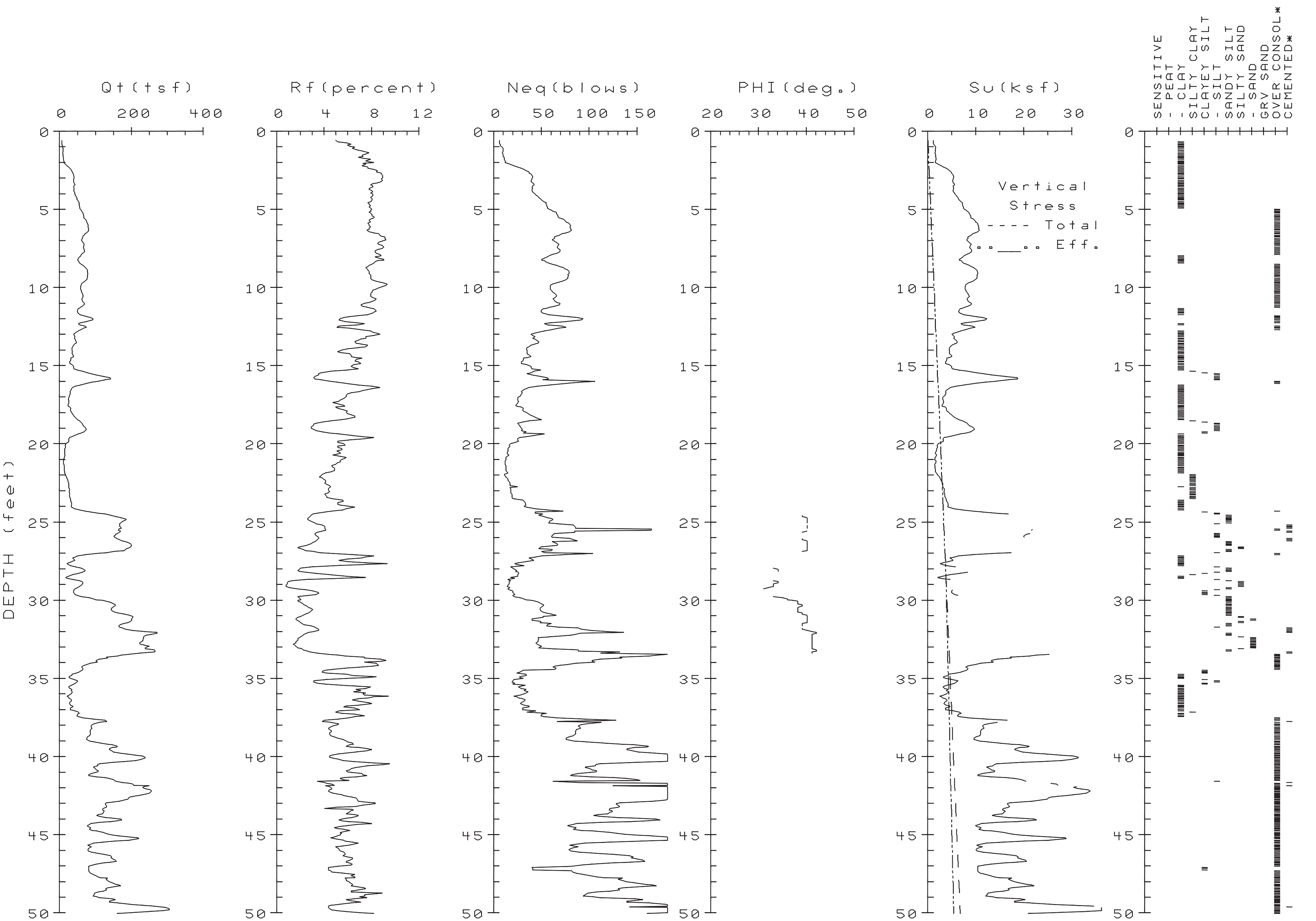
Pro ect No: 9901.000.000

Tested By: AV **Chec ed By:** DS

APPENDIX D

Cone Penetration Test (CPT) Logs
(John Sarmiento & Associates, June 2013)

APPENDIX D



Terminated at 50.0 feet

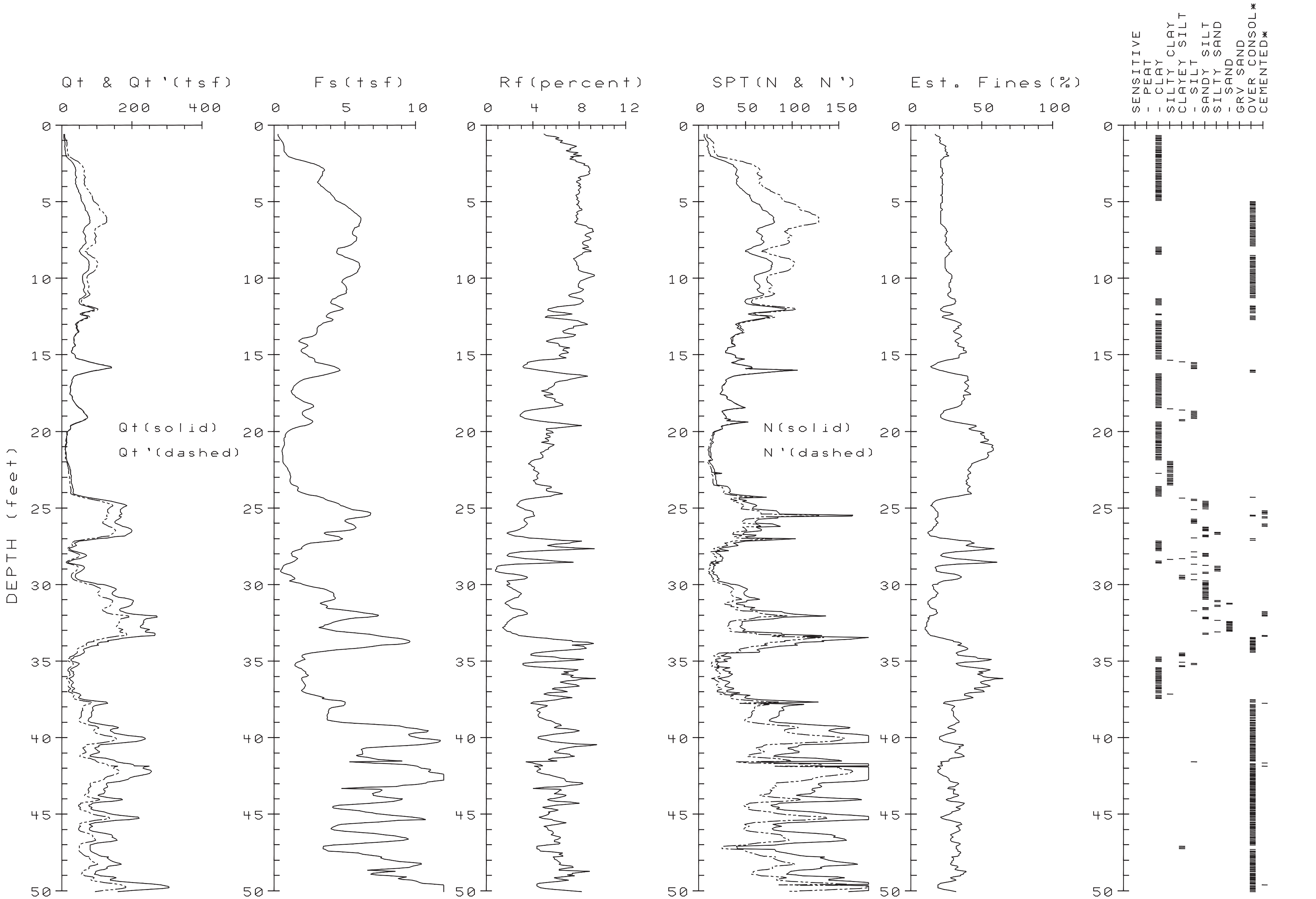
Groundwater measured at 28.6 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-01
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



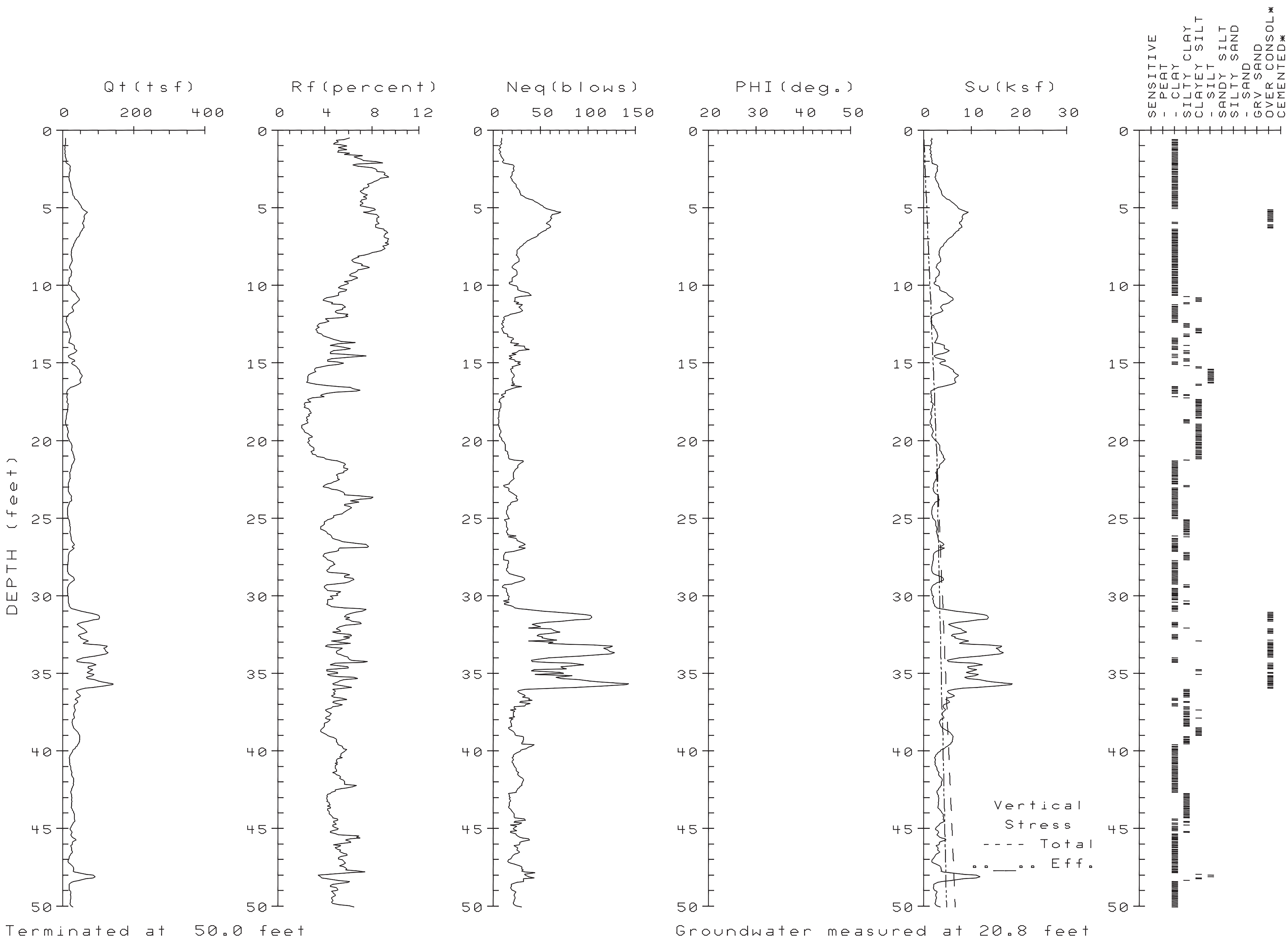
Terminated at 50.0 feet

Groundwater measured at 28.6 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-01
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates

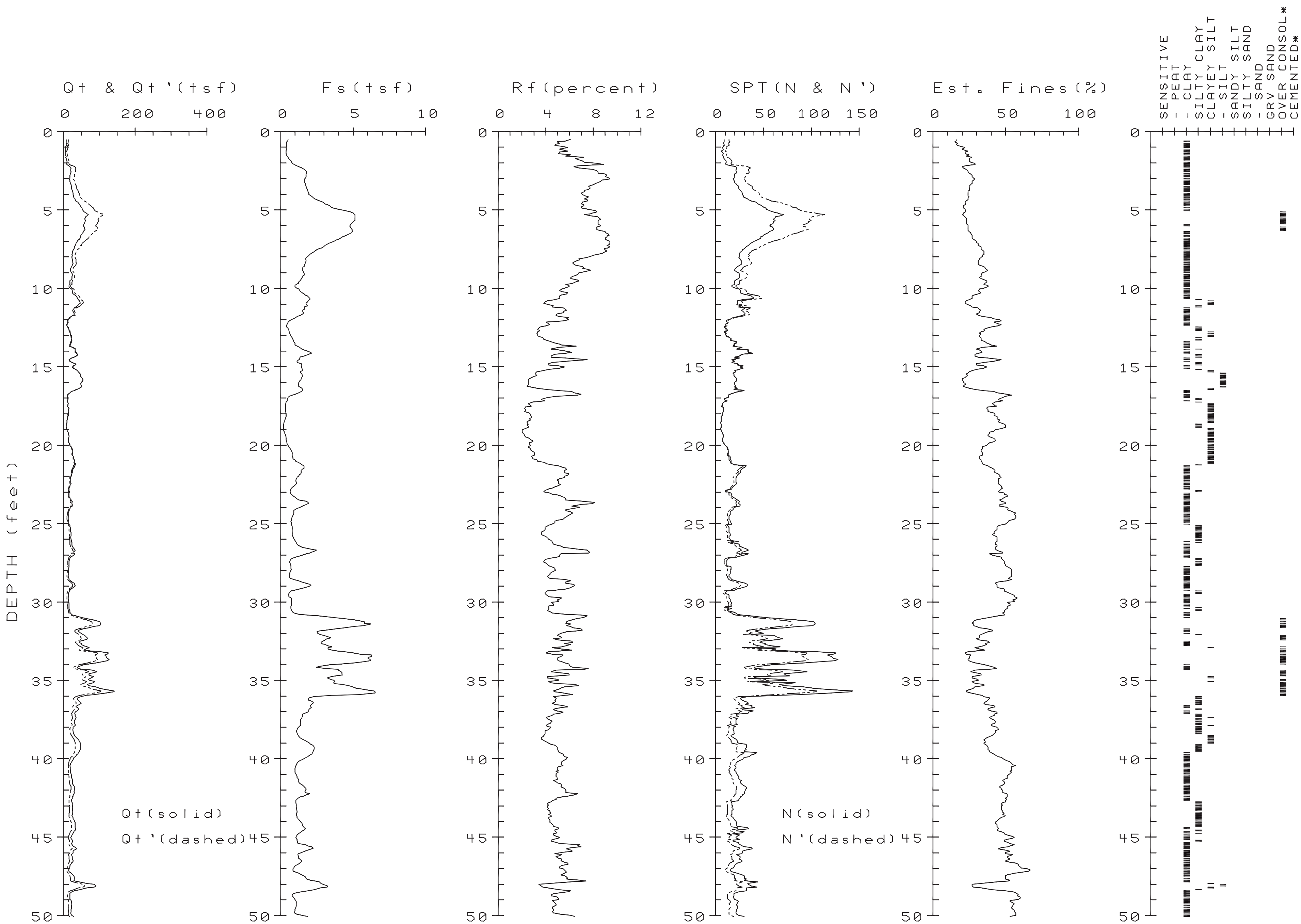


PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-02
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



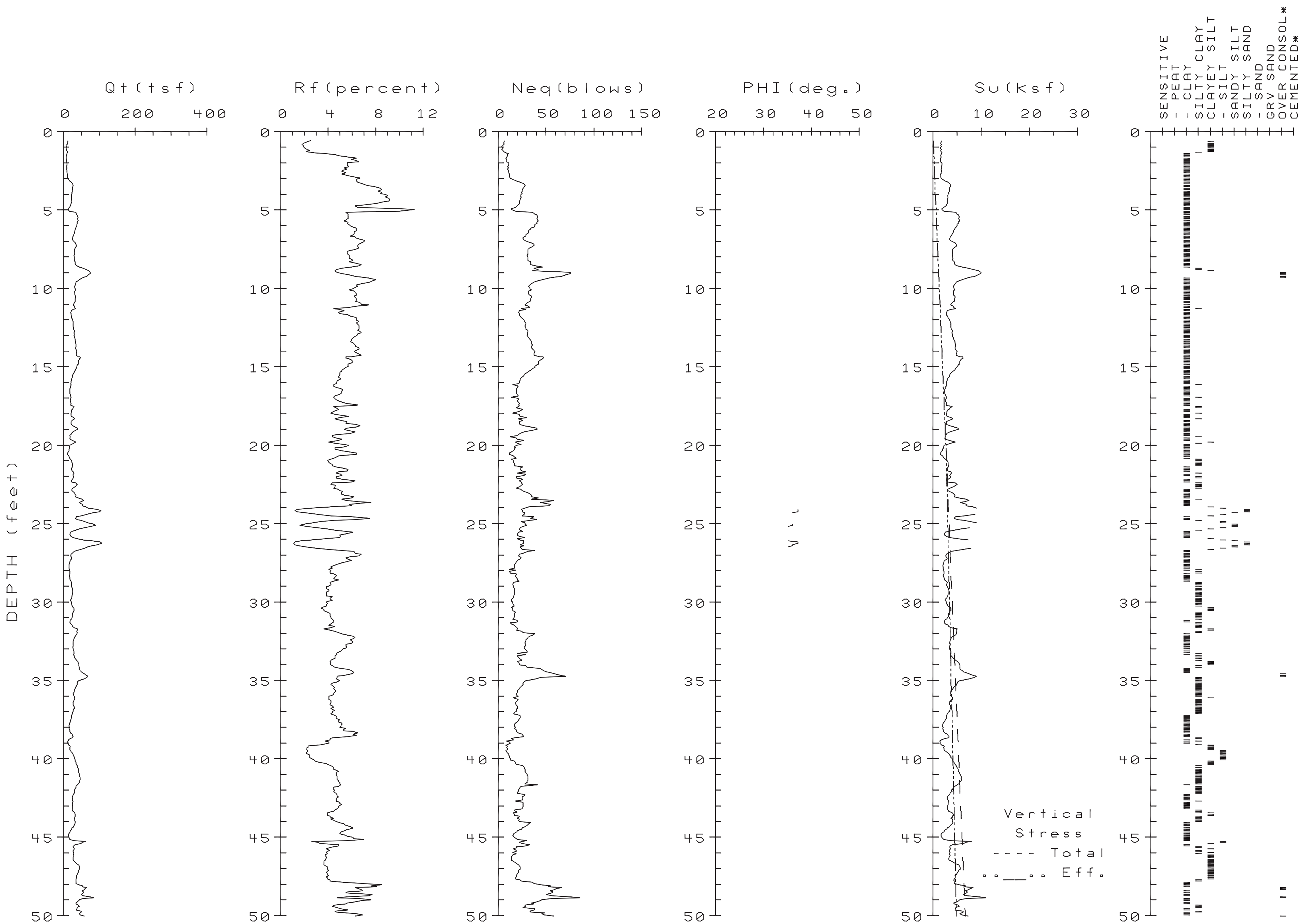
Terminated at 50.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-02
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



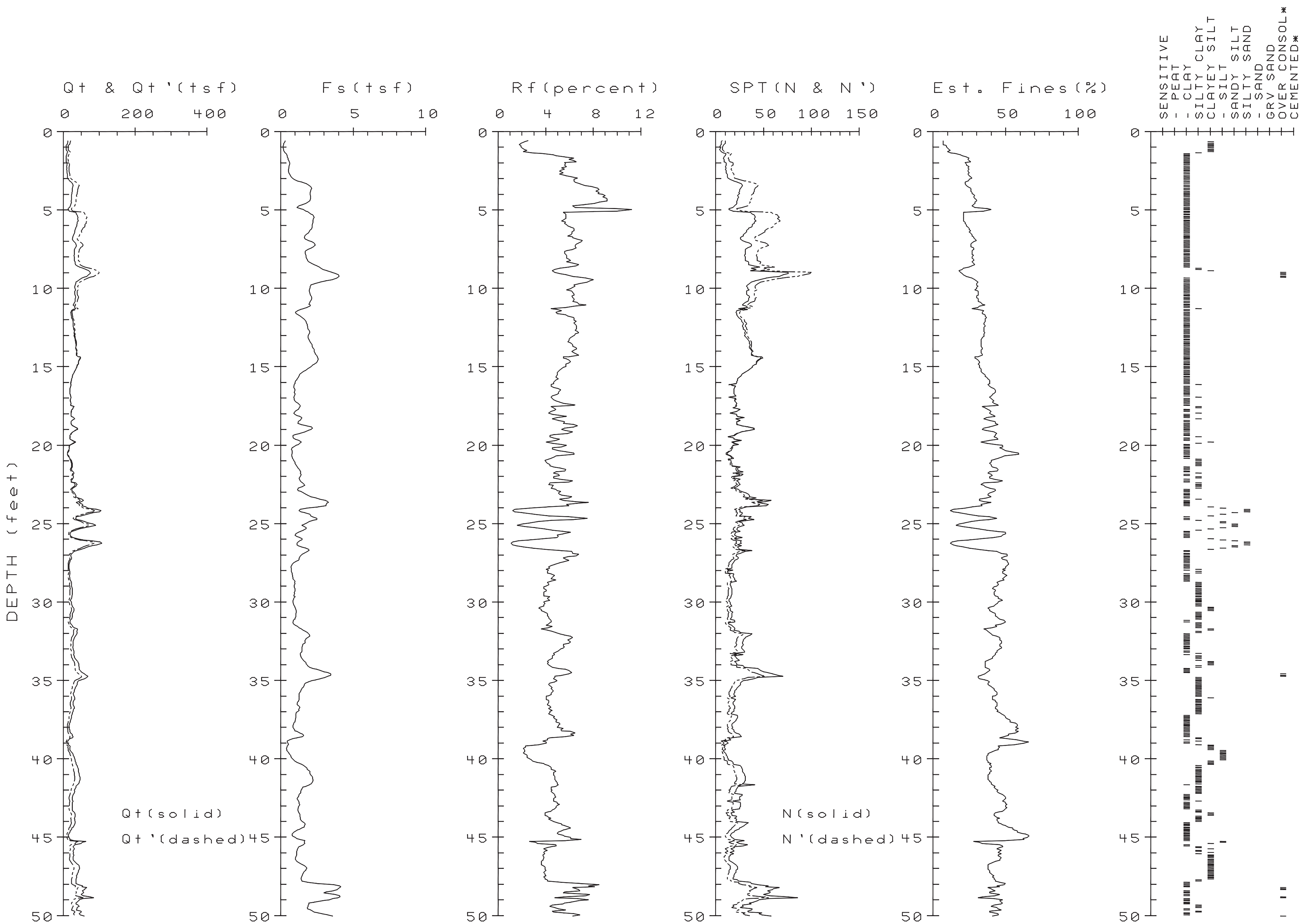
Terminated at 50.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-03
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



Terminated at 50.0 feet

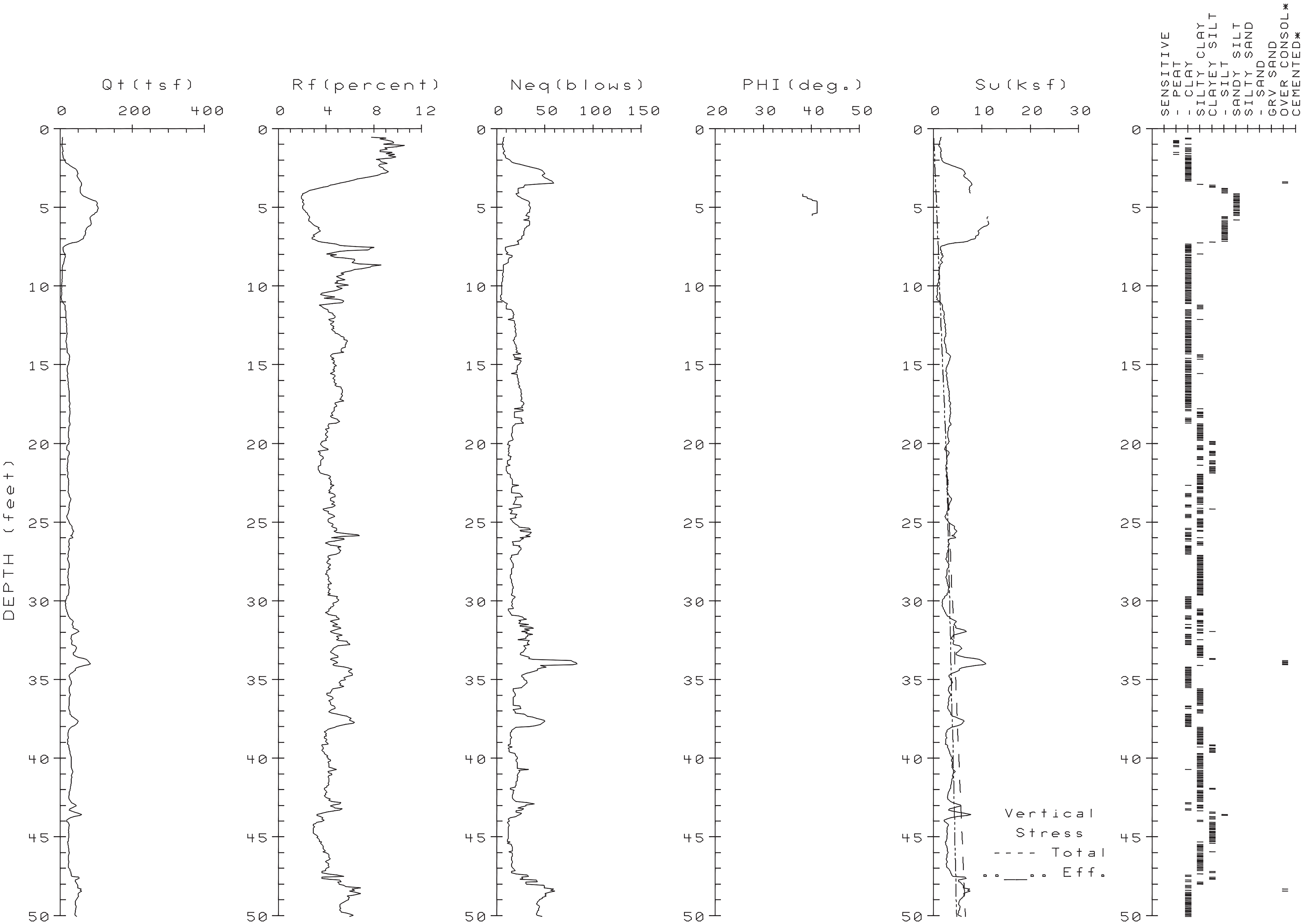
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-03
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

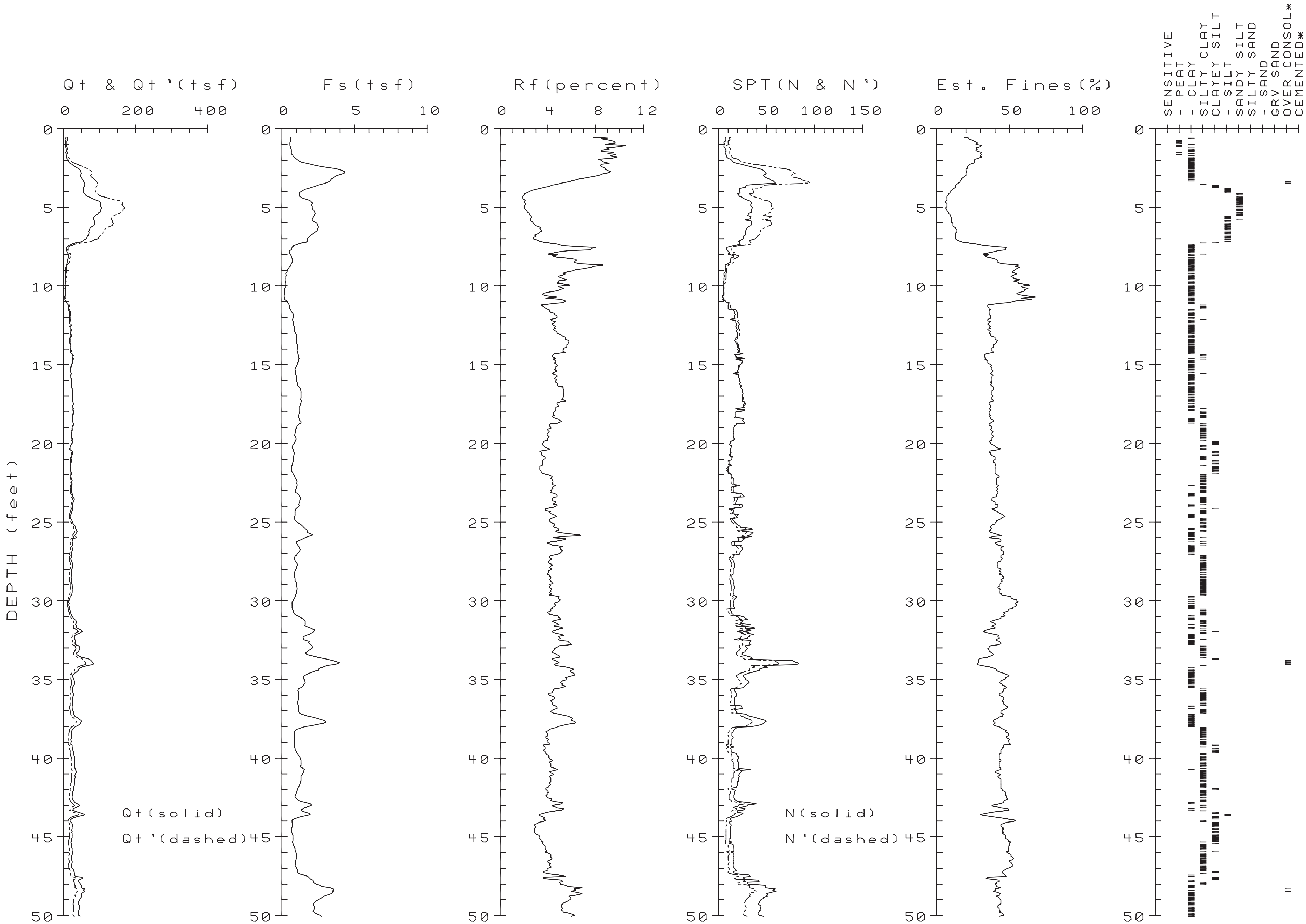
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-04
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



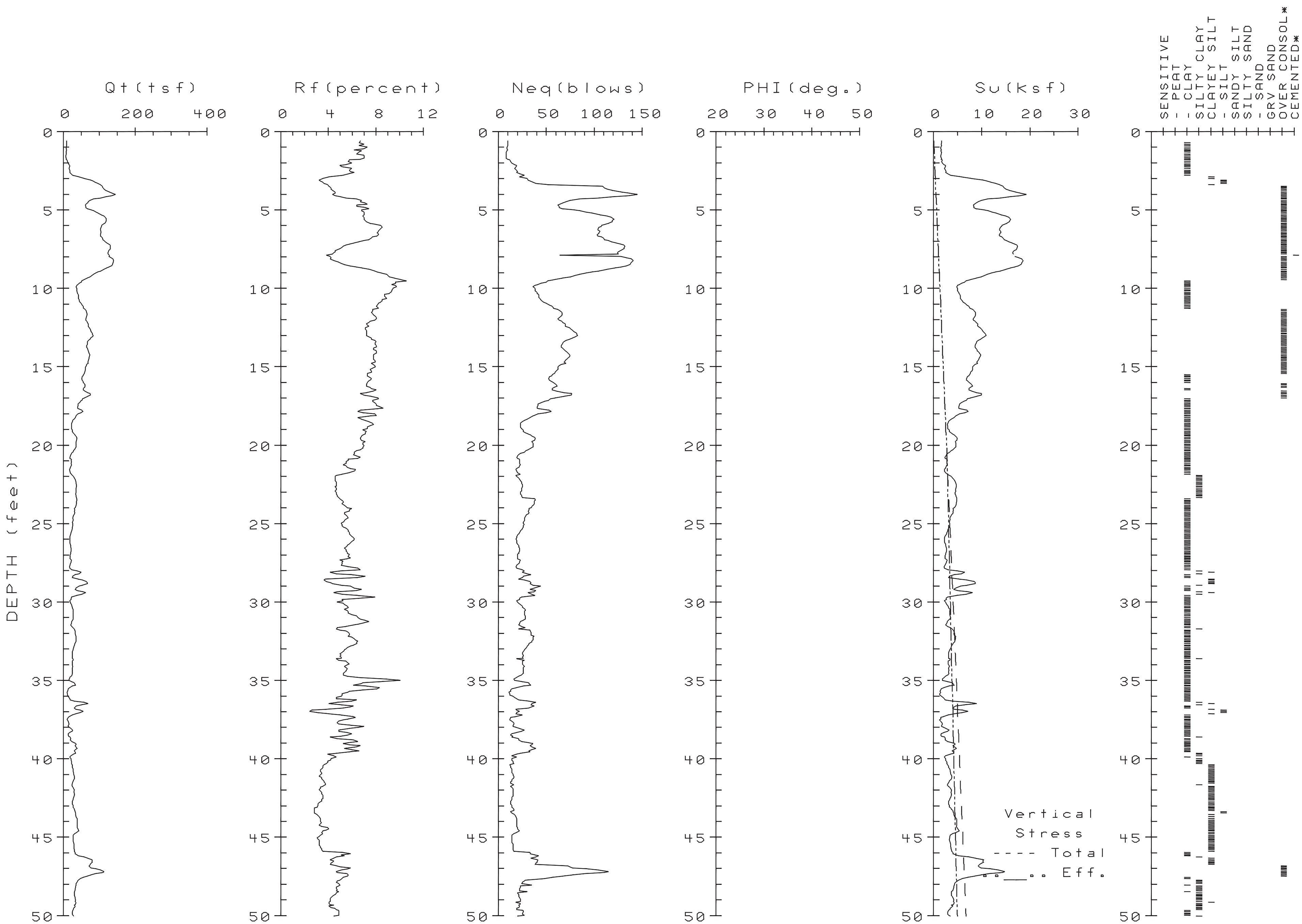
Terminated at 50.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-04
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



Terminated at 50.0 feet

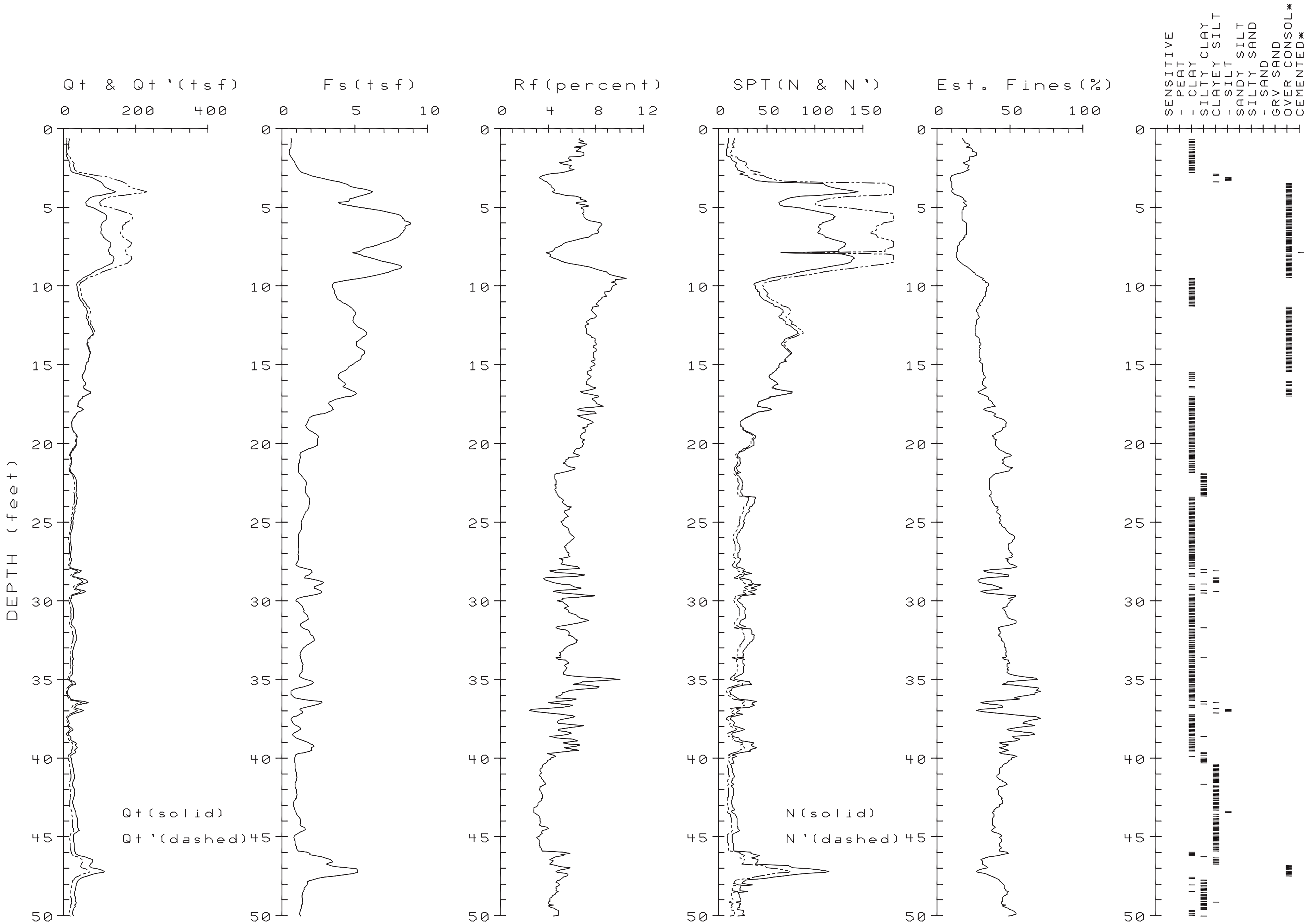
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-05
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

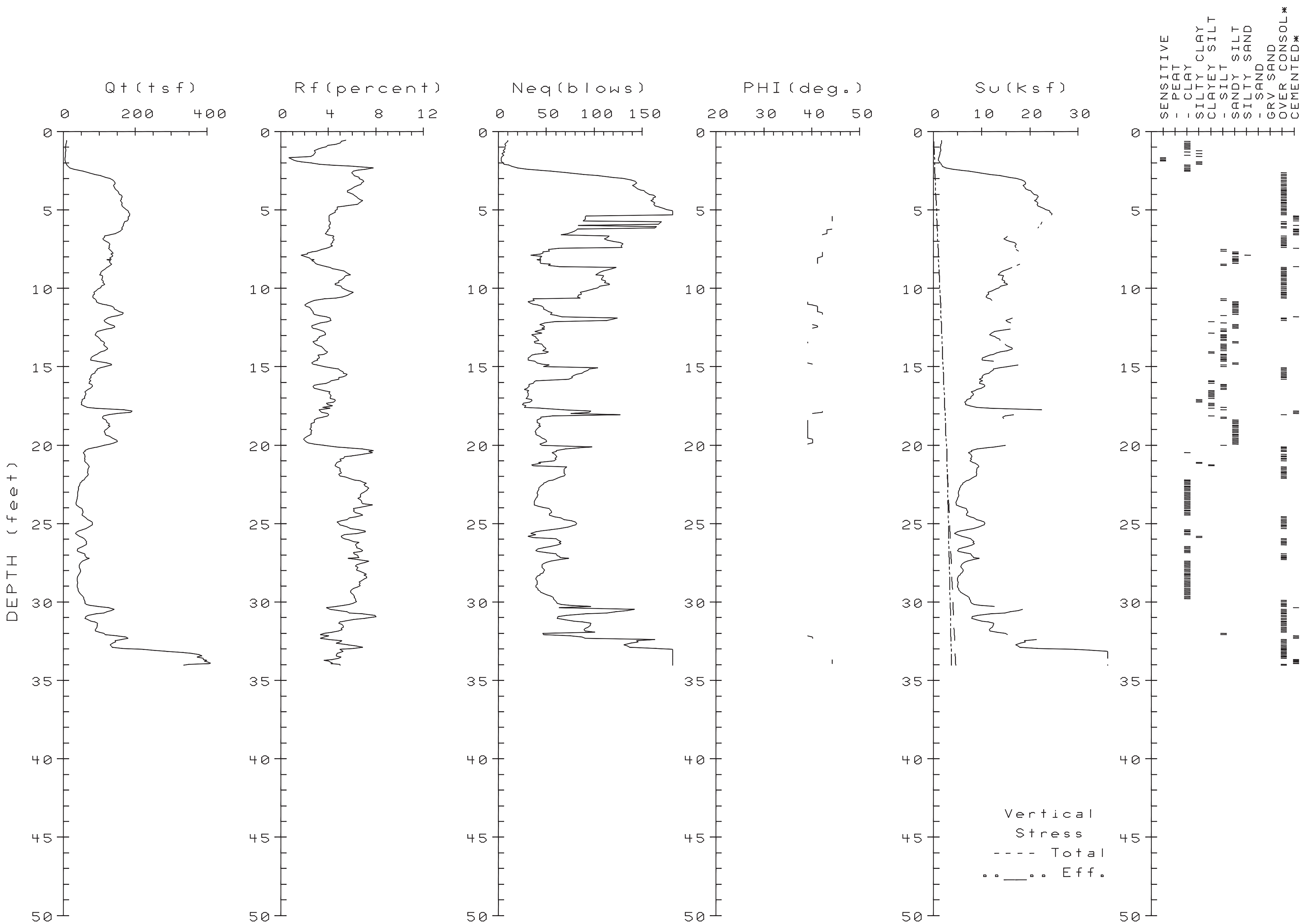
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-05
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 34.0 feet

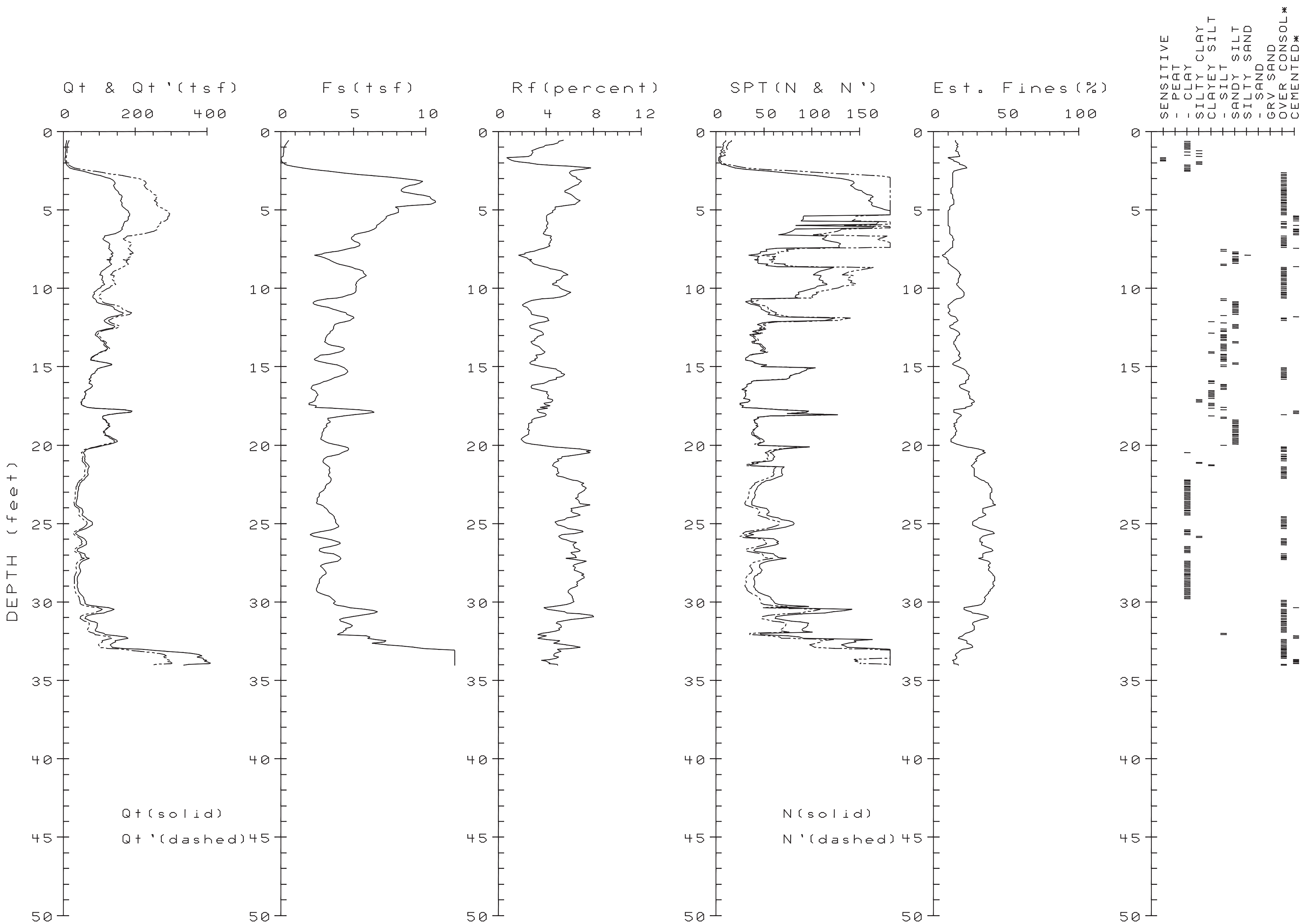
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-06
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 34.0 feet

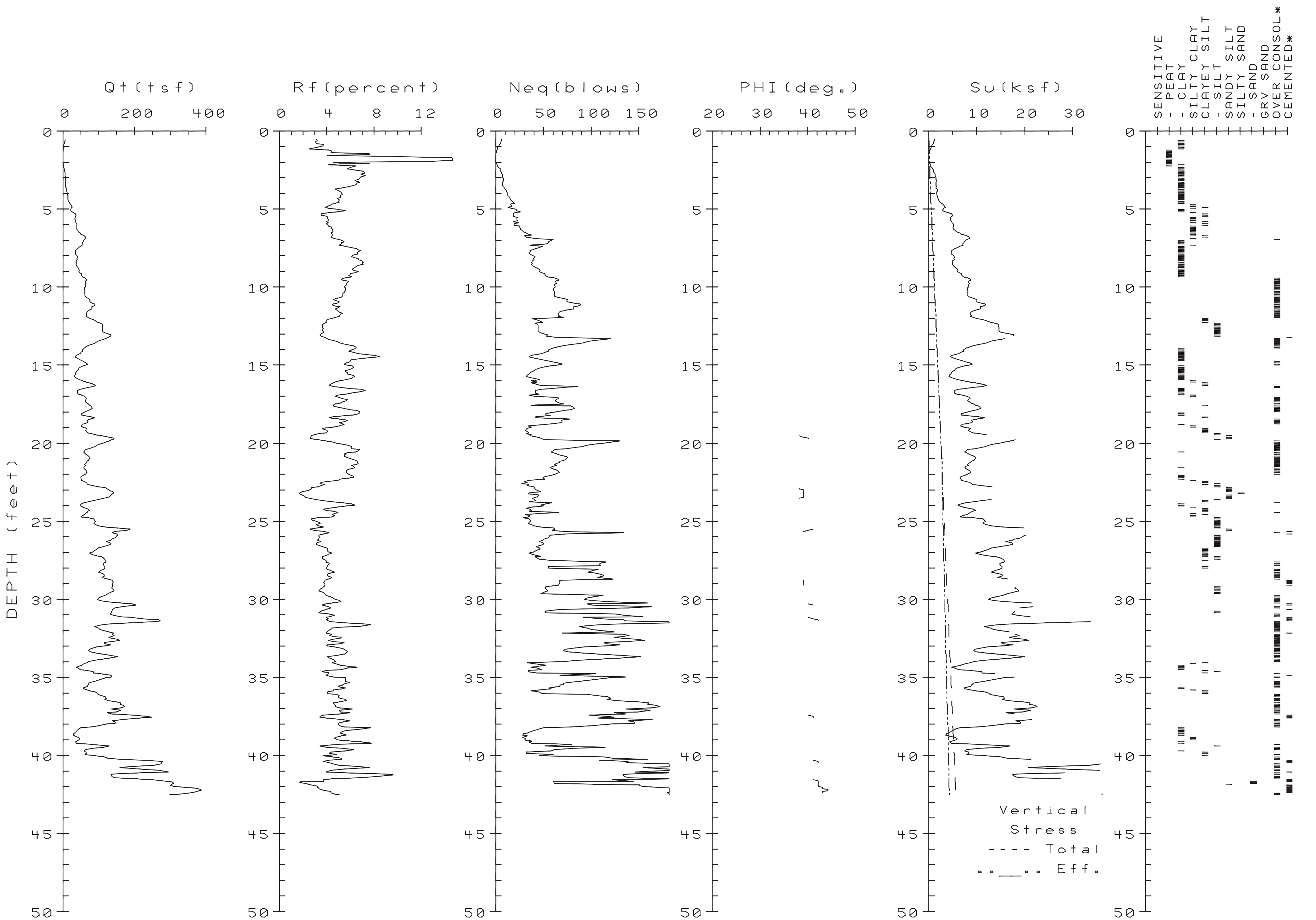
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-06
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



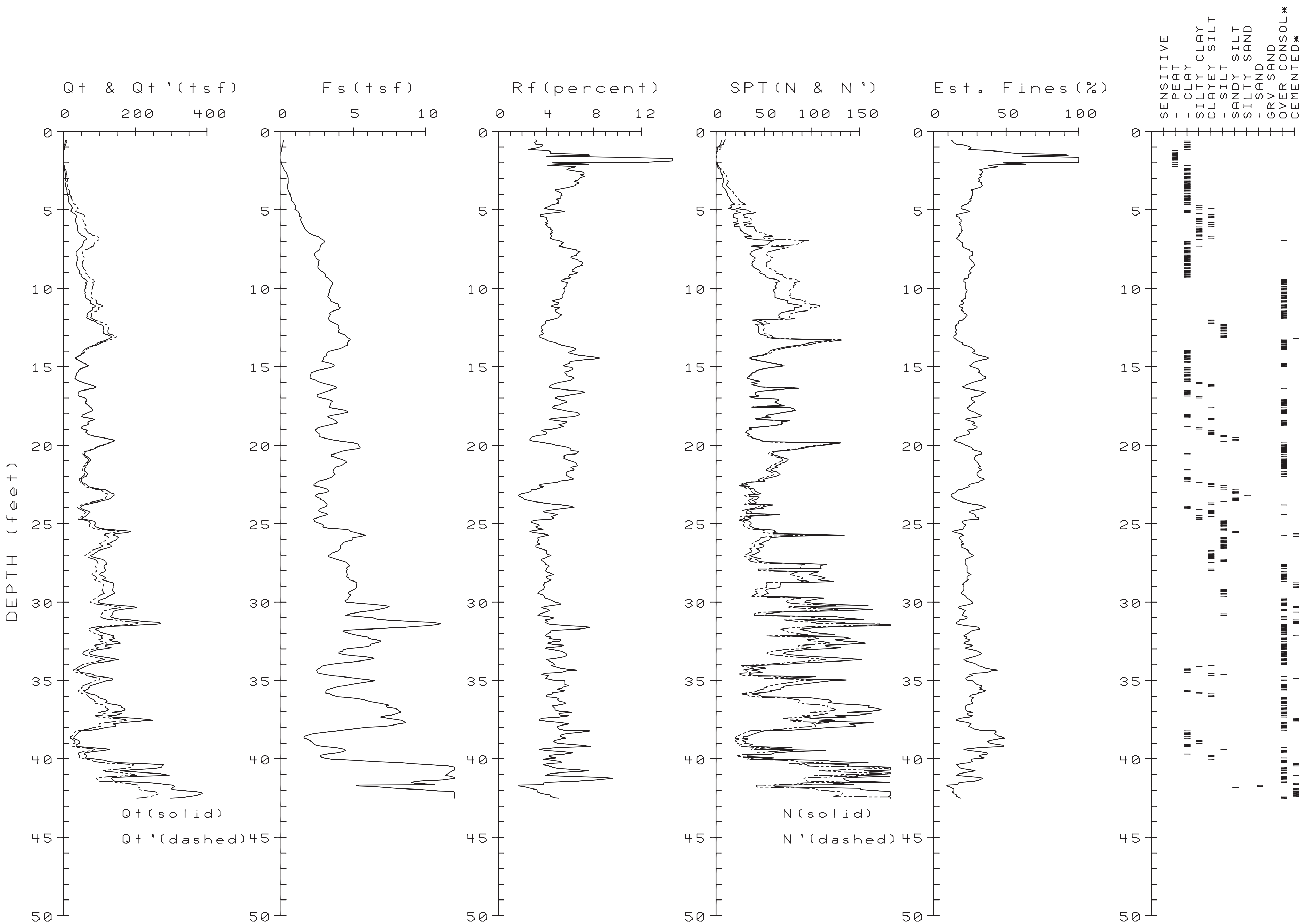
Terminated at 42.5 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-07
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



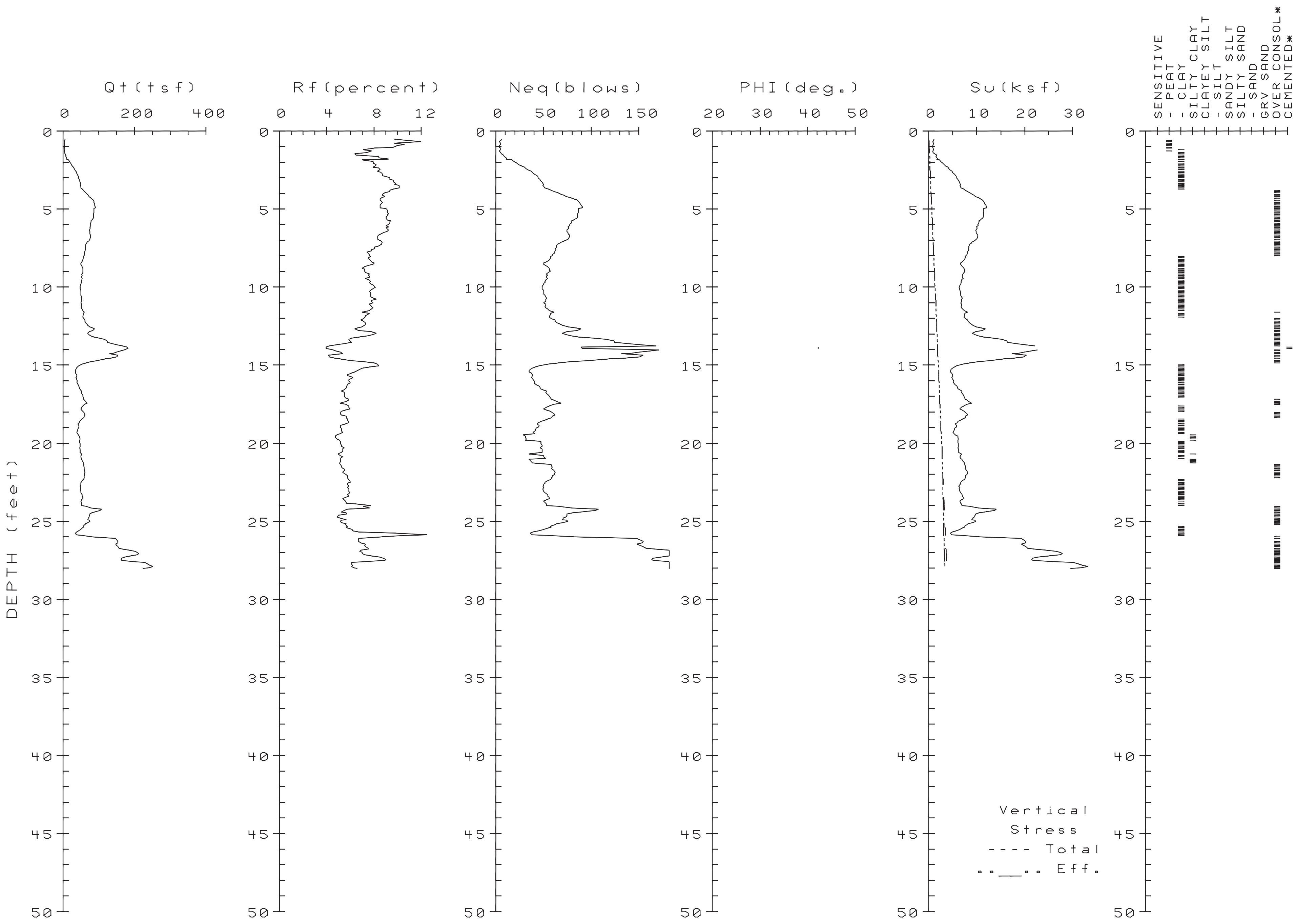
Terminated at 42.5 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-07
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



Terminated at 28.0 feet

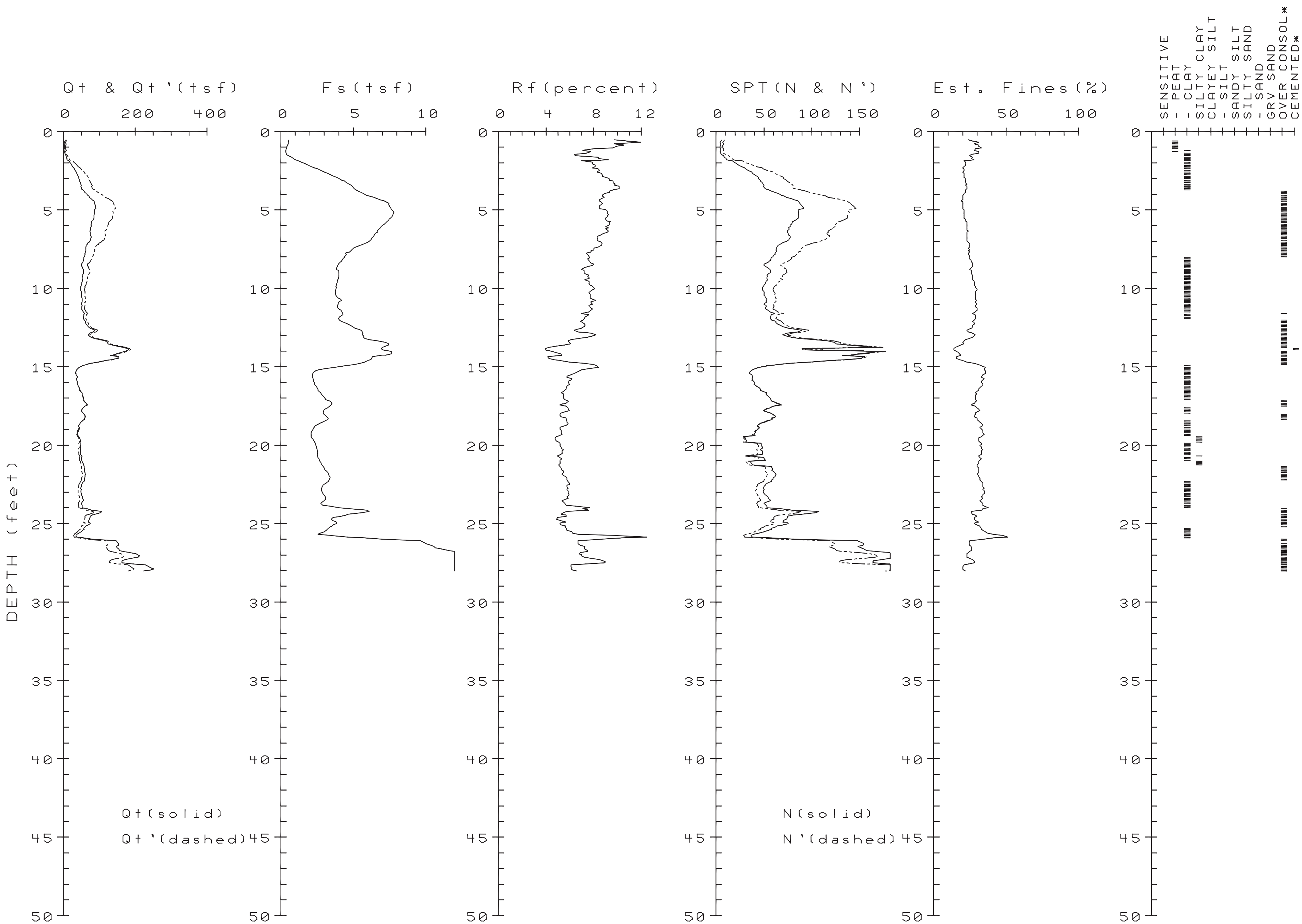
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-08
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



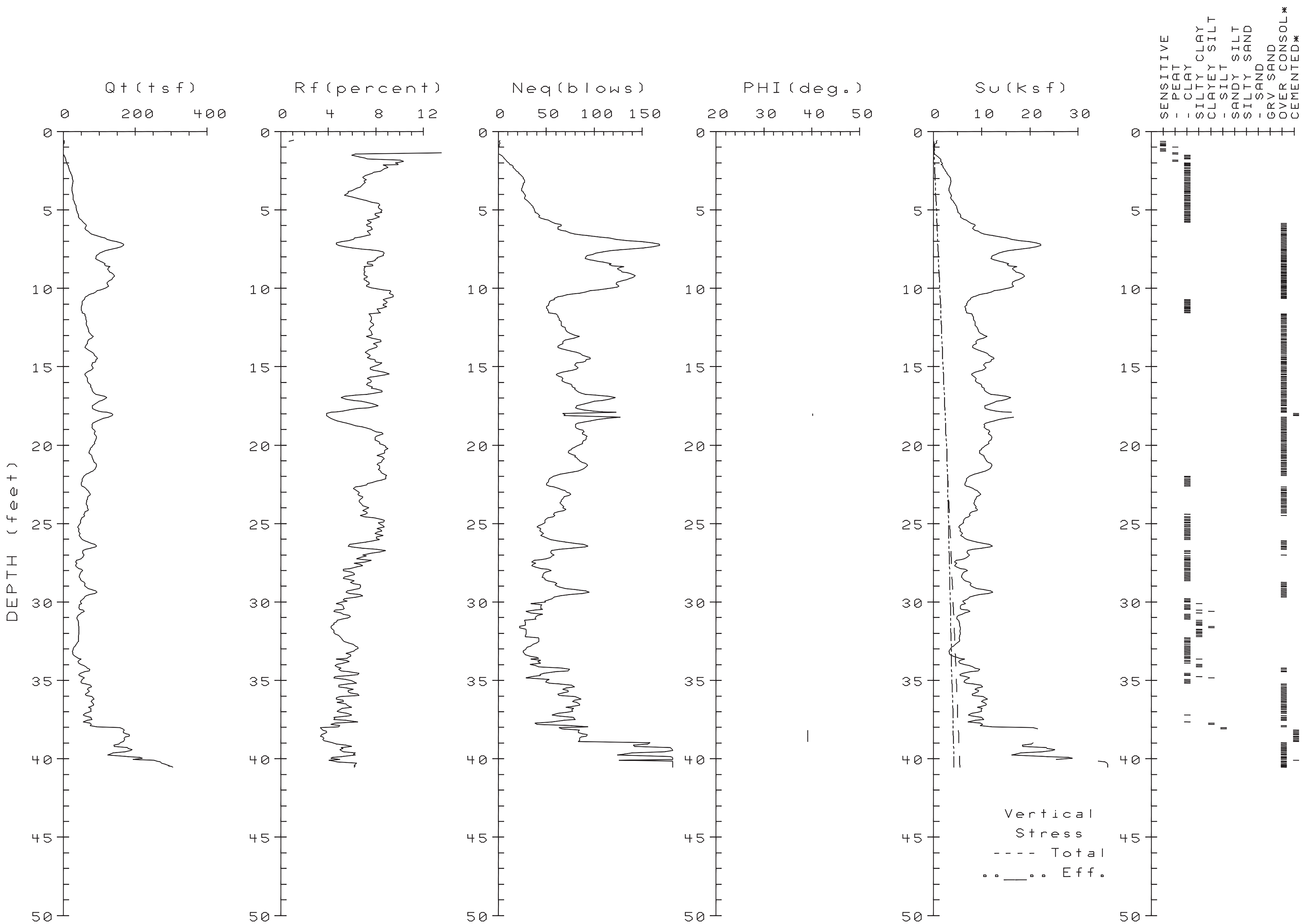
Terminated at 28.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-08
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



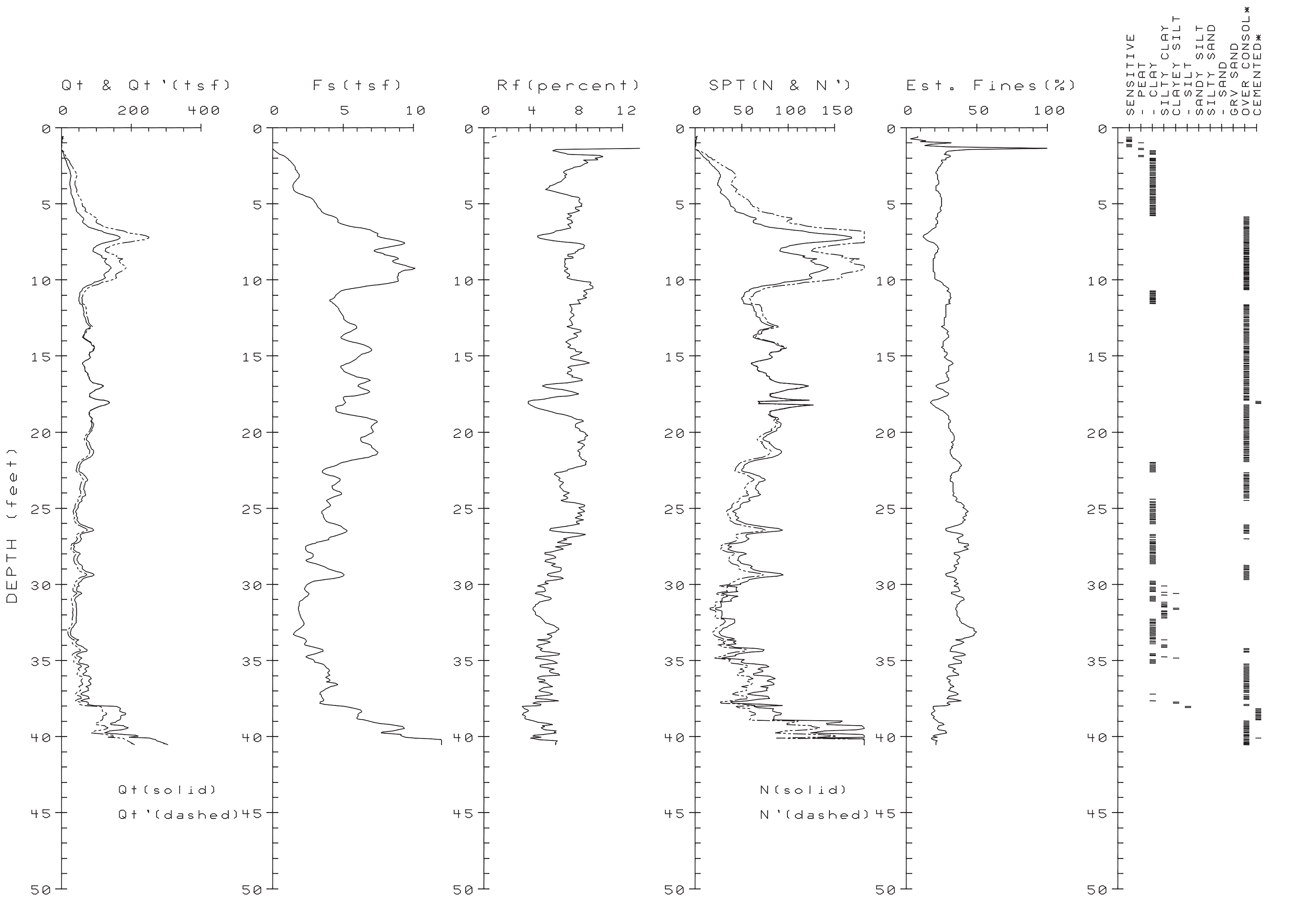
Terminated at 40.5 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-09
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



Terminated at 40.5 feet

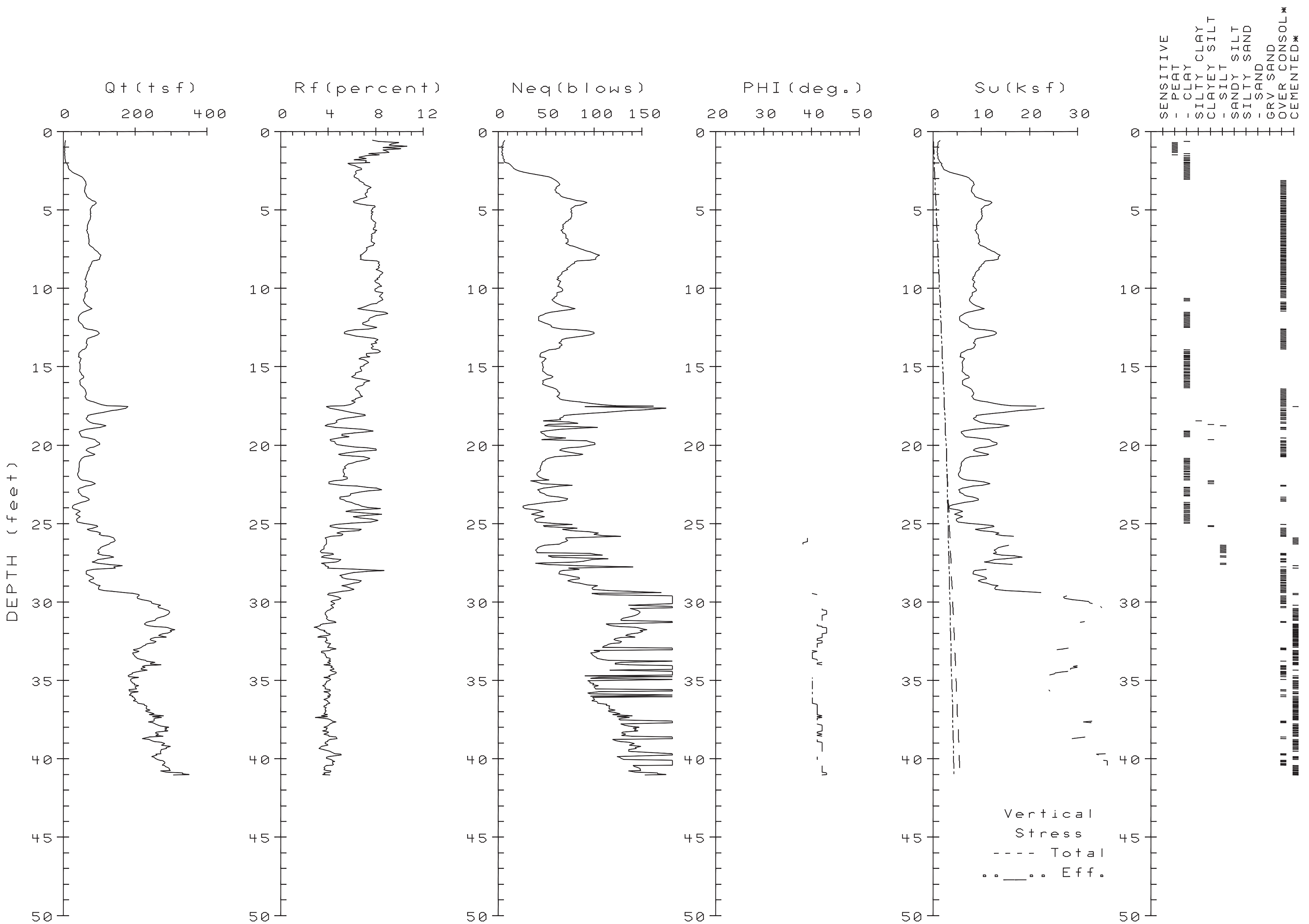
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-09
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



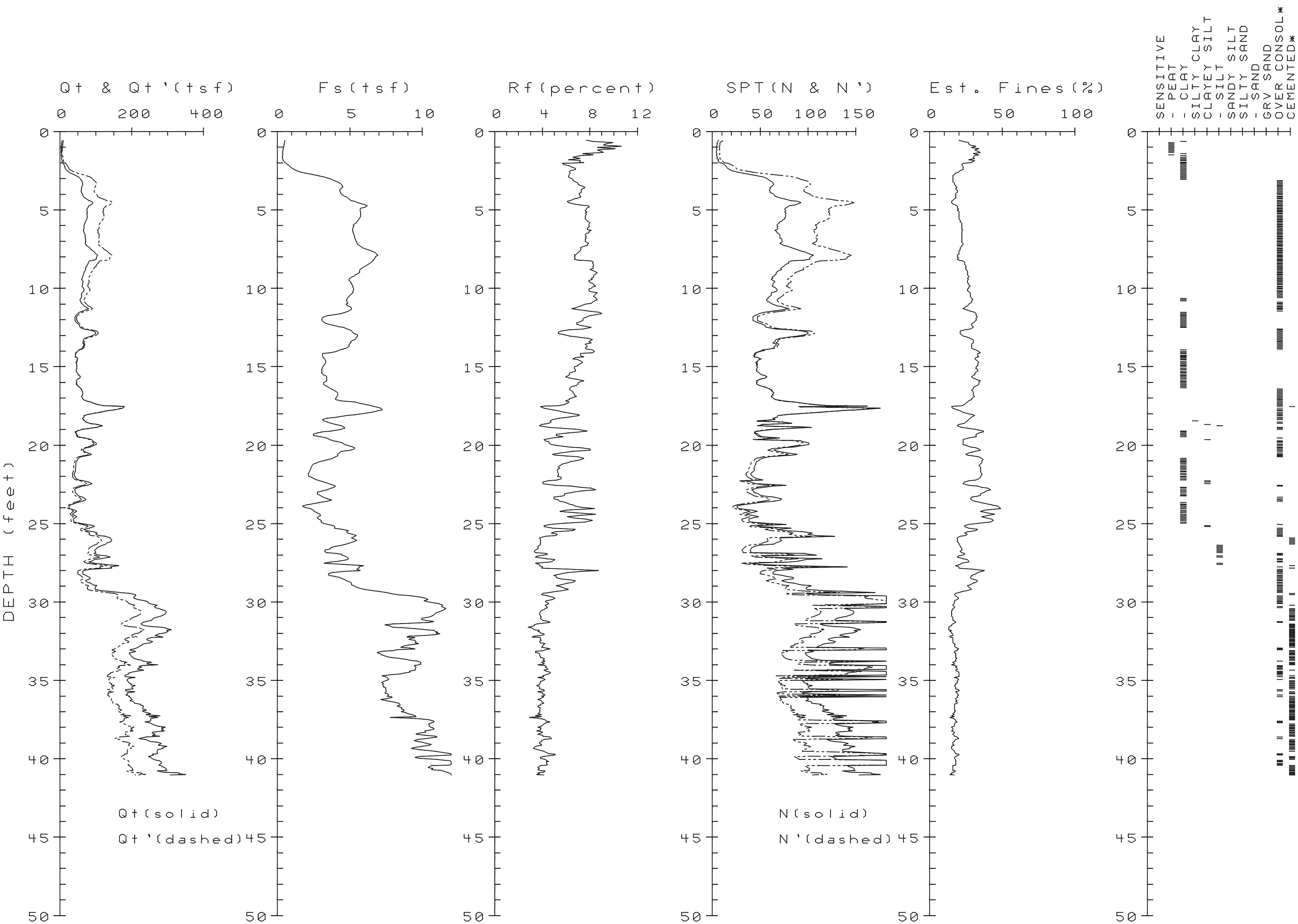
Terminated at 41.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-10
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



Terminated at 41.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-10
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-01
DATE: 02-06-2013
TI E: 16:34:00
Groundwater measured at 28.6 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.58	5.9	9.44	0.29	4.9	6	9	0.07	----	1.17	CLAY	100-110
1.02	8.5	13.60	0.55	6.5	9	14	0.12	----	1.69	"	110-120
1.53	10.2	16.32	0.72	7.1	10	16	0.18	----	1.68	"	120-130
2.01	12.4	19.84	1.00	8.1	12	20	0.24	----	1.64	"	"
2.53	34.2	54.72	2.86	8.4	34	55	0.31	----	4.54	"	130-140
3.06	39.8	63.68	3.45	8.7	40	64	0.38	----	5.28	"	"
3.50	40.6	64.96	3.24	8.0	41	65	0.44	----	5.38	"	"
4.01	42.9	68.64	3.42	8.0	43	68	0.51	----	5.69	"	"
4.57	54.6	87.36	4.14	7.6	55	87	0.59	----	7.24	"	"
5.06	60.4	96.64	4.72	7.8	60	96	0.65	----	8.01	Very Stiff Fine Grained *	"
5.53	67.7	108.32	5.51	8.1	68	108	0.72	----	8.98	"	>140
6.04	79.9	127.84	6.15	7.7	80	128	0.79	----	10.60	"	"
6.57	70.9	108.93	6.06	8.5	71	109	0.86	----	9.40	"	"
7.03	62.9	92.75	5.56	8.8	63	93	0.93	----	8.32	"	130-140
7.57	68.7	96.14	5.78	8.4	69	96	1.00	----	9.09	"	>140
8.03	55.6	76.03	4.58	8.2	56	76	1.06	----	7.34	CLAY	130-140
8.52	61.2	81.58	4.84	7.9	61	81	1.13	----	8.08	Very Stiff Fine Grained *	"
9.03	78.1	101.19	6.04	7.7	78	101	1.20	----	10.33	"	>140
9.57	71.9	90.42	5.91	8.2	72	90	1.28	----	9.50	"	"
10.02	58.8	72.21	5.00	8.5	59	72	1.34	----	7.75	"	130-140
10.57	65.5	78.12	5.11	7.8	65	78	1.41	----	8.64	"	"
11.02	69.4	80.75	5.06	7.3	69	81	1.47	----	9.16	"	"
11.58	49.7	56.31	4.02	8.1	50	56	1.55	----	6.52	CLAY	"
12.00	93.2	103.60	4.91	5.3	93	103	1.61	----	12.32	Very Stiff Fine Grained *	>140
12.53	74.7	81.11	3.76	5.0	75	81	1.68	----	9.85	"	130-140
13.00	39.1	41.56	3.38	8.6	39	41	1.74	----	5.10	CLAY	"
13.54	45.9	47.94	3.04	6.6	46	48	1.81	----	6.00	"	"
14.01	34.6	35.62	1.86	5.4	35	36	1.88	----	4.49	"	"
14.53	30.8	31.18	2.20	7.1	31	31	1.95	----	3.98	"	"
15.03	38.8	38.79	2.40	6.2	39	39	2.02	----	5.04	"	"
15.51	87.5	87.36	3.09	3.5	35	35	2.08	----	11.53	Sandy SILT to Clayey SILT	"
16.05	90.3	90.02	4.61	5.1	90	90	2.15	----	11.90	Very Stiff Fine Grained *	"
16.51	32.5	32.36	2.46	7.6	32	32	2.21	----	4.19	CLAY	"
17.05	24.9	24.76	1.43	5.7	25	25	2.29	----	3.17	"	"
17.53	23.4	23.23	1.31	5.6	23	23	2.35	----	2.96	"	"
18.06	36.3	35.99	2.13	5.9	36	36	2.42	----	4.68	"	"
18.53	55.7	55.16	2.52	4.5	37	37	2.49	----	7.26	Silty CLAY to CLAY	"
19.07	74.0	71.77	2.26	3.1	30	29	2.56	----	9.70	Sandy SILT to Clayey SILT	"
19.53	34.5	32.75	2.48	7.2	34	33	2.62	----	4.43	CLAY	"
20.08	15.9	14.74	0.91	5.7	16	15	2.69	----	1.94	"	120-130
20.54	13.6	12.35	0.72	5.3	14	12	2.75	----	1.63	"	"
21.01	12.5	11.11	0.67	5.4	13	11	2.81	----	1.48	"	"
21.55	13.1	11.34	0.63	4.8	13	11	2.88	----	1.55	"	"
22.03	18.2	15.40	0.67	3.7	12	10	2.94	----	2.23	Silty CLAY to CLAY	"
22.50	25.2	20.80	1.00	4.0	17	14	3.00	----	3.16	"	130-140
23.05	27.0	22.05	1.18	4.4	18	15	3.07	----	3.40	"	"
23.50	30.1	24.37	1.38	4.6	20	16	3.13	----	3.80	"	"
24.06	33.7	26.99	2.20	6.5	34	27	3.21	----	4.28	CLAY	"
24.56	141.7	112.39	4.07	2.9	47	37	3.28	39	----	Silty SAND to Sandy SILT	"
25.04	170.3	133.80	5.40	3.2	57	45	3.34	40	----	"	"
25.52	163.2	126.97	6.66	4.1	163	127	3.41	----	21.53	Very Stiff Fine Grained *	>140
26.05	158.3	121.85	5.52	3.5	79	61	3.48	39	----	SAND to Clayey SAND *	130-140
26.58	197.0	150.03	3.66	1.9	49	37	3.55	40	----	SAND to Silty SAND	"
27.02	102.8	77.57	4.86	4.7	103	77	3.61	----	13.47	Very Stiff Fine Grained *	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-01
DATE: 02-06-2013
TI E: 16:34:00
Groundwater measured at 28.6 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.52	34.5	25.77	2.03	5.9	34	26	3.68	----	4.35	CLAY	130-140
28.02	67.1	49.60	1.30	1.9	22	17	3.75	34	----	Silty SAND to Sandy SILT	"
28.53	17.7	12.94	1.31	7.4	18	13	3.81	----	2.11	CLAY	"
29.04	60.1	43.76	0.50	0.8	15	11	3.84	33	----	SAND to Silty SAND	110-120
29.56	41.2	29.82	1.46	3.5	21	15	3.88	----	5.23	Clayey SILT to Silty CLAY	130-140
30.00	118.5	85.34	2.09	1.8	39	28	3.91	37	----	Silty SAND to Sandy SILT	"
30.51	143.9	103.01	4.19	2.9	48	34	3.95	38	----	"	"
31.03	203.6	144.88	4.00	2.0	51	36	3.99	40	----	SAND to Silty SAND	"
31.57	168.6	119.34	3.84	2.3	56	40	4.03	39	----	Silty SAND to Sandy SILT	"
32.05	270.2	190.45	7.35	2.7	135	95	4.06	42	----	SAND to Clayey SAND *	"
32.53	231.0	162.14	4.08	1.8	46	32	4.10	41	----	SAND	"
33.04	236.8	165.47	4.38	1.8	47	33	4.13	41	----	"	"
33.51	170.5	118.61	8.83	5.2	170	119	4.17	----	22.43	Very Stiff Fine Grained *	>140
34.03	85.1	58.91	7.05	8.3	85	59	4.21	----	11.04	"	"
34.55	57.5	39.62	2.20	3.8	29	20	4.25	----	7.36	Clayey SILT to Silty CLAY	130-140
35.01	30.8	21.13	1.82	5.9	31	21	4.28	----	3.79	CLAY	"
35.56	26.3	17.96	2.05	7.8	26	18	4.32	----	3.19	"	"
36.06	27.9	18.96	2.04	7.3	28	19	4.36	----	3.40	"	"
36.55	28.8	19.49	2.22	7.7	29	19	4.39	----	3.51	"	"
37.08	43.6	29.36	2.28	5.2	44	29	4.43	----	5.48	"	"
37.52	64.8	43.46	3.90	6.0	65	43	4.46	----	8.31	Very Stiff Fine Grained *	"
38.04	87.9	58.67	4.11	4.7	88	59	4.50	----	11.38	"	"
38.57	85.1	56.52	3.75	4.4	85	56	4.54	----	11.00	"	"
39.06	95.8	63.32	5.66	5.9	96	63	4.58	----	12.42	"	>140
39.56	138.5	91.09	10.94	7.9	138	91	4.62	----	18.11	"	"
40.04	237.1	155.19	10.35	4.4	237	155	4.65	----	31.26	"	"
40.52	106.2	69.17	9.47	8.9	106	69	4.69	----	13.80	"	"
41.01	100.7	65.27	6.29	6.2	101	65	4.73	----	13.06	"	"
41.53	152.1	98.06	9.07	6.0	152	98	4.77	----	19.91	"	"
42.01	234.1	150.18	10.71	4.6	234	150	4.81	----	30.84	"	"
42.55	205.1	130.84	12.16	5.9	205	131	4.85	----	26.97	"	"
43.01	127.1	80.69	10.46	8.2	127	81	4.88	----	16.56	"	"
43.53	122.7	77.49	7.49	6.1	123	77	4.92	----	15.97	"	"
44.00	169.3	106.38	9.10	5.4	169	106	4.96	----	22.18	"	"
44.54	86.5	54.07	4.15	4.8	86	54	5.00	----	11.13	"	130-140
45.02	146.1	90.97	7.77	5.3	146	91	5.04	----	19.08	"	>140
45.55	94.2	58.40	6.38	6.8	94	58	5.08	----	12.15	"	"
46.03	79.7	49.23	4.26	5.3	80	49	5.11	----	10.21	"	130-140
46.55	148.7	91.46	9.35	6.3	149	91	5.15	----	19.41	"	>140
47.01	81.4	49.89	4.18	5.1	81	50	5.19	----	10.43	"	130-140
47.54	93.3	56.93	6.02	6.5	93	57	5.23	----	12.01	"	>140
48.00	138.4	84.13	8.31	6.0	138	84	5.26	----	18.02	"	"
48.53	130.9	79.22	8.89	6.8	131	79	5.30	----	17.02	"	"
49.01	110.2	66.43	8.22	7.5	110	66	5.34	----	14.25	"	"
49.51	232.5	139.57	10.51	4.5	232	139	5.38	----	30.55	"	"
50.04	159.6	95.38	12.90	8.1	159	95	5.42	----	20.83	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance Fs = Sleeve friction resistance Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density** Phi = Soil friction angle* Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test* (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988 ** Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-02
DATE: 02-06-2013
TI E: 16:05:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	8.5	13.60	0.51	6.0	9	14	0.06	----	1.69	CLAY	110-120
1.02	6.7	10.72	0.39	5.8	7	11	0.12	----	1.33	"	"
1.56	8.2	13.12	0.46	5.6	8	13	0.18	----	1.62	"	"
2.02	10.1	16.16	0.84	8.3	10	16	0.24	----	1.66	"	120-130
2.56	21.6	34.56	1.80	8.3	22	35	0.31	----	2.86	"	130-140
3.02	18.0	28.80	1.67	9.3	18	29	0.37	----	2.38	"	"
3.55	23.6	37.76	1.80	7.6	24	38	0.44	----	3.12	"	"
4.00	28.3	45.28	1.97	7.0	28	45	0.50	----	3.74	"	"
4.51	41.6	66.56	2.93	7.0	42	66	0.57	----	5.51	"	"
5.04	55.6	88.96	4.50	8.1	56	89	0.64	----	7.37	"	"
5.52	61.5	98.40	5.14	8.4	61	98	0.71	----	8.15	Very Stiff Fine Grained *	"
6.02	56.2	89.92	4.77	8.5	56	90	0.78	----	7.44	CLAY	"
6.51	52.7	82.08	4.78	9.1	53	82	0.84	----	6.97	"	"
7.07	37.8	56.00	3.48	9.2	38	56	0.92	----	4.98	"	"
7.55	28.1	39.80	2.49	8.9	28	40	0.98	----	3.68	"	"
8.04	24.4	33.53	1.78	7.3	24	33	1.05	----	3.18	"	"
8.51	25.8	34.60	1.65	6.4	26	34	1.11	----	3.37	"	"
9.01	24.1	31.47	1.61	6.7	24	31	1.18	----	3.13	"	"
9.53	19.8	25.13	1.33	6.7	20	25	1.25	----	2.56	"	"
10.06	24.5	30.27	1.30	5.3	25	30	1.32	----	3.18	"	"
10.50	37.0	44.64	1.87	5.1	37	45	1.38	----	4.84	"	"
11.03	43.2	50.65	1.80	4.2	22	25	1.45	----	5.66	Clayey SILT to Silty CLAY	"
11.54	29.7	33.92	1.59	5.4	30	34	1.52	----	3.86	CLAY	"
12.07	11.5	12.86	0.62	5.4	11	13	1.59	----	1.78	"	120-130
12.53	15.1	16.57	0.51	3.4	10	11	1.65	----	1.90	Silty CLAY to CLAY	"
13.06	21.6	23.19	0.74	3.4	11	12	1.71	----	2.77	Clayey SILT to Silty CLAY	"
13.54	19.4	20.44	0.98	5.1	19	20	1.78	----	2.47	CLAY	130-140
14.07	34.1	35.34	2.07	6.1	34	35	1.85	----	4.42	"	"
14.56	17.4	17.76	1.28	7.4	17	18	1.91	----	2.19	"	"
15.01	26.4	26.55	1.45	5.5	26	26	1.98	----	3.39	"	"
15.54	47.8	47.76	1.52	3.2	19	19	2.05	----	6.24	Sandy SILT to Clayey SILT	"
16.06	49.3	49.18	1.23	2.5	20	20	2.12	----	6.43	"	"
16.51	30.5	30.39	1.55	5.1	30	30	2.18	----	3.92	CLAY	"
17.03	13.0	12.94	0.48	3.7	9	9	2.24	----	1.58	Silty CLAY to CLAY	120-130
17.52	12.7	12.62	0.35	2.8	6	6	2.30	----	1.54	Clayey SILT to Silty CLAY	110-120
18.03	13.6	13.50	0.37	2.7	7	7	2.36	----	1.66	"	"
18.56	10.8	10.71	0.26	2.4	5	5	2.42	----	1.60	"	"
19.02	11.9	11.79	0.24	2.0	6	6	2.47	----	1.78	"	100-110
19.56	14.6	14.29	0.38	2.6	7	7	2.53	----	1.78	"	120-130
20.00	19.8	19.02	0.53	2.7	10	10	2.59	----	2.47	"	"
20.53	26.4	24.73	0.80	3.0	13	12	2.66	----	3.34	"	130-140
21.02	32.2	29.78	1.07	3.3	16	15	2.70	----	4.11	"	"
21.56	26.7	24.35	1.51	5.7	27	24	2.74	----	3.37	CLAY	"
22.06	20.6	18.54	1.14	5.5	21	18	2.77	----	2.56	"	"
22.52	20.6	18.32	1.07	5.2	21	18	2.81	----	2.55	"	"
23.04	16.2	14.23	0.70	4.3	16	14	2.84	----	1.96	"	120-130
23.57	25.3	21.90	1.78	7.0	25	22	2.88	----	3.17	"	130-140
24.03	18.5	15.81	1.14	6.2	18	16	2.91	----	2.26	"	"
24.56	13.9	11.73	0.79	5.7	14	12	2.94	----	1.64	"	120-130
25.02	16.7	13.93	0.75	4.5	17	14	2.97	----	2.01	"	"
25.54	21.7	17.89	0.79	3.6	14	12	3.00	----	2.67	Silty CLAY to CLAY	"
26.07	22.9	18.78	1.01	4.4	15	12	3.04	----	2.83	"	130-140
26.52	28.2	23.02	1.52	5.4	28	23	3.08	----	3.53	CLAY	"
27.00	30.2	24.53	1.54	5.1	30	24	3.11	----	3.79	"	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-02
DATE: 02-06-2013
TI E: 16:05:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.53	16.7	13.50	0.66	4.0	11	9	3.14	----	1.99	Silty CLAY to CLAY	120-130
28.05	15.0	12.07	0.69	4.6	15	12	3.18	----	1.76	CLAY	"
28.50	16.2	12.98	0.70	4.3	16	13	3.20	----	1.91	"	"
29.02	32.0	25.51	1.97	6.2	32	25	3.24	----	4.02	"	130-140
29.53	13.8	10.95	0.55	4.0	14	11	3.27	----	1.58	"	120-130
30.03	17.4	13.74	0.76	4.4	17	14	3.31	----	2.06	"	"
30.56	18.8	14.78	0.77	4.1	12	10	3.34	----	2.24	Silty CLAY to CLAY	"
31.06	67.9	53.09	4.44	6.5	68	53	3.38	----	8.78	Very Stiff Fine Grained *	130-140
31.56	85.3	66.31	5.10	6.0	85	66	3.41	----	11.10	"	>140
32.07	56.1	43.37	2.78	5.0	37	29	3.45	----	7.20	Silty CLAY to CLAY	130-140
32.50	47.5	36.55	2.92	6.1	48	37	3.48	----	6.05	CLAY	"
33.00	63.5	48.60	3.30	5.2	63	49	3.52	----	8.18	Very Stiff Fine Grained *	"
33.54	120.7	91.80	6.04	5.0	121	92	3.56	----	15.80	"	>140
34.02	57.6	43.58	3.38	5.9	58	44	3.60	----	7.38	CLAY	130-140
34.51	85.7	64.49	4.25	5.0	86	64	3.63	----	11.13	Very Stiff Fine Grained *	"
35.00	74.3	55.60	3.71	5.0	74	56	3.67	----	9.60	"	"
35.54	108.9	80.97	5.55	5.1	109	81	3.71	----	14.21	"	>140
36.04	49.7	36.75	2.30	4.6	33	24	3.74	----	6.31	Silty CLAY to CLAY	130-140
36.53	46.6	34.26	2.17	4.7	31	23	3.78	----	5.89	"	"
37.01	34.3	25.08	1.86	5.4	34	25	3.82	----	4.25	CLAY	"
37.51	32.2	23.41	1.38	4.3	21	16	3.85	----	3.97	Silty CLAY to CLAY	"
38.07	27.5	19.87	1.18	4.3	18	13	3.89	----	3.33	"	"
38.58	34.8	24.99	1.29	3.7	17	12	3.93	----	4.30	Clayey SILT to Silty CLAY	"
39.07	48.5	34.63	2.12	4.4	32	23	3.96	----	6.13	Silty CLAY to CLAY	"
39.54	45.0	31.96	2.23	5.0	30	21	4.00	----	5.65	"	"
40.04	27.6	19.51	1.54	5.6	28	19	4.03	----	3.33	CLAY	"
40.52	20.8	14.64	1.03	5.0	21	15	4.07	----	2.42	"	"
41.02	22.8	15.98	1.10	4.8	23	16	4.11	----	2.68	"	"
41.52	26.3	18.36	1.30	4.9	26	18	4.14	----	3.14	"	"
42.00	31.0	21.54	1.73	5.6	31	21	4.18	----	3.77	"	"
42.52	25.4	17.57	1.21	4.8	25	17	4.22	----	3.01	"	"
43.08	26.3	18.10	1.09	4.1	17	12	4.26	----	3.13	Silty CLAY to CLAY	"
43.56	25.7	17.61	1.09	4.2	17	12	4.29	----	3.04	"	"
44.04	33.3	22.72	1.43	4.3	22	15	4.33	----	4.05	"	"
44.53	35.0	23.78	1.65	4.7	23	16	4.36	----	4.28	"	"
45.01	21.1	14.27	1.07	5.1	21	14	4.40	----	2.42	CLAY	"
45.54	28.6	19.25	1.90	6.6	28	19	4.43	----	3.41	"	"
46.04	26.6	17.82	1.26	4.7	27	18	4.47	----	3.14	"	"
46.52	28.6	19.08	1.51	5.3	28	19	4.51	----	3.40	"	"
47.01	16.2	10.76	0.88	5.4	16	11	4.54	----	1.75	"	120-130
47.53	30.5	20.17	1.73	5.7	30	20	4.57	----	3.65	"	130-140
48.01	85.8	56.48	2.95	3.4	34	23	4.61	----	11.02	Sandy SILT to Clayey SILT	"
48.55	21.4	14.02	1.09	5.1	21	14	4.65	----	2.43	CLAY	"
49.04	23.5	15.32	1.05	4.5	23	15	4.68	----	2.70	"	"
49.51	22.9	14.86	1.03	4.5	23	15	4.72	----	2.62	"	"
50.04	29.9	19.31	1.90	6.4	30	19	4.76	----	3.55	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance Fs = Sleeve friction resistance Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density** Phi = Soil friction angle* Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test* (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988 ** Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-03
DATE: 02-06-2013
TI E: 15:21:00
Groundwater measured at 20.8 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.58	13.1	20.96	0.33	2.5	7	10	0.07	----	1.74	Clayey SILT to Silty CLAY	110-120
1.05	9.0	14.40	0.18	2.0	5	7	0.12	----	1.49	"	100-110
1.55	9.5	15.20	0.46	4.8	10	15	0.17	----	1.57	CLAY	110-120
2.05	11.0	17.60	0.62	5.6	11	18	0.24	----	1.81	"	120-130
2.53	10.7	17.12	0.55	5.1	11	17	0.30	----	1.76	"	"
3.03	15.3	24.48	0.96	6.3	15	24	0.36	----	2.02	"	"
3.52	26.9	43.04	2.11	7.8	27	43	0.42	----	3.56	"	130-140
4.08	23.2	37.12	2.07	8.9	23	37	0.50	----	3.06	"	"
4.57	22.0	35.20	1.76	8.0	22	35	0.57	----	2.90	"	"
5.07	17.9	28.64	1.77	9.9	18	28	0.63	----	2.34	"	"
5.54	40.3	64.48	2.27	5.6	40	64	0.70	----	5.33	"	"
6.01	37.9	60.64	2.19	5.8	38	60	0.76	----	5.00	"	"
6.57	29.4	45.96	1.77	6.0	29	46	0.84	----	3.86	"	"
7.03	31.5	47.32	2.18	6.9	31	47	0.90	----	4.14	"	"
7.51	31.0	44.56	1.91	6.2	31	45	0.96	----	4.07	"	"
8.07	31.5	43.47	1.80	5.7	31	43	1.04	----	4.13	"	"
8.55	38.8	52.23	2.53	6.5	39	52	1.10	----	5.10	"	"
9.05	74.6	97.81	3.82	5.1	75	98	1.17	----	9.87	Very Stiff Fine Grained *	"
9.53	41.0	52.36	3.12	7.6	41	52	1.24	----	5.38	CLAY	"
10.02	33.5	41.71	2.00	6.0	33	42	1.30	----	4.38	"	"
10.50	34.9	42.36	2.13	6.1	35	42	1.37	----	4.56	"	"
11.07	28.3	33.31	2.08	7.3	28	33	1.44	----	3.68	"	"
11.53	21.5	24.68	1.03	4.8	21	25	1.51	----	2.77	"	"
12.01	26.8	30.14	1.70	6.3	27	30	1.57	----	3.47	"	"
12.50	28.9	31.81	1.87	6.5	29	32	1.64	----	3.74	"	"
13.06	30.6	32.85	1.91	6.2	31	33	1.71	----	3.97	"	"
13.52	35.3	37.21	2.14	6.1	35	37	1.77	----	4.59	"	"
14.02	38.1	39.55	2.33	6.1	38	39	1.84	----	4.96	"	"
14.57	43.9	44.78	2.60	5.9	44	45	1.92	----	5.73	"	"
15.04	37.6	37.78	2.03	5.4	38	38	1.98	----	4.88	"	"
15.52	26.9	26.88	1.31	4.9	27	27	2.04	----	3.45	"	"
16.07	21.5	21.45	0.98	4.6	21	21	2.12	----	2.73	"	"
16.54	19.0	18.93	0.97	5.1	19	19	2.18	----	2.39	"	"
17.02	21.1	21.00	0.95	4.5	21	21	2.25	----	2.66	"	"
17.53	30.9	30.70	1.35	4.4	21	20	2.32	----	3.97	Silty CLAY to CLAY	"
18.02	21.8	21.63	0.98	4.5	22	22	2.38	----	2.75	CLAY	"
18.51	22.2	22.00	1.22	5.5	22	22	2.45	----	2.80	"	"
19.06	35.6	34.97	1.96	5.5	36	35	2.52	----	4.58	"	"
19.53	19.5	18.76	0.89	4.6	19	19	2.59	----	2.43	"	"
20.02	18.9	17.76	1.08	5.7	19	18	2.65	----	2.34	"	"
20.50	12.5	11.50	0.79	6.3	12	11	2.71	----	1.49	"	120-130
21.08	24.5	22.20	0.99	4.0	16	15	2.75	----	3.08	Silty CLAY to CLAY	130-140
21.54	23.3	20.86	1.31	5.6	23	21	2.79	----	2.92	CLAY	"
22.01	28.9	25.54	1.34	4.6	19	17	2.82	----	3.66	Silty CLAY to CLAY	"
22.56	36.9	32.12	1.69	4.6	24	21	2.86	----	4.72	"	"
23.04	32.3	27.75	1.63	5.0	32	28	2.90	----	4.10	CLAY	"
23.51	57.6	48.84	3.12	5.4	58	49	2.93	----	7.47	"	"
24.01	69.5	58.09	1.81	2.6	28	23	2.97	----	9.05	Sandy SILT to Clayey SILT	"
24.57	37.2	30.66	2.21	5.9	37	31	3.01	----	4.74	CLAY	"
25.03	84.4	69.23	1.68	2.0	28	23	3.04	36	----	Silty SAND to Sandy SILT	"
25.56	21.0	17.13	1.26	6.0	21	17	3.08	----	2.57	CLAY	"
26.04	56.4	45.79	1.44	2.6	23	18	3.11	----	7.29	Sandy SILT to Clayey SILT	"
26.56	60.8	49.09	1.78	2.9	24	20	3.15	----	7.87	"	"
27.04	21.5	17.28	1.39	6.5	21	17	3.19	----	2.63	CLAY	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-03
DATE: 02-06-2013
TI E: 15:21:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.51	18.0	14.40	0.92	5.1	18	14	3.22	----	2.16	CLAY	120-130
28.06	18.6	14.81	0.76	4.1	12	10	3.25	----	2.23	Silty CLAY to CLAY	"
28.51	19.8	15.69	0.88	4.4	20	16	3.28	----	2.39	CLAY	130-140
29.05	24.7	19.46	0.95	3.8	16	13	3.32	----	3.04	Silty CLAY to CLAY	"
29.50	25.4	19.92	0.96	3.8	17	13	3.36	----	3.13	"	"
30.00	22.6	17.63	0.87	3.8	15	12	3.39	----	2.75	"	"
30.55	30.0	23.26	1.09	3.6	15	12	3.43	----	3.73	Clayey SILT to Silty CLAY	"
31.01	24.2	18.67	1.02	4.2	16	12	3.46	----	2.95	Silty CLAY to CLAY	"
31.55	26.7	20.48	1.19	4.5	18	14	3.50	----	3.28	"	"
32.02	38.3	29.23	1.95	5.1	38	29	3.54	----	4.82	CLAY	"
32.56	28.2	21.39	1.70	6.0	28	21	3.58	----	3.47	"	"
33.00	28.1	21.20	1.47	5.2	28	21	3.58	----	3.45	"	"
33.51	31.9	23.94	1.42	4.5	21	16	3.65	----	3.96	Silty CLAY to CLAY	"
34.06	43.9	32.75	1.88	4.3	29	22	3.69	----	5.55	"	"
34.51	53.8	39.94	3.27	6.1	54	40	3.72	----	6.87	CLAY	"
35.01	43.9	32.40	2.14	4.9	29	22	3.76	----	5.54	Silty CLAY to CLAY	"
35.52	33.1	24.29	1.47	4.4	22	16	3.79	----	4.10	"	"
36.01	31.6	23.06	1.27	4.0	21	15	3.83	----	3.89	"	"
36.55	28.5	20.67	1.17	4.1	19	14	3.87	----	3.48	"	"
37.06	25.6	18.46	1.09	4.3	17	12	3.90	----	3.08	"	"
37.51	21.1	15.13	1.04	4.9	21	15	3.94	----	2.48	CLAY	"
38.07	17.4	12.41	0.94	5.4	17	12	3.97	----	1.98	"	120-130
38.58	27.5	19.50	1.54	5.6	27	19	4.01	----	3.32	"	130-140
39.00	13.3	9.40	0.53	4.0	13	9	4.04	----	1.43	"	120-130
39.54	23.4	16.48	0.51	2.2	9	7	4.07	----	2.77	Sandy SILT to Clayey SILT	"
40.06	33.1	23.20	0.92	2.8	13	9	4.11	----	4.06	"	130-140
40.53	40.1	27.99	1.78	4.4	27	19	4.14	----	4.99	Silty CLAY to CLAY	"
41.03	45.6	31.69	2.12	4.6	30	21	4.18	----	5.72	"	"
41.51	44.6	30.86	2.18	4.9	30	20	4.21	----	5.58	"	"
42.00	31.5	21.70	1.42	4.5	21	14	4.25	----	3.83	"	"
42.55	25.1	17.21	1.16	4.6	25	17	4.29	----	2.97	CLAY	"
43.05	25.7	17.54	1.23	4.8	26	17	4.32	----	3.04	"	"
43.52	34.2	23.24	1.33	3.9	17	12	4.36	----	4.17	Clayey SILT to Silty CLAY	"
44.00	33.1	22.40	1.51	4.6	22	15	4.39	----	4.02	Silty CLAY to CLAY	"
44.55	21.9	14.74	1.18	5.4	22	15	4.43	----	2.52	CLAY	"
45.01	17.1	11.46	1.03	6.0	17	11	4.47	----	1.88	"	"
45.54	29.6	19.75	1.42	4.8	29	20	4.50	----	3.54	"	"
46.06	28.3	18.79	1.11	3.9	19	12	4.54	----	3.36	Silty CLAY to CLAY	"
46.55	32.5	21.48	1.16	3.6	16	11	4.58	----	3.92	Clayey SILT to Silty CLAY	"
47.05	45.6	30.00	1.77	3.9	23	15	4.61	----	5.66	"	"
47.54	38.0	24.88	1.45	3.8	19	12	4.65	----	4.64	"	"
48.03	43.8	28.55	3.68	8.4	44	28	4.69	----	5.41	CLAY	"
48.56	55.7	36.12	2.98	5.4	56	36	4.72	----	6.99	"	"
49.06	43.7	28.20	2.94	6.7	44	28	4.76	----	5.39	"	"
49.56	37.9	24.34	1.88	5.0	38	24	4.80	----	4.61	"	"
50.03	58.4	37.34	3.61	6.2	58	37	4.83	----	7.34	Very Stiff Fine Grained *	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance Fs = Sleeve friction resistance Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density** Phi = Soil friction angle* Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test* (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988 ** Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-04
DATE: 02-06-2013
TI E: 14:44:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.54	8.3	13.28	0.64	7.7	8	13	0.06	----	1.65	CLAY	120-130
1.00	6.7	10.72	0.58	8.7	7	11	0.12	----	1.33	"	110-120
1.51	7.1	11.36	0.67	9.4	7	11	0.18	----	1.40	Organic Material	120-130
2.01	13.5	21.60	1.13	8.4	14	22	0.24	----	1.78	CLAY	"
2.53	41.4	66.24	3.61	8.7	41	66	0.31	----	5.50	"	130-140
3.05	47.8	76.48	3.67	7.7	48	76	0.38	----	6.35	"	"
3.53	59.3	94.88	2.76	4.7	39	63	0.45	----	7.88	Silty CLAY to CLAY	"
4.01	55.8	89.28	1.32	2.4	22	36	0.51	----	7.41	Sandy SILT to Clayey SILT	"
4.50	86.9	139.04	1.75	2.0	29	46	0.58	40	----	Silty SAND to Sandy SILT	"
5.05	106.1	169.76	2.12	2.0	35	57	0.65	41	----	"	"
5.51	88.7	141.92	2.23	2.5	30	47	0.71	40	----	"	"
6.01	86.1	137.76	2.42	2.8	34	55	0.78	----	11.43	Sandy SILT to Clayey SILT	"
6.50	69.5	107.86	2.42	3.5	28	43	0.85	----	9.21	"	"
7.06	58.8	86.84	1.77	3.0	24	35	0.92	----	7.78	"	"
7.55	9.1	12.88	0.72	7.9	9	13	0.98	----	1.43	CLAY	120-130
8.02	13.4	18.46	0.64	4.8	13	18	1.04	----	1.72	"	"
8.51	11.9	16.01	0.72	6.1	12	16	1.10	----	1.89	"	"
9.02	6.5	8.55	0.39	6.0	7	9	1.16	----	1.18	"	110-120
9.52	6.2	7.98	0.32	5.2	6	8	1.22	----	1.12	"	100-110
10.02	5.2	6.56	0.25	4.8	5	6	1.27	----	0.91	"	"
10.54	4.9	6.06	0.17	3.5	5	6	1.32	----	0.85	"	90-100
11.05	8.5	10.28	0.45	5.3	9	10	1.38	----	1.56	"	110-120
11.51	15.1	17.84	0.62	4.1	15	18	1.43	----	1.92	"	120-130
12.05	16.9	19.43	0.78	4.6	17	19	1.50	----	2.15	"	"
12.55	18.4	20.74	0.85	4.6	18	21	1.56	----	2.35	"	"
13.04	20.0	22.06	0.98	4.9	20	22	1.63	----	2.56	"	130-140
13.53	17.5	18.89	1.00	5.7	18	19	1.70	----	2.22	"	"
14.02	20.4	21.56	1.06	5.2	20	22	1.76	----	2.60	"	"
14.51	26.8	27.91	1.17	4.4	18	19	1.83	----	3.45	Silty CLAY to CLAY	"
15.05	21.4	21.91	1.02	4.8	21	22	1.90	----	2.73	CLAY	"
15.54	22.0	22.17	0.95	4.3	15	15	1.97	----	2.80	Silty CLAY to CLAY	"
16.02	22.4	22.39	1.04	4.6	22	22	2.03	----	2.85	CLAY	"
16.50	24.4	24.35	1.28	5.2	24	24	2.10	----	3.11	"	"
17.06	25.6	25.51	1.33	5.2	26	25	2.17	----	3.27	"	"
17.50	27.6	27.47	1.29	4.7	28	27	2.23	----	3.53	"	"
18.05	27.6	27.43	1.22	4.4	18	18	2.31	----	3.53	Silty CLAY to CLAY	"
18.53	25.5	25.31	1.25	4.9	25	25	2.37	----	3.24	CLAY	"
19.04	24.1	23.89	1.02	4.2	16	16	2.44	----	3.05	Silty CLAY to CLAY	"
19.52	23.1	22.83	0.93	4.0	15	15	2.50	----	2.91	"	"
20.00	24.0	23.21	0.85	3.5	12	12	2.57	----	3.03	Clayey SILT to Silty CLAY	"
20.55	25.2	23.75	0.86	3.4	13	12	2.64	----	3.18	"	"
21.03	21.8	20.33	0.79	3.6	14	13	2.67	----	2.73	Silty CLAY to CLAY	120-130
21.54	20.8	19.18	0.69	3.3	10	10	2.71	----	2.59	Clayey SILT to Silty CLAY	"
22.02	21.1	19.22	0.86	4.1	14	13	2.74	----	2.62	Silty CLAY to CLAY	130-140
22.56	23.8	21.36	1.05	4.4	16	14	2.78	----	2.98	"	"
23.06	22.3	19.75	0.95	4.3	15	13	2.82	----	2.78	"	"
23.56	29.7	25.95	1.27	4.3	20	17	2.85	----	3.76	"	"
24.04	24.8	21.38	1.12	4.5	25	21	2.89	----	3.10	CLAY	"
24.51	21.0	17.87	0.92	4.4	21	18	2.92	----	2.59	"	"
25.05	26.8	22.46	1.16	4.3	18	15	2.96	----	3.36	Silty CLAY to CLAY	"
25.52	36.8	30.42	1.77	4.8	24	20	2.99	----	4.69	"	"
26.04	27.8	22.83	1.51	5.4	28	23	3.03	----	3.48	CLAY	"
26.51	24.3	19.86	1.16	4.8	24	20	3.07	----	3.01	"	"
27.03	22.4	18.21	1.07	4.8	22	18	3.10	----	2.75	"	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-04
DATE: 02-06-2013
TI E: 14:44:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.56	24.2	19.57	0.98	4.0	16	13	3.14	----	2.99	Silty CLAY to CLAY	130-140
28.03	22.7	18.27	0.96	4.2	15	12	3.18	----	2.78	"	"
28.55	21.6	17.29	0.91	4.2	14	11	3.22	----	2.63	"	"
29.01	24.2	19.27	1.01	4.2	16	13	3.25	----	2.97	"	"
29.55	23.0	18.21	0.98	4.3	15	12	3.29	----	2.81	"	"
30.02	15.7	12.38	0.77	4.9	16	12	3.32	----	1.83	CLAY	120-130
30.52	18.1	14.21	0.76	4.2	12	9	3.35	----	2.15	Silty CLAY to CLAY	"
31.05	27.1	21.15	1.29	4.8	27	21	3.39	----	3.34	CLAY	130-140
31.56	35.5	27.56	1.59	4.5	24	18	3.42	----	4.46	Silty CLAY to CLAY	"
32.00	48.8	37.70	2.16	4.4	32	25	3.46	----	6.23	"	"
32.52	33.7	25.89	1.69	5.0	34	26	3.49	----	4.21	CLAY	"
33.04	45.6	34.83	2.05	4.5	30	23	3.53	----	5.79	Silty CLAY to CLAY	"
33.50	41.6	31.62	2.03	4.9	28	21	3.56	----	5.26	"	"
34.04	79.6	60.14	3.57	4.5	79	60	3.60	----	10.32	Very Stiff Fine Grained *	"
34.55	35.2	26.45	2.08	5.9	35	26	3.64	----	4.39	CLAY	"
35.02	29.0	21.68	1.59	5.5	29	21	3.67	----	3.56	"	"
35.51	26.1	19.40	1.34	5.1	26	19	3.71	----	3.17	"	"
36.02	28.7	21.21	1.17	4.1	19	14	3.75	----	3.51	Silty CLAY to CLAY	"
36.55	25.6	18.81	1.10	4.3	17	12	3.79	----	3.09	"	"
37.06	28.2	20.60	1.19	4.2	19	14	3.82	----	3.44	"	"
37.53	46.2	33.56	2.72	5.9	46	33	3.86	----	5.83	CLAY	"
38.05	30.8	22.24	1.44	4.7	20	15	3.90	----	3.77	Silty CLAY to CLAY	"
38.52	22.0	15.80	0.86	3.9	14	10	3.93	----	2.60	"	"
39.06	21.2	15.13	0.86	4.1	14	10	3.97	----	2.49	"	"
39.57	27.2	19.30	1.00	3.7	13	10	4.01	----	3.28	Clayey SILT to Silty CLAY	"
40.04	31.6	22.33	1.30	4.1	21	15	4.04	----	3.86	Silty CLAY to CLAY	"
40.57	31.3	22.02	1.31	4.2	21	15	4.08	----	3.82	"	"
41.04	32.2	22.56	1.41	4.4	21	15	4.11	----	3.93	"	"
41.51	31.0	21.63	1.30	4.2	20	14	4.15	----	3.77	"	"
42.05	27.5	19.09	1.06	3.9	18	13	4.19	----	3.30	"	"
42.52	24.6	17.01	0.99	4.0	16	11	4.22	----	2.91	"	"
43.03	45.4	31.25	1.97	4.3	30	21	4.26	----	5.68	"	"
43.50	51.9	35.57	1.89	3.6	26	18	4.29	----	6.54	Clayey SILT to Silty CLAY	"
44.01	19.9	13.58	0.72	3.6	13	9	4.32	----	2.27	Silty CLAY to CLAY	120-130
44.56	23.6	16.04	0.68	2.9	12	8	4.36	----	2.76	Clayey SILT to Silty CLAY	"
45.04	24.0	16.24	0.77	3.2	12	8	4.39	----	2.81	"	130-140
45.54	23.0	15.49	0.84	3.7	15	10	4.43	----	2.67	Silty CLAY to CLAY	"
46.03	25.0	16.77	1.00	4.0	16	11	4.46	----	2.93	"	"
46.51	24.1	16.09	0.96	4.0	16	11	4.50	----	2.81	"	"
47.07	27.6	18.33	1.09	3.9	18	12	4.54	----	3.27	"	"
47.51	33.7	22.29	1.81	5.4	33	22	4.57	----	4.08	CLAY	"
48.07	49.1	32.31	2.64	5.4	49	32	4.61	----	6.12	"	"
48.51	54.6	35.78	3.47	6.4	54	36	4.64	----	6.85	"	"
49.07	43.0	28.03	2.40	5.6	43	28	4.68	----	5.30	"	"
49.54	43.8	28.42	2.26	5.2	43	28	4.72	----	5.40	"	"
50.05	47.1	30.42	2.76	5.9	47	30	4.76	----	5.84	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-05
DATE: 02-06-2013
TI E: 13:00:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.58	9.9	15.84	0.65	6.6	10	16	0.07	----	1.64	CLAY	120-130
1.09	9.3	14.88	0.64	6.9	9	15	0.13	----	1.54	"	"
1.52	7.5	12.00	0.52	6.9	8	12	0.18	----	1.48	"	110-120
2.01	13.9	22.24	0.82	5.9	14	22	0.24	----	1.84	"	120-130
2.54	19.6	31.36	1.14	5.8	20	31	0.31	----	2.59	"	130-140
3.08	77.8	124.48	2.48	3.2	31	50	0.39	----	10.35	Sandy SILT to Clayey SILT	"
3.53	109.1	174.56	4.51	4.1	109	175	0.45	----	14.52	Very Stiff Fine Grained *	"
4.08	135.7	217.12	6.13	4.5	136	217	0.52	----	18.06	"	>140
4.55	66.7	106.72	4.68	7.0	67	107	0.59	----	8.85	"	130-140
5.06	85.5	136.80	5.73	6.7	85	137	0.66	----	11.36	"	>140
5.53	119.4	191.04	8.21	6.9	119	191	0.72	----	15.87	"	"
6.06	105.7	169.12	8.86	8.4	106	169	0.80	----	14.04	"	"
6.51	103.8	159.66	8.36	8.1	104	160	0.86	----	13.78	"	"
7.02	117.4	172.14	7.68	6.5	117	172	0.93	----	15.59	"	"
7.53	128.1	179.02	5.99	4.7	128	179	1.00	----	17.01	"	"
8.04	132.5	180.26	5.51	4.2	132	180	1.08	----	17.59	"	"
8.55	133.2	176.25	7.62	5.7	133	176	1.15	----	17.68	"	"
9.03	90.1	116.07	7.57	8.4	90	116	1.21	----	11.93	"	"
9.51	51.3	64.41	5.31	10.4	51	64	1.28	----	6.75	CLAY	130-140
10.08	38.3	46.69	3.52	9.2	38	47	1.36	----	5.02	"	"
10.57	42.6	50.58	3.69	8.7	42	50	1.42	----	5.59	"	"
11.05	52.6	60.81	4.20	8.0	53	61	1.49	----	6.91	"	"
11.52	65.6	74.25	4.93	7.5	66	74	1.55	----	8.64	Very Stiff Fine Grained *	"
12.02	62.9	69.67	4.90	7.8	63	70	1.62	----	8.28	"	"
12.51	73.6	79.68	5.16	7.0	74	80	1.69	----	9.70	"	>140
13.08	80.0	84.47	5.84	7.3	80	84	1.77	----	10.55	"	"
13.55	66.5	69.20	5.16	7.8	66	69	1.83	----	8.74	"	130-140
14.04	70.7	72.41	5.59	7.9	71	72	1.90	----	9.30	"	>140
14.51	70.8	71.40	5.44	7.7	71	71	1.96	----	9.31	"	"
15.01	62.0	61.96	4.84	7.8	62	62	2.03	----	8.13	"	130-140
15.58	55.1	54.98	3.95	7.2	55	55	2.11	----	7.21	CLAY	"
16.07	59.5	59.29	4.21	7.1	59	59	2.18	----	7.79	Very Stiff Fine Grained *	"
16.56	60.1	59.81	4.60	7.7	60	60	2.24	----	7.86	"	"
17.05	53.7	53.37	4.36	8.1	54	53	2.31	----	7.01	CLAY	"
17.55	40.3	40.00	3.30	8.2	40	40	2.37	----	5.22	"	"
18.01	41.3	40.94	3.21	7.8	41	41	2.44	----	5.34	"	"
18.51	25.0	24.72	1.83	7.3	25	25	2.50	----	3.17	"	"
19.02	25.6	24.72	1.75	6.8	26	25	2.57	----	3.24	"	"
19.51	38.1	35.96	2.50	6.6	38	36	2.64	----	4.90	"	"
20.02	35.8	32.97	2.47	6.9	36	33	2.71	----	4.59	"	"
20.53	23.3	20.94	1.43	6.1	23	21	2.78	----	2.92	"	"
21.05	22.6	20.03	1.23	5.4	22	20	2.81	----	2.82	"	"
21.56	18.3	15.99	1.14	6.2	18	16	2.85	----	2.25	"	"
22.08	31.1	26.79	1.40	4.5	21	18	2.89	----	3.95	Silty CLAY to CLAY	"
22.51	37.1	31.58	1.70	4.6	25	21	2.92	----	4.74	"	"
23.01	35.2	29.54	1.61	4.6	23	20	2.96	----	4.49	"	"
23.51	38.0	31.43	1.92	5.1	38	31	2.99	----	4.85	CLAY	"
24.00	33.9	27.85	1.87	5.5	34	28	3.03	----	4.30	"	"
24.54	28.1	22.96	1.54	5.5	28	23	3.07	----	3.53	"	"
25.05	26.7	21.70	1.35	5.1	27	22	3.11	----	3.33	"	"
25.56	22.4	18.11	1.27	5.7	22	18	3.14	----	2.76	"	"
26.07	18.9	15.20	1.14	6.0	19	15	3.18	----	2.29	"	"
26.56	21.7	17.37	1.16	5.3	22	17	3.21	----	2.65	"	"
27.05	19.7	15.69	1.11	5.6	20	16	3.25	----	2.38	"	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-05
DATE: 02-06-2013
TI E: 13:00:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.56	20.6	16.31	1.05	5.1	21	16	3.29	----	2.50	CLAY	130-140
28.02	40.6	32.00	1.98	4.9	27	21	3.32	----	5.16	Silty CLAY to CLAY	"
28.53	42.0	32.92	1.57	3.7	21	16	3.36	----	5.34	Clayey SILT to Silty CLAY	"
29.00	44.6	34.78	2.60	5.8	44	35	3.39	----	5.69	CLAY	"
29.58	38.0	29.45	2.45	6.4	38	29	3.43	----	4.80	"	"
30.00	20.5	15.82	0.97	4.7	20	16	3.46	----	2.46	"	"
30.53	27.6	21.17	1.51	5.5	28	21	3.50	----	3.40	"	"
31.08	27.6	21.05	1.81	6.6	28	21	3.54	----	3.40	"	"
31.54	24.0	18.21	1.30	5.4	24	18	3.58	----	2.92	"	"
32.01	33.9	25.59	1.93	5.7	34	25	3.61	----	4.23	"	"
32.56	34.7	26.03	2.20	6.3	35	26	3.65	----	4.33	"	"
33.06	27.4	20.44	1.45	5.3	27	20	3.69	----	3.36	"	"
33.52	25.5	18.92	1.27	5.0	25	19	3.72	----	3.10	"	"
34.01	26.4	19.49	1.46	5.5	26	19	3.76	----	3.21	"	"
34.56	26.3	19.29	1.36	5.2	26	19	3.80	----	3.20	"	"
35.07	23.8	17.36	2.00	8.4	24	17	3.83	----	2.86	"	"
35.54	14.4	10.44	1.15	8.0	14	10	3.87	----	1.60	"	"
36.01	14.7	10.61	0.73	5.0	15	10	3.90	----	1.64	"	120-130
36.56	51.3	36.80	2.55	5.0	34	24	3.94	----	6.51	Silty CLAY to CLAY	130-140
37.04	47.8	34.10	1.45	3.0	19	14	3.97	----	6.04	Sandy SILT to Clayey SILT	"
37.52	12.1	8.59	0.63	5.2	12	8	4.00	----	1.28	CLAY	120-130
38.07	22.2	15.68	1.27	5.7	22	16	4.04	----	2.62	"	130-140
38.55	15.4	10.84	0.77	5.0	15	11	4.07	----	1.71	"	120-130
39.03	36.1	25.31	1.86	5.2	36	25	4.11	----	4.46	"	130-140
39.56	33.6	23.44	1.96	5.8	33	23	4.14	----	4.12	"	"
40.00	21.6	15.01	0.90	4.2	14	10	4.18	----	2.52	Silty CLAY to CLAY	"
40.55	26.0	17.98	0.91	3.5	13	9	4.22	----	3.10	Clayey SILT to Silty CLAY	"
41.02	30.3	20.87	0.99	3.3	15	10	4.25	----	3.67	"	"
41.56	25.4	17.41	0.93	3.7	13	9	4.29	----	3.01	"	"
42.04	30.3	20.68	1.00	3.3	15	10	4.32	----	3.66	"	"
42.53	27.7	18.82	0.98	3.5	14	9	4.36	----	3.31	"	"
43.04	27.2	18.39	0.82	3.0	14	9	4.40	----	3.24	"	"
43.56	34.7	23.36	1.04	3.0	17	12	4.43	----	4.24	"	"
44.07	38.7	25.93	1.30	3.4	19	13	4.47	----	4.76	"	"
44.54	42.5	28.35	1.60	3.8	21	14	4.51	----	5.27	"	"
45.03	28.0	18.59	0.84	3.0	14	9	4.54	----	3.33	"	"
45.50	29.7	19.63	0.96	3.2	15	10	4.58	----	3.55	"	"
46.05	33.2	21.83	1.94	5.8	33	22	4.62	----	4.01	CLAY	"
46.51	79.5	52.06	3.49	4.4	40	26	4.65	----	10.18	Clayey SILT to Silty CLAY	"
47.02	92.5	60.26	5.15	5.6	92	60	4.69	----	11.91	Very Stiff Fine Grained *	>140
47.56	56.2	36.42	2.91	5.2	56	36	4.73	----	7.07	CLAY	130-140
48.04	35.4	22.84	1.73	4.9	35	23	4.76	----	4.29	"	"
48.55	30.8	19.78	1.43	4.6	20	13	4.80	----	3.67	Silty CLAY to CLAY	"
49.00	34.5	22.05	1.43	4.1	23	15	4.83	----	4.16	"	"
49.54	29.3	18.63	1.32	4.5	19	12	4.87	----	3.46	"	"
50.03	29.6	18.73	1.31	4.4	20	12	4.91	----	3.50	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 34.0 feet

CPT NO : CPT-06
DATE: 02-06-2013
TI E: 12:26:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.54	10.1	16.16	0.55	5.4	10	16	0.06	----	1.68	CLAY	120-130
1.05	7.1	11.36	0.24	3.4	7	11	0.12	----	1.41	"	100-110
1.58	5.9	9.44	0.15	2.5	4	6	0.17	----	1.16	Silty CLAY to CLAY	90-100
2.01	7.7	12.32	0.20	2.6	5	8	0.21	----	1.52	"	100-110
2.53	55.5	88.80	3.33	6.0	55	88	0.28	----	7.38	CLAY	130-140
3.09	138.1	220.96	9.39	6.8	138	221	0.36	----	18.39	Very Stiff Fine Grained *	>140
3.54	141.8	226.88	8.59	6.1	142	226	0.42	----	18.88	"	"
4.07	161.4	258.24	9.87	6.1	161	258	0.50	----	21.49	"	"
4.54	162.6	260.16	10.57	6.5	162	260	0.56	----	21.64	"	"
5.06	180.7	289.12	8.11	4.5	181	289	0.64	----	24.05	"	"
5.52	180.4	288.64	7.27	4.0	90	144	0.70	44	----	SAND to Clayey SAND *	"
6.05	163.6	261.76	6.62	4.0	164	262	0.78	----	21.76	Very Stiff Fine Grained *	"
6.58	130.7	202.66	5.07	3.9	65	101	0.85	42	----	SAND to Clayey SAND *	"
7.07	126.3	187.16	5.37	4.3	126	187	0.92	----	16.78	Very Stiff Fine Grained *	"
7.52	129.1	183.47	4.45	3.4	52	73	0.98	----	17.15	Sandy SILT to Clayey SILT	130-140
8.05	129.3	177.69	3.07	2.4	43	59	1.05	41	----	Silty SAND to Sandy SILT	"
8.53	130.2	174.56	4.41	3.4	52	70	1.11	----	17.29	Sandy SILT to Clayey SILT	"
9.04	103.1	134.36	5.77	5.6	103	134	1.19	----	13.67	Very Stiff Fine Grained *	>140
9.53	111.4	141.27	5.33	4.8	111	141	1.25	----	14.77	"	"
10.05	97.6	120.32	5.19	5.3	98	120	1.33	----	12.92	"	"
10.53	82.2	98.80	4.30	5.2	82	99	1.39	----	10.87	"	130-140
11.07	122.2	142.60	2.48	2.0	41	47	1.46	40	----	Silty SAND to Sandy SILT	"
11.56	166.8	189.92	4.50	2.7	56	63	1.53	42	----	"	"
12.04	113.3	126.37	4.78	4.2	113	126	1.60	----	15.00	Very Stiff Fine Grained *	"
12.54	135.1	147.44	3.64	2.7	45	49	1.66	40	----	Silty SAND to Sandy SILT	"
13.02	90.9	97.08	3.19	3.5	36	39	1.73	----	12.00	Sandy SILT to Clayey SILT	"
13.56	112.2	117.56	3.28	2.9	45	47	1.80	----	14.84	"	"
14.04	104.5	107.87	4.11	3.9	52	54	1.87	----	13.81	Clayey SILT to Silty CLAY	"
14.51	76.6	77.89	2.32	3.0	31	31	1.93	----	10.08	Sandy SILT to Clayey SILT	"
15.07	103.5	103.49	4.39	4.2	103	103	2.00	----	13.67	Very Stiff Fine Grained *	"
15.55	77.6	77.49	4.20	5.4	78	77	2.07	----	10.21	"	"
16.04	72.6	72.40	2.73	3.8	36	36	2.14	----	9.54	Clayey SILT to Silty CLAY	"
16.52	65.0	64.74	2.37	3.6	32	32	2.20	----	8.52	"	"
17.01	58.6	58.29	2.41	4.1	29	29	2.27	----	7.66	"	"
17.58	67.9	67.43	2.37	3.5	27	27	2.34	----	8.90	Sandy SILT to Clayey SILT	"
18.06	125.7	124.67	5.06	4.0	126	125	2.41	----	16.60	Very Stiff Fine Grained *	>140
18.56	121.5	120.34	3.38	2.8	40	40	2.48	39	----	Silty SAND to Sandy SILT	130-140
19.05	115.6	112.76	2.96	2.6	39	38	2.54	39	----	"	"
19.53	135.8	129.52	2.77	2.0	45	43	2.61	39	----	"	"
20.10	97.1	90.17	4.49	4.6	97	90	2.69	----	12.77	Very Stiff Fine Grained *	"
20.58	59.5	53.98	4.03	6.8	59	54	2.75	----	7.75	"	"
21.09	62.7	56.11	2.95	4.7	42	37	2.79	----	8.17	Silty CLAY to CLAY	"
21.55	68.3	60.37	3.34	4.9	68	60	2.82	----	8.91	Very Stiff Fine Grained *	"
22.04	64.1	55.90	3.43	5.4	64	56	2.86	----	8.35	"	"
22.51	46.2	39.77	3.17	6.9	46	40	2.89	----	5.96	CLAY	"
23.07	40.1	33.98	2.67	6.7	40	34	2.93	----	5.14	"	"
23.57	37.1	31.00	2.50	6.7	37	31	2.97	----	4.74	"	"
24.04	52.9	43.63	3.17	6.0	53	44	3.00	----	6.84	"	"
24.56	58.4	47.91	3.70	6.3	58	48	3.04	----	7.57	Very Stiff Fine Grained *	"
25.07	80.1	65.38	3.95	4.9	80	65	3.08	----	10.46	"	"
25.52	38.8	31.52	2.70	7.0	39	31	3.11	----	4.95	CLAY	"
26.05	61.9	50.01	3.55	5.7	62	50	3.15	----	8.02	Very Stiff Fine Grained *	"
26.54	47.0	37.78	2.97	6.3	47	38	3.18	----	6.03	CLAY	"
27.03	61.5	49.18	3.91	6.4	61	49	3.22	----	7.96	Very Stiff Fine Grained *	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 34.0 feet

CPT NO : CPT-06
DATE: 02-06-2013
TI E: 12:26:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.56	47.0	37.38	3.10	6.6	47	37	3.26	----	6.02	CLAY	130-140
28.06	47.3	37.42	3.11	6.6	47	37	3.29	----	6.06	"	"
28.55	39.1	30.77	2.69	6.9	39	31	3.33	----	4.96	"	"
29.03	39.4	30.85	2.52	6.4	39	31	3.36	----	4.99	"	"
29.53	50.4	39.26	3.01	6.0	50	39	3.40	----	6.46	"	"
30.07	61.0	47.24	3.65	6.0	61	47	3.44	----	7.86	Very Stiff Fine Grained *	"
30.54	134.2	103.36	6.43	4.8	134	103	3.48	----	17.62	"	>140
31.04	61.5	47.11	4.29	7.0	61	47	3.51	----	7.92	"	130-140
31.51	94.7	72.15	4.96	5.2	95	72	3.55	----	12.34	"	>140
32.07	117.3	88.82	3.92	3.3	47	35	3.59	----	15.35	Sandy SILT to Clayey SILT	130-140
32.54	145.3	109.41	7.17	4.9	145	109	3.63	----	19.08	Very Stiff Fine Grained *	>140
33.01	220.7	165.26	10.86	4.9	221	165	3.66	----	29.13	"	"
33.52	369.8	275.22	18.48	5.0	370	275	3.70	----	49.01	"	"
34.03	332.5	245.93	16.36	4.9	332	245	3.74	----	44.03	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance Fs = Sleeve friction resistance Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density** Phi = Soil friction angle* Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test* (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988 ** Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 42.5 feet

CPT NO : CPT-07
DATE: 02-06-2013
TI E: 10:17:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.52	6.5	10.40	0.20	3.1	6	10	0.06	----	1.29	CLAY	100-110
1.05	2.5	4.00	0.08	3.2	2	4	0.11	----	0.49	"	85-90
1.52	0.4	0.64	0.03	7.5	0	0	0.15	----	0.07	Organic Material	"
2.08	0.8	1.28	0.06	7.5	1	1	0.20	----	0.14	"	"
2.58	5.4	8.64	0.38	7.0	5	8	0.25	----	1.06	CLAY	100-110
3.01	7.9	12.64	0.53	6.7	8	12	0.30	----	1.55	"	110-120
3.50	7.8	12.48	0.48	6.2	7	12	0.36	----	1.52	"	"
4.04	12.8	20.48	0.68	5.3	12	20	0.42	----	1.68	"	120-130
4.55	18.4	29.44	0.92	5.0	18	29	0.49	----	2.42	"	"
5.02	22.2	35.52	1.08	4.9	22	35	0.55	----	2.92	"	130-140
5.53	34.5	55.20	1.39	4.0	23	36	0.62	----	4.56	Silty CLAY to CLAY	"
6.03	38.7	61.92	1.59	4.1	19	30	0.69	----	5.11	Clayey SILT to Silty CLAY	"
6.53	49.0	78.40	2.11	4.3	32	51	0.75	----	6.48	Silty CLAY to CLAY	"
7.02	57.3	90.58	3.01	5.3	57	90	0.82	----	7.59	CLAY	"
7.53	41.0	62.00	2.68	6.5	41	62	0.89	----	5.41	"	"
8.03	40.9	59.06	2.44	6.0	41	58	0.96	----	5.39	"	"
8.53	37.5	52.06	2.61	7.0	37	52	1.02	----	4.93	"	"
9.07	48.6	65.63	3.07	6.3	48	65	1.10	----	6.41	"	"
9.56	66.5	87.47	3.53	5.3	66	87	1.16	----	8.79	Very Stiff Fine Grained *	"
10.04	61.6	78.98	3.38	5.5	61	78	1.23	----	8.13	"	"
10.56	62.2	77.60	3.28	5.3	61	76	1.30	----	8.21	"	"
11.08	89.2	108.27	3.99	4.5	88	107	1.37	----	11.80	"	"
11.54	69.1	81.79	3.40	4.9	68	81	1.43	----	9.12	"	"
12.02	77.3	89.10	3.36	4.3	38	44	1.49	----	10.21	Clayey SILT to Silty CLAY	"
12.56	110.5	124.39	4.02	3.6	44	50	1.57	----	14.63	Sandy SILT to Clayey SILT	"
13.06	134.0	147.63	4.54	3.4	54	59	1.63	----	17.76	"	"
13.54	92.3	99.52	4.59	5.0	92	99	1.70	----	12.19	Very Stiff Fine Grained *	"
14.02	55.1	58.22	3.32	6.0	55	58	1.76	----	7.23	CLAY	"
14.56	40.3	41.87	2.91	7.2	40	41	1.84	----	5.25	"	"
15.03	57.1	58.47	3.47	6.1	57	58	1.90	----	7.49	"	"
15.56	35.8	36.04	2.05	5.7	35	36	1.97	----	4.64	"	"
16.07	65.2	65.15	3.05	4.7	43	43	2.04	----	8.56	Silty CLAY to CLAY	"
16.55	47.2	47.10	3.26	6.9	47	47	2.11	----	6.15	CLAY	"
17.06	65.2	64.97	3.23	5.0	65	65	2.18	----	8.55	Very Stiff Fine Grained *	"
17.56	74.7	74.34	3.34	4.5	37	37	2.24	----	9.81	Clayey SILT to Silty CLAY	"
18.05	56.8	56.45	3.82	6.7	56	56	2.31	----	7.42	CLAY	"
18.53	68.6	68.09	3.91	5.7	68	68	2.37	----	8.99	Very Stiff Fine Grained *	"
19.03	66.9	66.31	2.39	3.6	33	33	2.44	----	8.76	Clayey SILT to Silty CLAY	"
19.52	109.2	107.87	2.90	2.7	36	36	2.51	38	----	Silty SAND to Sandy SILT	"
20.06	102.1	98.30	5.42	5.3	102	98	2.58	----	13.44	Very Stiff Fine Grained *	>140
20.54	58.0	54.59	3.72	6.4	58	54	2.65	----	7.56	CLAY	130-140
21.03	73.3	68.15	4.50	6.1	73	68	2.68	----	9.59	Very Stiff Fine Grained *	"
21.57	57.7	52.90	3.65	6.3	57	52	2.72	----	7.51	CLAY	"
22.06	57.5	52.04	3.46	6.0	57	52	2.76	----	7.48	"	"
22.51	65.3	58.39	2.29	3.5	33	29	2.79	----	8.51	Clayey SILT to Silty CLAY	"
23.03	130.9	115.41	3.11	2.4	44	38	2.83	39	----	Silty SAND to Sandy SILT	"
23.52	114.3	99.45	2.91	2.5	38	33	2.86	38	----	"	"
24.01	50.3	43.17	2.83	5.6	50	43	2.90	----	6.50	CLAY	"
24.56	61.8	52.22	2.74	4.4	31	26	2.94	----	8.03	Clayey SILT to Silty CLAY	"
25.07	87.4	72.79	2.95	3.4	35	29	2.98	----	11.44	Sandy SILT to Clayey SILT	"
25.57	178.2	146.76	5.13	2.9	59	49	3.01	40	----	Silty SAND to Sandy SILT	"
26.03	146.3	119.93	4.94	3.4	55	45	3.05	----	19.28	Sandy SILT to Clayey SILT	"
26.54	125.6	102.42	4.14	3.3	47	38	3.08	----	16.52	"	"
27.03	75.5	61.26	3.31	4.4	35	29	3.12	----	9.83	Clayey SILT to Silty CLAY	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 42.5 feet

CPT NO : CPT-07
DATE: 02-06-2013
TI E: 10:17:00
Groundwater measured at 20.8 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.51	119.3	96.32	4.61	3.9	57	46	3.15	----	15.67	"	"
28.07	113.0	90.71	4.52	4.0	107	86	3.19	----	14.82	Very Stiff Fine Grained *	"
28.52	115.7	92.43	4.73	4.1	111	89	3.23	----	15.18	"	"
29.08	138.3	109.84	5.21	3.8	65	52	3.27	39	----	SAND to Clayey SAND *	"
29.55	132.5	104.72	4.84	3.7	50	40	3.30	----	17.41	Sandy SILT to Clayey SILT	"
30.00	96.0	75.51	4.53	4.7	92	73	3.33	----	12.54	Very Stiff Fine Grained *	"
30.56	144.4	112.86	6.28	4.3	139	108	3.38	----	18.99	"	>140
31.02	140.1	108.92	6.39	4.6	133	103	3.41	----	18.41	"	"
31.51	182.9	141.40	10.22	5.6	182	140	3.45	----	24.11	"	"
32.07	127.8	98.21	5.09	4.0	123	95	3.49	----	16.76	"	130-140
32.50	136.0	103.98	6.92	5.1	132	101	3.53	----	17.85	"	>140
33.05	93.8	71.29	4.31	4.6	92	70	3.56	----	12.22	"	130-140
33.58	133.4	100.75	6.45	4.8	131	99	3.61	----	17.49	"	>140
34.05	67.5	50.71	2.95	4.4	33	25	3.64	----	8.70	Clayey SILT to Silty CLAY	130-140
34.54	68.4	51.11	2.64	3.9	34	25	3.68	----	8.82	"	"
35.02	118.6	88.11	6.48	5.5	118	87	3.71	----	15.51	Very Stiff Fine Grained *	>140
35.50	68.9	50.91	3.65	5.3	67	50	3.75	----	8.87	"	130-140
36.03	98.4	72.28	3.92	4.0	48	35	3.79	----	12.80	Clayey SILT to Silty CLAY	"
36.57	153.2	111.80	7.46	4.9	152	111	3.83	----	20.10	Very Stiff Fine Grained *	>140
37.01	136.3	98.93	8.27	6.1	136	98	3.86	----	17.85	"	"
37.54	247.1	178.17	8.34	3.4	123	89	3.90	41	----	SAND to Clayey SAND *	"
38.08	100.7	72.13	5.04	5.0	100	72	3.95	----	13.09	Very Stiff Fine Grained *	"
38.54	33.3	23.72	1.70	5.1	33	23	3.98	----	4.10	CLAY	130-140
39.07	39.2	27.77	2.35	6.0	38	27	4.02	----	4.88	"	"
39.55	80.0	56.44	4.28	5.4	79	56	4.05	----	10.32	Very Stiff Fine Grained *	"
40.01	92.6	65.07	3.47	3.7	45	32	4.09	----	11.99	Clayey SILT to Silty CLAY	"
40.54	271.5	189.84	12.14	4.5	269	188	4.13	----	35.84	Very Stiff Fine Grained *	>140
41.04	293.2	204.04	11.37	3.9	145	101	4.17	42	----	SAND to Clayey SAND *	"
41.56	249.9	173.05	9.21	3.7	121	84	4.21	41	----	"	"
42.03	340.1	234.46	10.80	3.2	169	117	4.24	43	----	"	"
42.51	296.5	203.45	14.79	5.0	296	203	4.28	----	39.16	Very Stiff Fine Grained *	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 28.0 feet

CPT NO : CPT-08
DATE: 02-06-2013
TI E: 13:27:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.51	5.7	9.12	0.55	9.6	6	9	0.06	----	1.13	Organic Material	110-120
1.03	4.2	6.72	0.40	9.5	4	7	0.11	----	0.83	"	100-110
1.54	8.4	13.44	0.54	6.4	8	13	0.17	----	1.66	CLAY	110-120
2.05	22.1	35.36	1.72	7.8	22	35	0.24	----	2.93	"	130-140
2.57	37.0	59.20	3.04	8.2	37	59	0.31	----	4.91	"	"
3.08	45.7	73.12	4.21	9.2	46	73	0.38	----	6.07	"	"
3.54	49.7	79.52	4.99	10.0	50	79	0.44	----	6.60	"	"
4.04	68.6	109.76	5.91	8.6	68	109	0.51	----	9.11	Very Stiff Fine Grained *	>140
4.57	87.0	139.20	7.47	8.6	87	139	0.59	----	11.56	"	"
5.05	85.8	137.28	7.75	9.0	86	137	0.65	----	11.40	"	"
5.52	85.1	136.16	7.58	8.9	85	136	0.72	----	11.30	"	"
6.06	77.4	123.84	6.92	8.9	77	124	0.79	----	10.27	"	"
6.50	74.7	115.30	6.51	8.7	75	115	0.86	----	9.90	"	"
7.05	71.3	104.59	6.03	8.5	71	104	0.93	----	9.44	"	"
7.53	62.5	87.64	4.91	7.9	62	87	1.00	----	8.27	"	130-140
8.03	57.5	78.53	4.37	7.6	57	78	1.07	----	7.60	CLAY	"
8.53	50.5	67.21	3.93	7.8	50	67	1.13	----	6.66	"	"
9.06	55.3	71.54	4.00	7.2	55	71	1.20	----	7.29	"	"
9.54	52.1	65.68	3.89	7.5	52	66	1.27	----	6.86	"	"
10.02	47.9	58.90	3.82	8.0	48	59	1.33	----	6.30	"	"
10.52	50.9	60.95	3.87	7.6	51	61	1.40	----	6.69	"	"
11.08	52.1	60.47	3.92	7.5	52	60	1.48	----	6.85	"	"
11.51	56.5	64.27	4.24	7.5	56	64	1.53	----	7.43	"	"
12.01	58.5	65.12	4.08	7.0	58	65	1.60	----	7.69	Very Stiff Fine Grained *	"
12.53	74.8	81.30	5.16	6.9	75	81	1.68	----	9.86	"	>140
13.03	73.3	77.82	5.71	7.8	73	78	1.75	----	9.66	"	"
13.52	123.6	129.10	7.45	6.0	123	129	1.81	----	16.36	"	"
14.01	170.5	175.30	7.68	4.5	170	175	1.88	----	22.61	"	"
14.54	135.2	136.61	6.21	4.6	135	136	1.96	----	17.90	"	"
15.03	44.7	44.68	3.72	8.3	45	44	2.02	----	5.83	CLAY	130-140
15.52	36.7	36.63	2.20	6.0	37	37	2.09	----	4.75	"	"
16.00	40.1	39.98	2.32	5.8	40	40	2.15	----	5.20	"	"
16.58	49.5	49.27	2.67	5.4	49	49	2.23	----	6.45	"	"
17.08	57.0	56.66	3.12	5.5	57	56	2.30	----	7.45	"	"
17.52	60.1	59.67	3.39	5.6	60	59	2.36	----	7.86	Very Stiff Fine Grained *	"
18.03	58.8	58.30	3.02	5.1	59	58	2.43	----	7.68	"	"
18.53	50.9	50.40	2.90	5.7	51	50	2.50	----	6.62	CLAY	"
19.04	41.9	40.59	2.19	5.2	42	40	2.56	----	5.42	"	"
19.53	46.3	43.84	2.16	4.7	31	29	2.63	----	6.00	Silty CLAY to CLAY	"
20.01	47.6	44.06	2.42	5.1	47	44	2.70	----	6.17	CLAY	"
20.52	47.9	43.24	2.54	5.3	48	43	2.76	----	6.20	"	"
21.03	53.4	47.55	2.71	5.1	35	32	2.80	----	6.93	Silty CLAY to CLAY	"
21.52	58.7	51.58	3.04	5.2	59	51	2.84	----	7.63	Very Stiff Fine Grained *	"
22.01	60.8	52.71	3.40	5.6	61	53	2.87	----	7.91	"	"
22.57	51.1	43.61	2.91	5.7	51	43	2.91	----	6.61	CLAY	"
23.07	50.2	42.26	2.91	5.8	50	42	2.95	----	6.49	"	"
23.54	56.0	46.51	2.98	5.3	56	46	2.98	----	7.26	"	"
24.04	66.0	54.30	4.65	7.0	66	54	3.02	----	8.58	Very Stiff Fine Grained *	"
24.54	74.6	61.06	4.18	5.6	74	61	3.06	----	9.73	"	"
25.00	75.6	61.59	3.85	5.1	75	61	3.09	----	9.86	"	"
25.51	50.0	40.52	3.03	6.1	50	40	3.13	----	6.44	CLAY	"
26.08	146.8	117.90	9.67	6.6	147	118	3.19	----	19.34	"	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 28.0 feet

CPT NO : CPT-08
DATE: 02-06-2013
TI E: 13:27:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
26.54	150.0	120.19	10.64	7.1	150	120	3.21	----	19.76	Very Stiff Fine Grained *	>140
27.07	211.0	168.07	14.64	6.9	211	168	3.25	----	27.89	"	"
27.50	164.4	130.31	14.43	8.8	164	130	3.28	----	21.67	"	"
28.03	223.2	175.86	14.50	6.5	223	176	3.32	----	29.51	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance Fs = Sleeve friction resistance Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density** Phi = Soil friction angle* Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test* (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988 ** Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 40.5 feet

CPT NO : CPT-09
DATE: 02-06-2013
TI E: 11:57:00
Groundwater measured at 20.8 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.55	3.8	6.08	0.04	1.1	2	3	0.06	----	0.75	Sensitive Fine Grained	85-90
1.00	0.7	1.12	0.01	1.4	1	1	0.10	----	0.13	Organic Material	80-85
1.53	3.6	5.76	0.22	6.1	4	6	0.15	----	0.71	CLAY	90-100
2.05	11.6	18.56	1.12	9.7	12	18	0.21	----	1.92	"	120-130
2.52	19.1	30.56	1.58	8.3	19	30	0.28	----	2.53	"	130-140
3.07	26.7	42.72	1.89	7.1	27	43	0.35	----	3.54	"	"
3.53	24.6	39.36	1.63	6.6	25	39	0.41	----	3.25	"	"
4.05	28.1	44.96	1.50	5.3	28	45	0.48	----	3.71	"	"
4.57	32.8	52.48	2.65	8.1	33	52	0.55	----	4.34	"	"
5.00	37.2	59.52	3.11	8.4	37	59	0.61	----	4.92	"	"
5.51	44.4	71.04	3.52	7.9	44	71	0.68	----	5.87	"	"
6.02	64.7	103.52	4.63	7.2	65	103	0.75	----	8.58	Very Stiff Fine Grained *	"
6.52	78.7	124.29	5.84	7.4	79	124	0.82	----	10.44	"	>140
7.03	150.4	226.79	7.45	5.0	150	226	0.89	----	19.99	"	"
7.53	125.6	180.60	9.38	7.5	125	180	0.96	----	16.68	"	"
8.03	90.4	125.09	7.27	8.0	90	125	1.03	----	11.98	"	"
8.55	118.0	158.83	8.91	7.6	118	159	1.10	----	15.66	"	"
9.06	136.9	179.20	9.46	6.9	137	179	1.18	----	18.17	"	"
9.54	126.2	160.70	8.98	7.1	126	160	1.24	----	16.74	"	"
10.02	113.3	140.64	8.94	7.9	113	140	1.31	----	15.02	"	"
10.53	62.6	75.54	5.84	9.3	62	75	1.38	----	8.25	"	"
11.02	52.5	61.68	4.48	8.5	52	61	1.45	----	6.90	CLAY	130-140
11.52	52.4	59.98	4.29	8.2	52	60	1.51	----	6.89	"	"
12.01	63.2	70.83	4.77	7.5	63	71	1.58	----	8.32	Very Stiff Fine Grained *	"
12.50	68.7	75.34	5.06	7.4	69	75	1.65	----	9.05	"	"
13.07	84.3	90.03	5.97	7.1	84	90	1.73	----	11.12	"	>140
13.52	67.4	70.83	5.20	7.7	67	71	1.79	----	8.87	"	130-140
14.07	80.7	83.32	5.68	7.0	81	83	1.86	----	10.64	"	>140
14.56	90.9	92.34	7.05	7.8	91	92	1.93	----	11.99	"	"
15.05	82.6	82.60	6.09	7.4	83	82	2.00	----	10.88	"	"
15.52	60.1	60.02	5.25	8.7	60	60	2.07	----	7.88	"	130-140
16.06	72.1	71.90	5.19	7.2	72	72	2.14	----	9.47	"	>140
16.52	81.0	80.67	6.80	8.4	81	80	2.21	----	10.65	"	"
17.06	115.2	114.55	6.25	5.4	115	114	2.28	----	15.21	"	"
17.50	81.0	80.44	6.56	8.1	81	80	2.34	----	10.64	"	"
18.06	138.3	137.14	5.20	3.8	69	69	2.42	40	----	SAND to Clayey SAND *	"
18.52	88.8	87.94	4.50	5.1	89	88	2.48	----	11.67	Very Stiff Fine Grained *	130-140
19.06	87.9	85.32	6.71	7.6	88	85	2.56	----	11.55	"	>140
19.51	91.3	86.71	7.16	7.8	91	87	2.62	----	12.00	"	"
20.06	81.4	75.23	7.06	8.7	81	75	2.70	----	10.67	"	"
20.50	72.7	65.71	6.25	8.6	73	66	2.76	----	9.51	"	"
21.09	87.2	77.50	7.21	8.3	87	77	2.81	----	11.44	"	"
21.55	87.5	76.74	7.12	8.1	87	77	2.84	----	11.47	"	"
22.00	57.1	49.46	4.99	8.7	57	49	2.88	----	7.42	CLAY	130-140
22.53	49.8	42.51	3.56	7.1	50	42	2.91	----	6.44	"	"
23.04	74.0	62.26	4.78	6.5	74	62	2.95	----	9.66	Very Stiff Fine Grained *	"
23.53	65.3	54.17	4.23	6.5	65	54	2.99	----	8.49	"	"
24.00	67.0	55.12	4.91	7.3	67	55	3.02	----	8.72	"	"
24.57	56.9	46.54	3.91	6.9	57	46	3.06	----	7.37	CLAY	"
25.05	45.2	36.79	3.75	8.3	45	37	3.10	----	5.80	"	"
25.54	45.0	36.44	3.62	8.0	45	36	3.13	----	5.77	"	"
26.02	54.0	43.51	4.41	8.2	54	43	3.17	----	6.97	"	"
26.57	77.6	62.15	5.22	6.7	77	62	3.21	----	10.11	Very Stiff Fine Grained *	>140
27.07	56.6	45.10	4.01	7.1	56	45	3.25	----	7.30	CLAY	130-140

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 40.5 feet

CPT NO : CPT-09
DATE: 02-06-2013
TI E: 11:57:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.53	38.6	30.60	2.36	6.1	39	31	3.28	----	4.90	CLAY	130-140
28.00	55.1	43.47	2.88	5.2	55	43	3.31	----	7.09	"	"
28.57	48.4	37.96	2.76	5.7	48	38	3.35	----	6.20	"	"
29.04	63.3	49.39	4.19	6.6	63	49	3.39	----	8.18	Very Stiff Fine Grained *	"
29.53	72.9	56.58	4.80	6.6	73	56	3.42	----	9.45	"	"
30.01	48.7	37.60	2.49	5.1	49	37	3.46	----	6.22	CLAY	"
30.52	55.9	42.93	2.51	4.5	37	29	3.50	----	7.18	Silty CLAY to CLAY	"
31.01	37.9	28.95	2.14	5.6	38	29	3.53	----	4.77	CLAY	"
31.57	43.5	33.02	1.83	4.2	22	16	3.57	----	5.52	Clayey SILT to Silty CLAY	"
32.03	43.8	33.08	1.97	4.5	29	22	3.61	----	5.55	Silty CLAY to CLAY	"
32.52	42.0	31.55	2.24	5.3	42	31	3.64	----	5.31	CLAY	"
33.05	27.8	20.76	1.71	6.2	28	21	3.68	----	3.41	"	"
33.54	39.7	29.49	2.21	5.6	40	29	3.72	----	4.99	"	"
34.05	58.2	42.98	2.64	4.5	39	29	3.75	----	7.45	Silty CLAY to CLAY	"
34.54	47.7	35.03	3.10	6.5	47	35	3.79	----	6.05	CLAY	"
35.01	50.2	36.67	2.97	5.9	50	37	3.82	----	6.38	"	"
35.56	67.0	48.63	4.01	6.0	67	48	3.86	----	8.61	Very Stiff Fine Grained *	"
36.04	80.1	57.82	3.93	4.9	80	58	3.90	----	10.36	"	"
36.58	83.9	60.19	4.65	5.5	84	60	3.94	----	10.86	"	"
37.02	72.7	51.88	3.53	4.9	72	52	3.97	----	9.36	"	"
37.56	67.9	48.17	3.64	5.4	68	48	4.01	----	8.72	"	"
38.02	157.5	111.28	5.13	3.3	63	44	4.04	----	20.66	Sandy SILT to Clayey SILT	"
38.54	181.8	127.83	6.08	3.3	91	64	4.08	39	----	SAND to Clayey SAND *	>140
39.05	155.3	108.66	7.18	4.6	155	108	4.12	----	20.35	Very Stiff Fine Grained *	"
39.55	173.1	120.55	8.93	5.2	173	120	4.16	----	22.72	"	"
40.03	193.2	133.94	9.45	4.9	192	133	4.20	----	25.40	"	"
40.54	303.7	209.53	18.53	6.1	301	208	4.24	----	40.13	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 41.0 feet

CPT NO : CPT-10
DATE: 02-06-2013
TI E: 11:00:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.55	7.0	11.20	0.53	7.6	7	11	0.06	----	1.39	CLAY	110-120
1.01	5.2	8.32	0.44	8.5	5	8	0.11	----	1.03	Organic Material	100-110
1.55	5.1	8.16	0.36	7.1	5	8	0.17	----	1.00	CLAY	"
2.02	11.0	17.60	0.62	5.6	11	17	0.23	----	1.81	"	120-130
2.57	25.7	41.12	1.60	6.2	26	41	0.30	----	3.41	"	130-140
3.04	57.8	92.48	3.74	6.5	58	92	0.36	----	7.68	"	"
3.57	60.1	96.16	4.51	7.5	60	96	0.44	----	7.98	Very Stiff Fine Grained *	"
4.02	64.0	102.40	4.49	7.0	64	102	0.50	----	8.50	"	"
4.53	91.9	147.04	5.57	6.1	92	147	0.57	----	12.22	"	>140
5.03	75.9	121.44	5.71	7.5	76	121	0.64	----	10.08	"	"
5.55	75.6	120.96	5.66	7.5	75	120	0.71	----	10.03	"	"
6.03	67.9	108.64	5.28	7.8	68	108	0.78	----	9.00	"	130-140
6.51	69.6	108.50	5.27	7.6	69	108	0.84	----	9.22	"	"
7.06	72.5	107.50	5.50	7.6	72	107	0.92	----	9.61	"	>140
7.53	88.8	125.76	6.30	7.1	89	125	0.98	----	11.77	"	"
8.00	102.1	140.30	6.77	6.6	102	140	1.05	----	13.54	"	"
8.53	75.3	100.59	6.19	8.2	75	100	1.12	----	9.97	"	"
9.01	66.6	86.65	5.67	8.5	66	86	1.19	----	8.80	"	"
9.56	64.9	81.96	5.06	7.8	65	82	1.26	----	8.57	"	130-140
10.06	67.7	83.28	5.27	7.8	67	83	1.33	----	8.94	"	"
10.51	60.4	72.57	4.96	8.2	60	72	1.39	----	7.96	"	"
11.02	63.6	74.28	4.77	7.5	63	74	1.46	----	8.38	"	"
11.52	54.7	62.33	4.74	8.7	54	62	1.53	----	7.19	CLAY	"
12.05	42.4	47.22	3.11	7.3	42	47	1.60	----	5.55	"	"
12.50	57.5	62.76	4.60	8.0	57	62	1.66	----	7.56	"	"
13.03	88.9	94.69	5.54	6.2	89	94	1.74	----	11.74	Very Stiff Fine Grained *	>140
13.56	66.6	69.68	4.97	7.5	66	69	1.81	----	8.76	"	130-140
14.01	49.2	50.75	4.10	8.3	49	50	1.87	----	6.44	CLAY	"
14.56	48.5	49.16	3.33	6.9	48	49	1.94	----	6.34	"	"
15.02	47.1	47.09	3.13	6.6	47	47	2.01	----	6.15	"	"
15.57	55.2	55.11	3.36	6.1	55	55	2.08	----	7.22	"	"
16.03	46.4	46.27	3.21	6.9	46	46	2.14	----	6.04	"	"
16.57	62.7	62.43	4.07	6.5	62	62	2.21	----	8.21	Very Stiff Fine Grained *	"
17.03	64.1	63.75	4.00	6.2	64	63	2.28	----	8.39	"	"
17.51	161.3	160.19	6.62	4.1	161	160	2.34	----	21.35	"	>140
18.05	76.6	75.96	5.39	7.0	76	76	2.42	----	10.05	"	"
18.53	73.9	73.18	3.46	4.7	74	73	2.48	----	9.69	"	130-140
19.00	63.1	61.48	4.38	6.9	63	61	2.55	----	8.24	"	"
19.55	70.4	66.87	3.40	4.8	70	67	2.62	----	9.21	"	"
20.02	95.5	88.73	4.89	5.1	95	88	2.68	----	12.55	"	"
20.58	88.1	79.65	4.19	4.8	88	79	2.76	----	11.56	"	"
21.06	46.2	41.24	2.93	6.3	46	41	2.80	----	5.97	CLAY	"
21.55	43.8	38.58	2.29	5.2	44	38	2.83	----	5.65	"	"
22.05	43.2	37.54	2.36	5.5	43	37	2.87	----	5.56	"	"
22.54	77.7	66.60	3.90	5.0	77	66	2.90	----	10.16	Very Stiff Fine Grained *	"
23.00	42.9	36.29	2.78	6.5	43	36	2.94	----	5.51	CLAY	"
23.58	64.6	53.76	3.48	5.4	64	54	2.98	----	8.40	Very Stiff Fine Grained *	"
24.05	27.8	22.90	2.30	8.3	28	23	3.01	----	3.49	CLAY	"
24.56	47.9	39.25	2.87	6.0	48	39	3.05	----	6.17	"	"
25.05	77.4	63.10	3.53	4.6	77	63	3.08	----	10.10	Very Stiff Fine Grained *	"
25.52	95.7	77.64	4.78	5.0	95	77	3.12	----	12.53	"	"
26.07	144.6	116.61	5.52	3.8	72	58	3.16	39	----	SAND to Clayey SAND *	>140
26.53	103.1	82.74	3.69	3.6	41	33	3.20	----	13.51	Sandy SILT to Clayey SILT	130-140
27.06	129.1	103.04	4.67	3.6	52	41	3.23	----	16.97	"	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 41.0 feet

CPT NO : CPT-10
DATE: 02-06-2013
TI E: 11:00:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.52	96.7	76.81	3.25	3.4	39	31	3.27	----	12.65	Sandy SILT to Clayey SILT	130-140
28.05	64.6	51.03	4.64	7.2	64	51	3.31	----	8.36	Very Stiff Fine Grained *	"
28.51	84.7	66.57	4.54	5.4	84	66	3.34	----	11.04	"	"
29.04	99.1	77.43	5.44	5.5	99	77	3.38	----	12.95	"	>140
29.53	210.0	163.15	8.29	3.9	105	81	3.42	41	----	SAND to Clayey SAND *	"
30.04	244.6	188.92	10.80	4.4	244	188	3.46	----	32.34	Very Stiff Fine Grained *	"
30.56	291.3	223.64	11.41	3.9	145	112	3.50	43	----	SAND to Clayey SAND *	"
31.04	259.3	197.97	9.96	3.8	129	99	3.54	42	----	"	"
31.55	250.9	190.42	7.86	3.1	125	95	3.57	42	----	"	"
32.02	275.6	208.01	11.23	4.1	138	104	3.61	42	----	"	"
32.53	257.0	192.79	9.60	3.7	128	96	3.65	42	----	"	"
33.05	194.4	144.93	8.25	4.2	194	145	3.69	----	25.62	Very Stiff Fine Grained *	"
33.53	203.9	151.14	7.85	3.8	102	75	3.73	40	----	SAND to Clayey SAND *	"
34.02	270.5	199.32	9.77	3.6	135	100	3.77	42	----	"	"
34.53	191.8	140.45	8.80	4.6	192	140	3.81	----	25.26	Very Stiff Fine Grained *	"
35.01	186.9	136.07	7.49	4.0	93	68	3.84	40	----	SAND to Clayey SAND *	"
35.54	203.2	146.97	7.46	3.7	101	73	3.88	40	----	"	"
36.05	191.3	137.50	7.88	4.1	191	137	3.92	----	25.18	Very Stiff Fine Grained *	"
36.53	225.5	161.12	8.48	3.8	113	80	3.96	41	----	SAND to Clayey SAND *	"
37.06	241.8	171.62	8.87	3.7	121	86	4.00	41	----	"	"
37.52	252.6	178.53	10.52	4.2	126	89	4.04	41	----	"	"
38.03	280.1	197.02	10.79	3.9	140	98	4.08	42	----	"	"
38.56	276.2	193.32	10.96	4.0	138	97	4.12	42	----	"	"
39.02	281.3	196.03	10.36	3.7	141	98	4.15	42	----	"	"
39.51	269.5	186.58	10.93	4.1	135	93	5.39	42	----	"	"
40.03	261.2	180.29	11.04	4.2	130	90	4.23	41	----	"	"
40.50	283.0	194.45	10.54	3.7	141	97	4.27	42	----	"	"
41.03	305.0	208.51	12.52	4.1	152	104	4.31	42	----	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance Fs = Sleeve friction resistance Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density** Phi = Soil friction angle* Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test* (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988 ** Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-12 (CPT 11)
DATE: 02-06-2013
TI E: 13:59:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.54	7.9	12.64	0.49	6.2	8	13	0.06	----	1.57	CLAY	110-120
1.04	8.2	13.12	0.55	6.7	8	13	0.12	----	1.63	"	"
1.52	16.0	25.60	0.31	1.9	8	13	0.17	----	2.12	Clayey SILT to Silty CLAY	"
2.02	9.6	15.36	0.48	5.0	10	15	0.23	----	1.58	CLAY	"
2.58	36.5	58.40	1.53	4.2	24	39	0.31	----	4.85	Silty CLAY to CLAY	130-140
3.07	28.0	44.80	1.30	4.6	28	45	0.37	----	3.71	CLAY	"
3.52	23.4	37.44	1.05	4.5	23	37	0.43	----	3.09	"	"
4.07	45.4	72.64	1.59	3.5	23	36	0.51	----	6.02	Clayey SILT to Silty CLAY	"
4.54	114.9	183.84	2.63	2.3	38	61	0.57	42	----	Silty SAND to Sandy SILT	"
5.07	44.5	71.20	2.38	5.3	44	71	0.64	----	5.89	CLAY	"
5.53	136.7	218.72	4.78	3.5	55	87	0.71	----	18.18	Sandy SILT to Clayey SILT	"
6.06	147.0	235.20	4.41	3.0	49	78	0.78	43	----	Silty SAND to Sandy SILT	"
6.50	176.0	275.03	2.71	1.5	44	69	0.84	44	----	SAND to Silty SAND	"
7.07	145.4	216.05	3.31	2.3	48	72	0.91	42	----	Silty SAND to Sandy SILT	"
7.52	64.8	92.34	1.97	3.0	26	37	0.97	----	8.58	Sandy SILT to Clayey SILT	"
8.01	14.4	19.89	1.10	7.6	14	20	1.04	----	1.85	CLAY	120-130
8.56	8.9	11.98	0.65	7.3	9	12	1.10	----	1.67	"	"
9.03	10.3	13.55	0.72	7.0	10	13	1.16	----	1.62	"	"
9.51	21.6	27.67	1.37	6.3	22	28	1.23	----	2.80	"	130-140
10.03	29.7	37.03	1.78	6.0	30	37	1.30	----	3.87	"	"
10.51	28.9	35.12	1.72	6.0	29	35	1.36	----	3.76	"	"
11.08	31.9	37.60	2.23	7.0	32	38	1.44	----	4.16	"	"
11.55	34.9	40.09	2.50	7.2	35	40	1.50	----	4.55	"	"
12.00	28.4	31.99	1.99	7.0	28	32	1.57	----	3.68	"	"
12.56	21.1	23.20	1.55	7.3	21	23	1.64	----	2.70	"	"
13.03	86.2	92.80	3.82	4.4	86	93	1.70	----	11.38	Very Stiff Fine Grained *	"
13.51	116.0	122.44	4.39	3.8	46	49	1.77	----	15.35	Sandy SILT to Clayey SILT	"
14.01	56.1	58.32	3.25	5.8	56	58	1.84	----	7.36	CLAY	"
14.53	15.5	15.85	1.39	9.0	15	16	1.91	----	1.94	"	"
15.08	19.3	19.39	1.29	6.7	19	19	1.98	----	2.44	"	"
15.55	16.2	16.19	1.28	7.9	16	16	2.04	----	2.02	"	"
16.01	57.3	57.18	2.00	3.5	29	29	2.11	----	7.50	Clayey SILT to Silty CLAY	"
16.56	20.3	20.23	1.07	5.3	20	20	2.18	----	2.56	CLAY	"
17.04	22.9	22.79	1.19	5.2	23	23	2.25	----	2.90	"	"
17.55	21.7	21.56	1.17	5.4	22	22	2.31	----	2.74	"	"
18.02	20.5	20.35	1.02	5.0	20	20	2.38	----	2.57	"	"
18.56	28.2	27.95	1.51	5.4	28	28	2.45	----	3.60	"	"
19.03	30.9	30.46	1.98	6.4	31	30	2.51	----	3.95	"	"
19.52	30.9	29.77	2.08	6.7	31	30	2.58	----	3.95	"	"
20.00	26.5	24.97	1.94	7.3	26	25	2.64	----	3.36	"	"
20.55	24.3	22.30	1.66	6.8	24	22	2.72	----	3.06	"	"
21.04	28.2	25.55	1.74	6.2	28	25	2.75	----	3.57	"	"
21.51	32.9	29.43	1.88	5.7	33	29	2.79	----	4.20	"	"
22.06	35.2	31.03	1.92	5.5	35	31	2.83	----	4.50	"	"
22.54	40.1	34.89	2.36	5.9	40	35	2.86	----	5.15	"	"
23.01	43.4	37.27	2.79	6.4	43	37	2.90	----	5.58	"	"
23.56	42.1	35.60	2.84	6.7	42	36	2.94	----	5.40	"	"
24.03	44.4	37.04	3.03	6.8	44	37	2.97	----	5.71	"	"
24.58	39.0	32.12	2.71	6.9	39	32	3.01	----	4.98	"	"
25.03	36.9	30.25	2.54	6.9	37	30	3.04	----	4.70	"	"
25.57	35.5	28.95	2.54	7.2	35	29	3.08	----	4.51	"	"
26.03	34.0	27.59	2.43	7.1	34	28	3.12	----	4.30	"	"
26.51	28.0	22.61	1.92	6.9	28	23	3.15	----	3.50	"	"
27.04	22.1	17.75	1.79	8.1	22	18	3.19	----	2.71	"	"

PRO ECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PRO NO : 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO : CPT-12 (CPT 11)
DATE: 02-06-2013
TI E: 13:59:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.50	21.6	17.26	1.84	8.5	22	17	3.22	----	2.64	CLAY	130-140
28.03	20.2	16.06	1.55	7.7	20	16	3.26	----	2.44	"	"
28.58	29.4	23.24	2.14	7.3	29	23	3.30	----	3.67	"	"
29.05	39.6	31.14	2.89	7.3	40	31	3.34	----	5.02	"	"
29.52	45.4	35.52	3.17	7.0	45	35	3.37	----	5.79	"	"
30.06	28.8	22.40	1.58	5.5	29	22	3.41	----	3.57	"	"
30.50	23.8	18.43	1.30	5.5	24	18	3.44	----	2.90	"	"
31.06	19.8	15.24	1.46	7.4	20	15	3.48	----	2.36	"	"
31.53	30.8	23.58	1.73	5.6	31	24	3.52	----	3.83	"	"
32.01	34.6	26.35	1.84	5.3	35	26	3.55	----	4.33	"	"
32.56	28.1	21.27	1.96	7.0	28	21	3.59	----	3.46	"	"
33.03	39.4	29.67	2.31	5.9	39	30	3.62	----	4.96	"	"
33.57	34.0	25.45	2.01	5.9	34	25	3.66	----	4.23	"	"
34.04	34.5	25.69	1.90	5.5	34	26	3.70	----	4.30	"	"
34.58	37.2	27.53	2.01	5.4	37	27	3.74	----	4.65	"	"
35.01	36.6	26.96	2.06	5.6	37	27	3.77	----	4.57	"	"
35.55	41.2	30.16	2.36	5.7	41	30	3.81	----	5.18	"	"
36.02	34.9	25.41	1.93	5.5	35	25	3.84	----	4.33	"	"
36.55	38.3	27.72	2.12	5.5	38	28	3.88	----	4.78	"	"
37.01	32.2	23.18	1.91	5.9	32	23	3.91	----	3.96	"	"
37.55	24.2	17.31	1.39	5.7	24	17	3.95	----	2.89	"	"
38.03	21.2	15.08	1.49	7.0	21	15	3.99	----	2.49	"	"
38.57	117.4	83.06	5.41	4.6	117	83	4.03	----	15.31	Very Stiff Fine Grained *	>140
39.03	67.9	47.84	4.39	6.5	68	48	4.06	----	8.71	"	130-140
39.57	51.1	35.83	3.00	5.9	51	36	4.10	----	6.46	CLAY	"
40.01	43.4	30.32	2.52	5.8	43	30	4.13	----	5.43	"	"
40.50	31.1	21.63	1.78	5.7	31	22	4.17	----	3.79	"	"
41.04	26.9	18.62	1.78	6.6	27	18	4.21	----	3.22	"	"
41.51	38.3	26.40	2.40	6.3	38	26	4.24	----	4.74	"	"
42.05	26.8	18.38	2.05	7.6	27	18	4.28	----	3.20	"	"
42.55	37.1	25.34	2.15	5.8	37	25	4.32	----	4.57	"	"
43.03	44.3	30.12	2.36	5.3	44	30	4.35	----	5.52	"	"
43.57	88.6	59.95	4.73	5.3	88	60	4.39	----	11.42	Very Stiff Fine Grained *	"
44.04	85.2	57.40	4.53	5.3	85	57	4.43	----	10.97	"	"
44.58	83.2	55.76	5.47	6.6	83	56	4.47	----	10.70	"	>140
45.04	90.1	60.12	4.05	4.5	90	60	4.50	----	11.61	"	130-140
45.53	55.6	36.93	2.88	5.2	55	37	4.54	----	7.01	CLAY	"
46.03	43.7	28.89	2.35	5.4	44	29	4.57	----	5.42	"	"
46.52	49.0	32.25	2.34	4.8	33	21	4.61	----	6.12	Silty CLAY to CLAY	"
47.06	45.5	29.79	2.20	4.8	30	20	4.65	----	5.65	"	"
47.51	46.3	30.19	2.37	5.1	46	30	4.68	----	5.75	CLAY	"
48.05	42.1	27.31	1.95	4.6	28	18	4.72	----	5.18	Silty CLAY to CLAY	"
48.52	40.6	26.22	2.12	5.2	40	26	4.76	----	4.98	CLAY	"
49.06	45.2	29.04	2.65	5.9	45	29	4.79	----	5.59	"	"
49.57	59.0	37.72	3.41	5.8	59	38	4.83	----	7.42	Very Stiff Fine Grained *	"
50.04	67.0	42.64	3.41	5.1	67	43	4.87	----	8.49	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

APPENDIX E

Corrosivity Analysis
(CERCO Analytical, Inc.)

APPENDIX E

California State Certified Laboratory No. 2153

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 **462 2771** Fax. 925 **462 2775**
www.cercoanalytical.com

25 July, 2013

Job No.1307107
Cust. No.11521

Ms. Jeanine Ruffoni
ENGEO Incorporated
6399 San Ignacio Avenue, Suite 150
San Jose, CA 95119

Subject: Project No.: 9901.000.000 Phase 1
Project Name: San Juan Oaks
Corrosivity Analysis – ASTM Test Methods

Dear Ms. Ruffoni:

Pursuant to your request, Cerco Analytical has analyzed the soil samples submitted on July 16, 2013. Based on the analytical results, this brief corrosivity evaluation is enclosed for your consideration.

Based upon the resistivity measurements, sample No. 001 is classified as "corrosive" and sample No. 002 is classified as "moderately corrosive". All buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion.

The chloride ion concentrations ranged from none detected to 59 mg/kg. Because the chloride ion concentrations are less than 300 mg/kg, they are determined to be insufficient to attack steel embedded in a concrete mortar coating.

The sulfate ion concentrations are none detected to 15 mg/kg.

The sulfide ion concentrations reflect none detected with a detection limit of 50 mg/kg.

The pH of the soils range from 7.2 to 7.6 which does not present corrosion problems for buried iron, steel, mortar-coated steel and reinforced concrete structures.

The redox potentials range from 370 to 410-mV. Sample No.001 is indicative of aerobic soil conditions. Sample No.002 is indicative of potentially "slightly corrosive" soils resulting from anaerobic soil conditions.

This corrosivity evaluation is based on general corrosion engineering standards and is non-specific in nature. For specific long-term corrosion control design recommendations or consultation, please *call JDH Corrosion Consultants, Inc. at (925) 927-6630.*

We appreciate the opportunity of working with you on this project. If you have any questions, or if you require further information, please do not hesitate to contact us.

Very truly yours,
CERCO ANALYTICAL, INC.

J. Darby Howard, Jr., P.E.
President

JDH/jdl
Enclosure

California State Certified Laboratory No. 2153

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

Client: ENGEO Incorporated
Client's Project No.: 9901.000.000 - Phase 1
Client's Project Name: San Juan Oaks
Date Sampled: 06/24 & 25/13
Date Received: 16-Jul-13
Matrix: Soil
Authorization: Signed Chain of Custody

Date of Report: 25-Jul-2013

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Conductivity (umhos/cm)*	Resistivity (100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
1307107-001	1-BH 3 @ 2.0'	410	7.6	-	1,200	N.D.	59	N.D.
1307107-002	1-BH 15 @ 2'	370	7.2	-	4,300	N.D.	N.D.	N.D.

Method:	ASTM D1498	ASTM D4972	ASTM D1125M	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Detection Limit:	-	-	10	-	50	15	15
Date Analyzed:	22-Jul-2013	22-Jul-2013	-	22-Jul-2013	22-Jul-2013	22-Jul-2013	22-Jul-2013

Cheryl McMillen
Laboratory Director

* Results Reported on "As Received" Basis

N.D. - None Detected

<u>Quality Control Summary</u> - All laboratory quality control parameters were found to be within established limits

CA 1307107

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 9901.000.000 Ph 001
PROJECT NAME: SAN JUAN OAKS
SAMPLED BY: (SIGNATURE/PRINT) [signature] / JEANINE RUFFONI
PROJECT MANAGER: JEANINE RUFFONI
ROUTING: E-MAIL JRUFFONI@ENGEO.COM ~~Hard Copy~~

SAMPLE NUMBER	DATE	TIME	MATRIX	NUMBER OF CONTAINERS	CONTAINER SIZE	PRESERVATIVE	Redox	pH	Sulfate	Resistivity	Chloride	Sulfide	REMARKS REQUIRED DETECTION LIMITS
1-BH3@2.0	6/24/2013	-	SOIL	BAG	-	N/A	X	X	X	X	X	X	ASTM test methods w/ brief eval.
1-BH5@2	6/25/2013	-	SOIL	SS LINER	2"x6"	N/A	X	X	X	X	X	X	

limited amt of soil

add'l chrg for liner

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature]	7/16/13 1008	[signature]			
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS	
				STANDARD ~~5-day~~ T.A.T.	

ENGEO INCORPORATED

6399 SAN IGNACIO AVENUE, SUITE 150
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APPENDIX F

Guide Contract Specifications

APPENDIX F

GUIDE CONTRACT SPECIFICATIONS

PART I - EARTHWORK

PREFACE

These specifications are intended as a guide for the earthwork performed at the subject development project. If there is a conflict between these specifications (including the recommendations of the geotechnical report) and agency or code requirements, it should be brought to the attention of ENGEO and Owner prior to contract bidding.

PART 1 - GENERAL

1.01 WORK COVERED

A. Grading, excavating, filling and backfilling, including trenching and backfilling for utilities as necessary to complete the Project as indicated on the Drawings.

B. Subsurface drainage as indicated on the Drawings.

1.02 CODES AND STANDARDS

A. Excavating, trenching, filling, backfilling, and grading work shall meet the applicable requirements of the Uniform Building Code and the standards and ordinances of state and local governing authorities.

1.03 SUBSURFACE SOIL CONDITIONS

A. The Owners' Geotechnical Exploration report is available for inspection by bidder or Contractor. The Contractor shall refer to the findings and recommendations of the Geotechnical Exploration report in planning and executing his work.

1.04 DEFINITIONS

A. Fill: All soil, rock, or soil-rock materials placed to raise the grades of the site or to backfill excavations.

B. Backfill: All soil, rock or soil-rock material used to fill excavations and trenches.

C. Onsite Material: Soil and/or rock material which is obtained from the site.

D. Imported Material: Soil and/or rock material which is brought to the site from offsite areas.

E. Select Material: Onsite and/or imported material which is approved by ENGEO as a specific-purpose fill.

F. Engineered Fill: Fill upon which ENGEO has made sufficient observations and tests to confirm that the fill has been placed and compacted in accordance with specifications and requirements.

G. Degree of Compaction or Relative Compaction: The ratio, expressed as a percentage, of the in-place dry density of the fill and backfill material as compacted in the field to the maximum dry density of the same material as determined by ASTM D-1557 or California 216 compaction test method.

H. Optimum Moisture: Water content, percentage by dry weight, corresponding to the maximum dry density as determined by ASTM D-1557.

I. ENGEO: The project geotechnical engineering consulting firm, its employees or its designated representatives.

J. Drawings: All documents, approved for construction, which describe the Work.

1.05 OBSERVATION AND TESTING

A. All site preparation, cutting and shaping, excavating, filling, and backfilling shall be carried out under the observation of ENGEO, employed and paid for by the Owners. ENGEO will perform appropriate field and laboratory tests to evaluate the suitability of fill material, the proper moisture content for compaction, and the degree of compaction achieved. Any fill that does not meet the specification requirements shall be removed and/or reworked until the requirements are satisfied.

B. Cutting and shaping, excavating, conditioning, filling, and compacting procedures require approval of ENGEO as they are performed. Any work found unsatisfactory or any work disturbed by subsequent operations before approval is granted shall be corrected in an approved manner as recommended by ENGEO.

C. Tests for compaction will be made in accordance with test procedures outlined in ASTM D-1557, as applicable. Field testing of soils or compacted fill shall conform with the applicable requirements of ASTM D-2922.

D. All authorized observation and testing will be paid for by the Owners.

1.06 SITE CONDITIONS

A. Excavating, filling, backfilling, and grading work shall not be performed during unfavorable weather conditions. When the work is interrupted by rain, excavating, filling, backfilling, and grading work shall not be resumed until the site and soil conditions are suitable.

B. Contractor shall take the necessary measures to prevent erosion of freshly filled, backfilled, and graded areas until such time as permanent drainage and erosion control measures have been installed.

PART 2 - PRODUCTS

2.01 GENERAL

A. Contractor shall furnish all materials, tools, equipment, facilities, and services as required for performing the required excavating, filling, backfilling, and grading work, and trenching and backfilling for utilities.

2.02 SOIL MATERIALS

A. Fill

1. Material to be used for engineered fill and backfill shall be free from organic matter and other deleterious substances, and of such quality that it will compact thoroughly without excessive voids when watered and rolled. Excavated onsite material will be considered suitable for engineered fill and backfill if it contains no more than 3 percent organic matter, is free of debris and other deleterious substances and conforms to the requirements specified above. Rocks of maximum dimension in excess of two-thirds of the lift thickness shall be removed from any fill material to the satisfaction of ENGEO.

2. Excavated earth material which is suitable for engineered fill or backfill, as determined by ENGEO, shall be conditioned for reuse and properly stockpiled as required for later filling and backfilling operations. Conditioning shall consist of spreading material in layers not to exceed 8 inches and raking free of debris and rubble. Rocks and aggregate exceeding the allowed largest dimension, and deleterious material shall be removed from the site and disposed off site in a legal manner.

3. ENGEO shall be immediately notified if potential hazardous materials or suspect soils exhibiting staining or odor are encountered. Work activities shall be discontinued within the area of potentially hazardous materials. ENGEO environmental personnel will conduct an assessment of the suspect hazardous material to determine the appropriate response and mitigation. Regulatory agencies may also be contacted to request concurrence and oversight. *ENGEO will rely on the Owner, or a designated Owner's representative, to make necessary notices to the appropriate regulatory agencies. The Owner may request ENGEO's*

assistance in notifying regulatory agencies, provided ENGEO receives Owner's written authorization to expand its scope of services.

4. ENGEO shall be notified at least 48 hours prior to the start of filling and backfilling operations so that it may evaluate samples of the material intended for use as fill and backfill. All materials to be used for filling and backfilling require the approval of ENGEO.

B. Import Material: Where conditions require the importation of fill material, the material shall be an inert, nonexpansive soil or soil-rock material free of organic matter and meeting the following requirements unless otherwise approved by ENGEO.

Gradation (ASTM D-421):	Sieve Size	Percent Passing
	2-inch	100
	#200	15 - 70
Plasticity (ASTM D-4318):	Liquid Limit	Plasticity Index
	< 30	< 12
Swell Potential (ASTM D-4546B): (at optimum moisture)	Percent Heave	Swell Pressure
	< 2 percent	< 300 psf
Resistance Value (ASTM D-2844):	Minimum 25	
Organic Content (ASTM D-2974):	Less than 2 percent	

A sample of the proposed import material should be submitted to ENGEO for evaluation prior to delivery at the site.

2.03 SAND

A. Sand for sand cushion under slabs and for bedding of pipe in utility trenches shall be a clean and graded, washed sand, free from clay or organic material, suitable for the intended purpose with 90 to 100 percent passing a No. 4 U.S. Standard Sieve, not more than 5 percent passing a No. 200 U.S. Standard Sieve, and generally conforming to ASTM C33 for fine aggregate.

2.04 AGGREGATE DRAINAGE FILL

A. Aggregate drainage fill under concrete slabs and paving shall consist of broken stone, crushed or uncrushed gravel, clean quarry waste, or a combination thereof. The aggregate shall be free from fines, vegetable matter, loam, volcanic tuff, and other deleterious substances. It shall be of such quality that the absorption of water in a saturated surface dry condition does not exceed 3 percent of the oven dry weight of the samples.

B. Aggregate drainage fill shall be of such size that the percentage composition by dry weight as determined by laboratory sieves (U. S. Series) will conform to the following grading:

Sieve Size	Percentage Passing Sieve
1½-inches	100
1-inch	90 - 100
#4	0 - 5

2.05 SUBDRAINS

A. Perforated subdrain pipe of the required diameter shall be installed as shown on the drawings. The pipe(s) shall also conform to these specifications unless otherwise specified by ENGEO in the field.

Subdrain pipe shall be manufactured in accordance with one of the following requirements:

Design depths less than 30 feet

- Perforated ABS Solid Wall SDR 35 (ASTM D-2751)
- Perforated PVC Solid Wall SDR 35 (ASTM D-3034)
- Perforated PVC A-2000 (ASTM F949)
- Perforated Corrugated HDPE double-wall (AASHTO M-252 or M-294, Caltrans Type S, 50 psi minimum stiffness)

Design depths less than 50 feet

- Perforated PVC SDR 23.5 Solid Wall (ASTM D-3034)
- Perforated Sch. 40 PVC Solid Wall (ASTM-1785)
- Perforated ABS SDR 23.5 Solid Wall (ASTM D-2751)
- Perforated ABS DWV/Sch. 40 (ASTM D-2661 and D-1527)
- Perforated Corrugated HDPE double-wall (AASHTO M-252 or M-294, Caltrans Type S, 70 psi minimum stiffness)

Design depths less than 70 feet

- Perforated ABS Solid Wall SDR 15.3 (ASTM D-2751)
- Perforated Sch. 80 PVC (ASTM D-1785)
- Perforated Corrugated Aluminum (ASTM B-745)

B. Permeable Material (Class 2): Class 2 permeable material for filling trenches under, around, and over subdrains, behind building and retaining walls, and for pervious blankets shall consist of clean, coarse sand and gravel or crushed stone, conforming to the following grading requirements:

Sieve Size	Percentage Passing Sieve
1-inch	100
¾-inch	90 - 100
⅜-inch	40 - 100
#4	25 - 40
#8	18 - 33
#30	5 - 15
#50	0 - 7
#200	0 - 3

C. Filter Fabric: All filter fabric shall meet the following Minimum Average Roll Values unless otherwise specified by ENGEO.

Grab Strength (ASTM D-4632)..180 lbs
Mass Per Unit Area (ASTM D-4751)................................6 oz/yd^2
Apparent Opening Size (ASTM D-4751)...........................70-100 U.S. Std. Sieve
Flow Rate (ASTM D-4491)..80 gal/min/ft^2
Puncture Strength (ASTM D-4833) ....80 lbs

D. Vapor Retarder: Vapor Retarders shall consist of PVC, LDPE or HDPE impermeable sheeting at least 10 mils thick.

2.06 PERMEABLE MATERIAL (Class 1; Type A)

A. Class 1 permeable material to be used in conjunction with filter fabric for backfilling of subdrain excavations shall conform to the following grading requirements:

Sieve Size	Percentage Passing Sieve
¾-inch	100
½-inch	95 - 100
⅜-inch	70 - 100
#4	0 - 55
#8	0 - 10
#200	0 - 3

PART 3 - EXECUTION

3.01 STAKING AND GRADES

A. Contractor shall lay out all his work, establish all necessary markers, bench marks, grading stakes, and other stakes as required to achieve design grades.

3.02 EXISTING UTILITIES

A. Contractor shall verify the location and depth (elevation) of all existing utilities and services before performing any excavation work.

3.03 EXCAVATION

A. Contractor shall perform excavating as indicated and required for concrete footings, drilled piers, foundations, floor slabs, concrete walks, and site leveling and grading, and provide shoring, bracing, underpinning, cribbing, pumping, and planking as required. The bottoms of excavations shall be firm undisturbed earth, clean and free from loose material, debris, and foreign matter.

B. Excavations shall be kept free from water at all times. Adequate dewatering equipment shall be maintained at the site to handle emergency situations until concrete or backfill is placed.

C. Unauthorized excavations for footings shall be filled with concrete to required elevations, unless other methods of filling are authorized by ENGEO.

D. Excavated earth material which is suitable for engineered fill or backfill, as determined by ENGEO, shall be conditioned for reuse and properly stockpiled for later filling and backfilling operations as specified under Section 2.02, "Soil Materials."

E. Abandoned sewers, piping, and other utilities encountered during excavating shall be removed and the resulting excavations shall be backfilled with engineered fill as required by ENGEO.

F. Any active utility lines encountered shall be reported immediately to the Owner's Representative and authorities involved. The Owner and proper authorities shall be permitted free access to take the measures deemed necessary to repair, relocate, or remove the obstruction as determined by the responsible authority or Owner's Representative.

3.04 SUBGRADE PREPARATION

A. All brush and other rubbish, as well as trees and root systems not marked for saving, shall be removed from the site and legally disposed of.

B. Any existing structures, foundations, underground storage tanks, or debris must be removed from the site prior to any building, grading, or fill operations. Septic tanks, including all drain fields and other lines, if encountered, must be totally removed. The resulting depressions shall be properly prepared and filled to the satisfaction of ENGEO.

C. Vegetation and organic topsoil shall be removed from the surface upon which the fill is to be placed and either removed and legally disposed of or stockpiled for later use in approved landscape areas. The surface shall then be scarified to a depth of at least eight inches until the surface is free from ruts, hummocks, or other uneven features which would tend to prevent uniform compaction by the equipment to be used.

D. After the foundation for the fill has been cleared and scarified, it shall be made uniform and free from large clods. The proper moisture content must be obtained by adding water or aerating. The foundation for the fill shall be compacted at the proper moisture content to a relative compaction as specified herein.

3.05 ENGINEERED FILL

A. Select Material: Fill material shall be "Select" or "Imported Material" as previously specified.

B. Placing and Compacting: Engineered fill shall be constructed by approved and accepted methods. Fill material shall be spread in uniform lifts not exceeding 8 inches in uncompacted thickness. Each layer shall be spread evenly, and thoroughly blade-mixed to obtain uniformity of material. Fill material which does not contain sufficient moisture as specified by ENGEO shall be sprinkled with water; if it contains excess moisture it shall be aerated or blended with drier material to achieve the proper water content. Select material and water shall then be thoroughly mixed before being compacted.

C. Unless otherwise specified in the Geotechnical Exploration report, each layer of spread select material shall be compacted to at least 90 percent relative compaction at a moisture content of at least three percentage points above the optimum moisture content. Minimum compaction in all keyways shall be a minimum of 95 percent with a minimum moisture content of at least 1 percentage point above optimum.

D. Unless otherwise specified in the Geotechnical Exploration report or otherwise required by the local authorities, the upper 6 inches of engineered fill in areas to receive pavement shall be compacted to at least 95 percent relative compaction with a minimum moisture content of at least 3 percentage points above optimum.

E. Testing and Observation of Fill: The work shall consist of field observation and testing to determine that each layer has been compacted to the required density and that the required moisture is being obtained. Any layer or portion of a layer that does not attain the compaction required shall be reworked until the required density is obtained.

F. Compaction: Compaction shall be by sheepsfoot rollers, multiple-wheel steel or pneumatic-tired rollers or other types of acceptable compaction equipment. Rollers shall be of such design that they will be able to compact the fill to the specified compaction. Rolling shall be accomplished while the fill material is within the specified moisture content range. Rolling of each layer must be continuous so that the required compaction may be obtained uniformly throughout each layer.

G. Fill slopes shall be constructed by overfilling the design slopes and later cutting back the slopes to the design grades. No loose soil will be permitted on the faces of the finished slopes.

H. Strippings and topsoil shall be stockpiled as approved by Owner, then placed in accordance with ENGEO's recommendations to a minimum thickness of 6 inches and a maximum thickness of 12 inches over exposed open space cut slopes which are 3:1 or flatter, and track walked to the satisfaction of ENGEO.

I. Final Prepared Subgrade: Finish blading and smoothing shall be performed as necessary to produce the required density, with a uniform surface, smooth and true to grade.

3.06 BACKFILLING

A. Backfill shall not be placed against footings, building walls, or other structures until approved by ENGEO.

B. Backfill material shall be Select Material as specified for engineered fill.

C. Backfill shall be placed in 6-inch layers, leveled, rammed, and tamped in place. Each layer shall be compacted with suitable compaction equipment to 90 percent relative compaction at a moisture content of at least 3 percent above optimum.

3.07 TRENCHING AND BACKFILLING FOR UTILITIES

A. Trenching:

1. Trenching shall include the removal of material and obstructions, the installation and removal of sheeting and bracing and the control of water as necessary to provide the required utilities and services.

2. Trenches shall be excavated to the lines, grades, and dimensions indicated on the Drawings. Maximum allowable trench width shall be the outside diameter of the pipe plus 24 inches, inclusive of any trench bracing.

3. When the trench bottom is a soft or unstable material as determined by ENGEO, it shall be made firm and solid by removing said unstable material to a sufficient depth and replacing it with onsite material compacted to 90 percent minimum relative compaction.

4. Where water is encountered in the trench, the contractor must provide materials necessary to drain the water and stabilize the bed.

B. Backfilling:

1. Trenches must be backfilled within 2 days of excavation to minimize desiccation.

2. Bedding material shall be sand and shall not extend more than 6 inches above any utility lines.

3. Backfill material shall be select material.

4. Trenches shall be backfilled as indicated or required and compacted with suitable equipment to 90 percent minimum relative compaction at the required moisture content.

3.08 SUBDRAINS

A. Trenches for subdrain pipe shall be excavated to a minimum width equal to the outside diameter of the pipe plus at least 12 inches and to a depth of approximately 2 inches below the grade established for the invert of the pipe, or as indicated on the Drawings.

B. The space below the pipe invert shall be filled with a layer of Class 2 permeable material, upon which the pipe shall be laid with perforations down. Sections shall be joined as recommended by the pipe manufacturer.

C. Rocks, bricks, broken concrete, or other hard material shall not be used to give intermediate support to pipes. Large stones or other hard objects shall not be left in contact with the pipes.

D. Excavations for subdrains shall be filled as required to fill voids and prevent settlement without damaging the subdrain pipe. Alternatively, excavations for subdrains may be filled with Class 1 permeable material (as defined in Section 2.06) wrapped in Filter Fabric (as defined in Section 2.05).

3.09 AGGREGATE DRAINAGE FILL

A. ENGEO shall approve finished subgrades before aggregate drainage fill is installed.

B. Pipes, drains, conduits, and any other mechanical or electrical installations shall be in place before any aggregate drainage fill is placed. Backfill at walls to elevation of drainage fill shall be in place and compacted.

C. Aggregate drainage fill under slabs and concrete paving shall be the minimum uniform thickness after compaction of dimensions indicated on Drawings. Where not indicated, minimum thickness after compaction shall be 4 inches.

D. Aggregate drainage fill shall be rolled to form a well-compacted bed.

E. The finished aggregate drainage fill must be observed and approved by ENGEO before proceeding with any subsequent construction over the compacted base or fill.

3.10 SAND CUSHION

A. A sand cushion shall be placed over the vapor retarder membrane under concrete slabs on grade. Sand cushion shall be placed in uniform thickness as indicated on the Drawings. Where not indicated, the thickness shall be 2 inches.

3.11 FINISH GRADING

A. All areas must be finish graded to elevations and grades indicated on the Drawings. In areas to receive topsoil and landscape planting, finish grading shall be performed to a uniform 6 inches below the grades and elevations indicated on the Drawings, and brought to final grade with topsoil.

3.12 DISPOSAL OF WASTE MATERIALS

A. Excess earth materials and debris shall be removed from the site and disposed of in a legal manner. Location of dump site and length of haul are the Contractor's responsibility.

PART II - GEOGRID SOIL REINFORCEMENT

1. DESCRIPTION:

   Work shall consist of furnishing geogrid soil reinforcement for use in construction of reinforced soil slopes and retention systems.

2. GEOGRID MATERIAL:

   2.1 The specific geogrid material shall be preapproved by ENGEO.

   2.2 The geogrid shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock. The geogrid structure shall be dimensionally stable and able to retain its geometry under construction stresses and shall have high resistance to damage during construction, to ultraviolet degradation, and to all forms of chemical and biological degradation encountered in the soil being reinforced.

   2.3 The geogrids shall have an Allowable Strength (T_a) and Pullout Resistance, for the soil type(s) indicated, as listed in Table I.

   2.4 Certifications: The Contractor shall submit a manufacturer's certification that the geogrids supplied meet the respective index criteria set when geogrid was approved by ENGEO, measured in full accordance with all test methods and standards specified. In case of dispute over validity of values, the Contractor will supply test data from an ENGEO-approved laboratory to support the certified values submitted.

3. CONSTRUCTION:

   3.1 Delivery, Storage, and Handling: Contractor shall check the geogrid upon delivery to ensure that the proper material has been received. During all periods of shipment and storage, the geogrid shall be protected from temperatures greater than 140 °F, mud, dirt, dust, and debris. Manufacturer's recommendations in regard to protection from direct sunlight must also be followed. At the time of installation, the geogrid will be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be repaired by placing a patch over the damaged area. Any geogrid damaged during storage or installation shall be replaced by the Contractor at no additional cost to the owner.

3.2 Onsite Representative: Geogrid material suppliers shall provide a qualified and experienced representative on site at the initiation of the project, for a minimum of three days, to assist the Contractor and ENGEO personnel at the start of construction. If there is more than one slope on a project, this criterion will apply to construction of the initial slope only. The representative shall also be available on an as-needed basis, as requested by ENGEO, during construction of the remaining slope(s).

3.3 Geogrid reinforcement may be joined with mechanical connections or overlaps as recommended and approved by the Manufacturer. Joints shall not be placed within 6 feet of the slope face, within 4 feet below top of slope, nor horizontally or vertically adjacent to another joint.

3.4 Geogrid Placement: The geogrid reinforcement shall be installed in accordance with the manufacturer's recommendations. The geogrid reinforcement shall be placed within the layers of the compacted soil as shown on the plans or as directed.

The geogrid reinforcement shall be placed in continuous longitudinal strips in the direction of main reinforcement. However, if the Contractor is unable to complete a required length with a single continuous length of geogrid, a joint may be made with the Manufacturer's approval. Only one joint per length of geogrid shall be allowed. This joint shall be made for the full width of the strip by using a similar material with similar strength. Joints in geogrid reinforcement shall be pulled and held taut during fill placement.

Adjacent strips, in the case of 100 percent coverage in plan view, need not be overlapped. The minimum horizontal coverage is 50 percent, with horizontal spacings between reinforcement no greater than 40 inches. Horizontal coverage of less than 100 percent shall not be allowed unless specifically detailed in the construction drawings.

Adjacent rolls of geogrid reinforcement shall be overlapped or mechanically connected where exposed in a wrap around face system, as applicable.

The Contractor may place only that amount of geogrid reinforcement required for immediately pending work to prevent undue damage. After a layer of geogrid reinforcement has been placed, the next succeeding layer of soil shall be placed and compacted as appropriate. After the specified soil layer has been placed, the next geogrid reinforcement layer shall be installed. The process shall be repeated for each subsequent layer of geogrid reinforcement and soil.

Geogrid reinforcement shall be placed to lay flat and pulled tight prior to backfilling. After a layer of geogrid reinforcement has been placed, suitable means, such as pins or small piles of soil, shall be used to hold the geogrid reinforcement in position until the subsequent soil layer can be placed.

Under no circumstances shall a track-type vehicle be allowed on the geogrid reinforcement before at least six inches of soil have been placed. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and the geogrid reinforcement. If approved by the Manufacturer, rubber-tired equipment may pass over the geosynthetic reinforcement at slow speeds, less than 10 mph. Sudden braking and sharp turning shall be avoided.

During construction, the surface of the fill should be kept approximately horizontal. Geogrid reinforcement shall be placed directly on the compacted horizontal fill surface. Geogrid reinforcements are to be placed within three inches of the design elevations and extend the length as shown on the elevation view unless otherwise directed by ENGEO. Correct orientation of the geogrid reinforcement shall be verified by ENGEO.

Table I
Allowable Geogrid Strength
With Various Soil Types
For Geosynthetic Reinforcement In
Mechanically Stabilized Earth Slopes

(Geogrid Pullout Resistance and Allowable Strengths vary with reinforced backfill used due to soil anchorage and site damage factors. Guidelines are provided below.)

SOIL TYPE	MINIMUM ALLOWABLE STRENGTH, T_a (lb/ft)*		
	GEOGRID Type I	GEOGRID Type II	GEOGRID Type III
A. Gravels, sandy gravels, and gravel-sand-silt mixtures (GW, GP, GC, GM & SP)**	2400	4800	7200
B. Well graded sands, gravelly sands, and sand-silt mixtures (SW & SM)**	2000	4000	6000
C. Silts, very fine sands, clayey sands and clayey silts (SC & ML)**	1000	2000	3000
D. Gravelly clays, sandy clays, silty clays, and lean clays (CL)**	1600	3200	4800

* All partial Factors of Safety for reduction of design strength are included in listed values. Additional factors of safety may be required to further reduce these design strengths based on site conditions.

** Unified Soil Classifications.

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PART III - GEOTEXTILE SOIL REINFORCEMENT

1. DESCRIPTION:

   Work shall consist of furnishing geotextile soil reinforcement for use in construction of reinforced soil slopes.

2. GEOTEXTILE MATERIAL:

   2.1 The specific geotextile material and supplier shall be preapproved by ENGEO.

   2.2 The geotextile shall have a high tensile modulus and shall have high resistance to damage during construction, to ultraviolet degradation, and to all forms of chemical and biological degradation encountered in the soil being reinforced.

   2.3 The geotextiles shall have an Allowable Strength (T_a) and Pullout Resistance, for the soil type(s) indicated as listed in Table II.

   2.4 Certification: The Contractor shall submit a manufacturer's certification that the geotextiles supplied meet the respective index criteria set when geotextile was approved by ENGEO, measured in full accordance with all test methods and standards specified. In case of dispute over validity of values, the Contractor will supply the data from an ENGEO-approved laboratory to support the certified values submitted.

3. CONSTRUCTION:

   3.1 Delivery, Storage and Handling: Contractor shall check the geotextile upon delivery to ensure that the proper material has been received. During all periods of shipment and storage, the geotextile shall be protected from temperatures greater than 140 °F, mud, dirt, dust, and debris. Manufacturer's recommendations in regard to protection from direct sunlight must also be followed. At the time of installation, the geotextile will be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be repaired by placing a patch over the damaged area. Any geotextile damaged during storage or installation shall be replaced by the Contractor at no additional cost to the owner.

   3.2 Onsite Representative: Geotextile material suppliers shall provide a qualified and experienced representative on site at the initiation of the project, for a minimum of three days, to assist the Contractor and ENGEO personnel at the start of construction. If there is more than one slope on a project, this criterion will apply to construction of the initial slope only. The representative shall also be available on an as-needed basis, as requested by ENGEO, during construction of the remaining slope(s).

3.3 Geotextile Placement: The geotextile reinforcement shall be installed in accordance with the manufacturer's recommendations. The geotextile reinforcement shall be placed within the layers of the compacted soil as shown on the plans or as directed.

The geotextile reinforcement shall be placed in continuous longitudinal strips in the direction of main reinforcement. Joints shall not be used with geotextiles.

Adjacent strips, in the case of 100 percent coverage in plan view, need not be overlapped. The minimum horizontal coverage is 50 percent, with horizontal spacings between reinforcement no greater than 40 inches. Horizontal coverage of less than 100 percent shall not be allowed unless specifically detailed in the construction drawings.

Adjacent rolls of geotextile reinforcement shall be overlapped or mechanically connected where exposed in a wrap around face system, as applicable.

The Contractor may place only that amount of geotextile reinforcement required for immediately pending work to prevent undue damage. After a layer of geotextile reinforcement has been placed, the succeeding layer of soil shall be placed and compacted as appropriate. After the specified soil layer has been placed, the next geotextile reinforcement layer shall be installed. The process shall be repeated for each subsequent layer of geotextile reinforcement and soil.

Geosynthetic reinforcement shall be placed to lay flat and be pulled tight prior to backfilling. After a layer of geotextile reinforcement has been placed, suitable means, such as pins or small piles of soil, shall be used to hold the geotextile reinforcement in position until the subsequent soil layer can be placed.

Under no circumstances shall a track-type vehicle be allowed on the geotextile reinforcement before at least six inches of soil has been placed. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and the geotextile reinforcement. If approved by the Manufacturer, rubber-tired equipment may pass over the geotextile reinforcement as slow speeds, less than 10 mph. Sudden braking and sharp turning shall be avoided.

During construction, the surface of the fill should be kept approximately horizontal. Geotextile reinforcement shall be placed directly on the compacted horizontal fill surface. Geotextile reinforcements are to be placed within three inches of the design elevations and extend the length as shown on the elevation view unless otherwise directed by ENGEO. Correct orientation of the geotextile reinforcement shall be verified by ENGEO.

Table II
Allowable Geotextile Strength
With Various Soil Types
For Geosynthetic Reinforcement In
Mechanically Stabilized Earth Slopes

(Geotextile Pullout Resistance and Allowable Strengths vary with reinforced backfill used due to soil anchorage and site damage factors. Guidelines are provided below.)

SOIL TYPE	MINIMUM ALLOWABLE STRENGTH, T_a (lb/ft)*		
	GEOTEXTILE Type I	GEOTEXTILE Type II	GEOTEXTILE Type III
A. Gravels, sandy gravels, and gravel-sand-silt mixtures (GW, GP, GC, GM & SP)**	2400	4800	7200
B. Well graded sands, gravelly sands, and sand-silt mixtures (SW & SM)**	2000	4000	6000
C. Silts, very fine sands, clayey sands and clayey silts (SC & ML)**	1000	2000	3000
D. Gravelly clays, sandy clays, silty clays, and lean clays (CL)**	1600	3200	4800

* All partial Factors of Safety for reduction of design strength are included in listed values. Additional factors of safety may be required to further reduce these design strengths based on site conditions.

** Unified Soil Classifications.

PART IV - EROSION CONTROL MAT OR BLANKET

1. DESCRIPTION:

Work shall consist of furnishing and placing a synthetic erosion control mat and/or degradable erosion control blanket for slope face protection and lining of runoff channels.

2. EROSION CONTROL MATERIALS:

2.1 The specific erosion control material and supplier shall be pre-approved by ENGEO.

2.2 Certification: The Contractor shall submit a manufacturer's certification that the erosion mat/blanket supplied meets the criteria specified when the material was approved by ENGEO. The manufacturer's certification shall include a submittal package of documented test results that confirm the property values. In case of a dispute over validity of values, the Contractor will supply property test data from an ENGEO-approved laboratory, to support the certified values submitted. Minimum average roll values, per ASTM D 4759, shall be used for conformance determinations.

3. CONSTRUCTION:

3.1 Delivery, Storage, and Handling: Contractor shall check the erosion control material upon delivery to ensure that the proper material has been received. During all periods of shipment and storage, the erosion mat shall be protected from temperatures greater than 140 °F, mud, dirt, and debris. Manufacturer's recommendations in regard to protection from direct sunlight must also be followed. At the time of installation, the erosion mat/blanket shall be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be removed by cutting OUT a section of the mat. The remaining ends should be overlapped and secured with ground anchors. Any erosion mat/blanket damaged during storage or installation shall be replaced by the Contractor at no additional cost to the Owner.

3.2 Onsite Representative: Erosion control material suppliers shall provide a qualified and experienced representative on site, for a minimum of one day, to assist the Contractor and ENGEO personnel at the start of construction. If there is more than one slope on a project, this criteria will apply to construction of the initial slope only. The representative shall be available on an as-needed basis, as requested by ENGEO, during construction of the remaining slope(s).

3.3 Placement: The erosion control material shall be placed and anchored on a smooth graded, firm surface approved by the Engineer. Anchoring terminal ends of the erosion control material shall be accomplished through use of key trenches. The material in the trenches shall be anchored to the soil on maximum 1½ foot centers. Topsoil, if required by construction drawings, placed over final grade prior to installation of the erosion control material shall be limited to a depth not exceeding 3 inches.

3.4 Erosion control material shall be anchored, overlapped, and otherwise constructed to ensure performance until vegetation is well established. Anchors shall be as designated on the construction drawings, with a minimum of 12 inches length, and shall be spaced as designated on the construction drawings, with a maximum spacing of 4 feet.

3.5 Soil Filling: If noted on the construction drawings, the erosion control mat shall be filled with a fine grained topsoil, as recommended by the manufacturer. Soil shall be lightly raked or brushed on/into the mat to fill the mat voids or to a maximum depth of 1 inch.

PART V - GEOSYNTHETIC DRAINAGE COMPOSITE

1. DESCRIPTION:

   Work shall consist of furnishing and placing a geosynthetic drainage system as a subsurface drainage medium for reinforced soil slopes.

2. DRAINAGE COMPOSITE MATERIALS:

   2.1 The specific drainage composite material and supplier shall be preapproved by ENGEO.

   2.2 The drain shall be of composite construction consisting of a supporting structure or drainage core material surrounded by a geotextile. The geotextile shall encapsulate the drainage core and prevent random soil intrusion into the drainage structure. The drainage core material shall consist of a three dimensional polymeric material with a structure that permits flow along the core laterally. The core structure shall also be constructed to permit flow regardless of the water inlet surface. The drainage core shall provide support to the geotextile. The fabric shall meet the minimum property requirements for filter fabric listed in Section 2.05C of the Guide Earthwork Specifications.

   2.3 A geotextile flap shall be provided along all drainage core edges. This flap shall be of sufficient width for sealing the geotextile to the adjacent drainage structure edge to prevent soil intrusion into the structure during and after installation. The geotextile shall cover the full length of the core.

   2.4 The geocomposite core shall be furnished with an approved method of constructing and connecting with outlet pipes or weepholes as shown on the plans. Any fittings shall allow entry of water from the core but prevent intrusion of backfill material into the core material.

   2.5 Certification and Acceptance: The Contractor shall submit a manufacturer's certification that the geosynthetic drainage composite meets the design properties and respective index criteria measured in full accordance with all test methods and standards specified. The manufacturer's certification shall include a submittal package of documented test results that confirm the design values. In case of dispute over validity of design values, the Contractor will supply design property test data from an ENGEO-approved laboratory, to support the certified values submitted. Minimum average roll values, per ASTM D 4759, shall be used for determining conformance.

3. CONSTRUCTION:

   3.1 Delivery, Storage, and Handling: Contractor shall check the geosynthetic drainage composite upon delivery to ensure that the proper material has been received. During all periods of shipment and storage, the geosynthetic drainage composite shall be protected from temperatures greater than 140 °F, mud, dirt, and debris. Manufacturer's recommendations in regards to protection from direct sunlight must also be followed. At the time of installation, the geosynthetic drainage composite shall be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be removed or repaired. Any geosynthetic drainage composite damaged during storage or installation shall be replaced by the Contractor at no additional cost to the Owner.

3.2 Onsite Representative: Geosynthetic drainage composite material suppliers shall provide a qualified and experienced representative on site, for a minimum of one half day, to assist the Contractor and ENGEO personnel at the start of construction with directions on the use of drainage composite. If there is more than one application on a project, this criterion will apply to construction of the initial application only. The representative shall also be available on an as-needed basis, as requested by ENGEO, during construction of the remaining applications.

3.3 Placement: The soil surface against which the geosynthetic drainage composite is to be placed shall be free of debris and inordinate irregularities that will prevent intimate contact between the soil surface and the drain.

3.4 Seams: Edge seams shall be formed by utilizing the flap of the geotextile extending from the geocomposite's edge and lapping over the top of the fabric of the adjacent course. The fabric flap shall be securely fastened to the adjacent fabric by means of plastic tape or non-water-soluble construction adhesive, as recommended by the supplier. Where vertical splices are necessary at the end of a geocomposite roll or panel, an 8-inch-wide continuous strip of geotextile may be placed, centering over the seam and continuously fastened on both sides with plastic tape or non-water-soluble construction adhesive. As an alternative, rolls of geocomposite drain material may be joined together by turning back the fabric at the roll edges and interlocking the cuspidations approximately 2 inches. For overlapping in this manner, the fabric shall be lapped and tightly taped beyond the seam with tape or adhesive. Interlocking of the core shall always be made with the upstream edge on top in the direction of water flow. To prevent soil intrusion, all exposed edges of the geocomposite drainage core edge must be covered. Alternatively, a 12-inch-wide strip of fabric may be utilized in the same manner, fastening it to the exposed fabric 8 inches in from the edge and folding the remaining flap over the core edge.

3.5 Soil Fill Placement: Structural backfill shall be placed immediately over the geocomposite drain. Care shall be taken during the backfill operation not to damage the geotextile surface of the drain. Care shall also be taken to avoid excessive settlement of the backfill material. The geocomposite drain, once installed, shall not be exposed for more than seven days prior to backfilling.

GEOTECHNICAL/GEOLOGIC FEASIBILITY ASSESSMENT

SAN JUAN OAKS – DEL WEBB RESIDENTIAL DEVELOPMENT
SAN BENITO COUNTY, CALIFORNIA

Submitted to:
Mr. Tim Fisher
San Juan Oaks, LLC
c/o Pulte Home Corporation
210 Stoneridge Mall Road, 5th Floor
Pleasanton, California 94588

Prepared by:
ENGEO Incorporated

March 7, 2013

Project No:
9901.000.000

Project No.
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March 7, 2013

Mr. Tim Fisher
San Juan Oaks LLC
c/o Pulte Homes Corporation
210 Stoneridge Mall Road, 5th Floor
Pleasanton, California 94588

Subject: San Juan Oaks – Del Webb Residential Development
San Benito County, California

GEOTECHNICAL/GEOLOGIC FEASIBILITY ASSESSMENT

Dear Mr. Fisher:

With your authorization, we completed this preliminary geotechnical/geologic feasibility report for the proposed San Juan Oaks retirement community project located in San Benito County, California. The accompanying preliminary report presents our field exploration and limited laboratory testing together with our conclusions and preliminary recommendations regarding residential development at the site.

We also concurrently conducted a modified Phase I environmental assessment at the project site, which was presented under separate cover.

Our findings indicate that the project site is suitable for the proposed development provided the preliminary recommendations and guidelines provided in this report are implemented during project planning. Additional design-level exploration services will be required prior to final grading plan preparation in order to present grading, drainage, and foundation design recommendations. We are pleased to have been of service to you on this project and are prepared to consult further with you and your design team as the project progresses.

Sincerely

ENGEO Incorporated

Jeanine Ruffoni, EIT

Raymond P. Skinner CEG

Julia A. Moriarty, GE

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EXECUTIVE SUMMARY

As part of a due diligence effort, ENGEO performed a preliminary geotechnical/geologic feasibility report for the proposed San Juan Oaks retirement community project. The study focused on assessing primary geologic/geotechnical hazards such as faulting, liquefaction, landsliding, shallow groundwater, and load-induced clay settlements.

The findings of this preliminary study and potential geotechnical/geologic hazards, which are described in further detail in subsequent sections of this report are summarized as follows:.

- Evidence of faulting was not observed in the fault trench across the mapped Nutting fault.
- Strong ground shaking is expected due to the nearby San Andreas fault.
- Potentially liquefiable soils and liquefaction-induced settlement is expected but within ranges tolerable for post-tensioned mat foundations.
- Near-surface expansive soils are anticipated but do not pose a significant impact to development.
- Shallow landsliding is present along the foothills and will require remedial grading/buttressing if encroached upon or if development is not set back adequately from the landslide areas.

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this geotechnical/geologic feasibility assessment is to identify geologic hazards within the project site and provide planning level recommendations for the proposed retirement community residential development. This assessment included the following scope of services:

- Published geologic maps and literature pertinent to the site were reviewed.
- A geologic reconnaissance performed by an ENGEO geologist.
- Aerial photographs were examined to identify geomorphic features that may be related to faulting, landsliding and other geologic conditions.
- Advancing 11 cone penetration tests (1-CPT01 through 1-CPT11) to characterize the site soils and provide preliminary assessment of liquefaction susceptibility.
- Excavation and logging of eight exploratory test pits (TP-1 through TP-8) to characterize existing fill, soil, and bedrock conditions across the study area.
- Excavation and logging of one exploratory trench (T-1) to evaluate a previously mapped trace of the Nutting fault crossing the site.
- Preparation of this preliminary geotechnical/geologic feasibility assessment summarizing our findings, conclusions and development of preliminary recommendations to assist in site planning.

We prepared this report exclusively for San Juan Oaks LLC, c/o Pulte Home Corporation and their design team consultants. ENGEO should review any changes made in the character, design or layout of the development to modify the conclusions and recommendations contained in this report, as necessary. This document may not be reproduced in whole or in part by any means whatsoever, nor may it be quoted or excerpted without the express written consent of ENGEO.

1.2 SITE LOCATION AND DESCRIPTION

The roughly 310-acre study site is located west of San Juan Oaks Golf Course (3825 Union Road) approximately 1 mile south of San Juan Road (Highway 156) in San Benito County, California (Figures 1 and 2). The study site is part of the larger San Juan Oaks Golf Course property. The study site (site) is bounded by agricultural land to the west and north, San Juan Oaks Golf Course to the east, and undeveloped hillsides to the south. A small drainage channel is located along the northern boundary of the site typically an estimated 5 feet deep with vegetated side slopes at approximately 2½:1 (horizontal:vertical) or flatter.

The site generally consists of undeveloped grazing land with sparsely spaced mature trees. Existing site improvements comprising a cattle corral located along the central northern boundary and a protected wetlands area situated in the northwestern corner.

Based on a review of a topographic map of the site, prepared by Whitson Engineers and dated October 12, 2012, the site consists of foothills along the southern boundary while the central and northern site areas consist of relatively flat ground extending from the southern foothills towards the north. The highest topographic area on the site is the southwestern foothill at approximately 370 feet above mean sea level (msl) while the site typically slopes towards the north/northwest to the lowest topographic area in the northwestern corner of the site at approximately 220 feet above msl. A seasonal drainage channel extends from the southeastern corner of the site and trends north across the site in which it bisects a second drainage channel.

In addition, two small swales trend north onto the site along the eastern and western sides of the southwestern foothill. The observed seasonal drainage channels were dry at the time of our site reconnaissance.

During our site reconnaissance, we also observed two water wells in the northern portion of the site. Based on the findings of our concurrent environmental study, the water wells are identified by the San Benito County Water District (SBCWD) as SBCWD #1652 and SBCWD #1746. Well #1652 was supported on a concrete slab and a mound of vegetated soil material was located in the vicinity of the pump. The SBCWD indicated that well #1652 had a 16-inch casing and #1746 was a District Blue Valve. Two storm drain manholes and a single concrete pad were also observed in the northeastern portion of the site, as well as an enclosed concrete-block trash enclosure structure located near the northern site boundary.

1.3 PROPOSED DEVELOPMENT

Based on discussions with you, and the conceptual site plan prepared by MacKay & Somps Civil Engineers, dated January 8, 2013, we understand the development will comprise roughly 1,000 single-family homes, an approximately 25,000 square foot clubhouse with indoor and outdoor pools, sport courts, two approximately 2-acre landscaped parks, and four open-space parks.

We understand the homes and clubhouse will be single-story and we anticipate wood-framed construction with light building loads. Figure 3 shows the currently proposed development plan superimposed on the site geology map.

The proposed development is in the early planning stage at this time. Design-level studies will need to be conducted as planning progresses.

1.4 CONCURRENT ENVIRONMENTAL STUDY

We conducted a concurrent modified phase one environmental site assessment. The study included limited (baseline) near-surface soil sampling and testing due to the historic and current uses of the northern and western neighboring properties for agricultural cultivation to assess potential pesticide spray drift. The analytical results of the sampling reported non-detectable concentrations of organochlorine pesticides. The reported concentrations of arsenic along the western and northern border are generally consistent with the site background samples collected along the southern hillside and are also consistent with typical background levels for the State of California.

Given the findings of this assessment, no Recognized Environmental Conditions (RECs) and no historical RECs were identified for the Property.

1.5 SITE HISTORY AND PREVIOUS EXPLORATION

We reviewed both historical topographic maps and aerial photographs of the site dated 1939, 1949, 1953, 1960, 1971, 1981, 1987, 1998, 2005, and 2006 provided by Environmental Data Resources (EDR). Review of the photographs indicates the site has remained undeveloped land, primarily utilized for cattle grazing, since at least 1939.

In 2000, Earth Systems Consultants provided a Regional Geologic Study for the San Juan Oaks Golf Course Expansion. The study area encompassed the San Juan Oaks property and included our current study area. The report provided a review of geologic hazards and preliminary recommendations for Vesting Tentative Map process. The report has been reviewed and pertinent information incorporated as deemed necessary as part of our current study.

2.0 GEOLOGY AND SEISMICITY

2.1 SITE SOILS AND GEOLOGY

The roughly 310-acre study site is located in the Coast Range geomorphic province in the San Juan Valley, on the south end of the Santa Clara Valley with the Gabilan Range situated to the west. The property is predominantly located in an alluvial valley with the southern portion of the site located on the foothills of a northwest trending ridge situated east of the San Andreas Rift Zone.

As depicted on Figure 4, regional geologic mapping by Wagner (2002) maps the site as underlain by Pliocene unnamed continental mudstone in the foothills and Holocene alluvium in the low lying portion of the site. Dibblee (2006) describes bedrock units at the site as weakly lithified terrestrial valley and lacustrine deposits, predominantly mudstone with fine grained sandy layers. Regional bedrock orientation is generally shown as striking northwest and dipping approximately 50 degrees southwest.

Regional landslide mapping by Majmundar (1994) depicts several small earthflows and debris flows in the foothills on the southern portion of the site.

Site specific geologic and landslide mapping based on aerial photo review, field exploration and site reconnaissance mapping is depicted on Figure 3. A brief discussion of the geologic units and mapped locations follows:

- *Colluvial Deposits* (Qc) were mapped as overlying bedrock on slopes in the southern portion of the property. Typically, colluvium encountered during our exploration consists of stiff clays and sandy clays and generally have gradational contacts with the underlying bedrock.

- *Alluvial Deposits* (Qa) were mapped as underlying the majority of the northern portion of the property, typically in low lying areas. Typically, the alluvial deposits encountered at the site consist of interlayered stiff clays and dense sands.

- *Unnamed Pliocene Bedrock (Puc)* were mapped in the foothills on the southern portion of the site. Bedrock encountered during our exploration generally consists of weak interbedded sandstone, shale and claystone. Bedding attitudes were measured striking 42 to 60 degrees northwest and dipping relatively steeply southwest 30 to 61 degrees.

- *Landslide Deposits (Qls)* were identified in the foothills on the southern portion of the property and generally consist of silty clay materials. The landslides encountered are generally relatively shallow slumps for earthflow type slides.

2.2 FAULTING AND SITE SEISMICITY

2.2.1 Fault Mapping

The San Andreas rift zone is located southwest of the project site and represents the structural divide between Pliocene terrestrial bedrock on the northeast and Salinian block granitics to the southwest. Regional mapping at the site by Majmundar (1994), Wagner (2002) and Rogers (1993) show two northwest trending, concealed faults crossing the project site, the Morse fault in the northeast portion of the site and the Nutting fault crossing the southern portion of the site. The Morse is queried crossing the site, indicating that the existence of the fault is doubtful. Earth Systems Consultants previously described both faults as high-angle reverse with the down dropped block on the northeast. Additionally, the Nutting and Morse faults are described as offsetting Quaternary sediments but not Holocene in the area.

The USGS Quaternary Fold and Fault Database (QFFD) is a nationwide GIS-based database that identifies fault locations and classifies faults based on estimated age. In California, the QFFD is jointly maintained by the USGS and the California Geological Survey (CGS). The QFFD does not recognize the Nutting and Morse faults as Quaternary active. In conjunction with this preliminary study, an exploratory trench was excavated across the mapped trace of the Nutting fault as described in subsequent sections of this report.

2.2.2 Site Seismicity

The site is not located within a State of California Earthquake Fault Zone (1982), and no known active faults cross the site. The nearest known active[1] fault surface trace is the San Andreas fault mapped about 2,000 feet southwest of the as shown on Figure 5. Other nearby active faults include the Sargent fault mapped about 3.2 miles north of the site; the Calaveras fault mapped about 3.5 miles northeast of the site; and the Hayward Fault mapped approximately 33 miles northwest of the site.

Because of the presence of nearby active faults including the San Andreas Fault Zone, the region is considered seismically active. Numerous small earthquakes occur every year in the region, and large (>M7) earthquakes have been recorded and can be expected to occur in the future. Figure 5 shows the approximate locations of these faults and significant historic earthquakes recorded within the Greater Bay Area Region.

The Uniform California Earthquake Rupture Forecast (UCERF, 2008) evaluated the 30-year probability of a M6.7 or greater earthquake occurring on the known active fault systems in the Bay Area, including the San Andreas fault. The UCERF generated an overall probability of 63 percent for the Bay Area as a whole, and a probability of 59 percent for the south San Andreas fault, and 31 percent for the Hayward-Rodgers Creek fault, and 7 percent for the Calaveras fault.

3.0 FIELD EXPLORATION

The field exploration for this study was conducted on February 6 and 7, 2013, and consisted of advancing 11 CPTs and excavating eight exploratory test pits and one exploratory trench at the approximate locations shown on Figures 2 and 3. The field exploration locations were obtained by taping or pacing from existing features; therefore, they should be considered accurately located only to the degree implied by the method used.

3.1 CONE PENETRATION TEST PROBES

The cone penetration test (CPT) probes were advanced to depths of approximately 28 to 50 feet below ground surface (bgs) before meeting practical refusal (high tip resistance) or target depth.

The CPT equipment used was equipped with a 20-ton compression-type cone with a 15-square-centimeter (cm^2) base area, an apex angle of 60 degrees, and a friction sleeve with a surface area of 225 cm^2. The cone, connected with a series of rods, is pushed into the ground at a constant rate. Cone readings are taken at approximately 5-cm intervals with a penetration rate of 2 cm per second in accordance with revised (2002) ASTM standards (D-5778-95).

[1] An active fault is defined by the State Mining and Geology Board as one that has had surface displacement within Holocene time (about the last 11,000 years). The State of California has prepared maps designating zones for special studies that contain these active earthquake faults.

Measurements include the tip resistance to penetration of the cone (Qc), the resistance of the surface sleeve (Fs), and dynamic pore pressure (U). The CPT logs and supporting empirical data are located in Appendix C.

A water level indicator instrument was used upon removal of the probes to record groundwater levels, if encountered. The CPT holes were backfilled with cement-bentonite grout. With exception to four near-surface samples collected at select CPT locations, no soil samples were collected as part of this study due to the exploration method implemented.

3.2 TEST PITS AND TRENCHING

The exploratory trench and eight test pits were excavated to observe and provide additional assessment of the geologic conditions and possible faulting at the study site. The excavations were made using a track-mounted excavator equipped with a 30-inch-wide bucket. The exploratory trench extended approximately 170 feet long and had an average depth of 9 to 11 feet. The exploratory test pits (TP-1 through TP-8) were excavated to depths of up to 12 feet below grades.

An ENGEO Geologist logged the test pits and trench. The field logs for the test pits and trench were used to develop the report logs, which are located in Appendix A and exploratory trench log, Figure 6. The logs depict subsurface conditions within the pits for the date of site activities; however, subsurface conditions may vary with time.

Once completed, the test pits and trench were backfilled following field exploration activities using nominal compactive effort by the excavator bucket and trackwalking the surface. Depending on future grading activities in these areas, it should be anticipated that the test pit/trench spoils will need to be removed and replaced as engineered fill.

3.3 FAULT EXPLORATION

As discussed in previous sections, regional mapping at the site by Majmundar (1994), Wagner (2002) and Rogers (1993) show two northwest trending concealed faults crossing the project site, the Morse fault in the northeast portion of the site and the Nutting fault crossing the southern portion of the site. The Morse is queried crossing the site indicating that the existence of the fault is doubtful.

The Nutting fault is depicted as trending parallel with the mapped bedrock and alluvium contact at the front of the foothills on the southern portion of the property. Based on review of regional mapping and aerial photographs an exploratory trench location was selected.

An exploratory trench (T-1), totaling approximately 170 lineal feet, was excavated crossing relatively perpendicular to the Nutting Fault at the location shown on Figures 2 and 3. The trench was located in the field by tape measuring from existing features and hand held GPS. The log of the trench is included, Figure 6. The location of the trench was established at the base of an alluvial fan and crossing a distinct break in slope from the foothills to the south and the alluvial valley deposits to the north in order to increase the likely hood of encountering thicker deposits of soil that could demonstrate the presence or absence of Holocene faulting.

The depth of the trench averaged 9 to 11 feet below the adjacent ground surface. The southeast wall of the trench was cleaned with hand tools and examined by ENGEO geologists. The exposure was logged at a horizontal and vertical scale of 1 inch to 5 feet. A level line was established in the trench and measurements were referenced to this line.

Based on logging of the trench, soil stratigraphy encountered is believed to represent at least 10,000 years. Continuous across the length of the trench, units 1 and 2 represent relatively young modern A-horizon soil deposits with very dark gray and black clay and some blocky soil structure. Unit 3 represents a Bk-horizon with well developed blocky soil structure, clay film development on gravels and abundant calcium carbonate as masses, filaments and lining ped surfaces within the entire length of the unit observed. Unit 3 is believed to represent up to 7,000 years and was continuous across the entire length of the trench. Unit 10 was encountered near Station 0+56 displaying well developed medium angular blocky structure, thick clay films on gravel surfaces, translocated clay lined tubular pores and is believed to be a buried paleosol, representing a past soil development that currently does not exist at the site. Based on the approximate location of the current surface drainage crossing the trench location and observed localized channel deposits from Station 0+00 to 0+56, the absence of unit 10 prior to Station 0+56 may be the result of erosional processes, and the deposition of younger soils represented in units 7, 8 and 9. Although units 4 and 6 were not continuous across the length of the trench, no offset or shearing was observed, and discontinuity within the units is most likely due to erosional and depositional processes. Gravel sized rock fragments encountered within the alluvium were observed to be consistent with the upslope bedrock formation. Bedrock was not encountered within the trench.

No evidence of faulting was observed in Trench T-1. Slope break features or lineaments observed in air photos are most likely the result of an ephemeral drainage crossing the trench location as well as erosion from livestock grazing. As described above, unit 3 (Bk) was exposed in the trench laterally continuous and undisturbed. In addition, unit 5 underlying unit 3, was laterally continuous with the exception of a portion of trench from Station 0+95 to 1+22 where unit 3 overlies unit 10 directly. It is therefore, our opinion, that the Nutting fault mapped by others does not require land planning setbacks or design constraints.

3.4 LABORATORY TESTING

We performed the following laboratory tests on select near-surface samples recovered during our field exploration activities:

TABLE 3.4-1

Soil Characteristic	Testing Method	Location of Results
Atterberg Limits	ASTM D-4318	Appendix B
Grain Size Distribution	ASTM D-422	Appendix B

The individual test results are presented in Appendix B.

3.5 SUBSURFACE CONDITIONS

Figures 2 and 3 shows exploration locations and depth to bedrock as applicable and the exploration logs are presented in Appendix A and Figure 6. The logs describe the soil type, color, consistency, and visual classification in general accordance with the Unified Soil Classification System (USCS) of the subsurface conditions encountered at the time of the exploration.

Four near-surface samples were recovered from CPT locations 1-CPT01, 1-CPT04, 1-CPT06, and 1-CPT10 and tested for Plasticity Index (PI). The testing yielded PI values ranging from 19 to 33. This is an indication that the near-surface alluvial soils tested have moderate to high expansion potential. The colluvium and landslide debris may contain a higher PI and will be sampled/tested during design-level study if these mapped areas are located within the limits of grading.

Alluvium

In general, within the proposed development area, the valley floor subsurface soils encountered in the trench and CPTs predominantly consist of interlayered silty clay, sandy clay, silty sand and clayey silts. Based on empirical correlations of the CPT data, the subsurface conditions generally consist of very stiff to hard clay with lenses of soft to stiff silty clay and sandy silt. In addition, dense silty sand and very stiff to hard sandy silt interbeds ranging in thickness from 6 inches up to 2 feet are identified in 1-CPT06 and 1-CPT07 (generally the central and eastern-central areas of the site) from approximately 11 up to 29 ½ feet below the ground surface.

Trench T-1 encountered similar interlayered alluvial deposits to the depth explored.

Landslide Debris

As described in Appendix A and shown on Figures 2 and 3, several test pits (TP-1, TP-4, TP-6 and TP-8) were excavated within mapped colluvial and landslide areas. The general subsurface conditions encountered are described below.

Test Pits TP-1, TP-4 and TP-6 encountered landslide deposits approximately 4 feet thick consisting of silty clay, with a discrete polished shear plane observed at 4 feet in TP-1. In addition, Test Pit TP-8 encountered landslide deposits approximately 8 feet thick consisting of silty and sandy clay, with a discrete polished shear plane observed at 8 feet trending 5 degrees northeast and dipping 21 degrees east.

Colluvium

Test Pits TP-3 and TP-5 were excavated in colluvial filled swales containing approximately 6 feet (TP-5) and 10½ feet (TP-3) of medium stiff to very stiff silty clay, sandy clay and clayey sand overlying bedrock.

Residual Soils and Bedrock

Bedrock encountered in TP-1, TP-3 and TP-4 consists of weak, thinly interbedded sandstone and shale. In Test Pits TP-2 and TP-7, bedrock is weak, thinly bedded claystone, while in TP-5, TP-6 and TP-8 bedrock is weak, thickly bedded claystone.

3.6 GROUNDWATER

We provide the following information regarding depth to groundwater at the site and within the site vicinity.

- Groundwater was encountered at depths ranging from 20 to 32 feet bgs in probes 1-CPT01, 1-CPT02, and 1-CPT10 (generally northeastern and southeastern areas of the site).
- Well Number USGS3220665 situated at elevation 220.20 (NGVD 1929) is mapped approximately ¼-mile north of the site. Groundwater level measurements ranging from 31.0 and 69.5 feet bgs are recorded between 1949 and 1988.

Fluctuations in groundwater levels occur seasonally and over a period of years because of variations in precipitation, temperature, irrigation, or other factors. A design groundwater level of 20 feet below the existing ground surface has been selected for analysis purposes.

4.0 DISCUSSION

From a geologic and geotechnical standpoint, the study area is generally suitable for the proposed residential development. The preliminary recommendations in this report should be considered in the initial planning for the study area. Design-level explorations will be required to develop recommendations for site grading and foundations.

Potential geologic hazards in the study area include potentially liquefiable soils, expansive near-surface soils, seismic shaking, and landsliding. These potential hazards and other geotechnical issues relevant to the study area are discussed below.

4.1 SEISMIC HAZARDS

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, ground lurching, soil liquefaction, lateral spreading and landsliding. The following sections present a discussion of these hazards as they apply to the site.

Based on topographic and lithologic data, risk from earthquake-induced regional subsidence/uplift, tsunamis and seiches is considered low to negligible at the site.

4.1.1 Ground Rupture

The site is not located within a State of California Earthquake Fault Hazard Zone and no known active faults cross the site. As discussed in previous sections, two concealed faults are mapped crossing the project site; however based on our exploratory trench and document review, we have concluded that the risk of surface fault rupture within the planned residential development is low to unlikely.

4.1.2 Ground Shaking

An earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the site, similar to that which has occurred in the past. To mitigate the shaking effects, all structures should be designed using sound engineering judgment and the latest California Building Code (CBC) requirements, as a minimum.

Seismic design provisions of current building codes generally prescribe minimum lateral forces, applied statically to the structure, combined with the gravity forces of dead-and-live loads. The code-prescribed lateral forces are generally considered to be substantially smaller than the comparable forces that would be associated with a major earthquake. Therefore, structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse but with some structural as well as nonstructural damage. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake; however, it is reasonable to expect that a well-designed and well-constructed structure will not collapse or cause loss of life in a major earthquake (SEAOC, 1996).

4.1.3 Ground Lurching

Ground lurching is a result of the rolling motion imparted to the ground surface during energy released by an earthquake. Such rolling motion can cause ground cracks to form in weaker soils. The potential for the formation of these cracks is considered greater at contacts between deep alluvium and bedrock. Such an occurrence is possible at the site as in other locations in the

Bay Area, but based on the site location, it is our opinion that the offset is expected to be minor. Recommendations for site preparation and grading will be provided that are intended to reduce the potential for lurch cracking.

4.1.4 Liquefaction

Liquefaction is a phenomenon in which saturated, loose or medium dense, cohesionless soils are subject to a temporary, but essentially total, loss of shear strength because of pore pressure build-up under the reversing cyclic shear stresses associated with earthquakes. Historically, standard geotechnical engineering practices for liquefaction assessment have determined that layers of loose to medium dense and saturated sandy deposits as being potentially liquefiable. However, empirical evidence from recent major earthquakes and published research projects at major universities indicate that some fine-grained soils (including low plasticity silts and clays) can also liquefy.

Preliminary liquefaction analyses were performed on the CPT probes using the computer program CLiq. We assumed a groundwater level of 20 feet below the existing ground surface, a PGA of 0.57g, and an earthquake magnitude (Mw) of 7.9. Our analyses were based on guidelines provided in DMG Special Publication 117A (2008) and methods developed by Youd et al. (2001) (NCEER 1998) and Moss et al. (2006).

Liquefaction assessments for the CPT probes identified potentially liquefiable clay and silty clay deposits within the probes. These potentially liquefiable layers ranged from roughly 6 inches up to 2 feet in thickness below depths of 20 feet bgs.

The above liquefaction analysis considers some clay and silty clay layers to be potentially liquefiable. The liquefaction risk of these fine-grained soils may change depending on their plasticity, therefore, to completely evaluate liquefaction potential of the fine-grained soils, we recommend collection and testing of samples of the clay and silt material below the design groundwater level as part of our design-level study. Testing would include moisture content, plasticity index, and gradation and results would be compared to criterion published by Bray and Sancio (2006) and Seed (2003) to evaluate the liquefaction susceptibility of these fine-grained soils.

Potentially liquefiable soils are commonly susceptible to earthquake-induced ground settlement and surface rupture (sand boils) as discussed in the following sections.

4.1.4.1 Liquefaction-Induced Ground Settlement

Based on the preliminary liquefaction analysis described above, we estimate up to approximately 1½ inches of total (¾-inch differential) liquefaction-induced settlement may occur based on existing conditions.

Liquefaction-induced ground settlement should be reassessed during future design-level study to refine our preliminary estimates. Preliminary recommendations to address this concern are provided in subsequent sections.

4.1.4.2 Liquefaction-Induced Surface Rupture

In addition to the above liquefaction analysis, we also evaluated the capping effect of overlying non-liquefiable soils. In order for liquefaction-induced ground failure to occur, the pore water pressure generated within the liquefied strata must exert a force sufficient to break through the overlying soil and vent to the surface resulting in sand boils or fissures.

In 1985, Ishihara presented preliminary empirical criteria to assess the potential for ground surface disruption at liquefiable sites based on the relationship between thickness of liquefiable sediments and thickness of overlying non-liquefiable soil. A more recent study by Youd and Garris (1995) expanded on the work of Ishihara to include data from over 300 exploratory borings, 15 different earthquakes, and several ranges of recorded peak ground acceleration.

Based on our preliminary review, the project site currently has a thick non-liquefiable soil cap and the risk of liquefaction induced surface rupture is considered low. However, if finished site grades are lowered, the risk of liquefaction-induced surface rupture increases and should be reevaluated in the design-level study when finished site grades are further refined.

4.1.5 Lateral Spreading

Lateral spreading is a failure within a nearly horizontal soil zone (possibly due to liquefaction) that causes the overlying soil mass to move toward a free face or down a gentle slope. Generally, effects of lateral spreading are most significant at the free face or the crest of a slope and diminish with distance from the slope.

Based on our site reconnaissance, the project site is relatively flat and no significant free face is present within or around the project site. It is our opinion that the potential for lateral spreading is low.

4.1.6 Seismically-Induced Landsliding

Common to the greater San Francisco Bay area, the risk of instability is greater during major earthquakes than during other time periods. The majority of the site, planned for development is relatively flat and is not subject to seismically induced landsliding. There are mapped landslides within the foothills on the southern portion of the site; however, based on our field exploration the landslides observed are relatively shallow slumps or earthflows and the impact to development can be minimized through avoidance (setback) or corrective grading. Mitigation of onsite landsliding should be reviewed and addressed during design level exploration based on planned site development.

4.2 EXPANSIVE SOILS

Near-surface soil samples tested indicate moderate to high expansion potential (PIs of 19 to 33). Expansive soils shrink and swell as a result of moisture changes. This can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Structures can be adequately supported on structural reinforced mat foundations that are designed to accommodate shrinking and swelling subgrade soils.

Successful on expansive soils requires special attention during grading. It is imperative to keep exposed soils moist by occasional sprinkling. If the soils dry, it is extremely difficult to remoisturize the soils (because of their clayey nature) without excavation, moisture conditioning, and recompaction.

Conventional grading operations, incorporating fill placement specifications tailored to the expansive characteristics of the soil, and use of a mat foundation (either post-tensioned or conventionally reinforced) are common, generally cost-effective measures to address the expansive potential of the foundation soils. Based upon our initial findings, the effects of expansive soils are expected to pose a low impact when mitigated.

4.3 EXISTING FILLS

Considering the site has been predominantly undeveloped land since at least 1939 and evidence of existing fills was not readily apparent in the preliminary field study, we do not anticipate the presence of extensive existing fills across the site. However, during our site reconnaissance, we observed two water wells, one of which supported on a concrete slab and a single concrete pad and two storm drain manholes located in the northeastern portion of the site. Existing fills may be associated with the above-mentioned site improvements or in other isolated areas. In addition, based on a questionnaire provided by the key site manager as part of our environmental studies (presented under separate cover), we learned that approximately 16 cubic yards of asphalt shavings from a local road-works job was brought onto the site to support a short dirt access road.

Existing fills not documented as engineered could undergo vertical movement that is not easily characterized and could ultimately be inadequate to effectively support the proposed building loads. Where documentation on placement of fill is not available, the fill materials should be considered undocumented and removed during grading activities and replaced as engineered soil fill.

The extent and quality of existing fills should be evaluated at the time of design-level study and mitigated during grading activities.

4.1 LOAD-INDUCED SETTLEMENT

Based on review of CPT logs, the clayey deposits encountered were identified as stiff to hard, with the exception of thin layers of soft to stiff silty clay and sandy silt encountered at depths of 20 feet or below.

We do not anticipate load-induced settlements will exceed more than 1 inch; however, this should be evaluated during design-level studies based on actual loading conditions due to anticipated fill depths and structure loads.

4.2 LANDSLIDES

As described above, there are mapped landslides within the foothills on the southern portion of the site; however, based on our field exploration the landslides observed are relatively shallow slumps or earthflows and the impact to development can be minimized through avoidance (setback) or corrective grading. Mitigation of onsite landsliding should be reviewed and addressed during design level exploration based on planned site development.

4.3 DIFFERENTIAL FILL THICKNESS

Depending upon the depths of excavations during grading, a differential fill condition may arise that could adversely impact the performance of the residential foundations. Preliminary recommendations to address this potential condition are presented in a subsequent section.

4.4 FLOODING/INUNDATION HAZARDS

San Justo Reservoir is located approximately 1.2 miles east of the site. According to the Flood Insurance Rate Mapping published by the Federal Emergency Management Agency (FEMA), the site is designated as Zone X. FEMA defines this area as "areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood."

The project Civil Engineer should assess if the site is located above or below the 100-year flood elevation.

4.5 2010 CALIFORNIA BUILDING CODE SEISMIC PARAMETERS

Based on the CPT empirical correlations and local seismic sources, the following 2010 California Building Code (CBC) seismic design parameters have been developed. These parameters will be reviewed and may be revised as part of the design-level exploration.

TABLE 4.5-1
2010 CBC Seismic Parameters

Coefficient	Value
Mapped MCE Spectral Response Acceleration at Short Periods, S_S	2.16
Mapped MCE Spectral Response Acceleration at a Period of 1 second, S_1	1.22
Site Class	D
Long-period Transition Period, T_L	12 sec
MCE, 5% Damped, Spectral Response Acceleration at Short Periods Adjusted for Site Class Effects, S_{MS}	2.16
MCE, 5% Damped, Spectral Response Acceleration at a Period of 1 second Adjusted for Site Class Effects, S_{M1}	1.82
Design, 5% Damped, Spectral Response Acceleration at Short Periods, S_{DS}	1.44
Design, 5% Damped, Spectral Response Acceleration at a Period of 1 second, S_{D1}	1.22

Latitude = 36.8229; Longitude = -121.4793

4.6 CORROSION POTENTIAL

Sampling and testing for corrosion potential on foundation concrete and buried metal was not included in this preliminary study. Baseline sampling/testing is recommended during our design-level study to determine the corrosion potential. A corrosion specialist should then be consulted.

5.0 CONCLUSIONS

Based upon this preliminary study, it is our opinion that the project site is suitable for the proposed development. Based on this preliminary geotechnical exploration, the significant potential geotechnical issues for the site are:

- Strong ground shaking
- Potentially liquefiable soils and liquefaction-induced settlement
- Presence of expansive soils
- Landsliding

A design-level geotechnical exploration should be performed as part of the design process, which would include borings, test pits, and laboratory soil testing as needed to provide data for preparation of specific recommendations regarding site grading, remedial grading measures, foundations, and drainage for the proposed residential development. The exploration will also allow for more detailed evaluations of the above-described geotechnical issues and afford the opportunity to provide techniques and procedures to be implemented during construction to mitigate potential geotechnical/geological hazards.

6.0 PRELIMINARY RECOMMENDATIONS

The following recommendations are for initial land planning and preliminary estimating purposes. Final recommendations regarding site grading and foundation construction will be provided after additional site-specific exploration has been undertaken.

6.1 DEMOLITION AND STRIPPING

Site development would commence with the removal of any existing foundations, utilities, vegetation, and surface and subsurface improvements. All debris or soft compressible soils should be removed from any location to be graded, from areas to receive fill or structures, or those areas to serve as borrow. The depth of removal of such materials should be determined by the Geotechnical Engineer in the field at the time of grading.

Existing vegetation should be removed from areas to receive fill, or structures, or those areas to serve for borrow. Tree roots should be removed down to a depth of at least 3 feet below finished grade. The actual depths of tree root removal should be determined by the Geotechnical Engineer's representative in the field. Subject to approval by the Landscape Architect, strippings and organically contaminated soils can be used in landscape areas. Otherwise, such soils should be removed from the project site. Any topsoil that will be retained for future use in landscape areas should be stockpiled in areas where it will not interfere with grading operations.

6.2 EXISTING FILL

Existing fill, utility trench backfill, and existing foundation backfill are considered undocumented. Depending upon the limits of grading and planned civil cuts, existing fills should be subexcavated to expose underlying competent native soils that are approved by the Geotechnical Engineer.

6.3 SELECTION OF MATERIALS

With the exception of construction debris (wood, brick, asphalt, concrete, metal, etc.), trees, organically contaminated materials (soil which contains more than 3 percent organic content by weight), and environmentally impacted soils (if any), we anticipate the site soils are suitable for use as engineered fill provided they are broken down to 6 inches or less in size. Other materials and debris, including trees with their root balls, should be removed from the project site.

6.4 GRADED SLOPES

In general and for preliminary purposes, graded slopes up to 20 feet high should be no steeper than 2:1 (horizontal:vertical). Graded slopes over 20 feet high should be no steeper than 3:1 (horizontal:vertical). Depending on the findings of future explorations, modifications, or other slope configurations may be feasible.

6.4.1 Slope Stability

Slope stability analysis was not included in this preliminary study, but is recommended as part of the design and final land planning stages. Common mitigation measures for shallow landslides and slope instability include avoiding placement of structures in or downslope of slide areas, removing the landslide debris to bedrock and replacing it with engineered fill, buttressing the toes of landslides with engineered fill, and constructing keyways, debris benches, and/or landslide buffer/catchment areas with surface and subsurface drainage.

6.4.2 Slope Setbacks and Debris Benches

Typical slope setbacks are variable depending on slope height and soil conditions. The recommended slope setbacks for habitable structures should be determined based on site specific slope stability analyses for static and seismic loading conditions. We recommend that these be determined during design level exploration and analysis during future planning phases for the project.

Debris benches are recommended at the interface between the open space hillside and the residential lots. A minimum debris bench of 50-feet is recommended below hillside areas containing unmitigated landslides. A minimum debris bench of 25-feet is recommended below hillside areas with no mapped landslides or for mitigated landslide areas. These recommendations will be further assessed and modified during design level exploration and analysis during future planning phases for the project.

6.5 TOE KEYWAYS

Depending upon the type and heights of graded slopes, toe keyways may be recommended. General keyway dimensions will be presented as part of the design-level geotechnical study, with anticipated layout and sizing determined during review of final grading plans and after performing slope stability analysis, when applicable. For planning purposes, a minimum keyway width of 24-feet and a minimum keyway depth of 5 feet should be considered for interior and northern perimeter slopes. Keyway(s) along the southern perimeter, if needed, would likely be wider and deeper.

6.6 SUBSURFACE DRAINAGE FACILITIES

For planning purposes, subsurface drainage systems should be anticipated for keyways, debris benches, and at the base of removal areas. In addition, observed seepage areas or suspected spring areas should be controlled in development areas through the use of subdrains. Subdrain systems should consist of a minimum 6-inch-diameter perforated pipe encased in Caltrans Class 2 permeable material, or crushed rock wrapped in filter fabric. As an alternative, prefabricated geocomposite drainage material (such as SKAPS TNS 220-6) could be considered in lieu of the granular medium above the subdrain zone.

Discharge from the subdrains will generally be low but in some instances may be continuous. Subdrains should outlet into the storm drain system or other approved outlets, and their locations should be surveyed and documented by the project Civil Engineer for future maintenance.

Not all sources of seepage are evident during the time of field work because of the intermittent nature of some of these conditions and their dependence on long-term climatic conditions. Furthermore, new sources of seepage may be created by a combination of changed topography, manmade irrigation patterns and potential utility leakage. Since uncontrolled water movements are one of the major causes of detrimental soil movements, it is of utmost importance that a Geotechnical Engineer be advised of any seepage conditions so that remedial action may be initiated, if necessary.

The recommended locations of subdrains will be developed by ENGEO and presented on future remedial grading plans used during site grading once final 40-scale plans are developed.

6.7 DIFFERENTIAL FILL THICKNESS

Where topography or subexcavation activities create a differential fill thickness across individual building pads, mitigation to achieve a similar fill thickness across the pad is beneficial for the performance of a shallow foundation system. For preliminary planning purposes, a differential fill thickness of up to 5 feet is recommended across individual building pads. For a differential fill thickness exceeding 5 feet across an individual pad, subexcavation activities to bring this vertical distance to within the 5-foot tolerance would be needed. As a minimum, the subexcavation area would include the entire structure footprint plus 5 feet beyond the edges of the building footprint.

6.8 BUILDING PAD TREATMENT

For preliminary purposes, based on the expansive characteristics of the soils tested, the upper 3 feet of pad subgrade (cut, fill, and cut-fill transition) should consist of uniform engineered fill.

6.9 FILL PLACEMENT

For land planning and cost estimating purposes, the following compaction control requirements should be anticipated:

General fill areas:

Test Procedures:	ASTM D-1557.
Required Moisture Content:	Not less than 3 percentage points above optimum moisture content.
Minimum Relative Compaction:	Not less than 90 percent.

Keyway backfill and Deep Fills (greater than 30 feet):

Test Procedures:	ASTM D-1557.
Required Moisture Content:	Not less than 2 percentage points above optimum moisture content.
Minimum Relative Compaction:	Not less than 95 percent.

Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same material.

Additional compaction requirements may be required for near-surface building pad foundation soils and retaining wall backfill soils. These additional requirements will be developed during design-level exploration.

6.10 RESIDENTIAL FOUNDATION DESIGN

In order to reduce the effects of the potentially expansive soils and liquefaction-induced settlements, the foundations should be sufficiently stiff to move as rigid units with minimum differential movements. This can be accomplished with construction of relatively rigid mat foundations, such as post-tensioned structural mats. Other types of foundation systems may also be considered during design-level study if desired.

For preliminary purposes, a minimum mat thickness of 10 to 12 inches should be anticipated. A tough, water vapor retarding membrane should also be considered below the mats to reduce moisture condensation under floor coverings. The vapor retarder should meet ASTM E 1745 – 97 Class A requirements for water vapor permeance, tensile strength, and puncture resistance. Vapor transmission through the mat foundations can also be reduced by using high strength concrete with a low water-cement ratio.

6.11 SITE RETAINING WALLS

For preliminary purposes, unrestrained drained retaining walls constructed on level ground with level backfill may be designed using an active equivalent fluid weight of 50 pounds per cubic foot (pcf). The walls may be supported on either footings or drilled piers.

Footings should be at least 18 inches below lowest adjacent subgrade or deeper, as needed, to achieve at least 10 horizontal feet between the outer base edge of the footing and the nearest slope face. An allowable bearing pressure of 2,500 pounds per square foot (psf) for dead plus live loads may be considered for planning purposes. This bearing capacity may be increased by one-third for the short-term effects of wind or seismic loading.

Lateral loads may be resisted by friction along the base and by passive pressure along the sides of foundations. The passive pressure is based on an equivalent fluid pressure in pounds per cubic foot (pcf) and may start at a depth of 12 inches below finished grade or below that depth needed to achieve at least 10 horizontal feet between the outer base edge of the footing and the nearest slope face. A sliding friction of 0.3 could be considered for preliminary purposes.

6.12 PRELIMINARY PAVEMENT DESIGN

For planning purposes, the following preliminary pavement sections have been determined for Traffic Indices of 5 and 6, an assumed R-value of 5, and in accordance with the design methods contained in Chapter 610 of Highway Design Manual by CALTRANS (2012).

TABLE 6.12-1
Preliminary Pavement Sections

Traffic Index	AC (inches)	AB (inches)
5.0	3.0	10.0
6.0	3.5	13.0

Note: AC – Asphalt Concrete
AB – Caltrans Class 2 aggregate base (R-value of 78 or greater)

The above preliminary pavement sections are provided for estimating only. We recommend the actual subgrade material be tested for R-value once established and the Traffic Index and minimum pavement section(s) should be confirmed by the Civil Engineer and the City.

6.13 SURFACE DRAINAGE

As a minimum requirement, finished grades should have slopes of at least 3 percent within 5 feet from the exterior walls at right angles to them to allow surface water to drain positively away from the structures. For paved areas, the slope gradient can be reduced to 2 percent. All surface water should be collected and discharged into the storm drain system. Landscape mounds must not interfere with this requirement.

All roof stormwater should be collected and directed to downspouts. Stormwater from roof downspouts should not be allowed to discharge onto splashblocks or into landscape areas within 5 feet from the foundation; rather they should discharge through the curb and into the street or onto an impermeable material that drains into the street. If discharging into a landscape area is required, the finished surface should be sloped away from the foundation at a gradient of at least 3 percent within 5 feet from the foundation. ENGEO should be consulted to develop alternate recommendations if these criteria are not feasible.

6.14 STORMWATER TREATMENT

Due to the anticipated high clay content and density of the underlying soils, the near-surface site soils are not expected to have adequate permeability values to handle stormwater infiltration in grassy swales or permeable pavers. Therefore, best management practices should assume that little stormwater infiltration will occur at the site.

Bioretention cells or bioswales should contain a drainage gallery with subdrain and their excavations (even temporary) should be situated outside a 1:1 line of projection extending downwards from nearby improvements (such as curb, street, site wall, or house) unless retaining side walls are planned. Bioretention soil treatment mixes should be compacted to at least 85 percent relative compaction.

6.15 REQUIREMENTS FOR LANDSCAPING IRRIGATION

When planting adjacent to the building is desired, we recommend using plants that require very little moisture with drip irrigation systems. Similarly, sprinkler systems should not be installed where they may cause ponding or saturation of foundation soils within 5 feet of the walls or under the structure as ponding or saturation of foundation soils may cause loss of soil strength, and movements of the foundation and slabs.

Irrigation of landscaped areas should be strictly limited to that necessary to sustain vegetation. Excessive irrigation could result in saturating and weakening of foundation soils.

7.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This preliminary report is issued with the understanding that it is the responsibility of the owner to transmit the information and recommendations of this preliminary report to developers, owners, buyers, architects, engineers, and designers for the project so that the necessary steps can be taken by the contractors and subcontractors to carry out such recommendations in the field. The conclusions and recommendations contained in this preliminary report are solely professional opinions.

The professional staff of ENGEO strives to perform its services in a proper and professional manner with reasonable care and competence but is not infallible. There are risks of earth movement and property damages inherent in land development. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our services.

This preliminary report is based upon field and other conditions discovered at the time of preparation of ENGEO's preliminary report. This document must not be subject to unauthorized reuse that is, reusing without written authorization of ENGEO. Such authorization is essential because it requires ENGEO to evaluate the document's applicability given new circumstances, not the least of which is passage of time. Actual field or other conditions will necessitate clarifications, adjustments, modifications or other changes to ENGEO's documents. Therefore, ENGEO must be engaged to prepare the necessary clarifications, adjustments, modifications or other changes before construction activities commence or further activity proceeds. If ENGEO's scope of services does not include on-study area construction observation, or if other persons or entities are retained to provide such services, ENGEO cannot be held responsible for any or all claims arising from or resulting from the performance of such services by other persons or entities, and from any or all claims arising from or resulting from clarifications, adjustments, modifications, discrepancies or other changes necessary to reflect changed field or other conditions.

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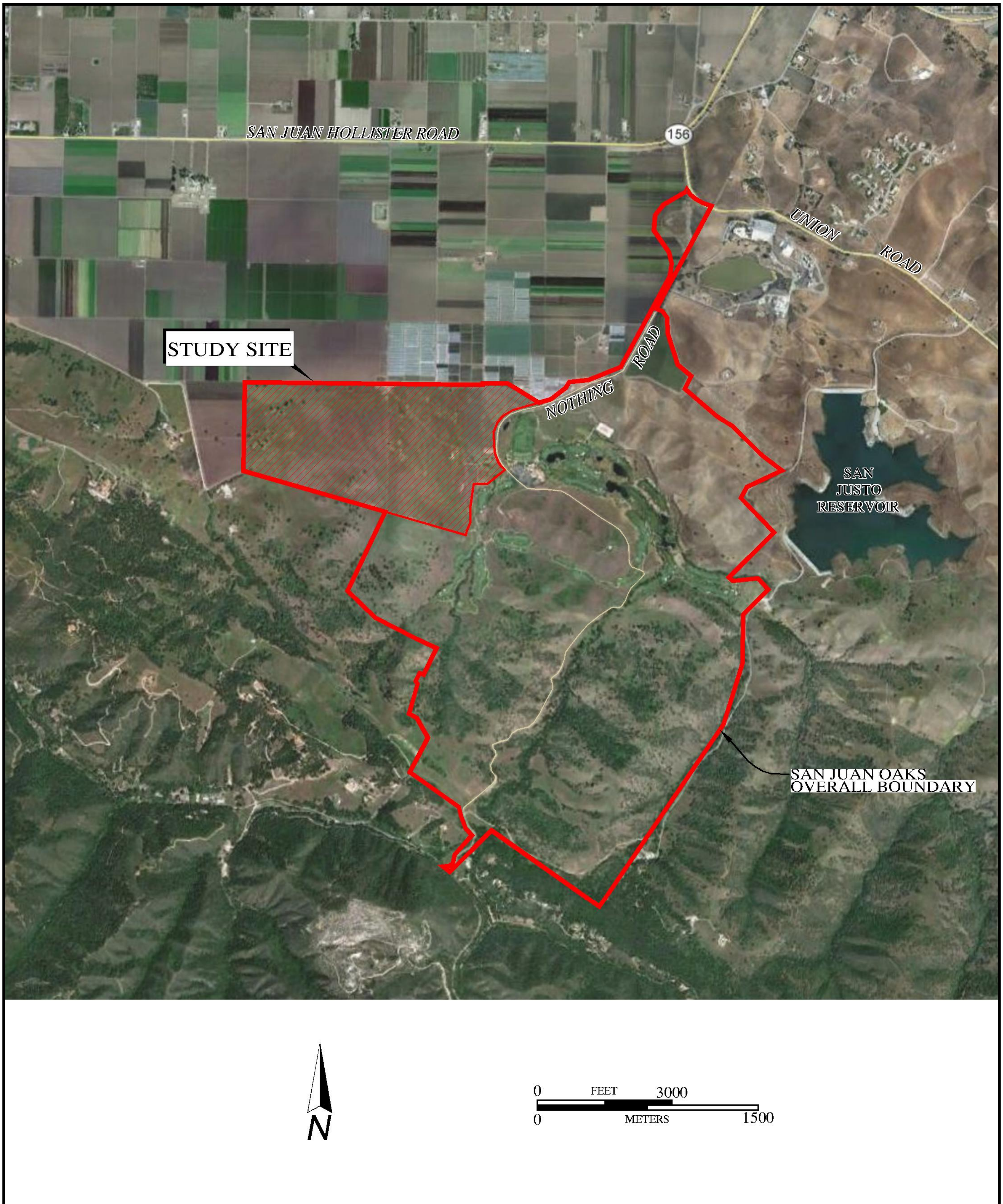
LIST OF FIGURES

FIGURES



BASE MAP SOURCE: GOOGLE EARTH PRO, 2012

ENGEO Expect Excellence	VICINITY MAP SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT HOLLISTER, CALIFORNIA	PROJECT NO.: 9901.000.000 SCALE: AS SHOWN DRAWN BY: SRP CHECKED BY: JAM	FIGURE NO. 1

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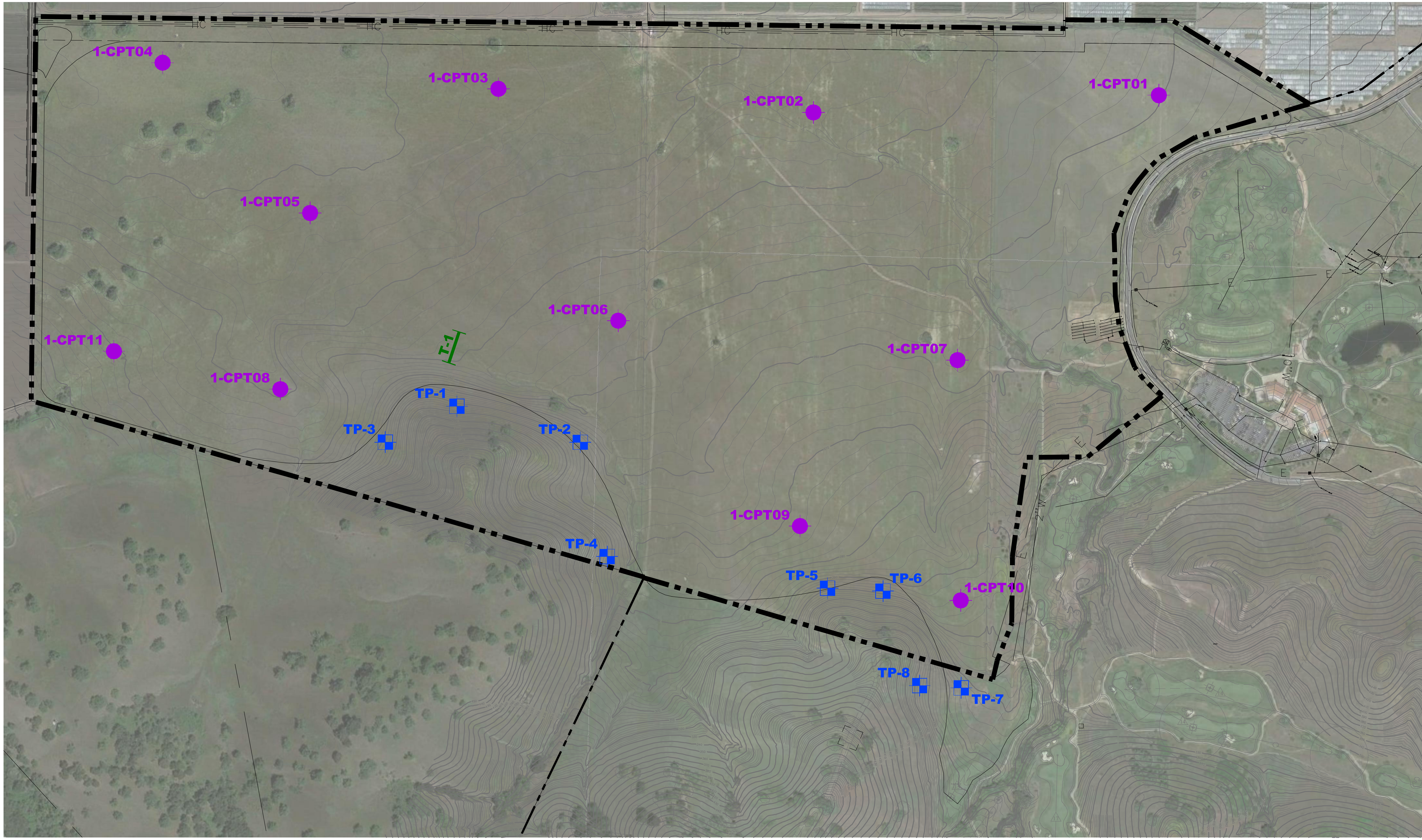


EXPLANATION

TP-8 APPROXIMATE LOCATION OF TEST PIT SHOWING DEPTH TO BEDROCK

1-CPT11 APPROXIMATE LOCATION OF CONE PENETRATION TEST

T-1 APPROXIMATE LOCATION OF TRENCH

N

0 FEET 500
0 METERS 250

BASE MAP SOURCE: GOOGLE EARTH PRO 2012, WHITSON ENGINEERS

ENGEO Expect Excellence

SITE EXPLORATION MAP SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT HOLLISTER, CALIFORNIA	PROJECT NO.: 9901.000.000		FIGURE NO
	SCALE: AS SHOWN		2
	DRAWN BY: DLB	CHECKED BY: JAM	

ORIGINAL FIGURE PRINTED IN COLOR

G:\Drafting\DRAFTING2_Dwg\9901\000\PGEX\9901000000-PGEX-2-SiteMap-0213.dwg Plot Date: 2-27-13 dborde

EXPLANATION

TP-8 (8')	APPROXIMATE LOCATION OF TEST PIT SHOWING DEPTH TO BEDROCK
1-CPT11	APPROXIMATE LOCATION OF CONE PENETRATION TEST
T-1	APPROXIMATE LOCATION OF TRENCH
	APPROXIMATE GEOLOGIC CONTACT
	LANDSLIDE
Qa	ALLUVIUM
Qc	COLLUVIUM
Puc	UNNAMED PLIOCENE CONTINENTAL MUDSTONE
30	STRIKE AND DIP OF BEDDING
22	TREND AND PLUNGE OF SHEAR
?	FAULT, MAJMUNDAR 1994 DOTTED WHERE CONCEALED, QUERIED WHERE EXISTENCE DOUBTFUL

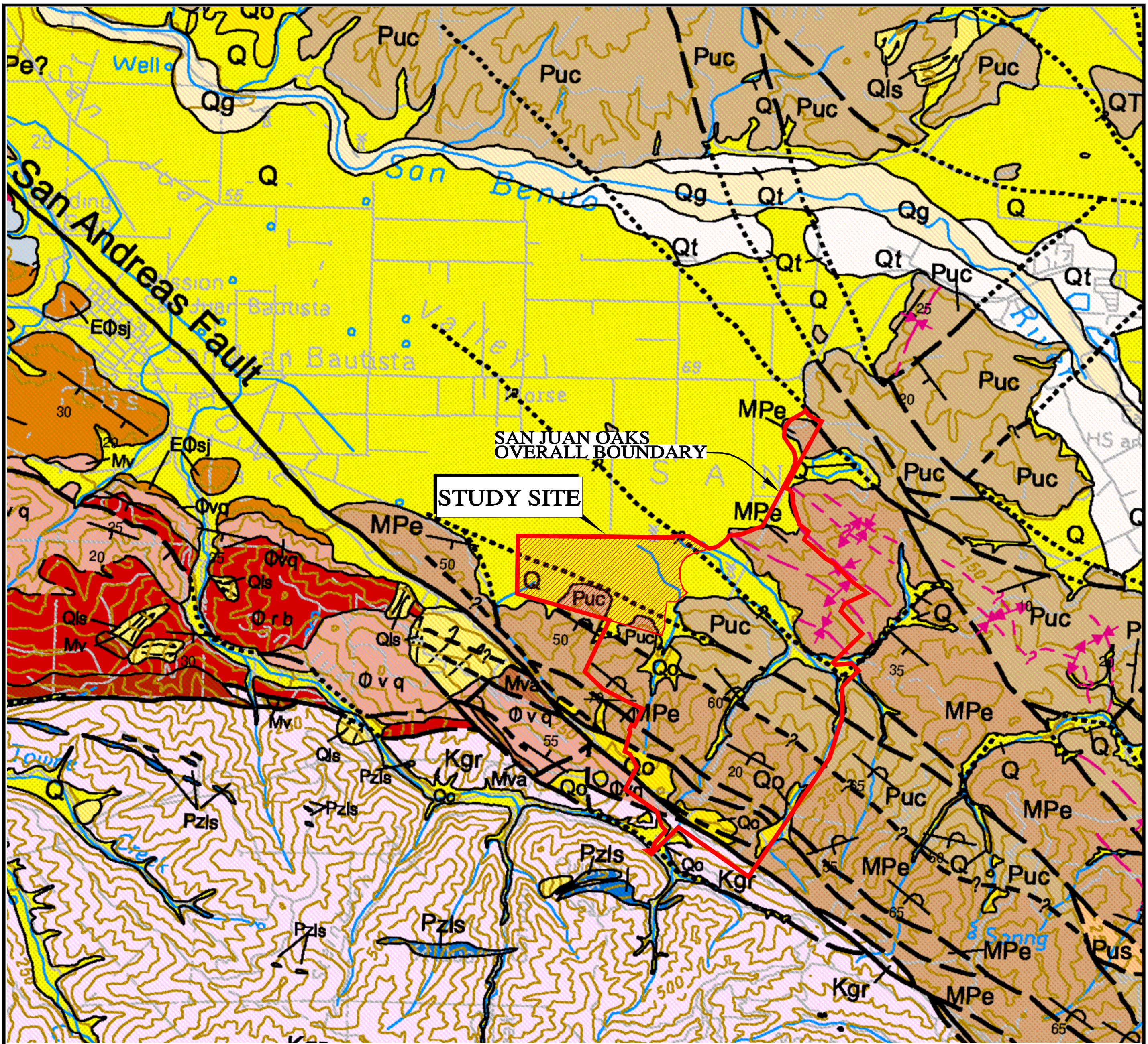
BASE MAP SOURCE: MACKAY & SOMPS, 2013

ENGEO
Expect Excellence

SITE GEOLOGIC MAP

SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT
HOLLISTER, CALIFORNIA

PROJECT NO.: 9901.000.000
SCALE: AS SHOWN
DRAWN BY: DLB
CHECKED BY: JAM
FIGURE NO 3



0 MILES 1

0 KILOMETERS 2

EXPLANATION

Q	ALLUVIUM
Puc	UNNAMED PLIOCENE CONTINENTAL MUDSTONE
Mpe	ETCHEGOIN FORMATION

BASE MAP SOURCE: WAGNER, 2002

ENGEO Expect Excellence

REGIONAL GEOLOGIC MAP

SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT

HOLLISTER, CALIFORNIA

PROJECT NO.: 9901.000.000

SCALE: AS SHOWN

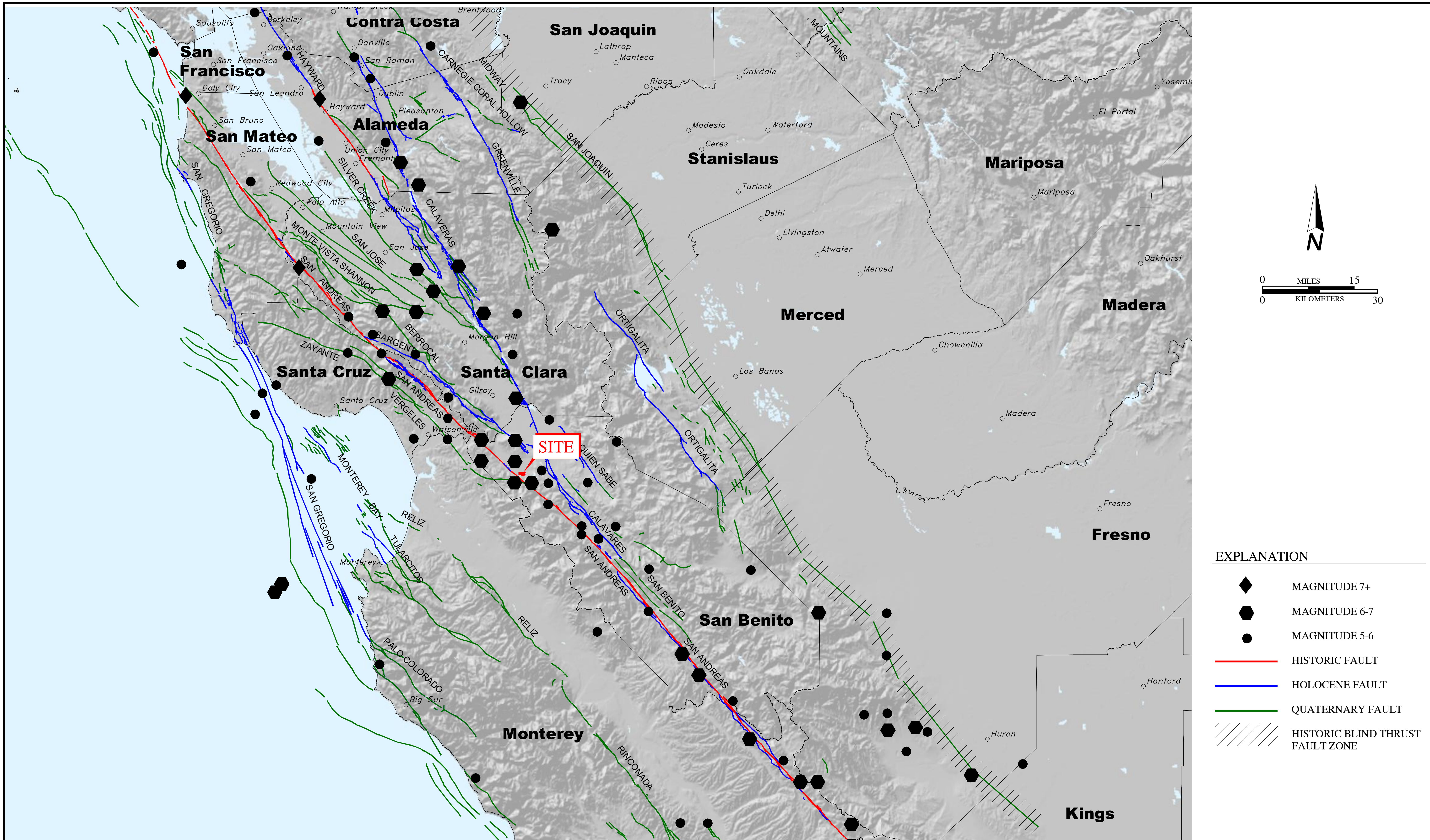
DRAWN BY: DLB

CHECKED BY: JAM

FIGURE NO 4

G:\Drafting\DRAFTING2_Dwg\9901\000\PGEX\9901000000-PGEX-4-RegGeoMap-0213.dwg Plot Date: 2-27-13 dborde

ORIGINAL FIGURE PRINTED IN COLOR



BASE MAP SOURCE:
U.S.G.S. 1-ARC SECOND S.R.T.M. DATABASE
U.S.G.S. QUATERNARY FAULT DATABASE, MARCH, 2006
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800-2000)

ENGEO — Expect Excellence

REGIONAL FAULTING AND SEISMICITY	PROJECT NO.: 9901.000.000		FIGURE NO.
SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT	SCALE: AS SHOWN		5
HOLLISTER, CALIFORNIA	DRAWN BY: DLB	CHECKED BY: JAM	

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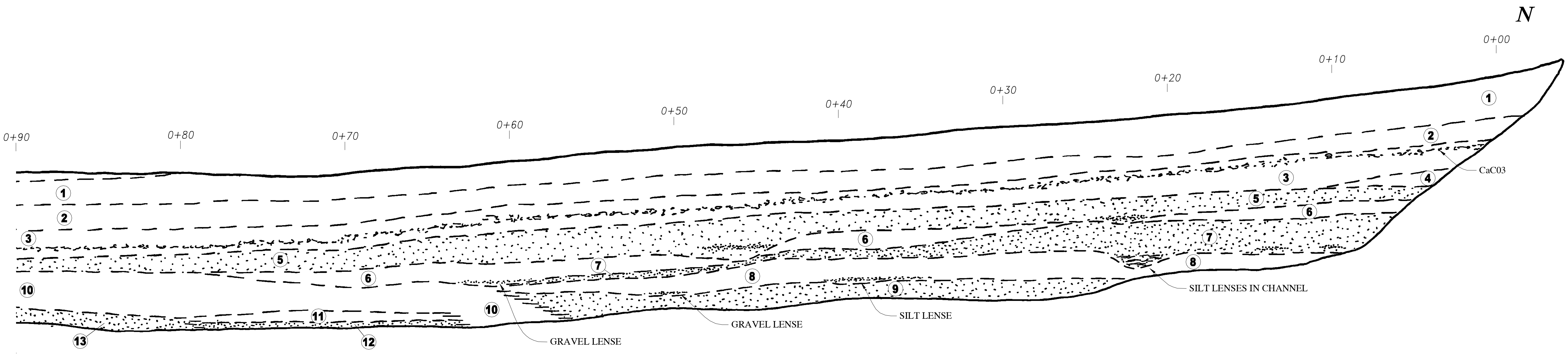
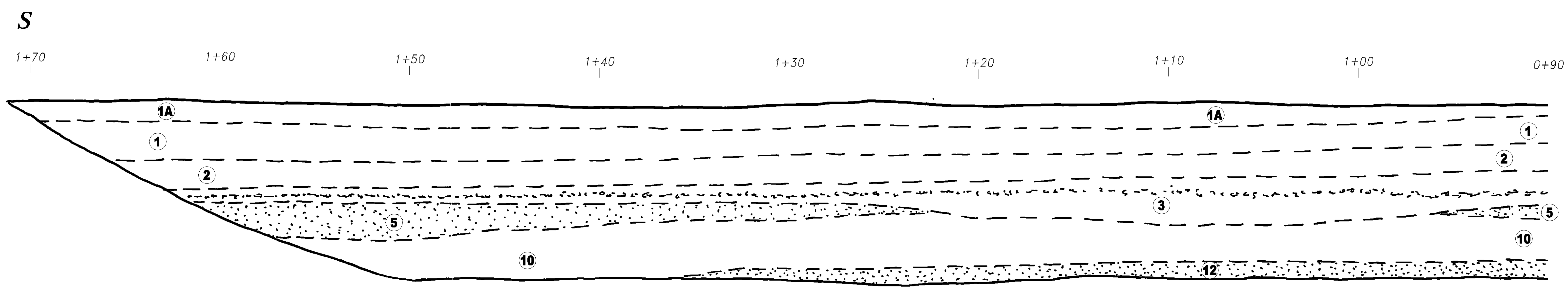
ORIGINAL FIGURE PRINTED IN COLOR





1 Silty CLAY (CL), black (10YR 2/1), upper 12 inches soft from discing, becomes stiff below 12 inches, very moist to moist with depth, with fine gravel, rootlets, few krotovina

1A Silty CLAY (CL), brown, soft, moist, with fine grained sand, completely disced, overlies unit 1 starting at Station 0+80

2 Silty CLAY (CL), very dark gray (2.5Y 3/1), very stiff, moist, few carbonate nodules, moderately developed coarse blocky pedogenic structure, few fine gravels, polished ped surfaces

3 Silty CLAY (CL), dark brown (10YR 3/3), very stiff, moist, few fine gravels, well developed blocky pedogenic structure, thin clay films on gravel, abundant carbonates as nodules and lining ped surfaces near unit 2 and unit 3 contact, after Station 0+45 carbonates are concentrated in middle of unit 3, well-polished ped surfaces-Bk horizon

4 Sandy CLAY (CL), very dark grayish brown (2.5Y 3/2), very stiff, moist, few fine gravels, fine grained sand, well developed medium blocky pedogenic structure, few rootlets and root pores 1/32-inch to 1/16- inch, krotovina, bioturbated, pinches out by Station 0+10

5 Clayey SAND (SC), very dark grayish brown (10YR 3/2) and dark yellowish brown (10YR 4/6), very dense, moist, with fine gravel, few clay lined tubular pores, medium angular blocky pedogenic structure, few carbonate nodules, thick clay films on gravels, becomes olive brown (2.5Y 4/3) and dark yellowish brown (10YR 4/6) at Station 0+15, grades to Silty SAND (SM)

6 Sandy CLAY (CL), dark grayish brown (2.5Y 4/2), very stiff, moist, fine grained sand, few fine gravels, fine blocky pedogenic structure, translocated clays lining ped surfaces, few tubular pores with translocated clays, some yellowish brown staining, some charcoal, unit pinches out by Station 0+77

7 Silty SAND (SM), dark yellowish brown (10YR 3/4), very dense, moist, with very fine gravel, clay lined root/tubular pores throughout, clay lined ped surfaces, clay films on gravel, several relatively horizontal gravel (rock fragments) lenses, at Station 0+22 several horizontal silt lenses light yellowish brown (10YR 6/4), some charcoal, pinches out at Station 0+60

8 Sandy CLAY (CL), dark brown (10YR 3/3) mottled with brown (10YR 4/3), very stiff, moist, with fine gravel, root pores and krotovina throughout, well developed medium blocky pedogenic structure, pinches out at Station 0+60

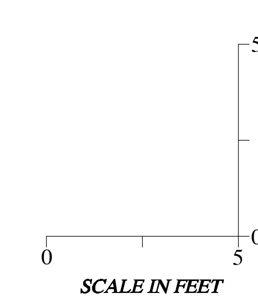
9 Clayey SAND (SC), dark yellowish brown (10YR 3/4), very dense, moist, with very fine gravel, fine to medium grained sand, clay lined tubular pores, well developed fine angular blocky pedogenic structure, thick clay films on gravels, unit terminates at Station 0+60, gradational contact with unit 10

10 Sandy CLAY (CL), dark yellowish brown (10YR 3/4) and dark brown (10YR 3/3), hard, moist, well developed medium angular blocky pedogenic structure, thick clay films on gravel, clay lined tubular pores

11 Sandy CLAY (CL) dark yellowish brown (10YR 3/6), hard, moist, well developed medium blocky pedogenic structure, thick clay films on gravels, translocated clays lining ped surfaces and tubular pores

12 Clayey SAND (SC), dark yellowish brown (10YR 4/4), very dense, moist, with gravel, thick clay films on gravel, dark brown translocated clay filled tubular pores, angular blocky pedogenic structure

13 Clayey SAND (SC), dark yellowish brown (10YR 3/6), very dense, moist, with fine gravel, medium angular blocky pedogenic structure, thick clay films on gravels, clay film on ped surfaces



ENGEO Expect Excellence	TRENCH LOG T-1 SAN JUAN OAKS - DEL WEBB RESIDENTIAL DEVELOPMENT HOLLISTER, CALIFORNIA	PROJECT NO.: 9901.000.000 SCALE: AS SHOWN DRAWN BY: DLB CHECKED BY: JAM	FIGURE NO. 6

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APPENDIX A

Test Pit Logs

APPENDIX A

ENGEO INCORPORATED	Test Pit Logs	
San Juan Oaks – Retirement Community Hollister, California 9901.000.000	Logged By: J. White Logged Date: 2/7/2013	

Test Pit Number	Depth (Feet)	Description
TP-1	0 – 4	SILTY LEAN CLAY (CL), very dark brown, stiff, very moist, few fine gravels, paper thin polished shear surfaces at 4 feet, N89W/ 22N. (Qls)
	4 – 6	Interbedded SANDSTONE and SHALE, brown and tan, extremely weak, very closely fractured, moderately weathered, thinly bedded to laminated, bedding N60W/ 61S, fine to medium grained sand. (Puc)
TP-2	0 – 3	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels. (Qc)
	3 – 6	CLAYSTONE, olive brown, extremely weak, very closely fractured, moderately weathered, thinly bedded N70W/ 35S, iron staining along fracture surfaces. (Puc)
TP-3	0 – 3.5	SILTY LEAN CLAY (CL), very dark brown, medium stiff, very moist, few fine gravels. (Qc)
	3.5 – 6	SANDY LEAN CLAY (CL), dark brown, stiff, moist, few fine gravels, coarse blocky structure, PP=2. (Qc)
	6 – 10.5	CLAYEY SAND (SC), dark brown, dense, moist, fine grained sand, few fine gravels. (Qc)
	10.5 - 12	Interbedded SANDSTONE and SHALE, brown and tan, extremely weak, very closely fractured, moderately weathered, thinly to thickly bedded and laminated. (Puc)
TP-4	0 – 4	SILTY LEAN CLAY (CL), dark brown, stiff, moist, few fine gravels, few carbonates. (Qls?)
	4 – 7	Interbedded SANDSTONE and SHALE, brown and tan, extremely weak, closely fractured, thinly bedded to laminated, medium grained sand, iron staining. (Puc)

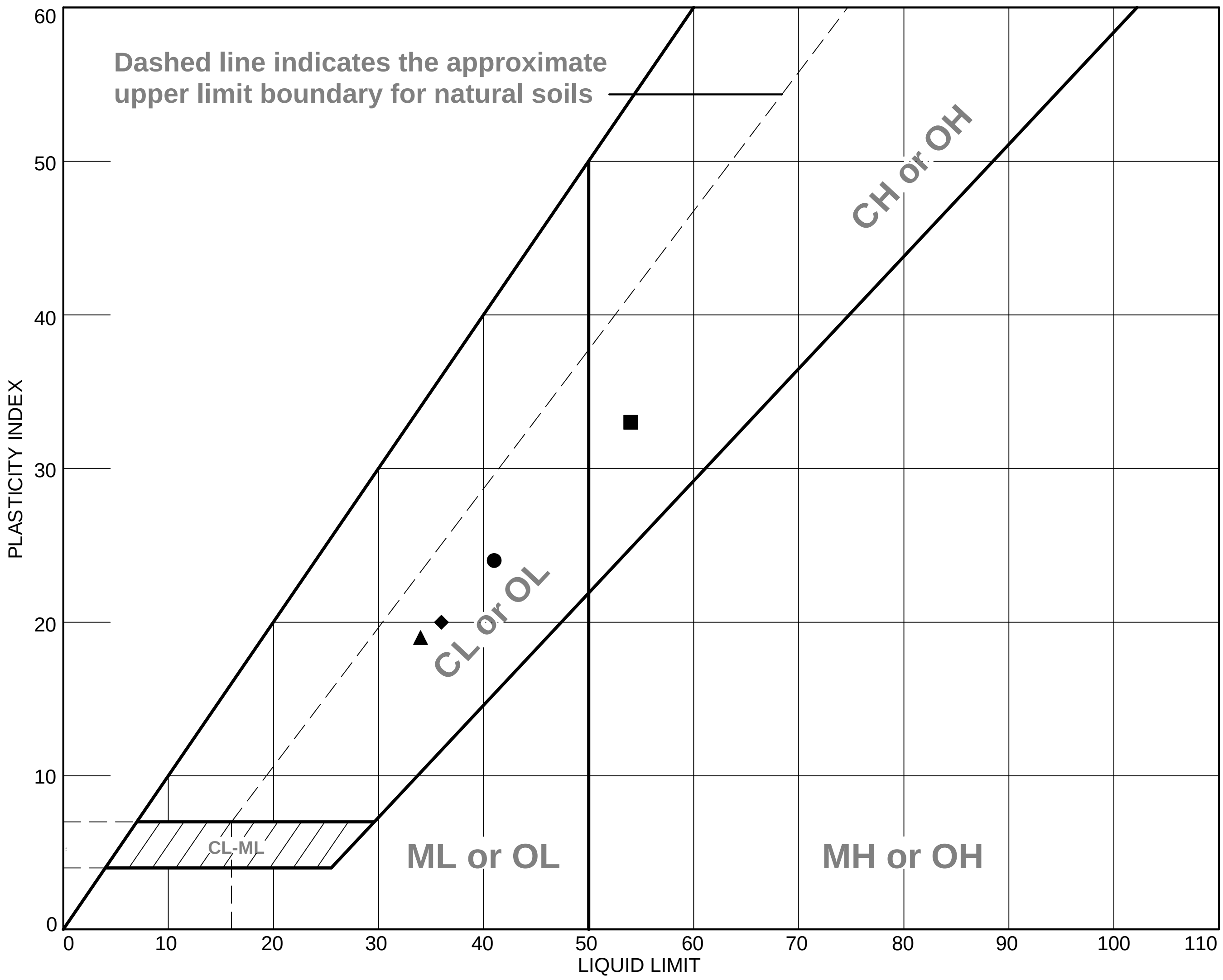
ENGEO INCORPORATED		Test Pit Logs
San Juan Oaks – Retirement Community Hollister, California 9901.000.000		Logged By: J. White Logged Date: 2/7/2013
Test Pit Number	Depth (Feet)	Description
TP-5	0 – 4	SILTY LEAN CLAY (CL), very dark brown, medium stiff, very moist, few fine gravels. (Qc)
	4 – 6	SANDY LEAN CLAY (CL), very dark reddish brown, stiff, moist, few fine gravels, coarse blocky structure. (Qc)
	6 – 8	CLAYSTONE, olive brown, extremely weak, very closely fractured, moderately weathered, thickly bedded, iron staining along fracture surfaces. (Puc)
TP-6	0 – 4	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels. (Qls?)
	4 – 7	CLAYSTONE, olive brown, extremely weak, very closely fractured, moderately weathered, thickly bedded, iron staining along fracture surfaces. (Puc)
TP-7	0 – 3	SILTY LEAN CLAY (CL), very dark brown, stiff, moist, few fine gravels. (Qls?)
	3 – 7	SANDSTONE, brown, weak, poorly cemented, closely fractured, moderately weathered, thinly bedded N42W/ 30S, iron staining along fracture surfaces. (Puc)
TP-8	0 – 4	SILTY LEAN CLAY (CL), very dark brown, very stiff, very moist, few fine gravels. (Qls)
	4 – 6	SANDY LEAN CLAY (CL), dark reddish brown, very stiff, moist, with fine gravels, coarse blocky structure. (Qls)
	6 – 8	SILTY LEAN CLAY (CL), very dark olive brown, very stiff, moist, few fine gravels, polished shear surface at 8 feet N5E/ 21E. (Qls)
	8 – 10	CLAYSTONE, olive brown, extremely weak, very closely fractured, moderately weathered, thickly bedded, iron staining along fracture surfaces. (Puc)

APPENDIX B

Laboratory Test Data

A P P E N D I X B

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	41	17	24	95.5	69.6	CL
■	See exploration logs	54	21	33	96.9	84.7	CH
▲	See exploration logs	34	15	19	93.9	67.9	CL
◆	See exploration logs	36	16	20	90.9	64.2	CL

Project No. 9901.000.000 **Client:** Pulte Group

Project: San Juan Oaks - Retirement Community

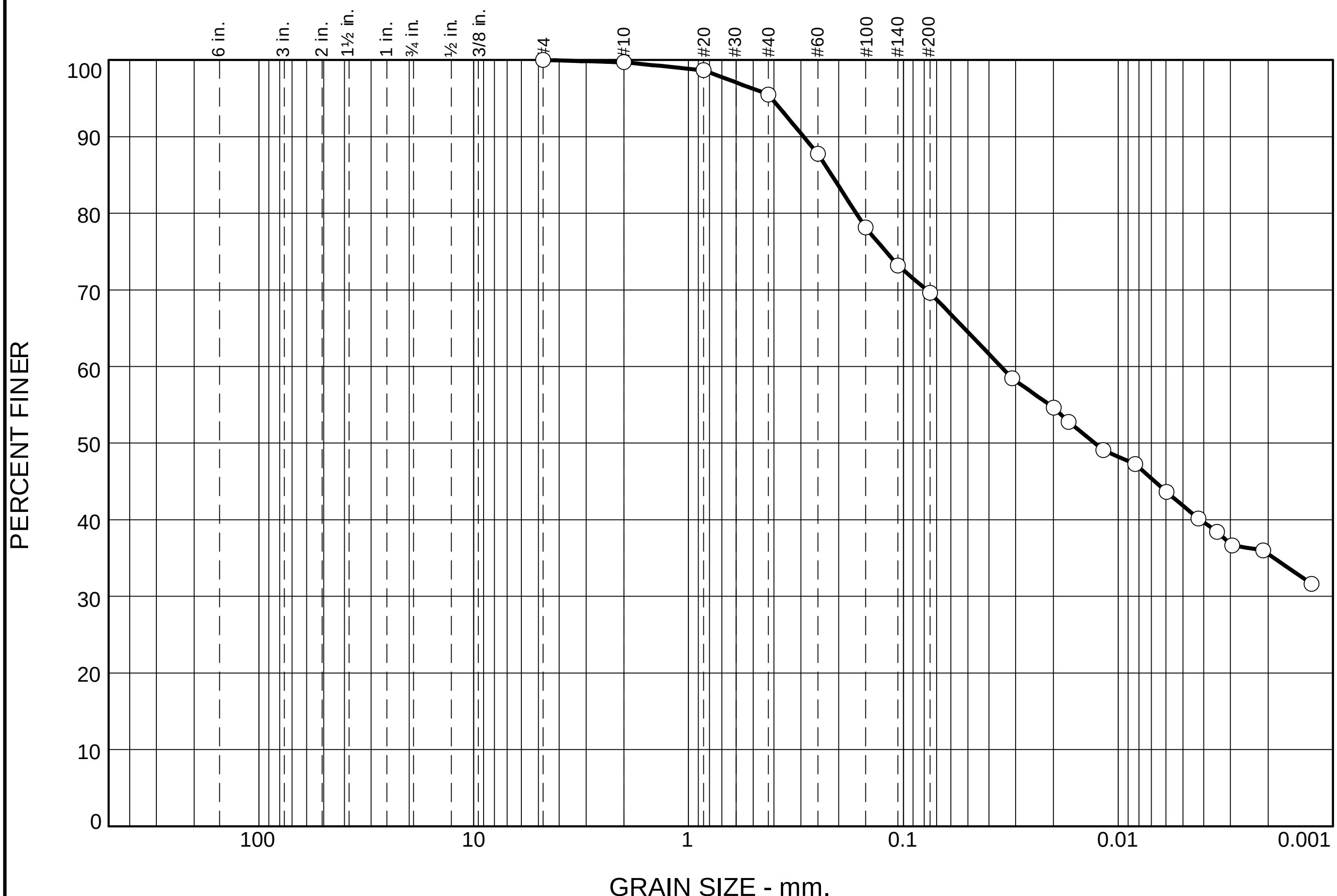
● **Depth:** 6.0 feet **Sample Number:** 1-CPT01 @ 6
■ **Depth:** 6.0 feet **Sample Number:** 1-CPT04 @ 6
▲ **Depth:** 6.0 feet **Sample Number:** 1-CPT06 @ 6
◆ **Depth:** 6.0 feet **Sample Number:** 1-CPT10 @ 6

ENGEO INCORPORATED

Remarks:
● PI: ASTM D4318, Grain Size: ASTM D422, USCS: ASTM D2487

Tested By: AV **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	4.2	25.9	27.7	41.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.7		
#20	98.7		
#40	95.5		
#60	87.8		
#100	78.1		
#140	73.2		
#200	69.6		
0.0311 mm.	58.5		
0.0200 mm.	54.6		
0.0170 mm.	52.8		
0.0117 mm.	49.1		
0.0083 mm.	47.3		
0.0060 mm.	43.6		
0.0042 mm.	40.1		
0.0035 mm.	38.4		
0.0029 mm.	36.7		
0.0021 mm.	36.0		
0.0013 mm.	31.6		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 17 LL= 41 PI= 24

Coefficients

D_{90}= 0.2913 D_{85}= 0.2158 D_{60}= 0.0351
D_{50}= 0.0129 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(15)

Remarks

Grain Size: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Sample Number: 1-CPT01 @ 6" **Depth:** 6.0 inches

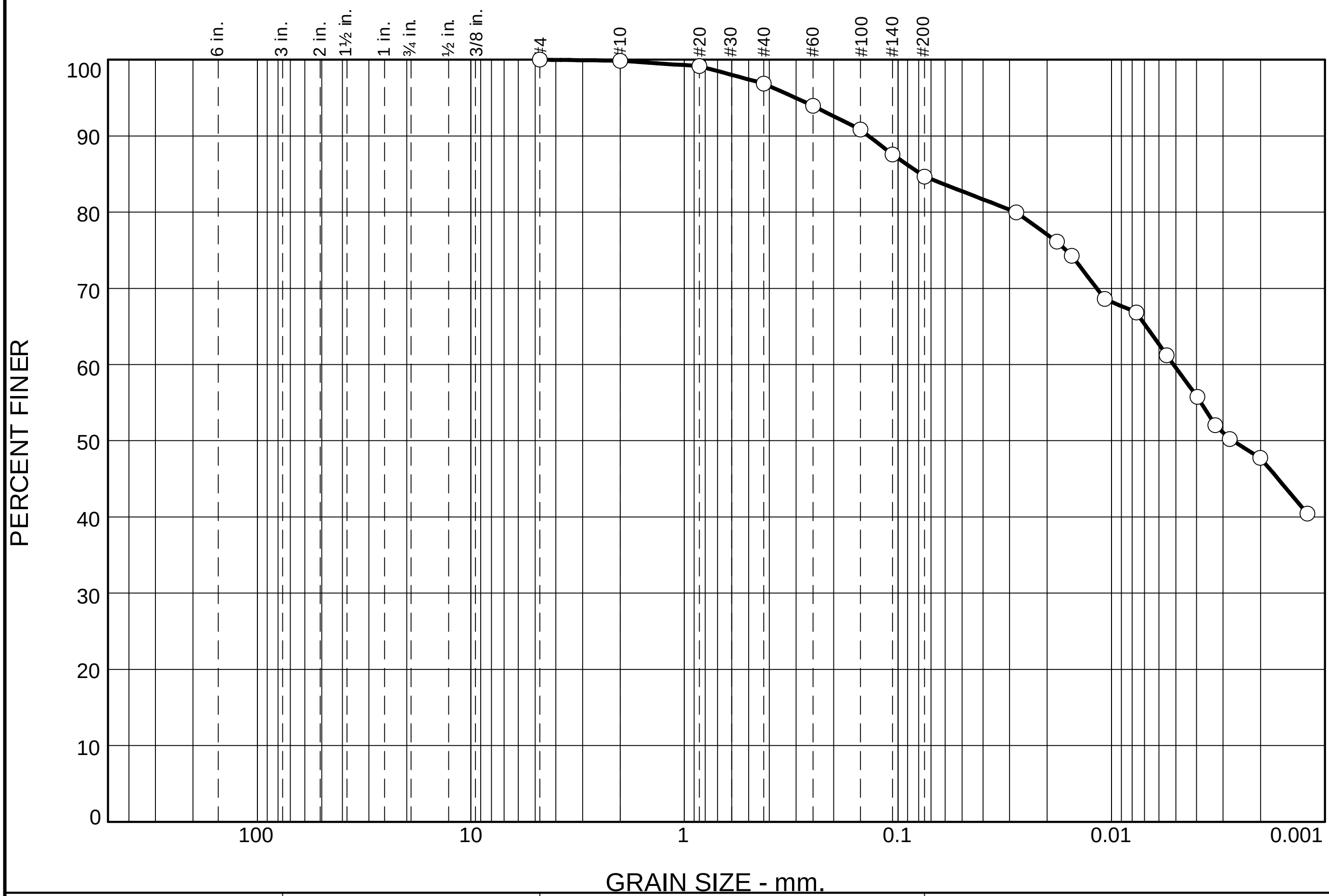
Date: 2.11.13

ENGEO INCORPORATED

Client: Pulte Group
Project: San Juan Oaks - Del Webb Residential Development
Project No: 9901.000.000

Tested By: AV **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	3.0	12.2	25.1	59.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#20	99.2		
#40	96.9		
#60	94.0		
#100	90.8		
#140	87.6		
#200	84.7		
0.0279 mm.	80.0		
0.0180 mm.	76.1		
0.0153 mm.	74.3		
0.0107 mm.	68.6		
0.0076 mm.	66.8		
0.0055 mm.	61.2		
0.0040 mm.	55.8		
0.0033 mm.	52.1		
0.0028 mm.	50.2		
0.0020 mm.	47.8		
0.0012 mm.	40.5		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 21 LL= 54 PI= 33

Coefficients

D_{90}= 0.1374 D_{85}= 0.0781 D_{60}= 0.0051
D_{50}= 0.0027 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(30)

Remarks

Grain Size: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Sample Number: 1-CPT04 @ 6" **Depth:** 6.0 inches

Date: 2.11.13

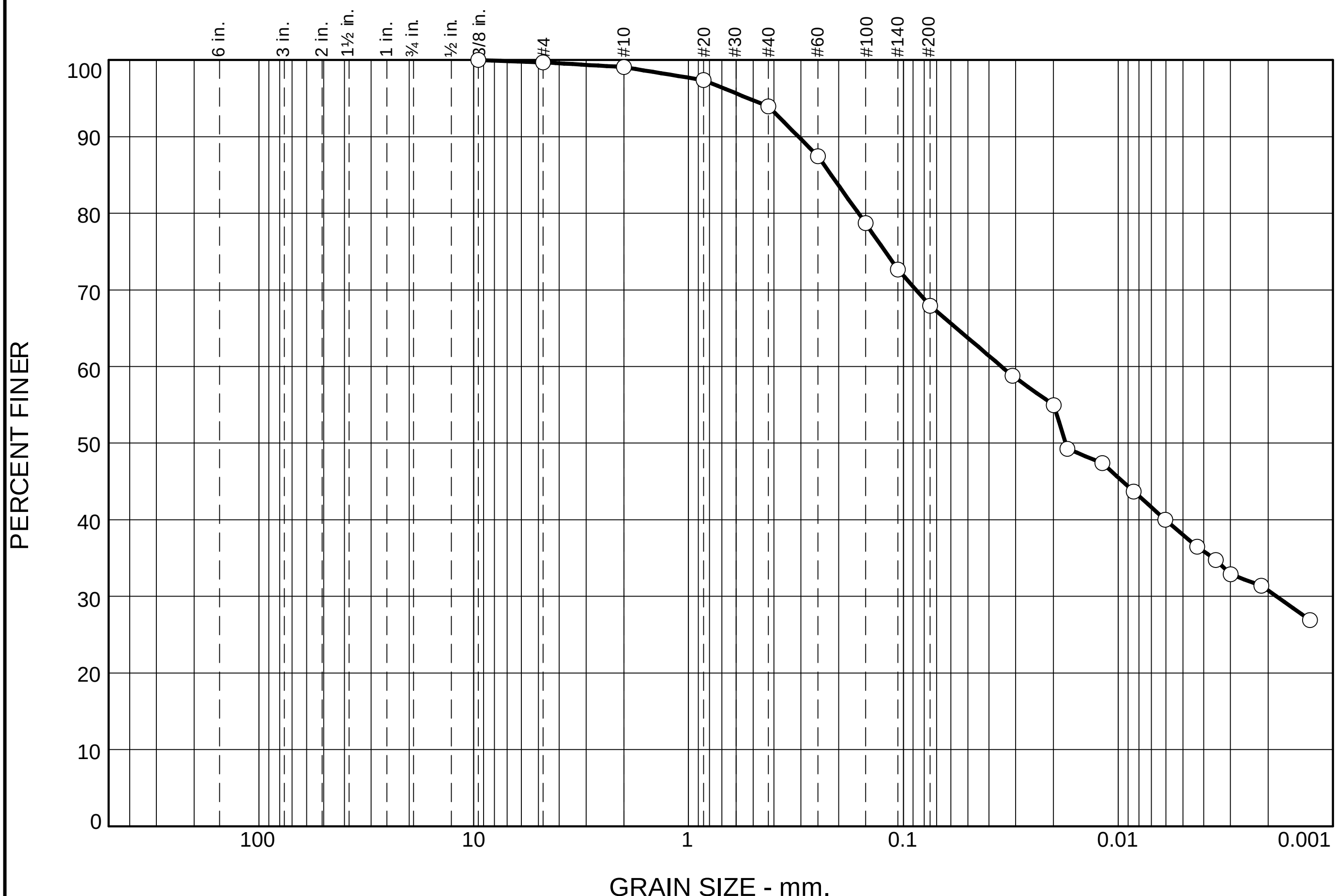
ENGEO INCORPORATED

Client: Pulte Group
Project: San Juan Oaks - Del Webb Residential Development

Project No: 9901.000.000

Tested By: AV **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.6	5.2	26.0	29.8	38.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100.0		
#4	99.7		
#10	99.1		
#20	97.4		
#40	93.9		
#60	87.5		
#100	78.7		
#140	72.6		
#200	67.9		
0.0310 mm.	58.8		
0.0199 mm.	55.0		
0.0172 mm.	49.3		
0.0118 mm.	47.4		
0.0085 mm.	43.7		
0.0060 mm.	40.0		
0.0043 mm.	36.5		
0.0035 mm.	34.8		
0.0030 mm.	32.9		
0.0022 mm.	31.4		
0.0013 mm.	26.9		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 15 LL= 34 PI= 19

Coefficients

D_{90}= 0.3078 D_{85}= 0.2166 D_{60}= 0.0349
D_{50}= 0.0175 D_{30}= 0.0018 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(10)

Remarks

Grain Size: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Sample Number: 1-CPT06 @ 6" **Depth:** 6.0 inches

Date: 2.11.13

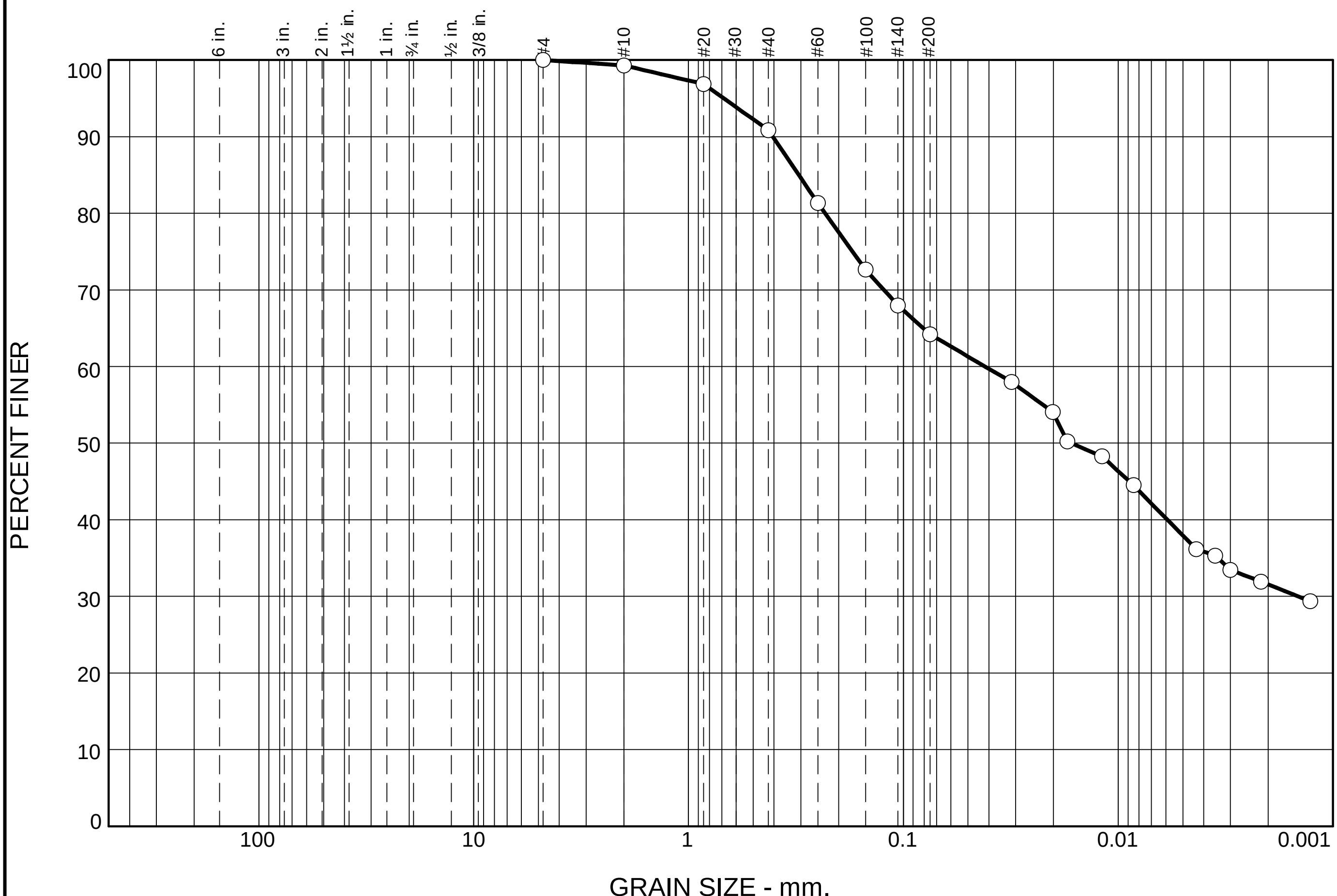
ENGEO INCORPORATED

Client: Pulte Group
Project: San Juan Oaks - Del Webb Residential Development

Project No: 9901.000.000

Tested By: AV **Checked By:** DS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.7	8.4	26.7	26.2	38.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.3		
#20	96.9		
#40	90.9		
#60	81.3		
#100	72.6		
#140	68.0		
#200	64.2		
0.0313 mm.	58.0		
0.0201 mm.	54.1		
0.0172 mm.	50.2		
0.0119 mm.	48.3		
0.0085 mm.	44.5		
0.0043 mm.	36.2		
0.0035 mm.	35.3		
0.0030 mm.	33.5		
0.0022 mm.	31.9		
0.0013 mm.	29.4		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 16 LL= 36 PI= 20

Coefficients

D_{90}= 0.4053 D_{85}= 0.3068 D_{60}= 0.0417
D_{50}= 0.0166 D_{30}= 0.0014 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(10)

Remarks

Grain Size: ASTM D422, PI: ASTM D4318, USCS: ASTM D2487

Sample Number: 1-CPT10 @ 6" **Depth:** 6.0 inches

Date: 2.11.13

ENGEO INCORPORATED

Client: Pulte Group
Project: San Juan Oaks - Del Webb Residential Development

Project No: 9901.000.000

Tested By: AV **Checked By:** DS

APPENDIX C

Cone Penetration Test (CPT) Logs (John Sarmiento & Associates)

APPENDIX C

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-01
DATE: 02-06-2013
TIME: 16:34:00
Groundwater measured at 28.6 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.58	5.9	9.44	0.29	4.9	6	9	0.07	----	1.17	CLAY	100-110
1.02	8.5	13.60	0.55	6.5	9	14	0.12	----	1.69	"	110-120
1.53	10.2	16.32	0.72	7.1	10	16	0.18	----	1.68	"	120-130
2.01	12.4	19.84	1.00	8.1	12	20	0.24	----	1.64	"	"
2.53	34.2	54.72	2.86	8.4	34	55	0.31	----	4.54	"	130-140
3.06	39.8	63.68	3.45	8.7	40	64	0.38	----	5.28	"	"
3.50	40.6	64.96	3.24	8.0	41	65	0.44	----	5.38	"	"
4.01	42.9	68.64	3.42	8.0	43	68	0.51	----	5.69	"	"
4.57	54.6	87.36	4.14	7.6	55	87	0.59	----	7.24	"	"
5.06	60.4	96.64	4.72	7.8	60	96	0.65	----	8.01	Very Stiff Fine Grained *	"
5.53	67.7	108.32	5.51	8.1	68	108	0.72	----	8.98	"	>140
6.04	79.9	127.84	6.15	7.7	80	128	0.79	----	10.60	"	"
6.57	70.9	108.93	6.06	8.5	71	109	0.86	----	9.40	"	"
7.03	62.9	92.75	5.56	8.8	63	93	0.93	----	8.32	"	130-140
7.57	68.7	96.14	5.78	8.4	69	96	1.00	----	9.09	"	>140
8.03	55.6	76.03	4.58	8.2	56	76	1.06	----	7.34	CLAY	130-140
8.52	61.2	81.58	4.84	7.9	61	81	1.13	----	8.08	Very Stiff Fine Grained *	"
9.03	78.1	101.19	6.04	7.7	78	101	1.20	----	10.33	"	>140
9.57	71.9	90.42	5.91	8.2	72	90	1.28	----	9.50	"	"
10.02	58.8	72.21	5.00	8.5	59	72	1.34	----	7.75	"	130-140
10.57	65.5	78.12	5.11	7.8	65	78	1.41	----	8.64	"	"
11.02	69.4	80.75	5.06	7.3	69	81	1.47	----	9.16	"	"
11.58	49.7	56.31	4.02	8.1	50	56	1.55	----	6.52	CLAY	"
12.00	93.2	103.60	4.91	5.3	93	103	1.61	----	12.32	Very Stiff Fine Grained *	>140
12.53	74.7	81.11	3.76	5.0	75	81	1.68	----	9.85	"	130-140
13.00	39.1	41.56	3.38	8.6	39	41	1.74	----	5.10	CLAY	"
13.54	45.9	47.94	3.04	6.6	46	48	1.81	----	6.00	"	"
14.01	34.6	35.62	1.86	5.4	35	36	1.88	----	4.49	"	"
14.53	30.8	31.18	2.20	7.1	31	31	1.95	----	3.98	"	"
15.03	38.8	38.79	2.40	6.2	39	39	2.02	----	5.04	"	"
15.51	87.5	87.36	3.09	3.5	35	35	2.08	----	11.53	Sandy SILT to Clayey SILT	"
16.05	90.3	90.02	4.61	5.1	90	90	2.15	----	11.90	Very Stiff Fine Grained *	"
16.51	32.5	32.36	2.46	7.6	32	32	2.21	----	4.19	CLAY	"
17.05	24.9	24.76	1.43	5.7	25	25	2.29	----	3.17	"	"
17.53	23.4	23.23	1.31	5.6	23	23	2.35	----	2.96	"	"
18.06	36.3	35.99	2.13	5.9	36	36	2.42	----	4.68	"	"
18.53	55.7	55.16	2.52	4.5	37	37	2.49	----	7.26	Silty CLAY to CLAY	"
19.07	74.0	71.77	2.26	3.1	30	29	2.56	----	9.70	Sandy SILT to Clayey SILT	"
19.53	34.5	32.75	2.48	7.2	34	33	2.62	----	4.43	CLAY	"
20.08	15.9	14.74	0.91	5.7	16	15	2.69	----	1.94	"	120-130
20.54	13.6	12.35	0.72	5.3	14	12	2.75	----	1.63	"	"
21.01	12.5	11.11	0.67	5.4	13	11	2.81	----	1.48	"	"
21.55	13.1	11.34	0.63	4.8	13	11	2.88	----	1.55	"	"
22.03	18.2	15.40	0.67	3.7	12	10	2.94	----	2.23	Silty CLAY to CLAY	"
22.50	25.2	20.80	1.00	4.0	17	14	3.00	----	3.16	"	130-140
23.05	27.0	22.05	1.18	4.4	18	15	3.07	----	3.40	"	"
23.50	30.1	24.37	1.38	4.6	20	16	3.13	----	3.80	"	"
24.06	33.7	26.99	2.20	6.5	34	27	3.21	----	4.28	CLAY	"
24.56	141.7	112.39	4.07	2.9	47	37	3.28	39	----	Silty SAND to Sandy SILT	"
25.04	170.3	133.80	5.40	3.2	57	45	3.34	40	----	"	"
25.52	163.2	126.97	6.66	4.1	163	127	3.41	----	21.53	Very Stiff Fine Grained *	>140
26.05	158.3	121.85	5.52	3.5	79	61	3.48	39	----	SAND to Clayey SAND *	130-140
26.58	197.0	150.03	3.66	1.9	49	37	3.55	40	----	SAND to Silty SAND	"
27.02	102.8	77.57	4.86	4.7	103	77	3.61	----	13.47	Very Stiff Fine Grained *	"

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-01
DATE: 02-06-2013
TIME: 16:34:00
Groundwater measured at 28.6 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.52	34.5	25.77	2.03	5.9	34	26	3.68	----	4.35	CLAY	130-140
28.02	67.1	49.60	1.30	1.9	22	17	3.75	34	----	Silty SAND to Sandy SILT	"
28.53	17.7	12.94	1.31	7.4	18	13	3.81	----	2.11	CLAY	"
29.04	60.1	43.76	0.50	0.8	15	11	3.84	33	----	SAND to Silty SAND	110-120
29.56	41.2	29.82	1.46	3.5	21	15	3.88	----	5.23	Clayey SILT to Silty CLAY	130-140
30.00	118.5	85.34	2.09	1.8	39	28	3.91	37	----	Silty SAND to Sandy SILT	"
30.51	143.9	103.01	4.19	2.9	48	34	3.95	38	----	"	"
31.03	203.6	144.88	4.00	2.0	51	36	3.99	40	----	SAND to Silty SAND	"
31.57	168.6	119.34	3.84	2.3	56	40	4.03	39	----	Silty SAND to Sandy SILT	"
32.05	270.2	190.45	7.35	2.7	135	95	4.06	42	----	SAND to Clayey SAND *	"
32.53	231.0	162.14	4.08	1.8	46	32	4.10	41	----	SAND	"
33.04	236.8	165.47	4.38	1.8	47	33	4.13	41	----	"	"
33.51	170.5	118.61	8.83	5.2	170	119	4.17	----	22.43	Very Stiff Fine Grained *	>140
34.03	85.1	58.91	7.05	8.3	85	59	4.21	----	11.04	"	"
34.55	57.5	39.62	2.20	3.8	29	20	4.25	----	7.36	Clayey SILT to Silty CLAY	130-140
35.01	30.8	21.13	1.82	5.9	31	21	4.28	----	3.79	CLAY	"
35.56	26.3	17.96	2.05	7.8	26	18	4.32	----	3.19	"	"
36.06	27.9	18.96	2.04	7.3	28	19	4.36	----	3.40	"	"
36.55	28.8	19.49	2.22	7.7	29	19	4.39	----	3.51	"	"
37.08	43.6	29.36	2.28	5.2	44	29	4.43	----	5.48	"	"
37.52	64.8	43.46	3.90	6.0	65	43	4.46	----	8.31	Very Stiff Fine Grained *	"
38.04	87.9	58.67	4.11	4.7	88	59	4.50	----	11.38	"	"
38.57	85.1	56.52	3.75	4.4	85	56	4.54	----	11.00	"	"
39.06	95.8	63.32	5.66	5.9	96	63	4.58	----	12.42	"	>140
39.56	138.5	91.09	10.94	7.9	138	91	4.62	----	18.11	"	"
40.04	237.1	155.19	10.35	4.4	237	155	4.65	----	31.26	"	"
40.52	106.2	69.17	9.47	8.9	106	69	4.69	----	13.80	"	"
41.01	100.7	65.27	6.29	6.2	101	65	4.73	----	13.06	"	"
41.53	152.1	98.06	9.07	6.0	152	98	4.77	----	19.91	"	"
42.01	234.1	150.18	10.71	4.6	234	150	4.81	----	30.84	"	"
42.55	205.1	130.84	12.16	5.9	205	131	4.85	----	26.97	"	"
43.01	127.1	80.69	10.46	8.2	127	81	4.88	----	16.56	"	"
43.53	122.7	77.49	7.49	6.1	123	77	4.92	----	15.97	"	"
44.00	169.3	106.38	9.10	5.4	169	106	4.96	----	22.18	"	"
44.54	86.5	54.07	4.15	4.8	86	54	5.00	----	11.13	"	130-140
45.02	146.1	90.97	7.77	5.3	146	91	5.04	----	19.08	"	>140
45.55	94.2	58.40	6.38	6.8	94	58	5.08	----	12.15	"	"
46.03	79.7	49.23	4.26	5.3	80	49	5.11	----	10.21	"	130-140
46.55	148.7	91.46	9.35	6.3	149	91	5.15	----	19.41	"	>140
47.01	81.4	49.89	4.18	5.1	81	50	5.19	----	10.43	"	130-140
47.54	93.3	56.93	6.02	6.5	93	57	5.23	----	12.01	"	>140
48.00	138.4	84.13	8.31	6.0	138	84	5.26	----	18.02	"	"
48.53	130.9	79.22	8.89	6.8	131	79	5.30	----	17.02	"	"
49.01	110.2	66.43	8.22	7.5	110	66	5.34	----	14.25	"	"
49.51	232.5	139.57	10.51	4.5	232	139	5.38	----	30.55	"	"
50.04	159.6	95.38	12.90	8.1	159	95	5.42	----	20.83	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-02
DATE: 02-06-2013
TIME: 16:05:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	8.5	13.60	0.51	6.0	9	14	0.06	----	1.69	CLAY	110-120
1.02	6.7	10.72	0.39	5.8	7	11	0.12	----	1.33	"	"
1.56	8.2	13.12	0.46	5.6	8	13	0.18	----	1.62	"	"
2.02	10.1	16.16	0.84	8.3	10	16	0.24	----	1.66	"	120-130
2.56	21.6	34.56	1.80	8.3	22	35	0.31	----	2.86	"	130-140
3.02	18.0	28.80	1.67	9.3	18	29	0.37	----	2.38	"	"
3.55	23.6	37.76	1.80	7.6	24	38	0.44	----	3.12	"	"
4.00	28.3	45.28	1.97	7.0	28	45	0.50	----	3.74	"	"
4.51	41.6	66.56	2.93	7.0	42	66	0.57	----	5.51	"	"
5.04	55.6	88.96	4.50	8.1	56	89	0.64	----	7.37	"	"
5.52	61.5	98.40	5.14	8.4	61	98	0.71	----	8.15	Very Stiff Fine Grained *	"
6.02	56.2	89.92	4.77	8.5	56	90	0.78	----	7.44	CLAY	"
6.51	52.7	82.08	4.78	9.1	53	82	0.84	----	6.97	"	"
7.07	37.8	56.00	3.48	9.2	38	56	0.92	----	4.98	"	"
7.55	28.1	39.80	2.49	8.9	28	40	0.98	----	3.68	"	"
8.04	24.4	33.53	1.78	7.3	24	33	1.05	----	3.18	"	"
8.51	25.8	34.60	1.65	6.4	26	34	1.11	----	3.37	"	"
9.01	24.1	31.47	1.61	6.7	24	31	1.18	----	3.13	"	"
9.53	19.8	25.13	1.33	6.7	20	25	1.25	----	2.56	"	"
10.06	24.5	30.27	1.30	5.3	25	30	1.32	----	3.18	"	"
10.50	37.0	44.64	1.87	5.1	37	45	1.38	----	4.84	"	"
11.03	43.2	50.65	1.80	4.2	22	25	1.45	----	5.66	Clayey SILT to Silty CLAY	"
11.54	29.7	33.92	1.59	5.4	30	34	1.52	----	3.86	CLAY	"
12.07	11.5	12.86	0.62	5.4	11	13	1.59	----	1.78	"	120-130
12.53	15.1	16.57	0.51	3.4	10	11	1.65	----	1.90	Silty CLAY to CLAY	"
13.06	21.6	23.19	0.74	3.4	11	12	1.71	----	2.77	Clayey SILT to Silty CLAY	"
13.54	19.4	20.44	0.98	5.1	19	20	1.78	----	2.47	CLAY	130-140
14.07	34.1	35.34	2.07	6.1	34	35	1.85	----	4.42	"	"
14.56	17.4	17.76	1.28	7.4	17	18	1.91	----	2.19	"	"
15.01	26.4	26.55	1.45	5.5	26	26	1.98	----	3.39	"	"
15.54	47.8	47.76	1.52	3.2	19	19	2.05	----	6.24	Sandy SILT to Clayey SILT	"
16.06	49.3	49.18	1.23	2.5	20	20	2.12	----	6.43	"	"
16.51	30.5	30.39	1.55	5.1	30	30	2.18	----	3.92	CLAY	"
17.03	13.0	12.94	0.48	3.7	9	9	2.24	----	1.58	Silty CLAY to CLAY	120-130
17.52	12.7	12.62	0.35	2.8	6	6	2.30	----	1.54	Clayey SILT to Silty CLAY	110-120
18.03	13.6	13.50	0.37	2.7	7	7	2.36	----	1.66	"	"
18.56	10.8	10.71	0.26	2.4	5	5	2.42	----	1.60	"	"
19.02	11.9	11.79	0.24	2.0	6	6	2.47	----	1.78	"	100-110
19.56	14.6	14.29	0.38	2.6	7	7	2.53	----	1.78	"	120-130
20.00	19.8	19.02	0.53	2.7	10	10	2.59	----	2.47	"	"
20.53	26.4	24.73	0.80	3.0	13	12	2.66	----	3.34	"	130-140
21.02	32.2	29.78	1.07	3.3	16	15	2.70	----	4.11	"	"
21.56	26.7	24.35	1.51	5.7	27	24	2.74	----	3.37	CLAY	"
22.06	20.6	18.54	1.14	5.5	21	18	2.77	----	2.56	"	"
22.52	20.6	18.32	1.07	5.2	21	18	2.81	----	2.55	"	"
23.04	16.2	14.23	0.70	4.3	16	14	2.84	----	1.96	"	120-130
23.57	25.3	21.90	1.78	7.0	25	22	2.88	----	3.17	"	130-140
24.03	18.5	15.81	1.14	6.2	18	16	2.91	----	2.26	"	"
24.56	13.9	11.73	0.79	5.7	14	12	2.94	----	1.64	"	120-130
25.02	16.7	13.93	0.75	4.5	17	14	2.97	----	2.01	"	"
25.54	21.7	17.89	0.79	3.6	14	12	3.00	----	2.67	Silty CLAY to CLAY	"
26.07	22.9	18.78	1.01	4.4	15	12	3.04	----	2.83	"	130-140
26.52	28.2	23.02	1.52	5.4	28	23	3.08	----	3.53	CLAY	"
27.00	30.2	24.53	1.54	5.1	30	24	3.11	----	3.79	"	"

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-02
DATE: 02-06-2013
TIME: 16:05:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.53	16.7	13.50	0.66	4.0	11	9	3.14	----	1.99	Silty CLAY to CLAY	120-130
28.05	15.0	12.07	0.69	4.6	15	12	3.18	----	1.76	CLAY	"
28.50	16.2	12.98	0.70	4.3	16	13	3.20	----	1.91	"	"
29.02	32.0	25.51	1.97	6.2	32	25	3.24	----	4.02	"	130-140
29.53	13.8	10.95	0.55	4.0	14	11	3.27	----	1.58	"	120-130
30.03	17.4	13.74	0.76	4.4	17	14	3.31	----	2.06	"	"
30.56	18.8	14.78	0.77	4.1	12	10	3.34	----	2.24	Silty CLAY to CLAY	"
31.06	67.9	53.09	4.44	6.5	68	53	3.38	----	8.78	Very Stiff Fine Grained *	130-140
31.56	85.3	66.31	5.10	6.0	85	66	3.41	----	11.10	"	>140
32.07	56.1	43.37	2.78	5.0	37	29	3.45	----	7.20	Silty CLAY to CLAY	130-140
32.50	47.5	36.55	2.92	6.1	48	37	3.48	----	6.05	CLAY	"
33.00	63.5	48.60	3.30	5.2	63	49	3.52	----	8.18	Very Stiff Fine Grained *	"
33.54	120.7	91.80	6.04	5.0	121	92	3.56	----	15.80	"	>140
34.02	57.6	43.58	3.38	5.9	58	44	3.60	----	7.38	CLAY	130-140
34.51	85.7	64.49	4.25	5.0	86	64	3.63	----	11.13	Very Stiff Fine Grained *	"
35.00	74.3	55.60	3.71	5.0	74	56	3.67	----	9.60	"	"
35.54	108.9	80.97	5.55	5.1	109	81	3.71	----	14.21	"	>140
36.04	49.7	36.75	2.30	4.6	33	24	3.74	----	6.31	Silty CLAY to CLAY	130-140
36.53	46.6	34.26	2.17	4.7	31	23	3.78	----	5.89	"	"
37.01	34.3	25.08	1.86	5.4	34	25	3.82	----	4.25	CLAY	"
37.51	32.2	23.41	1.38	4.3	21	16	3.85	----	3.97	Silty CLAY to CLAY	"
38.07	27.5	19.87	1.18	4.3	18	13	3.89	----	3.33	"	"
38.58	34.8	24.99	1.29	3.7	17	12	3.93	----	4.30	Clayey SILT to Silty CLAY	"
39.07	48.5	34.63	2.12	4.4	32	23	3.96	----	6.13	Silty CLAY to CLAY	"
39.54	45.0	31.96	2.23	5.0	30	21	4.00	----	5.65	"	"
40.04	27.6	19.51	1.54	5.6	28	19	4.03	----	3.33	CLAY	"
40.52	20.8	14.64	1.03	5.0	21	15	4.07	----	2.42	"	"
41.02	22.8	15.98	1.10	4.8	23	16	4.11	----	2.68	"	"
41.52	26.3	18.36	1.30	4.9	26	18	4.14	----	3.14	"	"
42.00	31.0	21.54	1.73	5.6	31	21	4.18	----	3.77	"	"
42.52	25.4	17.57	1.21	4.8	25	17	4.22	----	3.01	"	"
43.08	26.3	18.10	1.09	4.1	17	12	4.26	----	3.13	Silty CLAY to CLAY	"
43.56	25.7	17.61	1.09	4.2	17	12	4.29	----	3.04	"	"
44.04	33.3	22.72	1.43	4.3	22	15	4.33	----	4.05	"	"
44.53	35.0	23.78	1.65	4.7	23	16	4.36	----	4.28	"	"
45.01	21.1	14.27	1.07	5.1	21	14	4.40	----	2.42	CLAY	"
45.54	28.6	19.25	1.90	6.6	28	19	4.43	----	3.41	"	"
46.04	26.6	17.82	1.26	4.7	27	18	4.47	----	3.14	"	"
46.52	28.6	19.08	1.51	5.3	28	19	4.51	----	3.40	"	"
47.01	16.2	10.76	0.88	5.4	16	11	4.54	----	1.75	"	120-130
47.53	30.5	20.17	1.73	5.7	30	20	4.57	----	3.65	"	130-140
48.01	85.8	56.48	2.95	3.4	34	23	4.61	----	11.02	Sandy SILT to Clayey SILT	"
48.55	21.4	14.02	1.09	5.1	21	14	4.65	----	2.43	CLAY	"
49.04	23.5	15.32	1.05	4.5	23	15	4.68	----	2.70	"	"
49.51	22.9	14.86	1.03	4.5	23	15	4.72	----	2.62	"	"
50.04	29.9	19.31	1.90	6.4	30	19	4.76	----	3.55	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-03
DATE: 02-06-2013
TIME: 15:21:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.58	13.1	20.96	0.33	2.5	7	10	0.07	----	1.74	Clayey SILT to Silty CLAY	110-120
1.05	9.0	14.40	0.18	2.0	5	7	0.12	----	1.49	"	100-110
1.55	9.5	15.20	0.46	4.8	10	15	0.17	----	1.57	CLAY	110-120
2.05	11.0	17.60	0.62	5.6	11	18	0.24	----	1.81	"	120-130
2.53	10.7	17.12	0.55	5.1	11	17	0.30	----	1.76	"	"
3.03	15.3	24.48	0.96	6.3	15	24	0.36	----	2.02	"	"
3.52	26.9	43.04	2.11	7.8	27	43	0.42	----	3.56	"	130-140
4.08	23.2	37.12	2.07	8.9	23	37	0.50	----	3.06	"	"
4.57	22.0	35.20	1.76	8.0	22	35	0.57	----	2.90	"	"
5.07	17.9	28.64	1.77	9.9	18	28	0.63	----	2.34	"	"
5.54	40.3	64.48	2.27	5.6	40	64	0.70	----	5.33	"	"
6.01	37.9	60.64	2.19	5.8	38	60	0.76	----	5.00	"	"
6.57	29.4	45.96	1.77	6.0	29	46	0.84	----	3.86	"	"
7.03	31.5	47.32	2.18	6.9	31	47	0.90	----	4.14	"	"
7.51	31.0	44.56	1.91	6.2	31	45	0.96	----	4.07	"	"
8.07	31.5	43.47	1.80	5.7	31	43	1.04	----	4.13	"	"
8.55	38.8	52.23	2.53	6.5	39	52	1.10	----	5.10	"	"
9.05	74.6	97.81	3.82	5.1	75	98	1.17	----	9.87	Very Stiff Fine Grained *	"
9.53	41.0	52.36	3.12	7.6	41	52	1.24	----	5.38	CLAY	"
10.02	33.5	41.71	2.00	6.0	33	42	1.30	----	4.38	"	"
10.50	34.9	42.36	2.13	6.1	35	42	1.37	----	4.56	"	"
11.07	28.3	33.31	2.08	7.3	28	33	1.44	----	3.68	"	"
11.53	21.5	24.68	1.03	4.8	21	25	1.51	----	2.77	"	"
12.01	26.8	30.14	1.70	6.3	27	30	1.57	----	3.47	"	"
12.50	28.9	31.81	1.87	6.5	29	32	1.64	----	3.74	"	"
13.06	30.6	32.85	1.91	6.2	31	33	1.71	----	3.97	"	"
13.52	35.3	37.21	2.14	6.1	35	37	1.77	----	4.59	"	"
14.02	38.1	39.55	2.33	6.1	38	39	1.84	----	4.96	"	"
14.57	43.9	44.78	2.60	5.9	44	45	1.92	----	5.73	"	"
15.04	37.6	37.78	2.03	5.4	38	38	1.98	----	4.88	"	"
15.52	26.9	26.88	1.31	4.9	27	27	2.04	----	3.45	"	"
16.07	21.5	21.45	0.98	4.6	21	21	2.12	----	2.73	"	"
16.54	19.0	18.93	0.97	5.1	19	19	2.18	----	2.39	"	"
17.02	21.1	21.00	0.95	4.5	21	21	2.25	----	2.66	"	"
17.53	30.9	30.70	1.35	4.4	21	20	2.32	----	3.97	Silty CLAY to CLAY	"
18.02	21.8	21.63	0.98	4.5	22	22	2.38	----	2.75	CLAY	"
18.51	22.2	22.00	1.22	5.5	22	22	2.45	----	2.80	"	"
19.06	35.6	34.97	1.96	5.5	36	35	2.52	----	4.58	"	"
19.53	19.5	18.76	0.89	4.6	19	19	2.59	----	2.43	"	"
20.02	18.9	17.76	1.08	5.7	19	18	2.65	----	2.34	"	"
20.50	12.5	11.50	0.79	6.3	12	11	2.71	----	1.49	"	120-130
21.08	24.5	22.20	0.99	4.0	16	15	2.75	----	3.08	Silty CLAY to CLAY	130-140
21.54	23.3	20.86	1.31	5.6	23	21	2.79	----	2.92	CLAY	"
22.01	28.9	25.54	1.34	4.6	19	17	2.82	----	3.66	Silty CLAY to CLAY	"
22.56	36.9	32.12	1.69	4.6	24	21	2.86	----	4.72	"	"
23.04	32.3	27.75	1.63	5.0	32	28	2.90	----	4.10	CLAY	"
23.51	57.6	48.84	3.12	5.4	58	49	2.93	----	7.47	"	"
24.01	69.5	58.09	1.81	2.6	28	23	2.97	----	9.05	Sandy SILT to Clayey SILT	"
24.57	37.2	30.66	2.21	5.9	37	31	3.01	----	4.74	CLAY	"
25.03	84.4	69.23	1.68	2.0	28	23	3.04	36	----	Silty SAND to Sandy SILT	"
25.56	21.0	17.13	1.26	6.0	21	17	3.08	----	2.57	CLAY	"
26.04	56.4	45.79	1.44	2.6	23	18	3.11	----	7.29	Sandy SILT to Clayey SILT	"
26.56	60.8	49.09	1.78	2.9	24	20	3.15	----	7.87	"	"
27.04	21.5	17.28	1.39	6.5	21	17	3.19	----	2.63	CLAY	"

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-03
DATE: 02-06-2013
TIME: 15:21:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.51	18.0	14.40	0.92	5.1	18	14	3.22	----	2.16	CLAY	120-130
28.06	18.6	14.81	0.76	4.1	12	10	3.25	----	2.23	Silty CLAY to CLAY	"
28.51	19.8	15.69	0.88	4.4	20	16	3.28	----	2.39	CLAY	130-140
29.05	24.7	19.46	0.95	3.8	16	13	3.32	----	3.04	Silty CLAY to CLAY	"
29.50	25.4	19.92	0.96	3.8	17	13	3.36	----	3.13	"	"
30.00	22.6	17.63	0.87	3.8	15	12	3.39	----	2.75	"	"
30.55	30.0	23.26	1.09	3.6	15	12	3.43	----	3.73	Clayey SILT to Silty CLAY	"
31.01	24.2	18.67	1.02	4.2	16	12	3.46	----	2.95	Silty CLAY to CLAY	"
31.55	26.7	20.48	1.19	4.5	18	14	3.50	----	3.28	"	"
32.02	38.3	29.23	1.95	5.1	38	29	3.54	----	4.82	CLAY	"
32.56	28.2	21.39	1.70	6.0	28	21	3.58	----	3.47	"	"
33.00	28.1	21.20	1.47	5.2	28	21	3.58	----	3.45	"	"
33.51	31.9	23.94	1.42	4.5	21	16	3.65	----	3.96	Silty CLAY to CLAY	"
34.06	43.9	32.75	1.88	4.3	29	22	3.69	----	5.55	"	"
34.51	53.8	39.94	3.27	6.1	54	40	3.72	----	6.87	CLAY	"
35.01	43.9	32.40	2.14	4.9	29	22	3.76	----	5.54	Silty CLAY to CLAY	"
35.52	33.1	24.29	1.47	4.4	22	16	3.79	----	4.10	"	"
36.01	31.6	23.06	1.27	4.0	21	15	3.83	----	3.89	"	"
36.55	28.5	20.67	1.17	4.1	19	14	3.87	----	3.48	"	"
37.06	25.6	18.46	1.09	4.3	17	12	3.90	----	3.08	"	"
37.51	21.1	15.13	1.04	4.9	21	15	3.94	----	2.48	CLAY	"
38.07	17.4	12.41	0.94	5.4	17	12	3.97	----	1.98	"	120-130
38.58	27.5	19.50	1.54	5.6	27	19	4.01	----	3.32	"	130-140
39.00	13.3	9.40	0.53	4.0	13	9	4.04	----	1.43	"	120-130
39.54	23.4	16.48	0.51	2.2	9	7	4.07	----	2.77	Sandy SILT to Clayey SILT	"
40.06	33.1	23.20	0.92	2.8	13	9	4.11	----	4.06	"	130-140
40.53	40.1	27.99	1.78	4.4	27	19	4.14	----	4.99	Silty CLAY to CLAY	"
41.03	45.6	31.69	2.12	4.6	30	21	4.18	----	5.72	"	"
41.51	44.6	30.86	2.18	4.9	30	20	4.21	----	5.58	"	"
42.00	31.5	21.70	1.42	4.5	21	14	4.25	----	3.83	"	"
42.55	25.1	17.21	1.16	4.6	25	17	4.29	----	2.97	CLAY	"
43.05	25.7	17.54	1.23	4.8	26	17	4.32	----	3.04	"	"
43.52	34.2	23.24	1.33	3.9	17	12	4.36	----	4.17	Clayey SILT to Silty CLAY	"
44.00	33.1	22.40	1.51	4.6	22	15	4.39	----	4.02	Silty CLAY to CLAY	"
44.55	21.9	14.74	1.18	5.4	22	15	4.43	----	2.52	CLAY	"
45.01	17.1	11.46	1.03	6.0	17	11	4.47	----	1.88	"	"
45.54	29.6	19.75	1.42	4.8	29	20	4.50	----	3.54	"	"
46.06	28.3	18.79	1.11	3.9	19	12	4.54	----	3.36	Silty CLAY to CLAY	"
46.55	32.5	21.48	1.16	3.6	16	11	4.58	----	3.92	Clayey SILT to Silty CLAY	"
47.05	45.6	30.00	1.77	3.9	23	15	4.61	----	5.66	"	"
47.54	38.0	24.88	1.45	3.8	19	12	4.65	----	4.64	"	"
48.03	43.8	28.55	3.68	8.4	44	28	4.69	----	5.41	CLAY	"
48.56	55.7	36.12	2.98	5.4	56	36	4.72	----	6.99	"	"
49.06	43.7	28.20	2.94	6.7	44	28	4.76	----	5.39	"	"
49.56	37.9	24.34	1.88	5.0	38	24	4.80	----	4.61	"	"
50.03	58.4	37.34	3.61	6.2	58	37	4.83	----	7.34	Very Stiff Fine Grained *	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-04
DATE: 02-06-2013
TIME: 14:44:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.54	8.3	13.28	0.64	7.7	8	13	0.06	----	1.65	CLAY	120-130
1.00	6.7	10.72	0.58	8.7	7	11	0.12	----	1.33	"	110-120
1.51	7.1	11.36	0.67	9.4	7	11	0.18	----	1.40	Organic Material	120-130
2.01	13.5	21.60	1.13	8.4	14	22	0.24	----	1.78	CLAY	"
2.53	41.4	66.24	3.61	8.7	41	66	0.31	----	5.50	"	130-140
3.05	47.8	76.48	3.67	7.7	48	76	0.38	----	6.35	"	"
3.53	59.3	94.88	2.76	4.7	39	63	0.45	----	7.88	Silty CLAY to CLAY	"
4.01	55.8	89.28	1.32	2.4	22	36	0.51	----	7.41	Sandy SILT to Clayey SILT	"
4.50	86.9	139.04	1.75	2.0	29	46	0.58	40	----	Silty SAND to Sandy SILT	"
5.05	106.1	169.76	2.12	2.0	35	57	0.65	41	----	"	"
5.51	88.7	141.92	2.23	2.5	30	47	0.71	40	----	"	"
6.01	86.1	137.76	2.42	2.8	34	55	0.78	----	11.43	Sandy SILT to Clayey SILT	"
6.50	69.5	107.86	2.42	3.5	28	43	0.85	----	9.21	"	"
7.06	58.8	86.84	1.77	3.0	24	35	0.92	----	7.78	"	"
7.55	9.1	12.88	0.72	7.9	9	13	0.98	----	1.43	CLAY	120-130
8.02	13.4	18.46	0.64	4.8	13	18	1.04	----	1.72	"	"
8.51	11.9	16.01	0.72	6.1	12	16	1.10	----	1.89	"	"
9.02	6.5	8.55	0.39	6.0	7	9	1.16	----	1.18	"	110-120
9.52	6.2	7.98	0.32	5.2	6	8	1.22	----	1.12	"	100-110
10.02	5.2	6.56	0.25	4.8	5	6	1.27	----	0.91	"	"
10.54	4.9	6.06	0.17	3.5	5	6	1.32	----	0.85	"	90-100
11.05	8.5	10.28	0.45	5.3	9	10	1.38	----	1.56	"	110-120
11.51	15.1	17.84	0.62	4.1	15	18	1.43	----	1.92	"	120-130
12.05	16.9	19.43	0.78	4.6	17	19	1.50	----	2.15	"	"
12.55	18.4	20.74	0.85	4.6	18	21	1.56	----	2.35	"	"
13.04	20.0	22.06	0.98	4.9	20	22	1.63	----	2.56	"	130-140
13.53	17.5	18.89	1.00	5.7	18	19	1.70	----	2.22	"	"
14.02	20.4	21.56	1.06	5.2	20	22	1.76	----	2.60	"	"
14.51	26.8	27.91	1.17	4.4	18	19	1.83	----	3.45	Silty CLAY to CLAY	"
15.05	21.4	21.91	1.02	4.8	21	22	1.90	----	2.73	CLAY	"
15.54	22.0	22.17	0.95	4.3	15	15	1.97	----	2.80	Silty CLAY to CLAY	"
16.02	22.4	22.39	1.04	4.6	22	22	2.03	----	2.85	CLAY	"
16.50	24.4	24.35	1.28	5.2	24	24	2.10	----	3.11	"	"
17.06	25.6	25.51	1.33	5.2	26	25	2.17	----	3.27	"	"
17.50	27.6	27.47	1.29	4.7	28	27	2.23	----	3.53	"	"
18.05	27.6	27.43	1.22	4.4	18	18	2.31	----	3.53	Silty CLAY to CLAY	"
18.53	25.5	25.31	1.25	4.9	25	25	2.37	----	3.24	CLAY	"
19.04	24.1	23.89	1.02	4.2	16	16	2.44	----	3.05	Silty CLAY to CLAY	"
19.52	23.1	22.83	0.93	4.0	15	15	2.50	----	2.91	"	"
20.00	24.0	23.21	0.85	3.5	12	12	2.57	----	3.03	Clayey SILT to Silty CLAY	"
20.55	25.2	23.75	0.86	3.4	13	12	2.64	----	3.18	"	"
21.03	21.8	20.33	0.79	3.6	14	13	2.67	----	2.73	Silty CLAY to CLAY	120-130
21.54	20.8	19.18	0.69	3.3	10	10	2.71	----	2.59	Clayey SILT to Silty CLAY	"
22.02	21.1	19.22	0.86	4.1	14	13	2.74	----	2.62	Silty CLAY to CLAY	130-140
22.56	23.8	21.36	1.05	4.4	16	14	2.78	----	2.98	"	"
23.06	22.3	19.75	0.95	4.3	15	13	2.82	----	2.78	"	"
23.56	29.7	25.95	1.27	4.3	20	17	2.85	----	3.76	"	"
24.04	24.8	21.38	1.12	4.5	25	21	2.89	----	3.10	CLAY	"
24.51	21.0	17.87	0.92	4.4	21	18	2.92	----	2.59	"	"
25.05	26.8	22.46	1.16	4.3	18	15	2.96	----	3.36	Silty CLAY to CLAY	"
25.52	36.8	30.42	1.77	4.8	24	20	2.99	----	4.69	"	"
26.04	27.8	22.83	1.51	5.4	28	23	3.03	----	3.48	CLAY	"
26.51	24.3	19.86	1.16	4.8	24	20	3.07	----	3.01	"	"
27.03	22.4	18.21	1.07	4.8	22	18	3.10	----	2.75	"	"

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-04
DATE: 02-06-2013
TIME: 14:44:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.56	24.2	19.57	0.98	4.0	16	13	3.14	----	2.99	Silty CLAY to CLAY	130-140
28.03	22.7	18.27	0.96	4.2	15	12	3.18	----	2.78	"	"
28.55	21.6	17.29	0.91	4.2	14	11	3.22	----	2.63	"	"
29.01	24.2	19.27	1.01	4.2	16	13	3.25	----	2.97	"	"
29.55	23.0	18.21	0.98	4.3	15	12	3.29	----	2.81	"	"
30.02	15.7	12.38	0.77	4.9	16	12	3.32	----	1.83	CLAY	120-130
30.52	18.1	14.21	0.76	4.2	12	9	3.35	----	2.15	Silty CLAY to CLAY	"
31.05	27.1	21.15	1.29	4.8	27	21	3.39	----	3.34	CLAY	130-140
31.56	35.5	27.56	1.59	4.5	24	18	3.42	----	4.46	Silty CLAY to CLAY	"
32.00	48.8	37.70	2.16	4.4	32	25	3.46	----	6.23	"	"
32.52	33.7	25.89	1.69	5.0	34	26	3.49	----	4.21	CLAY	"
33.04	45.6	34.83	2.05	4.5	30	23	3.53	----	5.79	Silty CLAY to CLAY	"
33.50	41.6	31.62	2.03	4.9	28	21	3.56	----	5.26	"	"
34.04	79.6	60.14	3.57	4.5	79	60	3.60	----	10.32	Very Stiff Fine Grained *	"
34.55	35.2	26.45	2.08	5.9	35	26	3.64	----	4.39	CLAY	"
35.02	29.0	21.68	1.59	5.5	29	21	3.67	----	3.56	"	"
35.51	26.1	19.40	1.34	5.1	26	19	3.71	----	3.17	"	"
36.02	28.7	21.21	1.17	4.1	19	14	3.75	----	3.51	Silty CLAY to CLAY	"
36.55	25.6	18.81	1.10	4.3	17	12	3.79	----	3.09	"	"
37.06	28.2	20.60	1.19	4.2	19	14	3.82	----	3.44	"	"
37.53	46.2	33.56	2.72	5.9	46	33	3.86	----	5.83	CLAY	"
38.05	30.8	22.24	1.44	4.7	20	15	3.90	----	3.77	Silty CLAY to CLAY	"
38.52	22.0	15.80	0.86	3.9	14	10	3.93	----	2.60	"	"
39.06	21.2	15.13	0.86	4.1	14	10	3.97	----	2.49	"	"
39.57	27.2	19.30	1.00	3.7	13	10	4.01	----	3.28	Clayey SILT to Silty CLAY	"
40.04	31.6	22.33	1.30	4.1	21	15	4.04	----	3.86	Silty CLAY to CLAY	"
40.57	31.3	22.02	1.31	4.2	21	15	4.08	----	3.82	"	"
41.04	32.2	22.56	1.41	4.4	21	15	4.11	----	3.93	"	"
41.51	31.0	21.63	1.30	4.2	20	14	4.15	----	3.77	"	"
42.05	27.5	19.09	1.06	3.9	18	13	4.19	----	3.30	"	"
42.52	24.6	17.01	0.99	4.0	16	11	4.22	----	2.91	"	"
43.03	45.4	31.25	1.97	4.3	30	21	4.26	----	5.68	"	"
43.50	51.9	35.57	1.89	3.6	26	18	4.29	----	6.54	Clayey SILT to Silty CLAY	"
44.01	19.9	13.58	0.72	3.6	13	9	4.32	----	2.27	Silty CLAY to CLAY	120-130
44.56	23.6	16.04	0.68	2.9	12	8	4.36	----	2.76	Clayey SILT to Silty CLAY	"
45.04	24.0	16.24	0.77	3.2	12	8	4.39	----	2.81	"	130-140
45.54	23.0	15.49	0.84	3.7	15	10	4.43	----	2.67	Silty CLAY to CLAY	"
46.03	25.0	16.77	1.00	4.0	16	11	4.46	----	2.93	"	"
46.51	24.1	16.09	0.96	4.0	16	11	4.50	----	2.81	"	"
47.07	27.6	18.33	1.09	3.9	18	12	4.54	----	3.27	"	"
47.51	33.7	22.29	1.81	5.4	33	22	4.57	----	4.08	CLAY	"
48.07	49.1	32.31	2.64	5.4	49	32	4.61	----	6.12	"	"
48.51	54.6	35.78	3.47	6.4	54	36	4.64	----	6.85	"	"
49.07	43.0	28.03	2.40	5.6	43	28	4.68	----	5.30	"	"
49.54	43.8	28.42	2.26	5.2	43	28	4.72	----	5.40	"	"
50.05	47.1	30.42	2.76	5.9	47	30	4.76	----	5.84	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-05
DATE: 02-06-2013
TIME: 13:00:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.58	9.9	15.84	0.65	6.6	10	16	0.07	----	1.64	CLAY	120-130
1.09	9.3	14.88	0.64	6.9	9	15	0.13	----	1.54	"	"
1.52	7.5	12.00	0.52	6.9	8	12	0.18	----	1.48	"	110-120
2.01	13.9	22.24	0.82	5.9	14	22	0.24	----	1.84	"	120-130
2.54	19.6	31.36	1.14	5.8	20	31	0.31	----	2.59	"	130-140
3.08	77.8	124.48	2.48	3.2	31	50	0.39	----	10.35	Sandy SILT to Clayey SILT	"
3.53	109.1	174.56	4.51	4.1	109	175	0.45	----	14.52	Very Stiff Fine Grained *	"
4.08	135.7	217.12	6.13	4.5	136	217	0.52	----	18.06	"	>140
4.55	66.7	106.72	4.68	7.0	67	107	0.59	----	8.85	"	130-140
5.06	85.5	136.80	5.73	6.7	85	137	0.66	----	11.36	"	>140
5.53	119.4	191.04	8.21	6.9	119	191	0.72	----	15.87	"	"
6.06	105.7	169.12	8.86	8.4	106	169	0.80	----	14.04	"	"
6.51	103.8	159.66	8.36	8.1	104	160	0.86	----	13.78	"	"
7.02	117.4	172.14	7.68	6.5	117	172	0.93	----	15.59	"	"
7.53	128.1	179.02	5.99	4.7	128	179	1.00	----	17.01	"	"
8.04	132.5	180.26	5.51	4.2	132	180	1.08	----	17.59	"	"
8.55	133.2	176.25	7.62	5.7	133	176	1.15	----	17.68	"	"
9.03	90.1	116.07	7.57	8.4	90	116	1.21	----	11.93	"	"
9.51	51.3	64.41	5.31	10.4	51	64	1.28	----	6.75	CLAY	130-140
10.08	38.3	46.69	3.52	9.2	38	47	1.36	----	5.02	"	"
10.57	42.6	50.58	3.69	8.7	42	50	1.42	----	5.59	"	"
11.05	52.6	60.81	4.20	8.0	53	61	1.49	----	6.91	"	"
11.52	65.6	74.25	4.93	7.5	66	74	1.55	----	8.64	Very Stiff Fine Grained *	"
12.02	62.9	69.67	4.90	7.8	63	70	1.62	----	8.28	"	"
12.51	73.6	79.68	5.16	7.0	74	80	1.69	----	9.70	"	>140
13.08	80.0	84.47	5.84	7.3	80	84	1.77	----	10.55	"	"
13.55	66.5	69.20	5.16	7.8	66	69	1.83	----	8.74	"	130-140
14.04	70.7	72.41	5.59	7.9	71	72	1.90	----	9.30	"	>140
14.51	70.8	71.40	5.44	7.7	71	71	1.96	----	9.31	"	"
15.01	62.0	61.96	4.84	7.8	62	62	2.03	----	8.13	"	130-140
15.58	55.1	54.98	3.95	7.2	55	55	2.11	----	7.21	CLAY	"
16.07	59.5	59.29	4.21	7.1	59	59	2.18	----	7.79	Very Stiff Fine Grained *	"
16.56	60.1	59.81	4.60	7.7	60	60	2.24	----	7.86	"	"
17.05	53.7	53.37	4.36	8.1	54	53	2.31	----	7.01	CLAY	"
17.55	40.3	40.00	3.30	8.2	40	40	2.37	----	5.22	"	"
18.01	41.3	40.94	3.21	7.8	41	41	2.44	----	5.34	"	"
18.51	25.0	24.72	1.83	7.3	25	25	2.50	----	3.17	"	"
19.02	25.6	24.72	1.75	6.8	26	25	2.57	----	3.24	"	"
19.51	38.1	35.96	2.50	6.6	38	36	2.64	----	4.90	"	"
20.02	35.8	32.97	2.47	6.9	36	33	2.71	----	4.59	"	"
20.53	23.3	20.94	1.43	6.1	23	21	2.78	----	2.92	"	"
21.05	22.6	20.03	1.23	5.4	22	20	2.81	----	2.82	"	"
21.56	18.3	15.99	1.14	6.2	18	16	2.85	----	2.25	"	"
22.08	31.1	26.79	1.40	4.5	21	18	2.89	----	3.95	Silty CLAY to CLAY	"
22.51	37.1	31.58	1.70	4.6	25	21	2.92	----	4.74	"	"
23.01	35.2	29.54	1.61	4.6	23	20	2.96	----	4.49	"	"
23.51	38.0	31.43	1.92	5.1	38	31	2.99	----	4.85	CLAY	"
24.00	33.9	27.85	1.87	5.5	34	28	3.03	----	4.30	"	"
24.54	28.1	22.96	1.54	5.5	28	23	3.07	----	3.53	"	"
25.05	26.7	21.70	1.35	5.1	27	22	3.11	----	3.33	"	"
25.56	22.4	18.11	1.27	5.7	22	18	3.14	----	2.76	"	"
26.07	18.9	15.20	1.14	6.0	19	15	3.18	----	2.29	"	"
26.56	21.7	17.37	1.16	5.3	22	17	3.21	----	2.65	"	"
27.05	19.7	15.69	1.11	5.6	20	16	3.25	----	2.38	"	"

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-05
DATE: 02-06-2013
TIME: 13:00:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.56	20.6	16.31	1.05	5.1	21	16	3.29	----	2.50	CLAY	130-140
28.02	40.6	32.00	1.98	4.9	27	21	3.32	----	5.16	Silty CLAY to CLAY	"
28.53	42.0	32.92	1.57	3.7	21	16	3.36	----	5.34	Clayey SILT to Silty CLAY	"
29.00	44.6	34.78	2.60	5.8	44	35	3.39	----	5.69	CLAY	"
29.58	38.0	29.45	2.45	6.4	38	29	3.43	----	4.80	"	"
30.00	20.5	15.82	0.97	4.7	20	16	3.46	----	2.46	"	"
30.53	27.6	21.17	1.51	5.5	28	21	3.50	----	3.40	"	"
31.08	27.6	21.05	1.81	6.6	28	21	3.54	----	3.40	"	"
31.54	24.0	18.21	1.30	5.4	24	18	3.58	----	2.92	"	"
32.01	33.9	25.59	1.93	5.7	34	25	3.61	----	4.23	"	"
32.56	34.7	26.03	2.20	6.3	35	26	3.65	----	4.33	"	"
33.06	27.4	20.44	1.45	5.3	27	20	3.69	----	3.36	"	"
33.52	25.5	18.92	1.27	5.0	25	19	3.72	----	3.10	"	"
34.01	26.4	19.49	1.46	5.5	26	19	3.76	----	3.21	"	"
34.56	26.3	19.29	1.36	5.2	26	19	3.80	----	3.20	"	"
35.07	23.8	17.36	2.00	8.4	24	17	3.83	----	2.86	"	"
35.54	14.4	10.44	1.15	8.0	14	10	3.87	----	1.60	"	"
36.01	14.7	10.61	0.73	5.0	15	10	3.90	----	1.64	"	120-130
36.56	51.3	36.80	2.55	5.0	34	24	3.94	----	6.51	Silty CLAY to CLAY	130-140
37.04	47.8	34.10	1.45	3.0	19	14	3.97	----	6.04	Sandy SILT to Clayey SILT	"
37.52	12.1	8.59	0.63	5.2	12	8	4.00	----	1.28	CLAY	120-130
38.07	22.2	15.68	1.27	5.7	22	16	4.04	----	2.62	"	130-140
38.55	15.4	10.84	0.77	5.0	15	11	4.07	----	1.71	"	120-130
39.03	36.1	25.31	1.86	5.2	36	25	4.11	----	4.46	"	130-140
39.56	33.6	23.44	1.96	5.8	33	23	4.14	----	4.12	"	"
40.00	21.6	15.01	0.90	4.2	14	10	4.18	----	2.52	Silty CLAY to CLAY	"
40.55	26.0	17.98	0.91	3.5	13	9	4.22	----	3.10	Clayey SILT to Silty CLAY	"
41.02	30.3	20.87	0.99	3.3	15	10	4.25	----	3.67	"	"
41.56	25.4	17.41	0.93	3.7	13	9	4.29	----	3.01	"	"
42.04	30.3	20.68	1.00	3.3	15	10	4.32	----	3.66	"	"
42.53	27.7	18.82	0.98	3.5	14	9	4.36	----	3.31	"	"
43.04	27.2	18.39	0.82	3.0	14	9	4.40	----	3.24	"	"
43.56	34.7	23.36	1.04	3.0	17	12	4.43	----	4.24	"	"
44.07	38.7	25.93	1.30	3.4	19	13	4.47	----	4.76	"	"
44.54	42.5	28.35	1.60	3.8	21	14	4.51	----	5.27	"	"
45.03	28.0	18.59	0.84	3.0	14	9	4.54	----	3.33	"	"
45.50	29.7	19.63	0.96	3.2	15	10	4.58	----	3.55	"	"
46.05	33.2	21.83	1.94	5.8	33	22	4.62	----	4.01	CLAY	"
46.51	79.5	52.06	3.49	4.4	40	26	4.65	----	10.18	Clayey SILT to Silty CLAY	"
47.02	92.5	60.26	5.15	5.6	92	60	4.69	----	11.91	Very Stiff Fine Grained *	>140
47.56	56.2	36.42	2.91	5.2	56	36	4.73	----	7.07	CLAY	130-140
48.04	35.4	22.84	1.73	4.9	35	23	4.76	----	4.29	"	"
48.55	30.8	19.78	1.43	4.6	20	13	4.80	----	3.67	Silty CLAY to CLAY	"
49.00	34.5	22.05	1.43	4.1	23	15	4.83	----	4.16	"	"
49.54	29.3	18.63	1.32	4.5	19	12	4.87	----	3.46	"	"
50.03	29.6	18.73	1.31	4.4	20	12	4.91	----	3.50	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 34.0 feet

CPT NO.: CPT-06
DATE: 02-06-2013
TIME: 12:26:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.54	10.1	16.16	0.55	5.4	10	16	0.06	----	1.68	CLAY	120-130
1.05	7.1	11.36	0.24	3.4	7	11	0.12	----	1.41	"	100-110
1.58	5.9	9.44	0.15	2.5	4	6	0.17	----	1.16	Silty CLAY to CLAY	90-100
2.01	7.7	12.32	0.20	2.6	5	8	0.21	----	1.52	"	100-110
2.53	55.5	88.80	3.33	6.0	55	88	0.28	----	7.38	CLAY	130-140
3.09	138.1	220.96	9.39	6.8	138	221	0.36	----	18.39	Very Stiff Fine Grained *	>140
3.54	141.8	226.88	8.59	6.1	142	226	0.42	----	18.88	"	"
4.07	161.4	258.24	9.87	6.1	161	258	0.50	----	21.49	"	"
4.54	162.6	260.16	10.57	6.5	162	260	0.56	----	21.64	"	"
5.06	180.7	289.12	8.11	4.5	181	289	0.64	----	24.05	"	"
5.52	180.4	288.64	7.27	4.0	90	144	0.70	44	----	SAND to Clayey SAND *	"
6.05	163.6	261.76	6.62	4.0	164	262	0.78	----	21.76	Very Stiff Fine Grained *	"
6.58	130.7	202.66	5.07	3.9	65	101	0.85	42	----	SAND to Clayey SAND *	"
7.07	126.3	187.16	5.37	4.3	126	187	0.92	----	16.78	Very Stiff Fine Grained *	"
7.52	129.1	183.47	4.45	3.4	52	73	0.98	----	17.15	Sandy SILT to Clayey SILT	130-140
8.05	129.3	177.69	3.07	2.4	43	59	1.05	41	----	Silty SAND to Sandy SILT	"
8.53	130.2	174.56	4.41	3.4	52	70	1.11	----	17.29	Sandy SILT to Clayey SILT	"
9.04	103.1	134.36	5.77	5.6	103	134	1.19	----	13.67	Very Stiff Fine Grained *	>140
9.53	111.4	141.27	5.33	4.8	111	141	1.25	----	14.77	"	"
10.05	97.6	120.32	5.19	5.3	98	120	1.33	----	12.92	"	"
10.53	82.2	98.80	4.30	5.2	82	99	1.39	----	10.87	"	130-140
11.07	122.2	142.60	2.48	2.0	41	47	1.46	40	----	Silty SAND to Sandy SILT	"
11.56	166.8	189.92	4.50	2.7	56	63	1.53	42	----	"	"
12.04	113.3	126.37	4.78	4.2	113	126	1.60	----	15.00	Very Stiff Fine Grained *	"
12.54	135.1	147.44	3.64	2.7	45	49	1.66	40	----	Silty SAND to Sandy SILT	"
13.02	90.9	97.08	3.19	3.5	36	39	1.73	----	12.00	Sandy SILT to Clayey SILT	"
13.56	112.2	117.56	3.28	2.9	45	47	1.80	----	14.84	"	"
14.04	104.5	107.87	4.11	3.9	52	54	1.87	----	13.81	Clayey SILT to Silty CLAY	"
14.51	76.6	77.89	2.32	3.0	31	31	1.93	----	10.08	Sandy SILT to Clayey SILT	"
15.07	103.5	103.49	4.39	4.2	103	103	2.00	----	13.67	Very Stiff Fine Grained *	"
15.55	77.6	77.49	4.20	5.4	78	77	2.07	----	10.21	"	"
16.04	72.6	72.40	2.73	3.8	36	36	2.14	----	9.54	Clayey SILT to Silty CLAY	"
16.52	65.0	64.74	2.37	3.6	32	32	2.20	----	8.52	"	"
17.01	58.6	58.29	2.41	4.1	29	29	2.27	----	7.66	"	"
17.58	67.9	67.43	2.37	3.5	27	27	2.34	----	8.90	Sandy SILT to Clayey SILT	"
18.06	125.7	124.67	5.06	4.0	126	125	2.41	----	16.60	Very Stiff Fine Grained *	>140
18.56	121.5	120.34	3.38	2.8	40	40	2.48	39	----	Silty SAND to Sandy SILT	130-140
19.05	115.6	112.76	2.96	2.6	39	38	2.54	39	----	"	"
19.53	135.8	129.52	2.77	2.0	45	43	2.61	39	----	"	"
20.10	97.1	90.17	4.49	4.6	97	90	2.69	----	12.77	Very Stiff Fine Grained *	"
20.58	59.5	53.98	4.03	6.8	59	54	2.75	----	7.75	"	"
21.09	62.7	56.11	2.95	4.7	42	37	2.79	----	8.17	Silty CLAY to CLAY	"
21.55	68.3	60.37	3.34	4.9	68	60	2.82	----	8.91	Very Stiff Fine Grained *	"
22.04	64.1	55.90	3.43	5.4	64	56	2.86	----	8.35	"	"
22.51	46.2	39.77	3.17	6.9	46	40	2.89	----	5.96	CLAY	"
23.07	40.1	33.98	2.67	6.7	40	34	2.93	----	5.14	"	"
23.57	37.1	31.00	2.50	6.7	37	31	2.97	----	4.74	"	"
24.04	52.9	43.63	3.17	6.0	53	44	3.00	----	6.84	"	"
24.56	58.4	47.91	3.70	6.3	58	48	3.04	----	7.57	Very Stiff Fine Grained *	"
25.07	80.1	65.38	3.95	4.9	80	65	3.08	----	10.46	"	"
25.52	38.8	31.52	2.70	7.0	39	31	3.11	----	4.95	CLAY	"
26.05	61.9	50.01	3.55	5.7	62	50	3.15	----	8.02	Very Stiff Fine Grained *	"
26.54	47.0	37.78	2.97	6.3	47	38	3.18	----	6.03	CLAY	"
27.03	61.5	49.18	3.91	6.4	61	49	3.22	----	7.96	Very Stiff Fine Grained *	"

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 34.0 feet

CPT NO.: CPT-06
DATE: 02-06-2013
TIME: 12:26:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.56	47.0	37.38	3.10	6.6	47	37	3.26	----	6.02	CLAY	130-140
28.06	47.3	37.42	3.11	6.6	47	37	3.29	----	6.06	"	"
28.55	39.1	30.77	2.69	6.9	39	31	3.33	----	4.96	"	"
29.03	39.4	30.85	2.52	6.4	39	31	3.36	----	4.99	"	"
29.53	50.4	39.26	3.01	6.0	50	39	3.40	----	6.46	"	"
30.07	61.0	47.24	3.65	6.0	61	47	3.44	----	7.86	Very Stiff Fine Grained *	"
30.54	134.2	103.36	6.43	4.8	134	103	3.48	----	17.62	"	>140
31.04	61.5	47.11	4.29	7.0	61	47	3.51	----	7.92	"	130-140
31.51	94.7	72.15	4.96	5.2	95	72	3.55	----	12.34	"	>140
32.07	117.3	88.82	3.92	3.3	47	35	3.59	----	15.35	Sandy SILT to Clayey SILT	130-140
32.54	145.3	109.41	7.17	4.9	145	109	3.63	----	19.08	Very Stiff Fine Grained *	>140
33.01	220.7	165.26	10.86	4.9	221	165	3.66	----	29.13	"	"
33.52	369.8	275.22	18.48	5.0	370	275	3.70	----	49.01	"	"
34.03	332.5	245.93	16.36	4.9	332	245	3.74	----	44.03	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 42.5 feet

CPT NO.: CPT-07
DATE: 02-06-2013
TIME: 10:17:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.52	6.5	10.40	0.20	3.1	6	10	0.06	----	1.29	CLAY	100-110
1.05	2.5	4.00	0.08	3.2	2	4	0.11	----	0.49	"	85-90
1.52	0.4	0.64	0.03	7.5	0	0	0.15	----	0.07	Organic Material	"
2.08	0.8	1.28	0.06	7.5	1	1	0.20	----	0.14	"	"
2.58	5.4	8.64	0.38	7.0	5	8	0.25	----	1.06	CLAY	100-110
3.01	7.9	12.64	0.53	6.7	8	12	0.30	----	1.55	"	110-120
3.50	7.8	12.48	0.48	6.2	7	12	0.36	----	1.52	"	"
4.04	12.8	20.48	0.68	5.3	12	20	0.42	----	1.68	"	120-130
4.55	18.4	29.44	0.92	5.0	18	29	0.49	----	2.42	"	"
5.02	22.2	35.52	1.08	4.9	22	35	0.55	----	2.92	"	130-140
5.53	34.5	55.20	1.39	4.0	23	36	0.62	----	4.56	Silty CLAY to CLAY	"
6.03	38.7	61.92	1.59	4.1	19	30	0.69	----	5.11	Clayey SILT to Silty CLAY	"
6.53	49.0	78.40	2.11	4.3	32	51	0.75	----	6.48	Silty CLAY to CLAY	"
7.02	57.3	90.58	3.01	5.3	57	90	0.82	----	7.59	CLAY	"
7.53	41.0	62.00	2.68	6.5	41	62	0.89	----	5.41	"	"
8.03	40.9	59.06	2.44	6.0	41	58	0.96	----	5.39	"	"
8.53	37.5	52.06	2.61	7.0	37	52	1.02	----	4.93	"	"
9.07	48.6	65.63	3.07	6.3	48	65	1.10	----	6.41	"	"
9.56	66.5	87.47	3.53	5.3	66	87	1.16	----	8.79	Very Stiff Fine Grained *	"
10.04	61.6	78.98	3.38	5.5	61	78	1.23	----	8.13	"	"
10.56	62.2	77.60	3.28	5.3	61	76	1.30	----	8.21	"	"
11.08	89.2	108.27	3.99	4.5	88	107	1.37	----	11.80	"	"
11.54	69.1	81.79	3.40	4.9	68	81	1.43	----	9.12	"	"
12.02	77.3	89.10	3.36	4.3	38	44	1.49	----	10.21	Clayey SILT to Silty CLAY	"
12.56	110.5	124.39	4.02	3.6	44	50	1.57	----	14.63	Sandy SILT to Clayey SILT	"
13.06	134.0	147.63	4.54	3.4	54	59	1.63	----	17.76	"	"
13.54	92.3	99.52	4.59	5.0	92	99	1.70	----	12.19	Very Stiff Fine Grained *	"
14.02	55.1	58.22	3.32	6.0	55	58	1.76	----	7.23	CLAY	"
14.56	40.3	41.87	2.91	7.2	40	41	1.84	----	5.25	"	"
15.03	57.1	58.47	3.47	6.1	57	58	1.90	----	7.49	"	"
15.56	35.8	36.04	2.05	5.7	35	36	1.97	----	4.64	"	"
16.07	65.2	65.15	3.05	4.7	43	43	2.04	----	8.56	Silty CLAY to CLAY	"
16.55	47.2	47.10	3.26	6.9	47	47	2.11	----	6.15	CLAY	"
17.06	65.2	64.97	3.23	5.0	65	65	2.18	----	8.55	Very Stiff Fine Grained *	"
17.56	74.7	74.34	3.34	4.5	37	37	2.24	----	9.81	Clayey SILT to Silty CLAY	"
18.05	56.8	56.45	3.82	6.7	56	56	2.31	----	7.42	CLAY	"
18.53	68.6	68.09	3.91	5.7	68	68	2.37	----	8.99	Very Stiff Fine Grained *	"
19.03	66.9	66.31	2.39	3.6	33	33	2.44	----	8.76	Clayey SILT to Silty CLAY	"
19.52	109.2	107.87	2.90	2.7	36	36	2.51	38	----	Silty SAND to Sandy SILT	"
20.06	102.1	98.30	5.42	5.3	102	98	2.58	----	13.44	Very Stiff Fine Grained *	>140
20.54	58.0	54.59	3.72	6.4	58	54	2.65	----	7.56	CLAY	130-140
21.03	73.3	68.15	4.50	6.1	73	68	2.68	----	9.59	Very Stiff Fine Grained *	"
21.57	57.7	52.90	3.65	6.3	57	52	2.72	----	7.51	CLAY	"
22.06	57.5	52.04	3.46	6.0	57	52	2.76	----	7.48	"	"
22.51	65.3	58.39	2.29	3.5	33	29	2.79	----	8.51	Clayey SILT to Silty CLAY	"
23.03	130.9	115.41	3.11	2.4	44	38	2.83	39	----	Silty SAND to Sandy SILT	"
23.52	114.3	99.45	2.91	2.5	38	33	2.86	38	----	"	"
24.01	50.3	43.17	2.83	5.6	50	43	2.90	----	6.50	CLAY	"
24.56	61.8	52.22	2.74	4.4	31	26	2.94	----	8.03	Clayey SILT to Silty CLAY	"
25.07	87.4	72.79	2.95	3.4	35	29	2.98	----	11.44	Sandy SILT to Clayey SILT	"
25.57	178.2	146.76	5.13	2.9	59	49	3.01	40	----	Silty SAND to Sandy SILT	"
26.03	146.3	119.93	4.94	3.4	55	45	3.05	----	19.28	Sandy SILT to Clayey SILT	"
26.54	125.6	102.42	4.14	3.3	47	38	3.08	----	16.52	"	"
27.03	75.5	61.26	3.31	4.4	35	29	3.12	----	9.83	Clayey SILT to Silty CLAY	"

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 42.5 feet

CPT NO.: CPT-07
DATE: 02-06-2013
TIME: 10:17:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.51	119.3	96.32	4.61	3.9	57	46	3.15	----	15.67	"	"
28.07	113.0	90.71	4.52	4.0	107	86	3.19	----	14.82	Very Stiff Fine Grained *	"
28.52	115.7	92.43	4.73	4.1	111	89	3.23	----	15.18	"	"
29.08	138.3	109.84	5.21	3.8	65	52	3.27	39	----	SAND to Clayey SAND *	"
29.55	132.5	104.72	4.84	3.7	50	40	3.30	----	17.41	Sandy SILT to Clayey SILT	"
30.00	96.0	75.51	4.53	4.7	92	73	3.33	----	12.54	Very Stiff Fine Grained *	"
30.56	144.4	112.86	6.28	4.3	139	108	3.38	----	18.99	"	>140
31.02	140.1	108.92	6.39	4.6	133	103	3.41	----	18.41	"	"
31.51	182.9	141.40	10.22	5.6	182	140	3.45	----	24.11	"	"
32.07	127.8	98.21	5.09	4.0	123	95	3.49	----	16.76	"	130-140
32.50	136.0	103.98	6.92	5.1	132	101	3.53	----	17.85	"	>140
33.05	93.8	71.29	4.31	4.6	92	70	3.56	----	12.22	"	130-140
33.58	133.4	100.75	6.45	4.8	131	99	3.61	----	17.49	"	>140
34.05	67.5	50.71	2.95	4.4	33	25	3.64	----	8.70	Clayey SILT to Silty CLAY	130-140
34.54	68.4	51.11	2.64	3.9	34	25	3.68	----	8.82	"	"
35.02	118.6	88.11	6.48	5.5	118	87	3.71	----	15.51	Very Stiff Fine Grained *	>140
35.50	68.9	50.91	3.65	5.3	67	50	3.75	----	8.87	"	130-140
36.03	98.4	72.28	3.92	4.0	48	35	3.79	----	12.80	Clayey SILT to Silty CLAY	"
36.57	153.2	111.80	7.46	4.9	152	111	3.83	----	20.10	Very Stiff Fine Grained *	>140
37.01	136.3	98.93	8.27	6.1	136	98	3.86	----	17.85	"	"
37.54	247.1	178.17	8.34	3.4	123	89	3.90	41	----	SAND to Clayey SAND *	"
38.08	100.7	72.13	5.04	5.0	100	72	3.95	----	13.09	Very Stiff Fine Grained *	"
38.54	33.3	23.72	1.70	5.1	33	23	3.98	----	4.10	CLAY	130-140
39.07	39.2	27.77	2.35	6.0	38	27	4.02	----	4.88	"	"
39.55	80.0	56.44	4.28	5.4	79	56	4.05	----	10.32	Very Stiff Fine Grained *	"
40.01	92.6	65.07	3.47	3.7	45	32	4.09	----	11.99	Clayey SILT to Silty CLAY	"
40.54	271.5	189.84	12.14	4.5	269	188	4.13	----	35.84	Very Stiff Fine Grained *	>140
41.04	293.2	204.04	11.37	3.9	145	101	4.17	42	----	SAND to Clayey SAND *	"
41.56	249.9	173.05	9.21	3.7	121	84	4.21	41	----	"	"
42.03	340.1	234.46	10.80	3.2	169	117	4.24	43	----	"	"
42.51	296.5	203.45	14.79	5.0	296	203	4.28	----	39.16	Very Stiff Fine Grained *	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 28.0 feet

CPT NO.: CPT-08
DATE: 02-06-2013
TIME: 13:27:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.51	5.7	9.12	0.55	9.6	6	9	0.06	----	1.13	Organic Material	110-120
1.03	4.2	6.72	0.40	9.5	4	7	0.11	----	0.83	"	100-110
1.54	8.4	13.44	0.54	6.4	8	13	0.17	----	1.66	CLAY	110-120
2.05	22.1	35.36	1.72	7.8	22	35	0.24	----	2.93	"	130-140
2.57	37.0	59.20	3.04	8.2	37	59	0.31	----	4.91	"	"
3.08	45.7	73.12	4.21	9.2	46	73	0.38	----	6.07	"	"
3.54	49.7	79.52	4.99	10.0	50	79	0.44	----	6.60	"	"
4.04	68.6	109.76	5.91	8.6	68	109	0.51	----	9.11	Very Stiff Fine Grained *	>140
4.57	87.0	139.20	7.47	8.6	87	139	0.59	----	11.56	"	"
5.05	85.8	137.28	7.75	9.0	86	137	0.65	----	11.40	"	"
5.52	85.1	136.16	7.58	8.9	85	136	0.72	----	11.30	"	"
6.06	77.4	123.84	6.92	8.9	77	124	0.79	----	10.27	"	"
6.50	74.7	115.30	6.51	8.7	75	115	0.86	----	9.90	"	"
7.05	71.3	104.59	6.03	8.5	71	104	0.93	----	9.44	"	"
7.53	62.5	87.64	4.91	7.9	62	87	1.00	----	8.27	"	130-140
8.03	57.5	78.53	4.37	7.6	57	78	1.07	----	7.60	CLAY	"
8.53	50.5	67.21	3.93	7.8	50	67	1.13	----	6.66	"	"
9.06	55.3	71.54	4.00	7.2	55	71	1.20	----	7.29	"	"
9.54	52.1	65.68	3.89	7.5	52	66	1.27	----	6.86	"	"
10.02	47.9	58.90	3.82	8.0	48	59	1.33	----	6.30	"	"
10.52	50.9	60.95	3.87	7.6	51	61	1.40	----	6.69	"	"
11.08	52.1	60.47	3.92	7.5	52	60	1.48	----	6.85	"	"
11.51	56.5	64.27	4.24	7.5	56	64	1.53	----	7.43	"	"
12.01	58.5	65.12	4.08	7.0	58	65	1.60	----	7.69	Very Stiff Fine Grained *	"
12.53	74.8	81.30	5.16	6.9	75	81	1.68	----	9.86	"	>140
13.03	73.3	77.82	5.71	7.8	73	78	1.75	----	9.66	"	"
13.52	123.6	129.10	7.45	6.0	123	129	1.81	----	16.36	"	"
14.01	170.5	175.30	7.68	4.5	170	175	1.88	----	22.61	"	"
14.54	135.2	136.61	6.21	4.6	135	136	1.96	----	17.90	"	"
15.03	44.7	44.68	3.72	8.3	45	44	2.02	----	5.83	CLAY	130-140
15.52	36.7	36.63	2.20	6.0	37	37	2.09	----	4.75	"	"
16.00	40.1	39.98	2.32	5.8	40	40	2.15	----	5.20	"	"
16.58	49.5	49.27	2.67	5.4	49	49	2.23	----	6.45	"	"
17.08	57.0	56.66	3.12	5.5	57	56	2.30	----	7.45	"	"
17.52	60.1	59.67	3.39	5.6	60	59	2.36	----	7.86	Very Stiff Fine Grained *	"
18.03	58.8	58.30	3.02	5.1	59	58	2.43	----	7.68	"	"
18.53	50.9	50.40	2.90	5.7	51	50	2.50	----	6.62	CLAY	"
19.04	41.9	40.59	2.19	5.2	42	40	2.56	----	5.42	"	"
19.53	46.3	43.84	2.16	4.7	31	29	2.63	----	6.00	Silty CLAY to CLAY	"
20.01	47.6	44.06	2.42	5.1	47	44	2.70	----	6.17	CLAY	"
20.52	47.9	43.24	2.54	5.3	48	43	2.76	----	6.20	"	"
21.03	53.4	47.55	2.71	5.1	35	32	2.80	----	6.93	Silty CLAY to CLAY	"
21.52	58.7	51.58	3.04	5.2	59	51	2.84	----	7.63	Very Stiff Fine Grained *	"
22.01	60.8	52.71	3.40	5.6	61	53	2.87	----	7.91	"	"
22.57	51.1	43.61	2.91	5.7	51	43	2.91	----	6.61	CLAY	"
23.07	50.2	42.26	2.91	5.8	50	42	2.95	----	6.49	"	"
23.54	56.0	46.51	2.98	5.3	56	46	2.98	----	7.26	"	"
24.04	66.0	54.30	4.65	7.0	66	54	3.02	----	8.58	Very Stiff Fine Grained *	"
24.54	74.6	61.06	4.18	5.6	74	61	3.06	----	9.73	"	"
25.00	75.6	61.59	3.85	5.1	75	61	3.09	----	9.86	"	"
25.51	50.0	40.52	3.03	6.1	50	40	3.13	----	6.44	CLAY	"
26.08	146.8	117.90	9.67	6.6	147	118	3.19	----	19.34	"	"

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 28.0 feet

CPT NO.: CPT-08
DATE: 02-06-2013
TIME: 13:27:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
26.54	150.0	120.19	10.64	7.1	150	120	3.21	----	19.76	Very Stiff Fine Grained *	>140
27.07	211.0	168.07	14.64	6.9	211	168	3.25	----	27.89	"	"
27.50	164.4	130.31	14.43	8.8	164	130	3.28	----	21.67	"	"
28.03	223.2	175.86	14.50	6.5	223	176	3.32	----	29.51	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance Fs = Sleeve friction resistance Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density** Phi = Soil friction angle* Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test* (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988 ** Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 40.5 feet

CPT NO.: CPT-09
DATE: 02-06-2013
TIME: 11:57:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.55	3.8	6.08	0.04	1.1	2	3	0.06	----	0.75	Sensitive Fine Grained	85-90
1.00	0.7	1.12	0.01	1.4	1	1	0.10	----	0.13	Organic Material	80-85
1.53	3.6	5.76	0.22	6.1	4	6	0.15	----	0.71	CLAY	90-100
2.05	11.6	18.56	1.12	9.7	12	18	0.21	----	1.92	"	120-130
2.52	19.1	30.56	1.58	8.3	19	30	0.28	----	2.53	"	130-140
3.07	26.7	42.72	1.89	7.1	27	43	0.35	----	3.54	"	"
3.53	24.6	39.36	1.63	6.6	25	39	0.41	----	3.25	"	"
4.05	28.1	44.96	1.50	5.3	28	45	0.48	----	3.71	"	"
4.57	32.8	52.48	2.65	8.1	33	52	0.55	----	4.34	"	"
5.00	37.2	59.52	3.11	8.4	37	59	0.61	----	4.92	"	"
5.51	44.4	71.04	3.52	7.9	44	71	0.68	----	5.87	"	"
6.02	64.7	103.52	4.63	7.2	65	103	0.75	----	8.58	Very Stiff Fine Grained *	"
6.52	78.7	124.29	5.84	7.4	79	124	0.82	----	10.44	"	>140
7.03	150.4	226.79	7.45	5.0	150	226	0.89	----	19.99	"	"
7.53	125.6	180.60	9.38	7.5	125	180	0.96	----	16.68	"	"
8.03	90.4	125.09	7.27	8.0	90	125	1.03	----	11.98	"	"
8.55	118.0	158.83	8.91	7.6	118	159	1.10	----	15.66	"	"
9.06	136.9	179.20	9.46	6.9	137	179	1.18	----	18.17	"	"
9.54	126.2	160.70	8.98	7.1	126	160	1.24	----	16.74	"	"
10.02	113.3	140.64	8.94	7.9	113	140	1.31	----	15.02	"	"
10.53	62.6	75.54	5.84	9.3	62	75	1.38	----	8.25	"	"
11.02	52.5	61.68	4.48	8.5	52	61	1.45	----	6.90	CLAY	130-140
11.52	52.4	59.98	4.29	8.2	52	60	1.51	----	6.89	"	"
12.01	63.2	70.83	4.77	7.5	63	71	1.58	----	8.32	Very Stiff Fine Grained *	"
12.50	68.7	75.34	5.06	7.4	69	75	1.65	----	9.05	"	"
13.07	84.3	90.03	5.97	7.1	84	90	1.73	----	11.12	"	>140
13.52	67.4	70.83	5.20	7.7	67	71	1.79	----	8.87	"	130-140
14.07	80.7	83.32	5.68	7.0	81	83	1.86	----	10.64	"	>140
14.56	90.9	92.34	7.05	7.8	91	92	1.93	----	11.99	"	"
15.05	82.6	82.60	6.09	7.4	83	82	2.00	----	10.88	"	"
15.52	60.1	60.02	5.25	8.7	60	60	2.07	----	7.88	"	130-140
16.06	72.1	71.90	5.19	7.2	72	72	2.14	----	9.47	"	>140
16.52	81.0	80.67	6.80	8.4	81	80	2.21	----	10.65	"	"
17.06	115.2	114.55	6.25	5.4	115	114	2.28	----	15.21	"	"
17.50	81.0	80.44	6.56	8.1	81	80	2.34	----	10.64	"	"
18.06	138.3	137.14	5.20	3.8	69	69	2.42	40	----	SAND to Clayey SAND *	"
18.52	88.8	87.94	4.50	5.1	89	88	2.48	----	11.67	Very Stiff Fine Grained *	130-140
19.06	87.9	85.32	6.71	7.6	88	85	2.56	----	11.55	"	>140
19.51	91.3	86.71	7.16	7.8	91	87	2.62	----	12.00	"	"
20.06	81.4	75.23	7.06	8.7	81	75	2.70	----	10.67	"	"
20.50	72.7	65.71	6.25	8.6	73	66	2.76	----	9.51	"	"
21.09	87.2	77.50	7.21	8.3	87	77	2.81	----	11.44	"	"
21.55	87.5	76.74	7.12	8.1	87	77	2.84	----	11.47	"	"
22.00	57.1	49.46	4.99	8.7	57	49	2.88	----	7.42	CLAY	130-140
22.53	49.8	42.51	3.56	7.1	50	42	2.91	----	6.44	"	"
23.04	74.0	62.26	4.78	6.5	74	62	2.95	----	9.66	Very Stiff Fine Grained *	"
23.53	65.3	54.17	4.23	6.5	65	54	2.99	----	8.49	"	"
24.00	67.0	55.12	4.91	7.3	67	55	3.02	----	8.72	"	"
24.57	56.9	46.54	3.91	6.9	57	46	3.06	----	7.37	CLAY	"
25.05	45.2	36.79	3.75	8.3	45	37	3.10	----	5.80	"	"
25.54	45.0	36.44	3.62	8.0	45	36	3.13	----	5.77	"	"
26.02	54.0	43.51	4.41	8.2	54	43	3.17	----	6.97	"	"
26.57	77.6	62.15	5.22	6.7	77	62	3.21	----	10.11	Very Stiff Fine Grained *	>140
27.07	56.6	45.10	4.01	7.1	56	45	3.25	----	7.30	CLAY	130-140

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 40.5 feet

CPT NO.: CPT-09
DATE: 02-06-2013
TIME: 11:57:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.53	38.6	30.60	2.36	6.1	39	31	3.28	----	4.90	CLAY	130-140
28.00	55.1	43.47	2.88	5.2	55	43	3.31	----	7.09	"	"
28.57	48.4	37.96	2.76	5.7	48	38	3.35	----	6.20	"	"
29.04	63.3	49.39	4.19	6.6	63	49	3.39	----	8.18	Very Stiff Fine Grained *	"
29.53	72.9	56.58	4.80	6.6	73	56	3.42	----	9.45	"	"
30.01	48.7	37.60	2.49	5.1	49	37	3.46	----	6.22	CLAY	"
30.52	55.9	42.93	2.51	4.5	37	29	3.50	----	7.18	Silty CLAY to CLAY	"
31.01	37.9	28.95	2.14	5.6	38	29	3.53	----	4.77	CLAY	"
31.57	43.5	33.02	1.83	4.2	22	16	3.57	----	5.52	Clayey SILT to Silty CLAY	"
32.03	43.8	33.08	1.97	4.5	29	22	3.61	----	5.55	Silty CLAY to CLAY	"
32.52	42.0	31.55	2.24	5.3	42	31	3.64	----	5.31	CLAY	"
33.05	27.8	20.76	1.71	6.2	28	21	3.68	----	3.41	"	"
33.54	39.7	29.49	2.21	5.6	40	29	3.72	----	4.99	"	"
34.05	58.2	42.98	2.64	4.5	39	29	3.75	----	7.45	Silty CLAY to CLAY	"
34.54	47.7	35.03	3.10	6.5	47	35	3.79	----	6.05	CLAY	"
35.01	50.2	36.67	2.97	5.9	50	37	3.82	----	6.38	"	"
35.56	67.0	48.63	4.01	6.0	67	48	3.86	----	8.61	Very Stiff Fine Grained *	"
36.04	80.1	57.82	3.93	4.9	80	58	3.90	----	10.36	"	"
36.58	83.9	60.19	4.65	5.5	84	60	3.94	----	10.86	"	"
37.02	72.7	51.88	3.53	4.9	72	52	3.97	----	9.36	"	"
37.56	67.9	48.17	3.64	5.4	68	48	4.01	----	8.72	"	"
38.02	157.5	111.28	5.13	3.3	63	44	4.04	----	20.66	Sandy SILT to Clayey SILT	"
38.54	181.8	127.83	6.08	3.3	91	64	4.08	39	----	SAND to Clayey SAND *	>140
39.05	155.3	108.66	7.18	4.6	155	108	4.12	----	20.35	Very Stiff Fine Grained *	"
39.55	173.1	120.55	8.93	5.2	173	120	4.16	----	22.72	"	"
40.03	193.2	133.94	9.45	4.9	192	133	4.20	----	25.40	"	"
40.54	303.7	209.53	18.53	6.1	301	208	4.24	----	40.13	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 41.0 feet

CPT NO.: CPT-10
DATE: 02-06-2013
TIME: 11:00:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.55	7.0	11.20	0.53	7.6	7	11	0.06	----	1.39	CLAY	110-120
1.01	5.2	8.32	0.44	8.5	5	8	0.11	----	1.03	Organic Material	100-110
1.55	5.1	8.16	0.36	7.1	5	8	0.17	----	1.00	CLAY	"
2.02	11.0	17.60	0.62	5.6	11	17	0.23	----	1.81	"	120-130
2.57	25.7	41.12	1.60	6.2	26	41	0.30	----	3.41	"	130-140
3.04	57.8	92.48	3.74	6.5	58	92	0.36	----	7.68	"	"
3.57	60.1	96.16	4.51	7.5	60	96	0.44	----	7.98	Very Stiff Fine Grained *	"
4.02	64.0	102.40	4.49	7.0	64	102	0.50	----	8.50	"	"
4.53	91.9	147.04	5.57	6.1	92	147	0.57	----	12.22	"	>140
5.03	75.9	121.44	5.71	7.5	76	121	0.64	----	10.08	"	"
5.55	75.6	120.96	5.66	7.5	75	120	0.71	----	10.03	"	"
6.03	67.9	108.64	5.28	7.8	68	108	0.78	----	9.00	"	130-140
6.51	69.6	108.50	5.27	7.6	69	108	0.84	----	9.22	"	"
7.06	72.5	107.50	5.50	7.6	72	107	0.92	----	9.61	"	>140
7.53	88.8	125.76	6.30	7.1	89	125	0.98	----	11.77	"	"
8.00	102.1	140.30	6.77	6.6	102	140	1.05	----	13.54	"	"
8.53	75.3	100.59	6.19	8.2	75	100	1.12	----	9.97	"	"
9.01	66.6	86.65	5.67	8.5	66	86	1.19	----	8.80	"	"
9.56	64.9	81.96	5.06	7.8	65	82	1.26	----	8.57	"	130-140
10.06	67.7	83.28	5.27	7.8	67	83	1.33	----	8.94	"	"
10.51	60.4	72.57	4.96	8.2	60	72	1.39	----	7.96	"	"
11.02	63.6	74.28	4.77	7.5	63	74	1.46	----	8.38	"	"
11.52	54.7	62.33	4.74	8.7	54	62	1.53	----	7.19	CLAY	"
12.05	42.4	47.22	3.11	7.3	42	47	1.60	----	5.55	"	"
12.50	57.5	62.76	4.60	8.0	57	62	1.66	----	7.56	"	"
13.03	88.9	94.69	5.54	6.2	89	94	1.74	----	11.74	Very Stiff Fine Grained *	>140
13.56	66.6	69.68	4.97	7.5	66	69	1.81	----	8.76	"	130-140
14.01	49.2	50.75	4.10	8.3	49	50	1.87	----	6.44	CLAY	"
14.56	48.5	49.16	3.33	6.9	48	49	1.94	----	6.34	"	"
15.02	47.1	47.09	3.13	6.6	47	47	2.01	----	6.15	"	"
15.57	55.2	55.11	3.36	6.1	55	55	2.08	----	7.22	"	"
16.03	46.4	46.27	3.21	6.9	46	46	2.14	----	6.04	"	"
16.57	62.7	62.43	4.07	6.5	62	62	2.21	----	8.21	Very Stiff Fine Grained *	"
17.03	64.1	63.75	4.00	6.2	64	63	2.28	----	8.39	"	"
17.51	161.3	160.19	6.62	4.1	161	160	2.34	----	21.35	"	>140
18.05	76.6	75.96	5.39	7.0	76	76	2.42	----	10.05	"	"
18.53	73.9	73.18	3.46	4.7	74	73	2.48	----	9.69	"	130-140
19.00	63.1	61.48	4.38	6.9	63	61	2.55	----	8.24	"	"
19.55	70.4	66.87	3.40	4.8	70	67	2.62	----	9.21	"	"
20.02	95.5	88.73	4.89	5.1	95	88	2.68	----	12.55	"	"
20.58	88.1	79.65	4.19	4.8	88	79	2.76	----	11.56	"	"
21.06	46.2	41.24	2.93	6.3	46	41	2.80	----	5.97	CLAY	"
21.55	43.8	38.58	2.29	5.2	44	38	2.83	----	5.65	"	"
22.05	43.2	37.54	2.36	5.5	43	37	2.87	----	5.56	"	"
22.54	77.7	66.60	3.90	5.0	77	66	2.90	----	10.16	Very Stiff Fine Grained *	"
23.00	42.9	36.29	2.78	6.5	43	36	2.94	----	5.51	CLAY	"
23.58	64.6	53.76	3.48	5.4	64	54	2.98	----	8.40	Very Stiff Fine Grained *	"
24.05	27.8	22.90	2.30	8.3	28	23	3.01	----	3.49	CLAY	"
24.56	47.9	39.25	2.87	6.0	48	39	3.05	----	6.17	"	"
25.05	77.4	63.10	3.53	4.6	77	63	3.08	----	10.10	Very Stiff Fine Grained *	"
25.52	95.7	77.64	4.78	5.0	95	77	3.12	----	12.53	"	"
26.07	144.6	116.61	5.52	3.8	72	58	3.16	39	----	SAND to Clayey SAND *	>140
26.53	103.1	82.74	3.69	3.6	41	33	3.20	----	13.51	Sandy SILT to Clayey SILT	130-140
27.06	129.1	103.04	4.67	3.6	52	41	3.23	----	16.97	"	"

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 41.0 feet

CPT NO.: CPT-10
DATE: 02-06-2013
TIME: 11:00:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.52	96.7	76.81	3.25	3.4	39	31	3.27	----	12.65	Sandy SILT to Clayey SILT	130-140
28.05	64.6	51.03	4.64	7.2	64	51	3.31	----	8.36	Very Stiff Fine Grained *	"
28.51	84.7	66.57	4.54	5.4	84	66	3.34	----	11.04	"	"
29.04	99.1	77.43	5.44	5.5	99	77	3.38	----	12.95	"	>140
29.53	210.0	163.15	8.29	3.9	105	81	3.42	41	----	SAND to Clayey SAND *	"
30.04	244.6	188.92	10.80	4.4	244	188	3.46	----	32.34	Very Stiff Fine Grained *	"
30.56	291.3	223.64	11.41	3.9	145	112	3.50	43	----	SAND to Clayey SAND *	"
31.04	259.3	197.97	9.96	3.8	129	99	3.54	42	----	"	"
31.55	250.9	190.42	7.86	3.1	125	95	3.57	42	----	"	"
32.02	275.6	208.01	11.23	4.1	138	104	3.61	42	----	"	"
32.53	257.0	192.79	9.60	3.7	128	96	3.65	42	----	"	"
33.05	194.4	144.93	8.25	4.2	194	145	3.69	----	25.62	Very Stiff Fine Grained *	"
33.53	203.9	151.14	7.85	3.8	102	75	3.73	40	----	SAND to Clayey SAND *	"
34.02	270.5	199.32	9.77	3.6	135	100	3.77	42	----	"	"
34.53	191.8	140.45	8.80	4.6	192	140	3.81	----	25.26	Very Stiff Fine Grained *	"
35.01	186.9	136.07	7.49	4.0	93	68	3.84	40	----	SAND to Clayey SAND *	"
35.54	203.2	146.97	7.46	3.7	101	73	3.88	40	----	"	"
36.05	191.3	137.50	7.88	4.1	191	137	3.92	----	25.18	Very Stiff Fine Grained *	"
36.53	225.5	161.12	8.48	3.8	113	80	3.96	41	----	SAND to Clayey SAND *	"
37.06	241.8	171.62	8.87	3.7	121	86	4.00	41	----	"	"
37.52	252.6	178.53	10.52	4.2	126	89	4.04	41	----	"	"
38.03	280.1	197.02	10.79	3.9	140	98	4.08	42	----	"	"
38.56	276.2	193.32	10.96	4.0	138	97	4.12	42	----	"	"
39.02	281.3	196.03	10.36	3.7	141	98	4.15	42	----	"	"
39.51	269.5	186.58	10.93	4.1	135	93	5.39	42	----	"	"
40.03	261.2	180.29	11.04	4.2	130	90	4.23	41	----	"	"
40.50	283.0	194.45	10.54	3.7	141	97	4.27	42	----	"	"
41.03	305.0	208.51	12.52	4.1	152	104	4.31	42	----	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-12 (CPT 11)
DATE: 02-06-2013
TIME: 13:59:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.54	7.9	12.64	0.49	6.2	8	13	0.06	----	1.57	CLAY	110-120
1.04	8.2	13.12	0.55	6.7	8	13	0.12	----	1.63	"	"
1.52	16.0	25.60	0.31	1.9	8	13	0.17	----	2.12	Clayey SILT to Silty CLAY	"
2.02	9.6	15.36	0.48	5.0	10	15	0.23	----	1.58	CLAY	"
2.58	36.5	58.40	1.53	4.2	24	39	0.31	----	4.85	Silty CLAY to CLAY	130-140
3.07	28.0	44.80	1.30	4.6	28	45	0.37	----	3.71	CLAY	"
3.52	23.4	37.44	1.05	4.5	23	37	0.43	----	3.09	"	"
4.07	45.4	72.64	1.59	3.5	23	36	0.51	----	6.02	Clayey SILT to Silty CLAY	"
4.54	114.9	183.84	2.63	2.3	38	61	0.57	42	----	Silty SAND to Sandy SILT	"
5.07	44.5	71.20	2.38	5.3	44	71	0.64	----	5.89	CLAY	"
5.53	136.7	218.72	4.78	3.5	55	87	0.71	----	18.18	Sandy SILT to Clayey SILT	"
6.06	147.0	235.20	4.41	3.0	49	78	0.78	43	----	Silty SAND to Sandy SILT	"
6.50	176.0	275.03	2.71	1.5	44	69	0.84	44	----	SAND to Silty SAND	"
7.07	145.4	216.05	3.31	2.3	48	72	0.91	42	----	Silty SAND to Sandy SILT	"
7.52	64.8	92.34	1.97	3.0	26	37	0.97	----	8.58	Sandy SILT to Clayey SILT	"
8.01	14.4	19.89	1.10	7.6	14	20	1.04	----	1.85	CLAY	120-130
8.56	8.9	11.98	0.65	7.3	9	12	1.10	----	1.67	"	"
9.03	10.3	13.55	0.72	7.0	10	13	1.16	----	1.62	"	"
9.51	21.6	27.67	1.37	6.3	22	28	1.23	----	2.80	"	130-140
10.03	29.7	37.03	1.78	6.0	30	37	1.30	----	3.87	"	"
10.51	28.9	35.12	1.72	6.0	29	35	1.36	----	3.76	"	"
11.08	31.9	37.60	2.23	7.0	32	38	1.44	----	4.16	"	"
11.55	34.9	40.09	2.50	7.2	35	40	1.50	----	4.55	"	"
12.00	28.4	31.99	1.99	7.0	28	32	1.57	----	3.68	"	"
12.56	21.1	23.20	1.55	7.3	21	23	1.64	----	2.70	"	"
13.03	86.2	92.80	3.82	4.4	86	93	1.70	----	11.38	Very Stiff Fine Grained *	"
13.51	116.0	122.44	4.39	3.8	46	49	1.77	----	15.35	Sandy SILT to Clayey SILT	"
14.01	56.1	58.32	3.25	5.8	56	58	1.84	----	7.36	CLAY	"
14.53	15.5	15.85	1.39	9.0	15	16	1.91	----	1.94	"	"
15.08	19.3	19.39	1.29	6.7	19	19	1.98	----	2.44	"	"
15.55	16.2	16.19	1.28	7.9	16	16	2.04	----	2.02	"	"
16.01	57.3	57.18	2.00	3.5	29	29	2.11	----	7.50	Clayey SILT to Silty CLAY	"
16.56	20.3	20.23	1.07	5.3	20	20	2.18	----	2.56	CLAY	"
17.04	22.9	22.79	1.19	5.2	23	23	2.25	----	2.90	"	"
17.55	21.7	21.56	1.17	5.4	22	22	2.31	----	2.74	"	"
18.02	20.5	20.35	1.02	5.0	20	20	2.38	----	2.57	"	"
18.56	28.2	27.95	1.51	5.4	28	28	2.45	----	3.60	"	"
19.03	30.9	30.46	1.98	6.4	31	30	2.51	----	3.95	"	"
19.52	30.9	29.77	2.08	6.7	31	30	2.58	----	3.95	"	"
20.00	26.5	24.97	1.94	7.3	26	25	2.64	----	3.36	"	"
20.55	24.3	22.30	1.66	6.8	24	22	2.72	----	3.06	"	"
21.04	28.2	25.55	1.74	6.2	28	25	2.75	----	3.57	"	"
21.51	32.9	29.43	1.88	5.7	33	29	2.79	----	4.20	"	"
22.06	35.2	31.03	1.92	5.5	35	31	2.83	----	4.50	"	"
22.54	40.1	34.89	2.36	5.9	40	35	2.86	----	5.15	"	"
23.01	43.4	37.27	2.79	6.4	43	37	2.90	----	5.58	"	"
23.56	42.1	35.60	2.84	6.7	42	36	2.94	----	5.40	"	"
24.03	44.4	37.04	3.03	6.8	44	37	2.97	----	5.71	"	"
24.58	39.0	32.12	2.71	6.9	39	32	3.01	----	4.98	"	"
25.03	36.9	30.25	2.54	6.9	37	30	3.04	----	4.70	"	"
25.57	35.5	28.95	2.54	7.2	35	29	3.08	----	4.51	"	"
26.03	34.0	27.59	2.43	7.1	34	28	3.12	----	4.30	"	"
26.51	28.0	22.61	1.92	6.9	28	23	3.15	----	3.50	"	"
27.04	22.1	17.75	1.79	8.1	22	18	3.19	----	2.71	"	"

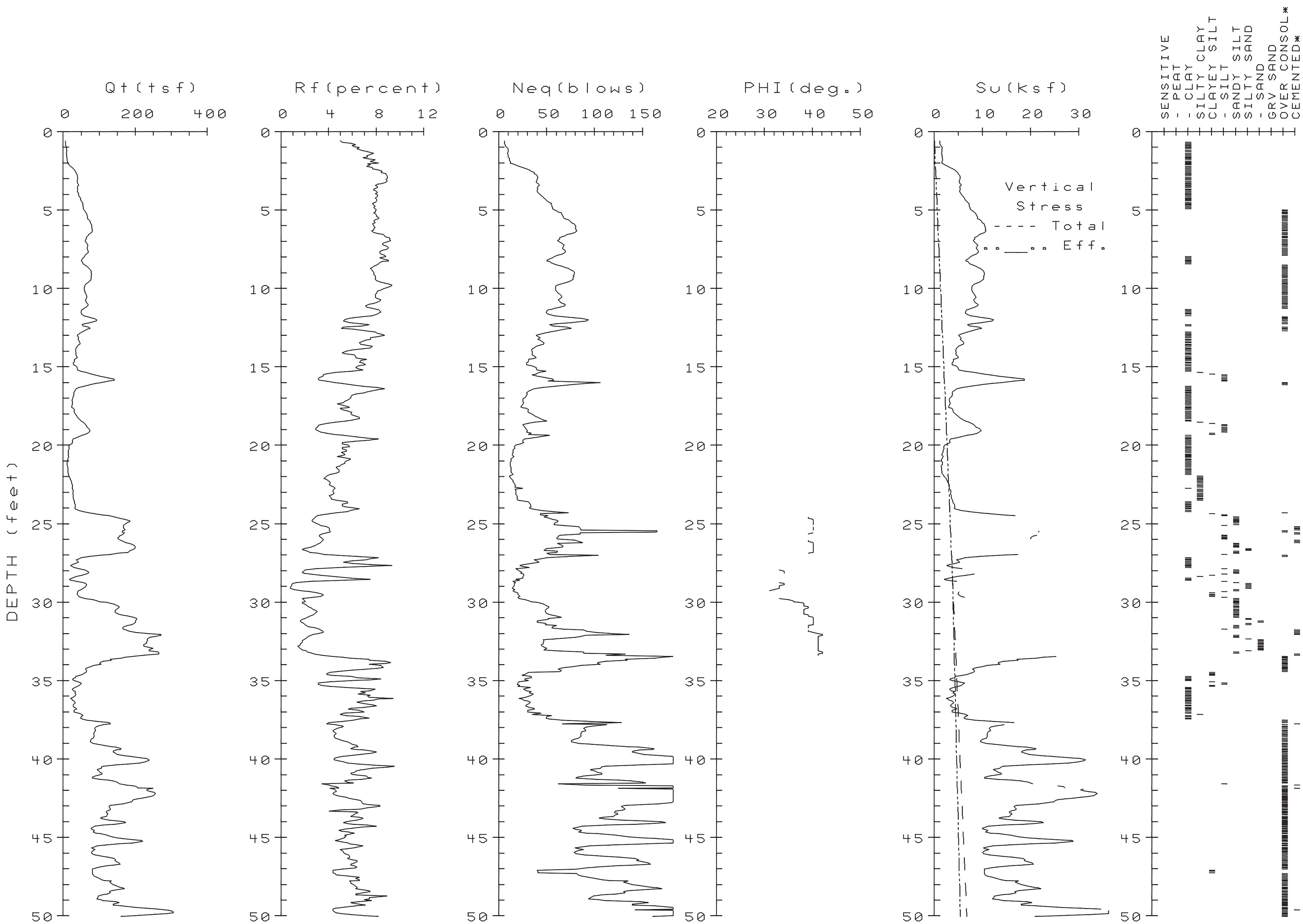
PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)
Terminated at 50.0 feet

CPT NO.: CPT-12 (CPT 11)
DATE: 02-06-2013
TIME: 13:59:00
Groundwater measured at 20.8 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.50	21.6	17.26	1.84	8.5	22	17	3.22	----	2.64	CLAY	130-140
28.03	20.2	16.06	1.55	7.7	20	16	3.26	----	2.44	"	"
28.58	29.4	23.24	2.14	7.3	29	23	3.30	----	3.67	"	"
29.05	39.6	31.14	2.89	7.3	40	31	3.34	----	5.02	"	"
29.52	45.4	35.52	3.17	7.0	45	35	3.37	----	5.79	"	"
30.06	28.8	22.40	1.58	5.5	29	22	3.41	----	3.57	"	"
30.50	23.8	18.43	1.30	5.5	24	18	3.44	----	2.90	"	"
31.06	19.8	15.24	1.46	7.4	20	15	3.48	----	2.36	"	"
31.53	30.8	23.58	1.73	5.6	31	24	3.52	----	3.83	"	"
32.01	34.6	26.35	1.84	5.3	35	26	3.55	----	4.33	"	"
32.56	28.1	21.27	1.96	7.0	28	21	3.59	----	3.46	"	"
33.03	39.4	29.67	2.31	5.9	39	30	3.62	----	4.96	"	"
33.57	34.0	25.45	2.01	5.9	34	25	3.66	----	4.23	"	"
34.04	34.5	25.69	1.90	5.5	34	26	3.70	----	4.30	"	"
34.58	37.2	27.53	2.01	5.4	37	27	3.74	----	4.65	"	"
35.01	36.6	26.96	2.06	5.6	37	27	3.77	----	4.57	"	"
35.55	41.2	30.16	2.36	5.7	41	30	3.81	----	5.18	"	"
36.02	34.9	25.41	1.93	5.5	35	25	3.84	----	4.33	"	"
36.55	38.3	27.72	2.12	5.5	38	28	3.88	----	4.78	"	"
37.01	32.2	23.18	1.91	5.9	32	23	3.91	----	3.96	"	"
37.55	24.2	17.31	1.39	5.7	24	17	3.95	----	2.89	"	"
38.03	21.2	15.08	1.49	7.0	21	15	3.99	----	2.49	"	"
38.57	117.4	83.06	5.41	4.6	117	83	4.03	----	15.31	Very Stiff Fine Grained *	>140
39.03	67.9	47.84	4.39	6.5	68	48	4.06	----	8.71	"	130-140
39.57	51.1	35.83	3.00	5.9	51	36	4.10	----	6.46	CLAY	"
40.01	43.4	30.32	2.52	5.8	43	30	4.13	----	5.43	"	"
40.50	31.1	21.63	1.78	5.7	31	22	4.17	----	3.79	"	"
41.04	26.9	18.62	1.78	6.6	27	18	4.21	----	3.22	"	"
41.51	38.3	26.40	2.40	6.3	38	26	4.24	----	4.74	"	"
42.05	26.8	18.38	2.05	7.6	27	18	4.28	----	3.20	"	"
42.55	37.1	25.34	2.15	5.8	37	25	4.32	----	4.57	"	"
43.03	44.3	30.12	2.36	5.3	44	30	4.35	----	5.52	"	"
43.57	88.6	59.95	4.73	5.3	88	60	4.39	----	11.42	Very Stiff Fine Grained *	"
44.04	85.2	57.40	4.53	5.3	85	57	4.43	----	10.97	"	"
44.58	83.2	55.76	5.47	6.6	83	56	4.47	----	10.70	"	>140
45.04	90.1	60.12	4.05	4.5	90	60	4.50	----	11.61	"	130-140
45.53	55.6	36.93	2.88	5.2	55	37	4.54	----	7.01	CLAY	"
46.03	43.7	28.89	2.35	5.4	44	29	4.57	----	5.42	"	"
46.52	49.0	32.25	2.34	4.8	33	21	4.61	----	6.12	Silty CLAY to CLAY	"
47.06	45.5	29.79	2.20	4.8	30	20	4.65	----	5.65	"	"
47.51	46.3	30.19	2.37	5.1	46	30	4.68	----	5.75	CLAY	"
48.05	42.1	27.31	1.95	4.6	28	18	4.72	----	5.18	Silty CLAY to CLAY	"
48.52	40.6	26.22	2.12	5.2	40	26	4.76	----	4.98	CLAY	"
49.06	45.2	29.04	2.65	5.9	45	29	4.79	----	5.59	"	"
49.57	59.0	37.72	3.41	5.8	59	38	4.83	----	7.42	Very Stiff Fine Grained *	"
50.04	67.0	42.64	3.41	5.1	67	43	4.87	----	8.49	"	"

DEPTH = Sampling interval (~.1 feet)
Qc = Tip bearing resistance   Fs = Sleeve friction resistance   Rf = Tip/Sleeve ratio
TotStr = Total Stress using est. density**   Phi = Soil friction angle*   Su = Undrained Soil Strength* (Nk=10 for Qc<9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=12 for Qc=9 to 12 tsf) (Nk=15 for Qc>12 tsf)
References: * Robertson and Campanella, 1988   ** Olsen, 1989   *** Durgunoglu & Mitchell, 1975



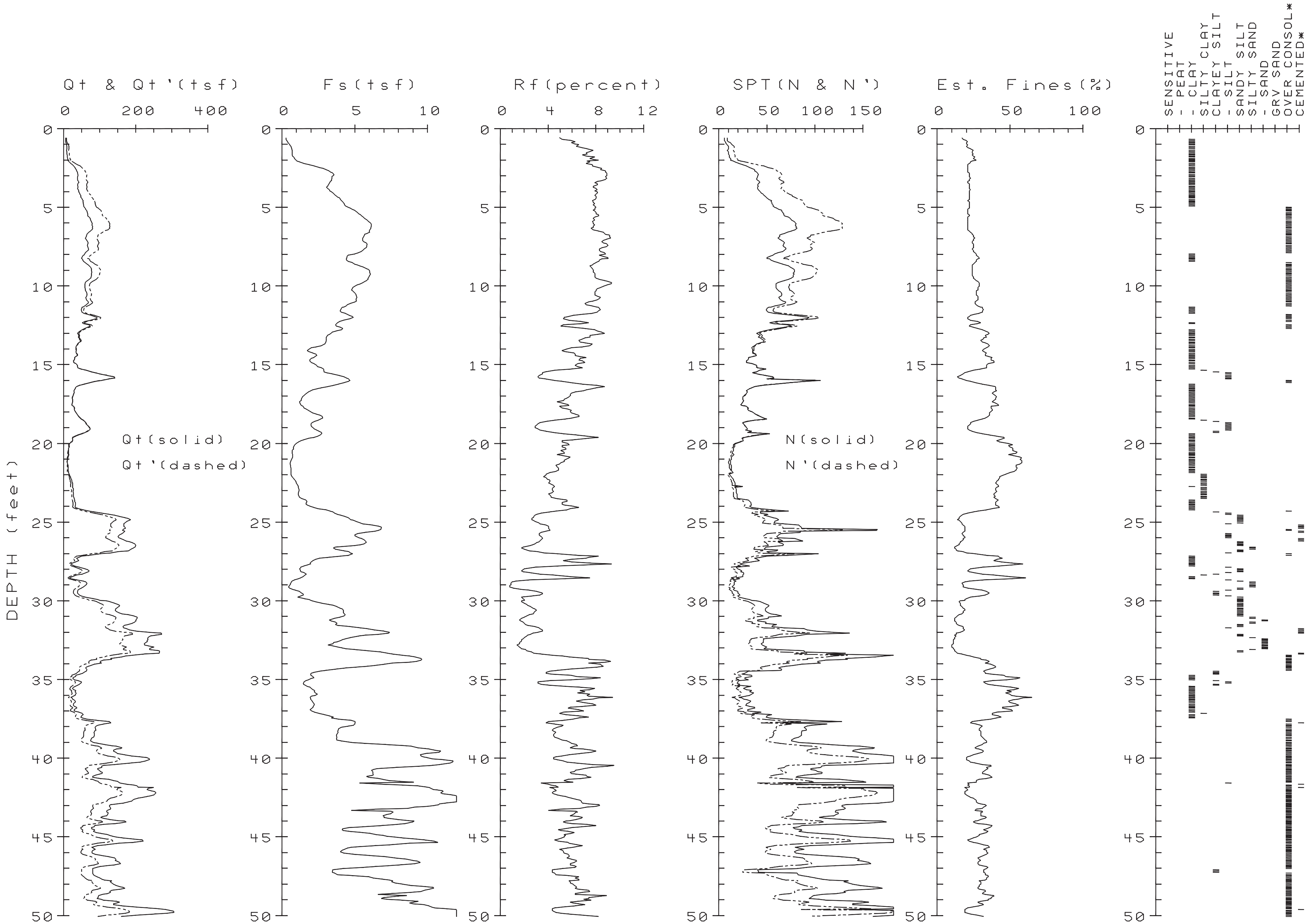
Terminated at 50.0 feet

Groundwater measured at 28.6 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-01
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



Terminated at 50.0 feet

Groundwater measured at 28.6 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-01
DATE : 02-06-2013

ENGEO, INC.

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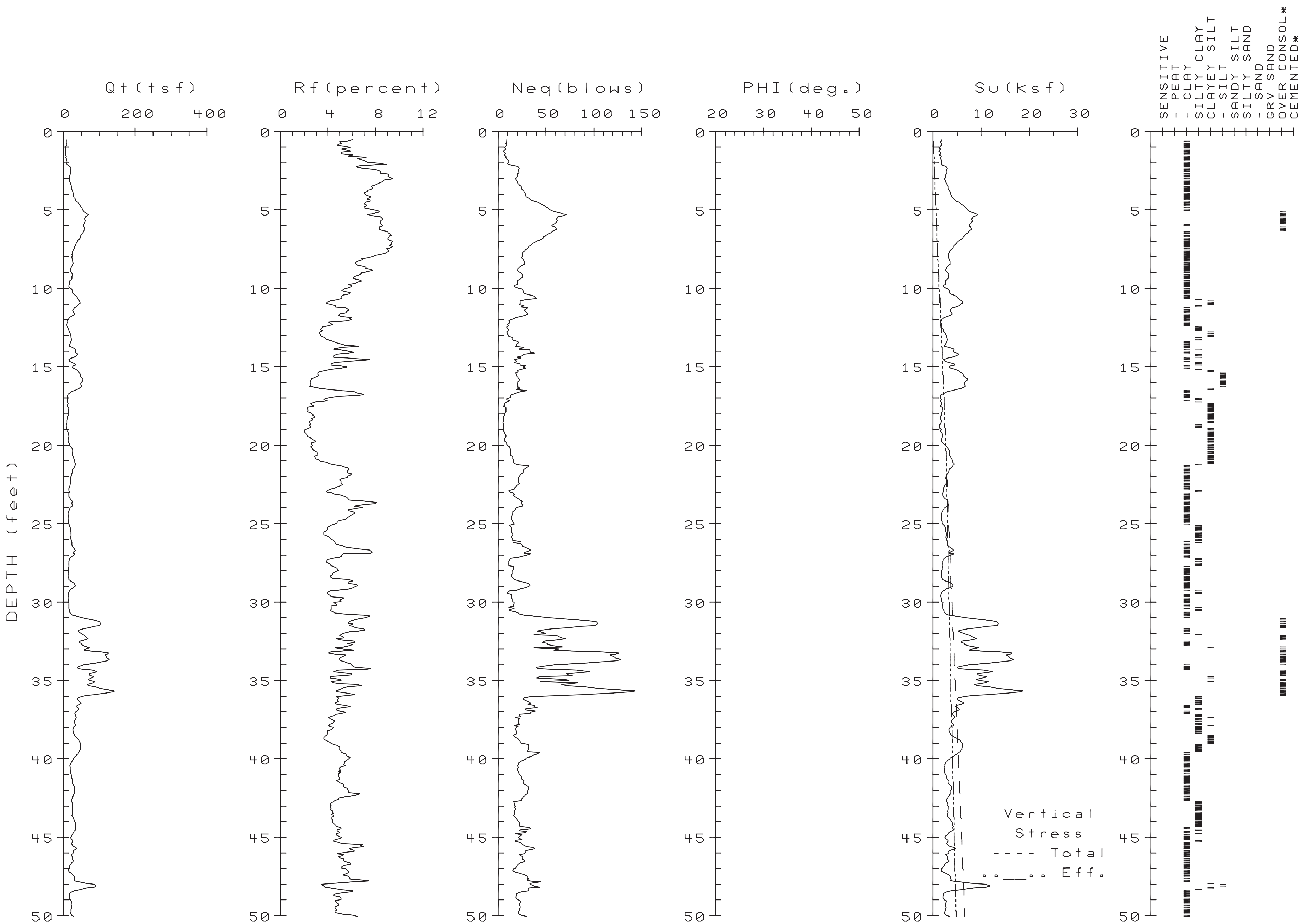


Terminated at 50.0 feet

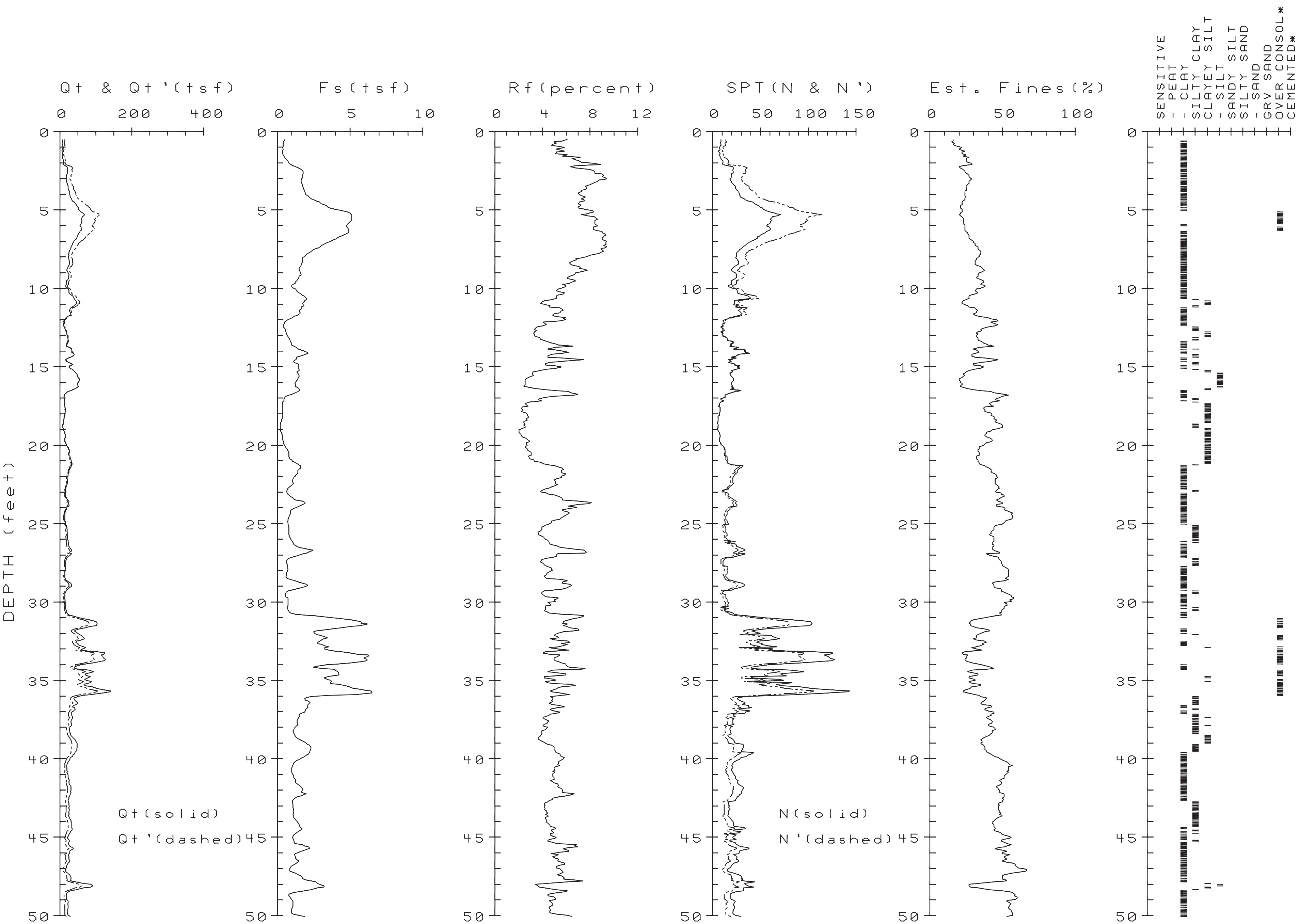
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-02
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

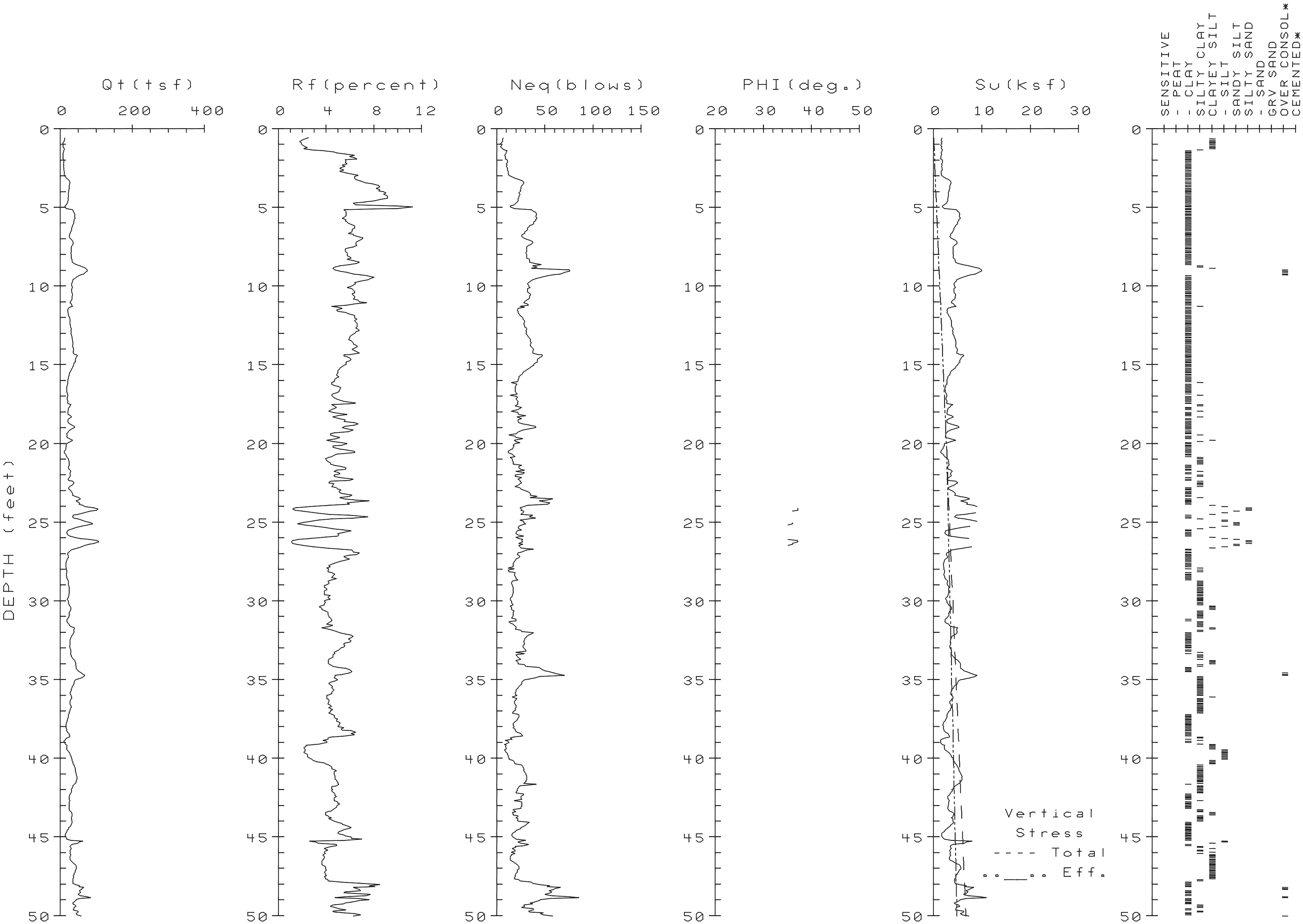
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-02
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

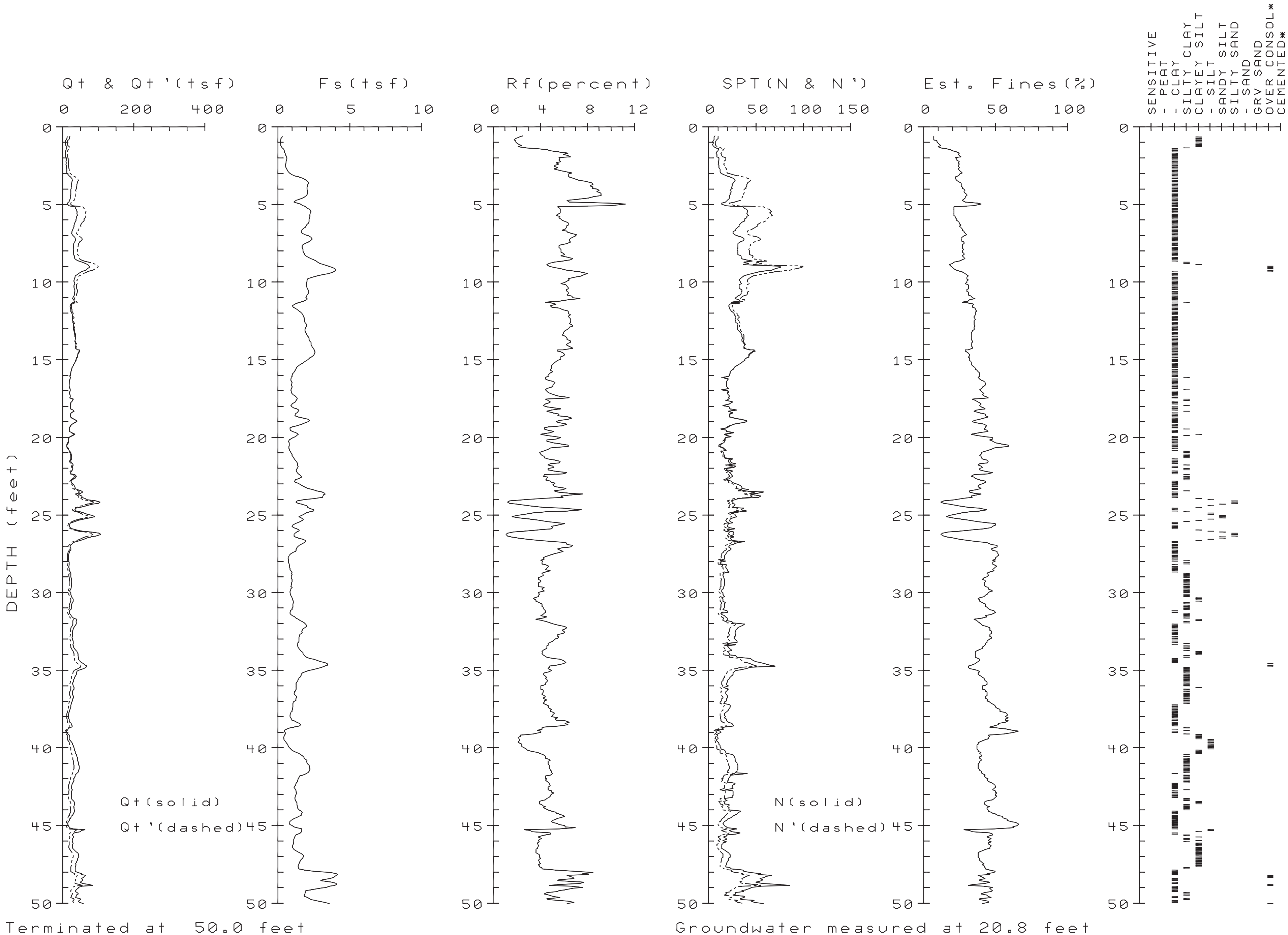
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-03
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-03
DATE : 02-06-2013

ENGEO, INC.

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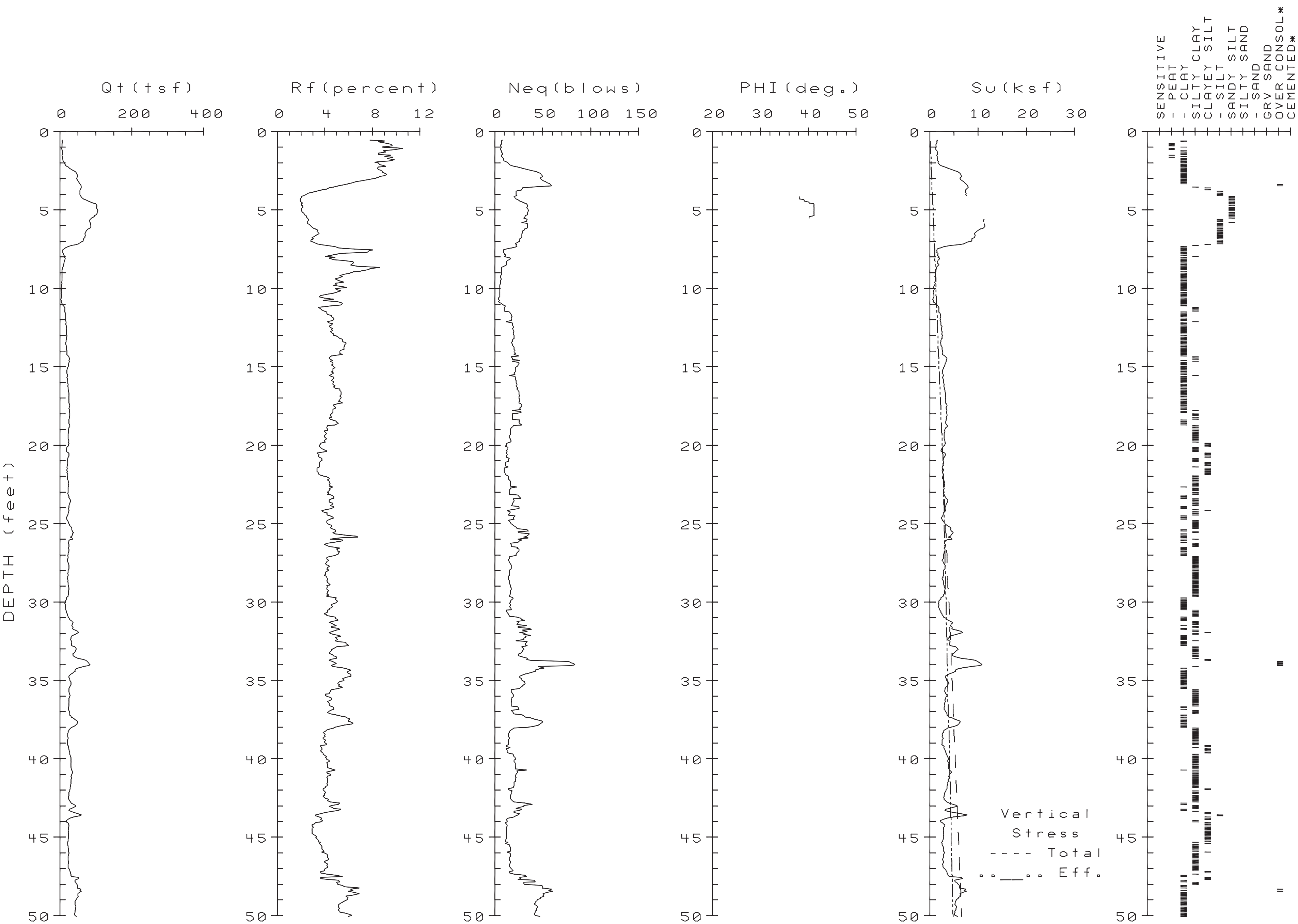


Terminated at 50.0 feet

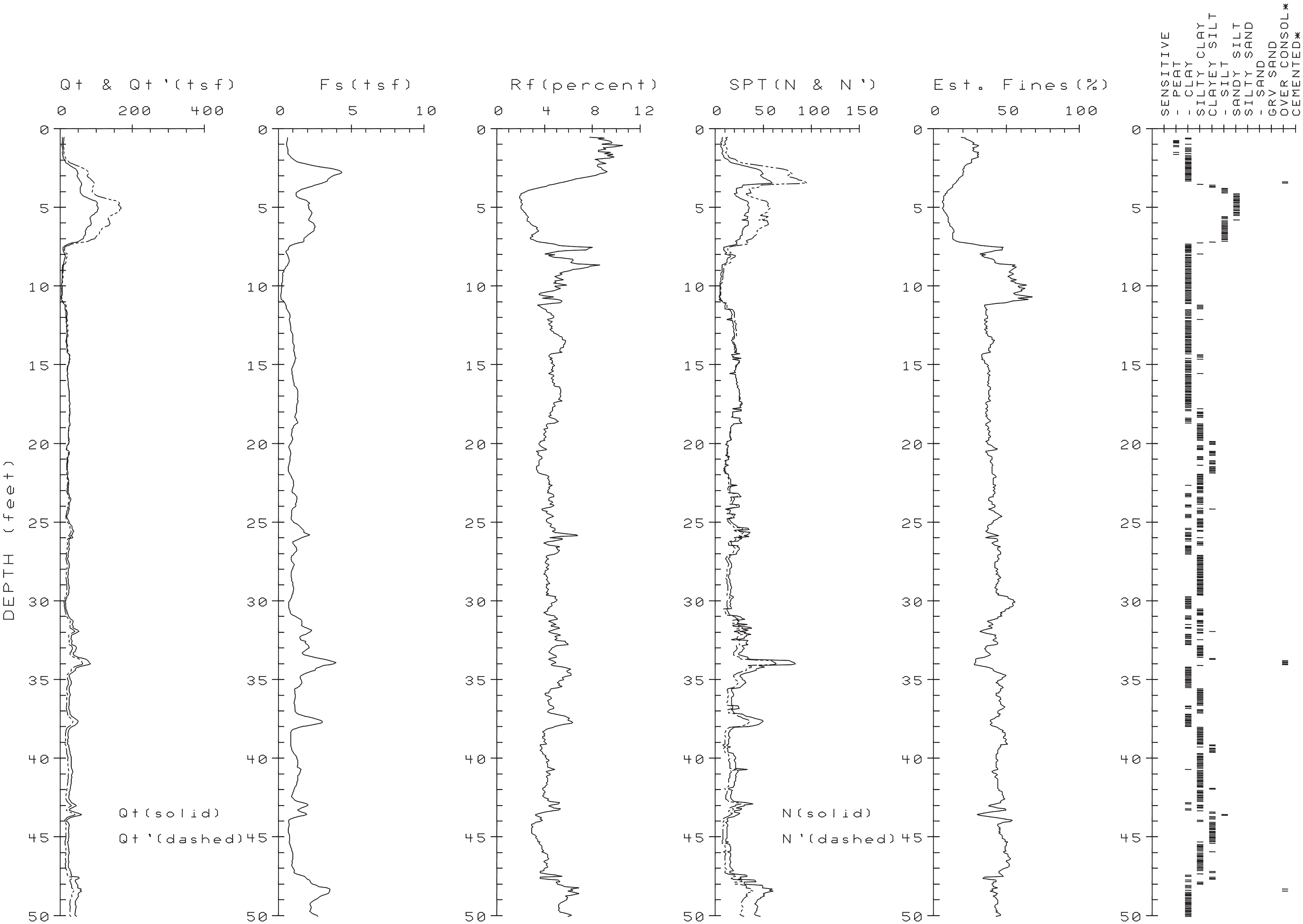
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-04
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

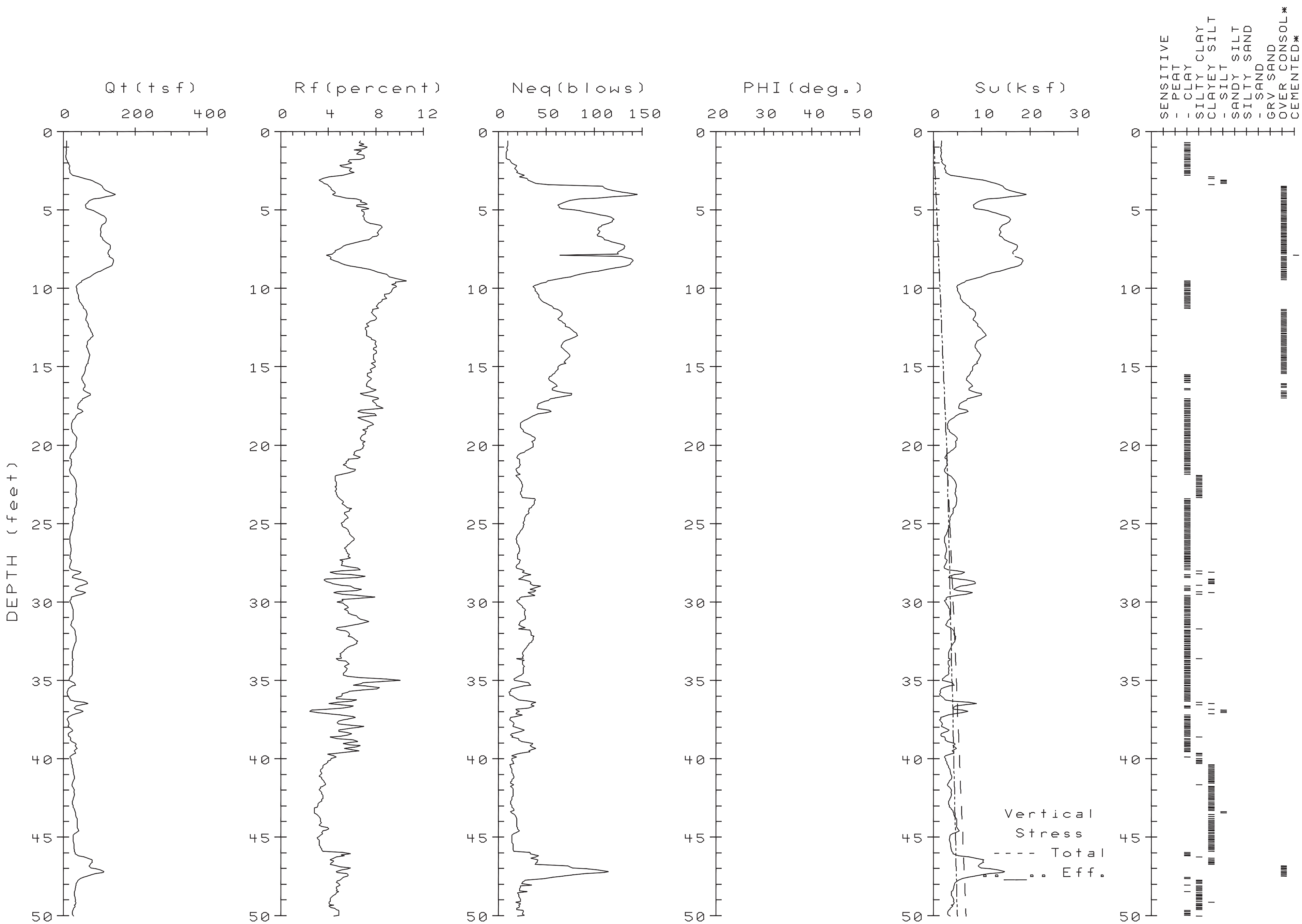
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-04
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

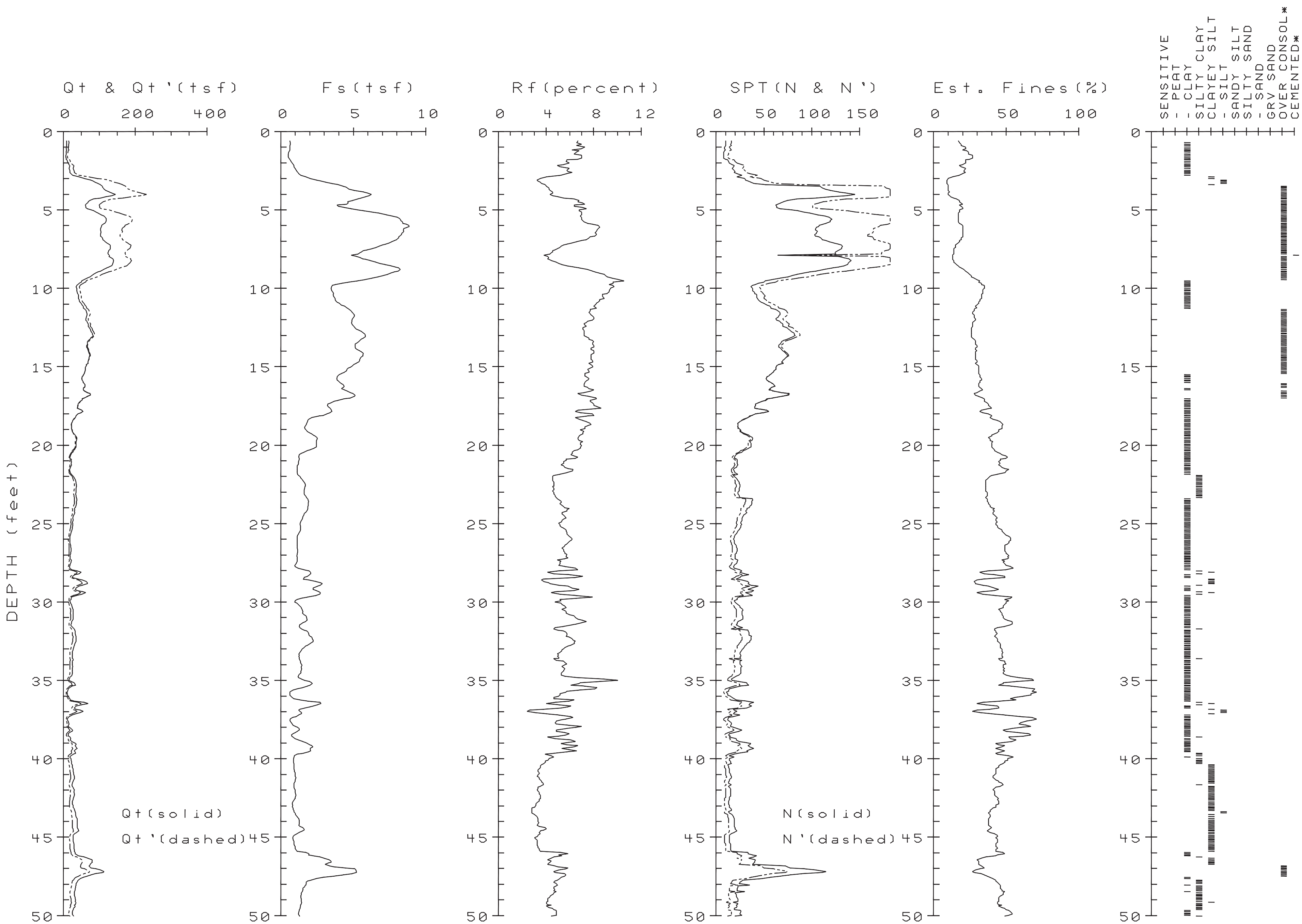
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-05
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



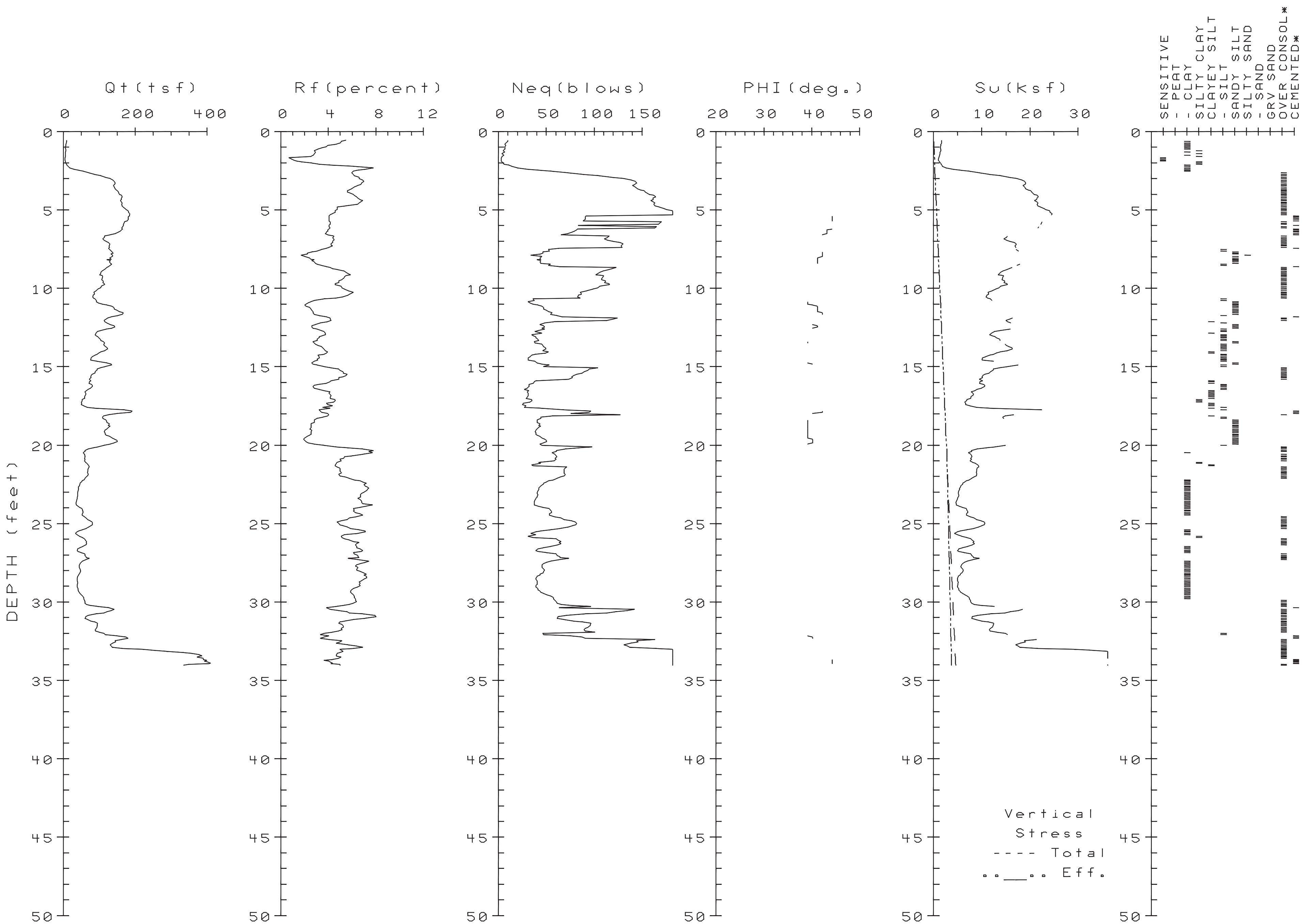
Terminated at 50.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-05
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



Terminated at 34.0 feet

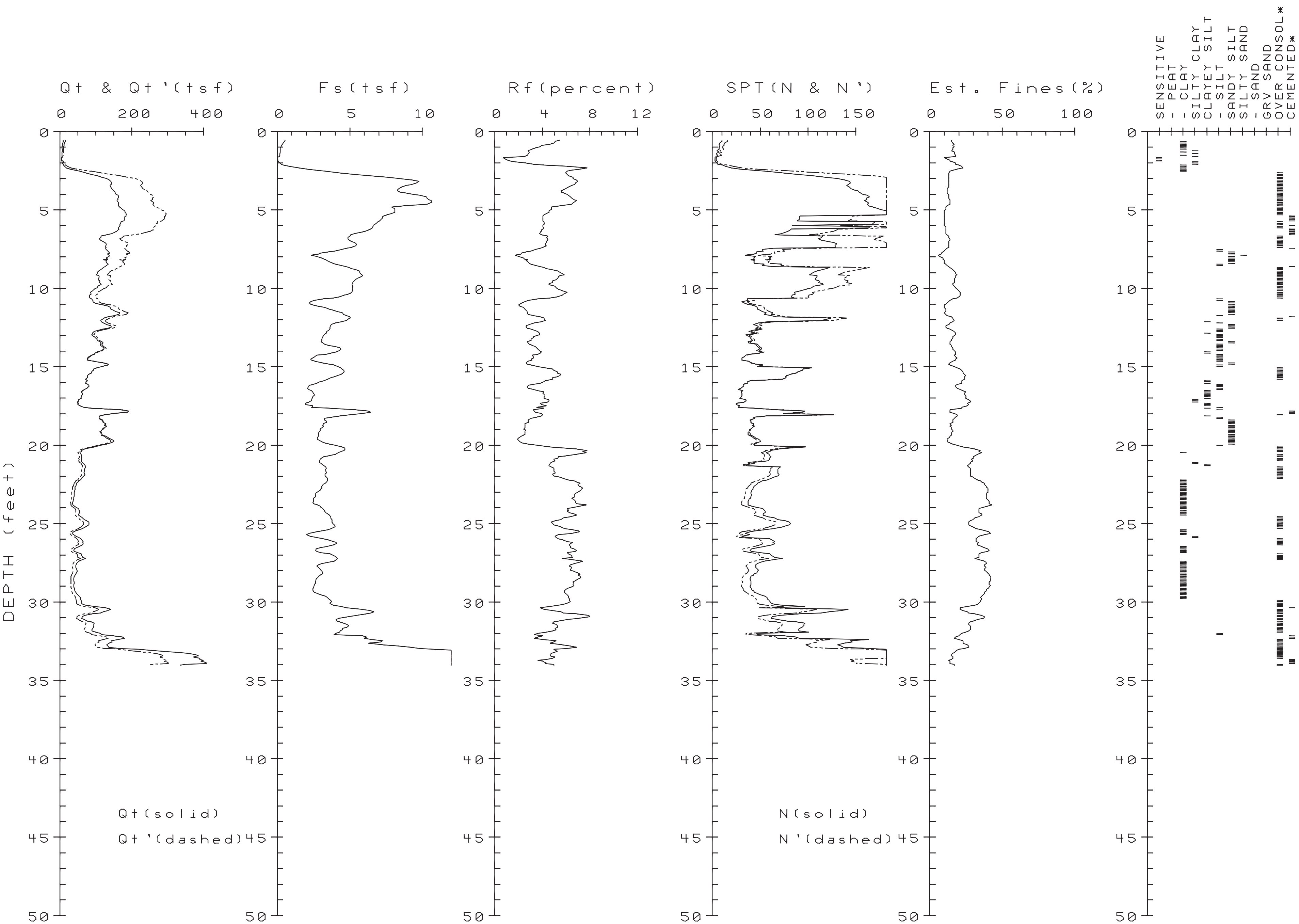
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-06
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



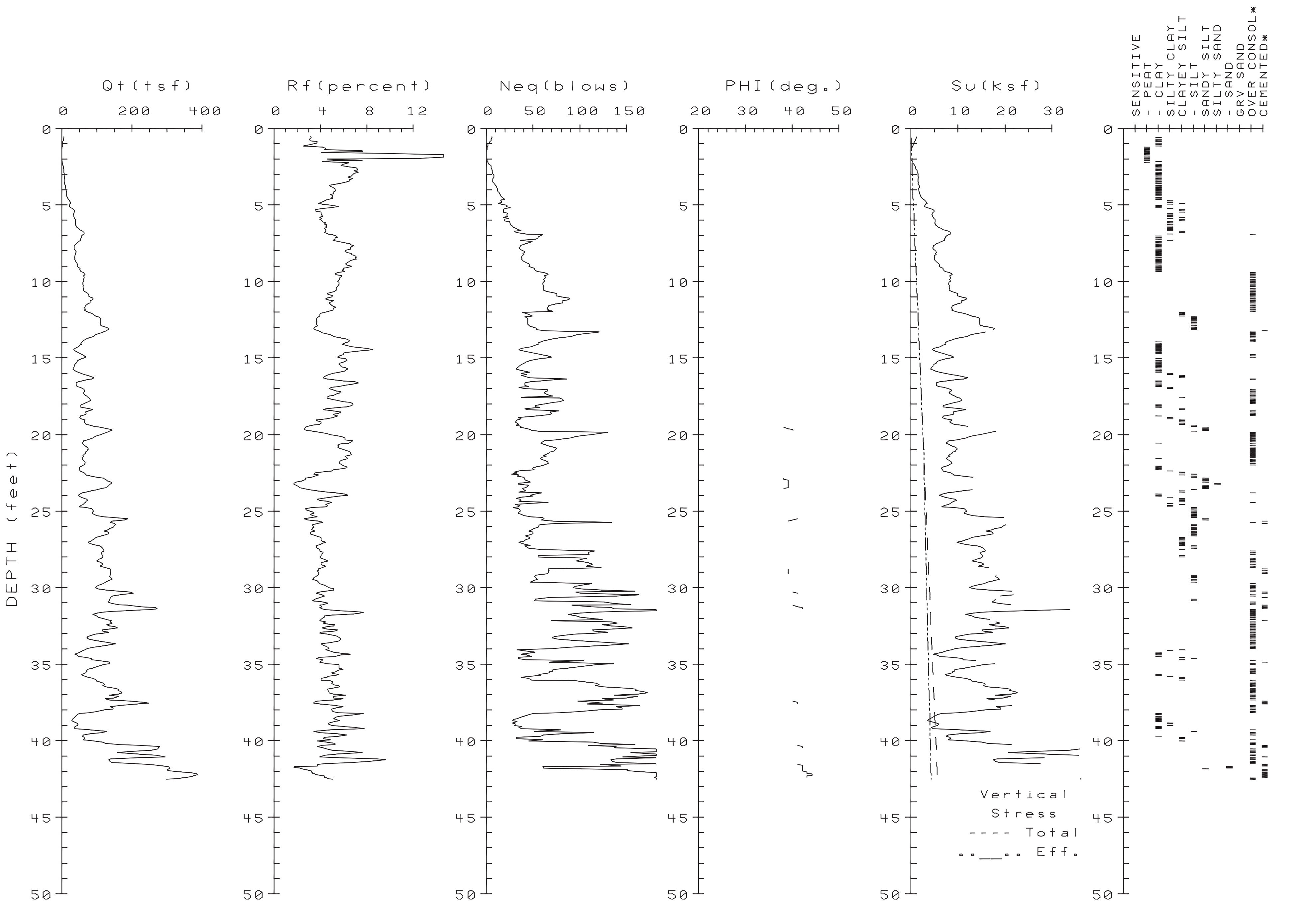
Terminated at 34.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-06
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



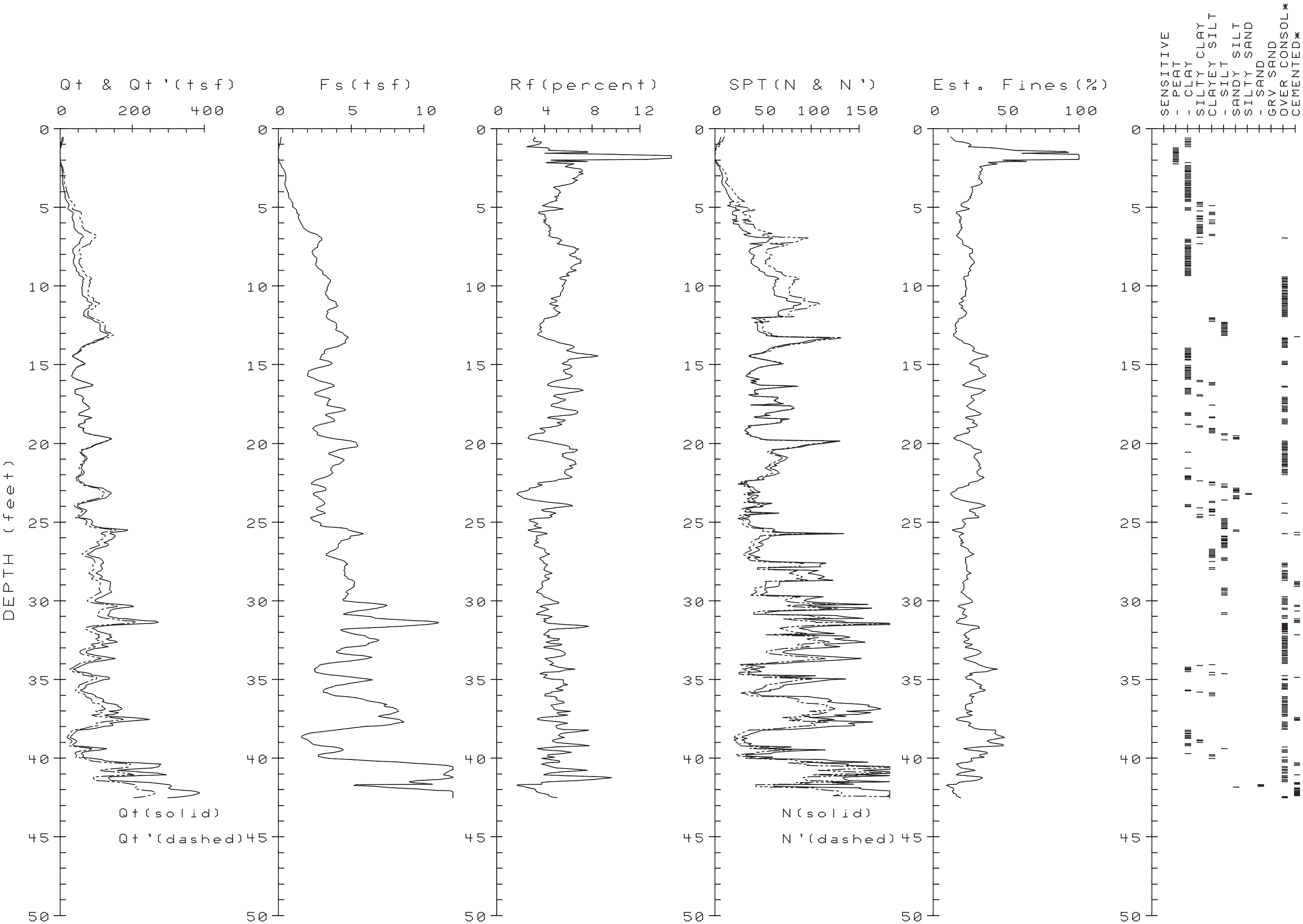
Terminated at 42.5 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-07
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



Terminated at 42.5 feet

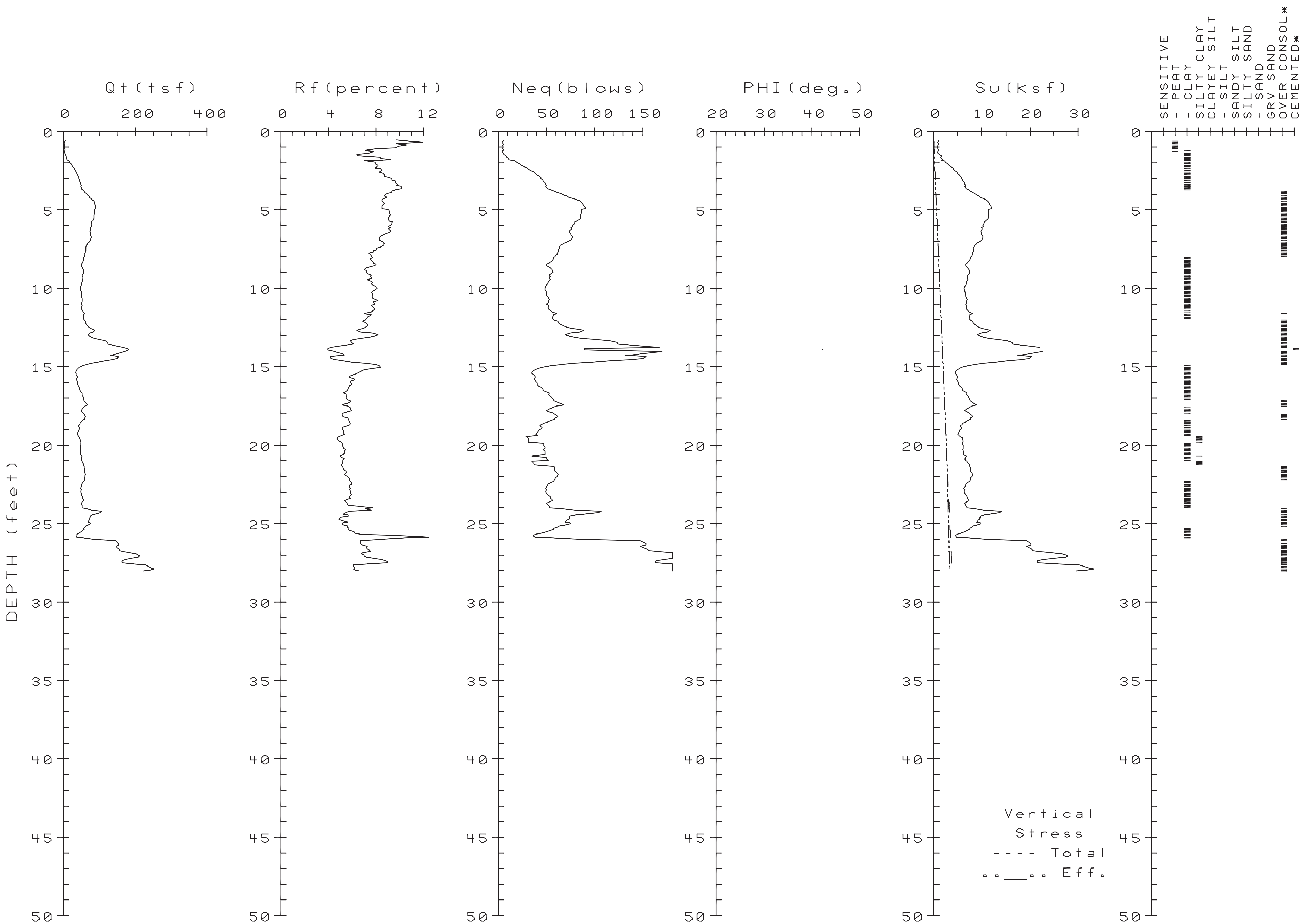
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-07
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 28.0 feet

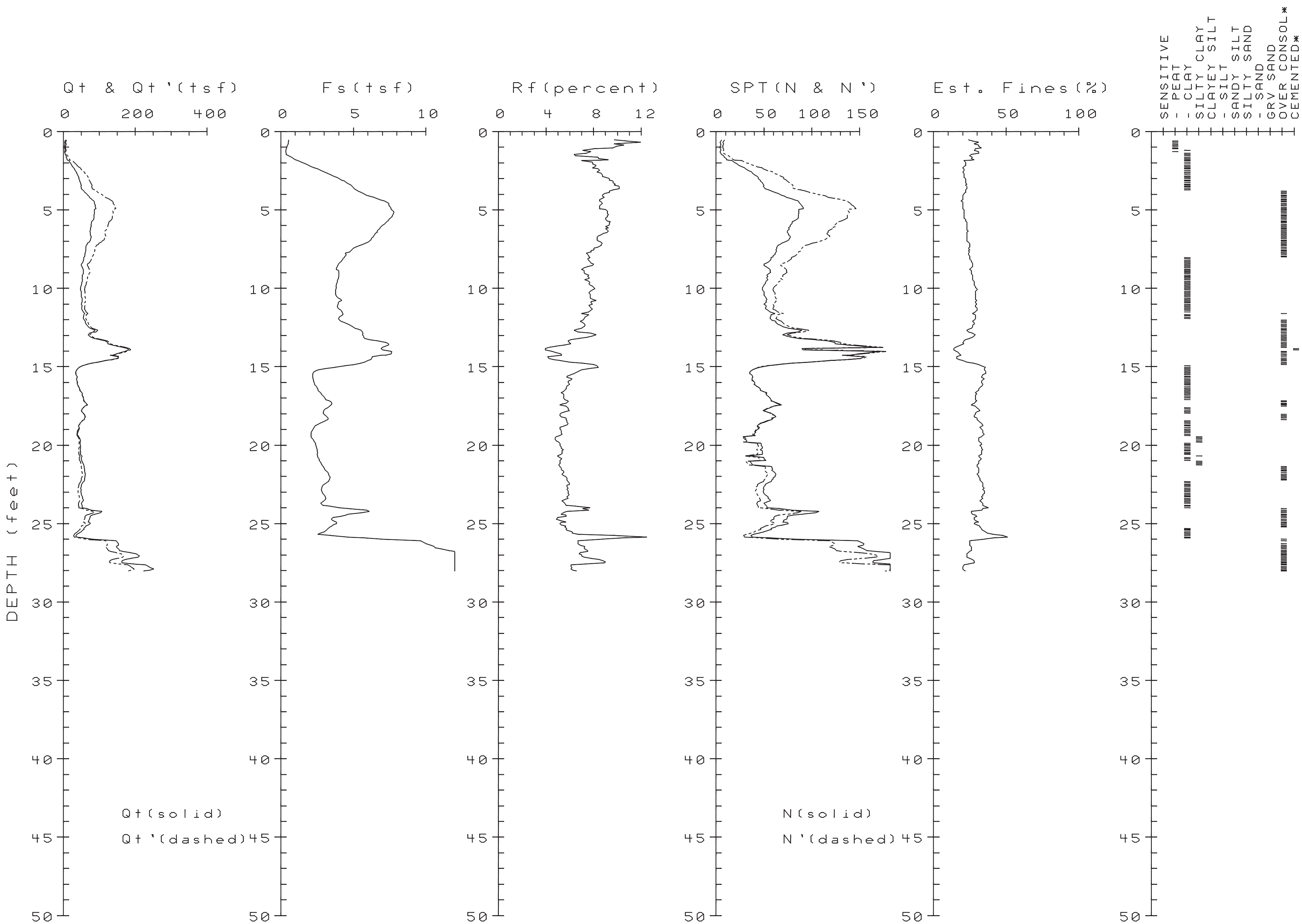
Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-08
DATE : 02-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



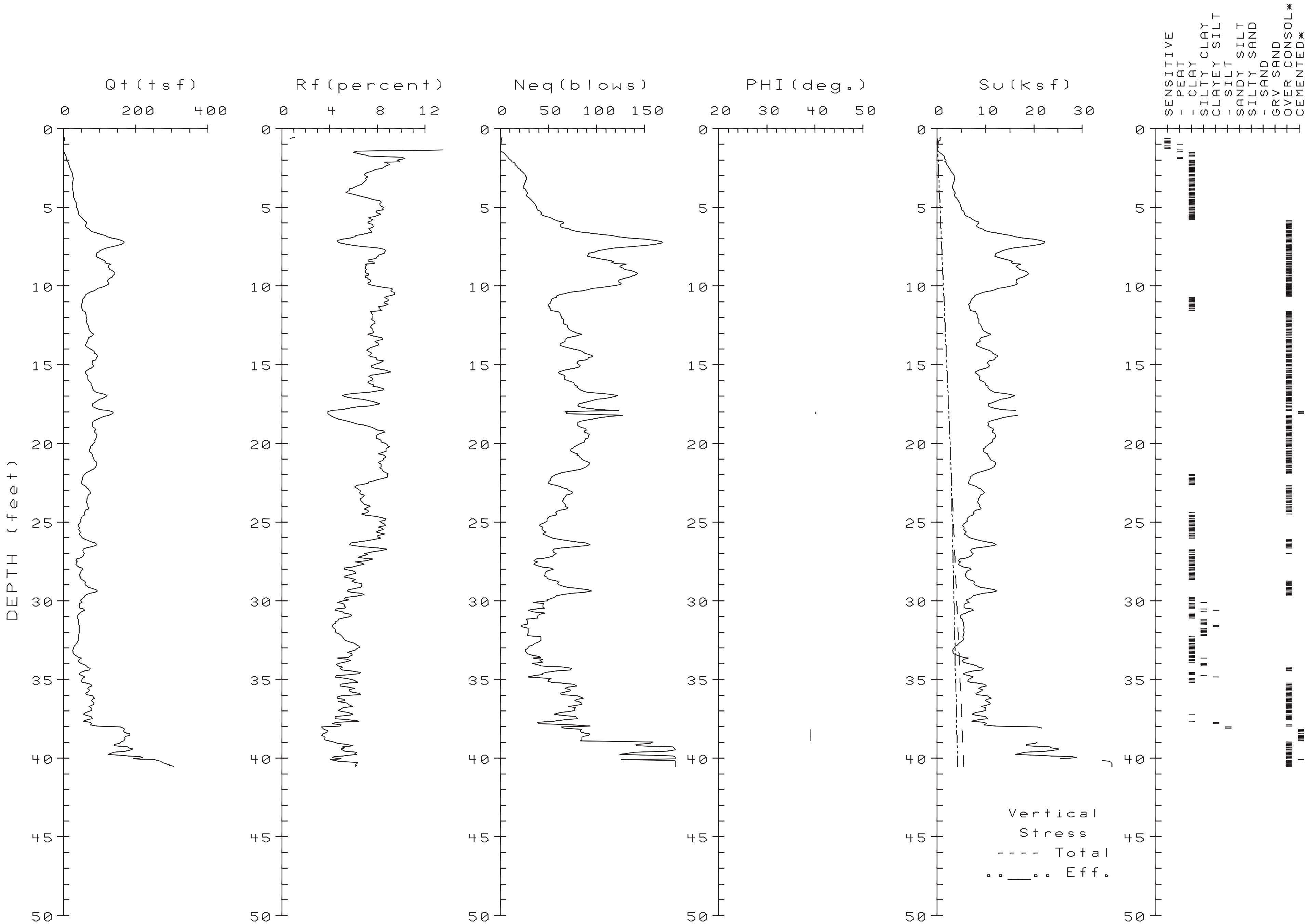
Terminated at 28.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-08
DATE : 02-06-2013

ENGEO, INC.
cpts by John Sarmiento & Associates



Terminated at 40.5 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-09
DATE : 02-06-2013

ENGEO, INC.

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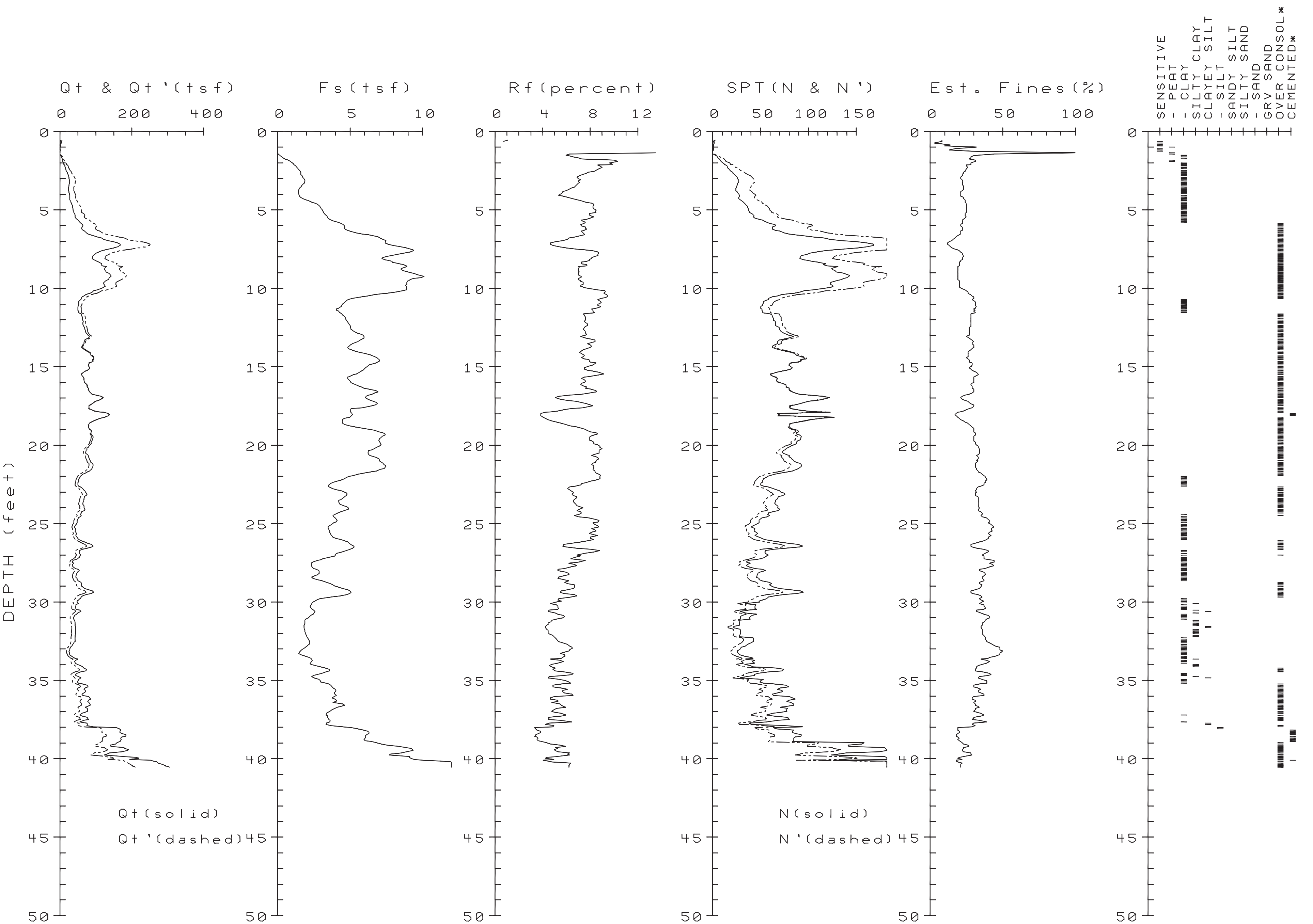

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PROJECT: SAN JUAN OAKS DEL WEB SITE
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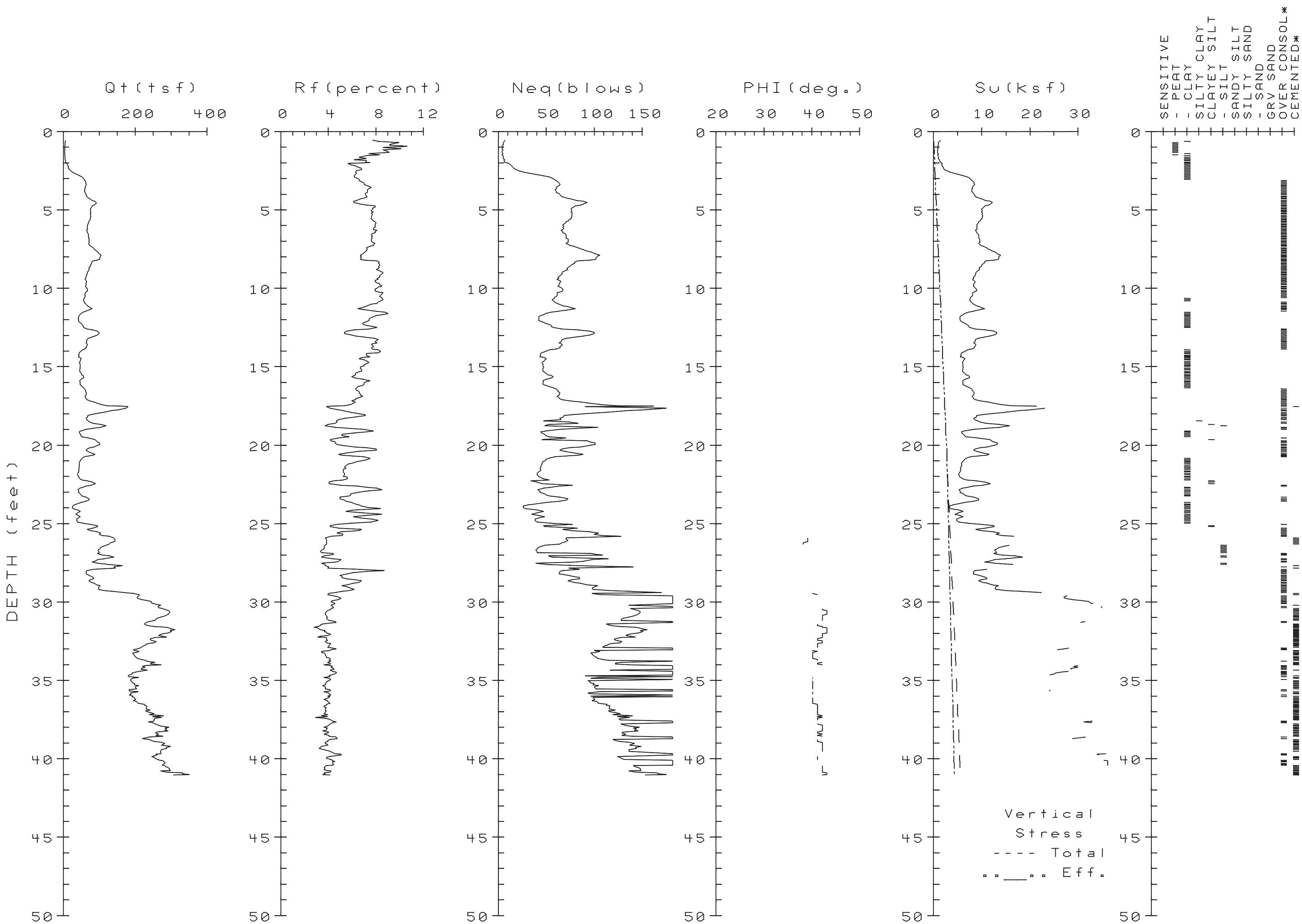

Terminated at 41.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
PROJ. NO.: 9901.000.000(EGO-217)

CPT NO.: CPT-10
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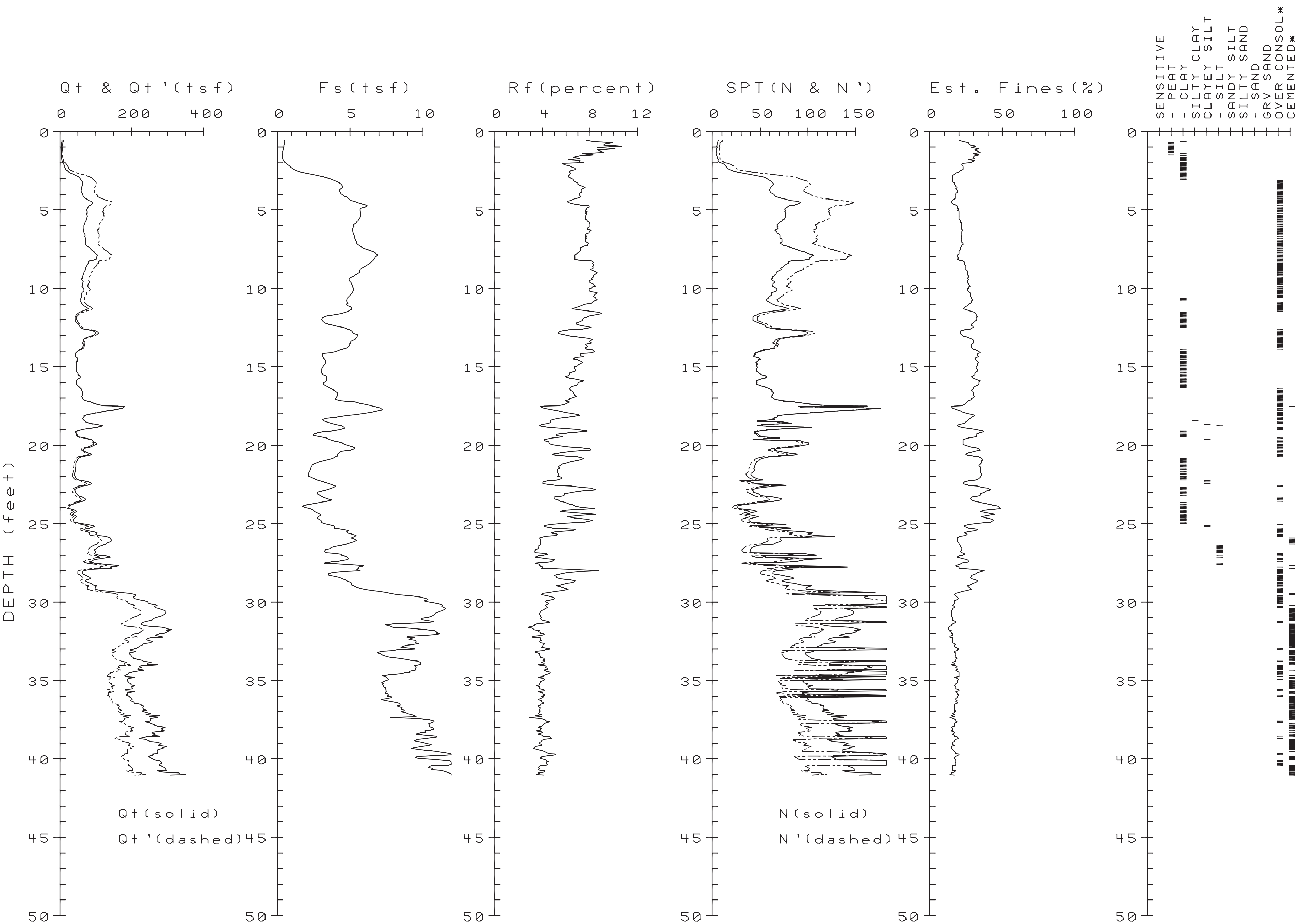

Terminated at 41.0 feet

Groundwater measured at 20.8 feet

PROJECT: SAN JUAN OAKS DEL WEB SITE
LOCATION: Hollister CA
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