Appendix E:
Geotechnical Feasibility Assessment

GEOTECHNICAL FEASIBILITY ASSESSMENT

TAMIEN STATION TRANSIT ORIENTED DEVELOPMENT
SAN JOSE, CALIFORNIA

ENGEO

Expect Excellence

DRAFT

Submitted to:
Ms. Lauri Moffet-Fehlberg
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5865 Owens Drive
Pleasanton, CA 94588

Prepared by:
ENGEO Incorporated

February 24, 2014

Project No:
10851.000.000

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Ms. Lauri Moffet-Fehlberg
The Dahlin Group
5865 Owens Drive
Pleasanton, CA 94588

Subject: Tamien Station Transit Oriented Development
San Jose, California

GEOTECHNICAL FEASIBILITY ASSESSMENT

Dear Ms. Moffet-Fehlberg:

With your authorization, we completed this geotechnical feasibility assessment for the Tamien Station Transit Oriented Development Project in San Jose, California. The accompanying geotechnical feasibility assessment presents our field exploration with our conclusions and preliminary recommendations regarding the proposed transit-oriented development (TOD).

Our findings indicate that the study area is suitable for the proposed TOD provided the preliminary recommendations and guidelines provided in this report are implemented during project planning. Additional design-level geotechnical exploration services will be required for grading plan preparation, construction and foundation design. 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 preliminary geotechnical assessment is to provide preliminary conclusions and recommendations for the proposed transit-oriented development (TOD) next to the Tamien Caltrain Station in San Jose, California. The information presented in this report may be used for general land planning purposes.

The scope of our services included:

- Reviewing available literature and geologic maps for the immediate area.
- Performing limited subsurface exploration consisting of five cone penetration test (CPT) probes.
- Performing CARB 435 testing for naturally occurring asbestos on three representative near-surface samples.
- Preparing a report summarizing our initial recommendations for proposed site development and recommendations for additional studies.

1.2 SITE LOCATION AND DESCRIPTION

The project site is located east of the Tamien Caltrain Station and is bounded by Lick Avenue to the east and vacant properties to the north and south as shown on Figures 1 and 2. Highway 87 is located directly west of the Tamien Caltrain Station. The site is approximately 6 acres in size. The northern portion of the site is currently used for temporary staging of construction equipment and the southern portion is currently used for Caltrain parking and a daycare center.

1.3 PROPOSED DEVELOPMENT

According to the development plan prepared by Dahlin Group dated April 5, 2013, the project site will be divided into two parcels (Figure 2). The northern parcel will be developed with six townhome buildings up to 3 stories high. The southern parcel will be developed into a wrap style multi-family complex which includes a 5-story central parking structure surrounded with wood-frame residential units. We understand that all planned structures will be at grade and no

subterranean levels are planned. Interior streets, utilities and landscaped areas are also planned within the project site.

1.4 HISTORY OF SITE

We reviewed individual aerial photographs of the site dated 1948, 1956, 1968, 1980, 1987, 1993, 1998, 2002, 2004, and publically available photographs at http://www.historicaerials.com and Google Earth.

Review of the photographs indicates that in 1948 and 1958 the southern edge of the site was an orchard and the remainder of the site was covered with sheds and warehouse type structures. In addition, the railroad is visible along the west boundary of the site. By 1968, the southern edge of the site is covered with structures. Structures on site were demolished and construction of Highway 87 began between 1987 and 1993. The daycare center was constructed between 1998 and 2000. By 2000, the parking lots, roads, and buildings onsite resembled the current configuration.

In addition, according to records published by the State Water Resources Control Board (www.geotracker.waterboards.ca.gov), two former underground storage tanks were located in close vicinity to northeast corner of the project site. The tanks and associated impacted soils were removed in 1989.

2.0 GEOLOGY AND SEISMICITY

2.1 REGIONAL GEOLOGY AND SITE SOILS

Regional geologic maps locate the site in the broad, north-south trending, alluvial Santa Clara Valley. Geologic mapping by Wentworth (1999) indicates the site is underlain by Holocene-age levee deposits (Qhl) associated with the Guadalupe River as shown on Figure 3. Wentworth (1999) describes the Holocene levee deposits as typically loose sandy and clayey silt ranging to sandy and silty clay.

2.2 SITE SEISMICITY

The site is not located within a State of California Earthquake Fault Hazard Zone (1982) and no known faults cross the site. The nearest known faults are the San Jose fault mapped approximately 1.6 miles southeast of the site and the Silver Creek fault mapped approximately 1.9 miles northeast of the site. Neither of these faults is considered active[1]. The site is within a State of California Seismic Hazard Zones Map (2002) for liquefaction susceptibility, as presented on Figure 4.

[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) (Hart, 1997).

The most common nearby active faults within 20 miles of the site are provided in the following table based on United States Geologic Survey (USGS) 2008 National Seismic Hazard Maps and the USGS 2010 Google Earth quaternary fault database. Figure 5 shows the approximate locations of these faults and significant historic earthquakes recorded within the Greater Bay Area Region.

TABLE 2.2-1
Regional Faults and Seismicity

Fault Name	Approximate Distance (miles)	Approximate Direction from Site
Monte Vista-Shannon	6.3	West
Calaveras	8.5	East
Hayward	9.9	Northeast
San Andreas	11.2	Southwest
Zayante Vergeles	16.3	Southwest

Because of the presence of nearby active faults, the Bay Area 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. Ground motions are typically expressed as a fraction of the acceleration due to gravity (g). As described in the 2013 California Building Code (CBC) Section 1803.5.12, the mapped MCE geometric mean peak ground acceleration (PGA) is 0.50g.

3.0 FIELD EXPLORATION

The field exploration for this study was conducted on February 6 and 13, 2014, and consisted of advancing five cone penetration test (CPT) probes. The CPTs were advanced from 45 to 65 feet below ground surface (bgs) and their locations are shown on Figure 2. The CPT locations were established by taping and visual sighting from existing features and should be considered accurately located only to the degree implied by the method used.

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). 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 A. The CPT holes were backfilled with cement-bentonite grout.

3.1 LABORATORY TESTING

We submitted three grab samples collected from near-surface soils for outside laboratory testing to measure the content of Naturally Occurring Asbestos (NOA) in accordance with CARB 435 testing procedures. Figure 2 presents the approximate locations of the NOA soil samples. The results of the CARB 435 testing for NOA are presented in Appendix B.

3.2 SUBSURFACE CONDITIONS

The northern area is covered with seasonal grasses (1-CPT4 and 1-CPT5) and the southern area (1-CPT1, 1-CPT2 and 1-CPT3) is currently paved. Rig refusal was encountered at 65 feet and 45 feet at the location of 1-CPT1 and 1-CPT4, respectively.

Based on empirical correlations of 1-CPT4 and 1-CPT5, the northern area (proposed townhome parcel) is underlain by approximately 8 to 9 feet of stiff to very stiff clayey, silty and sandy deposits. Based on the site topography, soils encountered within the upper 8 to 9 feet may be manmade fill. Beneath the fill materials, medium stiff to stiff clayey deposits were encountered and extend to approximately 38 to 42 feet bgs. Very dense sandy deposits are then encountered and extend to the termination depths of 1-CPT4 and 1-CPT5.

For the southern parcel, subsurface conditions encountered at 1-CPT1, 1-CPT-2 and 1-CPT3 consist of very dense or very stiff clayey and gravelly soil within the upper 5 to 6 feet, which may represent fill. At 1-CPT2, a layer of dense sand is encountered between 6 and 10 feet bgs. Below the fill at 1-CPT1 and 1-CPT3 and the sandy layer at 1-CPT-2, stiff clay and silty clay deposits were encountered and extend to approximately 38 to 45 feet bgs. Very dense sandy deposits and very stiff clayey deposits are then encountered and extend to the termination depths of 1-CPT1, 1-CPT2 and 1-CPT3.

3.3 GROUNDWATER

A water level indicator instrument was used upon removal of the CPT probes to record groundwater levels at the time of drilling. Groundwater was recorded between 18 and 20 feet bgs in three of the CPT probes during our exploration activities. Plate 1.2 of the Seismic Hazard Zone Report for the San Jose West Quadrangle (2002) maps the highest historical groundwater in the site vicinity at 15 feet to 20 feet bgs.

Fluctuations in groundwater levels should be expected during seasonal changes or over a period of years because of precipitation changes, perched zones, changes in drainage patterns, or irrigation. For preliminary design and budgeting purposes, a groundwater level at 15 feet bgs, may be considered.

4.0 DISCUSSION AND CONCLUSIONS

From a geologic and geotechnical standpoint, the study area appears to be suitable for the proposed transit-oriented 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 create a final land plan and to develop recommendations for site grading and foundations. Potential geologic and geotechnical hazards relevant to the proposed development 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, liquefaction, densification and lateral spreading. The following sections present a discussion of these hazards as they apply to the site.

Based on topographic and lithologic data, the risk of regional subsidence/uplift, landslides, tsunamis, or seiches is considered low to negligible at the site.

4.1.1 Ground Rupture

As described above, the site is not located within a State of California Earthquake Fault Hazard Zone (1982) and no known active faults cross the site. Therefore, it is our opinion that ground rupture is unlikely at the subject property.

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 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 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. The site is mapped within a potentially liquefiable zone as identified by the State of California Seismic Hazard Zone Map (Figure 4).

We performed preliminary liquefaction analyses on the CPT probes using the computer program CLiq. We considered a groundwater level of 15 feet bgs for the site in our preliminary liquefaction analysis. In addition, we considered a PGA of 0.5g and a Mw of 6.7. Our analyses were based on guidelines provided in DMG Special Publication 117A (2008) and methods developed Robertson and Wride (1997), Robertson and Campanella (1988) and Finn (1996).

The analyses indicated that layers of silty and sandy materials encountered below 40 feet bgs within the northern parcel (proposed townhome development area) may be potentially liquefiable. These silty and sandy layers, generally ranging from ½ to 2 feet thick, do not appear to be continuous. For the southern parcel, a ½-foot-thick silty soil layer at 27 feet bgs, ½-foot-thick sandy layers between 38 and 42 feet bgs and 2-foot-thick sandy and gravelly layer below 47 feet bgs are considered potentially liquefiable.

We evaluated potential post-liquefaction ground settlement at the site using the computer program CLiq. Based on our liquefaction analyses and for preliminary purposes, we recommend theoretical total liquefaction-induced volumetric strain settlements up to approximately ¼ inch at the northern parcel and up to approximately ½ inch at the southern parcel may occur at the site as a result of a strong seismic event. Results of our liquefaction analysis are included in Appendix C.

It is important to update the liquefaction analysis during a design-level study. Soil samples of the of fine-grained soils should be tested during a design-level study for moisture content, plasticity index, and gradation to correlate with liquefaction hazard criterion published by Bray and Sancio (2006), Idriss and Boulanger (2004), and Seed (2003).

4.1.4 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, the effects of lateral spreading are most significant at the free face or the crest of a slope and diminishes with distance from the slope.

As discussed in the above sections, the upper 27 feet of site soils are generally non-liquefiable. The potentially liquefiable deposits identified above do not appear to intersect with the free face created by existing slopes within the project site. Thus, it is our opinion that the potential for lateral spreading is low.

4.2 COMPRESSIBLE SOIL

Clayey soils encountered within the project site are generally stiff to very stiff and do not exhibit compressive behavior under low to moderate loading conditions such as from the proposed 3-story townhome buildings. However, based on our experience with wrap-style developments, structural loading of the central garage will be high. Stiff to very stiff clays may potentially compress under high structural loads imposed by the central garage.

For preliminary project planning purposes, based on an assumed uniform central garage structural load of 1,500 psf, we estimate total load-induced settlement of 2 to 3 inches assuming the garage is supported on a convention mat foundation. Residential units within the wrap-style complex imposing up to 1,000 psf on the foundation soils may result in approximately ½ to 1 inch of settlement. Differential settlement between the central garage and surrounding residential should be considered. The actual amount of total and differential settlement is highly dependent on the actual structural loading and the type of foundation support of the proposed structures.

Load-induced settlement should be reevaluated during future design-level study when building and grading concepts are defined.

4.3 NATURALLY OCCURING ASBESTOS

The alluvial deposits along the Guadalupe River in San Jose were commonly derived from the Franciscan Assemblage bedrock. Therefore, we collected surficial soil samples within the project site for Naturally Occurring Asbestos (NOA) testing to determine if NOA is present within the surficial soil. The laboratory test results indicate that none of the samples contained asbestos greater than the 0.25% sensitivity limit of the test method.

4.4 EXPANSIVE SOIL

Sampling and testing of site soils were not performed as part of this study; however, based upon visual observation and our experience on nearby projects, the surficial soils at the site are expected to be moderately expansive. 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.

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

Existing fills may be present within the project site. In addition, based on historic use of the site, foundations and pipes associated with former site structures may be present beneath the paved surface or surficial fill. Existing fills could undergo vertical movement that is not easily characterized and could ultimately be inadequate to effectively support the proposed building loads. For preliminary design and estimate purposes, up to 9 feet of existing fill may exist within the northern parcel and up to 6 feet of existing fill may exist within the southern parcel. In general, undocumented fills should be excavated 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.

4.6 SOIL CORROSIVITY CONSIDERATIONS

We did not collect soil samples for soil corrosivity testing. For preliminary design and planning purposes, we recommend 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 considered for structures at the project site.

Representative samples of the near-finished grade soils should be obtained during design-level studies or during grading to determine the potential for sulfate attack on foundation concrete and provide recommended concrete design parameters in accordance with the guidelines presented in ACI and CBC.

4.7 CONCLUSIONS

Based upon this preliminary study, it is our opinion that the project site is suitable for the proposed development. In our opinion, the significant potential geotechnical issues for the site are:

- Potential minor liquefaction-induced settlement
- Potential load-induced settlement of the wrap-style complex
- Presence of expansive soils
- Presence of existing fills

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 transit-oriented, master-planned community. 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.

5.0 PRELIMINARY RECOMMENDATIONS

The following preliminary recommendations are for initial land planning and estimating purposes. Final design-level recommendations regarding site grading and foundation construction will be provided after additional site-specific exploration has been undertaken.

5.1 DEMOLITION AND STRIPPING

Site development should commence with the removal of the existing buildings and 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.

For existing landscape areas, the 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.

5.2 EXISTING FILL

Where applicable, existing fill, utility trench backfill, and existing foundation backfill are considered undocumented and should be subexcavated to expose underlying competent native soils that are approved by the Geotechnical Engineer. If in a fill area, the base of the excavations should be processed, moisture conditioned, as needed, and compacted in accordance with the recommendations for engineered fill.

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 3 inches or less in size. Other materials and debris, including trees with their root balls, should be removed from the project site.

5.4 GRADED SLOPES

In general and for preliminary purposes, graded slopes should be no steeper than 2:1 (horizontal:vertical). Depending on the findings of future explorations, other slope configurations may be feasible.

5.5 DIFFERENTIAL FILL THICKNESS

For subexcavation activities that create a differential fill thickness across a building footprint, mitigation to achieve a similar fill thickness across the pad is beneficial for the performance of a shallow foundation system. We recommend that a differential fill thickness of up to 5 feet is acceptable across a building footprint. For a differential fill thickness exceeding 5 feet across a footprint, we recommend performing subexcavation activities to bring this vertical distance to within the 5-foot tolerance and that the material be replaced as engineered fill. As a minimum, the subexcavation area should include the entire structure footprint plus 5 feet beyond the edges of the building footprint.

5.6 FILL PLACEMENT

For land planning and cost estimating purposes, the following compaction control requirements should be anticipated for 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.

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 that will be developed during our detailed exploration.

5.7 2013 CALIFORNIA BUILDING CODE SEISMIC DESIGN PARAMETERS

Based on the CPT empirical correlations and local seismic sources, the following preliminary 2013 California Building Code (CBC) seismic design parameters may be considered for land planning purposes. These parameters should be reevaluated during design-level explorations.

TABLE 5.7-1
2013 CBC Seismic Information

Parameter	Design Value
Site Class	D
Mapped MCE_R Spectral Response Acceleration at Short Periods, S_S (g)	1.5
Mapped MCE_R Spectral Response Acceleration at 1-second Period, S_1 (g)	0.6
Site Coefficient, F_A	1.0
Site Coefficient, F_V	1.5
MCE_R Spectral Response Acceleration at Short Periods, S_{MS} (g)	1.5
MCE_R Spectral Response Acceleration at 1-second Period, S_{M1} (g)	0.9
Design spectral response acceleration at short periods, S_{DS} (g)	1.0
Design spectral response acceleration at 1-second periods, S_{D1} (g)	0.6
Mapped MCE Geometric Mean Peak Ground Acceleration (g)	0.5
Site Coefficient, F_{PGA}	1.0
MCE Geometric Mean Peak Ground Acceleration, PGA_M (g)	0.5

Latitude = 37.313328; Longitude = -121.884018

5.8 FOUNDATION DESIGN

The following sections present preliminary foundation recommendations for the planned wrap apartment complex on the south end of the site and the planned townhome buildings on the north end of the site.

5.8.1 Central Garage and Wrap Residential Buildings

A wrap-style apartment complex consisting of a central garage with surrounding residential buildings is planned within the southern parcel. Based on our experience, foundation design for a wrap-style apartment complex is dependent on the tolerable total and differential settlement under the proposed structures as well as the tolerable differential settlement between the central garage and the residential buildings.

Provided the liquefaction-induced settlement plus the load-induced settlement is within tolerable amounts for the central garage and the surrounding residential buildings, the central garage may be supported on a conventionally reinforced structural mat foundation or shallow footings. We anticipate a post-tensioned structural mat foundation may be appropriate for the wood-frame residential buildings.

For the parking structure, a minimum mat thickness of 16 inches should be anticipated. For the wood-frame residential buildings, a minimum mat thickness of 12 inches should be anticipated.

An average allowable bearing pressure of 1,500 psf and 1,000 psf can be considered for dead-plus-live loads for the garage mat and the surrounding residential mat, respectively. Alternatively, the garage can be supported on shallow footings embedded at least 24 inches. Shallow footings for the garage may impose a maximum allowable bearing pressure of 2,500 psf. The preliminary allowable bearing values may be increased by one-third when considering total loads including wind or seismic.

If the estimated total and differential settlement (load-induced plus liquefaction-induced) exceeds a tolerable amount, we anticipate a drilled pier foundation or an intermediate foundation system such as Rammed Aggregate Piers (RAP) will be required. Based on our experience, a RAP foundation system may provide an increased bearing capacity ranging from 3,500 to 4,000 psf with a reduced potential for differential settlement.

Further discussion about proposed building loads and layouts, additional exploration, laboratory testing, and detailed assessment of estimated liquefaction- and load-induced settlements should occur prior to preparation of site-specific foundation designs for the development. The amount of estimated settlement will impact the selection of foundation type for the structures.

5.8.2 Townhome Buildings

Based on subsurface conditions encountered within the northern portion of the project site, the townhome buildings may be supported on post-tensioned structural mats. A minimum mat thickness of 12 inches should be anticipated for preliminary purposes. A maximum allowable bearing pressure of 1,000 psf can be considered. The allowable bearing pressure may be increased by one-third when considering total loads including wind or seismic.

5.9 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). Restrained walls should be designed as drained retaining walls using an at-rest fluid pressure of 80 pcf for level backfill conditions.

Drainage facilities should be installed behind retaining walls to prevent the build-up of hydrostatic pressures on the walls. Wall drainage may be provided using 4-inch-diameter perforated (SDR 35 or approved equivalent) pipe encapsulated in either Class 2 permeable material, or free-draining gravel surrounded by synthetic filter fabric. The width of the gravel-type drain blanket should be at least 12 inches. The drain blanket should extend from base of the wall to about one foot below the finished grade. The upper one foot of wall backfill should consist of onsite clayey soil. If preapproved by the Geotechnical Engineer, prefabricated wall drain panels could be considered in lieu of the granular drain blanket above the pipe system. Collected water should flow to an outlet approved by the Civil Engineer via solid pipe.

5.10 PRELIMINARY PAVEMENT DESIGN

The following preliminary pavement sections have been determined for Traffic Indices of 5 to 7, an assumed R-value of 5, and in accordance with the design methods contained in Topic 610 of Caltrans Highway Design Manual (2012). The section below considers private and public streets with Hot Mix Asphalt (HMA) section thickness required by the City of San Jose.

TABLE 5.10-1
Preliminary Pavement Sections

Traffic Index	HMA (inches)	AB (inches)
5.0	4.2*	7.0
6.0	4.2*	11.0
7.0	4.2*	15.0

Notes: HMA – Hot Mix Asphalt (* indicates city minimum thickness of 0.35 feet)
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 of San Jose.

5.11 SURFACE DRAINAGE

The building pads must be positively graded at all times to provide for rapid removal of surface water runoff from the foundation systems and to prevent ponding of water under floors or seepage toward the foundation systems at any time during or after construction. Ponding of stormwater must not be permitted on the building pads during prolonged periods of inclement weather. As a minimum requirement, finished grades should have slopes of at least 5 percent within 10 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. ENGEO should be consulted to develop alternate recommendations if these criteria are not feasible.

5.12 STORMWATER TREATMENT AND FACILITIES

Due to the relatively 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, unless subdrains are installed. Therefore, best management practices should assume that little stormwater infiltration will occur at the site.

5.13 REQUIREMENTS FOR LANDSCAPING IRRIGATION

If planting adjacent to the buildings 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 structures 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.

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 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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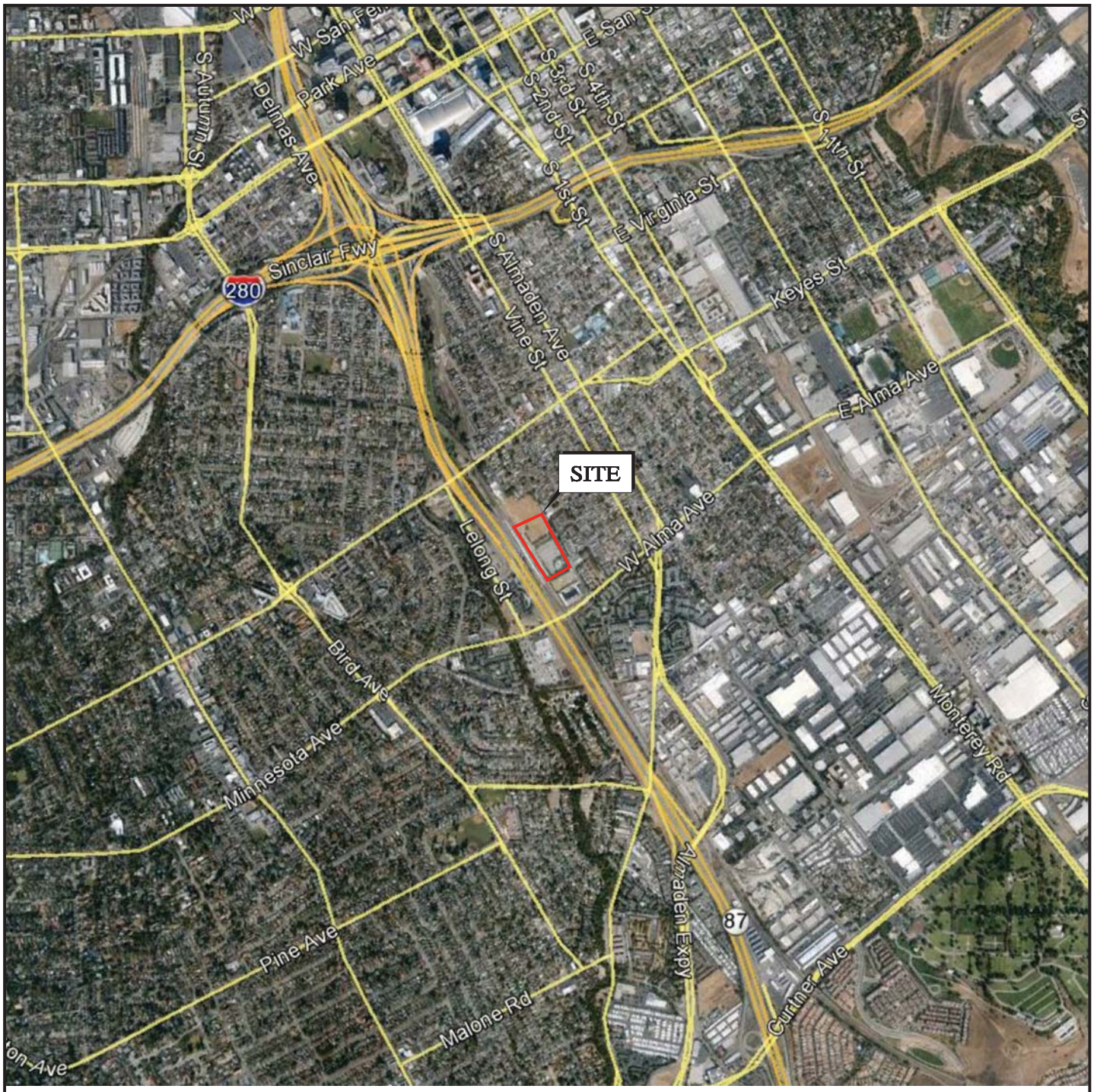
FIGURES



N

0 FEET 2000

0 METERS 1000

BASE MAP SOURCE: GOOGLE EARTH PRO

ENGEO Expect Excellence

VICINITY MAP

TAMIEN STATION TRANSIT ORIENTED DEVELOPMENT

SAN JOSE, CALIFORNIA

PROJECT NO.: 10851.000.000		FIGURE NO. 1
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: JK	

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\10851\000\GEX\10851000000-GEX-1-VicinityMap-0214.dwg Plot Date: 2-21-14 spatters

ORIGINAL FIGURE PRINTED IN COLOR

N

0 FEET 200

0 METERS 100

EXPLANATION

1-CPT4 APPROXIMATE LOCATION OF CONE PENETRATION TEST

S-3 APPROXIMATE LOCATION OF NEAR SURFACE NOA SAMPLE

BASE MAP SOURCE: GOOGLE EARTH PRO

ENGEO Expect Excellence

SITE PLAN

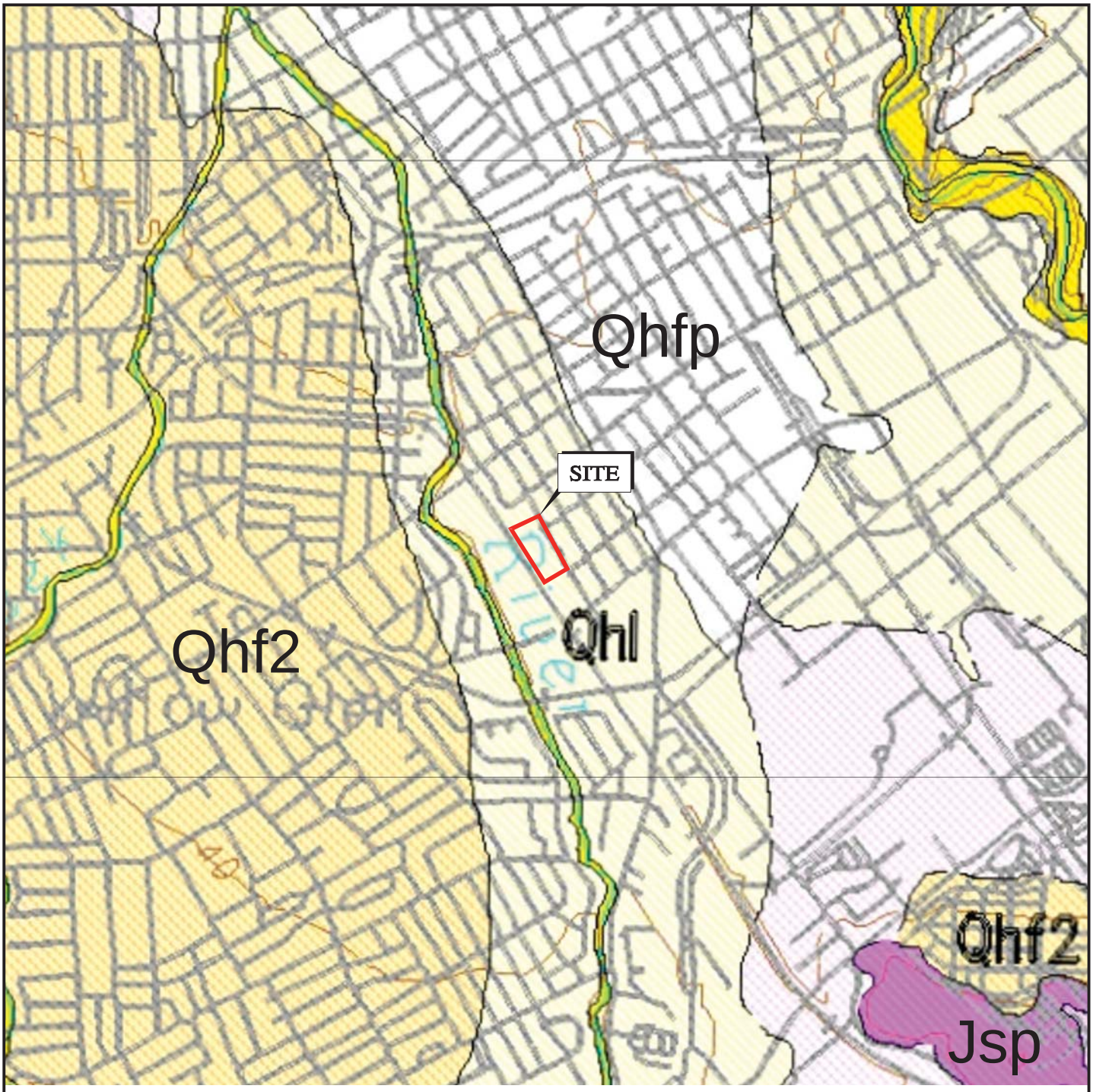
TAMIEN STATION TRANSIT ORIENTED DEVELOPMENT

SAN JOSE, CALIFORNIA

PROJECT NO.: 10851.000.000		FIGURE NO. 2
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: JK	

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\10851\000\GEX\10851000000-GEX-2-SitePlan-0214.dwg Plot Date: 2-21-14 spatters

ORIGINAL FIGURE PRINTED IN COLOR



N

0 FEET 2000

0 METERS 1000

EXPLANATION

Qhfp	FLOOD PLAIN DEPOSITS
Qhl	LEVEE DEPOSITS
Qhf2	ALLUVIAL FAN DEPOSITS (OLDER)
Jsp	SERPENTINIZED HARBURGITE AND DUNITE

BASE MAP SOURCE: WENTWORTH, 1999

ENGEO Expect Excellence

REGIONAL GEOLOGIC MAP

TAMIEN STATION TRANSIT ORIENTED DEVELOPMENT

SAN JOSE, CALIFORNIA

PROJECT NO.: 10851.000.000

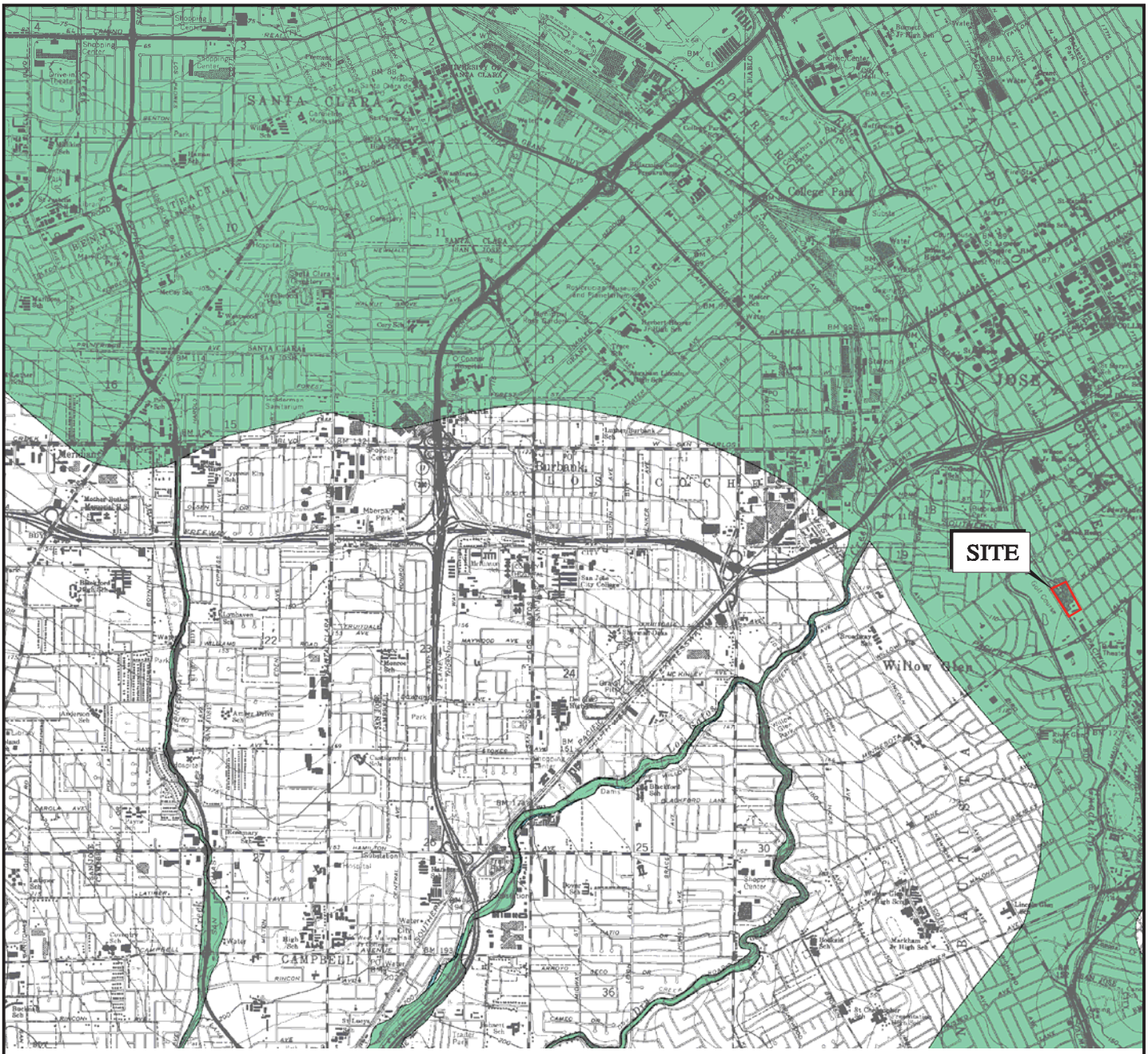
SCALE: AS SHOWN

DRAWN BY: SRP CHECKED BY: JK

FIGURE NO. 3

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\10851\000\GEX\10851000000-GEX-3-RegionalGeologicMap-0214.dwg Plot Date: 2-21-14 spatters

ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

LIQUEFACTION

AREAS WHERE HISTORIC OCCURRENCE OF LIQUEFACTION, OR LOCAL GEOLOGICAL, GEOTECHNICAL AND GROUNDWATER CONDITIONS INDICATE A POTENTIAL FOR PERMANENT GROUND DISPLACEMENTS SUCH THAT MITIGATION AS DEFINED IN PUBLIC RESOURCES CODE SECTION 2693(c) WOULD BE REQUIRED

BASE MAP SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, CALIFORNIA GEOLOGICAL SURVEY, 2006

ENGEO Expect Excellence

SEISMIC HAZARD ZONES MAP

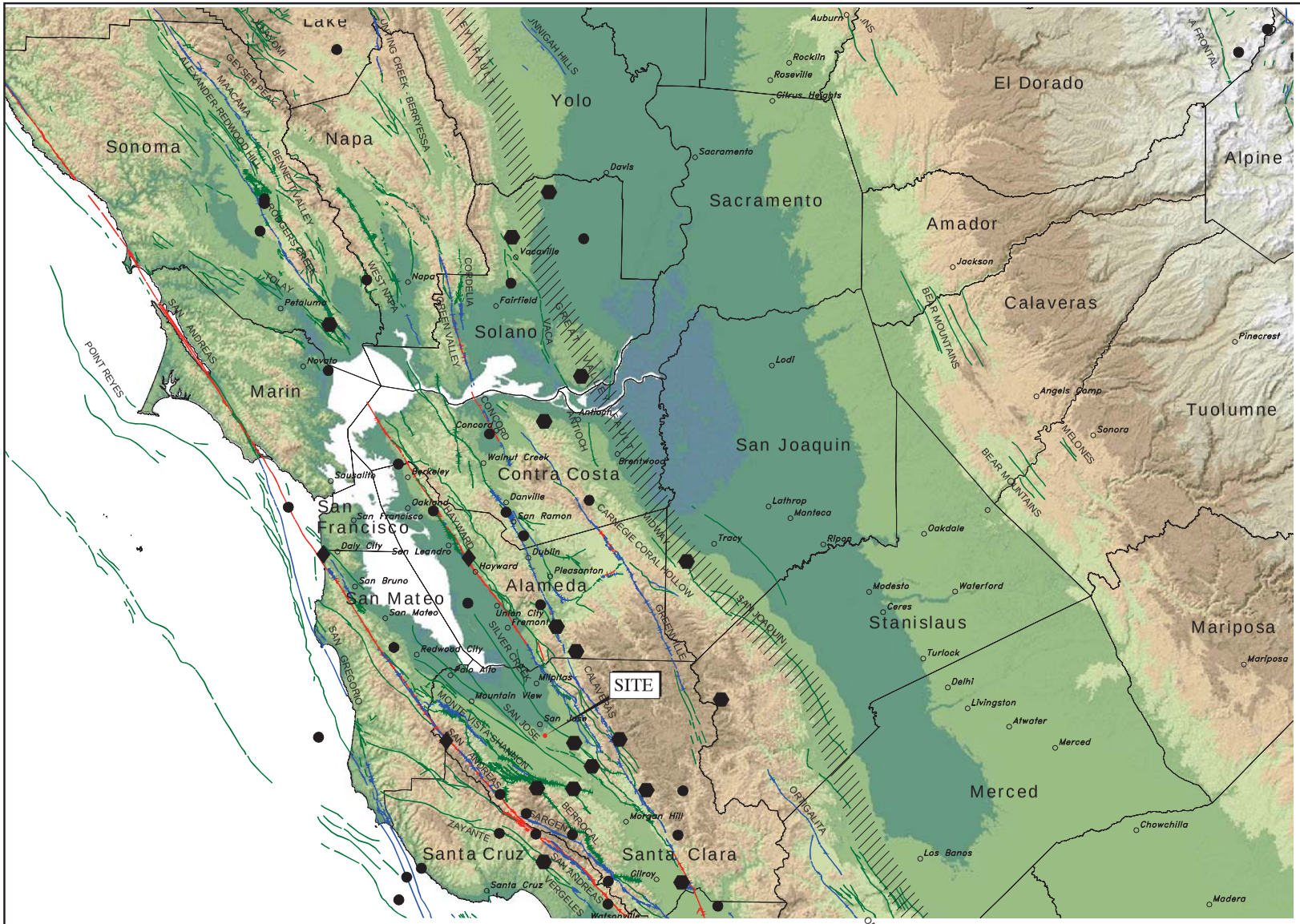
TAMIEN STATION TRANSIT ORIENTED DEVELOPMENT

SAN JOSE, CALIFORNIA

PROJECT NO.: 10851.000.000		FIGURE NO. 4
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: JK	

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\10851\000\GEX\10851000000-GEX-4-SeismichazardsMap-0214.dwg Plot Date: 2-21-14 spatters

ORIGINAL FIGURE PRINTED IN COLOR



BASE MAP SOURCE:
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATASET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, NOVEMBER, 2010
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800–2000)

ENGEO Expect Excellence

REGIONAL FAULTING AND SEISMICITY
TAMIEN STATION TRANSIT ORIENTED DEVELOPMENT
SAN JOSE, CALIFORNIA

PROJECT NO.: 10851.000.000		FIGURE NO 5
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: JK	

ORIGINAL FIGURE PRINTED IN COLOR

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\10851\000\GEX\10851000000-GEX-5-RegionalFaultingMap-0214.dwg Plot Date: 2-21-14 spatters

APPENDIX A

JOHN SARMIENTO & ASSOCIATES
Cone Penetration Test (CPT) Logs

APPENDIX A

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 65.3 feet

CPT NO.: 1-CPT1
DATE: 02-06-2014
TIME: 14:56:00
Groundwater measured at 18.0 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.52	0.5	0.77	0.00	0.5	0	1	0.06	----	0.09	Organic Material	<80
1.01	0.4	0.61	0.61	20.0	0	1	0.11	----	0.06	"	100-110
1.57	27.9	44.66	0.82	2.9	14	22	0.19	----	3.71	Clayey SILT to Silty CLAY	130-140
2.07	14.1	22.48	0.80	5.7	14	22	0.25	----	1.86	CLAY	120-130
2.50	14.7	23.55	0.57	3.9	10	16	0.30	----	1.94	Silty CLAY to CLAY	"
3.03	13.1	21.01	0.36	2.7	7	10	0.36	----	1.73	Clayey SILT to Silty CLAY	110-120
3.55	15.6	24.88	0.40	2.6	8	12	0.43	----	2.04	"	120-130
4.06	24.3	38.85	0.61	2.5	12	19	0.49	----	3.20	"	"
4.50	24.2	38.70	0.83	3.4	12	19	0.55	----	3.19	"	130-140
5.04	24.7	39.47	0.71	2.9	12	20	0.62	----	3.25	"	120-130
5.57	16.1	25.71	0.87	5.4	16	26	0.69	----	2.10	CLAY	"
6.03	17.8	28.46	0.90	5.1	18	28	0.74	----	2.32	"	"
6.55	20.6	32.69	0.91	4.4	21	33	0.81	----	2.69	"	130-140
7.00	27.5	42.02	0.92	3.3	14	21	0.87	----	3.61	Clayey SILT to Silty CLAY	"
7.54	18.3	26.64	0.79	4.3	18	27	0.94	----	2.37	CLAY	120-130
8.06	28.6	39.94	0.49	1.7	11	16	1.01	----	3.75	Sandy SILT to Clayey SILT	"
8.56	15.4	21.02	0.47	3.0	8	10	1.07	----	1.98	Clayey SILT to Silty CLAY	"
9.04	6.9	9.23	0.32	4.6	7	9	1.12	----	1.27	CLAY	100-110
9.52	11.1	14.56	0.46	4.1	11	15	1.18	----	1.76	"	120-130
10.07	14.3	18.18	0.44	3.1	10	12	1.25	----	1.82	Silty CLAY to CLAY	"
10.54	5.7	7.11	0.31	5.4	6	7	1.30	----	1.01	CLAY	100-110
11.03	4.5	5.53	0.23	5.2	4	5	1.35	----	0.77	"	"
11.54	5.6	6.67	0.25	4.5	6	7	1.40	----	0.97	"	"
12.01	5.4	6.32	0.22	4.1	5	6	1.45	----	0.93	"	"
12.51	6.3	7.18	0.28	4.4	6	7	1.50	----	1.10	"	"
13.02	7.9	8.95	0.42	5.3	8	9	1.56	----	1.43	"	110-120
13.51	10.2	11.27	0.52	5.1	10	11	1.62	----	1.56	"	120-130
14.01	11.9	12.84	0.64	5.4	12	13	1.69	----	1.84	"	"
14.52	13.2	13.98	0.84	6.3	13	14	1.75	----	1.64	"	"
15.01	13.1	13.69	0.90	6.9	13	14	1.81	----	1.63	"	"
15.53	16.7	17.15	0.94	5.6	17	17	1.88	----	2.10	"	"
16.03	15.5	15.74	0.91	5.9	15	16	1.94	----	1.94	"	"
16.52	14.8	14.81	0.87	5.9	15	15	2.00	----	1.84	"	"
17.02	16.1	16.07	0.99	6.2	16	16	2.06	----	2.01	"	"
17.51	15.9	15.89	1.11	7.0	16	16	2.13	----	1.98	"	130-140
18.01	14.1	14.07	0.93	6.6	14	14	2.16	----	1.74	"	120-130
18.58	13.7	13.60	0.88	6.4	14	14	2.20	----	1.67	"	"
19.07	12.5	12.44	0.83	6.6	12	12	2.23	----	1.51	"	"
19.57	11.4	11.33	0.73	6.5	11	11	2.26	----	1.70	"	"
20.06	10.3	10.24	0.76	7.4	10	10	2.29	----	1.51	"	"
20.56	10.1	10.08	0.64	6.3	10	10	2.32	----	1.48	"	"
21.06	10.5	10.45	0.61	5.8	10	10	2.35	----	1.54	"	"
21.54	10.0	9.87	0.55	5.5	10	10	2.38	----	1.44	"	"
22.01	11.4	11.30	0.58	5.1	11	11	2.41	----	1.67	"	"
22.50	11.6	11.48	0.61	5.3	12	11	2.44	----	1.70	"	"
23.00	19.3	19.14	0.80	4.2	13	13	2.47	----	2.39	Silty CLAY to CLAY	"
23.50	11.1	10.97	0.51	4.6	11	11	2.50	----	1.61	CLAY	"
24.07	11.3	11.04	0.52	4.6	11	11	2.54	----	1.64	"	"
24.57	11.0	10.67	0.40	3.6	11	11	2.57	----	1.59	"	110-120
25.01	13.7	13.18	0.46	3.4	9	9	2.59	----	1.63	Silty CLAY to CLAY	120-130
25.50	11.7	11.10	0.48	4.1	12	11	2.62	----	1.69	CLAY	"
26.00	12.4	11.61	0.43	3.5	8	8	2.66	----	1.44	Silty CLAY to CLAY	"
26.50	9.9	9.21	0.36	3.6	10	9	2.68	----	1.38	CLAY	110-120
27.08	10.1	9.31	0.47	4.6	10	9	2.71	----	1.41	"	"

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 65.3 feet

CPT NO.: 1-CPT1
DATE: 02-06-2014
TIME: 14:56:00
Groundwater measured at 18.0 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.58	9.0	8.23	0.49	5.4	9	8	2.74	----	1.22	CLAY	110-120
28.08	11.1	10.03	0.60	5.4	11	10	2.77	----	1.57	"	120-130
28.51	10.2	9.10	0.57	5.6	10	9	2.80	----	1.41	"	"
29.00	8.1	7.13	0.41	5.0	8	7	2.82	----	1.26	"	110-120
29.51	8.6	7.56	0.36	4.2	9	7	2.85	----	1.37	"	"
30.08	10.0	8.64	0.48	4.8	10	9	2.88	----	1.36	"	"
30.58	9.6	8.23	0.47	4.9	10	8	2.91	----	1.29	"	"
31.00	9.7	8.23	0.48	4.9	10	8	2.93	----	1.30	"	"
31.57	10.5	8.82	0.48	4.6	10	9	2.96	----	1.43	"	"
32.06	10.7	8.87	0.52	4.8	11	9	2.99	----	1.46	"	120-130
32.55	10.5	8.65	0.49	4.7	10	9	3.02	----	1.42	"	"
33.05	9.9	8.15	0.42	4.2	10	8	3.05	----	1.32	"	110-120
33.55	11.2	9.13	0.51	4.6	11	9	3.08	----	1.53	"	120-130
34.04	11.8	9.61	0.53	4.5	12	10	3.11	----	1.63	"	"
34.54	12.0	9.68	0.41	3.5	8	6	3.13	----	1.64	Silty CLAY to CLAY	110-120
35.03	11.1	8.94	0.45	4.1	11	9	3.16	----	1.49	CLAY	"
35.53	13.4	10.74	0.66	4.9	13	11	3.19	----	1.50	"	120-130
36.03	12.7	10.15	0.58	4.6	13	10	3.22	----	1.40	"	"
36.52	12.9	10.27	0.57	4.5	13	10	3.25	----	1.42	"	"
37.01	13.2	10.48	0.56	4.3	13	10	3.28	----	1.46	"	"
37.51	14.3	11.26	0.57	4.0	14	11	3.31	----	1.60	"	"
38.04	15.0	11.74	0.49	3.3	10	8	3.35	----	1.68	Silty CLAY to CLAY	"
38.53	15.2	11.89	0.50	3.3	10	8	3.38	----	1.72	"	"
39.02	13.6	10.57	0.49	3.6	9	7	3.41	----	1.50	"	"
39.51	14.5	11.20	0.42	2.9	7	6	3.44	----	1.61	Clayey SILT to Silty CLAY	"
40.07	21.0	16.20	1.05	5.0	21	16	3.48	----	2.48	CLAY	130-140
40.55	77.4	59.27	2.25	2.9	31	24	3.52	----	9.99	Sandy SILT to Clayey SILT	"
41.01	196.4	149.74	1.73	0.9	39	30	3.54	40	----	SAND	120-130
41.55	91.9	69.61	2.62	2.9	37	28	3.58	----	11.91	Sandy SILT to Clayey SILT	130-140
42.02	18.3	13.76	0.99	5.4	18	14	3.62	----	2.09	CLAY	"
42.57	17.3	12.98	1.06	6.1	17	13	3.66	----	1.96	"	"
43.02	194.8	145.25	3.37	1.7	49	36	3.69	40	----	SAND to Silty SAND	"
43.50	418.4	310.27	5.33	1.3	84	62	3.73	45	----	SAND	"
44.06	334.9	246.78	4.68	1.4	67	49	3.77	43	----	"	"
44.52	374.8	274.75	5.36	1.4	75	55	3.80	44	----	"	"
45.02	388.5	283.59	2.14	0.6	65	47	3.83	44	----	Gravelly SAND to SAND	110-120
45.55	346.4	251.35	7.08	2.0	69	50	3.86	43	----	SAND	130-140
46.03	258.9	186.83	4.32	1.7	52	37	3.90	42	----	"	"
46.50	296.2	212.57	3.48	1.2	59	42	3.93	42	----	"	"
47.03	287.3	204.90	3.81	1.3	57	41	3.97	42	----	"	"
47.51	221.1	156.86	4.96	2.2	74	52	4.01	41	----	Silty SAND to Sandy SILT	"
48.06	115.4	81.50	3.11	2.7	38	27	4.05	37	----	"	"
48.50	49.2	34.57	2.39	4.9	33	23	4.08	----	6.15	Silty CLAY to CLAY	"
49.02	15.0	10.48	1.10	7.4	15	10	4.12	----	1.59	CLAY	"
49.56	20.6	14.38	1.08	5.2	21	14	4.16	----	2.34	"	"
50.03	30.9	21.41	1.68	5.4	31	21	4.19	----	3.70	"	"
50.53	40.2	27.74	1.86	4.6	27	18	4.23	----	4.93	Silty CLAY to CLAY	"
51.00	101.4	69.78	3.29	3.3	41	28	4.26	----	13.10	Sandy SILT to Clayey SILT	"
51.55	42.1	28.79	2.08	4.9	28	19	4.30	----	5.18	Silty CLAY to CLAY	"
52.03	18.6	12.65	0.77	4.2	12	8	4.33	----	2.04	"	120-130
52.54	17.3	11.76	0.57	3.3	9	6	4.36	----	1.87	Clayey SILT to Silty CLAY	"
53.02	16.2	10.98	0.51	3.1	8	5	4.39	----	1.72	"	"
53.51	14.3	9.65	0.50	3.5	9	6	4.42	----	1.46	Silty CLAY to CLAY	"
54.00	14.9	10.00	0.48	3.2	10	7	4.45	----	1.54	"	"

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 65.3 feet

CPT NO.: 1-CPT1
DATE: 02-06-2014
TIME: 14:56:00
Groundwater measured at 18.0 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
54.52	20.1	13.40	0.94	4.7	20	13	4.49	----	2.22	CLAY	130-140
55.01	22.6	15.06	1.13	5.0	23	15	4.53	----	2.56	"	"
55.51	25.4	16.79	1.35	5.3	25	17	4.56	----	2.92	"	"
56.07	34.1	22.44	1.80	5.3	34	22	4.60	----	4.07	"	"
56.52	214.7	140.82	4.16	1.9	54	35	4.64	40	----	SAND to Silty SAND	"
57.04	252.4	164.71	5.21	2.1	63	41	4.67	41	----	"	"
57.56	299.5	194.69	3.36	1.1	60	39	4.71	42	----	SAND	120-130
58.02	409.6	265.06	6.29	1.5	82	53	4.74	44	----	"	130-140
58.52	356.7	229.74	4.82	1.4	71	46	4.78	43	----	"	"
59.04	322.2	206.64	2.58	0.8	64	41	4.81	42	----	"	120-130
59.51	269.4	172.22	1.90	0.7	54	34	4.83	41	----	"	110-120
60.05	327.2	208.35	2.20	0.7	55	35	4.86	42	----	Gravelly SAND to SAND	"
60.55	290.4	184.04	4.70	1.6	58	37	4.90	42	----	SAND	130-140
61.04	330.0	208.26	3.16	1.0	66	42	4.93	42	----	"	120-130
61.54	315.9	198.49	2.83	0.9	63	40	4.96	42	----	"	"
62.04	427.4	267.29	4.90	1.2	85	53	5.00	44	----	"	130-140
62.50	333.3	207.65	5.96	1.8	67	42	5.03	42	----	"	"
63.05	337.4	209.44	3.42	1.0	67	42	5.06	42	----	"	120-130
63.56	254.3	157.42	1.75	0.7	51	31	5.09	41	----	"	110-120
64.06	84.7	52.26	1.93	2.3	28	17	5.13	34	----	Silty SAND to Sandy SILT	130-140
64.56	296.6	182.41	2.04	0.7	59	36	5.15	41	----	SAND	110-120
65.01	458.3	281.00	4.69	1.0	92	56	5.18	44	----	"	120-130
65.35	598.2	281.00	5.49	1.0	92	56	5.18	44	----	"	"

DEPTH = Sampling interval (~0.1 feet)
Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs
SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden
EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*
Su = Undrained Soil Strength* (see classification chart)
References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 60.0 feet

CPT NO.: 1-CPT2
DATE: 02-06-2014
TIME: 11:10:00
Groundwater estimated at 18.0 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	0.9	1.38	0.01	0.6	1	1	0.06	----	0.17	Organic Material	<80
1.02	91.5	146.34	8.81	9.6	91	146	0.13	----	12.19	Very Stiff Fine Grained *	>140
1.52	84.6	135.36	5.71	6.7	85	135	0.20	----	11.27	"	"
2.02	44.3	70.90	2.16	4.9	30	47	0.27	----	5.89	Silty CLAY to CLAY	130-140
2.54	41.2	65.95	2.34	5.7	41	66	0.34	----	5.47	CLAY	"
3.01	39.4	63.10	2.49	6.3	39	63	0.40	----	5.23	"	"
3.57	49.4	79.09	2.70	5.5	49	79	0.48	----	6.56	"	"
4.06	76.3	122.13	3.53	4.6	76	122	0.54	----	10.14	Very Stiff Fine Grained *	"
4.55	96.4	154.30	5.44	5.6	96	154	0.61	----	12.82	"	>140
5.03	84.6	135.34	4.33	5.1	85	135	0.68	----	11.23	"	130-140
5.56	81.9	131.01	4.10	5.0	82	131	0.75	----	10.87	"	"
6.02	80.8	128.45	2.45	3.0	32	51	0.81	----	10.72	Sandy SILT to Clayey SILT	"
6.58	84.5	128.45	0.99	1.2	21	32	0.88	39	----	SAND to Silty SAND	120-130
7.05	90.9	132.77	0.96	1.1	23	33	0.94	40	----	"	"
7.54	135.8	189.72	2.28	1.7	34	47	1.00	42	----	"	130-140
8.01	262.2	358.32	2.16	0.8	52	72	1.06	45	----	SAND	120-130
8.58	236.3	314.84	1.36	0.6	47	63	1.13	45	----	"	110-120
9.06	168.7	219.09	3.39	2.0	56	73	1.19	43	----	Silty SAND to Sandy SILT	130-140
9.57	72.1	91.19	3.80	5.3	72	91	1.26	----	9.53	Very Stiff Fine Grained *	"
10.06	43.5	53.64	2.98	6.8	43	54	1.33	----	5.72	CLAY	"
10.56	38.8	46.49	2.30	5.9	39	46	1.40	----	5.07	"	"
11.06	31.1	36.30	2.25	7.2	31	36	1.46	----	4.05	"	"
11.56	32.0	36.39	2.02	6.3	32	36	1.53	----	4.16	"	"
12.00	31.8	35.47	1.98	6.2	32	35	1.59	----	4.13	"	"
12.50	28.6	31.25	1.73	6.1	29	31	1.66	----	3.70	"	"
13.01	24.7	26.34	1.69	6.8	25	26	1.73	----	3.17	"	"
13.52	23.3	24.40	1.66	7.1	23	24	1.80	----	2.98	"	"
14.02	21.2	21.91	1.63	7.7	21	22	1.86	----	2.71	"	"
14.54	20.1	20.42	1.61	8.0	20	20	1.93	----	2.55	"	"
15.07	19.3	19.30	1.55	8.0	19	19	2.01	----	2.44	"	"
15.58	24.0	23.94	1.67	7.0	24	24	2.07	----	3.06	"	"
16.01	24.9	24.87	1.73	7.0	25	25	2.13	----	3.18	"	"
16.52	20.5	20.40	1.43	7.0	20	20	2.20	----	2.58	"	"
17.04	17.5	17.42	1.19	6.8	18	17	2.27	----	2.18	"	"
17.54	16.7	16.54	1.09	6.5	17	17	2.34	----	2.06	"	"
18.06	16.0	15.83	1.18	7.4	16	16	2.38	----	1.97	"	"
18.55	13.3	13.16	0.97	7.3	13	13	2.41	----	1.60	"	120-130
19.06	13.4	13.25	0.93	6.9	13	13	2.44	----	1.61	"	"
19.58	11.2	11.06	0.80	7.2	11	11	2.47	----	1.65	"	"
20.01	10.4	10.30	0.77	7.4	10	10	2.50	----	1.51	"	"
20.53	9.4	9.25	0.71	7.5	9	9	2.53	----	1.35	"	"
21.06	7.7	7.49	0.55	7.2	8	7	2.56	----	1.27	"	110-120
21.53	8.4	8.07	0.53	6.3	8	8	2.58	----	1.39	"	"
22.05	8.4	8.00	0.54	6.4	8	8	2.61	----	1.39	"	"
22.56	10.8	10.16	0.64	5.9	11	10	2.64	----	1.55	"	120-130
23.08	9.4	8.80	0.57	6.0	9	9	2.68	----	1.32	"	"
23.51	10.7	9.87	0.60	5.6	11	10	2.70	----	1.53	"	"
24.03	33.1	30.11	1.65	5.0	33	30	2.74	----	4.20	"	130-140
24.55	11.8	10.66	0.93	7.9	12	11	2.77	----	1.71	"	120-130
25.05	12.5	11.15	0.67	5.4	12	11	2.80	----	1.45	"	"
25.56	12.4	10.85	0.56	4.5	12	11	2.84	----	1.42	"	"
26.01	11.6	10.08	0.45	3.9	12	10	2.86	----	1.65	"	"
26.52	10.5	9.00	0.42	4.0	10	9	2.89	----	1.45	"	110-120
27.04	10.5	8.91	0.45	4.3	10	9	2.92	----	1.45	"	"

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 60.0 feet

CPT NO.: 1-CPT2
DATE: 02-06-2014
TIME: 11:10:00
Groundwater estimated at 18.0 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.57	9.4	7.93	0.46	4.9	9	8	2.95	----	1.27	CLAY	110-120
28.05	10.7	8.88	0.55	5.1	11	9	2.98	----	1.47	"	120-130
28.57	10.2	8.40	0.49	4.8	10	8	3.00	----	1.39	"	110-120
29.01	20.4	16.79	0.70	3.4	10	8	3.03	----	2.48	Clayey SILT to Silty CLAY	120-130
29.53	9.6	7.87	0.40	4.2	10	8	3.06	----	1.29	CLAY	110-120
30.05	9.4	7.69	0.47	5.0	9	8	3.09	----	1.25	"	"
30.57	10.2	8.28	0.50	4.9	10	8	3.12	----	1.37	"	120-130
31.01	10.4	8.41	0.50	4.8	10	8	3.15	----	1.40	"	"
31.52	9.9	7.94	0.46	4.7	10	8	3.17	----	1.31	"	110-120
32.03	8.9	7.12	0.41	4.6	9	7	3.20	----	1.37	"	"
32.55	9.4	7.50	0.46	4.9	9	7	3.23	----	1.22	"	"
33.07	9.0	7.18	0.43	4.8	9	7	3.25	----	1.15	"	"
33.50	9.8	7.77	0.50	5.1	10	8	3.28	----	1.28	"	"
34.02	11.5	9.09	0.60	5.2	11	9	3.31	----	1.56	"	120-130
34.52	12.3	9.67	0.56	4.6	12	10	3.34	----	1.35	"	"
35.02	11.7	9.12	0.55	4.7	11	9	3.37	----	1.57	"	"
35.54	12.9	10.05	0.66	5.1	13	10	3.40	----	1.42	"	"
36.04	13.3	10.30	0.67	5.0	13	10	3.44	----	1.47	"	"
36.56	13.3	10.26	0.64	4.8	13	10	3.47	----	1.46	"	"
37.08	13.7	10.51	0.60	4.4	13	10	3.50	----	1.51	"	"
37.59	16.1	12.30	0.60	3.7	11	8	3.53	----	1.83	Silty CLAY to CLAY	"
38.08	15.0	11.39	0.50	3.3	10	7	3.56	----	1.67	"	"
38.51	13.3	10.05	0.41	3.1	9	7	3.59	----	1.44	"	"
39.03	14.6	10.96	0.39	2.7	7	5	3.62	----	1.61	Clayey SILT to Silty CLAY	"
39.55	12.9	9.71	0.34	2.6	6	5	3.65	----	1.39	"	110-120
40.06	13.2	9.83	0.35	2.7	6	5	3.68	----	1.42	"	"
40.58	14.9	11.08	0.48	3.2	10	7	3.71	----	1.64	Silty CLAY to CLAY	120-130
41.00	14.4	10.66	0.52	3.6	9	7	3.74	----	1.57	"	"
41.52	13.3	9.81	0.39	3.0	9	6	3.76	----	1.42	"	110-120
42.08	13.5	9.86	0.42	3.1	9	6	3.80	----	1.44	"	120-130
42.51	13.7	10.01	0.46	3.3	9	6	3.83	----	1.47	"	"
43.02	13.3	9.64	0.46	3.4	9	6	3.86	----	1.41	"	"
43.53	11.9	8.61	0.49	4.1	11	8	3.89	----	1.53	CLAY	"
44.07	12.6	9.06	0.42	3.3	8	6	3.92	----	1.31	Silty CLAY to CLAY	110-120
44.57	14.4	10.34	0.50	3.4	9	7	3.95	----	1.55	"	120-130
45.07	13.6	9.69	0.45	3.3	9	6	3.98	----	1.43	"	"
45.58	16.2	11.46	0.54	3.4	10	7	4.01	----	1.77	"	"
46.06	17.3	12.19	0.68	4.0	11	8	4.04	----	1.91	"	"
46.53	21.7	15.24	0.84	3.9	14	10	4.07	----	2.49	"	"
47.01	25.4	17.78	0.88	3.5	12	9	4.11	----	2.98	Clayey SILT to Silty CLAY	130-140
47.53	62.6	43.71	2.96	4.7	41	29	4.14	----	7.95	Silty CLAY to CLAY	"
48.06	129.8	90.15	3.15	2.4	43	30	4.18	37	----	Silty SAND to Sandy SILT	"
48.53	70.5	48.76	3.40	4.8	70	49	4.22	----	8.99	Very Stiff Fine Grained *	"
49.05	53.7	36.99	1.86	3.5	27	18	4.25	----	6.75	Clayey SILT to Silty CLAY	"
49.55	20.0	13.73	0.79	3.9	13	9	4.29	----	2.25	Silty CLAY to CLAY	120-130
50.01	21.5	14.66	0.60	2.8	11	7	4.31	----	2.44	Clayey SILT to Silty CLAY	"
50.54	17.6	11.94	0.66	3.8	11	8	4.35	----	1.91	Silty CLAY to CLAY	"
51.05	14.0	9.46	0.45	3.3	9	6	4.38	----	1.43	"	"
51.57	13.4	9.06	0.38	2.8	6	4	4.41	----	1.35	Clayey SILT to Silty CLAY	110-120
52.01	15.8	10.65	0.46	2.9	8	5	4.43	----	1.67	"	120-130
52.54	19.1	12.77	0.69	3.6	12	8	4.47	----	2.10	Silty CLAY to CLAY	"
53.05	20.7	13.81	0.85	4.1	13	9	4.50	----	2.31	"	"
53.57	27.7	18.39	1.80	6.5	27	18	4.54	----	3.24	CLAY	130-140
54.02	153.8	101.72	5.59	3.6	77	51	4.57	38	----	SAND to Clayey SAND *	>140

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 60.0 feet

CPT NO.: 1-CPT2
DATE: 02-06-2014
TIME: 11:10:00
Groundwater estimated at 18.0 feet

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
54.55	330.3	217.36	5.34	1.6	66	43	4.61	42	----	SAND	130-140
55.07	297.6	194.85	3.71	1.3	59	39	4.65	42	----	"	"
55.56	374.5	244.27	2.95	0.8	62	41	4.68	43	----	Gravelly SAND to SAND	120-130
56.04	412.5	267.96	3.96	1.0	82	54	4.71	44	----	SAND	"
56.54	341.2	220.63	3.91	1.2	68	44	4.75	43	----	"	130-140
57.01	487.5	313.99	5.26	1.1	97	63	4.78	45	----	"	120-130
57.54	327.0	209.55	4.45	1.4	65	42	4.81	42	----	"	130-140
58.01	472.9	301.83	4.57	1.0	95	60	4.84	44	----	"	120-130
58.51	387.2	245.93	5.47	1.4	77	49	4.88	43	----	"	130-140
59.06	380.1	240.34	2.95	0.8	63	40	4.91	43	----	Gravelly SAND to SAND	120-130
59.52	379.0	238.71	3.67	1.0	76	48	4.94	43	----	SAND	"
60.04	383.9	240.76	4.26	1.1	77	48	4.98	43	----	"	"

DEPTH = Sampling interval (~0.1 feet)
Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs
SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden
EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*
Su = Undrained Soil Strength* (see classification chart)
References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 50.0 feet

CPT NO.: 1-CPT3
DATE: 02-13-2014
TIME: 12:25:00
Groundwater measured at 19.5 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.54	0.6	1.01	0.12	18.4	1	1	0.06	----	0.12	Organic Material	85-90
1.03	6.7	10.67	0.78	11.6	7	11	0.12	----	1.32	"	120-130
1.52	149.6	239.39	6.87	4.6	150	239	0.19	----	19.94	Very Stiff Fine Grained *	>140
2.01	117.4	187.82	6.11	5.2	117	188	0.26	----	15.63	"	"
2.53	75.8	121.23	5.03	6.6	76	121	0.33	----	10.08	"	"
3.03	60.7	97.07	3.87	6.4	61	97	0.40	----	8.06	"	130-140
3.53	52.4	83.76	3.17	6.1	52	84	0.47	----	6.95	CLAY	"
4.02	50.2	80.34	2.61	5.2	50	80	0.53	----	6.66	"	"
4.54	73.9	118.22	1.48	2.0	25	39	0.60	39	----	Silty SAND to Sandy SILT	"
5.02	62.4	99.82	2.13	3.4	25	40	0.67	----	8.27	Sandy SILT to Clayey SILT	"
5.55	53.6	85.81	2.76	5.2	54	86	0.74	----	7.10	CLAY	"
6.04	59.6	94.96	2.81	4.7	40	63	0.81	----	7.89	Silty CLAY to CLAY	"
6.53	39.4	60.13	2.55	6.5	39	60	0.87	----	5.19	CLAY	"
7.04	25.1	36.60	1.78	7.1	25	37	0.94	----	3.28	"	"
7.56	22.6	31.52	1.74	7.7	23	32	1.01	----	2.95	"	"
8.02	19.6	26.62	1.41	7.2	20	27	1.07	----	2.54	"	"
8.56	19.3	25.56	1.20	6.2	19	26	1.15	----	2.50	"	"
9.08	22.7	29.28	1.72	7.6	23	29	1.22	----	2.95	"	"
9.53	22.6	28.45	1.98	8.8	23	28	1.28	----	2.93	"	"
10.06	20.3	24.78	1.90	9.4	20	25	1.35	----	2.61	"	"
10.53	17.3	20.66	1.49	8.6	17	21	1.41	----	2.22	"	"
11.06	15.8	18.25	1.51	9.6	16	18	1.48	----	2.00	"	"
11.52	12.6	14.30	1.12	8.9	13	14	1.54	----	1.58	"	120-130
12.02	12.5	13.95	1.07	8.6	13	14	1.60	----	1.57	"	"
12.58	11.9	12.91	1.02	8.6	12	13	1.67	----	1.84	"	"
13.06	12.3	13.06	1.00	8.1	12	13	1.73	----	1.52	"	"
13.54	14.0	14.74	0.94	6.7	14	15	1.79	----	1.75	"	"
14.02	14.9	15.42	1.14	7.7	15	15	1.86	----	1.87	"	130-140
14.51	15.8	16.03	1.23	7.8	16	16	1.93	----	1.97	"	"
15.05	15.2	15.16	1.23	8.1	15	15	2.00	----	1.89	"	"
15.54	13.1	13.03	0.99	7.6	13	13	2.06	----	1.60	"	120-130
16.04	12.1	12.06	0.99	8.2	12	12	2.12	----	1.47	"	"
16.52	10.6	10.51	0.88	8.3	11	11	2.18	----	1.58	"	"
17.01	10.0	9.93	0.79	7.9	10	10	2.24	----	1.48	"	"
17.58	8.1	8.02	0.73	9.0	8	8	2.31	----	1.38	"	"
18.06	7.1	7.06	0.61	8.6	7	7	2.37	----	1.19	"	110-120
18.52	8.9	8.86	0.61	6.8	9	9	2.43	----	1.55	"	120-130
19.01	10.8	10.65	0.68	6.3	11	11	2.49	----	1.59	"	"
19.58	9.1	8.98	0.56	6.2	9	9	2.52	----	1.31	"	"
20.07	9.5	9.26	0.57	6.0	10	9	2.55	----	1.37	"	"
20.55	7.8	7.54	0.37	4.7	8	7	2.58	----	1.30	"	110-120
21.04	8.8	8.40	0.43	4.9	9	8	2.61	----	1.48	"	"
21.52	9.3	8.79	0.51	5.5	9	9	2.63	----	1.31	"	"
22.03	11.2	10.44	0.50	4.5	11	10	2.66	----	1.62	"	120-130
22.53	9.6	8.94	0.46	4.8	10	9	2.69	----	1.36	"	110-120
23.01	8.8	8.09	0.44	5.0	9	8	2.71	----	1.46	"	"
23.50	8.1	7.41	0.45	5.5	8	7	2.74	----	1.33	"	"
24.08	7.7	6.92	0.42	5.5	7	7	2.77	----	1.23	"	"
24.57	12.3	10.97	0.68	5.5	12	11	2.80	----	1.43	"	120-130
25.07	11.0	9.64	0.51	4.7	11	9	2.83	----	1.56	"	"
25.56	9.9	8.59	0.45	4.6	10	8	2.86	----	1.37	"	110-120
26.06	9.1	7.81	0.39	4.3	9	8	2.88	----	1.23	"	"
26.54	10.4	8.85	0.59	5.7	10	9	2.92	----	1.45	"	120-130
27.03	11.1	9.34	0.58	5.3	11	9	2.95	----	1.56	"	"

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 50.0 feet

CPT NO.: 1-CPT3
DATE: 02-13-2014
TIME: 12:25:00
Groundwater measured at 19.5 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.52	10.3	8.61	0.57	5.5	10	8	2.98	----	1.43	CLAY	120-130
28.00	8.9	7.36	0.49	5.5	9	7	3.00	----	1.43	"	110-120
28.52	9.4	7.68	0.50	5.4	9	7	3.03	----	1.26	"	"
29.08	9.1	7.46	0.53	5.8	9	7	3.06	----	1.21	"	"
29.57	8.8	7.21	0.48	5.5	9	7	3.08	----	1.39	"	"
30.06	9.3	7.51	0.49	5.3	9	7	3.11	----	1.23	"	"
30.54	9.6	7.74	0.51	5.3	9	7	3.13	----	1.27	"	"
31.03	10.0	8.03	0.53	5.3	10	8	3.16	----	1.33	"	"
31.56	10.9	8.74	0.52	4.8	10	8	3.19	----	1.48	"	120-130
32.05	12.1	9.69	0.65	5.3	12	9	3.22	----	1.35	"	"
32.53	12.6	10.03	0.68	5.4	12	10	3.25	----	1.41	"	"
33.02	12.3	9.78	0.65	5.3	12	9	3.29	----	1.37	"	"
33.58	12.0	9.45	0.66	5.5	12	9	3.32	----	1.65	"	"
34.07	10.6	8.32	0.51	4.8	10	8	3.35	----	1.41	"	110-120
34.59	11.6	9.10	0.55	4.7	11	9	3.38	----	1.58	"	120-130
35.07	13.2	10.30	0.55	4.1	13	10	3.41	----	1.47	"	"
35.55	13.7	10.60	0.53	3.9	13	10	3.44	----	1.53	"	"
36.03	13.7	10.56	0.58	4.2	13	10	3.47	----	1.52	"	"
36.51	11.6	8.88	0.45	3.9	11	8	3.49	----	1.54	"	110-120
37.02	11.8	9.02	0.45	3.8	11	9	3.52	----	1.58	"	"
37.52	11.6	8.81	0.44	3.8	11	8	3.55	----	1.53	"	"
38.00	12.1	9.21	0.48	3.9	11	9	3.58	----	1.30	"	120-130
38.56	13.9	10.50	0.49	3.5	9	7	3.61	----	1.53	Silty CLAY to CLAY	"
39.04	15.0	11.25	0.45	3.0	7	5	3.64	----	1.67	Clayey SILT to Silty CLAY	"
39.51	14.0	10.43	0.50	3.6	9	7	3.67	----	1.53	Silty CLAY to CLAY	"
40.07	15.0	11.17	0.60	4.0	14	10	3.71	----	1.67	CLAY	"
40.54	23.1	17.07	0.80	3.5	11	8	3.74	----	2.74	Clayey SILT to Silty CLAY	130-140
41.06	80.5	59.20	2.16	2.7	32	24	3.78	----	10.39	Sandy SILT to Clayey SILT	"
41.52	119.4	87.36	3.93	3.3	48	35	3.81	----	15.57	"	"
42.06	42.2	30.71	3.00	7.1	42	31	3.85	----	5.28	CLAY	"
42.50	17.4	12.60	1.28	7.3	17	13	3.88	----	1.97	"	"
43.02	21.9	15.78	1.43	6.5	22	16	3.92	----	2.56	"	"
43.52	28.2	20.19	0.86	3.1	14	10	3.96	----	3.40	Clayey SILT to Silty CLAY	"
44.02	37.6	26.72	1.47	3.9	19	13	3.99	----	4.64	"	"
44.54	78.6	55.57	4.11	5.2	78	55	4.03	----	10.10	Very Stiff Fine Grained *	"
45.04	157.5	110.91	4.21	2.7	52	37	4.07	39	----	Silty SAND to Sandy SILT	"
45.57	21.6	15.17	1.61	7.5	22	15	4.11	----	2.50	CLAY	"
46.00	40.7	28.40	1.91	4.7	27	19	4.14	----	5.03	Silty CLAY to CLAY	"
46.52	16.3	11.34	1.06	6.5	16	11	4.18	----	1.78	CLAY	"
47.05	88.7	61.35	3.76	4.2	44	31	4.21	----	11.43	Clayey SILT to Silty CLAY	"
47.57	298.4	205.64	3.20	1.1	60	41	4.25	42	----	SAND	120-130
48.07	314.2	215.66	3.35	1.1	63	43	4.28	42	----	"	"
48.53	321.4	219.73	4.47	1.4	64	44	4.31	43	----	"	130-140
49.01	321.1	218.70	3.27	1.0	64	44	4.34	43	----	"	120-130
49.52	334.4	226.82	2.76	0.8	67	45	4.37	43	----	"	"
50.07	335.6	227.25	0.24	0.1	56	38	4.39	43	----	Gravelly SAND to SAND	80-85

DEPTH = Sampling interval (~0.1 feet)
Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs
SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden
EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*
Su = Undrained Soil Strength* (see classification chart)
References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 45.0 feet

CPT NO.: 1-CPT4
DATE: 02-06-2014
TIME: 09:11:00
Groundwater measured at 19.9 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.57	65.8	105.28	2.12	3.2	26	42	0.07	----	8.77	Sandy SILT to Clayey SILT	130-140
1.03	85.5	136.80	3.64	4.3	43	68	0.13	----	11.39	Clayey SILT to Silty CLAY	"
1.51	56.4	90.21	2.94	5.2	56	90	0.19	----	7.50	CLAY	"
2.03	42.6	68.08	2.78	6.5	43	68	0.26	----	5.66	"	"
2.52	60.8	97.26	2.77	4.6	40	65	0.33	----	8.08	Silty CLAY to CLAY	"
3.08	115.1	184.11	5.30	4.6	115	184	0.41	----	15.32	Very Stiff Fine Grained *	>140
3.57	84.8	135.73	3.87	4.6	85	136	0.47	----	11.28	"	130-140
4.04	87.7	140.30	2.39	2.7	35	56	0.54	----	11.66	Sandy SILT to Clayey SILT	"
4.54	187.4	299.87	5.48	2.9	62	100	0.61	44	----	Silty SAND to Sandy SILT	"
5.06	150.0	239.97	4.35	2.9	50	80	0.68	43	----	"	"
5.57	269.2	430.75	2.40	0.9	54	86	0.74	46	----	SAND	120-130
6.07	259.0	412.59	5.43	2.1	52	82	0.81	46	----	"	130-140
6.58	123.7	188.47	1.90	1.5	31	47	0.88	42	----	SAND to Silty SAND	"
7.01	69.8	102.27	2.26	3.2	28	41	0.93	----	9.24	Sandy SILT to Clayey SILT	"
7.54	40.1	56.07	2.21	5.5	40	56	1.01	----	5.28	CLAY	"
8.09	42.9	58.26	1.94	4.5	29	39	1.08	----	5.65	Silty CLAY to CLAY	"
8.53	42.0	55.72	1.99	4.8	28	37	1.14	----	5.52	"	"
9.03	43.0	55.60	2.07	4.8	29	37	1.21	----	5.66	"	"
9.54	22.1	27.84	1.31	5.9	22	28	1.28	----	2.87	CLAY	"
10.05	17.5	21.46	0.97	5.5	17	21	1.35	----	2.25	"	"
10.56	13.2	15.75	0.88	6.7	13	16	1.41	----	1.66	"	120-130
11.08	13.9	16.15	0.93	6.7	14	16	1.47	----	1.75	"	"
11.52	22.9	26.03	1.48	6.5	23	26	1.53	----	2.95	"	130-140
12.03	23.9	26.56	1.61	6.8	24	27	1.60	----	3.07	"	"
12.54	26.9	29.28	1.87	7.0	27	29	1.67	----	3.48	"	"
13.07	23.3	24.76	1.74	7.5	23	25	1.74	----	2.99	"	"
13.51	26.9	28.21	1.86	6.9	27	28	1.80	----	3.47	"	"
14.03	29.5	30.41	2.00	6.8	29	30	1.87	----	3.81	"	"
14.54	30.6	31.00	2.24	7.3	31	31	1.94	----	3.95	"	"
15.04	31.7	31.70	2.49	7.9	32	32	2.01	----	4.09	"	"
15.55	29.7	29.65	2.37	8.0	30	30	2.08	----	3.82	"	"
16.04	30.3	30.22	2.34	7.7	30	30	2.14	----	3.90	"	"
16.56	25.5	25.35	1.92	7.6	25	25	2.21	----	3.25	"	"
17.07	20.1	19.95	1.65	8.2	20	20	2.28	----	2.52	"	"
17.58	15.5	15.42	1.27	8.2	15	15	2.35	----	1.91	"	"
18.00	17.5	17.32	1.24	7.1	17	17	2.41	----	2.17	"	"
18.53	16.3	16.16	1.27	7.8	16	16	2.48	----	2.01	"	"
19.05	13.1	12.78	1.07	8.2	13	13	2.54	----	1.58	"	120-130
19.57	10.9	10.38	0.92	8.5	11	10	2.61	----	1.60	"	"
20.09	9.4	8.82	0.88	9.4	9	9	2.64	----	1.34	"	"
20.51	8.3	7.76	0.74	8.9	8	8	2.67	----	1.39	"	"
21.04	6.1	5.65	0.45	7.3	6	6	2.70	----	0.94	"	110-120
21.55	8.4	7.70	0.55	6.6	8	8	2.72	----	1.40	"	"
22.00	10.5	9.54	0.70	6.6	10	10	2.75	----	1.51	"	120-130
22.50	7.4	6.69	0.55	7.4	7	7	2.78	----	1.19	"	110-120
23.02	7.9	7.05	0.51	6.4	8	7	2.80	----	1.28	"	"
23.53	7.5	6.58	0.40	5.4	7	7	2.83	----	1.19	"	"
24.04	7.6	6.60	0.42	5.5	8	7	2.86	----	1.20	"	"
24.56	5.7	4.89	0.37	6.6	6	5	2.88	----	0.81	"	100-110
25.04	5.8	4.95	0.38	6.6	6	5	2.90	----	0.83	"	"
25.55	6.0	5.07	0.41	6.8	6	5	2.93	----	0.86	"	110-120
26.05	5.8	4.85	0.41	7.1	6	5	2.95	----	0.82	"	"
26.54	6.4	5.30	0.38	6.0	6	5	2.98	----	0.93	"	"
27.04	8.5	6.98	0.69	8.1	8	7	3.01	----	1.35	"	120-130

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 45.0 feet

CPT NO.: 1-CPT4
DATE: 02-06-2014
TIME: 09:11:00
Groundwater measured at 19.9 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.53	56.5	46.33	1.11	2.0	19	15	3.05	34	----	Silty SAND to Sandy SILT	130-140
28.01	24.7	20.15	1.24	5.0	25	20	3.08	----	3.05	CLAY	"
28.50	8.0	6.53	0.52	6.4	8	6	3.11	----	1.24	"	110-120
29.07	7.0	5.69	0.45	6.4	7	6	3.14	----	1.03	"	"
29.56	8.2	6.57	0.53	6.5	8	6	3.16	----	1.25	"	"
30.07	8.0	6.39	0.51	6.4	8	6	3.19	----	1.21	"	"
30.57	8.5	6.79	0.52	6.1	8	7	3.22	----	1.31	"	"
31.07	9.0	7.18	0.57	6.4	9	7	3.25	----	1.17	"	120-130
31.51	9.9	7.85	0.60	6.0	10	8	3.27	----	1.32	"	"
32.01	9.4	7.45	0.57	6.1	9	7	3.31	----	1.23	"	"
32.50	10.0	7.87	0.61	6.1	10	8	3.34	----	1.32	"	"
33.01	10.9	8.50	0.69	6.3	11	8	3.37	----	1.46	"	"
33.52	10.7	8.31	0.66	6.2	11	8	3.40	----	1.42	"	"
34.03	10.6	8.20	0.66	6.3	10	8	3.43	----	1.40	"	"
34.52	10.2	7.89	0.63	6.1	10	8	3.46	----	1.34	"	"
35.07	10.2	7.79	0.59	5.8	10	8	3.50	----	1.32	"	"
35.56	10.1	7.70	0.59	5.8	10	8	3.53	----	1.30	"	"
36.00	11.0	8.40	0.55	5.0	11	8	3.56	----	1.46	"	"
36.51	17.5	13.26	0.66	3.8	11	9	3.59	----	2.02	Silty CLAY to CLAY	"
37.02	20.5	15.46	0.80	3.9	13	10	3.62	----	2.42	"	"
37.53	21.7	16.29	1.03	4.8	21	16	3.66	----	2.58	CLAY	130-140
38.03	35.7	26.58	1.24	3.5	18	13	3.69	----	4.43	Clayey SILT to Silty CLAY	"
38.53	12.1	8.99	0.57	4.7	12	9	3.72	----	1.29	CLAY	120-130
39.04	9.9	7.33	0.46	4.7	10	7	3.75	----	1.24	"	110-120
39.56	9.1	6.70	0.45	5.0	9	7	3.78	----	1.10	"	"
40.06	9.2	6.77	0.40	4.4	9	7	3.81	----	1.12	"	"
40.58	11.5	8.40	0.46	4.0	11	8	3.84	----	1.49	"	120-130
41.08	14.5	10.54	0.56	3.8	10	7	3.87	----	1.59	Silty CLAY to CLAY	"
41.57	15.2	10.98	0.60	3.9	10	7	3.90	----	1.68	"	"
42.08	19.8	14.23	0.91	4.6	20	14	3.94	----	2.29	CLAY	130-140
42.50	31.0	22.09	2.14	6.9	31	22	3.97	----	3.77	"	"
43.05	149.6	106.13	4.55	3.0	50	35	4.01	38	----	Silty SAND to Sandy SILT	"
43.51	146.7	103.65	5.99	4.1	147	104	4.04	----	19.19	Very Stiff Fine Grained *	>140
44.04	164.6	115.73	4.03	2.5	55	39	4.08	39	----	Silty SAND to Sandy SILT	130-140
44.55	287.2	201.17	2.33	0.8	57	40	4.11	42	----	SAND	120-130
45.03	562.0	392.19	4.38	0.8	94	65	4.14	46	----	Gravelly SAND to SAND	"

DEPTH = Sampling interval (~0.1 feet)
Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs
SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden
EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*
Su = Undrained Soil Strength* (see classification chart)
References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 50.0 feet

CPT NO.: 1-CPT5
DATE: 02-06-2014
TIME: 09:58:00
Groundwater estimated at 18.0 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.55	195.8	313.30	4.50	2.3	65	104	0.06	45	----	Silty SAND to Sandy SILT	130-140
1.06	211.6	338.61	7.67	3.6	106	169	0.14	45	----	SAND to Clayey SAND *	>140
1.50	145.9	233.46	2.41	1.7	36	58	0.20	43	----	SAND to Silty SAND	130-140
2.03	86.9	139.10	1.14	1.3	22	35	0.26	40	----	"	120-130
2.53	45.9	73.38	1.17	2.5	18	29	0.33	----	6.09	Sandy SILT to Clayey SILT	130-140
3.04	31.6	50.58	1.15	3.7	16	25	0.40	----	4.19	Clayey SILT to Silty CLAY	"
3.55	58.3	93.26	0.58	1.0	19	31	0.46	38	----	Silty SAND to Sandy SILT	120-130
4.08	49.1	78.58	0.50	1.0	16	26	0.53	37	----	"	"
4.54	35.6	56.93	0.84	2.4	14	23	0.59	----	4.70	Sandy SILT to Clayey SILT	130-140
5.07	39.8	63.73	0.72	1.8	16	25	0.66	----	5.27	"	120-130
5.55	23.9	38.16	0.82	3.4	12	19	0.72	----	3.13	Clayey SILT to Silty CLAY	130-140
6.07	25.0	39.98	0.75	3.0	12	20	0.79	----	3.28	"	"
6.51	16.8	26.05	0.83	5.0	17	26	0.85	----	2.18	CLAY	120-130
7.04	19.7	29.35	0.57	2.9	10	15	0.91	----	2.57	Clayey SILT to Silty CLAY	"
7.54	24.5	34.94	0.65	2.7	12	17	0.97	----	3.20	"	"
8.05	23.7	32.77	0.53	2.2	9	13	1.04	----	3.10	Sandy SILT to Clayey SILT	"
8.56	17.2	23.22	0.46	2.7	9	12	1.10	----	2.23	Clayey SILT to Silty CLAY	"
9.00	10.3	13.52	0.53	5.2	10	13	1.16	----	1.61	CLAY	"
9.53	6.0	7.68	0.33	5.6	6	8	1.21	----	1.07	"	100-110
10.07	5.3	6.67	0.32	6.0	5	7	1.27	----	0.93	"	"
10.51	4.9	6.08	0.26	5.2	5	6	1.32	----	0.85	"	"
11.02	9.4	11.40	0.42	4.5	9	11	1.37	----	1.46	"	110-120
11.52	49.7	58.50	0.86	1.7	17	19	1.44	35	----	Silty SAND to Sandy SILT	130-140
12.07	7.3	8.37	0.42	5.7	7	8	1.50	----	1.31	CLAY	110-120
12.58	4.2	4.69	0.23	5.6	4	5	1.55	----	0.67	"	90-100
13.02	3.5	3.89	0.18	5.2	3	4	1.60	----	0.54	"	"
13.53	3.8	4.15	0.20	5.3	4	4	1.64	----	0.59	"	"
14.05	6.6	7.15	0.40	6.0	7	7	1.70	----	1.16	"	110-120
14.57	4.8	5.10	0.31	6.4	5	5	1.76	----	0.79	"	100-110
15.07	8.7	9.04	0.47	5.5	9	9	1.82	----	1.55	"	110-120
15.59	11.8	12.16	0.65	5.5	12	12	1.88	----	1.81	"	120-130
16.01	14.4	14.63	0.90	6.2	14	15	1.93	----	1.79	"	"
16.53	14.2	14.21	1.00	7.1	14	14	2.00	----	1.76	"	"
17.03	14.3	14.28	1.07	7.5	14	14	2.06	----	1.77	"	"
17.53	13.3	13.31	0.91	6.8	13	13	2.12	----	1.64	"	"
18.04	13.2	13.11	0.90	6.8	13	13	2.16	----	1.61	"	"
18.55	14.6	14.54	0.87	6.0	15	14	2.19	----	1.80	"	"
19.06	13.9	13.86	0.82	5.9	14	14	2.22	----	1.70	"	"
19.57	12.1	12.04	0.70	5.8	12	12	2.25	----	1.45	"	"
20.08	12.9	12.81	0.77	6.0	13	13	2.28	----	1.55	"	"
20.51	11.9	11.83	0.85	7.1	12	12	2.31	----	1.78	"	"
21.03	8.9	8.79	0.41	4.6	9	9	2.34	----	1.51	"	110-120
21.55	11.8	11.74	0.50	4.2	12	12	2.37	----	1.75	"	120-130
22.06	12.8	12.69	0.59	4.6	13	13	2.40	----	1.53	"	"
22.57	11.3	11.16	0.55	4.9	11	11	2.43	----	1.65	"	"
23.09	9.5	9.45	0.45	4.7	9	9	2.46	----	1.36	"	110-120
23.50	11.2	11.06	0.50	4.5	11	11	2.49	----	1.62	"	120-130
24.02	11.5	11.27	0.51	4.4	11	11	2.52	----	1.67	"	"
24.53	8.7	8.47	0.35	4.0	9	8	2.55	----	1.44	"	110-120
25.01	9.8	9.51	0.46	4.7	10	9	2.57	----	1.39	"	"
25.52	9.8	9.42	0.50	5.1	10	9	2.60	----	1.38	"	"
26.04	9.7	9.15	0.46	4.8	10	9	2.63	----	1.35	"	"
26.56	9.5	8.89	0.49	5.2	9	9	2.65	----	1.31	"	"
27.06	11.9	11.01	0.76	6.4	12	11	2.68	----	1.70	"	120-130

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)
Terminated at 50.0 feet

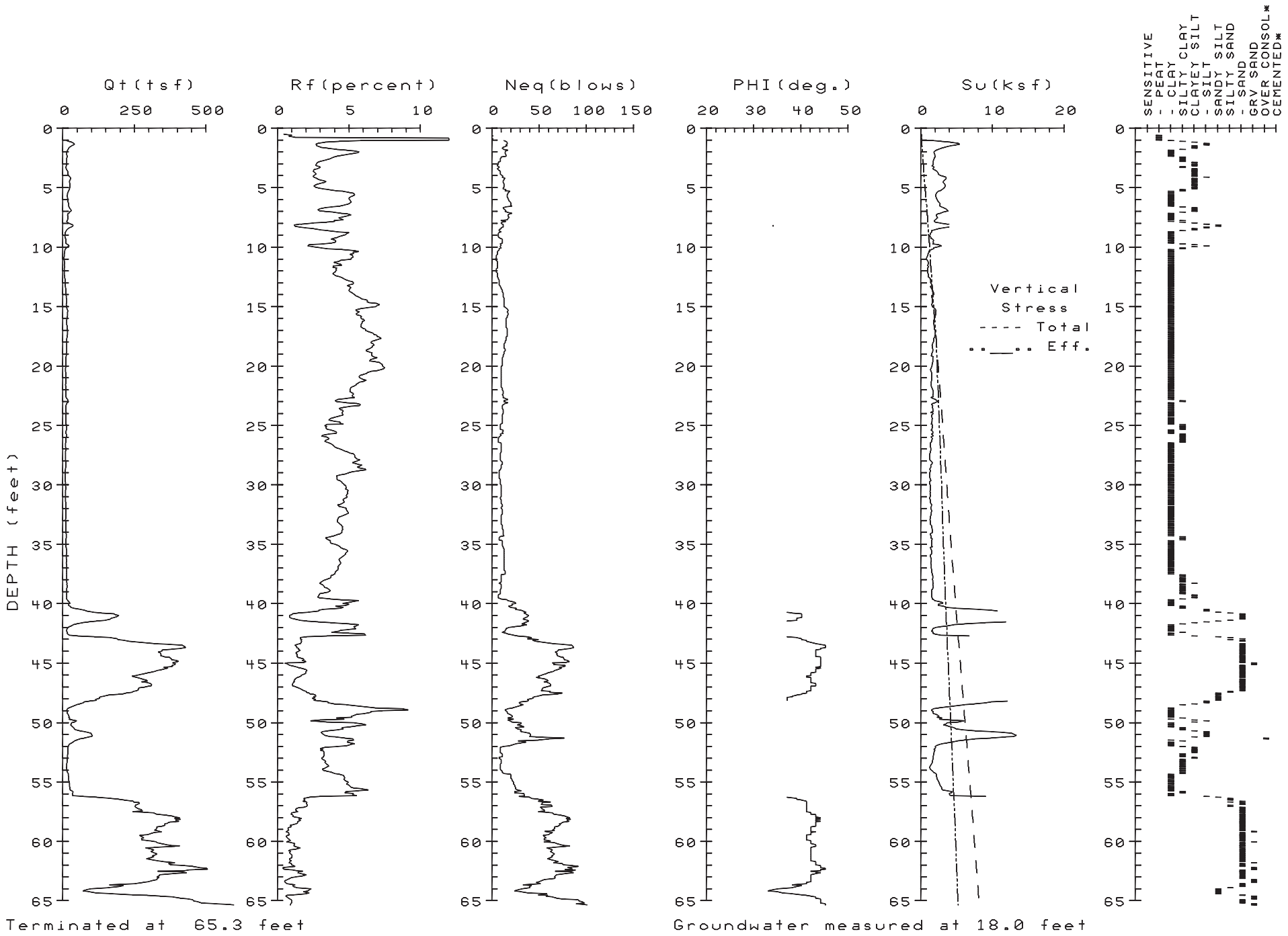
CPT NO.: 1-CPT5
DATE: 02-06-2014
TIME: 09:58:00
Groundwater estimated at 18.0 feet

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qt (tsf)	Qt' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
27.56	24.3	22.28	0.95	3.9	16	15	2.72	----	3.02	Silty CLAY to CLAY	130-140
28.04	17.0	15.43	0.71	4.2	17	15	2.75	----	2.04	CLAY	120-130
28.55	8.9	7.99	0.42	4.7	9	8	2.78	----	1.43	"	110-120
29.06	9.0	7.99	0.46	5.1	9	8	2.80	----	1.44	"	"
29.56	9.7	8.49	0.57	5.9	10	8	2.84	----	1.31	"	120-130
30.06	10.0	8.72	0.57	5.7	10	9	2.87	----	1.37	"	"
30.58	9.1	7.81	0.49	5.4	9	8	2.89	----	1.20	"	110-120
31.00	8.4	7.17	0.45	5.3	8	7	2.92	----	1.31	"	"
31.55	8.2	6.94	0.41	5.0	8	7	2.95	----	1.26	"	"
32.06	9.6	7.98	0.50	5.2	9	8	2.97	----	1.27	"	"
32.58	9.9	8.13	0.50	5.0	10	8	3.00	----	1.31	"	"
33.01	10.3	8.49	0.53	5.1	10	8	3.03	----	1.39	"	120-130
33.51	12.5	10.25	0.67	5.3	12	10	3.06	----	1.40	"	"
34.02	13.2	10.76	0.76	5.7	13	11	3.09	----	1.49	"	"
34.57	13.4	10.87	0.81	6.0	13	11	3.12	----	1.51	"	"
35.08	13.1	10.56	0.64	4.9	13	10	3.16	----	1.46	"	"
35.59	13.5	10.85	0.66	4.9	13	11	3.19	----	1.51	"	"
36.05	14.9	11.88	0.69	4.7	15	12	3.22	----	1.69	"	"
36.56	14.8	11.76	0.70	4.7	15	12	3.25	----	1.67	"	"
37.04	17.8	14.14	0.85	4.7	18	14	3.28	----	2.08	"	"
37.50	41.7	32.88	3.00	7.2	42	33	3.31	----	5.25	"	130-140
38.05	310.7	243.73	4.01	1.3	62	49	3.35	43	----	SAND	"
38.57	230.0	179.47	2.79	1.2	46	36	3.39	41	----	"	"
39.04	88.8	68.90	4.09	4.6	89	69	3.42	----	11.52	Very Stiff Fine Grained *	"
39.56	138.0	106.48	4.62	3.4	55	43	3.46	----	18.07	Sandy SILT to Clayey SILT	"
40.03	273.2	209.77	3.39	1.2	55	42	3.50	42	----	SAND	"
40.55	129.3	98.75	4.18	3.2	52	39	3.53	----	16.91	Sandy SILT to Clayey SILT	"
41.06	122.8	93.28	3.61	2.9	49	37	3.57	----	16.04	"	"
41.57	255.3	192.79	4.68	1.8	51	39	3.61	42	----	SAND	"
42.05	340.2	255.56	4.72	1.4	68	51	3.64	43	----	"	"
42.53	346.3	258.89	2.93	0.9	69	52	3.67	43	----	"	120-130
43.03	378.6	281.90	2.65	0.7	63	47	3.70	44	----	Gravelly SAND to SAND	110-120
43.57	353.1	261.54	3.02	0.9	71	52	3.73	44	----	SAND	120-130
44.07	374.3	275.70	4.74	1.3	75	55	3.77	44	----	"	130-140
44.54	439.2	322.89	0.82	0.2	73	54	3.78	45	----	Gravelly SAND to SAND	85-90
45.04	534.5	391.38	3.70	0.7	89	65	3.81	46	----	"	110-120
45.55	536.4	390.82	5.13	1.0	89	65	3.84	46	----	"	120-130
46.03	440.2	318.90	8.25	1.9	88	64	3.87	45	----	SAND	130-140
46.56	423.7	305.08	9.82	2.3	212	152	3.91	44	----	SAND to Clayey SAND *	"
47.03	173.5	124.22	6.77	3.9	87	62	3.95	39	----	"	>140
47.51	174.4	124.14	4.04	2.3	58	41	3.98	39	----	Silty SAND to Sandy SILT	130-140
48.07	151.3	107.10	2.90	1.9	50	36	4.02	38	----	"	"
48.58	46.6	32.82	1.00	2.1	19	13	4.06	----	5.81	Sandy SILT to Clayey SILT	"
49.01	189.5	133.03	2.97	1.6	38	27	4.09	40	----	SAND	"
49.51	205.8	143.88	2.83	1.4	41	29	4.13	40	----	"	"
50.05	130.7	90.96	1.48	1.1	33	23	4.16	37	----	SAND to Silty SAND	120-130

DEPTH = Sampling interval (~0.1 feet)
Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs
SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden
EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*
Su = Undrained Soil Strength* (see classification chart)
References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975



Terminated at 65.3 feet

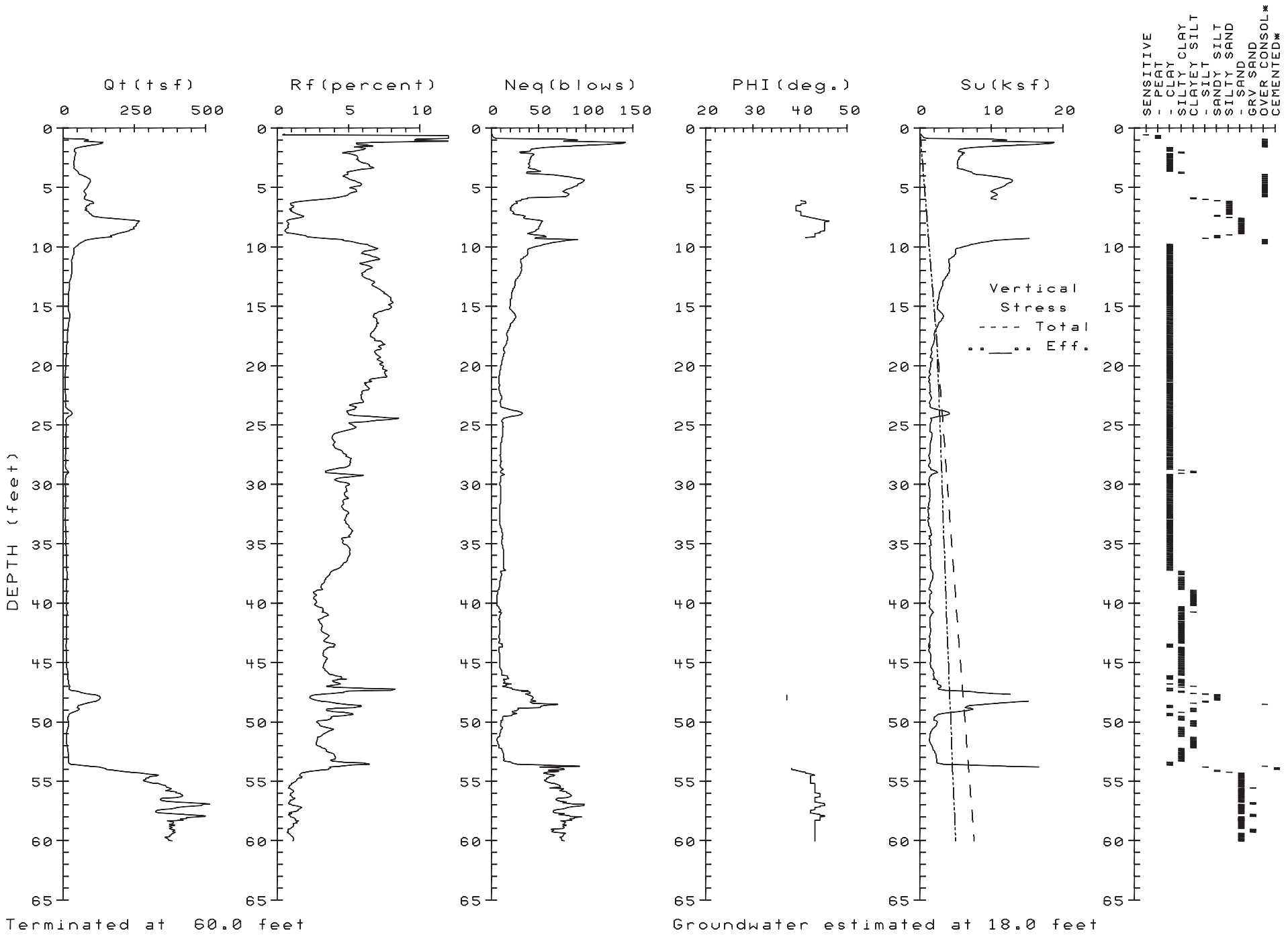
Groundwater measured at 18.0 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT1
DATE : 02-06-2014

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 60.0 feet

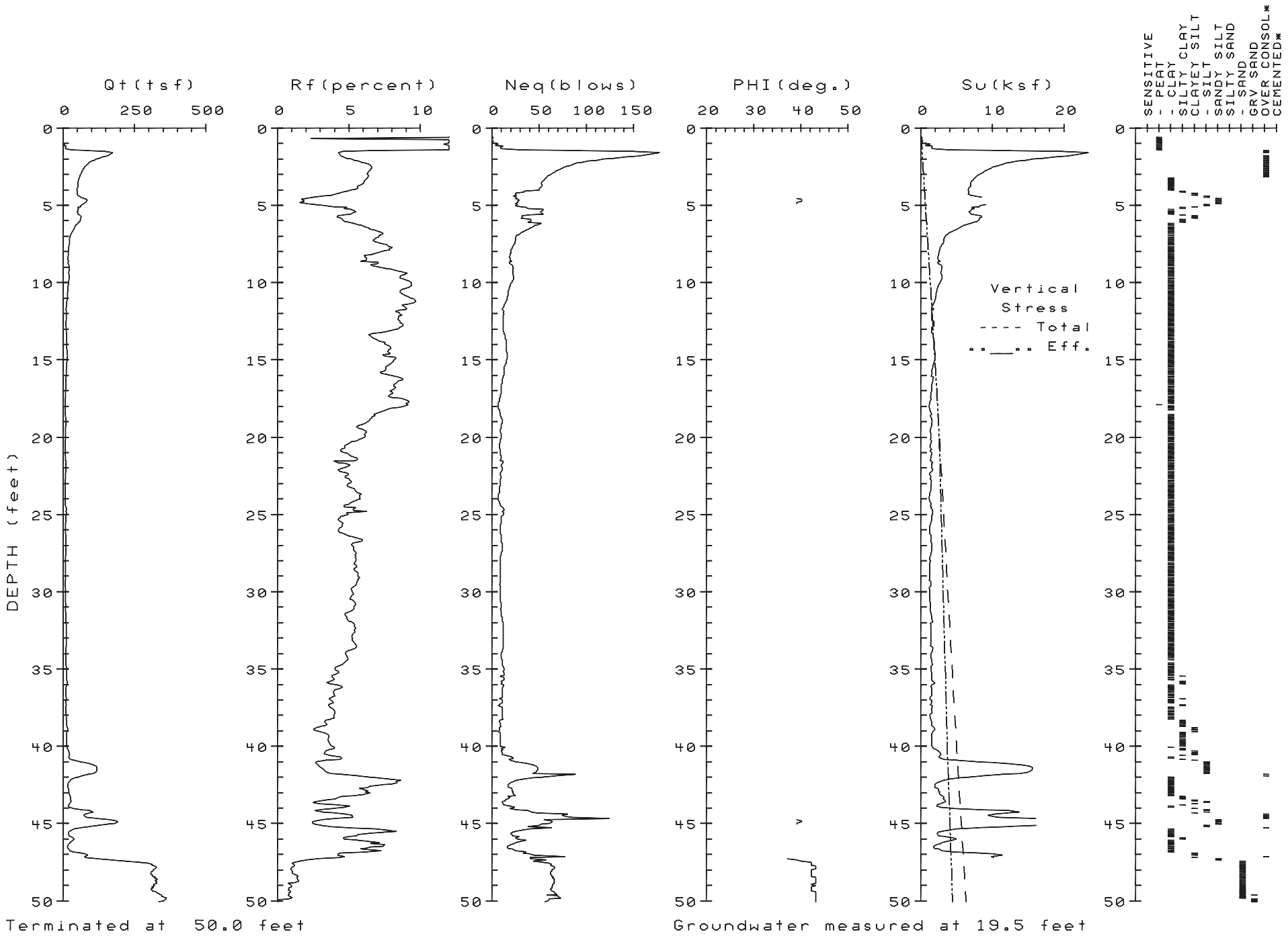
Groundwater estimated at 18.0 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT2
DATE : 02-06-2014

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

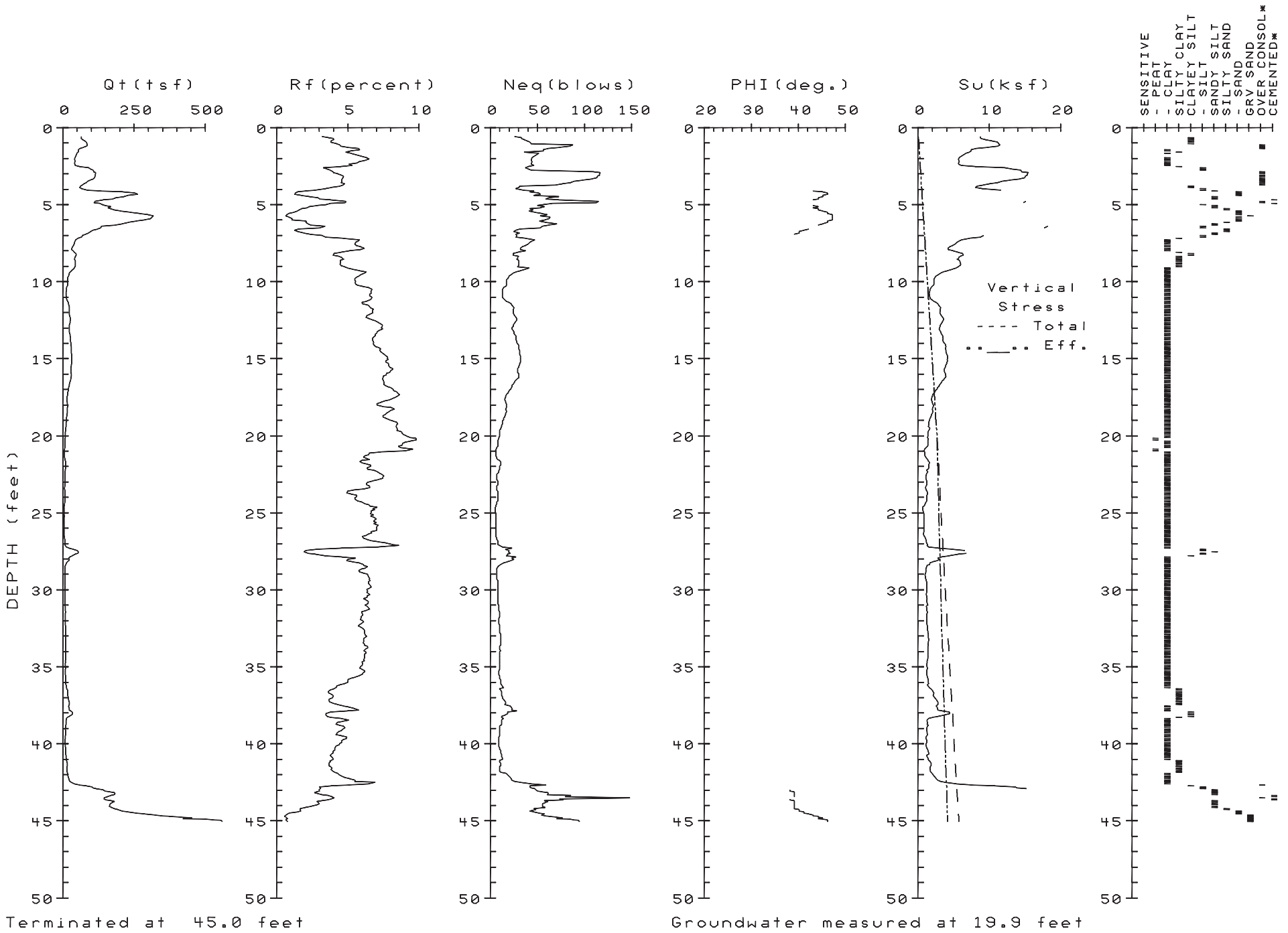
Groundwater measured at 19.5 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT3
DATE : 02-13-2014

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 45.0 feet

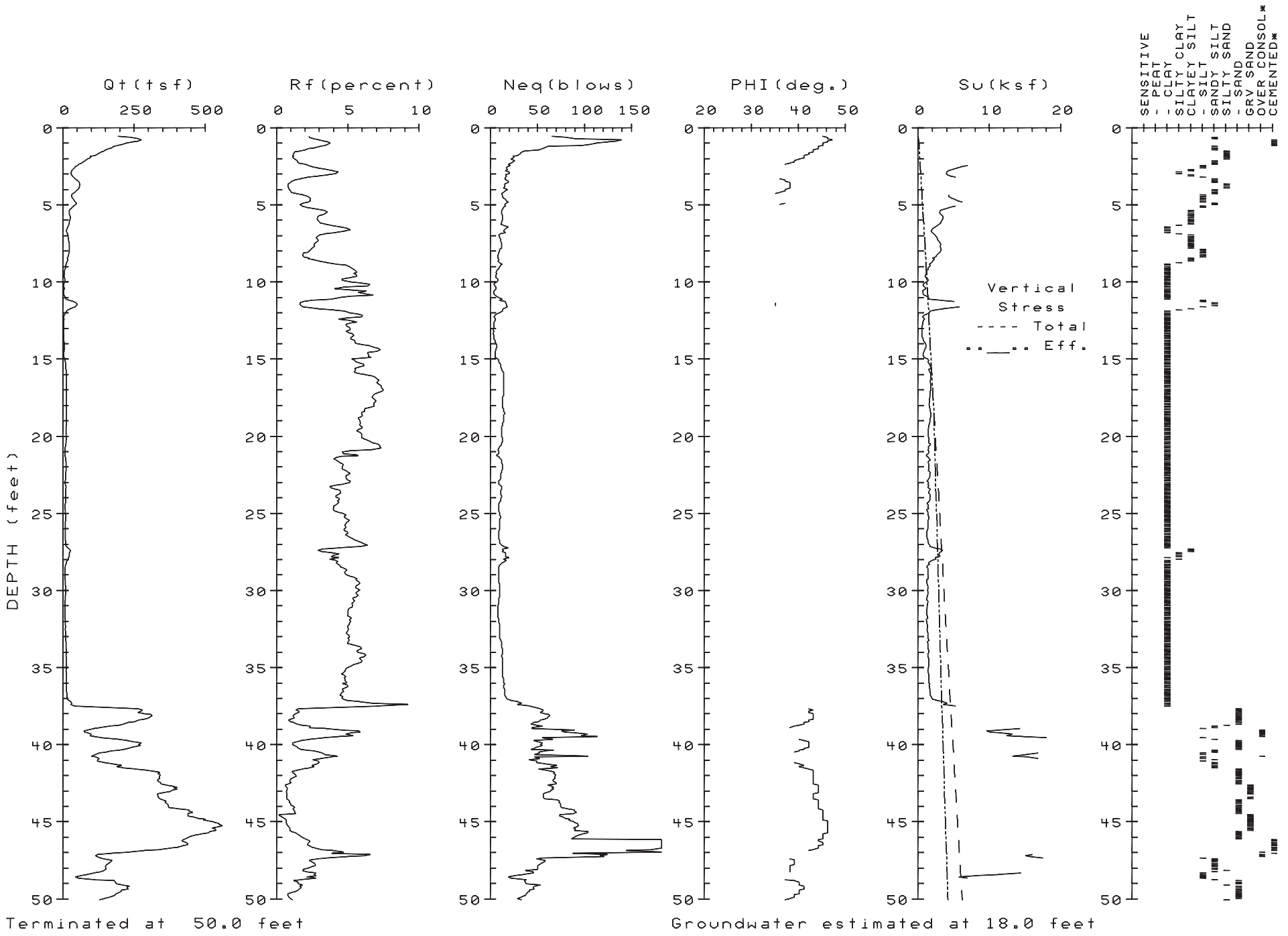
Groundwater measured at 19.9 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT4
DATE : 02-06-2014

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

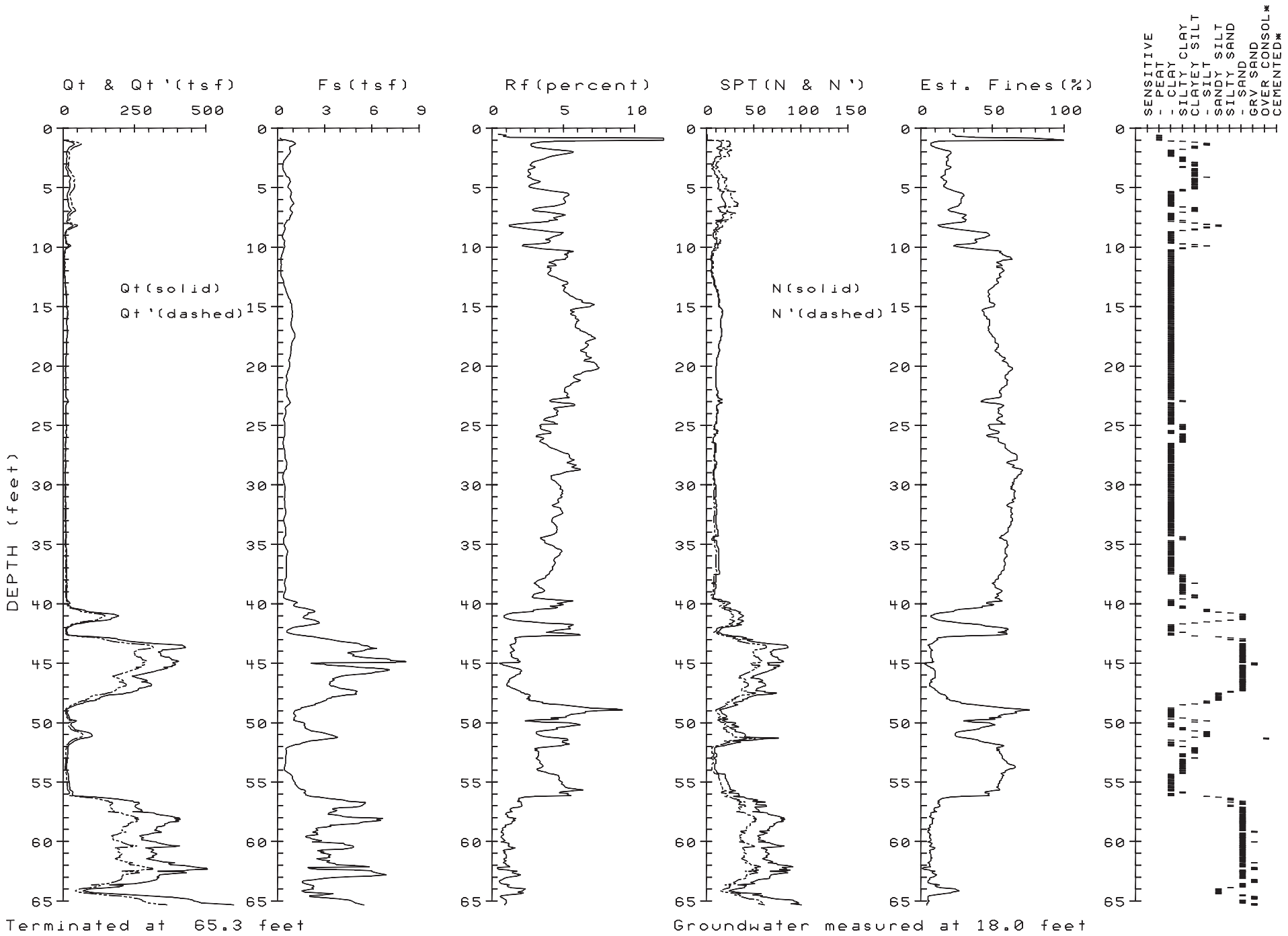
Groundwater estimated at 18.0 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT5
DATE : 02-06-2014

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 65.3 feet

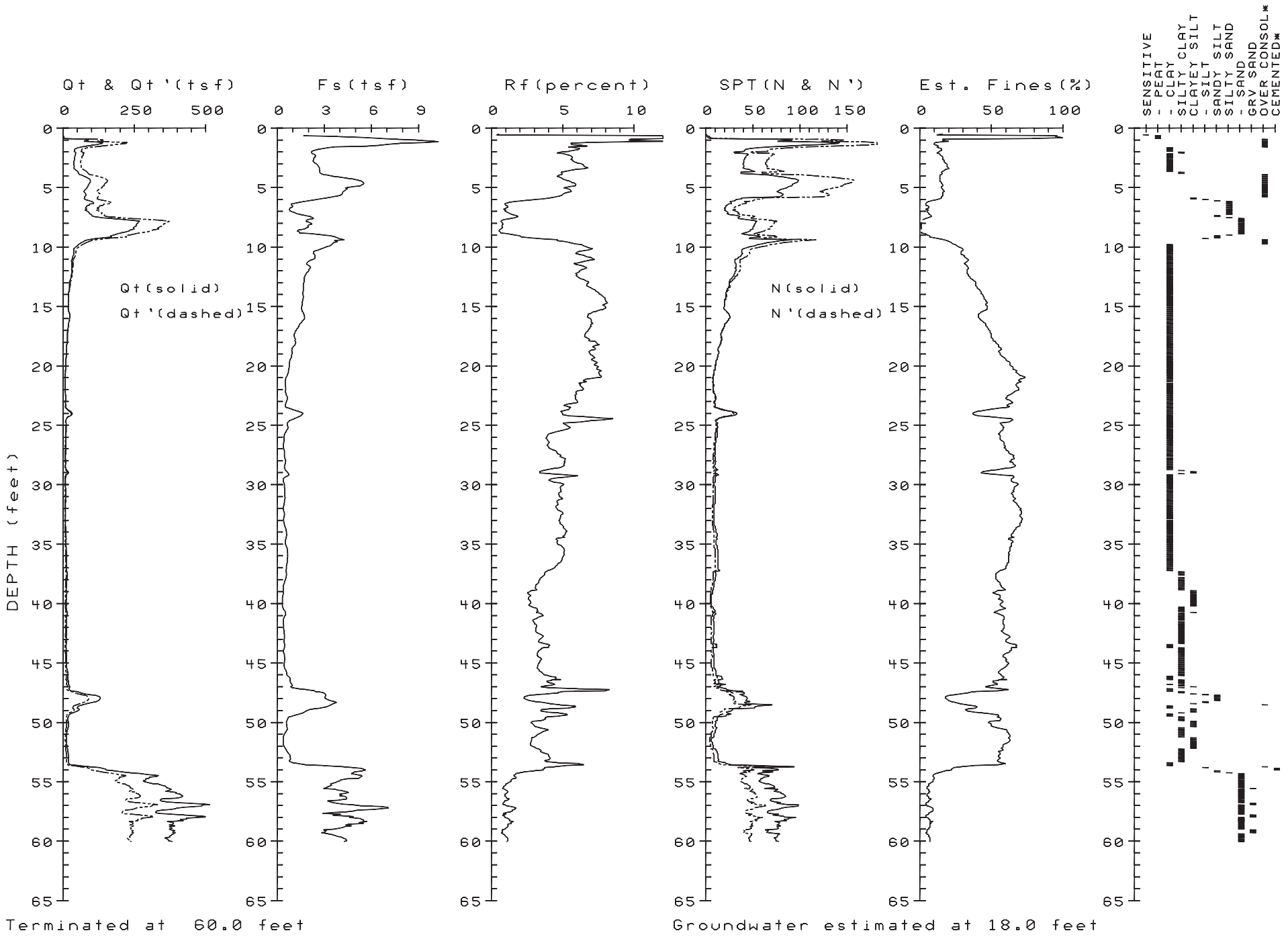
Groundwater measured at 18.0 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT1
DATE : 02-06-2014

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 60.0 feet

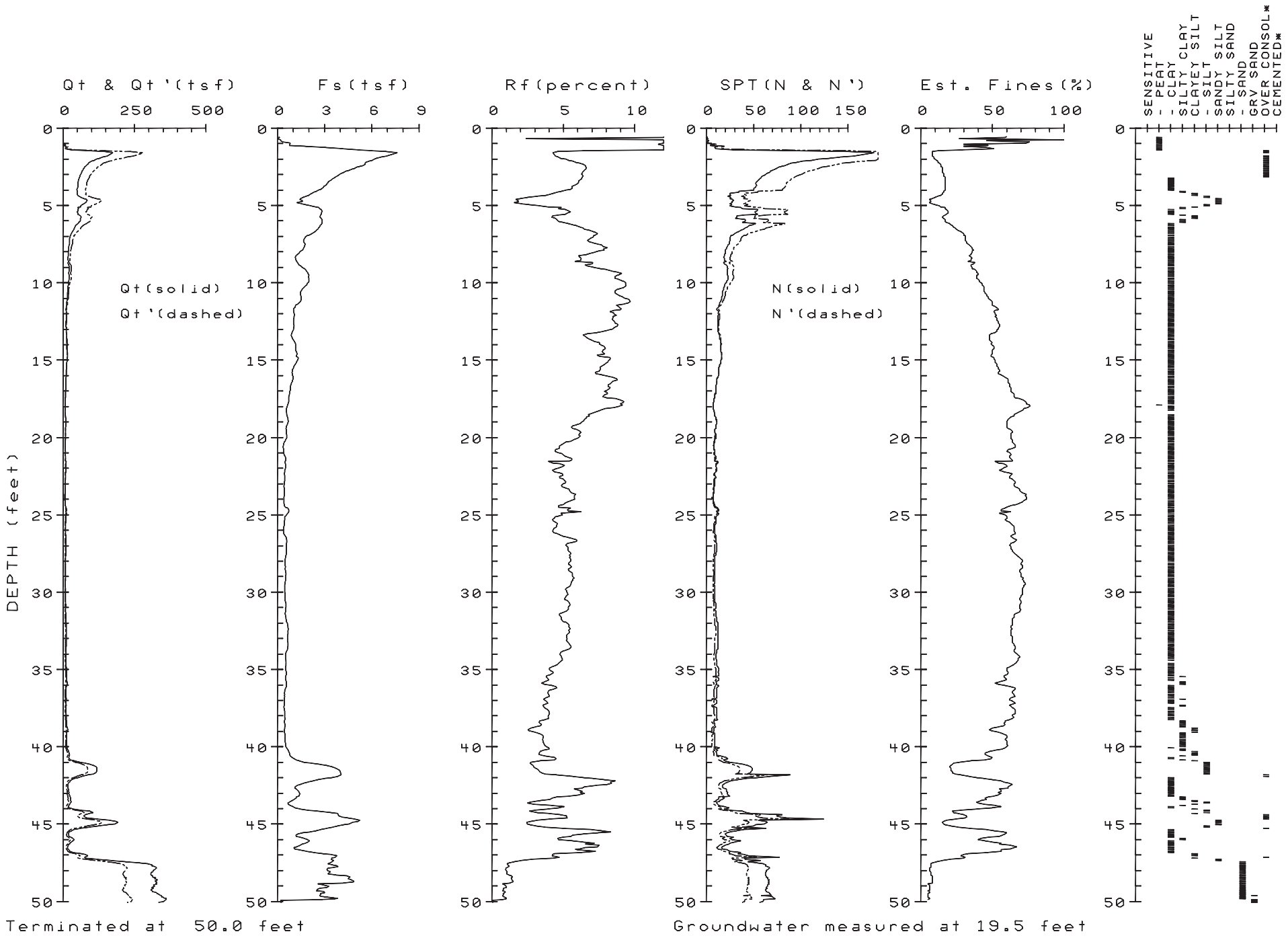
Groundwater estimated at 18.0 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT2
DATE : 02-06-2014

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

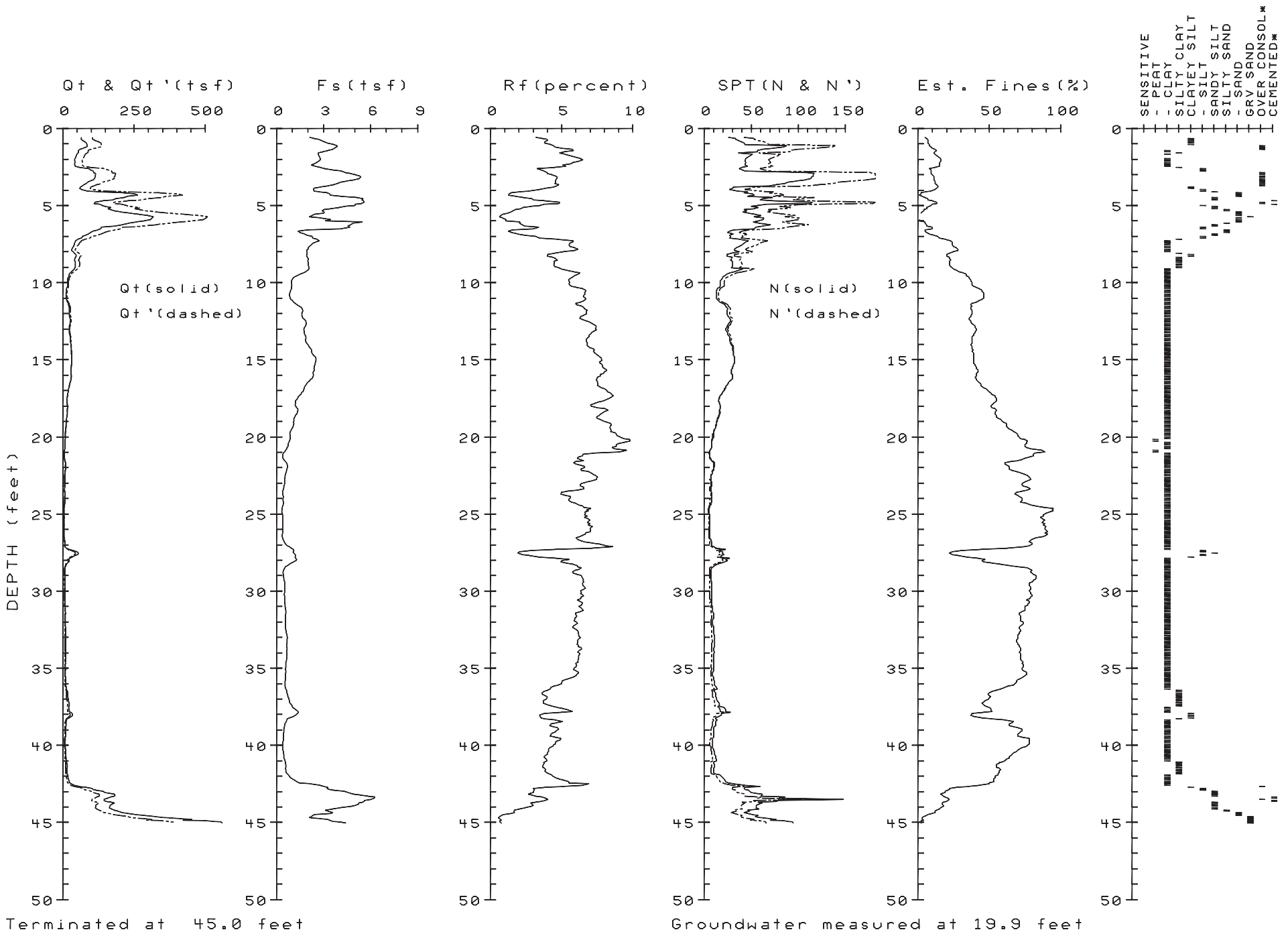
Groundwater measured at 19.5 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT3
DATE : 02-13-2014

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 45.0 feet

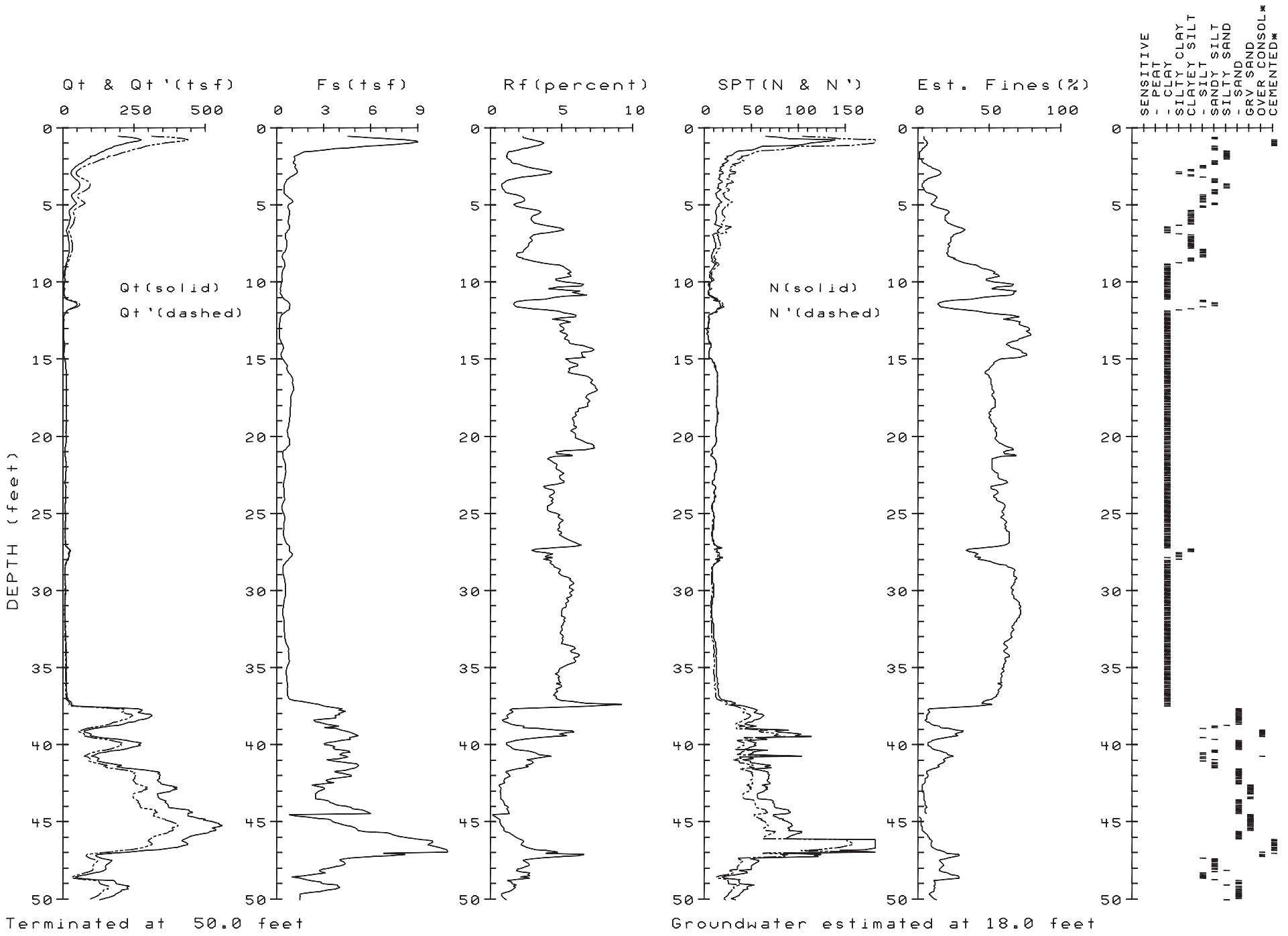
Groundwater measured at 19.9 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT4
DATE : 02-06-2014

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 50.0 feet

Groundwater estimated at 18.0 feet

PROJECT: TAMIEN STATION SITE
LOCATION: San Jose CA
PROJ. NO.: 10851.000.000(EGO-235)

CPT NO.: 1-CPT5
DATE : 02-06-2014

ENGEO, INC.

cpts by John Sarmiento & Associates

APPENDIX B

EMSL ANALYTICAL, INC.
NOA Test Results

APPENDIX B

EMSL Analytical, Inc
2235 Polvorosa Ave , Suite 230, San Leandro, CA 94577
Phone/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com sanleandrolab@emsl.com

EMSL Order:	091402007
CustomerID:	ENGE26
CustomerPO:	
ProjectID:	

Attn: **Cierra Atkinson**
Engeo, Inc.
6399 San Ignacio Ave
Suite 150
San Jose, CA 95119

Phone:	(408) 574-4900
Fax:	(925) 279-2698
Received:	02/12/14 3:00 PM
Analysis Date:	2/16/2014
Collected:	2/12/2014

Project: **10851.000.000 TAMIEN STATION**

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
S1 *091402007-0001*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
S2 *091402007-0002*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
S3 *091402007-0003*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**

Analyst(s)

Matthew Batongbacal (3)

Baojia Ke, Laboratory Manager
or other approved signatory

Initial report from 02/16/2014 04:57:38

OrderID: 091402007

№ 091402007

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 10851.000.000	PROJECT NAME: Tamien Station
SAMPLED BY: (SIGNATURE/PRINT) Cierra Atkinson	
PROJECT MANAGER: Cierra Atkinson	
ROUTING: E-MAIL catkinson@engeo.com	Hard Copy

SAMPLE NUMBER	DATE	TIME	MATRIX	NUMBER OF CONTAINERS	CONTAINER SIZE	PRESERVATIVE	Carb 435 Level A	REMARKS REQUIRED DETECTION LIMITS
S1	12-Feb-14	1:48	soil	1	bag	ice	x	
S2	12-Feb-14	1:56	soil	1	bag	ice	x	
S3	12-Feb-14	2:05	soil	1	bag	ice	x	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
	2/12/14 3:00	R Butler 2-12-14 3pm WJ.			
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	3 Day Turnaround Time	

ENGEO INCORPORATED

6399 SAN IGNACIO AVENUE, SUITE 150
SAN JOSE, CALIFORNIA 95119
(408) 574-4900 FAX (888) 279-2698
WWW.ENGEO.COM

DISTRIBUTION: ORIGINAL ACCOMPANIES SHIPMENT; COPY TO PROJECT FIELD FILES

APPENDIX C

CLIQ Liquefaction Analysis

APPENDIX C

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

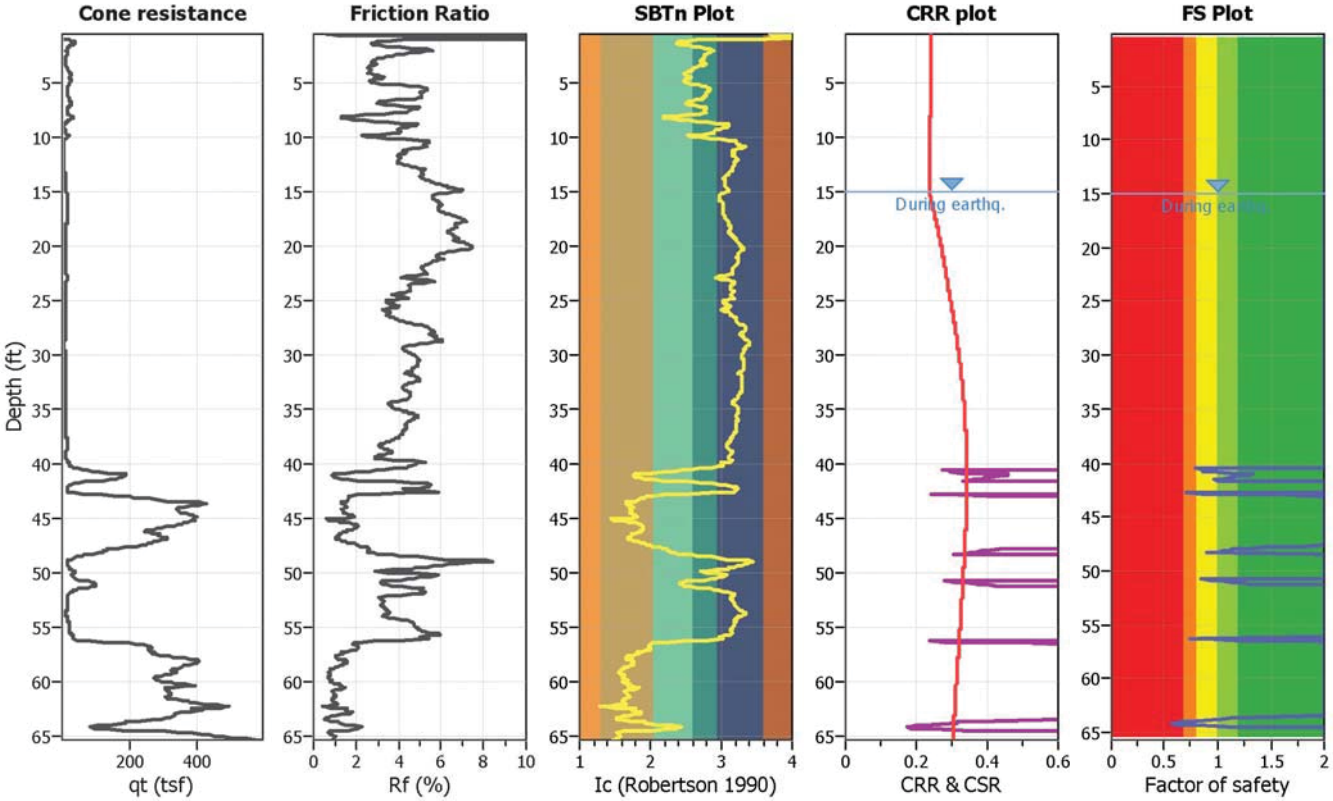
LIQUEFACTION ANALYSIS REPORT

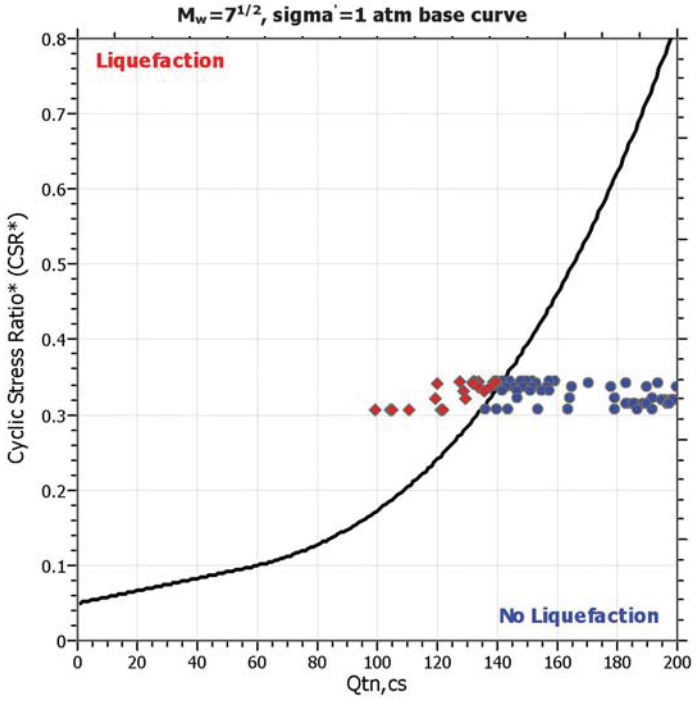
Project title : Tamien Station - 10851.000.000 **Location : Lick Avenue, San Jose**

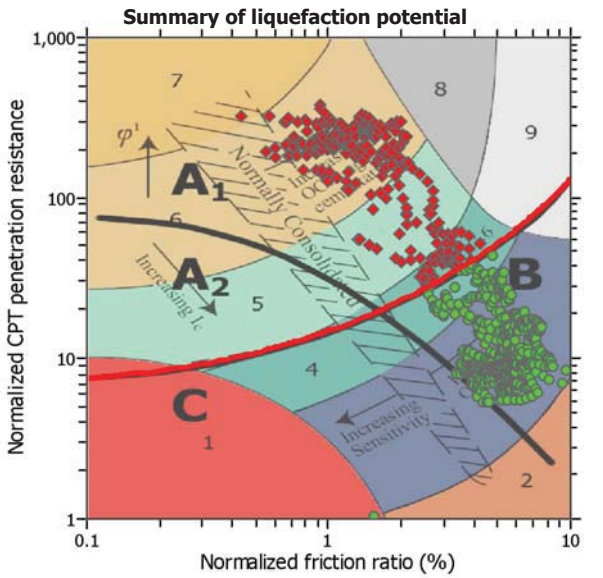
CPT file : 1-CPT1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	15.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.50	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

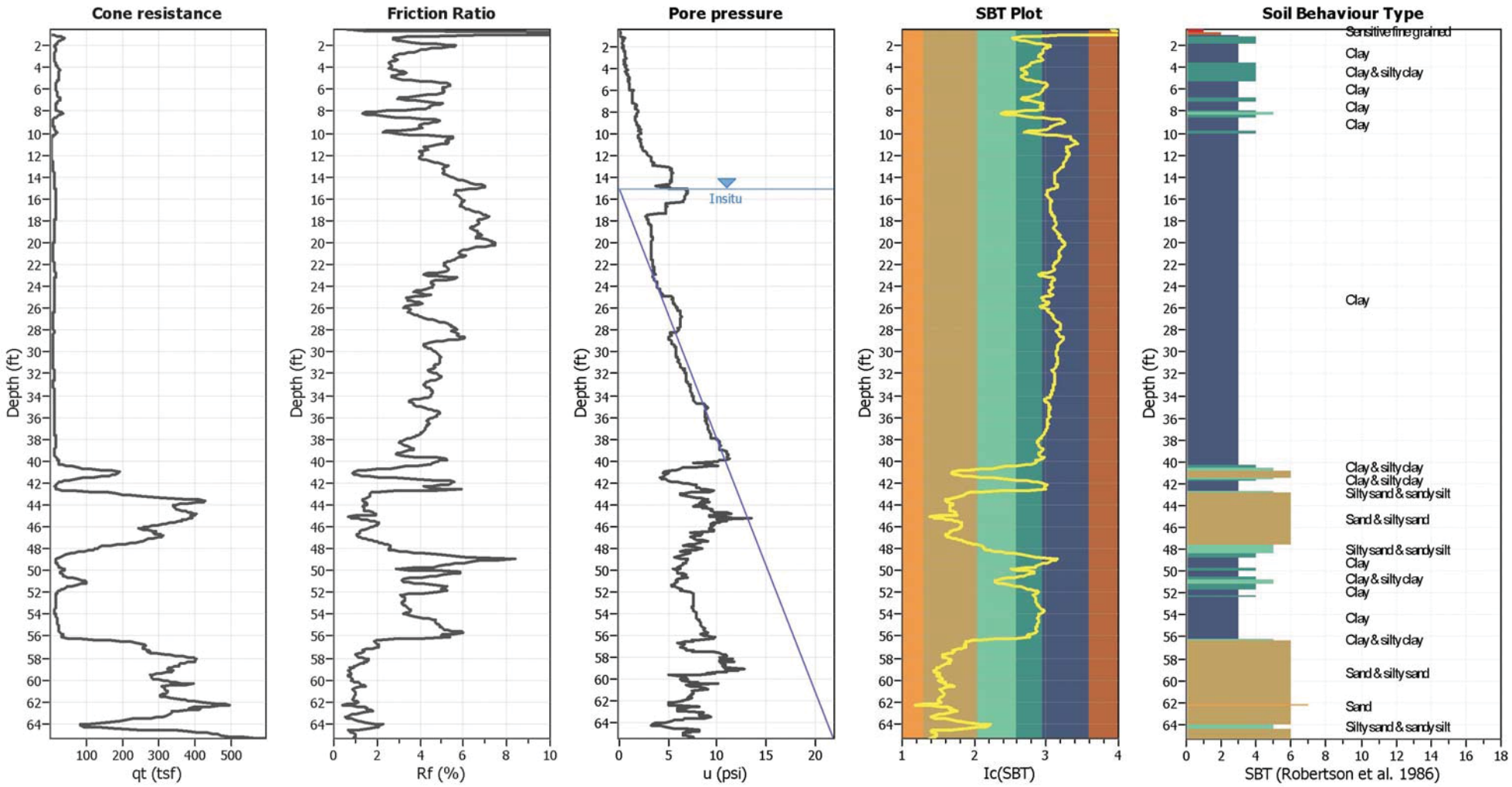






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



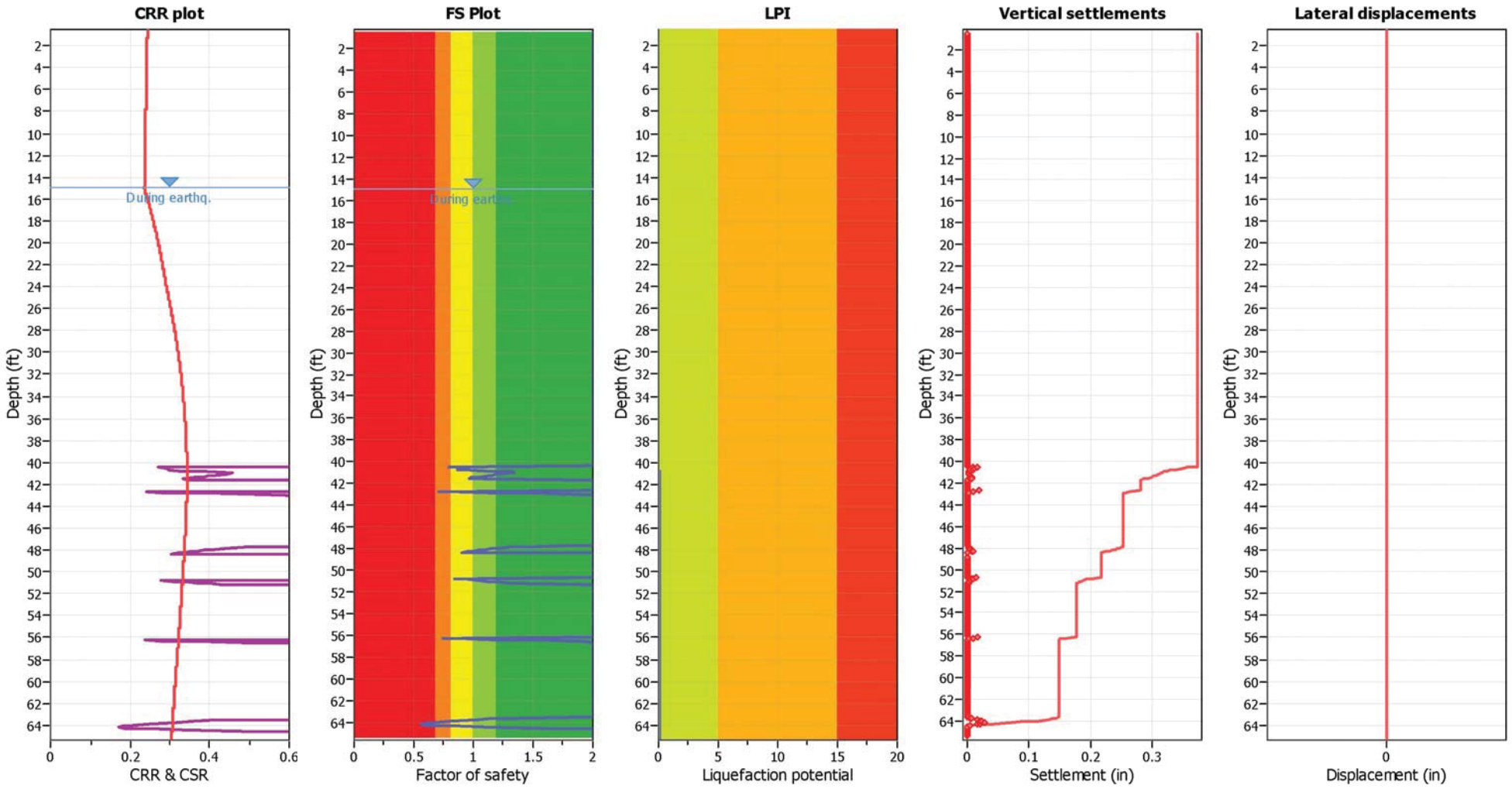
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

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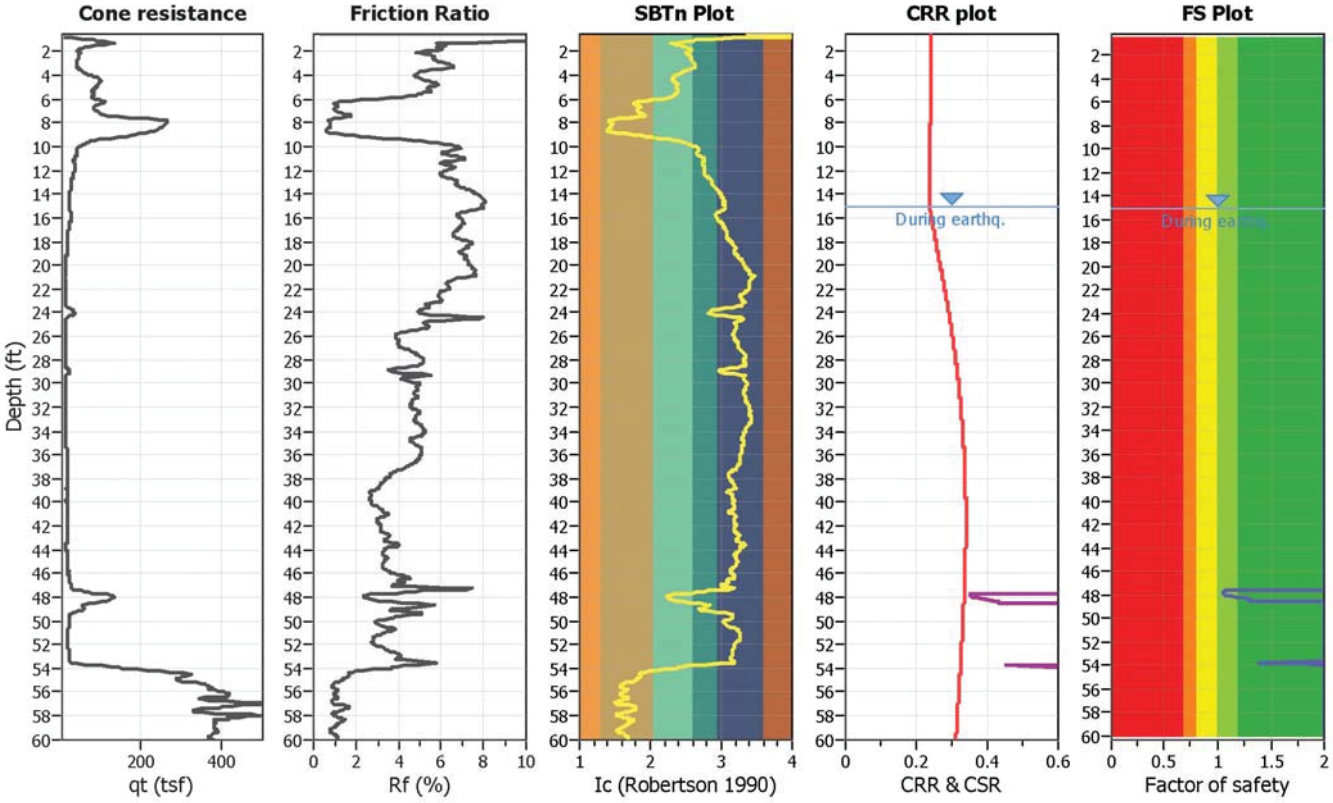
LIQUEFACTION ANALYSIS REPORT

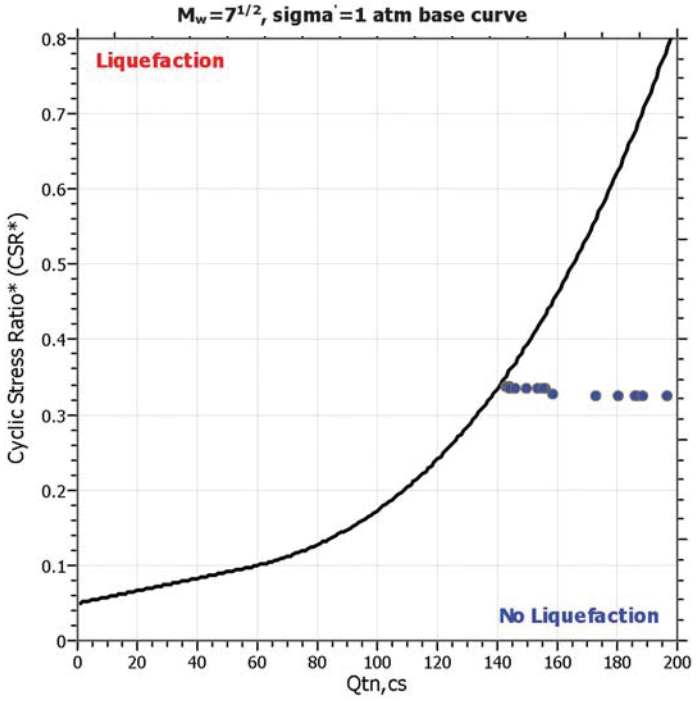
Project title : Tamien Station - 10851.000.000 **Location : Lick Avenue, San Jose**

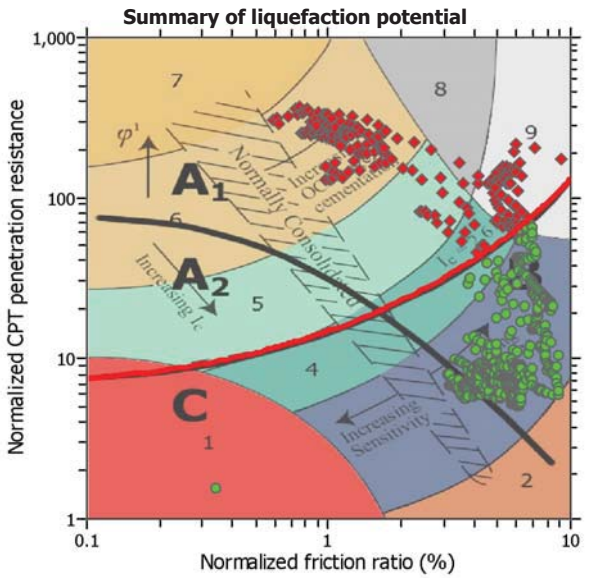
CPT file : 1-CPT2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	15.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.50	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

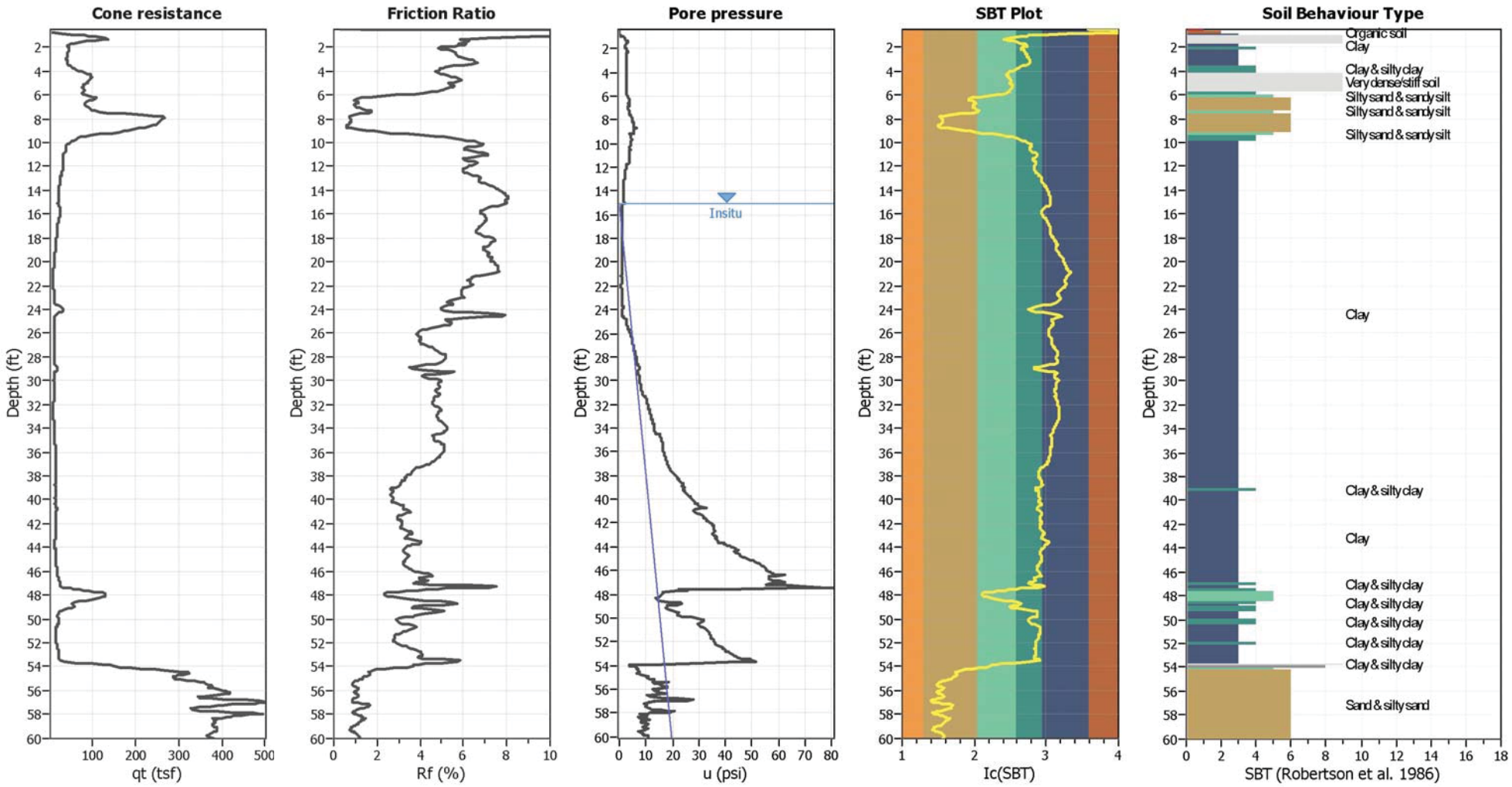






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



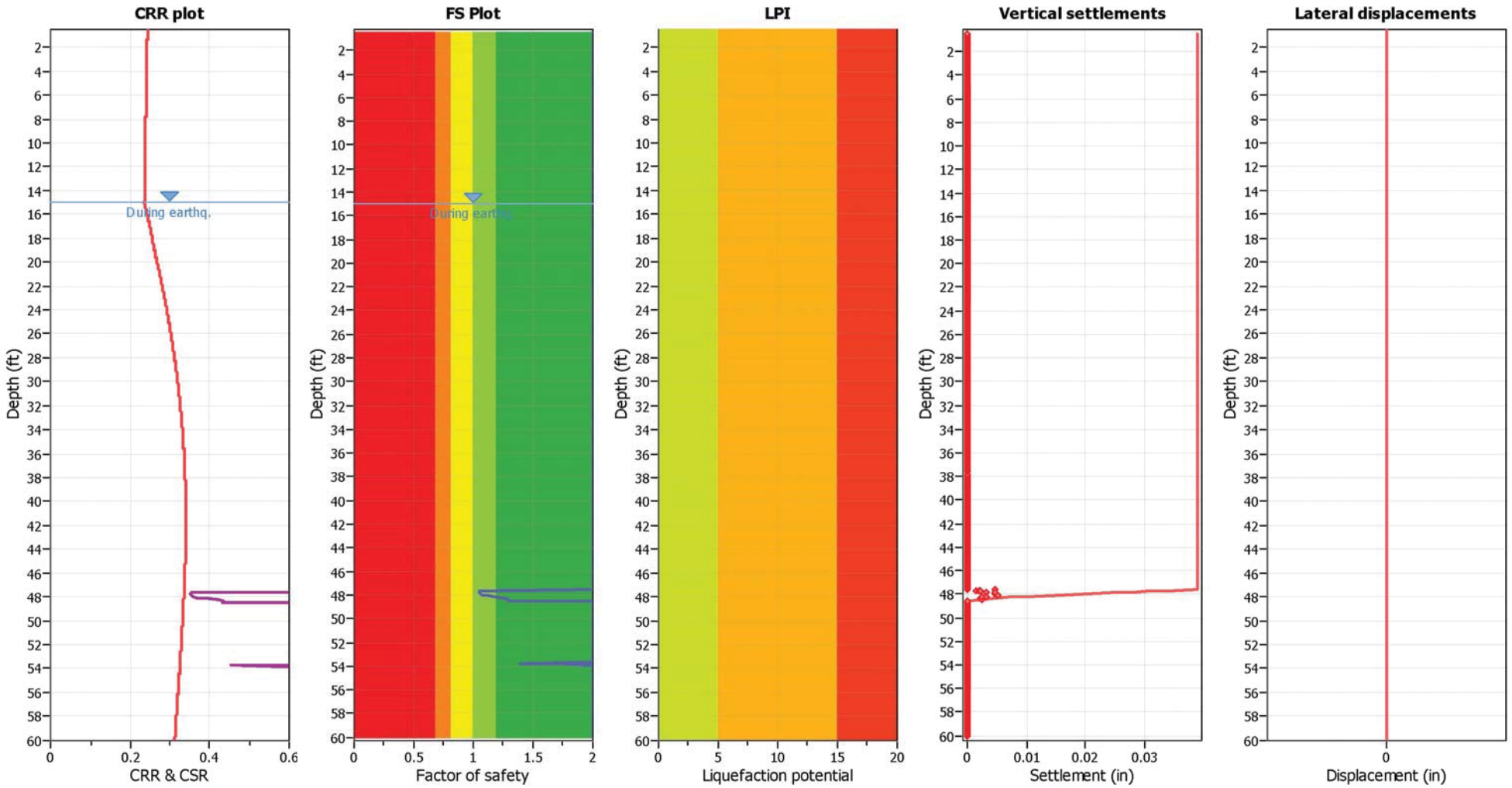
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

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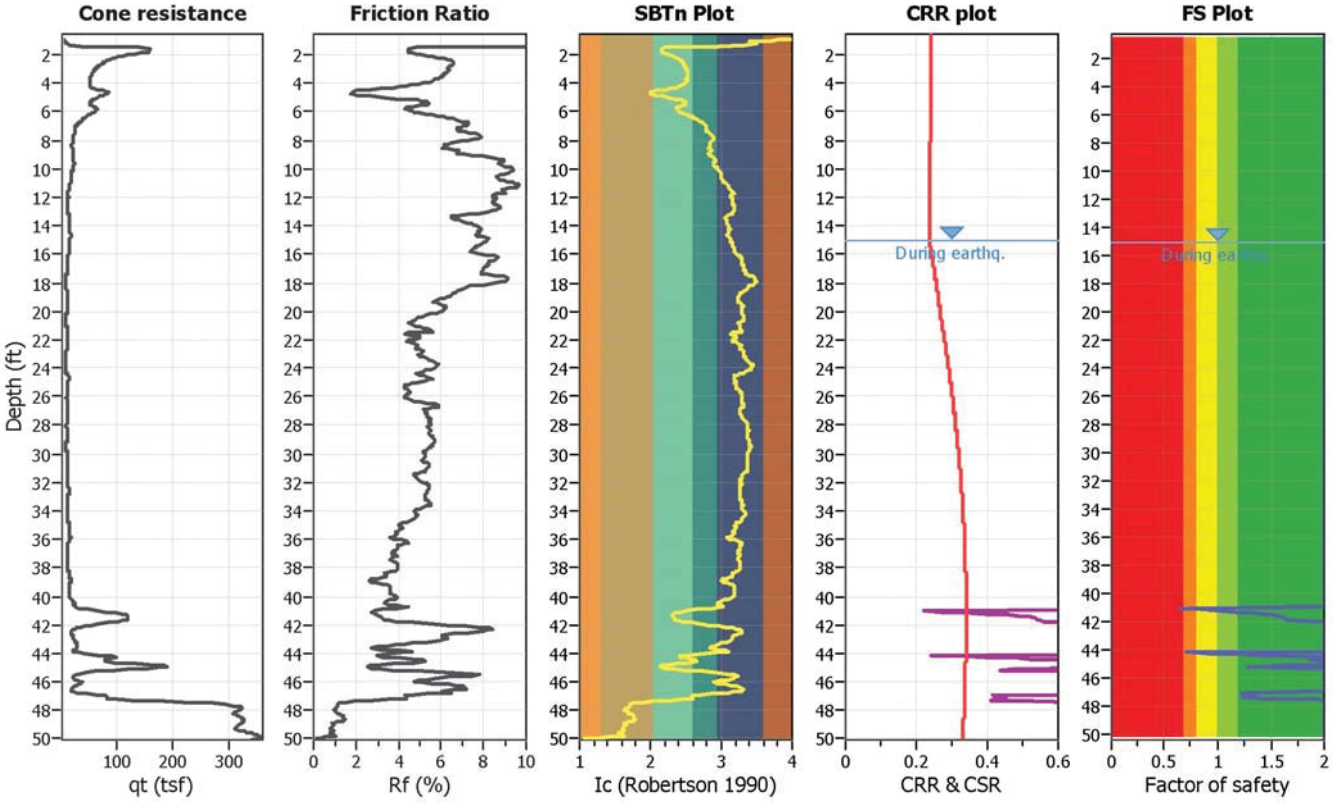
LIQUEFACTION ANALYSIS REPORT

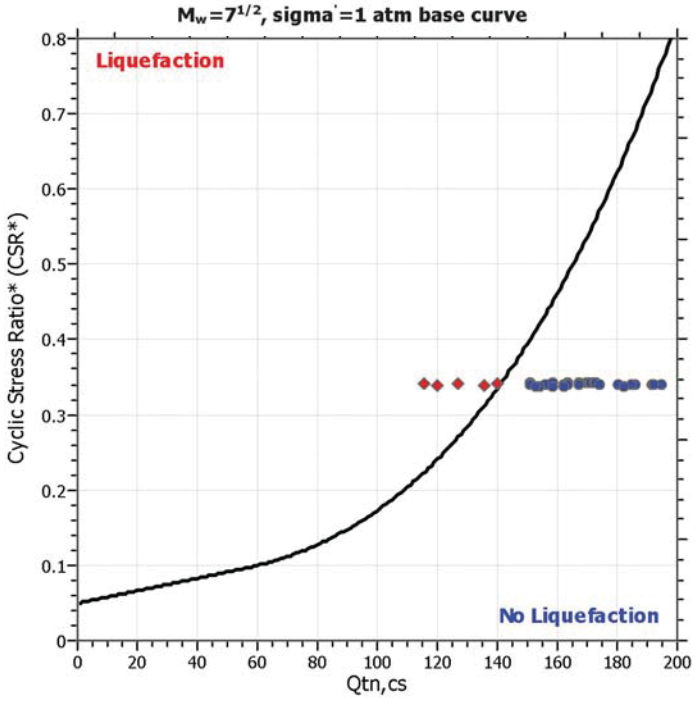
Project title : Tamien Station - 10851.000.000 **Location : Lick Avenue, San Jose**

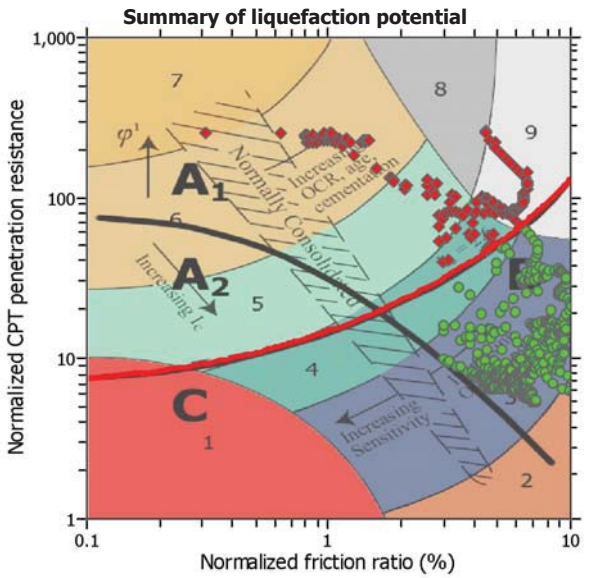
CPT file : 1-CPT03

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	15.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.50	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

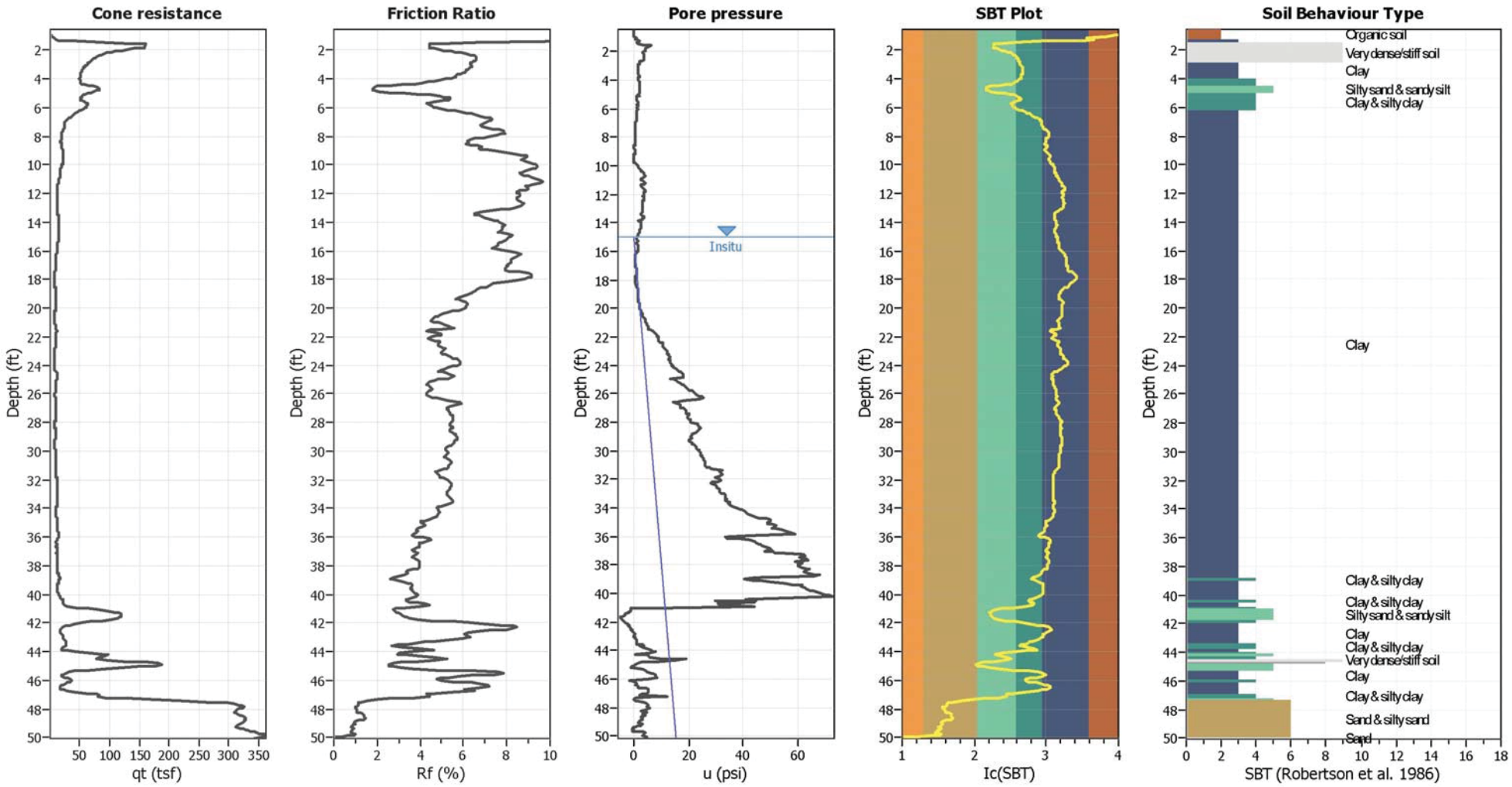






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



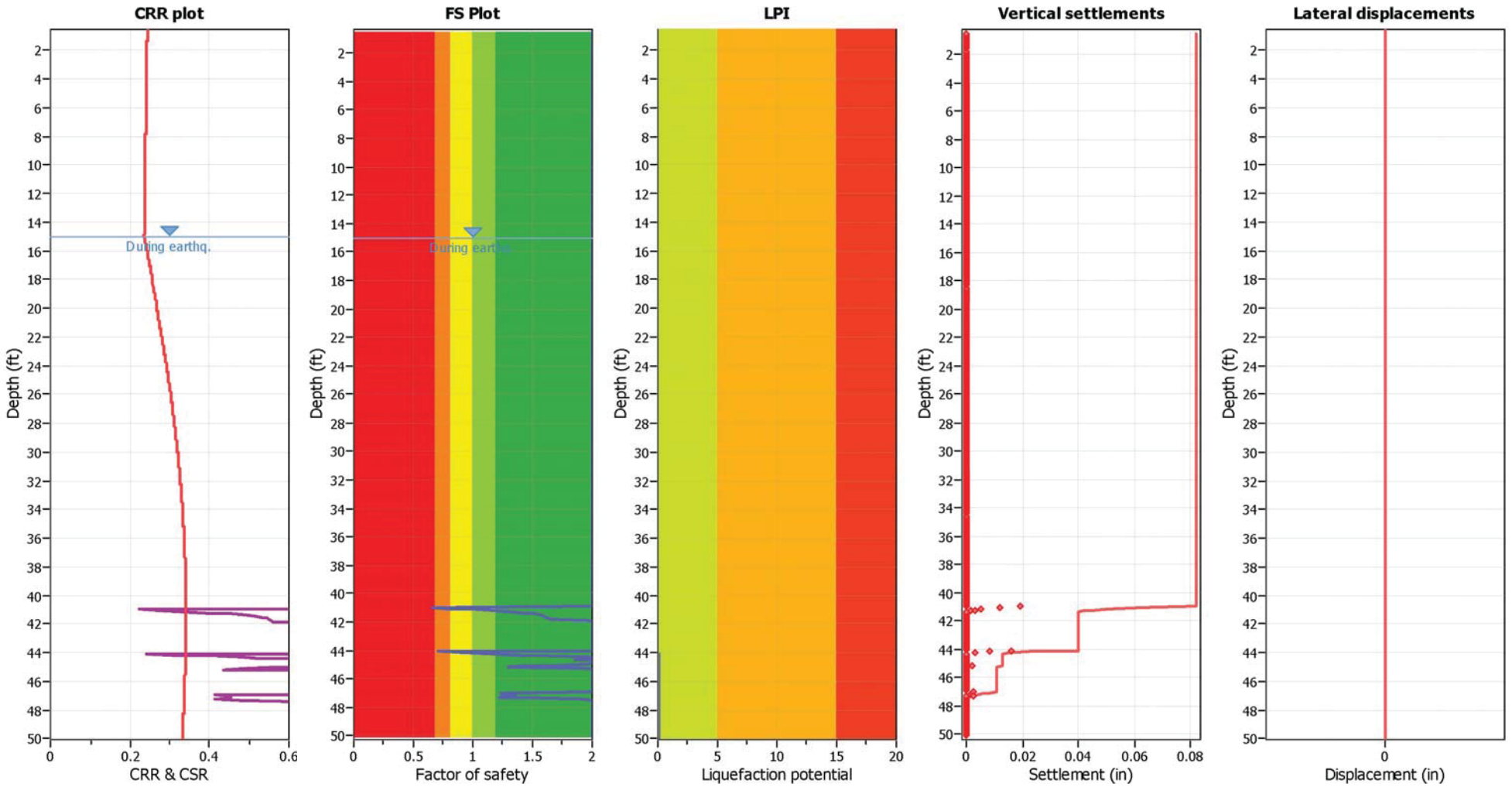
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

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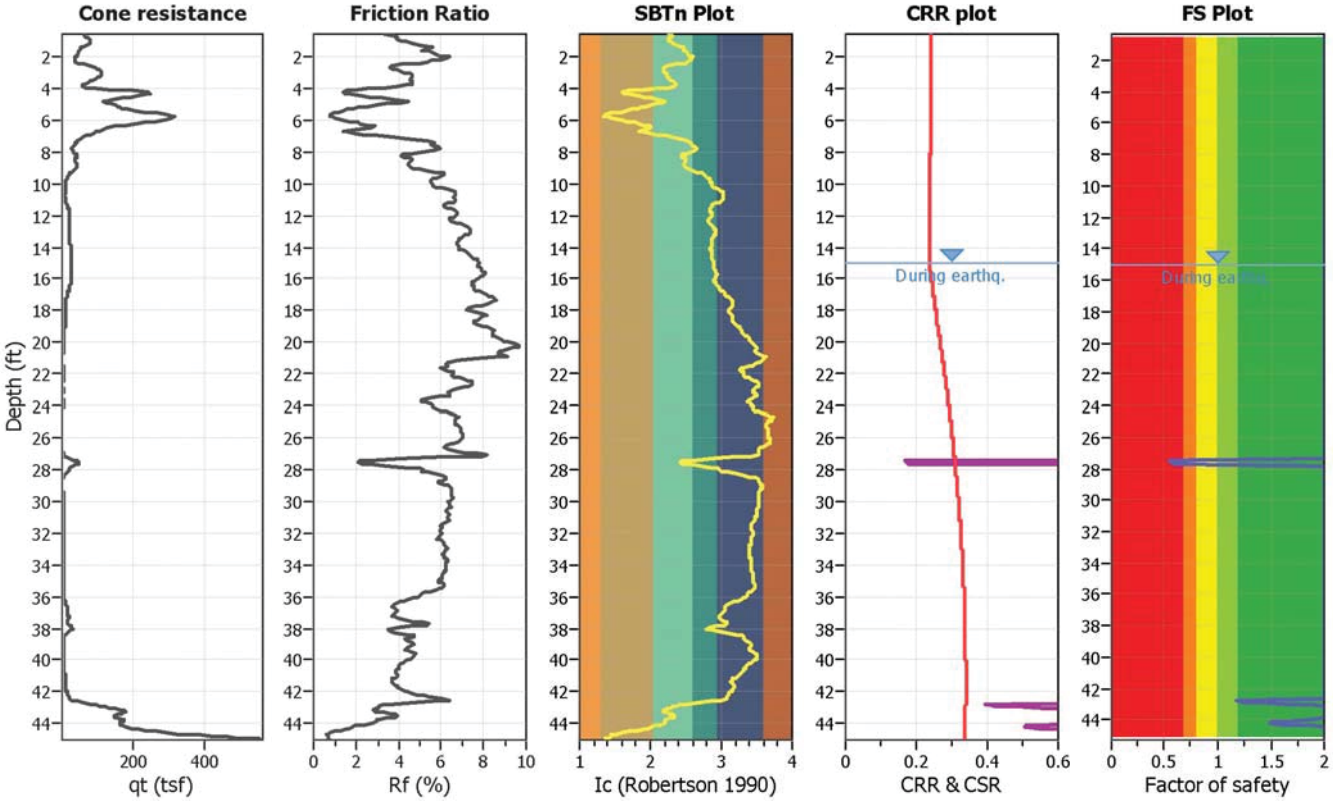
LIQUEFACTION ANALYSIS REPORT

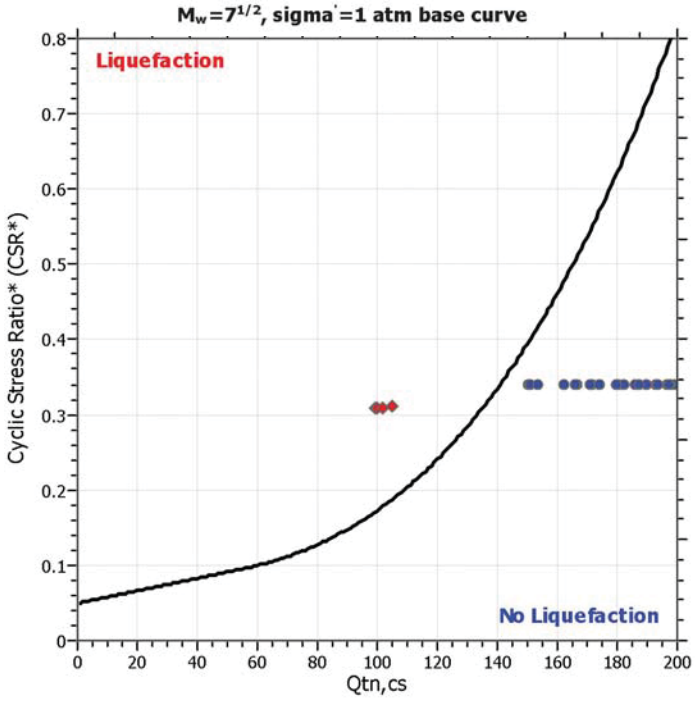
Project title : Tamien Station - 10851.000.000 **Location : Lick Avenue, San Jose**

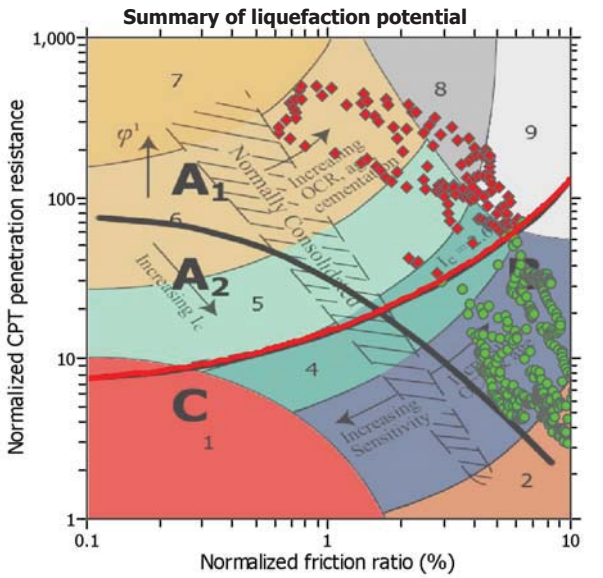
CPT file : 1-CPT4

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	15.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.50	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

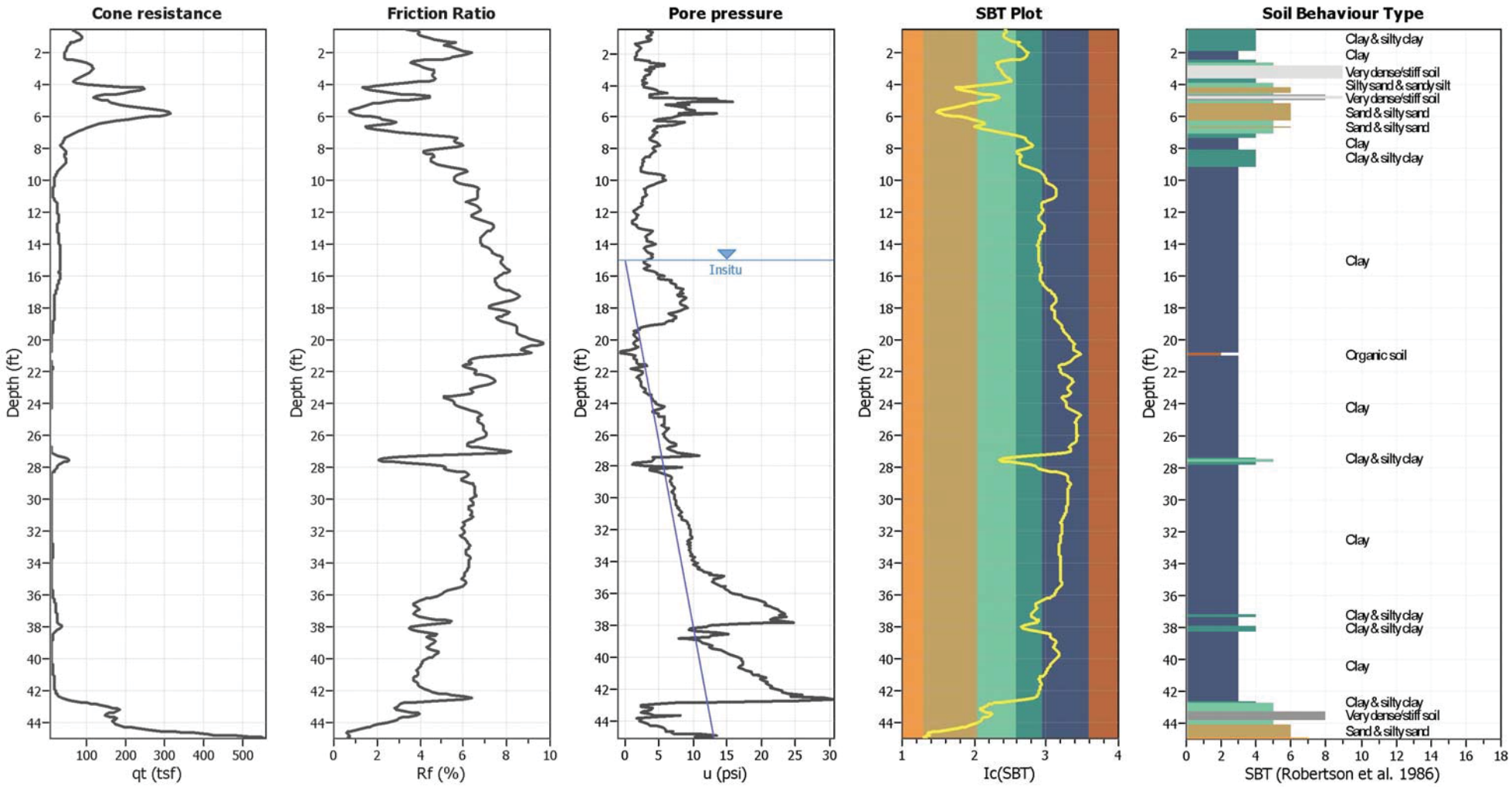






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



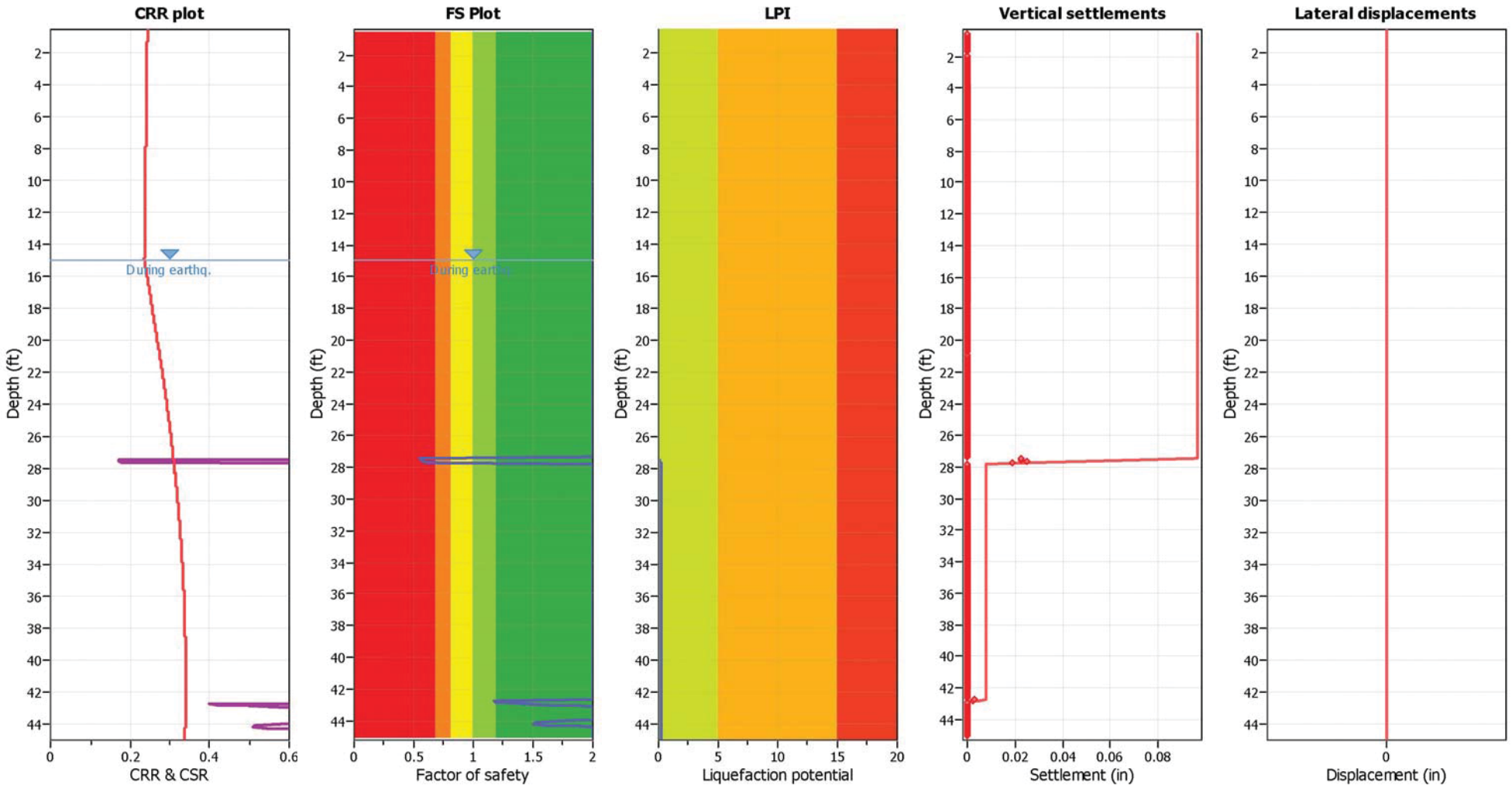
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

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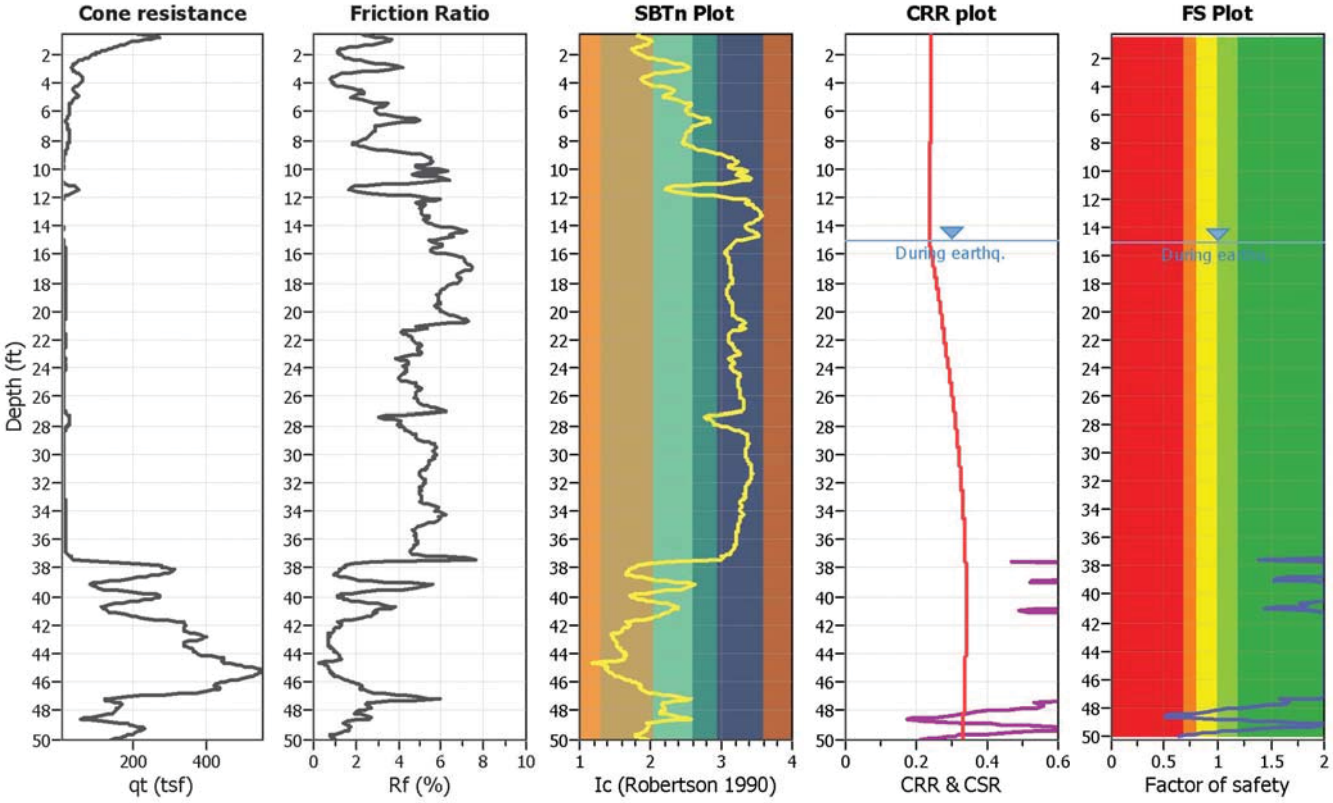
LIQUEFACTION ANALYSIS REPORT

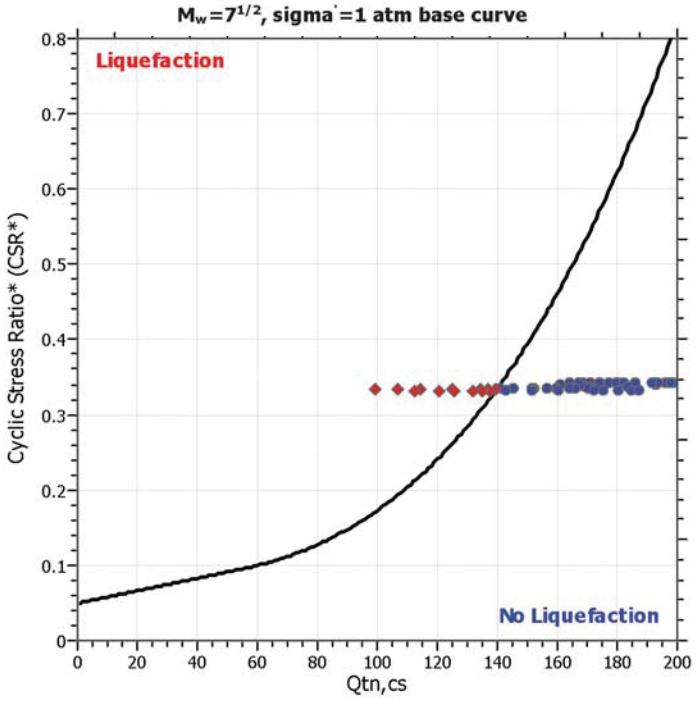
Project title : Tamien Station - 10851.000.000 **Location : Lick Avenue, San Jose**

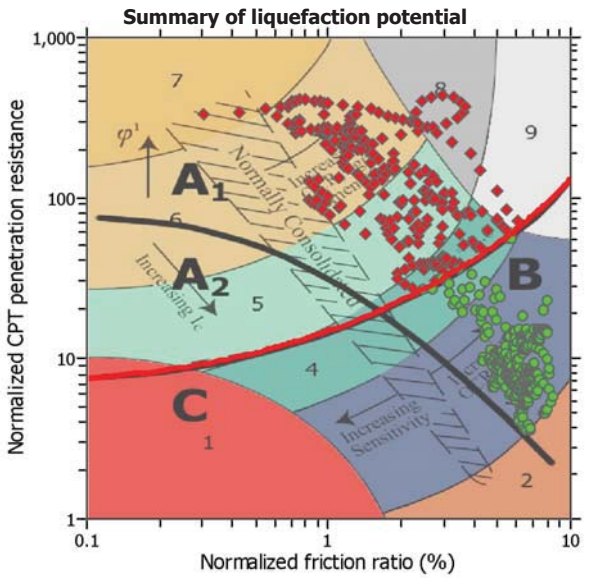
CPT file : 1-CPT5

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	15.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.50	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

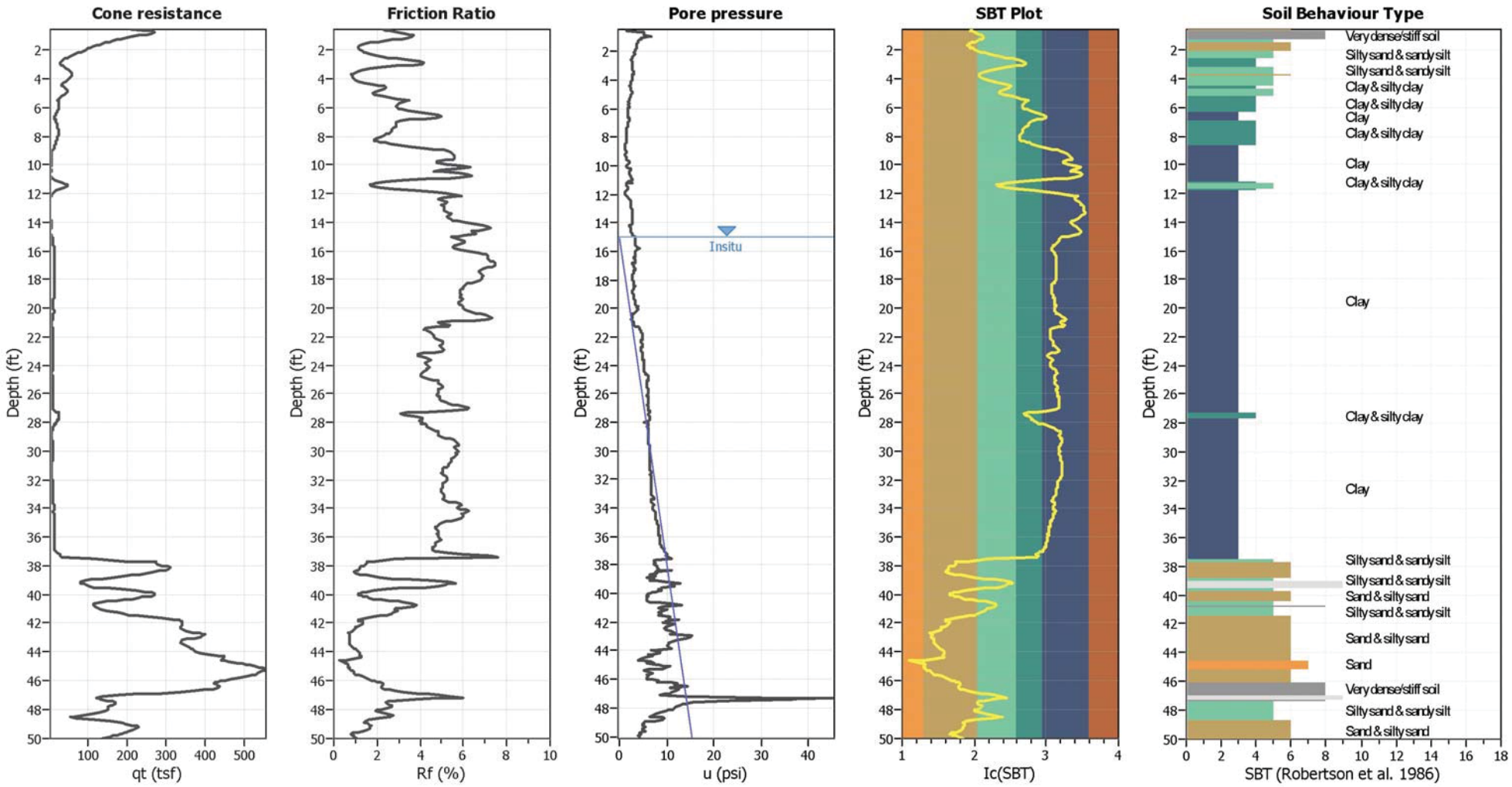






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



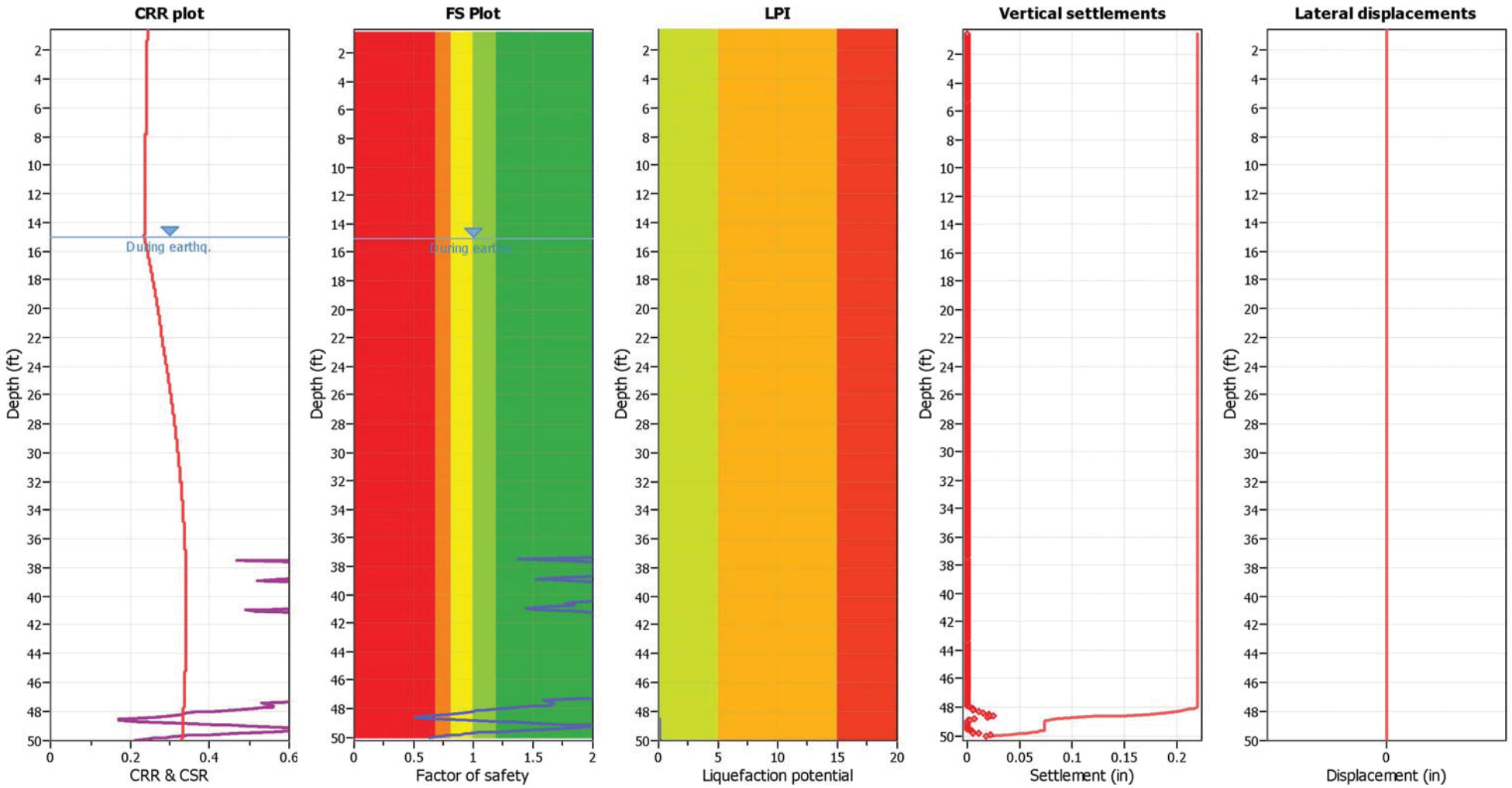
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	15.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk