C-4 Supplement to Geotechnical Report

Update Geotechnical Feasibility Report
Proposed High-Rise Residential Development
6220 West Yucca Street
Hollywood District
Los Angeles, California

For Champion Real Estate Company

July 10, 2020
GDC Project No. LA-1461

GROUP DELTA

Champion Real Estate Company
11601 Wilshire Boulevard, Suite 1650
Los Angeles, CA 90025

July 10, 2020
GDC Project No. LA-1461

Attention: Mr. Greg Beck, Vice-President

Subject: Updated Geotechnical Feasibility Report
Proposed High-Rise Residential Development
6220 West Yucca Street, Hollywood District, Los Angeles, California

Dear Mr. Beck,

Group Delta Consultants (GDC) is pleased to submit this updated geotechnical feasibility report for the proposed high-rise residential development planned at 6220 West Yucca Street in the Hollywood District, Los Angeles, California. Our updated report is in response to your review comments and also reflect recent changes in the project description. Our scope of work was conducted in general accordance with our proposal dated May 6, 2020.

We appreciate the opportunity to provide geotechnical services for this significant project. If you have any questions pertaining to this report, or if we can be of further service, please do not hesitate to contact us.

Sincerely,
Group Delta Consultants

Michael D. Reader, RCE, RGE
Principal Geotechnical Engineer

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Senior Engineer

Distribution: pdf via email

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PROPOSED HIGH-RISE RESIDENTIAL DEVELOPMENT
6220 WEST YUCCA STREET
LOS ANGELES, CALIFORNIA

1.0 INTRODUCTION

This report was prepared to address the feasibility of the proposed high-rise residential development from a geotechnical standpoint and to provide preliminary geotechnical recommendations for Project Entitlements or planning purposes. The project site is located at 6220 West Yucca Street in the Hollywood District of Los Angeles City, California. A Vicinity Map is presented in Figure 1.

1.1 Project Description

Our understanding of the project is based on the architectural plans dated June 29, 2020 prepared by TSM Architects. The project site covers 1.16 acres, and occupies the following four parcels; APN 5546-031-031, 5546-031-027, 5546-031-007 and 5546-031-008.

The project consists of constructing a 30-story 269-dwelling unit multiple family residential building. To construct the 30-story building, the existing 3-story apartment buildings that currently occupy parcel APN 5546-031-031 will be demolished. The existing one-story, and two-story buildings located in the southeast corner of the site at parcels APN 5546-031-007, and APN 5546-031-008 will remain.

The project will include a six-level podium parking structure with; one fully subterranean level (P1 Level); one semi-subterranean level due to site's sloping topography (1st Level); and four above ground levels (2nd to 5th Levels).

First Level, and second level (i.e. Ground Level) will include 7,760 square feet of commercial use, including restaurant use. The 6th Level Amenity Deck will include pool, spa, gym, lounge, dining areas, and a water feature. Sixth Level through 29th Level will include residential units. The 30th Level will include a Roof Deck (including a water feature), amenity, and mechanical equipment rooms. The project will also provide 414 parking spaces, 164 bike parking spaces, and 68 trees.

1.2 Project Scope

The purposes of this report are to address the primary geotechnical factors affecting the project and provide preliminary geotechnical recommendations for project entitlements and planning. The recommendations were developed based on review of the conceptual drawings of the proposed development and the data previously collected from our fault investigations conducted for the site. Our scope of work included the following:

- Review the available data for the project, including previous subsurface data and conceptual plans;
- Review published papers, maps and reports to perform a limited geologic hazard assessment for the site;
- Performing limited geotechnical laboratory tests on selected soil samples obtained from the fault investigations;
- Performing preliminary analyses to provide preliminary recommendations for excavation, shoring, foundation design, floor slab support, basement walls, resistance to lateral loads, and construction-related issues; and
- Prepare and submit six copies of our report.

1.3 Previous Reports

We previously performed a Fault Activity Investigation at the site and presented the results in a report dated September 7, 2014. The report was reviewed by the Grading Division of the City of Los Angeles and the City provided comments in their Geology Report Correction Letter, dated September 17, 2014. We subsequently conducted a supplemental fault investigation and provided the results in a response report dated February 12, 2015. The fault activity report was approved by the City in their approval letter dated February 20, 2015. At your request, an additional Supplemental Fault Report dated April 10, 2015 was prepared to cover the property located at 1765 North Vista Del Mar Avenue. The Supplemental Fault Report for 1765 North Vista Del Mar was approved by the City in their approval letter dated April 23, 2015. The results of the fault activity investigation indicate that no active faults are present beneath the site. A copy of the City's Geologic Report Approval Letters are provided in Appendix A.

2.0 GEOTECHNICAL INVESTIGATION AND LABORATORY TESTING

2.1 Field Investigation

No specific field investigation was performed for the preparation of this geotechnical feasibility report. Subsurface data presented in GDC previous fault investigation (2014) was used to evaluate the soil conditions beneath the site. The data included 11 borings to maximum 60 feet below the existing grade (bgs), and 13 Cone Penetration Tests (CPTs) to maximum 55 feet bgs. In addition, a 120-foot long, 10-foot deep trench was excavated along the west side of the site adjacent to Argyle Avenue; and a 30-foot long, 10-foot deep trench was excavated in the east area of the site. The locations of previous explorations are shown on Figure 2, Site Plan and Prior Exploration Plan. The logs of the prior borings and CPTs results are presented in Appendix B. Geologic subsurface cross-sections are provided in Figures 4.1, 4.2, and 4.3.

2.2 Laboratory Testing Program

The CPT data provides a means to evaluate in-situ soil properties such as density, shear strength and compressibility. Limited laboratory testing was also performed on representative samples of the cores obtained during the fault investigation, to further evaluate and correlate the physical properties and engineering characteristics of the soils encountered. The following tests were performed as part of this study:

- Corrosivity (pH, sulfate, chloride, electrical resistivity)
- Expansion index

All testing was done in general accordance with applicable ASTM specifications. Details of the laboratory testing program and test results are presented in Appendix C.

3.0 SITE CONDITIONS

3.1 Site Conditions

The site is located at southeast corner of West Yucca Street and North Argyle Avenue and is approximately 1.16 acres in size. The site is currently occupied by three existing 3-story apartment buildings and two single-family residential houses. Paved parking areas are in the northeast corner of the site and along the southern boundary. The parking lot along the southern boundary is covered and drive access is from Yucca Street, directed south between buildings and along the southern boundary. Residential service utilities are located on the site.

The topography of the site is a graded level pad positioned in the middle of a slope, descending approximately 10 degrees to the south. Locally the slope descends from Elevation 430 feet at the northeast corner of the site down to about Elevation 408 feet at the southwest portion of the site, shown in Figure 2. Regionally the slope is an anomalous steepened landform within gentle, south–sloping, alluvial fan deposits near the border of south trending ridgelines and canyons along the south limb of the Santa Monica Mountains, illustrated on the Historical Geologic Map presented in Figure 3.

3.2 Geologic Materials

Subsurface conditions were evaluated through review of our prior fault investigation field exploration data (GDC, 2014), which included 8 continuous core borings, 13 CPTs, 3 bucket auger borings, and two fault trenches. The locations of explorations are shown on Figure 2 and the subsurface data is summarized on Figures 4.1 through 4.3. Detailed logs are presented in Appendix B. A soil-stratagraphic age assessment and paleo-environmental reconstruction of the subsurface geology was performed for the site by Roy Shlemon & Associates, Inc. and is also presented in the GDC 2014 fault report.

Fill materials underlie the ground surface and existing pavements onsite to depths of about 2 to 6 feet. Boring B-4 encountered fill materials to depth of about 9 feet, likely localized deep fill associated with installation of an underground sewer pipe. The fill materials consist of reddish brown, dry to moist, medium dense to stiff, fine to medium grained, silty sand, clayey sand, and lean clay. Variable amounts of fine to coarse gravel and cobbles were encountered in the fill materials.

A native sand unit underlies the fill in the east portion of the site, encountered in borings BA-2, B-7, and B-8 to at least 20 feet depth. The sand deposit is a Holocene (<11,000 years old) alluvial fan infill of a paleo-channel trending south. The eastern portion of the site overlies the west wall/slope of the paleo-channel. The buried slope is estimated to descend about 20 to 30 degrees to the east, therefore the sand deposit thickens to the east, to at least a depth of 20 feet under the site. The deposit consists of a layered gradational soil profile of strong brown, moist, loose, fine to coarse grained silty sand, clayey sand, and poorly graded sand; massive with local gravel and cobble channels. The unit unconformably overlies older alluvial sediments.

Older alluvial sediments underlie the fill materials across most of the site and the sand unit in the east. The older alluvium is considered to be around 300,000 years old and consists of dense, very stiff to hard, strong brown with yellow, gray, and red mottling, clayey sand, silty sand, and sandy clay. Some gravel and cobbles were encountered in localized paleo-channels and few gravel and cobbles were matrix supported within massive layers. A laboratory test on a representative sample of the clayier portion of the order alluvium indicated an Expansive Index (EI) of over 100, which corresponds to a highly expansive characteristic. Thickness of the alluvium varies from north to south across the site, at approximately 7 feet depth in the north and over 60 feet depth in the south. The alluvium unconformably lies on top of a south sloping bedrock of the Modelo Formation.

The Modelo Formation is a Miocene age sedimentary rock. The encountered Modelo Formation consists of strong brown, reddish brown, and light gray, thinly interbedded, claystone, siltstone and sandstone. Few thin conglomerate beds were encountered at depth 51 feet in B-2, 57 feet in B-3. At 41 feet depth B-3 encountered a well cemented zone and boring B-4 encountered refusal at 36 feet on possible hard bedrock. As shown on the cross-sections (Figures 4.1 through 4.3), the contact between the old alluvium and bedrock occurs at a depth of about 7 feet (Elevation 410 feet) near the northwest corner of the site and slopes down to a depth at least 60 feet (Elevation 360 feet) at the south end of the site. The buried bedrock surface is descending to the south at about 30 degrees from horizontal.

Structurally, the site sits on the southern limb of a pre-Holocene anticline trending roughly eastwest (GDC 2014). Bedding within the older alluvium and bedrock has been tilted during pre-Holocene uplift and dips to the south. Magnitude of dip within the bedrock is unknown, however, bedding orientations measured within the west fault trench indicate older alluvial bedding dip increases in steepness to the south, from near horizontal at the north end of the site to about 30 degrees at the south end of the site.

3.3 Groundwater

The Seismic Hazard Zone Report for the Hollywood Quadrangle (CGS 1998) indicates that the historically highest groundwater level in the site area is deeper than 80 feet. During the previous fault investigation in 2014, a perched groundwater was encountered at depths of 27 to 36 feet below existing grade, corresponding to Elevation of 376 to 394 feet. The bedrock appears to be a barrier for the groundwater onsite. Water was encountered within sandstone layers and pooled on top of the alluvial bedrock contact. Seasonal perched groundwater may be present on shallower less-permeable layers within the alluvium.

4.0 GEOLOGIC AND SEISMIC HAZARD EVALUATION

Our preliminary evaluation of potential geologic hazards for the project site included review of available published maps, reports, and data. Geologic hazards evaluated include seismicity, ground surface rupture, liquefaction, landslides, soil stability, flooding, seiche, and inundation. The main geologic hazards which are present for the project site include seismicity, expansive soils, and inundation. Our preliminary findings and conclusions are discussed below. However, a detailed geologic and seismic hazard evaluation should be performed during the design-level geotechnical investigation.

The recent California Geological Survey (CGS) publication of the Earthquake Zones of Required Investigation Map (EZRI Map), indicates the site is within the Hollywood Earthquake Fault Zone. A site specific fault activity investigation was conducted at the site by GDC (2014) in accordance with the guidelines in the CGS (formerly California Division of Mines and Geology), Special Publication 42 (or Note 49) and approved by the City of Los Angeles (2015). The fault activity investigation concluded that there are no active faults underlying the project site. The City's approval letter is presented in Appendix A.

4.1 Geologic Setting

Regionally, the site is located at the boundary of the Transverse and Peninsular Ranges Geomorphic Provinces within the Los Angeles Basin area of southern California. This boundary is defined by uplifting thrust blocks including the Santa Monica-Hollywood-Raymond fault system. The Santa Monica east – west trending mountain range is to the north and sedimentation thousands of feet thick blanketed by alluvial fan deposits is to the south. Locally, the site is located on an alluvial fan at the base of the southern limb of the Santa Monica Mountains, within the Hollywood fault zone. The alluvial fan slopes gently southward across the site. Several south draining canyons in the Santa Monica Mountains, including Cahuenga, Beachwood, and Brush canyons, sourced the alluvial fan debris deposits. The location of the site with respect to the regional geology is presented in the Regional Geologic Map, Figure 5.

4.2 Faulting and Seismicity

The site is located within the seismically active area of southern California and there is a high potential for the site to experience strong ground shaking from local and regional faults. A fault that is considered to be seismically active is one that has ruptured in the last approximate 11,000 years (Holocene). It is the evidence of "recent" (Holocene) movement that determines the potential for a fault to produce future earthquakes. The location of the site with respect to regional faults with the potential for future seismic activity is presented in Figure 6, Regional Fault Map. Significant seismically active faults nearest to the site include the Hollywood, Upper Elysian Park, Puente Hills, Newport-Inglewood, Verdugo, Sierra Madre, and San Andreas faults.

The closest significant fault to the site is the Hollywood Fault. The actual location of the Hollywood fault in this area is uncertain. The site is within the Alquist-Priolo Earthquake Fault Zone (AP Zone) for the Hollywood Fault, as shown in Figure 7. The fault trends east-west over 10 miles in length and is considered a segment of the Santa Monica-Hollywood-Raymond fault zone which extends over 30 miles across the southern limb of the Santa Monica Mountains. The Hollywood fault is an estimated reverse strike-slip fault with a potential maximum magnitude Mw 6.7 earthquake (USGS, 2015). The current published CGS map shows two traces of the Hollywood Fault near to the site, shown in Figure 7. One trace is mapped across Yucca Street from the project site, north over 50 feet away, trending roughly east-west. The second trace is mapped across Carlos Avenue from the project site, south over 220 feet away, also trending east-west.

The Upper Elysian Park and Puente Hills faults are estimated to be within 2 and 3 miles east and south of the site, trending northwest and dipping northeast. Both faults are considered blind thrust faults. Blind thrust faults have the potential for surface deflection or folding during earthquakes, however they are not considered to produce surface ruptures. Therefore, although considered a potential significant seismic source, they are not considered for active AP-Zoning. A potential magnitude Mw 6.7 is estimated for these blind thrust faults (USGS, 2015).

The Newport-Inglewood fault zone is located about 5.7 miles east of the site, trending northwest over 40 miles in length. It is estimated to be a right lateral strike slip fault capable of potential magnitude Mw 7.5 (USGS, 2015). The Verdugo fault is located about 6 miles east of the site, trending northwest over 13 miles in length. It is estimated to be a reverse fault and is considered to have a potential maximum magnitude Mw 6.9 (USGS, 2015). The Sierra Madre fault is located about 11 miles northeast of the site, trending northwest over 47 miles in length. It is estimated to be a reverse fault and is considered to have a potential maximum magnitude Mw 7.3 (USGS, 2015).

The San Andreas Fault Zone is the largest fault zone within the southern California area and is capable of producing large earthquakes. It is a strike slip plate boundary that traverses northwest over 800 miles across the length of California's coastline. It is one of the more active fault zones within southern California and has a maximum magnitude potential of Mw 8.0 (CGS). The zone of faulting closest to the site is about 33 miles northeast and is known as the Mojave segment of the San Andreas Fault Zone. A significant earthquake scenario on this fault may trigger a series of earthquakes on surrounding regional faults affecting the Los Angeles area at large (USGS, 2008). The recurrence interval on the Mojave segment is considered by the CGS to be about every 140 years. The last major earthquake event on the fault in the southern California area was an estimated Mw 7.9 in 1857.

Local historical earthquakes recorded from 1933 to present within a 100 kilometer radius to the site include 41 recorded events with magnitudes greater than Mw 5.0. Of the 41 events, 4 were Mw 6.0 and greater (SCEDC, 2015). Significant historical earthquakes epicentered nearest to the

site include ruptures along the Elsinore, Newport-Inglewood, Raymond, and Northridge faults. Two historical earthquakes are estimated to be epicentered along the Elsinore fault zone, one in 1910 estimated to be a magnitude 6 located near Temescal Valley and the second in 1987 estimated to be magnitude 5.9 earthquake located just south of Pasadena. In 1933 an estimated magnitude 6.4 earthquake ruptured along the Newport-Inglewood fault zone near Newport Beach. In 1988 an estimated magnitude 5.0 earthquake ruptured along the Raymond fault zone near Pasadena. In 1994 an estimated magnitude 6.7 earthquake ruptured along the Northridge Blind Thrust fault (Pico Thrust), near Northridge and reportedly triggered lesser ruptures on nearby faults.

4.3 Ground Surface Rupture

As noted, the site is located in an AP Zone for the Hollywood Fault (Figure 7). The Hollywood Fault has been classified by the CGS as an active fault and therefore has a high potential for future earthquakes that may be capable of producing future ground surface ruptures. Fault surface rupture potential at the site was evaluated by previous fault investigations performed by GDC at the site and within the site vicinity (GDC, 2014 & 2015), see Figure 8. City of Los Angeles Approval Letter (2015) for the project site is presented in Appendix A. No known active faults are currently mapped crossing the site or projecting towards the site (CGS, 2010).

Current mapped location of the Hollywood Fault in the site vicinity is largely based on historical geomorphic evidence of south facing tectonic scarps along the southern foothills of the Santa Monica Mountains (CGS, 2014b). The project site is located on an anomalous steepened alluvial fan surface, interpreted by the CGS as a possible tectonic scarp. The most recent seismic event evidence on the Hollywood Fault indicates the last earthquake event on the Hollywood Fault is between 6,000 to 9,000 years ago (Dolan et al., 2001). Calculated slip rates for the Hollywood fault estimate at least a 0.075 mm/yr down dip slip rate and at least 0.25 mm/yr strike separation rate (Dolan et al., 2001). In addition, a significant groundwater level variance in the area was interpreted as evidence of the presence of faulting in the site area.

The Fault Activity Investigation performed by GDC (2014) for the project site and fault investigations performed by GDC (summarized in GDC, 2015) for the surrounding area, including the sites north and west of the project site, indicate no active faulting beneath the project site or projecting toward the project site, shown in Figure 8. The interpreted tectonic scarp the site is located on, was determined to be a buried nose of a ridgeline extending south from the Santa Monica Mountains. Fault trenches at the Yucca and Millennium East sites, location shown on Figure 8, exposed the erosional nature of the bedrock contact with upper alluvial units. The hypothesized scarp was determined to be an erosional south facing slope and not fault related. Groundwater level variance in the area was determined to be depositionally controlled due to the impermeable underlying sloped bedrock and not due to faulting.

Stratigraphic and structural data correlated from adjacent sites indicates the faulting encountered within the subsurface older alluvial soils onsite is stress expression related to pre-

Holocene folding and concluded inactive. A Holocene age alluvial sand deposit and underlying pre-Holocene "mud flow" deposit was encountered continuously from Argyle Avenue north of Yucca Street, west of Argyle Avenue south of Yucca Street to at least the southern extent of the Millennium East site. This continuous stratigraphy precludes the possibility of active east-west trending faulting underlying these sites and projecting east toward the project site.

4.4 Liquefaction, Lateral Spreading, and Seismic Settlement

Liquefaction involves the sudden loss in strength of a saturated, cohesionless soil caused by the build-up of pore water pressure during cyclic loading, such as that produced by an earthquake. This increase in pore water pressure can temporarily transform the soil into a fluid mass, resulting in vertical settlement and can also cause lateral ground deformations (lateral spreading). Typically, liquefaction occurs in areas where there are loose to medium dense non-cohesive soils and the depth to groundwater is less than 50 feet from the surface. Seismic shaking can also cause soil compaction and ground settlement without liquefaction occurring, including settlement of dry sands above the water table.

The State of California Seismic Hazard Zones map of the Hollywood Quadrangle and the Safety Element of the Los Angeles City General Plan - Areas Susceptible to Liquefaction. The site is not located within a State of California Seismic Hazard Liquefaction zone as shown in Figure 7; however, the site is located within an area susceptible to liquefaction based on the Los Angeles Safety Element, shown on Figure 9.

As discussed in SP 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California (CGS, 2008), the vast majority of liquefaction hazards are associated with sandy soils and silty soils of low plasticity. Cohesive soils are generally not considered susceptible to soil liquefaction. The site is mostly underlain by dense/stiff older alluvial soils that are not considered susceptible to liquefaction or lateral spreading. The potential of liquefaction and lateral spreading at the site is considered low.

A wedge of loose sand deposits was encountered in the east portion of the site, at boring BA-2 and B-7 locations to depth of 20 feet below ground surface and is preliminarily subject to dynamic settlement and will need to be evaluated during future design level geotechnical studies.

4.5 Landslide and Seismically Induced Slope Instability

The site is a relatively level pad located within a slope descending about 6:1 (Horizontal:Vertical) to the south. The surrounding slope is landscaped with garden walls, trees, grass, and sidewalks. Bedrock does not daylight. Dense to stiff, older alluvium is anticipated to be blanketing the bedrock to depths of at least 25 feet. The potential for landsliding and seismically induced slope instability at the site is considered low.

4.6 Flooding, Seiches, Inundation, and Tsunami

Flooding, seiche, and inundation potential at the site were evaluated through review of site relative topographic positioning and maps provided by City of Los Angeles Safety Element (1996) and FEMA (2008). The site is located on a broad alluvial plain gently sloping to the south, immediately south of the Cahuenga and Beachwood canyons of the Santa Monica Mountains, shown in Figure 1. The City of Los Angeles Safety Element Exhibit F indicates the site is within a 500 year flood plain area. FEMA National Flood Hazard Layer indicates the site is in an area of minimal flood hazard. Considering the southward gradient and the surrounding roadways and developed drainage, the potential for flooding to impact the site is considered low.

The site is located about 12 miles inland with an elevation of about El. 410 feet. The closest body of water is the Hollywood Reservoir about 1 mile up slope, north of the site, as shown in Figure 1. While the potential for tsunamis is not considered an issue at the site, the potential for inundation and seiche at the site is considered due to the proximity and topographic location of the Hollywood Reservoir.

The City of Los Angeles Safety Element (1996) indicates the site is within an inundation zone related to the Hollywood Reservoir, Mulholland Dam. The topographic position of the site, the seismicity in the region, and the proximity to the Hollywood Reservoir (see Figure 1), presents a potential for the site to be inundated in the event of a seiche or dam breach. The California Division of Safety of Dams is responsible for evaluating and regulating the safety of dams (DSOD). The Mulholland Dam is owned and operated by the Los Angeles Department of Water and Power (LADWP). Records indicate some improvements to the Mulholland Dam global stability were implemented following the 1928 catastrophic failure of the St. Frances Dam. The reservoir water storage level is maintained at a lowered capacity to mitigate the potential for seiches and overflow. LADWP performs regular monitoring and maintenance of the reservoir and dam to prevent overflow and dam breach during a storm or following a seismic event. The potential for seiches to substantially impact the site is considered low. City of Los Angles has emergency programs in place to limit and lower the risk to the public and property during the event of a dam breach (City of Los Angles, 2011). The City of Los Angeles Local Hazard Mitigation Plan indicates areas within a dam inundation zone have a moderate risk hazard to the public and property (2011).

4.7 Soil Stability

Soil stability geologic hazards for the site, such as expansive soils, soil collapse, and settlement will need to be evaluated for the site during future design level geotechnical investigations. The proposed development is planned to include one level of subterranean parking, and one level of semi-subterranean parking, which the subgrade is anticipated to be in alluvial soils. Preliminary evaluation of the older alluvial soils underlying the site indicate a low potential for soil collapse and settlement. However, geotechnical testing of the older alluvial soils indicate the clayey

alluvium has a high expansion potential. Preliminarily, the younger alluvial sands underlying the eastern portion of the site may require some removal and recompaction.

Excavations onsite will require suitable engineered stabilization according to the California Building Code. Application of appropriate engineering controls for planned excavation onsite will minimize the potential geologic hazard of excavation to the site and surrounding developments.

With proper engineering erosion control during development at the site and proper engineered drainage design, erosion potential for the proposed development is considered low.

No history of subsidence is known to impact the site and the hazard is considered low.

4.8 Naturally Occurring Hazardous Elements

Naturally occurring hazardous elements within subsurface materials, can include corrosivity, asbestos, radon, and oil and methane gas. Preliminary geotechnical testing of the older alluvial soils indicate the clayey alluvium has a low corrosivity potential. CGS Map Sheet 59, of known sites with naturally occurring asbestos does not indicate there is a potential for naturally occurring asbestos to be at the site (USGS, 2011). The California Geological Survey Special Radon Potential Zone Map indicates the site is in an area with a moderate potential for indoor radon levels (CGS, 2005). According to the EPA map all of Los Angeles County is “Zone 2”, with predicted average indoor radon screening levels from 2 to 4 pCi/L. The Environmental Protection Agency has established 4 pCi/L (picocuries of radon per liter of air) as the "action level" for radon reduction. Los Angeles County, for example, is not considered to have particularly high levels of radon. According to the EPA, if radon level are 4.0 pCi/L or above, a fan or standard ventilation can be installed easily to lower radon levels well below this guideline. Review of the City of Los Angeles Methane Zone Map and Safety Element indicates the site is outside methane zone and major oil drilling areas boundaries (2004 and 1996). Therefore the presence of naturally occurring oil and or methane gases onsite is considered low.

4.9 Summary

The project site is located in a seismically active area and will be exposed to strong ground shaking during the event of an earthquake. Secondary seismic effects such as liquefaction and dynamic settlement potential is lowered due to the anticipated subsurface conditions onsite and the proposed subterranean subgrade level. The site is within an AP-Zone for the Hollywood Fault. However recent fault investigations at the site and within the site vicinity performed by GDC (2014 and 2015) conclude that there is not active faulting beneath the site, therefore the potential for ground surface fault rupture at the site is low. The clayey alluvial soils onsite have a high expansion potential. Due to the property site proximity to the Hollywood Reservoir and its topographic positioning, there is a moderate potential for the site to be inundated during a dam breach. With the application of appropriate engineering practices, the potential for the identified geologic hazards onsite can be minimized to have a low risk to property and the public.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 General

Based on a review of existing subsurface information and the conceptual plans, it is our opinion that the proposed project is feasible from a geotechnical standpoint. Following proper site development grading, the proposed construction can be supported on conventional spread footings or mat foundations founded in dense, old, alluvial soils. The use of drilled piles may also be required to resist overturning. Preliminary geotechnical recommendations for design planning are discussed in the following sections. However, the previous borings and trenches at the site were performed for the fault investigations, and there was no laboratory testing. Therefore, a design-level geotechnical report will be required to develop geotechnical recommendations for final design, including drilling and sampling geotechnical borings, performing laboratory testing to confirm engineering parameters and detailed engineering analyses.

We anticipate that static design will be performed in accordance with 2020 Edition of the Los Angeles Building Code (2020 LABC). However, a performance-based seismic design may be considered for design of the proposed high-rise development, in accordance with "An Alternative Procedure for Seismic Analyses and Design of Tall Building in the Los Angeles Region" by the Los Angeles Tall Building Structural Design Council (LATBSDC), 2020 Edition. If a performance-based seismic design is selected, it is anticipated that construction cost will be significantly reduced. However, the overall design period will be longer than if the 2020 LABC is followed.

The sides of the deeper excavation for the basement will require shoring consisting of soldier pile and tie-back anchors. During the previous explorations, groundwater was encountered at an Elevation of 376 to 394 feet. The lowest basement level is estimated at about Elevation 403 feet. Therefore, dewatering may not be needed during basement construction, however, groundwater should be a consideration in the basement design.

5.2 Demolition

Prior to the start of earthwork, the existing buildings and improvements on the site will require demolition and removal, including the existing foundations, slabs, pavements, walls and utilities. It should be anticipated that the remnants of previous construction could be encountered anywhere on the site. The civil engineer should identify the presence and location of all existing utilities on and adjacent to the site. Precautions will be required to remove, relocate or protect existing utilities, as appropriate.

5.3 Temporary Excavation and Shoring

Excavation for the basement will be made to a maximum depth of approximately 28 feet below existing grade. The excavation will have a maximum depth of approximately 28 feet at the northeastern end of the site. The excavation will be made primarily in old alluvial soils consisting

of clay, sandy clay, clayey sand and silty sand, that is dense to very stiff and hard. We anticipate that the excavation can be readily accomplished using conventional heavy construction equipment.

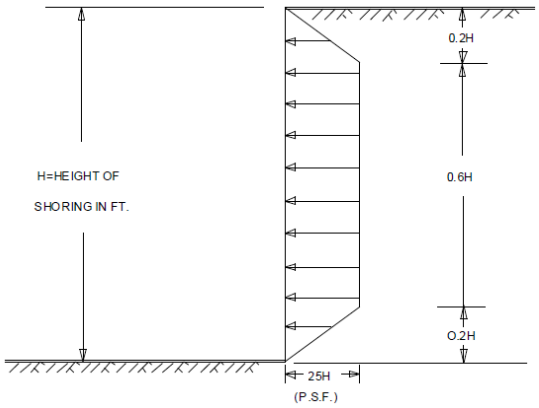
Cantilevered temporary shoring may be required to support the walls of the excavation. The shoring will likely involve soldier piles spaced at about 8 feet on center. For the excavation up to 28 feet, up to two levels of tied-back anchors / internal bracing may be required. Slurry should be used to backfill any voids behind lagging. The contractor will be responsible for the design of the shoring. The shoring designer should verify the depth and location of the existing utilities to select the appropriate tieback depth and inclination. City approval will be required to install anchors under streets, and the anchors will need to be detensioned when no longer needed. If anchors are to be installed under private property to the east and south, permission will also be required from the property owners.

If the excavation is exposed during periods of rainfall, provisions for collection of the runoff should be made. All surface drainage should be controlled and prevented from running down into the excavation. Ponding water should not be allowed within the excavation. Any collected water should be pumped out. Soils softened by wetting should be removed and backfilled as directed by the geotechnical engineer.

All excavation slopes and shoring systems should meet minimum requirements of the Occupational Safety and Health (OSHA) Standards. Maintaining safe and stable slopes on excavations is the responsibility of the contractor and will depend on the nature of the soils and groundwater conditions encountered and his method of excavation. Excavations during construction should be carried out in such a manner that failure or ground movement will not occur. The short-term stability of excavation depends on many factors, including slope angle, engineering characteristics of the subsurface materials, height of the excavation, and length of time the excavation remains unsupported and exposed to equipment vibrations, rainfall, and desiccation. The contractor should perform any additional studies deemed necessary to supplement the information contained in this report for the purpose of planning and executing his excavation plan. Recommendations regarding sloped temporary excavations and shoring are provided in the sections below.

5.3.1 Shoring Design

For the design of cantilevered temporary, where the surface of the backfill is level, it can be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 30 pounds per cubic foot. If tiebacks are planned to support the shoring, we recommend the use of a trapezoidal distribution of earth pressure. The recommended pressure distribution, for the case where the grade is level behind the shoring, is illustrated in the following diagram with the maximum pressure equal to 25H in pounds per square foot, where H is the height of the shoring in feet.



The recommended earth pressure provided above is a preliminary value. The final earth pressure for design of soldier piles and anchors will be provided in the during the design-level geotechnical investigation. Surcharge loads from equipment or stockpiled material should be kept behind the top of the temporary excavations a horizontal distance of at least twice the depth of the excavation.

Surcharge loads from equipment or stockpiled material should be kept behind the top of the shoring a horizontal distance of at least twice the depth of the excavation, or the shoring should be designed for the additional pressure. Foundation and traffic loads from adjacent areas should also be added to the lateral earth pressures. If traffic loading can occur near the top of the shoring, the design height of the shoring should be increased by 2 feet to account for the traffic surcharge. Surface drainage should be controlled and prevented from running down the temporary excavations or down the face of the shoring. Ponding water should not be allowed within the excavation.

Resistance to lateral loading of the shoring piles may be provided by passive pressure of the native soils below the bottom of the excavation. The allowable passive pressure of the native soils may be taken as the pressure developed from an equivalent fluid weight of 300 pcf. To account for the rounded shape of the soldier piles, when calculating the passive pressure on individual piles, the equivalent fluid pressure may be multiplied by a factor of 2.

The tieback contractor should select the design bond stress, drill hole diameter, and length of bonded zone in order to provide the design capacity specified by the structural engineers. All tiebacks should be load tested in accordance with the City of Los Angeles requirements.

5.3.2 Shoring Monitoring

A survey-monitoring program should be implemented to monitor shoring displacements during construction. In addition, prior to the start of construction, nearby improvements should also be surveyed and photographs and/or video taken to document baseline conditions. The deflection at the top of the shoring should be limited to a maximum of 1 inch, or a maximum of 1/2-inch if a structure or utility is located nearby. If the deflection of the shoring exceeds these criteria, or if distress or settlement is noted adjacent to the top of shoring, the excavation should be stopped

and an evaluation should be performed by the structural and geotechnical engineers and any appropriate corrective measures taken, as deemed necessary. The shoring should be monitored once a week until the excavation reaches full depth and further movement has stopped.

5.4 Foundations

5.4.1 Bearing Value

Following proper site development grading/excavation, the proposed structure may be supported on mat foundations. For preliminary design, a mat foundation may be designed for an allowable dead-plus-live load pressure of up to 8 Ksf for the tower support. Lower bearing values up to 5 Ksf are also allowed for isolated footings supporting the low-rise podium portion. Detailed mat deflection analyses will be required for the tower mat design when final loads are determined.

Alternatively, the proposed structure may be supported on spread footings. Spread footings may be designed for an allowable dead-plus-live load pressure of 4,000 psf. The final bearing capacity of footings and mat should be based on an evaluation of settlement performance during the design-level geotechnical investigation. The allowable bearing pressure may be increased by one-third when considering temporary loads associated with wind and seismic loading.

To support seismic uplift force, tie-down anchors may be needed. Cast-in-place concrete drilled shaft (CIDH) may be used for tie-down anchors. Detailed design of tie-down anchors should be performed during design phase.

Footing or mat excavations should be observed by the project geotechnical engineer before placement of concrete to verify that the foundation conditions meet the requirements of the geotechnical report. The project geotechnical engineer may perform compaction tests, probing, or use other methods, to verify that the foundations will be supported in competent soils. If disturbed, wet, or otherwise unsuitable soils are encountered, or if water saturates the soils, the soils shall be excavated or stabilized as recommended by the project geotechnical engineer.

5.4.2 Settlement

The anticipated structural loads are not currently known. Specific sampling and consolidation tests of foundation soils will be performed and settlement performance evaluated for footings and mats during our design-level geotechnical investigation.

5.4.3 Lateral Capacity

Resistance to lateral loads can be provided by friction developed between the bottom of footings and the supporting soil, and by the passive soil pressure developed on the face of the footing. For preliminary design purposes, an allowable passive fluid pressure of 300 pcf and a coefficient of friction of 0.4 may be used for lateral sliding resistance of footings.

5.5 Floor Slab

The basement floor slab may be placed on a properly prepared subgrade. To reduce the potential for moisture transmission through slabs where moisture sensitive covering will be installed, we recommend that a vapor retarder shall be used. In accordance with ACI 302.2R-06, the material must comply with the requirements of ASTM E 1745, "Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs," and have a permeance of less than 0.01 perms per ASTM E96. The installation of the moisture barrier should comply with ASTM E 1643-09. Reference is made to ACI 302.2R, Section 7.2 concerning whether to place 2 inches of sand over the barrier. The design of floor slabs for the expansion potential of the supporting soils or bedrock will be evaluated during the design-level investigation.

5.6 Seismic Coefficient

If performance based seismic design is selected for the structural design, the seismic provisions provided in "An Alternative Procedure for Seismic Analyses and Design of Tall Building in the Los Angeles Region" should be followed. Otherwise, the seismic design parameters in accordance with 2020 LABC should be used for seismic design.

The seismic design parameters were calculated using the OSHPD Seismic Design Maps Web Application. The site coordinates used are:

Latitude: 34.1034 Longitude: -118.3246

Since shear wave velocity data is not currently available, the Default Site Class D seismic parameters were used for the site. The mapped and design spectral acceleration parameters, i.e., S_S, S_1 and S_{DS}, S_{D1}, are provided below.

Mapped

S_s = 2.115 g S_1 = 0.76 g

Design

S_{MS} = 2.54 g S_{M1} = 1.29g

S_{DS} = 1.69 g S_{D1} = 0.86g

A site-specific ground motion hazard analysis is required for this Site Class D site (i.e. $S_1 > 0.2$) during final design, unless, the value of the seismic response coefficient, Cs, is determined by Eq. (12.8-2) for values of building fundamental period, $T \leq 1.5T_s$, and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for a building fundamental period between $T_L \geq T > 1.5T_s$, or Eq. (12.8-4) for building fundamental period, $T > T_L$. The short period, and Long Period transition, T_s, and T_L values are 0.51 and 8.0 seconds, respectively.

The peak ground acceleration adjusted for site class effects, PGA_M at the site is 1.09g.

5.7 Basement Walls

As required by the 2020 LABC, braced basement walls must be designed to resist at-rest earth pressures. Accordingly, for the case where the grade is level behind the walls, a triangular distribution of lateral earth pressure equivalent to that developed by a fluid with a density of 60 pounds per cubic foot. This earth pressure assumes that all walls are constructed with a properly designed drainage system to prevent buildup of hydrostatic pressures behind the wall. Any surcharge loadings occurring as a result of heavy crane loads, stockpiled materials or traffic should be added to this pressure. The recommended pressure should also be confirmed during the design-level geotechnical investigation and should consider the presence of expansive soils, which could require the use of higher design earth pressures.

Basement walls should also be designed for seismic earth pressure. The basement walls should be designed to resist, an active pressure combined with a seismic increment of lateral active earth pressure. For this project, the effective ground surface acceleration is 0.36g, corresponding to one-half of ⅔ of the PGA_M. Based on this acceleration, we recommend using an equivalent fluid pressure of 37 pcf with a triangular distribution. It should be noted that the seismic earth pressures are additive to the active earth pressures specified for permanent static support of the retention system walls. The resultant of the seismic pressure should be applied at a height of 1/3 times the wall height above the base of the wall.

5.8 Soil Corrosivity

A representative sample was tested to evaluate corrosion characteristics. The results indicate the tested sample had a pH of 7.22, water-soluble sulfate content (0.02%) and soluble chloride content (<0.01%) were negligible.

Results of laboratory electrical resistivity tests indicate a minimum resistivity value of 495 ohm-cm for the near-surface soils. To evaluate the corrosion potential of on-site soils, we used the following correlation between electrical resistivity and corrosion potential:

Electrical Resistivity (Ohm-cm)	Corrosion Potential
Less than 1,000	Severe
1,000 – 2,000	Corrosive
2,000 – 10,000	Moderate
Greater than 10,000	Mild

Based on this correlation, the tested soil has a severe corrosion potential for buried metal. All underground metal pipes/clamps/structures should consider this corrosion potential. A

corrosion expert should be consulted regarding the need for further testing and to evaluate options for protection.

6.0 LIMITATIONS

This consultation was performed in accordance with generally accepted Geotechnical Engineering principles and practice. The professional engineering work and judgments presented in this report meet the standard of care of our profession at this time. No other warranty, expressed or implied, is made. This report has been prepared for Champion Real Estate Company, and their design consultants. It may not contain sufficient information for other parties or other purposes and should not be used for other projects or other purposes without review and approval by GDC.

The recommendations for this project, to a high degree, are dependent upon proper quality control of site grading, shoring installation, fill and backfill placement, and foundation installation. The recommendations are made contingent on the opportunity for GDC to observe the earthwork operations. This firm should be notified of any pertinent changes in the project, or if conditions are encountered in the field, which differ from those described herein. If parties other than GDC are engaged to provide such services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project, and must either concur with the recommendations in this report or provide alternate recommendations.

7.0 REFERENCES

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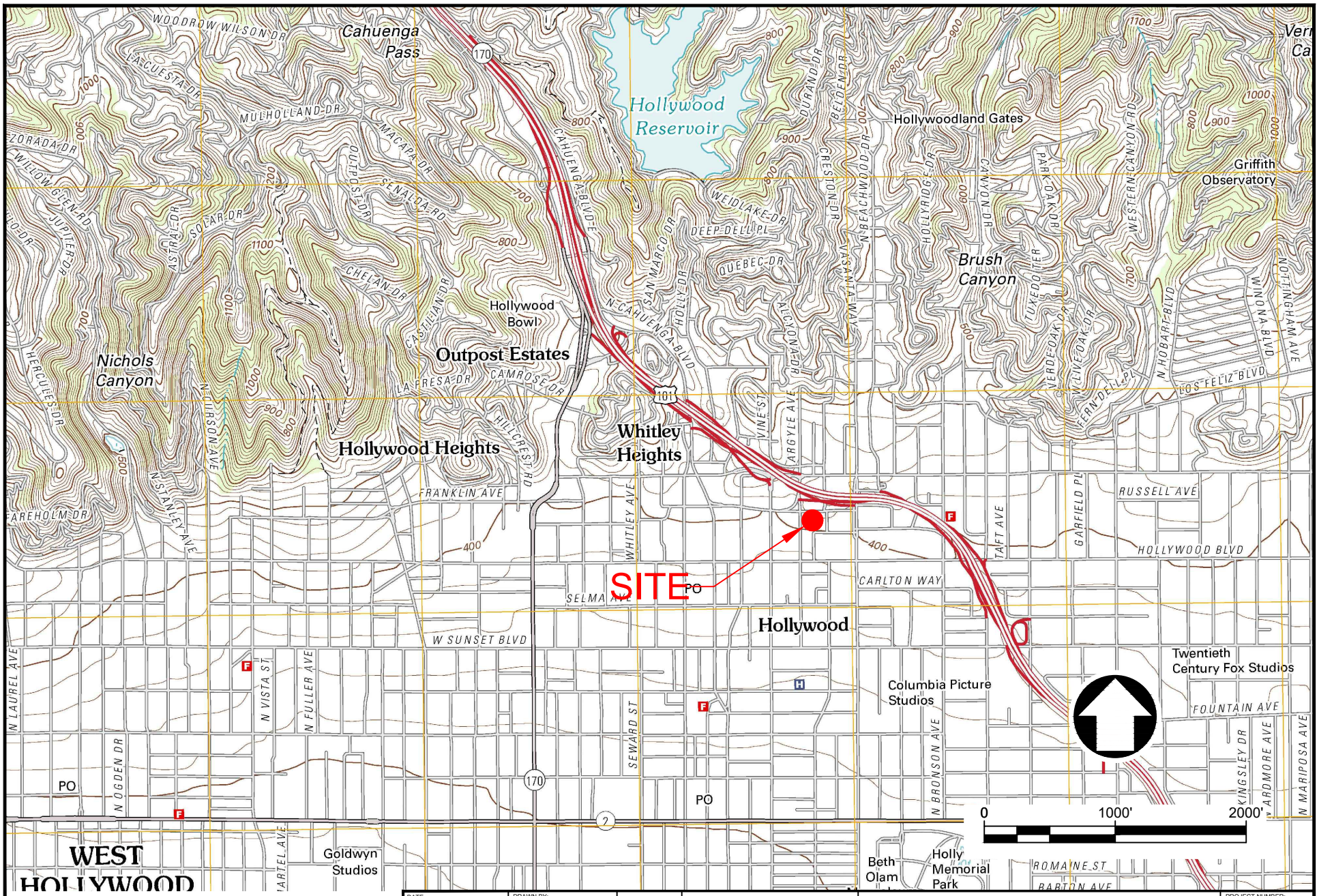

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7.5 MINUTE SERIES

DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA CONSULTANTS, INC	PROJECT NUMBER: LA-1461
REVISION:	APPROVED BY:	370 Amapola Ave. Suite 212 Torrance, CA. 90501	SCALE: AS SHOWN
PREPARED BY:			FIGURE NUMBER: 1

SITE LOCATION MAP

PROPOSED MIXED USE HIGH-RISE DEVELOPMENT
6220 W. YUCCA STREET LOS ANGELES, CA
LAT.: 34.1035° LONG.: -118.3246°

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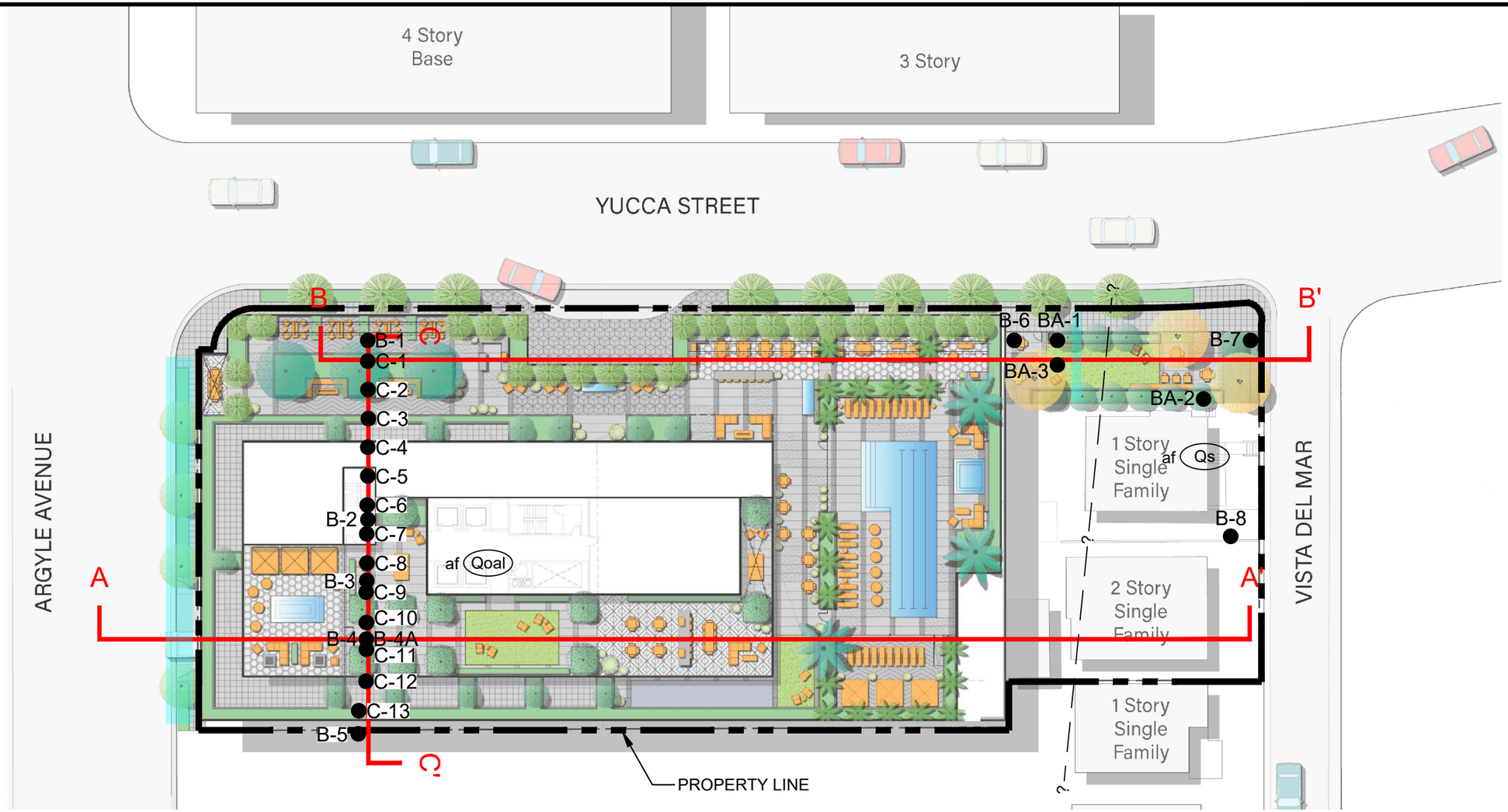

LEGEND

af	ARTIFICIAL FILL
Qs	BURIED SAND DEPOSIT
Qoal	BURIED OLDER ALLUVIUM DEPOSIT
— — — ?	APPROXIMATE GEOLOGIC CONTACT, QUERIED WHERE UNCONFINED

PRIOR GDC EXPLORATION (2014)

● B-6	BORING LOCATION AND NUMBER
● C-20	CPT (CONE PENETRATION TEST) LOCATION AND NUMBER
	TRENCH LOCATION
A — A'	APPROXIMATE LOCATION OF CROSS SECTION

0 40' 80'

REFERENCE: BASE MAP BY EPT DESIGN, DATED JUNE 19, 2020

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REVIEWED BY: -	APPROVED BY: -		SCALE: AS SHOWN
REVISED: -			FIGURE NUMBER: 2

SITE PLAN & PRIOR EXPLORATION MAP

PROPOSED MIXED USE HIGH-RISE DEVELOPMENT
6220 W. YUCCA STREET LOS ANGELES, CA.

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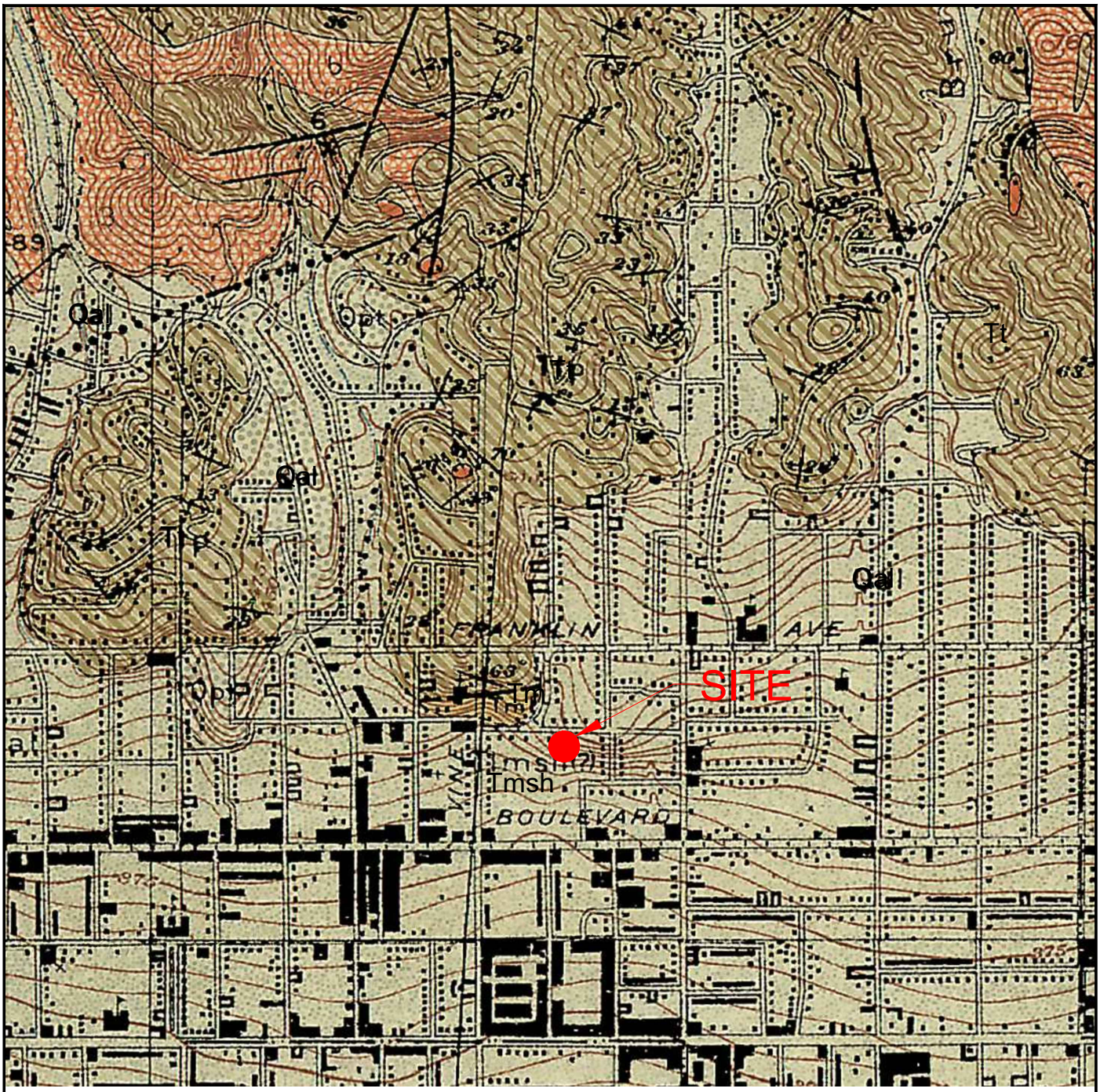

Figure 3: Geologic map Site and Vicinity (Hoots and Kew, 1931) showing inferred trace of a Hollywood Fault separating Modelo (T_m / T_{msh}), and Topanga (T_t) Formations, granite rocks (gr), and alluvium (Q_{al}).

FAULT TRACE, DOTTED WHERE BURIED

GEOLOGIC CONTACT

0 1000' 2000'

DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	HISTORICAL GEOLOGIC MAP	PROJECT NUMBER: LA-1461
REVIEW:	APPROVED BY:			PROPOSED MIXED USE HIGH-RISE DEVELOPMENT 6220 W. YUCCA STREET LOS ANGELES, CA	SCALE: AS SHOWN
PREPARED BY:					FIGURE NUMBER: 3

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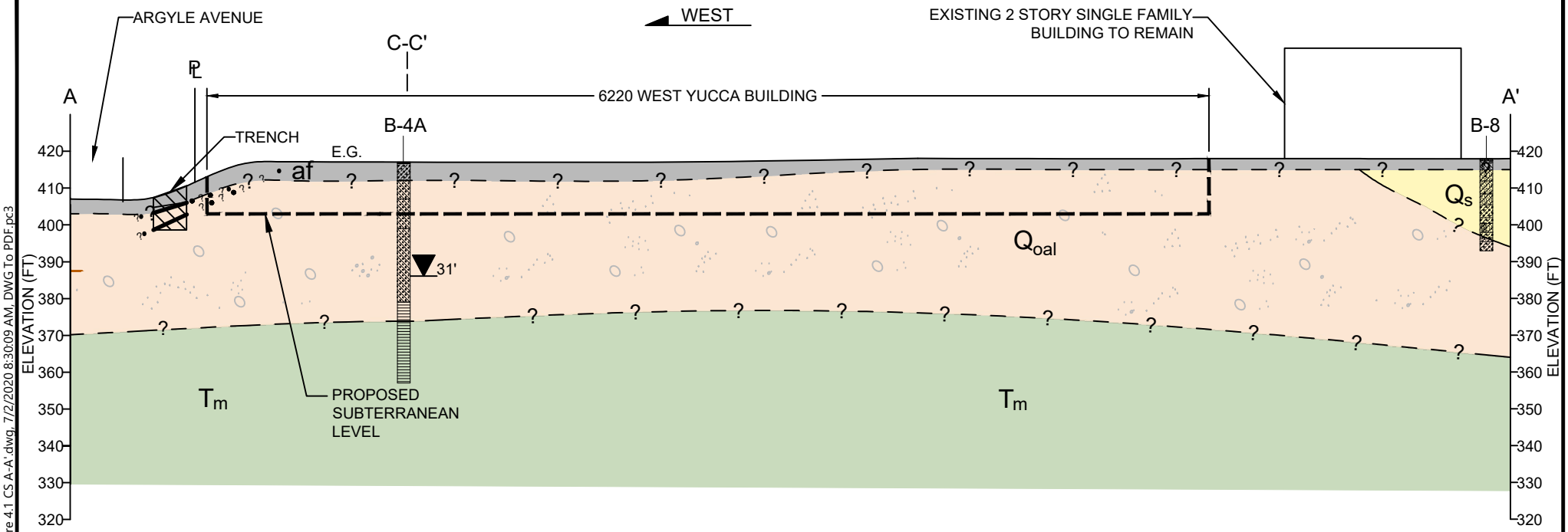

LEGEND

af	ARTIFICIAL FILL - SILTY TO CLAYEY SAND
Q_s	SAND UNIT - SILTY TO CLAYEY SAND
Q_{oal}	OLDER ALLUVIUM - CLAYEY SAND TO SANDY CLAY
T_m	MODELO FORMATION - INTERBEDDED CLAYSTONE, SANDY SILTSTONE

SYMBOLS

E.G.	EXISTING GRADE
	APPROXIMATE INACTIVE FAULT PROJECTION
	INFERRED GEOLOGIC CONTACT, QUERIED WHERE UNCONFINED
C-C'	CROSS SECTION INTERSECTION LOCATION

PRIOR EXPLORATION (GDC, 2014)

	GROUNDWATER DEPTH ENCOUNTERED DURING DRILLING
B-4A	CONTINUOUS CORE BORING LOCATION
	APPROXIMATE FAULT TRENCH LOCATION

V
40'
20'
SCALE (FT):
H
0'
20'
40'

DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	CROSS SECTION A-A'
REVISION:	APPROVED BY:		PROPOSED MIXED USE HIGH-RISE DEVELOPMENT 6220 W. YUCCA STREET LOS ANGELES, CA.

PROJECT NUMBER: LA-1461
SCALE: AS SHOWN
FIGURE NUMBER: 4.1

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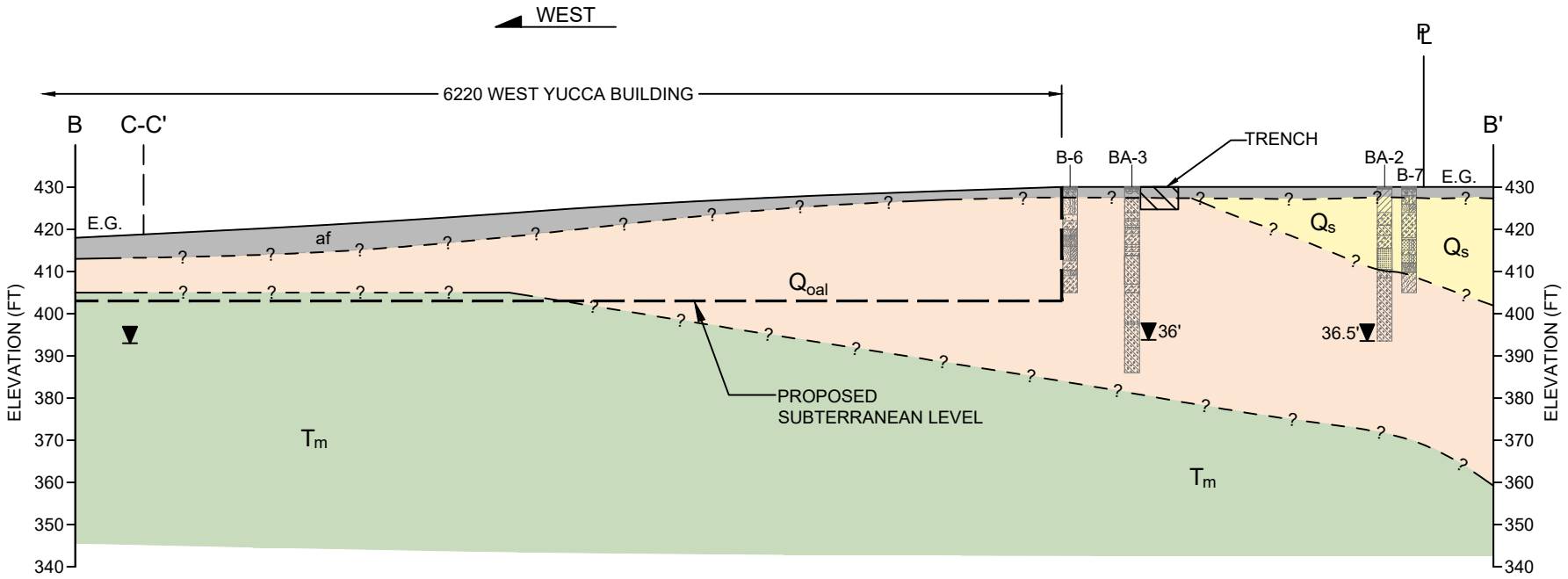

LEGEND

- af — ARTIFICIAL FILL - SILTY TO CLAYEY SAND
- Q_s — SAND UNIT - SILTY TO CLAYEY SAND
- Q_{oal} — OLDER ALLUVIUM - CLAYEY SAND TO SANDY CLAY
- T_m — MODELO FORMATION - INTERBEDDED CLAYSTONE, SANDY SILTSTONE

SYMBOLS

- E.G. — EXISTING GRADE
- — — — ? — INFERRED GEOLOGIC CONTACT, QUERIED WHERE UNCONFINED
- C-C' — CROSS SECTION INTERSECTION LOCATION

PRIOR EXPLORATION (GDC, 2014)

- GROUNDWATER DEPTH ENCOUNTERED DURING DRILLING
- B-6 — CONTINUOUS CORE BORING LOCATION
- APPROXIMATE FAULT TRENCH LOCATION

V
40'
20'
SCALE (FT):
H
0' 20' 40'

DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	CROSS SECTION B-B'	PROJECT NUMBER: LA-1461
REVISION:	APPROVED BY:			PROPOSED MIXED USE HIGH-RISE DEVELOPMENT 6220 W. YUCCA STREET LOS ANGELES, CA.	SCALE: AS SHOWN
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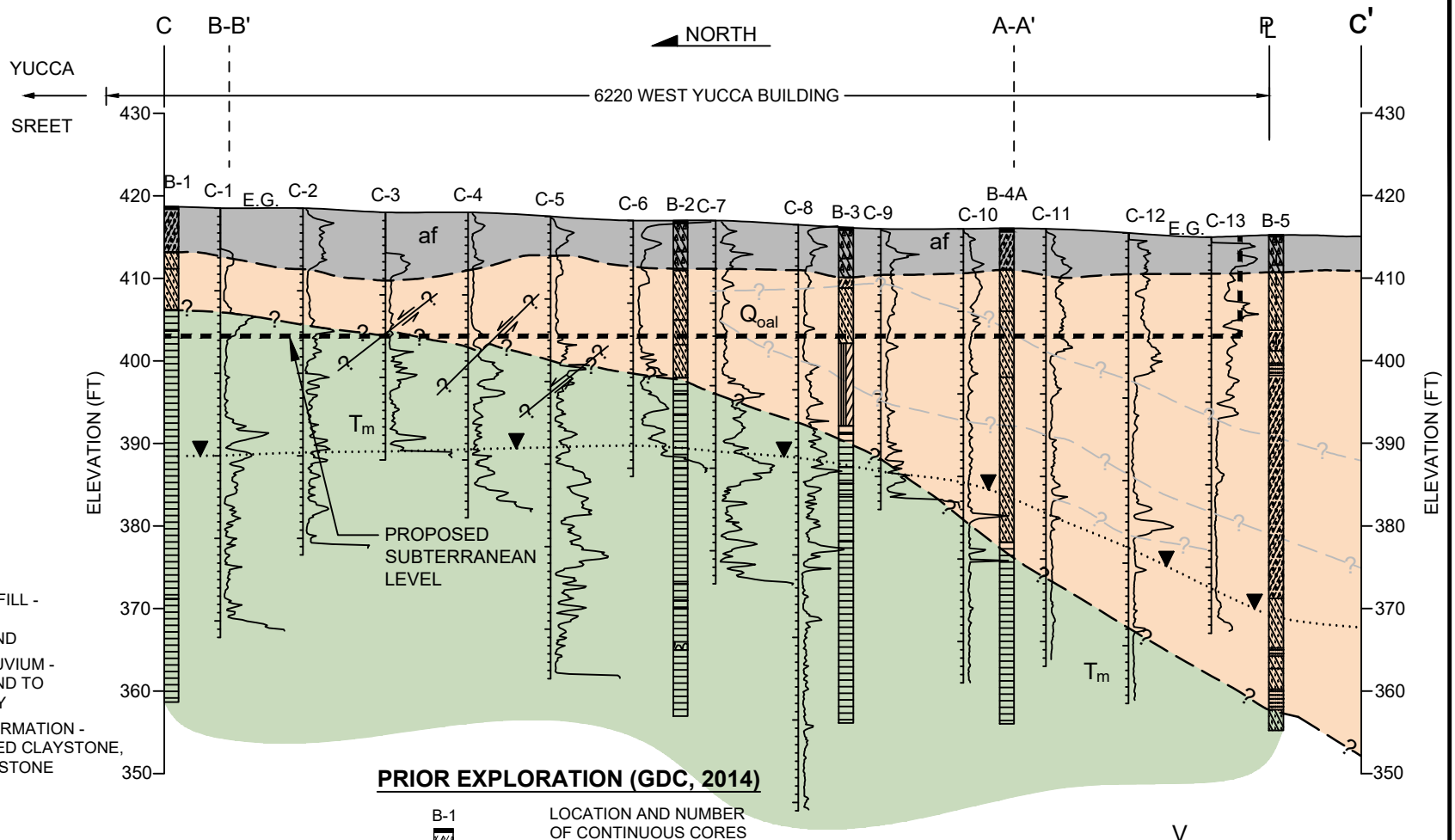


LEGEND

- af — ARTIFICIAL FILL - SILTY TO CLAYEY SAND
- Q_{oal} — OLDER ALLUVIUM - CLAYEY SAND TO SANDY CLAY
- T_m — MODELO FORMATION - INTERBEBBED CLAYSTONE, SANDY SILTSTONE

SYMBOLS

- E.G. — EXISTING GRADE
- — — —? — INFERRED GEOLOGIC CONTACT, QUERIED WHERE POORLY CONFINED
- WATER LEVEL ENCOUNTERED DURING DRILLING AND INFERRED GROUNDWATER LEVEL ACROSS SITE
- ESTIMATED PROJECTIONS OF INACTIVE FAULTING FROM GDC, 2014 CHAMPION TRENCH DATA
- INFERRED STRATIGRAPHIC DIP ILLUSTRATION
- B-B' — CROSS SECTION INTERSECTION LOCATION

PRIOR EXPLORATION (GDC, 2014)

- B-1 — LOCATION AND NUMBER OF CONTINUOUS CORES
- C-3 — LOCATION AND NUMBER OF CPT

V
20'
10'
SCALE (FT):
H
0'
10'
20'

DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	CROSS SECTION C-C' (CROSS SECTION G-G' FROM GDC, 2014) PROPOSED MIXED USE HIGH-RISE DEVELOPMENT 6220 W. YUCCA STREET LOS ANGELES, CA.
REVISION:	APPROVED BY:		PROJECT NUMBER: LA-1461 SCALE: AS SHOWN FIGURE NUMBER: 4.3
REVISION:			

MAP UNITS

Late Holocene (Surficial Deposits)

- af — **Artificial Fill** - deposits of fill resulting from human construction, mining, or quarrying activities; includes engineered fill for buildings, roads, dams, airport runways, harbor facilities, and waste landfills
- Qw — **Alluvial Wash Deposits** - unconsolidated sandy and gravelly sediment deposited in recently active channels of streams and rivers; may contain loose to moderately loose sand and silty sand
- Qf — **Alluvial Fan Deposits** - unconsolidated boulders, cobbles, gravel, sand, and silt recently deposited where a river or stream issues from a confined valley or canyon; sediment typically deposited in a fan-shaped cone; gravelly sediment generally more dominant than sandy sediment

Holocene to Late Pleistocene (Surficial Deposits)

- Qyf — **Young Alluvial Fan Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon
- Qya — **Young Alluvial Valley Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers

Late to Middle Pleistocene (Surficial Deposits)

- Qof — **Old Alluvial Fan Deposits** - slightly to moderately consolidated, moderately dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon
- Qoa — **Old Alluvial Valley Deposits** - slightly to moderately consolidated, moderately dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers
- Qol — **Old Lacustrine, Playa, and Estuarine (Paralic) Deposits** - slightly to moderately consolidated, moderately dissected fine-grained sand, silt, mud, and clay from lake, playa, and estuarine deposits of various types

Middle to Early Pleistocene (Surficial Deposits)

- Qvoa — **Very Old Alluvial Valley Deposits** - moderately to well-consolidated, highly dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers; generally uplifted and deformed

Tertiary (Bedrock)

- Tss — **Coarse-grained Tertiary age formations** - primarily sandstone and conglomerate
- Tsh — **Fine-grained Tertiary age formations** - includes fine-grained sandstone, siltstone, mudstone, shale, siliceous and calcareous sediments
- Tv — **Tertiary age formations of volcanic origin**

Mesozoic and Older (Bedrock)

- Kss — **Coarse-grained Cretaceous age formations of sedimentary origin**
- pKm — **Cretaceous and pre-Cretaceous metamorphic formations of sedimentary and volcanic origin**
- gr — **Granitic and other intrusive crystalline rocks of all ages**

SYMBOL EXPLANATION

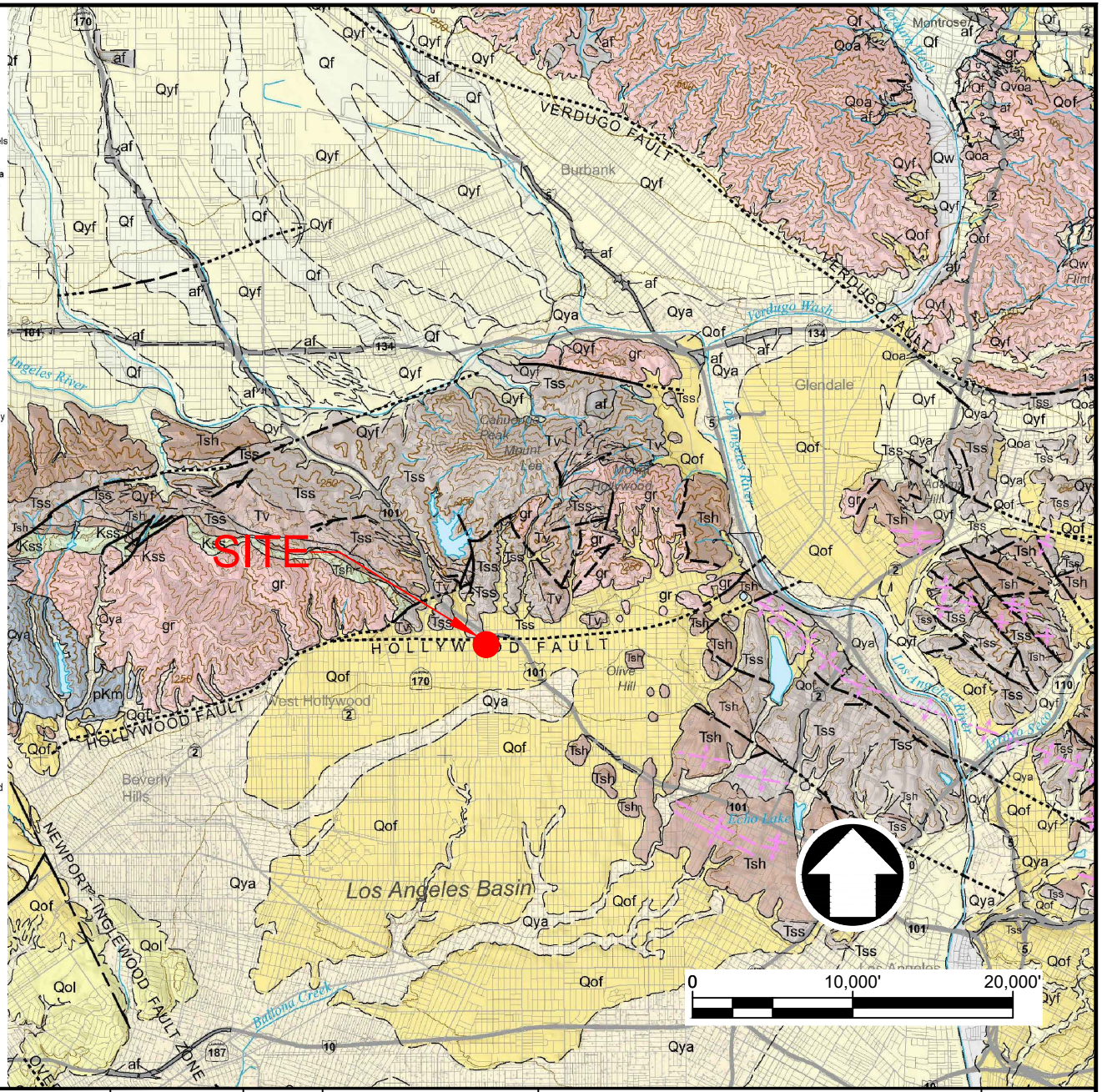
[For geologic line symbols: lines are solid where location is accurate, long-dashed where location is approximate, short-dashed where location is inferred, dotted where location is concealed. Queries added where identity or existence may be questionable.]

Contacts

- Contact
- Reference contact -- Used to delineate geologic units that were mapped as separate units on the original source map, but are consolidated on this map.

- Fault -- Includes strike-slip, normal, reverse, oblique, and unspecified slip
- Lineament
- Folds -- Showing direction of plunge where appropriate
- Anticline
- Stream
- Road

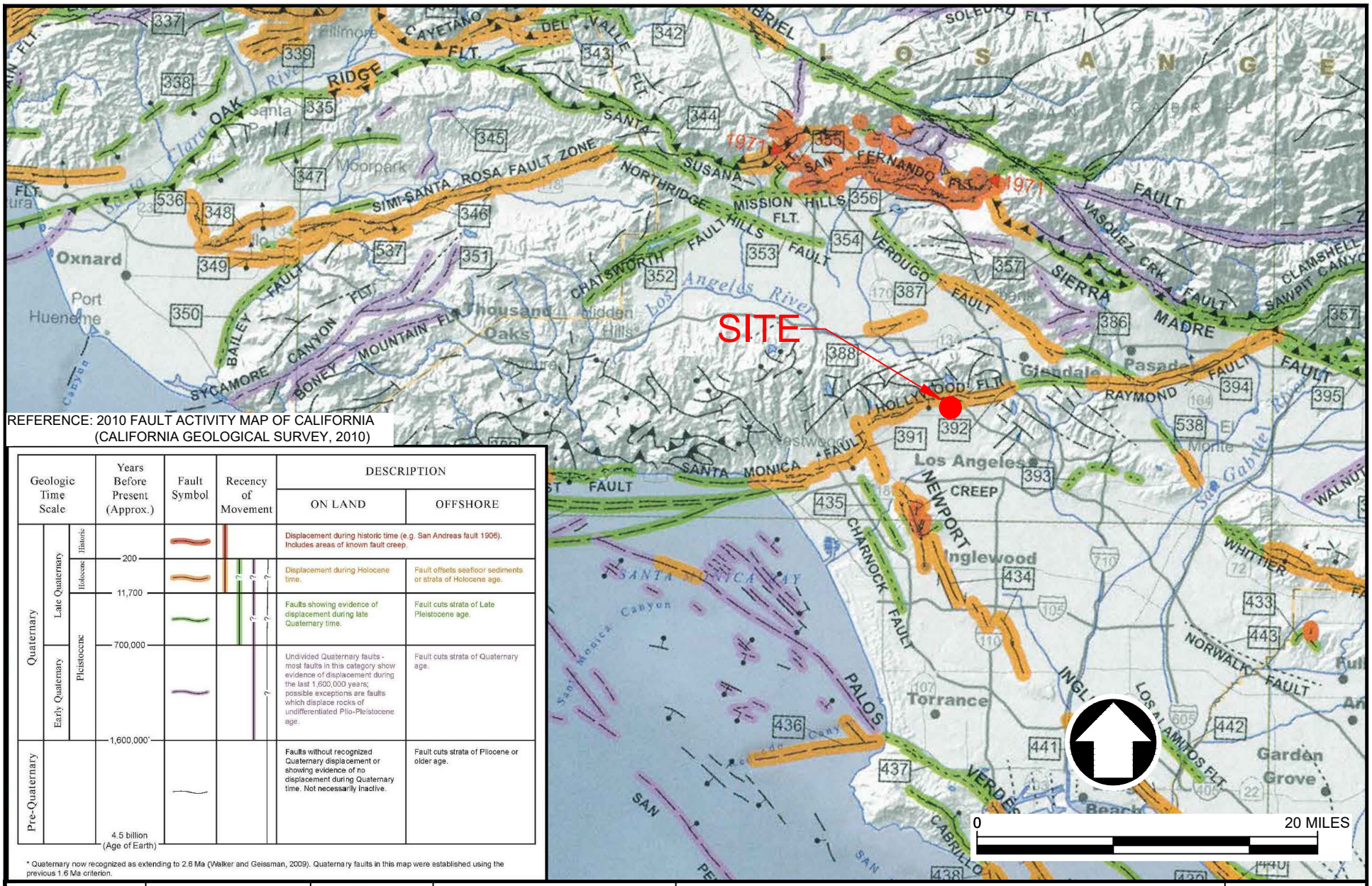
REFERENCE: CGS, 2010a



DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	REGIONAL GEOLOGY MAP PROPOSED MIXED USE HIGH-RISE DEVELOPMENT 6220 W. YUCCA STREET LOS ANGELES, CA
REVIEW:	APPROVED BY:		
PREPARED BY:			

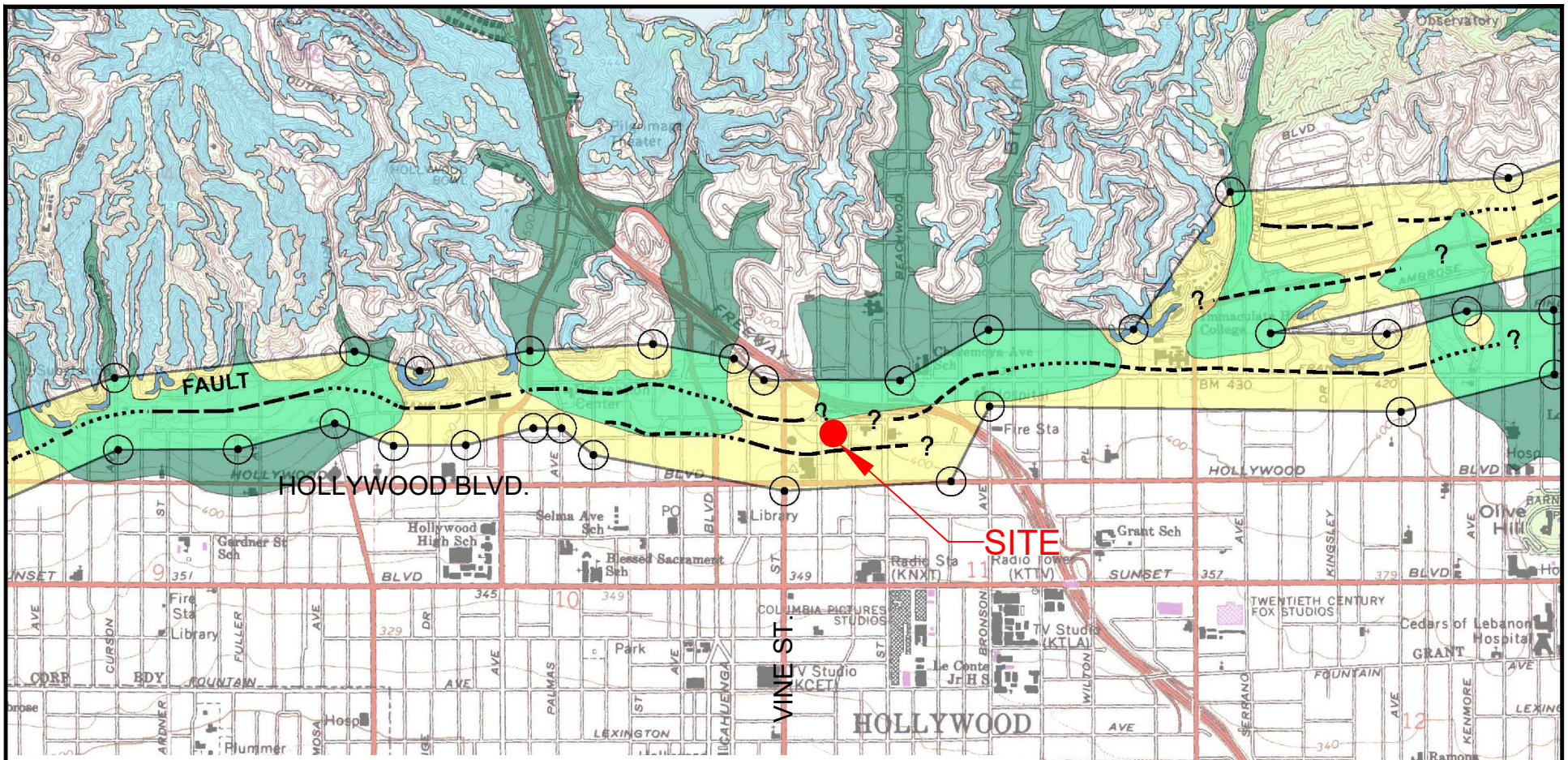
PROJECT NUMBER: LA-1461
SCALE: AS SHOWN
FIGURE NUMBER: 5

N:\Projects\1400-1499\LA1461 Champion Yucca Argyle Geotech Report Update\600 Drafting\LA-1461_Figure 5 & 6_Regional Geology Map&Regional fault Map.dwg, 7/2/2020 9:06:29 AM, DWG To PDF.pc3



DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	REGIONAL FAULT MAP	PROJECT NUMBER: LA-1461
REVIEWED BY:	PROJECT MANAGER:		PROPOSED MIXED USE HIGH-RISE DEVELOPMENT 6220 W. YUCCA STREET LOS ANGELES, CA	SCALE: AS SHOWN
PREPARED BY:				FIGURE NUMBER: 6

N:\Projects\1400-1499\LA1461 Champion Yucca Argyle Geotech Report Update\600 Drafting\LA-1461_Figure 5 & 6_Regional Geology Map&Regional fault Map.dwg, 7/2/2020 9:07:15 AM, DWG To PDF.pc3



MAP EXPLANATION

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONES

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments that connect encircled turning points; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

SEISMIC HAZARD ZONES

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Reference: *CGS, EARTHQUAKE ZONES OF REQUIRED INVESTIGATION, HOLLYWOOD QUADRANGLE, EARTHQUAKE FAULT ZONES, 2014, SEISMIC HAZARD ZONES, 1999.*

DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	EARTHQUAKE ZONES MAP PROPOSED MIXED USE HIGH-RISE DEVELOPMENT 6220 W. YUCCA STREET LOS ANGELES, CA
REVIEW:	APPROVED BY:		PROJECT NUMBER: LA-1461
PREPARED BY:			SCALE: AS SHOWN
			FIGURE NUMBER: 7

LEGEND

- APPROXIMATE BURIED INACTIVE FAULT LOCATION PROJECTED TO SURFACE, QUERIED WHERE POORLY CONFINED
- STRIKE AND DIP OF BEDDING (BELOW SURFACE)
- STRIKE AND DIP OF FAULT (BELOW SURFACE)
- DEPTH OF WATER BELOW GROUND SURFACE ENCOUNTERED IN EXCAVATION, AND DATE
- APPROXIMATE LOCATION OF BURIED ANTICLINE, BARB INDICATES DIRECTION OF PLUNGE
- APPROXIMATE PROPERTY LINE OF PROPERTY SITE
- CURRENT CGS ACTIVE HOLLYWOOD FAULT SURFACE TRACE

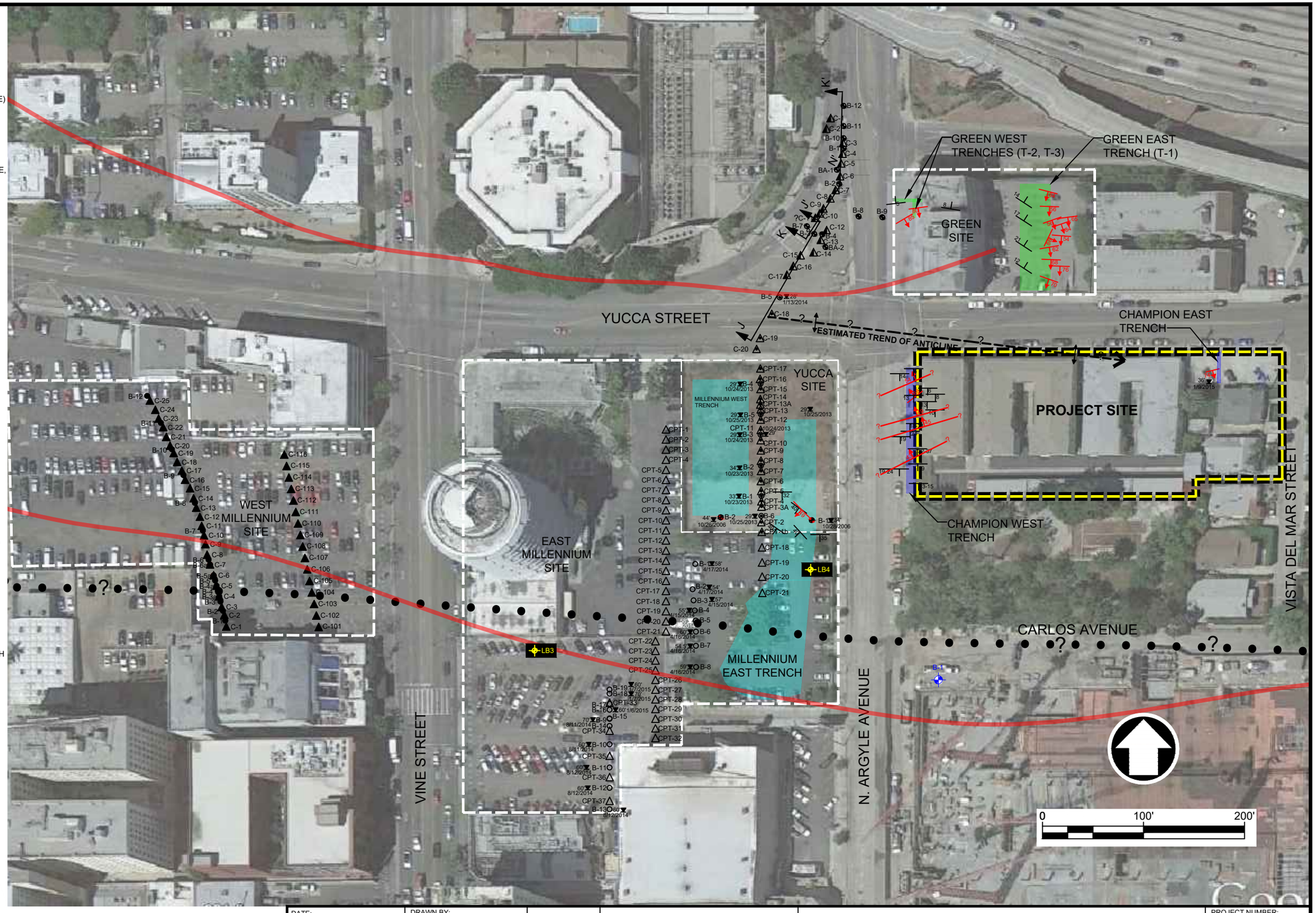
PRIOR INVESTIGATIONS

WEST MILLENNIUM SITE
- B-5 — BORING LOCATION AND NUMBER (GDC, 2015a)
- CPT-16 — CONE PENETRATION TEST LOCATION AND NUMBER (GDC, 2015a)

EAST MILLENNIUM SITE
- B-13 — BORING LOCATION AND NUMBER (GDC, 2015a)
- CPT-37 — CONE PENETRATION TEST LOCATION AND NUMBER (GDC, 2015a)

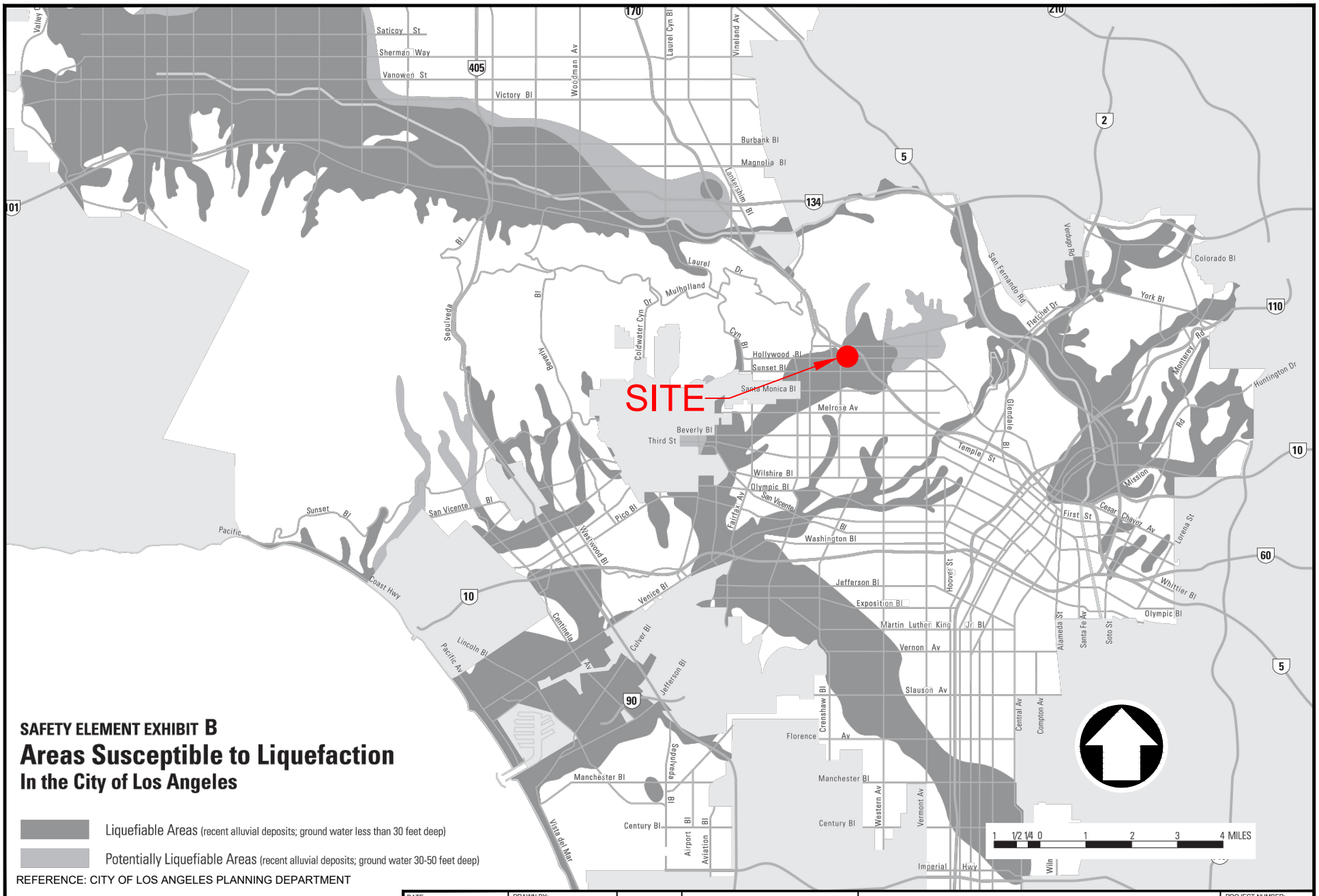
YUCCA SITE
- B-6 — BORING LOCATION AND NUMBER (GDC, 2014d)
- CPT-21 — CONE PENETRATION TEST LOCATION AND NUMBER (GDC, 2014d)
- B-2 — BORING LOCATION AND NUMBER (GDC, 2006)

GREEN SITE
- B-6 — BORING LOCATION AND NUMBER (GDC, 2014a)
- CPT-21 — CONE PENETRATION TEST LOCATION AND NUMBER (GDC, 2014a)
- LB4 — BORING LOCATION AND NUMBER (LOGAN 2011)
- B-1 — GEOTECHNICAL BORING BY APPROXIMATE LOCATION OF GEOTECHNOLOGIES, 2006
- K K' — LOCATION OF CROSS SECTION PUBLISHED IN PRIOR STUDY (GDC, 2014a)
- TRENCH LOCATION FOOTPRINT
- CHAMPION WEST AND CHAMPION EAST TRENCH LOCATION FOOTPRINT (GDC, 2014a)
- GREEN WEST AND GREEN EAST TRENCH LOCATION FOOTPRINT (GDC, 2014c)



DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	LOCAL FAULT INVESTIGATION MAP PROPOSED MIXED USE HIGH-RISE DEVELOPMENT 6220 W. YUCCA STREET LOS ANGELES, CA.
REVISION:	APPROVED BY:		PROJECT NUMBER: LA-1461 SCALE: AS SHOWN FIGURE NUMBER: 8
PREPARED BY:			

N:\Projects\1400-1499\LA1461 Champion Yucca Argyle Geotech Report Update\600 Drafting\LA-1461_Figure 8 Local Fault Investigation Map.dwg, 7/2/2020 9:12:25 AM, DWG To PDF.pc3



SAFETY ELEMENT EXHIBIT B

Areas Susceptible to Liquefaction

In the City of Los Angeles

Liquefiable Areas (recent alluvial deposits; ground water less than 30 feet deep)

Potentially Liquefiable Areas (recent alluvial deposits; ground water 30-50 feet deep)

REFERENCE: CITY OF LOS ANGELES PLANNING DEPARTMENT

DATE: 07/02/2020	DRAWN BY: JMT	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	CITY OF LOS ANGELES AREAS SUSCEPTIBLE TO LIQUEFACTION MAP PROPOSED MIXED USE HIGH-RISE DEVELOPMENT 6220 W. YUCCA STREET LOS ANGELES, CA
REVIEW:	APPROVED BY:		
PREPARED BY:			

PROJECT NUMBER: LA-1461

SCALE: AS SHOWN

FIGURE NUMBER: 9

N:\Projects\1400-1499\LA1461 Champion Yucca Argyle Geotech Report Update\600 Drafting\LA-1461_Figure 9 City of LA Liquefaction Map.dwg, 7/2/2020 9:15:17 AM, DWG To PDF.pc3

FIGURES

APPENDIX A
GEOLOGIC REPORT APPROVAL LETTER

CITY OF LOS ANGELES
CALIFORNIA

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

RAYMOND S. CHAN, C.E., S.E.
GENERAL MANAGER

FRANK BUSH
EXECUTIVE OFFICER

GEOLOGY REPORT APPROVAL LETTER

February 20, 2015

LOG # 85579-01
SOILS/GEOLOGY FILE - 2
AP

Greg Beck
11601 Wilshire Boulevard, Suite 1650
Los Angeles, CA 90025

TRACT: 10149
LOT(S): 1 and 3
LOCATION: 1756 and 1760 Argyle Avenue

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Addendum Report	LA-1183E	02/12/2015	Group Delta
Oversized Docs.	``	``	``

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Correction Letter	85579	09/17/2014	LADBS
Geology Report	LA-1183A	09/07/2014	Group Delta

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that present a fault rupture investigation at 1756 and 1760 Argyle Avenue for the future devolvement of the property. The site is currently occupied by 2-story apartment buildings.

The property is located within an Official Earthquake Fault Zone that was established (November 6, 2014) by the California Geological Survey for the Hollywood fault (on the USGS 7.5 minute Hollywood Quadrangle). The investigation included a transect of CPT soundings and continuous core borings in the west portion of the site and an exploration trench along the western edge. Additional exploration was conducted to address the Department correction letter dated 09/17/2014, which included three continuous core borings, three bucket auger borings and a trench just east of the site. Dr. Roy Shlemon (a well-known expert in soil stratigraphy, age-dating of soils and assessment of geologic hazards) provided a detailed soil stratigraphic/pedological analysis by to estimate the age of the soil horizons encountered in the recent trench. Data from offsite projects investigated by Group Delta were also used for the geologic analysis of the site.

The investigation documents folding and faulting of Pleistocene "older" alluvium (designated Qoal in the report). The age of the folding and faulting is estimated to be greater than 135,000 to 150,000

years. No active (Holocene) faults were observed on the site or nearby the site. Therefore, no building restrictions were recommended by Group Delta.

The referenced reports are acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2014 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Prior to issuance of any permit, a soil engineering report shall be submitted to the Grading Division to provide design recommendations for the proposed grading/construction.

2. During construction, the project engineering geologist shall observe all excavations that expose the natural alluvial soils to verify the conclusions of the fault investigation and that no Holocene faults are exposed. The project engineering geologist shall post a notice on the job site for the City Grading Inspector and the Contractor stating that the excavation (or portion thereof) has been observed and documented and meets the conditions of the report. No fill or lagging shall be placed until the LADBS Grading Inspector has verified the documentation.

3. A supplemental report that summarizes the geologist's observations (including photographs and simple logs of excavations) shall be submitted to the Grading Division of the Department upon completion of the excavations. If evidence of active faulting is observed, the Grading Division shall be notified immediately. (7009)

Daniel C Schneidereit

DANIEL C. SCHNEIDEREIT
Engineering Geologist I

DCS/dcs
Log No. 85579-01
213-482-0480

cc: Group Delta , Project Consultant
LA District Office

APPENDIX B
PRIOR EXPORATIONS

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-1**
SITE LOCATION	**DATE(S) DRILLED** 1/31/14	**LOGGED BY** TO	**SHEET NO.** 1 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 423	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Approximately 3.5 inches of Asphalt **Artificial Fill (Qaf)** **Silty SAND to Clayey SAND**, 7.5 YR 6/8 (Reddish Brown) , dry, fine to medium grained sand, some fine to coarse gravel with cobbles.				
5	420	1	1	30/30					**Older Alluvium (Qoal)** **Clayey SAND**, 7.5 YR 5/6 (Strong Brown), humid to moist, fine to medium grained sand, some coarse sand, trace fine gravel and cobbles.				
	415	2		30/30					**Sandy Clay to Clayey Sand**, mottled 5 YR 7/1 (Yellowish red) and 5 YR 7/1 (Light Gray), humid to moist, some fine gravel and coarse sand, well developed soil.				
10		3	2	30/30									
	410	4		30/30					**Modelo Formation (TM)** **Sandstone, Siltstone, Claystone**, 10YR 6/1 (Strong brown) to 7.5YR 7/1 (light gray), thinly bedded, some oxidation, some caliche.				
15		5	3	30/30					**Poorly Graded Sand, Silt and Clay**, 10 YR 7/6 (Yellowish Brown) to 10 YR 6/1 (Light Gray) moist, mostly sand, cobbles and gravels throughout.				
	405	6		30/30									

GDC_ROCK_CORE_ENG LA-1183 CORE LOGS.GPJ ROCK2.GDT 2/13/15

GROUP DELTA CONSULTANTS, INC.
32 Mauchly, Suite B
Irvine, CA 92618

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE a

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-1**
SITE LOCATION	**DATE(S) DRILLED** 1/31/14	**LOGGED BY** TO	**SHEET NO.** 2 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 423	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		7	4	60/60									
	400												
25		8	5	33/60									
	395												
30		9	6	54/60					**Sandstone, Siltstone, Claystone** 7.5YR 7/1 (light gray), wet, thinly bedded, some oxidation.				Water @ 30 Ft.
	390												
35		10	7	36/60									
	385												

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Irvine, CA 92618

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** B-1
SITE LOCATION	**DATE(S) DRILLED** 1/31/14	**LOGGED BY** TO	**SHEET NO.** 3 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 423	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		11	8	36/60									
	380												
45		12	9	40/60									
	375								**Interbedded Sandstone, Siltstone and Claystone**; 7.5 YR 7/1 (Strong Brown) to 7.5 YR 7/1 (Light Gray), wet, fine grained sand, some oxidation.				
50		13	10	11/60									
	370												
55		14	11	58/60									
	365												

GDC_ROCK_CORE_ENG LA-1183 CORE LOGS.GPJ ROCK2.GDT 2/13/15

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32 Mauchly, Suite B
Irvine, CA 92618

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE c

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-1**
SITE LOCATION	**DATE(S) DRILLED** 1/31/14	**LOGGED BY** TO	**SHEET NO.** 4 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 423	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Total Depth: 60 Ft Groundwater: Encountered at 30 Ft Boring backfilled with tamped soil cuttings and asphalt patched.				
	360												
65													
	355												
70													
	350												
75													
	345												

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Irvine, CA 92618

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE d

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-2**
SITE LOCATION	**DATE(S) DRILLED** 1/30/14	**LOGGED BY** TO	**SHEET NO.** 1 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 421	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	420								**Asphalt**				
									Artificial Fill (Qaf)				
									Silty SAND, 7.5 YR 5/8 (Strong Brown) , moist, mostly medium to coarse sand, some fine sand, some fines, little fine to coarse gravel, trace cobbles.				
5		1	1	25/30									
	415								**Older Alluvium (Qoal)**				
		2		20/30					**Clayey SAND**, 7.5 YR 5/6 (Strong Brown) with grayish mottling, moist, fine sand.				
									-Trace fine gravel				
10		3	2	18/30									
	410								-Polished surfaces				
		4		25/30					**Sandy CLAY**, 5 YR 4/6 (Yellowish Red), dry to moist, fine sand.				
15		5	3	30/30					**Caliche**,10 YR 7/6 (Yellow), layers of well deveoped carbonate.				
	405												
		6		29/30									
									Modelo Formation (Tm)				

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** B-2
SITE LOCATION	**DATE(S) DRILLED** 1/30/14	**LOGGED BY** TO	**SHEET NO.** 2 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 421	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	400	7	4	30/30					**Sandstone**, 10YR 7/8 (Yellow), dry to moist, mostly fine to medium sand, abundant carbonate infilling. **Modelo Formation (TM)** cont..				
		8		30/30					**Clayey Sandstone**, 7.5 YR 8/1 (White) and 7.5 YR 6/8 (Reddish Yellow), dry to moist, mostly fine to medium sand, abundant carbonate.				
25		9	5	22/30					**Sandstone**, 7.5 YR 6/8 (Reddish Yellow), moist to wet, mostly fine to medium sand, with some carbonate infilling in joints.				Ground water @ 27'
	395								-Layer of Clayey Sandstone, 7.5 YR 5/8 with carbonate infilling -Wet, 7.5 YR 5/6 (Strong Brown)				
		10		25/30					-Mottled 10 YR 6/8 (Brownish Yellow) and 10 YR 8/1 (White)				
30		11	6	45/60					**Clayey Sandstone**, 7.5 YR 5/8 (Strong Brown), wet, fine to medium sand, minor white mottling.				
	390								**Sandstone**, mottled 7.5 YR 8/1 (White) and 7.5 YR 5/8 (Strong Brown), wet, fine to medium sand.				
35		12	7	38/60					-Becomes 10 YR 6/6 (Brownish Yellow) -Layer of Clayey Sandstone, 7.5 YR 6/8 (Reddish Yellow), carbonate infilling of fractures.				
	385												

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** B-2
SITE LOCATION	**DATE(S) DRILLED** 1/30/14	**LOGGED BY** TO	**SHEET NO.** 3 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 421	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	380	13	8	60/60					**Sandy Claystone**, mottled 7.5 YR 8/1 (White) and 7.5 YR 5/8 (Strong Brown), wet, fine sand.				
45	375	14	9	44/60					**Sandstone**, 7.5 YR 5/6 (Strong Brown), wet, fine sand. **Sandy Claystone to Clayey Sandstone**, mottled 7.5 YR 8/1 (White) to 7.5 YR 5/8 (Strong Brown), wet, fine to medium sand.				
50	370	15	10	30/60					**Conglomerate Bed** **Sandy Claystone to Clayey Sandstone**, mottled 7.5 YR 4/1 (Dark Gray) and 7.5 YR 5/8 (Strong Brown), wet, mostly fine sand.				
55	365	16	11	30/60					-Sand lense with carbonate infilled fracture				

GDC_ROCK_CORE_ENG LA-1183 CORE LOGS.GPJ ROCK2.GDT 2/13/15

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THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE c

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-2**
SITE LOCATION	**DATE(S) DRILLED** 1/30/14	**LOGGED BY** TO	**SHEET NO.** 4 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 421	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	360								Total Depth: 60 Ft Groundwater: Encountered at 27 Ft Boring backfilled with tamped cuttigns and asphalt patched.				
65	355												
70	350												
75	345												

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FIGURE d

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183	**BORING** **B-3**
SITE LOCATION	**DATE(S) DRILLED** 1/30/14	**LOGGED BY** TO	**SHEET NO.** 1 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420.5	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	ROCK CORE: BOX NO.	ROCK CORE: RECOVERY, %	ROCK CORE: FRAC. FREQ.	ROCK CORE: R.Q.D., %	ROCK CORE: FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	420								**Asphalt**				
									Artificial Fill (Qaf) **Silty SAND**, 7.5 YR (Strong Brown), moist, mostly medium to coarse sand, some fine sand, few fine gravel, trace cobbles.				
5	415	1	1	32/30					**Older Alluvium (Qoal)**				
		2		19/30					**Silty SAND**, 7.5 YR 5/8 (Strong Brown), moist, mostly fine sand. **Clayey SAND**, 7.5 YR 5/8 (Strong Brown), moist, mostly fine sand, trace fine gravel.				
10	410	3	2	19/30									
		4		29/30					-Few medium sand and trace coarse sand				
15	405	5	3	21/30					**Sandy Clay**, mottled 7.5 YR 6/8 (Reddish yellow) to 7.5 YR 7/1 (Light Gray), moist, fine sand, oxide staining, polished surface along bedding, very weathered.				
		6		30/30					-Carbonate infilled fractures				

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-3**
SITE LOCATION	**DATE(S) DRILLED** 1/30/14	**LOGGED BY** TO	**SHEET NO.** 2 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420.5	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	400	7	4	29/30					-Coarsening sand, carbonate infilling fractures				
		8		22/30					**Modelo Formation (Tm)**				
25	395	9	5	30/30					**Sandstone**, mottled 7.5 YR 8/2 (Pinkish White) and 7.5 YR 6/8 (Reddish Yellow), moist to wet, mostly fine to medium sand.				
		10		25/30					**Clayey Sandstone**, mottled 7.5 YR 5/6 (Strong Brown) with 7.5 YR 7/1 (Light Gray), moist to wet, mostly fine sand with some medium sand, trace black oxide staining.				
30	390	11	6	29/30					**Sandstone** mottled 7.5 YR 5/6 (Strong Brown) and 7.5 YR 7.1 (Light Gray), wet, mostly fine to medium sand, few fine to coarse gravel, trace cobbles, trace black peat.				
									Clayey Sandstone, 7.5 YR 5/8 (Strong Brown), wet, mostly fine to medium sand with a minor gravel and cobble layer and lamination of sandstone.				
		12		30/30					**Clayey Sandstone**, mottled 7.5 YR 5/8 (Strong Brown) and 7.5 YR 8/1 (Gray), wet, mostly fine to medium sand, abundant carbonate infilling.				
35	385	13	7	29/30					-Sandstone Layer				
		14		30/30					**Clayey Sandstone to Sandy Claystone**, mottled 7.5 YR 5/8 (Strong Brown) and 7.5 YR 7/1 (Light Gray), wet, mostly fine to medium sandstone, carbonate infilling of fractures.				

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-3**
SITE LOCATION	**DATE(S) DRILLED** 1/30/14	**LOGGED BY** TO	**SHEET NO.** 3 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420.5	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	380	15	8	12/30					-Well cemented zone				
		16		22/30									
45	375	17	9	54/60									
50	370	18	10	59/60									
55	365	19	11	60/60					-Gravel and Cobble Layer				

GDC_ROCK_CORE_ENG LA-1183 CORE LOGS.GPJ ROCK2.GDT 2/13/15

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FIGURE c

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-3**
SITE LOCATION	**DATE(S) DRILLED** 1/30/14	**LOGGED BY** TO	**SHEET NO.** 4 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420.5	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	360								Total Depth: 60 Ft Groundwater: Encountered at 28 Ft Boring backfilled with tamped cuttings and asphalt patched.				
65	355												
70	350												
75	345												

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FIGURE d

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-4**
SITE LOCATION	**DATE(S) DRILLED** 1/29/14	**LOGGED BY** TO	**SHEET NO.** 1 of 2
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 36
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Asphalt				
									Artificial FIll (Qaf)				
									Silty SAND, 7.5 YR 5/8 (Strong Brown), moist, fine to medium sand, little fine gravel, trace cobbles.				
5	415	1	1	21/30					**Clayey SAND**7.5 YR 4/6 (Strong Brown), moist, medium to coarse sand, some fine sand, few fine to coarse gravel, trace cobbles.				
		2		27/30									
10	410	3	2	27/30					**Older Alluvium (Qoal)**				
									Clayey SAND, 7.5 YR 5/8 (Strong Brown), moist, fine to medium sand, little coarse sand, some fine gravel, trace cobbles.				
									Silty SAND, 7.5 YR 5/8 (Strong Brown), moist, medium to coarse sand, some fine sand, trace fine gravel.				
		4		6/30					**Clayey SAND**, 7.5 YR 5/8 (Strong Brown), moist, medium to coarse sand, some fine sand, trace fine gravel.				
15	405	5	3	0/30					-No recovery				
		6		0/30									
	400												

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-4**
SITE LOCATION	**DATE(S) DRILLED** 1/29/14	**LOGGED BY** TO	**SHEET NO.** 2 of 2
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 36
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		7	4	30/30					**Sandy CLAY**, mottled 7.5 YR 4/6 (Strong Brown) and 7.5 YR 6/1 (Gray), moist, fine to medium sand, trace coarse sand, trace cobbles.				
		8		30/30									
25	395	9	5	30/30									
		10		30/30									
30	390	11	6	60/60					-Thin layer of Sandstone, wet, medium to coarse sand				
35	385	12	7	12/12					-Very hard drilling Total Depth: Refusal at 36 ft Groundwater: Encountered at 31 Ft Boring backfilled with tamped cuttings and concrete patched.				
	380												

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-4A**
SITE LOCATION	**DATE(S) DRILLED** 1/31/14	**LOGGED BY** TO	**SHEET NO.** 1 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	ROCK CORE: BOX NO.	ROCK CORE: RECOVERY, %	ROCK CORE: FRAC. FREQ.	ROCK CORE: R.Q.D., %	ROCK CORE: FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Asphalt				
									Artificial Fill (Qaf)				
									Silty SAND, 7.5 YR 5/8 (Strong Brown), moist, mostly fine to medium sand, little fine gravel, trace cobbles.				
5	415		1						**Older Alluvium (Qoal)**				
									Clayey SAND7.5 YR 4/6 (Strong Brown), moist, mostly medium to coarse sand, some fine sand, few fine to coarse gravel, trace cobbles.				
10	410	1	2	19/30					**Clayey SAND**, 7.5 YR 5/8 (Strong Brown), moist, mostly fine to medium sand, few coarse sand, trace fine gravel, trace cobbles.				
		2		0/30									
15	405	3	3	30/30					-Becomes 7.5 YR 4/4 (Reddish Brown)				
		4		30/30					**Clayey Sand to Sandy Clays** mottled 7.5 YR 5/8 (Strong Brown) and 7.5 YR 7/1 (Light Gray), moist, mostly fine grained sand, few medium to coarse sand, trace fine gravel, some silt.				
	400												

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-4A**
SITE LOCATION	**DATE(S) DRILLED** 1/31/14	**LOGGED BY** TO	**SHEET NO.** 2 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		5	4	30/30									
		6		30/30					-5 YR 4/4 (Reddish Brown) and 5 YR 6/1 (Gray), with white carbonate infilling.				
25	395		5										
									Ground Water @ 31 ft.				
30	390		6										
									-Mottled 10 YR 6/6 (Brownish Yellow) and 10 YR 7/1 (Light Gray), abundant carbonate infilling				
35	385		7						**Modelo Formation (TM)** **Sandstone, Siltstone, Claystone** 10YR 6/1 (Strong brown) to 7.5YR 7/1 (light gray), thinly bedded, some oxidation.				
	380												

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-4A**
SITE LOCATION	**DATE(S) DRILLED** 1/31/14	**LOGGED BY** TO	**SHEET NO.** 3 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		7	8	60/60									
45	375	8	9	57/60									
50	370	9	10	59/60									
55	365	10	11	53/60									
	360												

GDC_ROCK_CORE_ENG LA-1183 CORE LOGS.GPJ ROCK2.GDT 2/13/15

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FIGURE c

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-4A**
SITE LOCATION	**DATE(S) DRILLED** 1/31/14	**LOGGED BY** TO	**SHEET NO.** 4 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 420	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
65	355								Total Depth: 60 Ft Groundwater: Encountered at 31 Ft Boring backfilled with tamped cuttings and asphalt patched.				
70	350												
75	345												
	340												

GDC_ROCK_CORE_ENG LA-1183 CORE LOGS.GPJ ROCK2.GDT 2/13/15

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FIGURE d

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-5**
SITE LOCATION	**DATE(S) DRILLED** 1/29/14	**LOGGED BY** TO	**SHEET NO.** 1 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 421	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	420								**Asphalt**				
									Artificial Fill (Qaf)				
									SIlty SAND, 7.5 YR 4/3 (Brown), moist, mostly fine sand, few medium sand, some fine to coarse gravel, trace cobbles.				
5		1	1	30/30					**Older Alluvium (Qoal)**				
	415								**Clayey SAND**, 7.5 YR 4/6 (Strong Brown), moist, mostly fine to medium sand, some coarse sand, some fine gravel.				
		2		28/30									
10		3	2	29/30									
	410								**Sandy SILT**, mottled 10 YR 7/3 (Pale Brown), and 7.5 YR 5/8 (Strong Brown), moist, mostly fine sand, trace fine gravel.				
		4		25/30									
									Clayey SAND, 7.5 YR 4/6 (Strong Brown), moist, mostly fine to medium sand, some cobbles and gravel.				
15		5	3	26/30									
	405								**SAND**, 7.5 YR 5/8 (Strong Brown), moist, mostly medium to coarse sand, few fine gravel, trace cobbles.				
		6		21/30					**Silty SAND**, 7.5 YR 4/6 (Yellowish Brown), moist, mostly fine sand, trace fine gravel.				

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-5**
SITE LOCATION	**DATE(S) DRILLED** 1/29/14	**LOGGED BY** TO	**SHEET NO.** 2 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 421	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	400	7	4	28/30									
		8		28/30									
25	395	9	5	22/30									
		10		30/30									
30	390	11	6	60/60									
35	385	12	7	60/60					**Buried Paleosol**, Mottled 5YR 3/3 (Dark Reddish Brown) to 5YR 6/1 (Gray).				

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** **B-5**
SITE LOCATION	**DATE(S) DRILLED** 1/29/14	**LOGGED BY** TO	**SHEET NO.** 3 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 421	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	380	13	8	47/60									
45									**Clayey Sand**, 5 YR 5/6 (Yellowish Brown), moist, mostly fine to medium sand, few coarse sand, trace fine gravel. Ground water @ 45 ft.				
	375	14	9	30/30					-Mottled 5YR 5/6 (Yellowish Brown) to 5YR 6/1 (Gray)				
50		15	10	22/30					**Sand**, 7.5 YR 6/2 (Strong Brown), wet, mostly medium to coarse sand, some fine sand, few fine gravel.				
	370								**Clayey Sand**, 5YR 4/4 (Reddish Brown) mottled with 7.5YR 6/2 (Pinkish Gray), wet, mostly fine to medium sand, trace coarse sand, trace fine gravel.				
									Clayey Sand, 5YR 4/4 (Reddish Brown), wet, mostly fine sand, few medium sand.				
55		16	11	50/60					**Sand** 5YR 5/6 (Yellowish Brown), wet, mostly medium to coarse sand, some fine sand, few fine gravel.				
	365								**Modelo Formation (Tm)**				
									Sandy Claystone 5YR 4/4 (Reddish Brown), wet, mostly fine sand, some fines.				

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FIGURE c

LOG OF CORE BORING

PROJECT NAME Yucca & Agryle Fault Investigation	**PROJECT NUMBER** LA-1183		**BORING** B-5
SITE LOCATION	**DATE(S) DRILLED** 1/29/14	**LOGGED BY** TO	**SHEET NO.** 4 of 4
DRILLING METHOD Hollow Stem Auger	**DRILL BIT SIZE/TYPE** 6"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 60
DRILL RIG TYPE Marl M12	**DRILLED BY** Gregg In-Situ Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 421	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	360								Total Depth: 60 Ft Groundwater: Encountered at 45 Ft Boring backfilled with tamped cuttings and asphalt patched.				
65	355												
70	350												
75	345												

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FIGURE d

LOG OF CORE BORING

PROJECT NAME Champion Supplemental Fault Trench Borings	**PROJECT NUMBER** LA1183C	**BORING** **B-6**	
SITE LOCATION	**DATE(S) DRILLED** 10/1/2014	**LOGGED BY** K.Neill	**SHEET NO.** 1 of 2
DRILLING METHOD HSA	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY**	**TOTAL DEPTH DRILLED (feet)** 25
DRILL RIG TYPE CME 75	**DRILLED BY** ABC Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 432	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Concrete approximatly 6 in thick				
	430								**Artificial Fill (Qaf)** **SAND with SILT** 7.5YR 4/4 Brown, moist, mostly medium to fine SAND, some coarse to fine GRAVEL, trace micas and FE oxides.				
		1	1	24/24					**OLDER ALLUVIUM (Qoal (u))** **SAND with SILT** 7.5YR 5/6 Strong Brown, moist, mostly mostly fine SAND, few medium SAND, trace coarse SAND and fine GRAVELS.				
5		2		30/30									
	425								**SAND** 10YR 4/6 Strong Brown, moist, mostly medium to fine SAND, interbedded clay lenses at 7.5ft.				
		3		30/30					-interbedded clay lenses **OLDER ALLUVIUM (Qoal (l))** **SAND with SILT** 7.5YR 4/4 Brown, moist, mostly fine SAND few medium SAND, trace coarse SAND, section fining with depth.				
10		4	2	30/30					**SAND with CLAY** 7.5 4/6 Strong Brown, moist, mostly fine to medium SAND, few coarse SAND, trace coarse to fine GRAVELS, interbedded clay lenses.				
	420								-Gravel Lense **SAND** 7.5YR 4/6 Strong Brown, moist, mostly fine to medium SAND, some coarse SAND, few fine GRAVELS, massive bedded, micacous.				
		5		30/30									
15		6	3	30/30					**SAND with CLAY** 7.5YR 4/6 Strong Brown, moist, mostly fine SAND, few medium SAND, trace coarse SAND and fine GRAVELS and COBBLES.				
	415												
		7		34/30					-Higher CLAY content, no GRAVELS or COBBLES. **Silty SAND** 7.5YR 4/4 Brown, moist, mostly fine SAND, interbedded clay lenses, gleying.				

GDC_ROCK_CORE_ENG LA1183C CHAMPION SUPPLEMENTAL BORINGS B-6_B-8.GPJ ROCK2.GDT 2/13/15

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Champion Supplemental Fault Trench Borings	**PROJECT NUMBER** LA1183C	**BORING** **B-6**	
SITE LOCATION	**DATE(S) DRILLED** 10/1/2014	**LOGGED BY** K.Neill	**SHEET NO.** 2 of 2
DRILLING METHOD HSA	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY**	**TOTAL DEPTH DRILLED (feet)** 25
DRILL RIG TYPE CME 75	**DRILLED BY** ABC Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 432	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		8	4	32/30					**SAND with Clay** 7.5YR 4/4 Strong Brown, moist. mostly medium to fine SAND, clay nodules.				
	410								**Silty SAND** 7.5YR 5/6 Strong Brown, moist, mostly fine to medium SAND, few coarse SAND, trace fine to coarse GRAVELS.				
		9		30/30									
25		10		31/30					Total Depth: 25 Ft Groundwater: No encountered Boring backfilled with tamped cuttings and concrete patch.				
	405												
30													
	400												
35													
	395												

GDC_ROCK_CORE_ENG LA1183C CHAMPION SUPPLEMENTAL BORINGS B-6_B-8.GPJ ROCK2.GDT 2/13/15

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Champion Supplemental Fault Trench Borings	**PROJECT NUMBER** LA1183C	**BORING** B-7	
SITE LOCATION	**DATE(S) DRILLED** 10/2/2014	**LOGGED BY** K.Neill	**SHEET NO.** 1 of 2
DRILLING METHOD HSA	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY**	**TOTAL DEPTH DRILLED (feet)** 25
DRILL RIG TYPE CME 75	**DRILLED BY** ABC Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 431	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Concrete approximately 6 in thick				
	430								**Artificial Fill (Qaf)** **Clayey SAND** 7.5YR 3/2 Dark Brown, moist, mostly fine SAND, some medium SAND, trace fine GRAVEL.				
									Sand (Qs) **Clayey Silty SAND** 7.5YR 4/6 Strong Brown, moist, mostly fine SAND, few medium SAND, trace coarse SAND.				
5		1	1	26/24					**SAND with CLAY** 7.5YR 4/4 Strong Brown, moist, mostly fine to medium SAND, few coarse SAND, soil development.				
	425	2		30/30					**Sitly SAND** 7.5YR 4/4 Brown, moist, mostly medium to fine SAND, some coarse SAND and GRAVEL. Massive, finnning down section to SANDS.				
		3		30/30									
10		4	2	30/30									
	420								**Silty SAND** 7.5YR 4/6 Strong Brown, moist, mostly fine SAND, few medium SAND, trace coarse SAND.				
		5		30/30					**SAND with SILT** 5YR 4/4 Reddish Brown, moist, loose, mostly fine to medium SAND, sub rounded to rounded grains, minor bedding structure, micas.				
15		6	3	30/30					**SAND with SILT** 7.5YR 4/6 Strong Brown, moist mostly fine SAND, few medium SAND, trace fine GRAVELS, massive, micacous.				
	415								**Silty SAND** 7.5YR Reddish Brown, mostly fine SAND, few fine GRAVELS and medium SAND, massive bedded, micas.				
		7		30/30					**SAND** 7.5YR 4/5 Strong Brown, moist, mostly medium SAND, some coarse to fine SAND, micacous.				

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Champion Supplemental Fault Trench Borings	**PROJECT NUMBER** LA1183C	**BORING** B-7	
SITE LOCATION	**DATE(S) DRILLED** 10/2/2014	**LOGGED BY** K.Neill	**SHEET NO.** 2 of 2
DRILLING METHOD HSA	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY**	**TOTAL DEPTH DRILLED (feet)** 25
DRILL RIG TYPE CME 75	**DRILLED BY** ABC Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 431	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	410	8	4	30/30					**GRAVELS** Coarse to fine GRAVEL, sub angular to angular. **OLDER ALLUVIUM (Qoal(u))** **Clayey SAND**, 7.5YR 5/6 Strong Brown, moist, mostly fine SAND, some medium to coarse SAND, few fine GRAVEL, grussification, micas, interbedded black clay laminations.				
		9		30/30									
25	405	10		30/30					Total Depth: 25 Ft Groundwater: No encountered Boring backfilled with tamped cuttings and concrete patch.				
30	400												
35	395												

GDC_ROCK_CORE_ENG LA1183C CHAMPION SUPPLEMENTAL BORINGS B-6_B-8.GPJ ROCK2.GDT 2/13/15

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Champion Supplemental Fault Trench Borings	**PROJECT NUMBER** LA1183C	**BORING** **B-8**	
SITE LOCATION	**DATE(S) DRILLED** 10/2/2014	**LOGGED BY** K.Neill	**SHEET NO.** 1 of 2
DRILLING METHOD HSA	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY**	**TOTAL DEPTH DRILLED (feet)** 25
DRILL RIG TYPE CME 75	**DRILLED BY** ABC Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 424	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Concrete approximatly 6 in thick				
									Artificial Fill (Qaf) **Clayey SAND** 7.5YR 4/6 Strong Brown, moist, mostly medium to fine SAND, few fine GRAVEL.				
	420								**Sand (Qs)** **Clayey SAND** 7.5YR 5/6 Strong Brown, moist. mostly fine to medium SAND, few coarse SAND, micacous, roots.				
5		1	1	24/30					**Sand with CLAY** 7.5YR 4/4 Brown, moist, mostly fine SAND, trace medium SAND.				
		2		24/30									
	415								**GRAVEL** mostly coarse GRAVEL, few fine GRAVEL, Grussification of granite clasts.				
10		3	2	30/30									
		4		30/30					**Silty SAND** 7.5YR 4/4 Brown, moist, fine to medium SAND, few coarse SAND, trace fine GRAVEL, interbedded CLAY lenses.				
	410												
15		5	3	28/30					**Silty SAND** 10YR 5/6 Yellowish Brown, moist mostly fine SAND and trace medium SAND.				
		6		26/30					**Clayey, Silty, SAND** 7.5YR 4/6 Strong Brown, moist, mostly fine to medium SAND, trace coarse SAND. Large quartzite clasts, gleying in soild maxtrix.				
	405												

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Champion Supplemental Fault Trench Borings	**PROJECT NUMBER** LA1183C	**BORING** **B-8**	
SITE LOCATION	**DATE(S) DRILLED** 10/2/2014	**LOGGED BY** K.Neill	**SHEET NO.** 2 of 2
DRILLING METHOD HSA	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY**	**TOTAL DEPTH DRILLED (feet)** 25
DRILL RIG TYPE CME 75	**DRILLED BY** ABC Drilling	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 424	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		7	4	24/30					**Silty SAND** 5YR 4/4 Reddish Brown, moist, medium dense, mostly medium to fine SAND, some coarse SAND, few large GRAVELS, interbedded at 21.0 with black clay lenses.				
									Clayed SAND 7.5YR 4/6 Strong Brown, moist, mostly fine SAND, interbedded black clay lenses.				
		8		27/30					**Silty SAND** 7.5YR 4/6 Strong Brown, moist, mostly medium to fine SAND, some coarse SAND, few large GRAVELS.				
	400												
25									Total Depth: 25 Ft Groundwater: No encountered Boring backfilled with tamped cuttings and concrete patch.				
	395												
30													
	390												
35													
	385												

GDC_ROCK_CORE_ENG LA1183C CHAMPION SUPPLEMENTAL BORINGS B-6_B-8.GPJ ROCK2.GDT 2/13/15

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Champion Site	**PROJECT NUMBER** LA1183D	**BORING** **BA-1**
SITE LOCATION	**DATE(S) DRILLED** 11/19/2014	**LOGGED BY** KN	**SHEET NO.** 1 of 2
DRILLING METHOD Bucket Auger	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 30
DRILL RIG TYPE Calweld 42 LS	**DRILLED BY** Tri-Valley	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 428	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Concrete, 3"				
									ARTIFICIAL FILL (Qaf)				
									Silty Clayey SAND 7.5YR 4/4 (dark brown); moist; mostly fine to medium sand; few fine to coarse gravel, subrounded to subangular clasts; micaceous; roots; white evaporate layer.				
	425								**ORGANIC HORIZON (Qor)**				
									OLDER ALLUVIUM (Qoal (u))				
5									**Poorly Graded Sand with Clay** 7.5YR 5/4 (Strong Brown); moist, mostly fine to medium sand; some coarse sand; some fines; micaceous.				
									Clayey Sand 7.5YR 5/6 (Strong Brown); moist; mostly fine to medium sand; few coarse sand; trace fine gravels; roots.				
									-2" gravel layer				
									- perched groundwater.				
	420								-Conglomerate lens above 8 ft contact.				
									Silty Sand 7.5YR 5/6 (Brown); moist; mostly medium to fine sand; few fine to coarse gravel lenses; micaceous,				
10									N55E, vertical erosion by sand, irregular surface; sub rounded to rounded clasts 1/8 to 1/4 in.				
									Silty Sand 7.5YR 5/8 (strong brown); moist; mostly fine to medium sand; few coarse sand; few fines; trace fine and coarse gravel.				
	415								- Interbeds of clayey sand and silty clay with some sand.				
									- 9" thick horizontal sand bed.				
									- Gravel 4" thick lens.				
15									Some fine and coarse gravel.				
									Clay layers in bucket auger cuttings ~ 1/8 in thick.				
									North side 1/4" root; offset bed; gray clayey bed; 6" carbonate nodules, well developed gleying.				
									- Fracture.				
	410								**OLDER ALLUVIUM (Qoal (l))**				
									Silty Clayey SAND 7.5YR 5/4 (brown); moist; mostly fine to medium sand, few coarse sand; clay films on gravel; clay lenses in cuttings.				

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Champion Site	**PROJECT NUMBER** LA1183D	**BORING** **BA-1**	
SITE LOCATION	**DATE(S) DRILLED** 11/19/2014	**LOGGED BY** KN	**SHEET NO.** 2 of 2
DRILLING METHOD Bucket Auger	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 30
DRILL RIG TYPE Calweld 42 LS	**DRILLED BY** Tri-Valley	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 428	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									- 2 feet of clay fractures, massive.				
	405								- Increase in medium sand. - Soil development.				
25									**Clayey Sand** 7.5YR 5/6 (strong brown); moist; mostly fine sand; some medium sand; clay lenses, 7.5YR 4/1 (dark gray); clay films on grains; soil development.				
	400												
30									Total Depth: 30 Feet bgs No groundwater				
	395												
35													
	390												

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Champion Site	**PROJECT NUMBER** LA1183D	**BORING** **BA-2**	
SITE LOCATION	**DATE(S) DRILLED** 11/19/2014	**LOGGED BY** KN	**SHEET NO.** 1 of 2
DRILLING METHOD Bucket Auger	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 36.5
DRILL RIG TYPE Calweld 42 LS	**DRILLED BY** Tri-Valley	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 428	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Concrete, 4".				
									ARTIFICIAL FILL (Qaf)				
									Lean Clay with Sand 7.5YR 5/4 (strong brown); moist; some fine to medium sand.				
	425												
5									- Cobble lense; hard drilling.				
									SAND (Qs)				
	420								**Silty Sand** 7.5YR 5/8 (strong brown); mostly medium to coarse sand; some fine sand; micaceous; massive. - Gravel lense; large cobble; horizontal bedding channel fill, interbedded with red sand lenses.				
									Clayey Sand 7.5YR 4/6 (strong brown); mostly medium to coarse sand; some fine sand; roots.				
10									- Horizontal bed fill, 2" gravel.				
									Silty Sand 7.5YR 4/6 (strong brown); moist; mostly fine to medium sand; some coarse sand; micaceous.				
	415												
15									**Poorly Graded Sand** 7.5 YR 6/8 (reddish yellow); moist; mostly medium sand; few coarse sand.				
									- Few gravels, subrounded to subangular. Angular horizontal sandy clay with krotovinas. Massive bedding to 20.5 feet. Increase in clayey sand lenses.				
	410												
									- Increase in gravels and cobbles on southwest side of boring.				

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Champion Site	**PROJECT NUMBER** LA1183D	**BORING** **BA-2**	
SITE LOCATION	**DATE(S) DRILLED** 11/19/2014	**LOGGED BY** KN	**SHEET NO.** 2 of 2
DRILLING METHOD Bucket Auger	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 36.5
DRILL RIG TYPE Calweld 42 LS	**DRILLED BY** Tri-Valley	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH None encountered		**APPROXIMATE PILE TOP ELEVATION (feet)** 428	
COMMENTS		**BOREHOLE BACKFILL**	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									-- Contact N56°E, 18°S.				
									OLDER ALLUVIUM (Qoal (u))				
									Silty Clayey Sand 7.5YR 4/4 (brown); moist; mostly fine to medium sand; few coarse sand; gleying in section.				
	405								**Clayey Sand** 7.5YR 4/3 (brown); moist; mostly fine sand; few medium to coarse sand.				
25									-Gleying interbed in section.				
	400												
30									- Gley lens interbedded on massive unit.				
	395												
35									- Perched groundwater.				
	390								Total Depth: 36.5 Feet bgs Groundwater at 36.5 feet bgs				

GDC_ROCK_CORE_ENG LA-1183D BUCKET AUGER BORINGS.GPJ ROCK2.GDT 2/13/15

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Champion Site	**PROJECT NUMBER** LA1183D	**BORING** **BA-3**	
SITE LOCATION Hollywood, CA	**DATE(S) DRILLED** 1/19/2015 to 1/20/2015	**LOGGED BY** KN	**SHEET NO.** 1 of 5
DRILLING METHOD Bucket Auger	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 44
DRILL RIG TYPE Calweld 42 LS	**DRILLED BY** Tri-Valley	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH Not Measured		**APPROXIMATE SURFACE ELEVATION (feet)** 430	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Concrete, 3"				
									Conducer Casing - Not logged in field to 30 inches below ground surface.				
									ARTIFICIAL FILL (Qaf)				
									Silty Clayey SAND 7.5YR 4/4 (dark brown); moist; mostly fine to medium sand; few fine to coarse gravel.				
									ORGANIC HORIZON (Qor)				
									OLD ALLUVIUM (Qoal (u))				
									Sandy Clay 7.5YR 5/6 (Strong Brown); mostly fine sand; few medium sand; trace coarse sand; trace fine to coarse gravels; moist; dense; roots; glaying,7.5YR black minor, vertical, massive; micaceous; subrounded clasts.				
									- soil development.				
5	425												
									- Interbeded sand lense, 10YR 5/6 (Yellowish Brown), sub-rounded clasts, krotovina. Soil development at 6 ft contact.				
									-**Clayey Sitly Sand** 7.5YR 6/6 (Reddish Yellow); moist; mostly fine sand; few medium sand; roots; trace fine gravel; magnesium oxide staining.				
									OLD ALLUVIUM (Qoal (l))				
									Buried paleosol, minor clay films along peds.				
									Sandy Clay 7.5YR 4/4 (Brown); moist; trace roots.				
									Fault is truncated by the over lying clayey Sand. -roots along fault surface				
									Silty Sand 10YR 5/6 (Yellowish Brown); moist; mostly fine sand; few medium sand; trace gravels.				
									Sand with Gravel 10YR 5/4 (Yellowish Brown); moist; mostly fine sand; few fine to coarse gravel, rounded to				

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FIGURE a

LOG OF CORE BORING

PROJECT NAME Champion Site	**PROJECT NUMBER** LA1183D	**BORING** **BA-3**	
SITE LOCATION Hollywood, CA	**DATE(S) DRILLED** 1/19/2015 to 1/20/2015	**LOGGED BY** KN	**SHEET NO.** 2 of 5
DRILLING METHOD Bucket Auger	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 44
DRILL RIG TYPE Calweld 42 LS	**DRILLED BY** Tri-Valley	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH Not Measured		**APPROXIMATE SURFACE ELEVATION (feet)** 430	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									subrounded clats; gravel lens at base. **Silty Sand** 7.5YR 5/6 (Strong Brown); moist; mostly fine sand; micaceous; roots; magnesium oxide staining. Coarse Sand lens off-set approximately 6-inches along fault. - 6" of Basal gravels and cobbles 1/8" - 6", subrounded to subangular, grussification. Fault = N76E, 74S **Silty Sand** 10YR 5/6 (Yellowish Brown); moist; mostly fine to medium sand; few coarse sand; trace fine gravel, roots along fracture. Laminated bedding ~1/8" - 1/4" thick, subrounded to rounded clasts. From 11 to 13 feet laminated Sand beds off set approximately 1.8 feet along the fault. Iron oxide staining within the sand beds. Fault appears to be a growth fault given the difference in off-set at 8 feet and at 11 feet. - Increase in coarse sand and gravel. - 10YR 5/6 (Yellow Brown); moist; mostly fine sand.				
15	415								**Silty Sand** unconformity; 7.5YR 4/4 (Brown); moist; mostly fine to medium sand; trace sand lenses with fine gravel; roots in sand lenses; magnesium oxide staining. **Silty Sand with Gravel** 10YR 6/6 (Brownish Yellow); moist; mostly medium sand; few fine to coarse sand; trace fine to coarse gravel; roots; micas; grussification; subrounded to rounded clasts; horizontal bedding 1/4" - 1/2" thick, 7.5 YR 5/5 (strong brown). **Silty Sand** 7.5YR 4/6 (Strong Brown); moist; mostly fine sand; trace course sand, fine gravel; fracture gleying. **Clayey Silty Sand** 7.5YR 4/6 (Strong Brown); moist; mostly fine sand; some medium sand; few coarse sand; trace gravel; massive; grussification clasts; roots along glaying, 7.5YR 2.5/1 (black); magnesium oxide staining, 7.5YR 6/2 (pinkish gray); increased sand along gleying zones; basalt and quartzite gravels. 16.8 ft- fine to coarse gravel along the base of the fault. From 17 to 19 feet: Fractures observed with gleying along fracture surface. - approximate attitude of fracture = N56°E 75°S 6-inch thick silty sand lens. Approximately 6 to 12 long				

GDC_ROCK_CORE_ENG_REV LA-1183D BUCKET AUGER BORINGS.GPJ ROCK2.GDT 2/13/15

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FIGURE b

LOG OF CORE BORING

PROJECT NAME Champion Site	**PROJECT NUMBER** LA1183D	**BORING** **BA-3**	
SITE LOCATION Hollywood, CA	**DATE(S) DRILLED** 1/19/2015 to 1/20/2015	**LOGGED BY** KN	**SHEET NO.** 3 of 5
DRILLING METHOD Bucket Auger	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 44
DRILL RIG TYPE Calweld 42 LS	**DRILLED BY** Tri-Valley	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH Not Measured		**APPROXIMATE SURFACE ELEVATION (feet)** 430	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									fractures below the base of silty sand lens with manganese oxide staining along fracture surface.				
									- Increase in clay content.				
									Silty Sand 7.5YR 5/6 (Strong Brown); moist; mostly fine to medium sand; few coarse sand, gravels; subrounded to rounded clasts; grussification; roots; Gleying 7.5YR 2.5/1 (black), 7.5YR 6/2 (pinkish gray); increase fine sand along gleying zones.				
									Silty Sand Lens - undulatory contact along the upper and lower surface. Coarse sand and fine to coarse gravel along the base fining upwards. Gleying along fracture surfaces which extend through the silty sand lens.				
25	405								**Clayey Silty Sand** 7.5YR 4/6 (Strong Brown); moist; mostly fine sand; few medium sand; trace coarse sand; fine gravel; gleying root zones; massive - Increase in gravel, subrounded to rounded; grussification; trace sand lenses. - Minor soil development; magnesium oxide zone; no gravel; massive unit - Increase in gleying zone.				

GDC_ROCK_CORE_ENG_REV LA-1183D BUCKET AUGER BORINGS.GPJ ROCK2.GDT 2/13/15

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FIGURE c

LOG OF CORE BORING

PROJECT NAME Champion Site	**PROJECT NUMBER** LA1183D	**BORING** **BA-3**	
SITE LOCATION Hollywood, CA	**DATE(S) DRILLED** 1/19/2015 to 1/20/2015	**LOGGED BY** KN	**SHEET NO.** 4 of 5
DRILLING METHOD Bucket Auger	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 44
DRILL RIG TYPE Calweld 42 LS	**DRILLED BY** Tri-Valley	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH Not Measured		**APPROXIMATE SURFACE ELEVATION (feet)** 430	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	ROCK CORE: BOX NO.	ROCK CORE: RECOVERY, %	ROCK CORE: FRAC. FREQ.	ROCK CORE: R.Q.D., %	ROCK CORE: FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Clayey Sand with Gravel 7.5YR 5/6 (Strong Brown); moist; mostly fine to medium sand; some coarse sand; few fine to coarse gravel; gleying zone.				
									No observed gleying to the bottom of boring.				
									Clayey Silty Sand 7.5YR 4/6 (Strong Brown); moist; mostly fine sand; few medium sand; trace coarse sand; and fine gravel; gleying root zones; massive				
35	395								Groundwater, no down-hole logging occured below this depth.				

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FIGURE d

LOG OF CORE BORING

PROJECT NAME Champion Site	**PROJECT NUMBER** LA1183D	**BORING** **BA-3**	
SITE LOCATION Hollywood, CA	**DATE(S) DRILLED** 1/19/2015 to 1/20/2015	**LOGGED BY** KN	**SHEET NO.** 5 of 5
DRILLING METHOD Bucket Auger	**DRILL BIT SIZE/TYPE** 8"	**CHECKED BY** SK	**TOTAL DEPTH DRILLED (feet)** 44
DRILL RIG TYPE Calweld 42 LS	**DRILLED BY** Tri-Valley	**INCLINATION FROM VERTICAL/BEARING** 0	
APPARENT GROUNDWATER DEPTH Not Measured		**APPROXIMATE SURFACE ELEVATION (feet)** 430	
COMMENTS		**BOREHOLE BACKFILL** Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE: RUN NO.	ROCK CORE: BOX NO.	ROCK CORE: RECOVERY, %	ROCK CORE: FRAC. FREQ.	ROCK CORE: R.Q.D., %	ROCK CORE: FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
45	385								Total Depth 44 Feet bgs Groudwater at 36 feet				

GDC_ROCK_CORE_ENG_REV LA-1183D BUCKET AUGER BORINGS.GPJ ROCK2.GDT 2/13/15

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FIGURE e

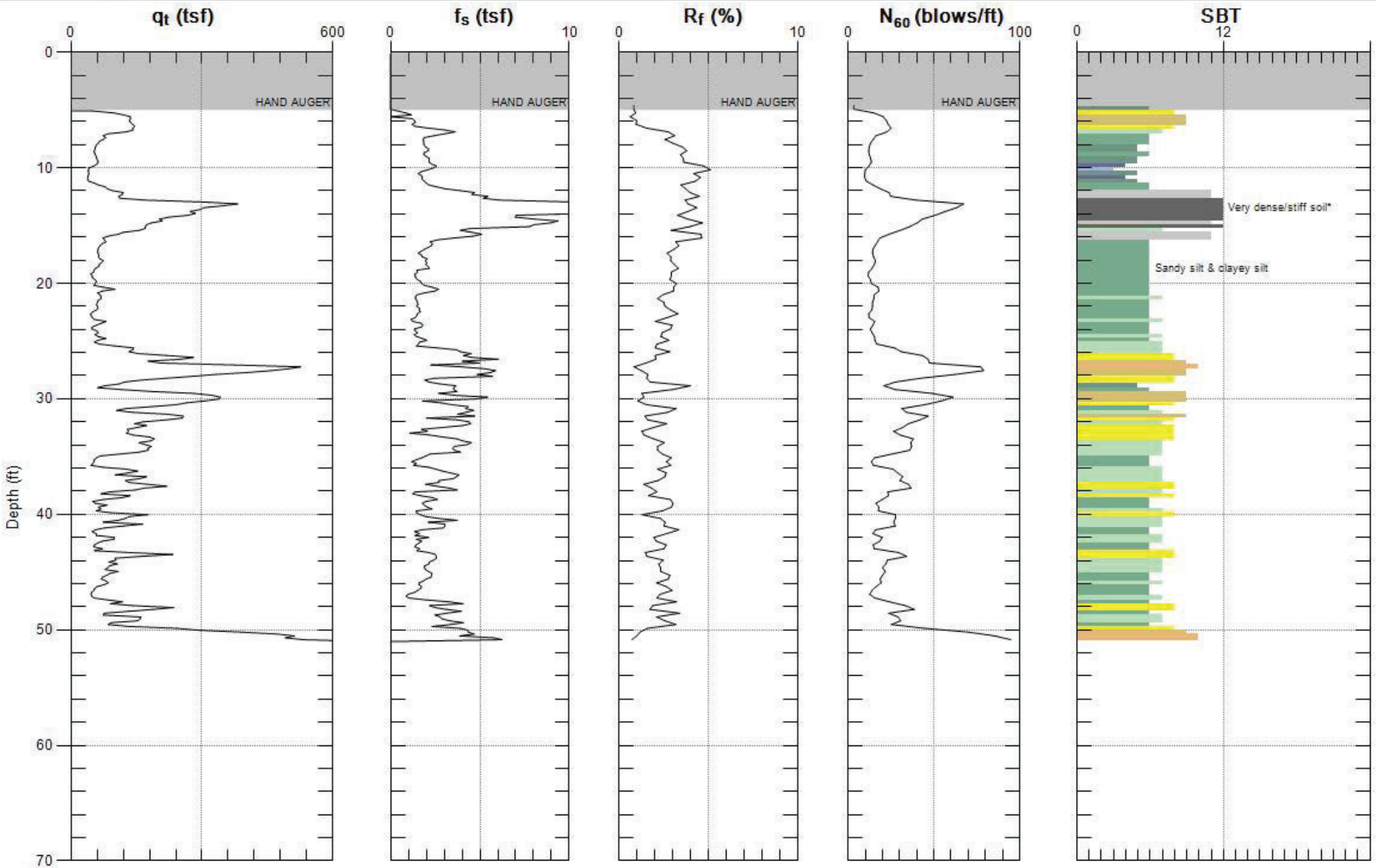
Figure A - 1

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-1

Engineer: S.KOLTHOFF
Date: 1/21/2014 07:17



Max. Depth: 51.181 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

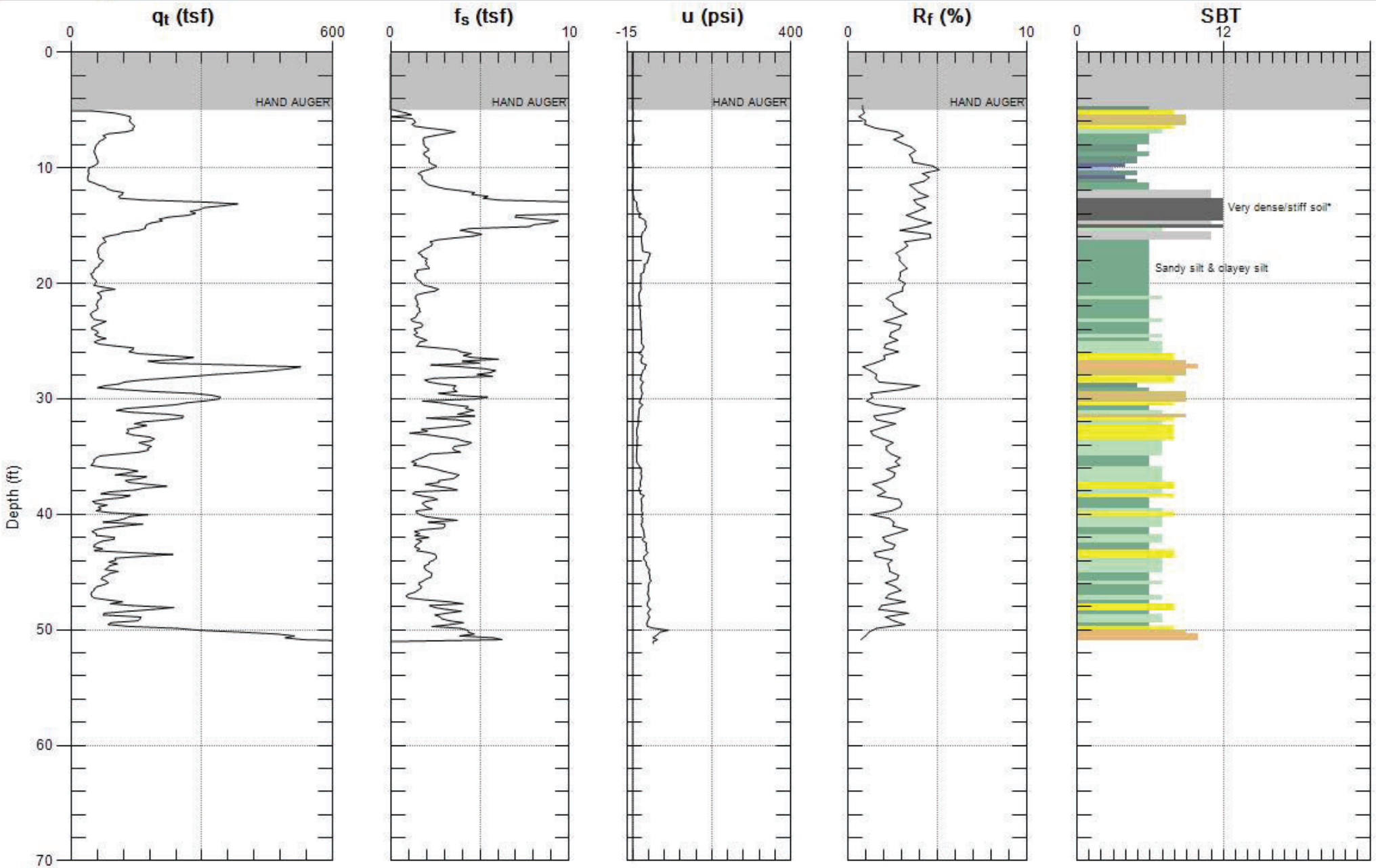
Figure A - 2

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-1

Engineer: S.KOLTHOFF
Date: 1/21/2014 07:17



Max. Depth: 51.181 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

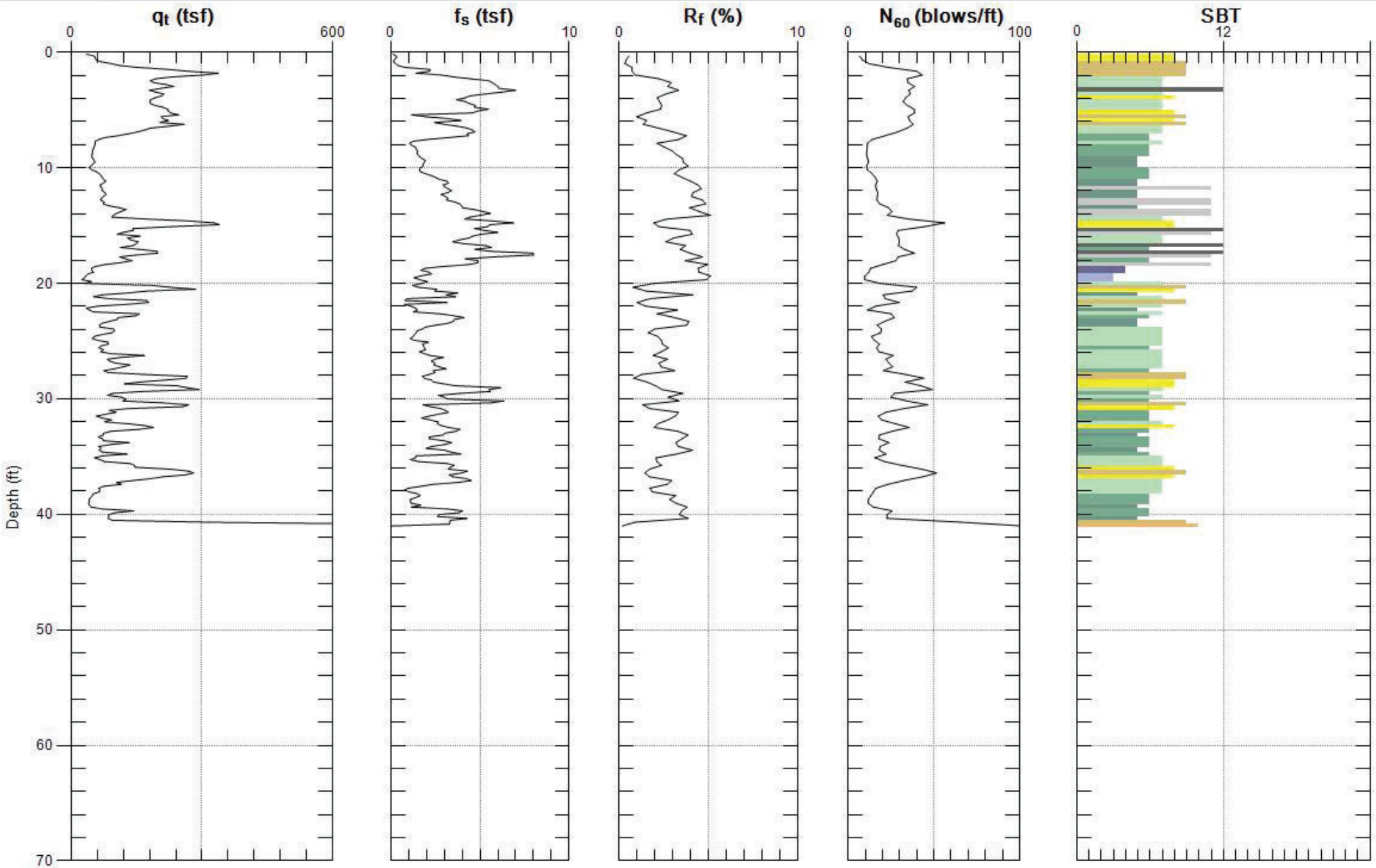
Figure A - 3

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-2

Engineer: S.KOLTHOFF
Date: 1/21/2014 08:52



Max. Depth: 41.175 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

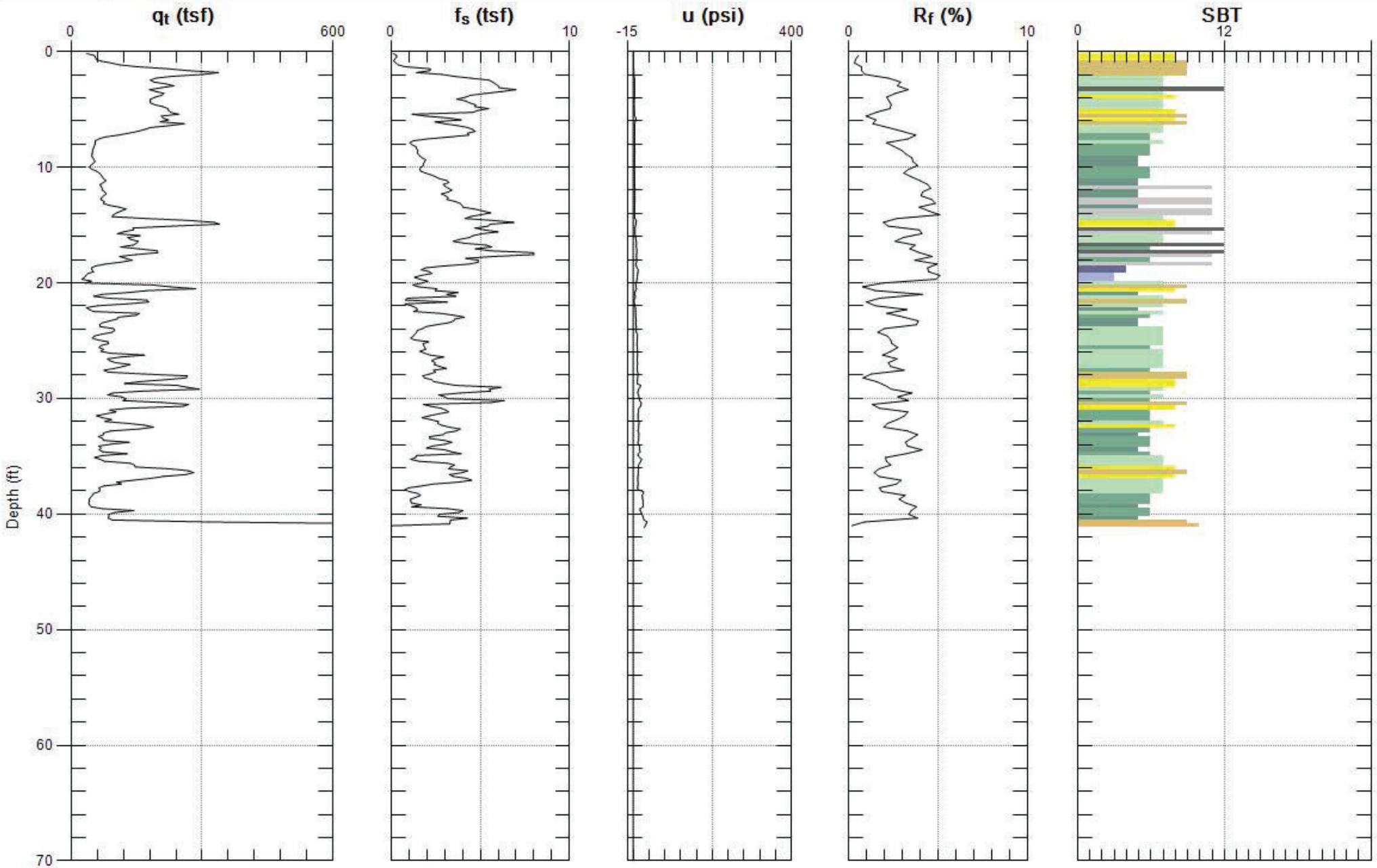
Figure A - 4

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-2

Engineer: S.KOLTHOFF
Date: 1/21/2014 08:52



Max. Depth: 41.175 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

Figure A - 5

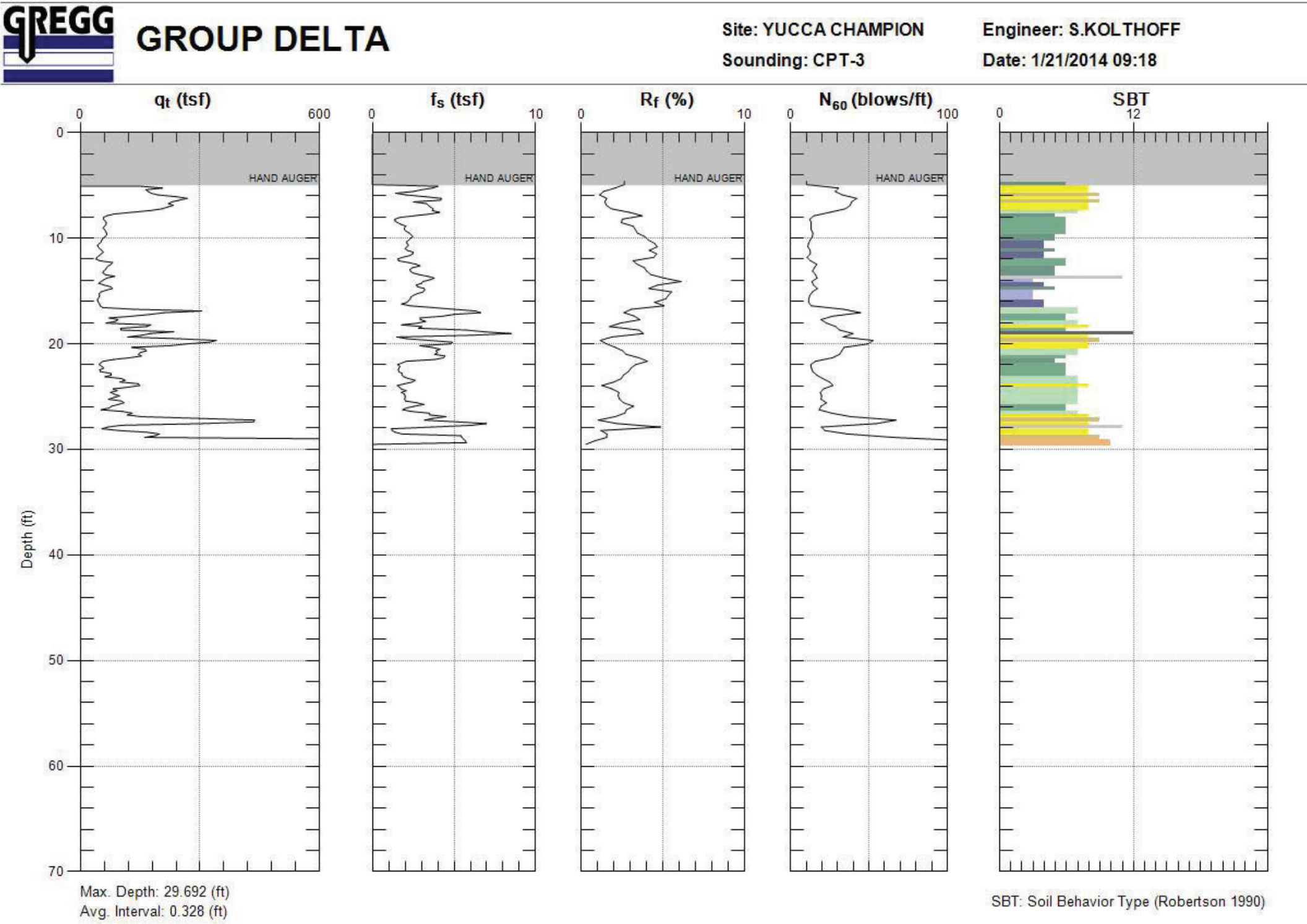
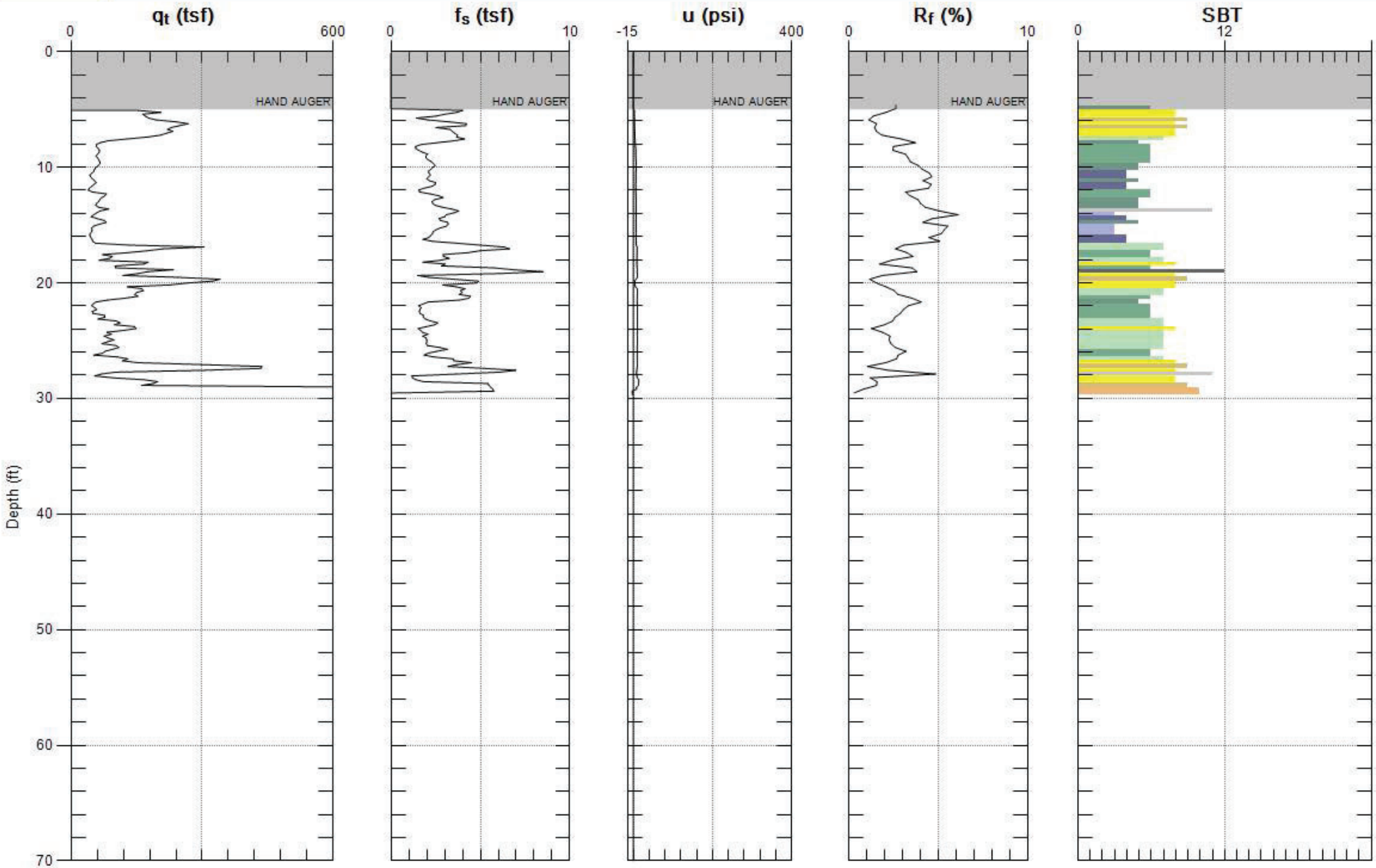

GREGG
GROUP DELTA
Site: YUCCA CHAMPION
Sounding: CPT-3
Engineer: S.KOLTHOFF
Date: 1/21/2014 09:18
q_t (tsf)
f_s (tsf)
R_f (%)
N_{60} (blows/ft)
SBT
HAND AUGER
Depth (ft)
Max. Depth: 29.692 (ft)
Avg. Interval: 0.328 (ft)
SBT: Soil Behavior Type (Robertson 1990)

Figure A - 6

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-3
Engineer: S.KOLTHOFF
Date: 1/21/2014 09:18



Max. Depth: 29.692 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

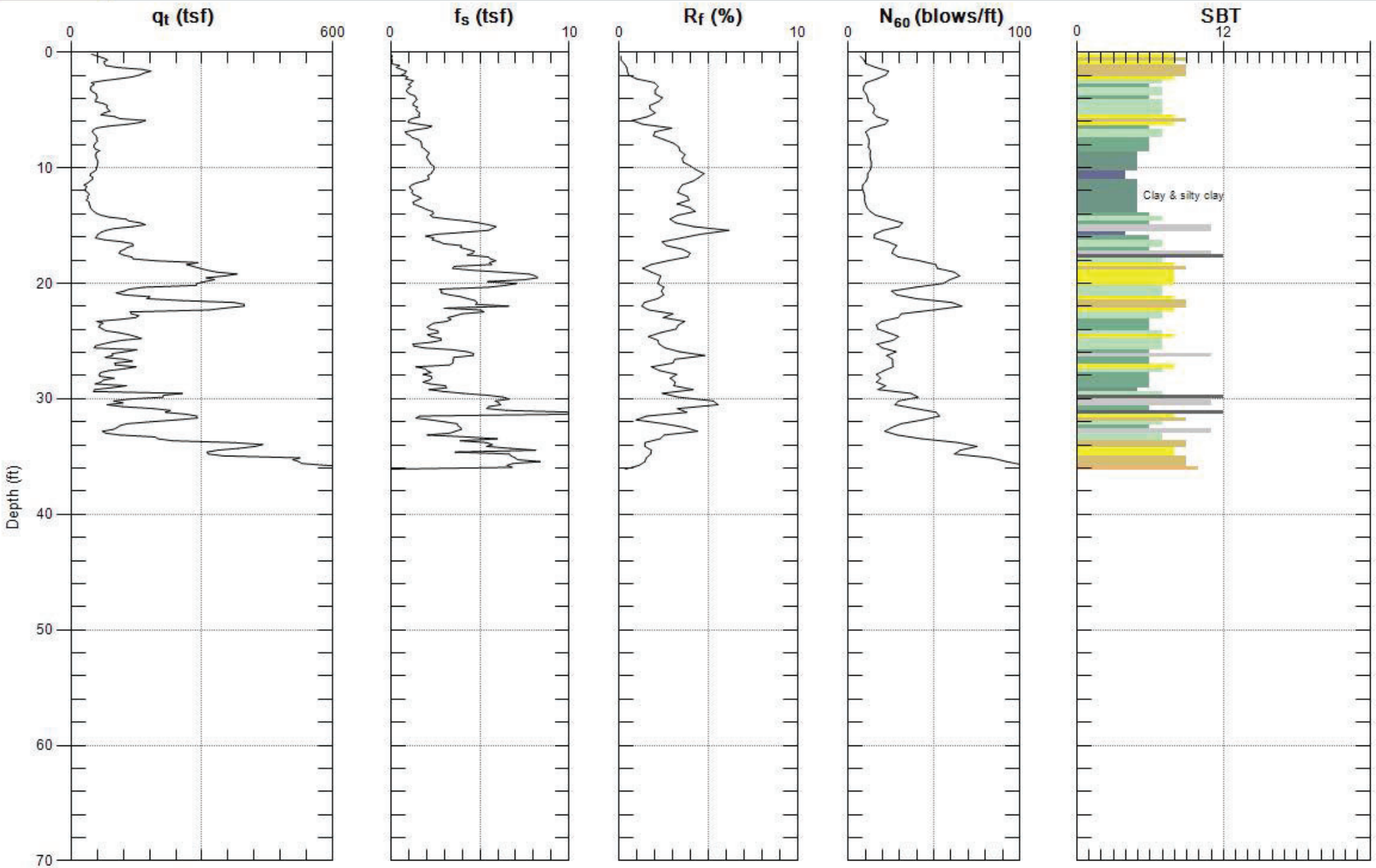
Figure A - 7

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-4

Engineer: S.KOLTHOFF
Date: 1/21/2014 10:02



Max. Depth: 36.253 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

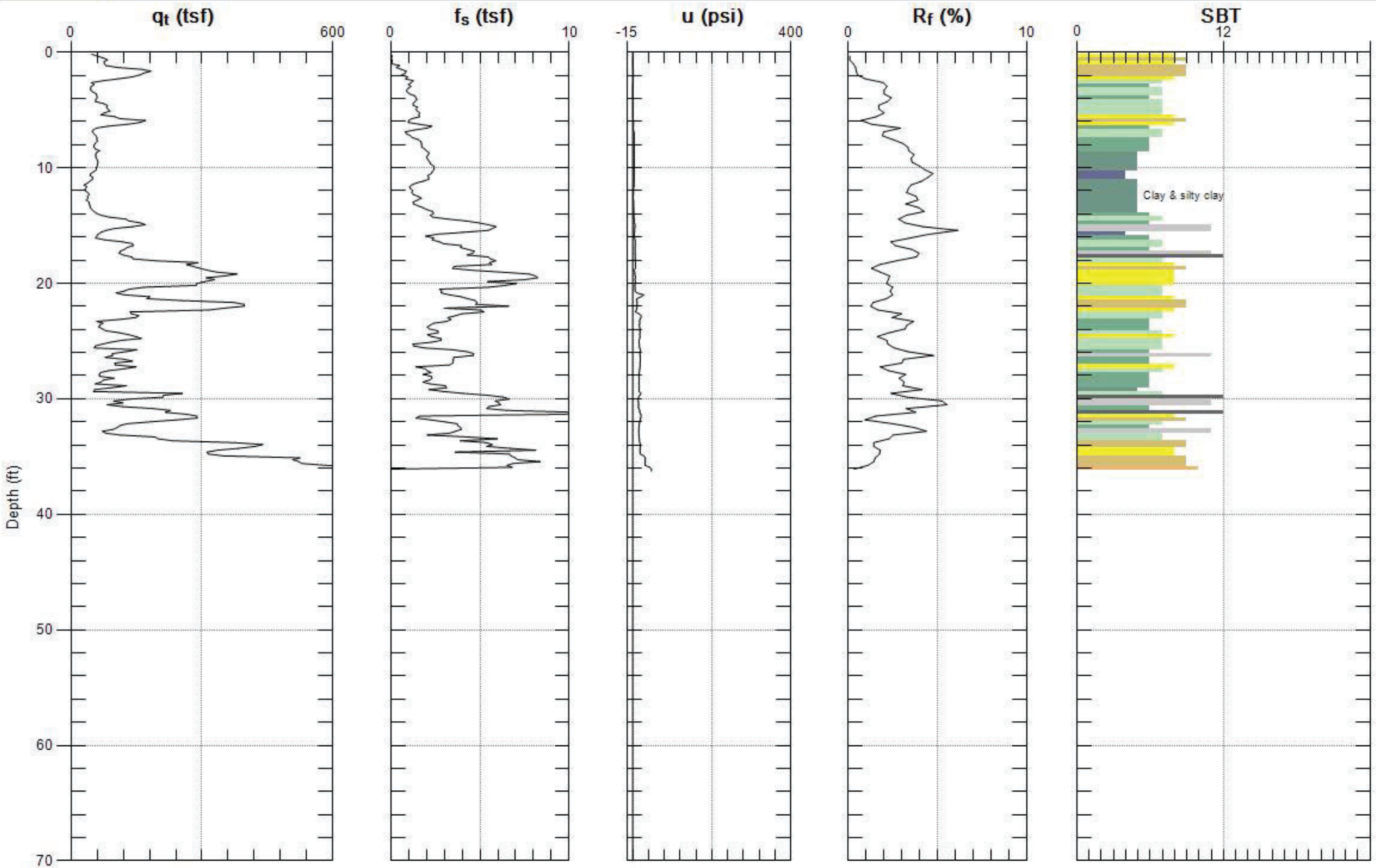
Figure A - 8

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-4

Engineer: S.KOLTHOFF
Date: 1/21/2014 10:02



Max. Depth: 36.253 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

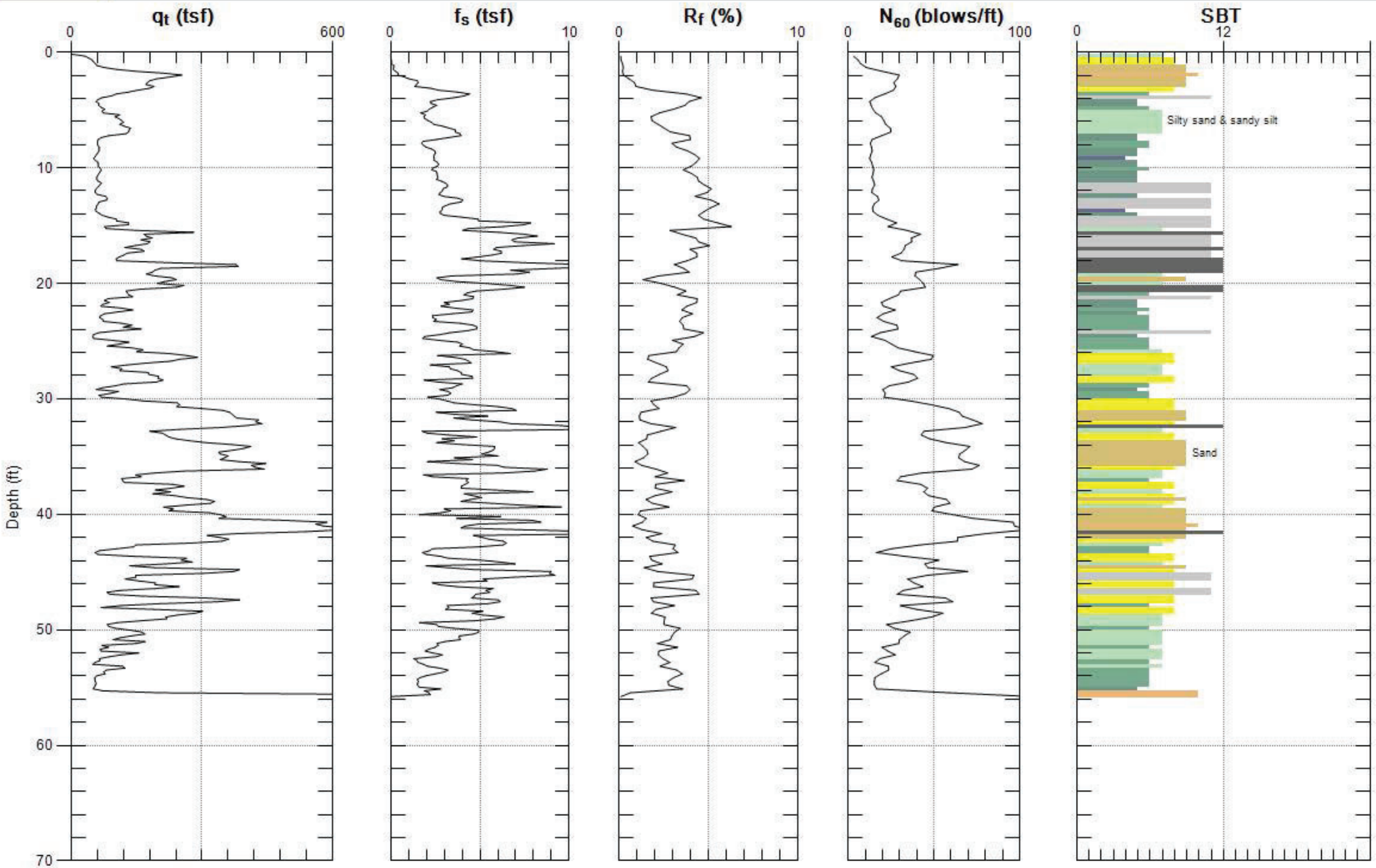
Figure A - 9

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-5

Engineer: S.KOLTHOFF
Date: 1/21/2014 10:27



Max. Depth: 55.938 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

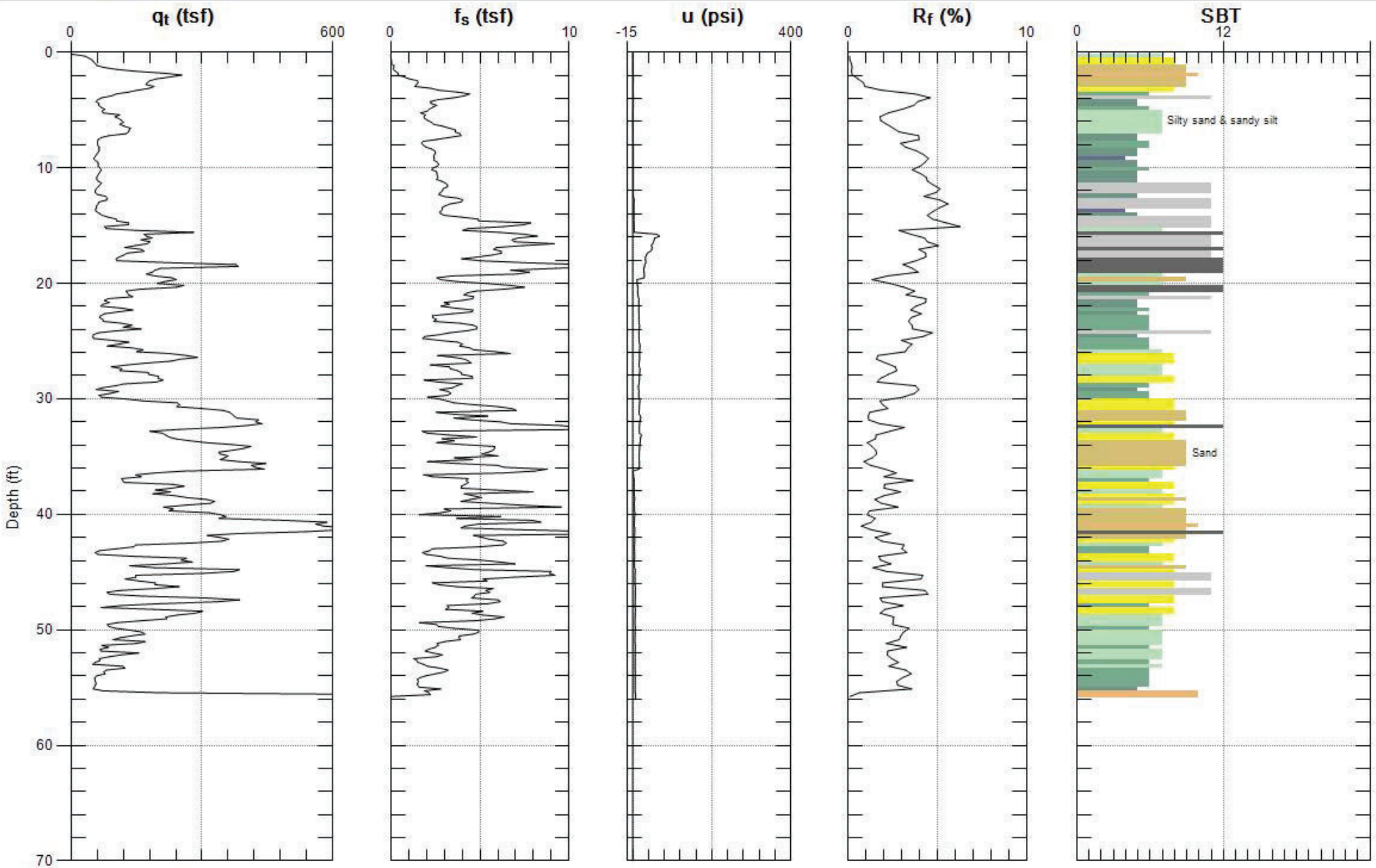
Figure A - 10

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-5

Engineer: S.KOLTHOFF
Date: 1/21/2014 10:27



Max. Depth: 55.938 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

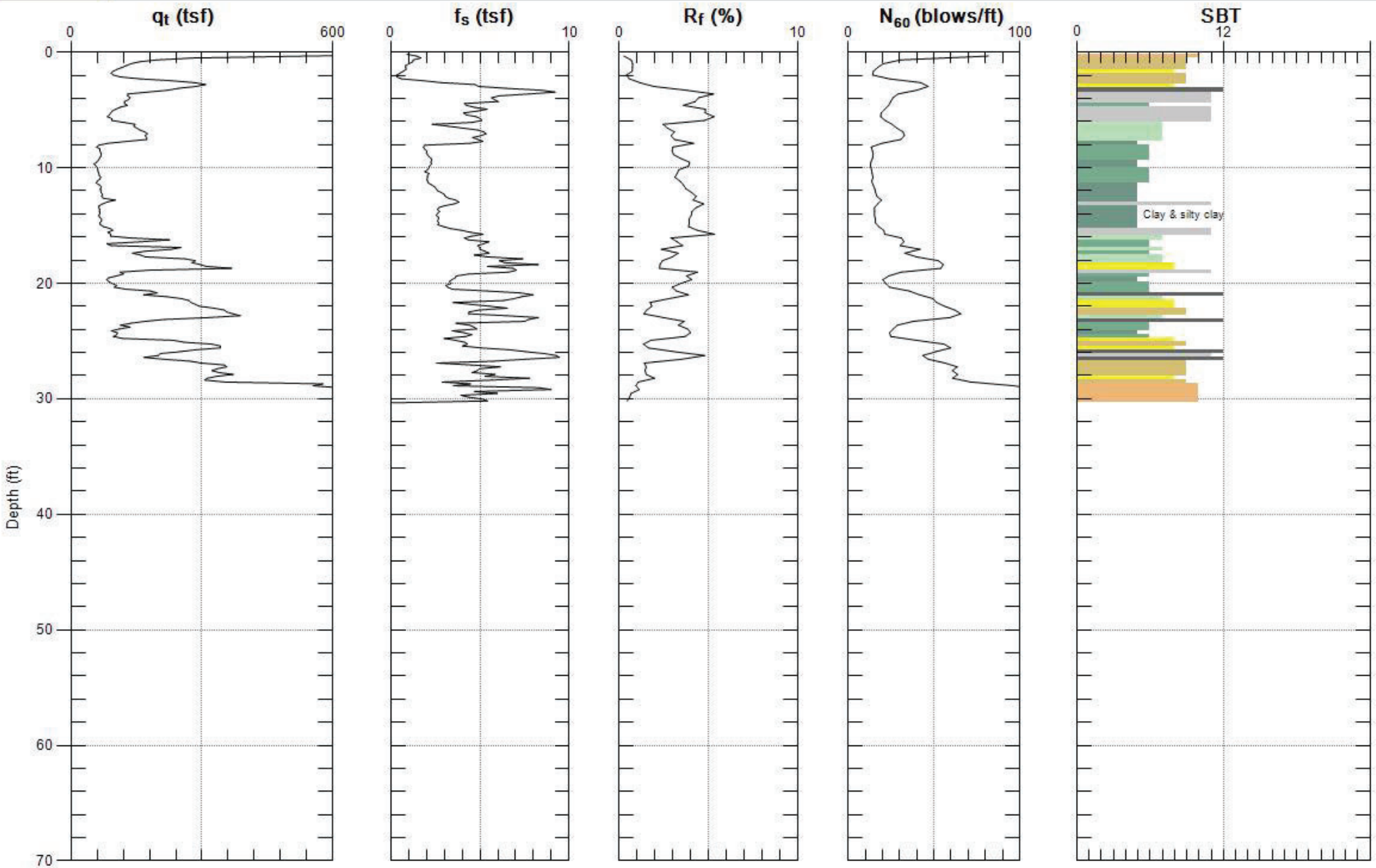
Figure A - 11

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-6A

Engineer: S.KOLTHOFF
Date: 1/21/2014 12:05



Max. Depth: 30.512 (ft)
Avg. Interval: 0.328 (ft)

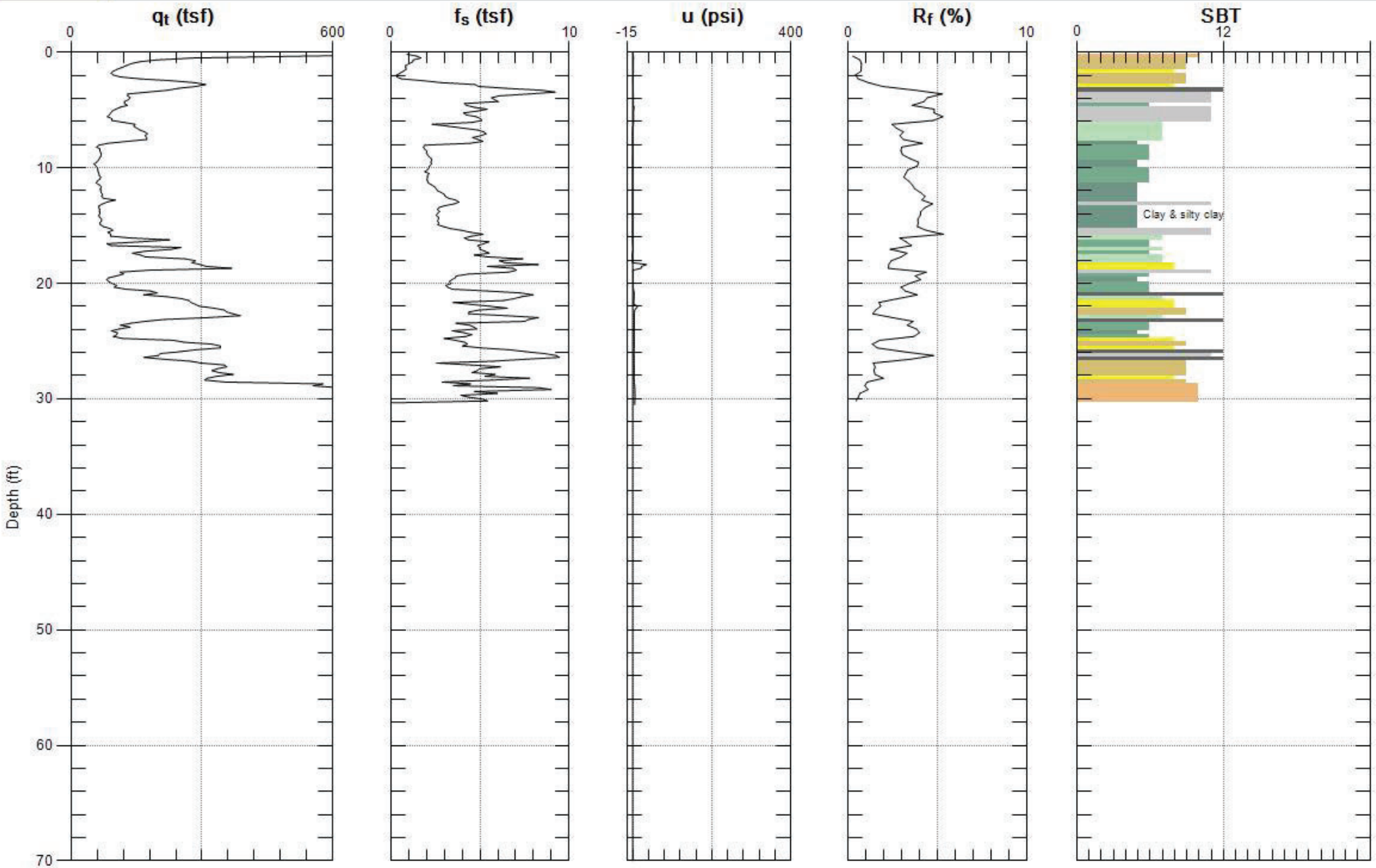
SBT: Soil Behavior Type (Robertson 1990)

Figure A - 12

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-6A
Engineer: S.KOLTHOFF
Date: 1/21/2014 12:05



Max. Depth: 30.512 (ft)
Avg. Interval: 0.328 (ft)

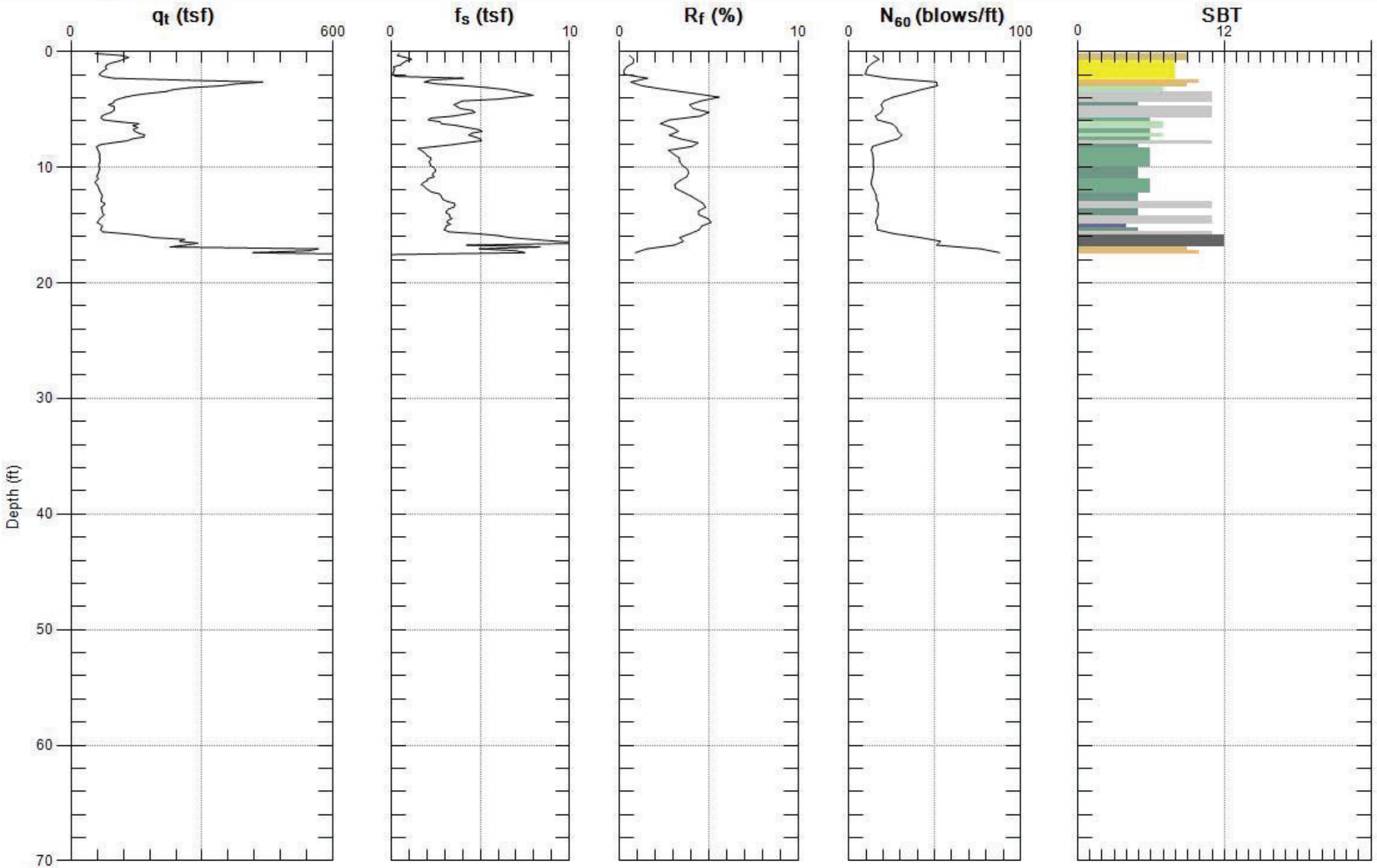
SBT: Soil Behavior Type (Robertson 1990)

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-6

Engineer: S.KOLTHOFF
Date: 1/21/2014 11:32



Max. Depth: 17.717 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

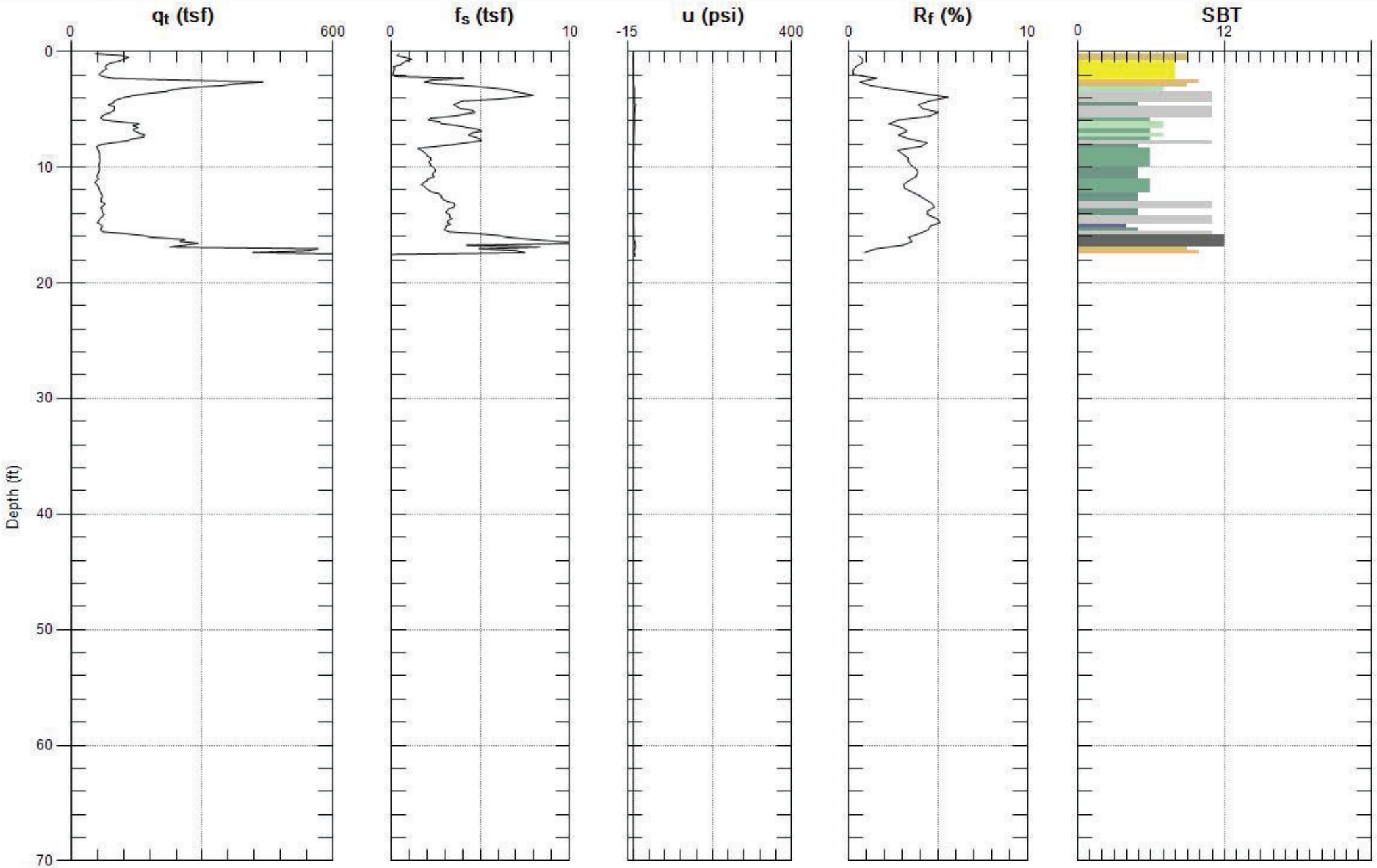
Figure A - 14

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-6

Engineer: S.KOLTHOFF
Date: 1/21/2014 11:32



Max. Depth: 17.717 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

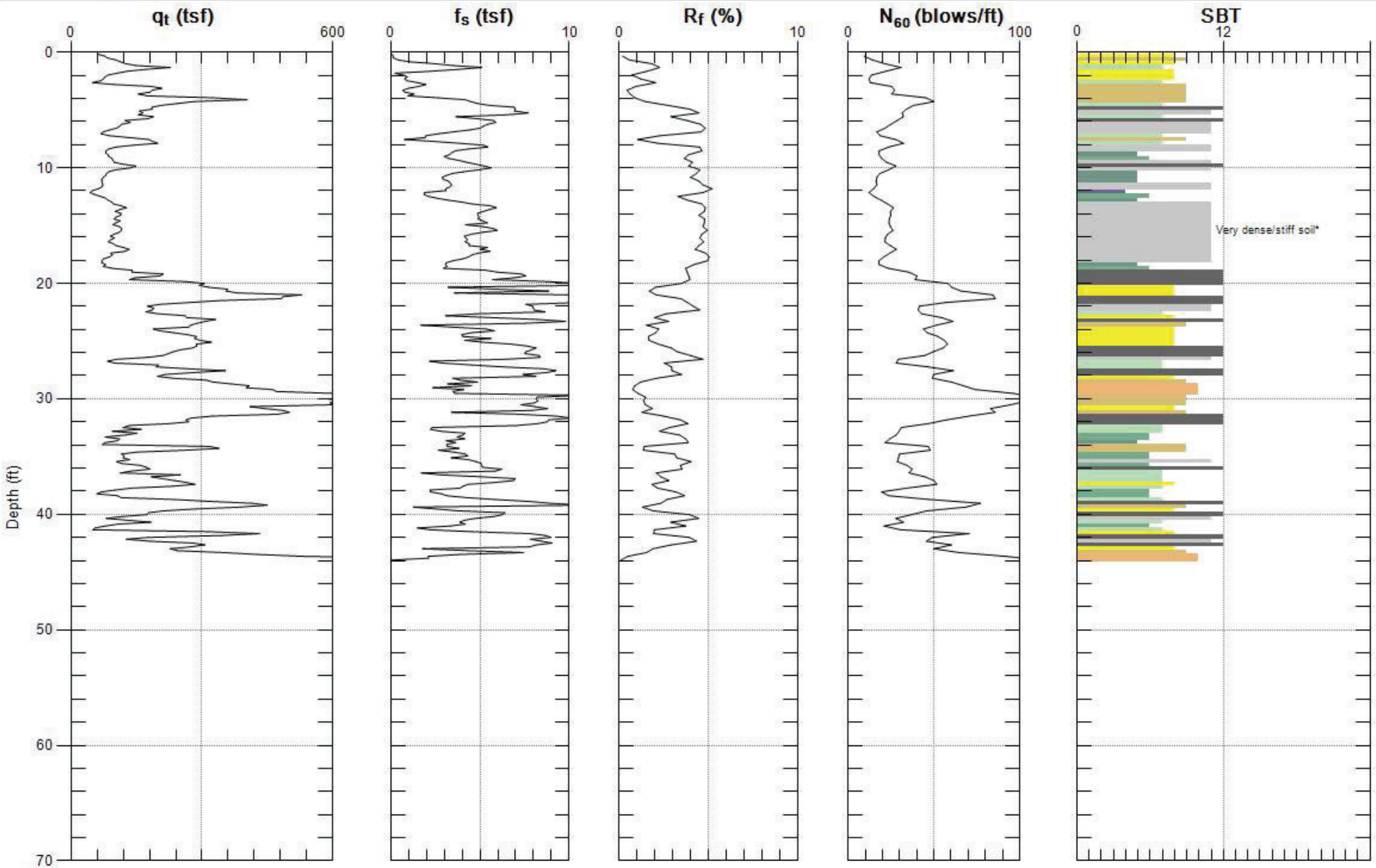
Figure A - 15

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-7

Engineer: S.KOLTHOFF
Date: 1/21/2014 12:34



Max. Depth: 44.127 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

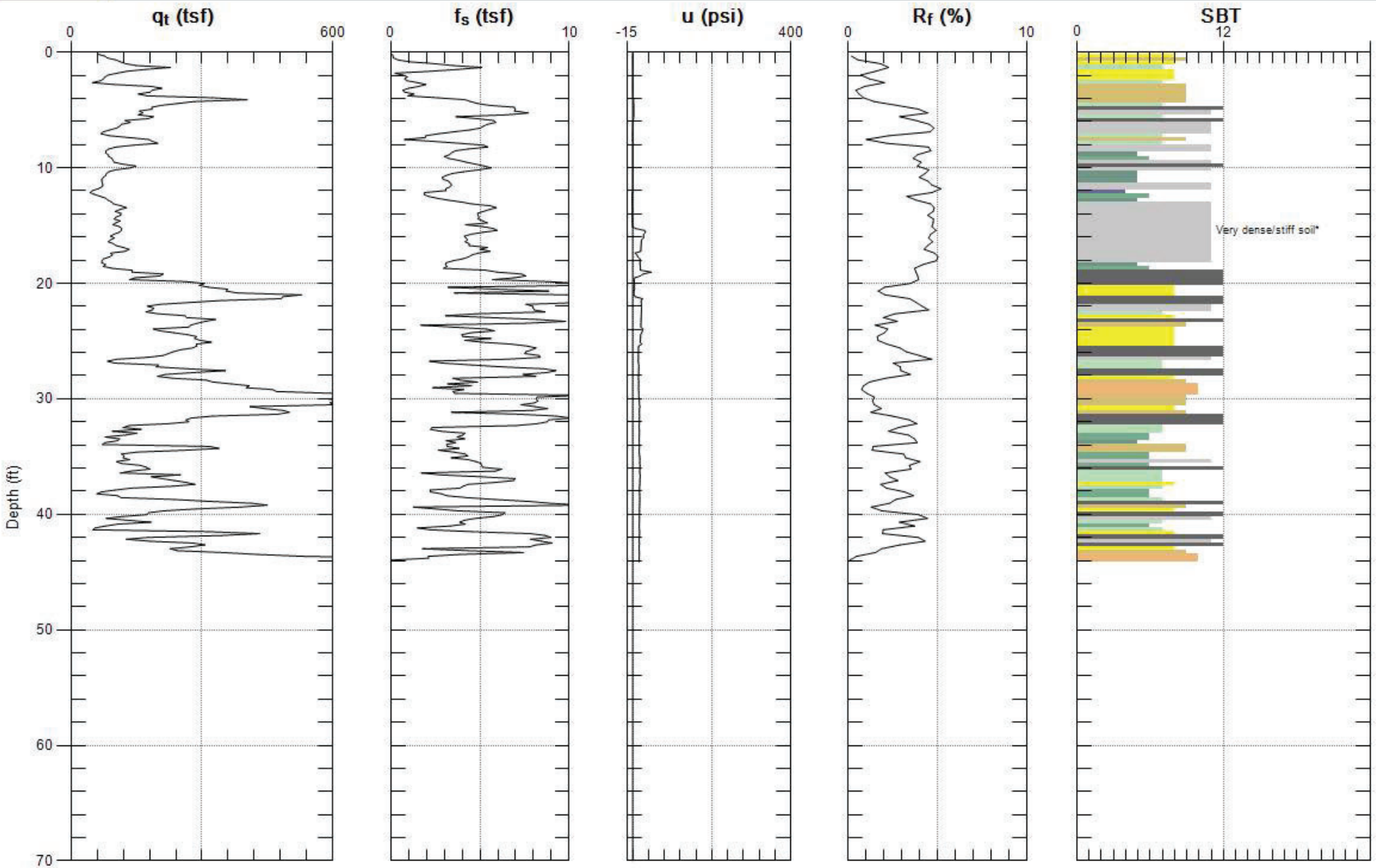
Figure A - 16

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-7

Engineer: S.KOLTHOFF
Date: 1/21/2014 12:34



Max. Depth: 44.127 (ft)
Avg. Interval: 0.328 (ft)

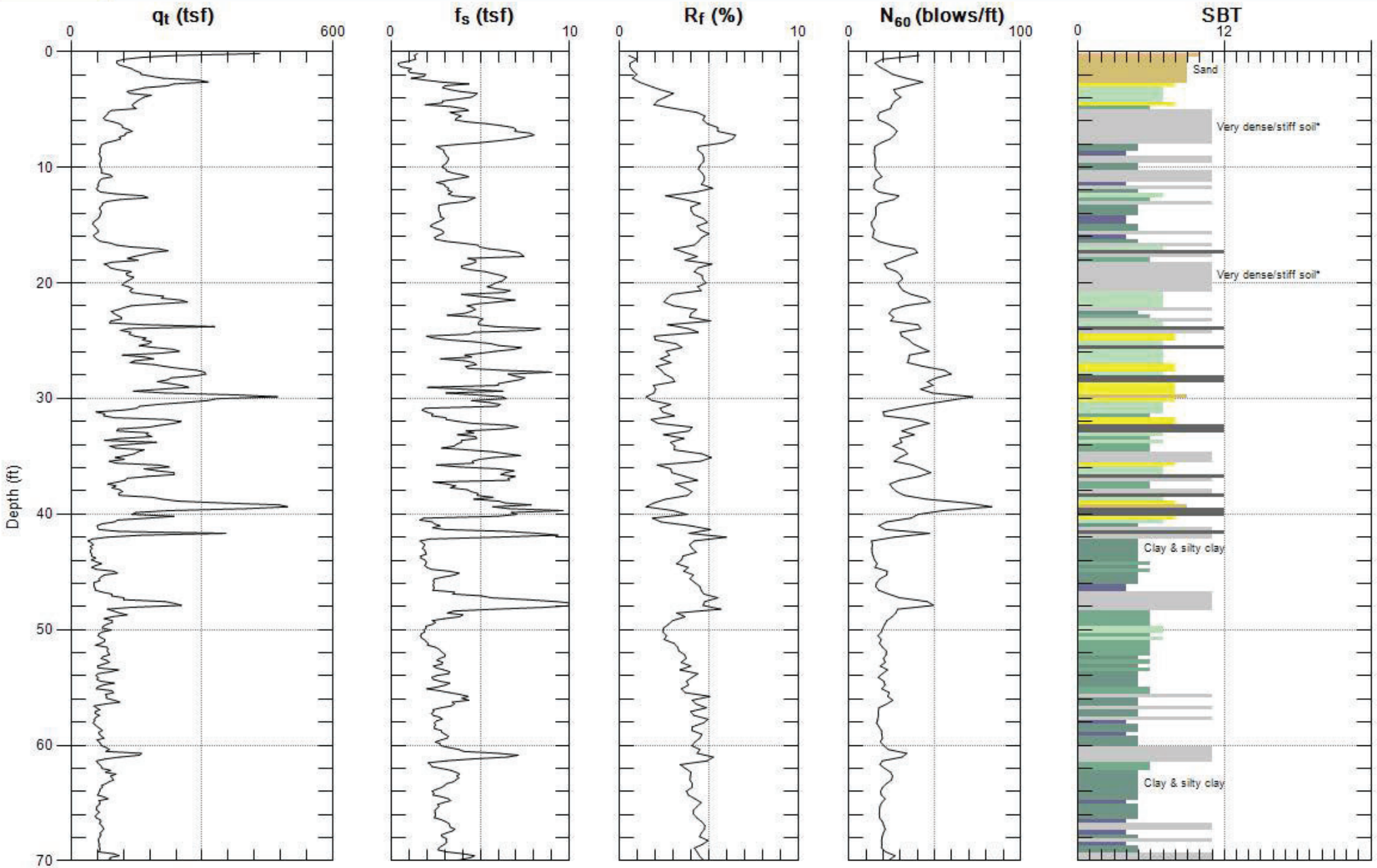
SBT: Soil Behavior Type (Robertson 1990)

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-8

Engineer: S.KOLTHOFF
Date: 1/21/2014 01:10



Max. Depth: 70.866 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

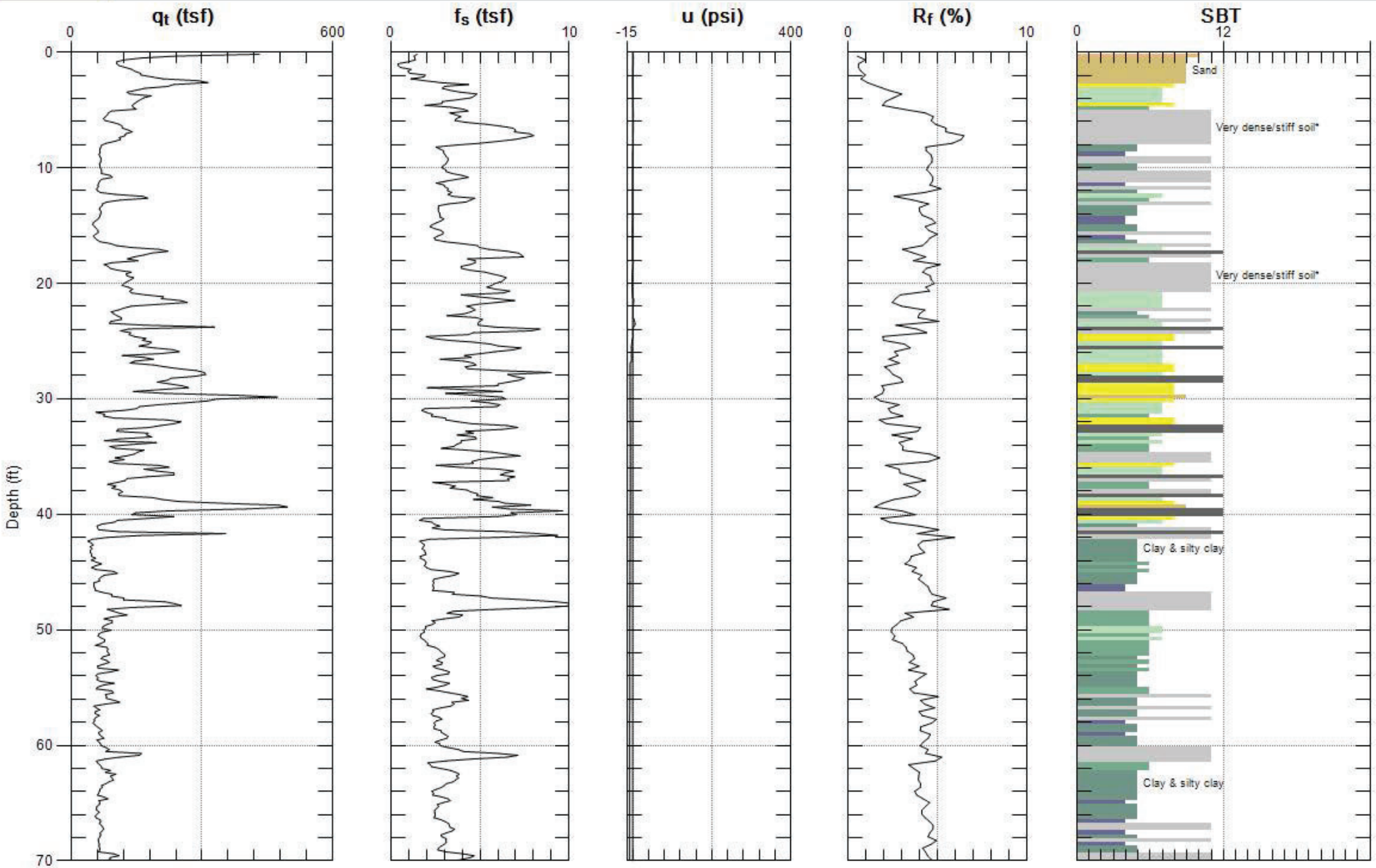
Figure A - 18

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-8

Engineer: S.KOLTHOFF
Date: 1/21/2014 01:10



Max. Depth: 70.866 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

Figure A - 19

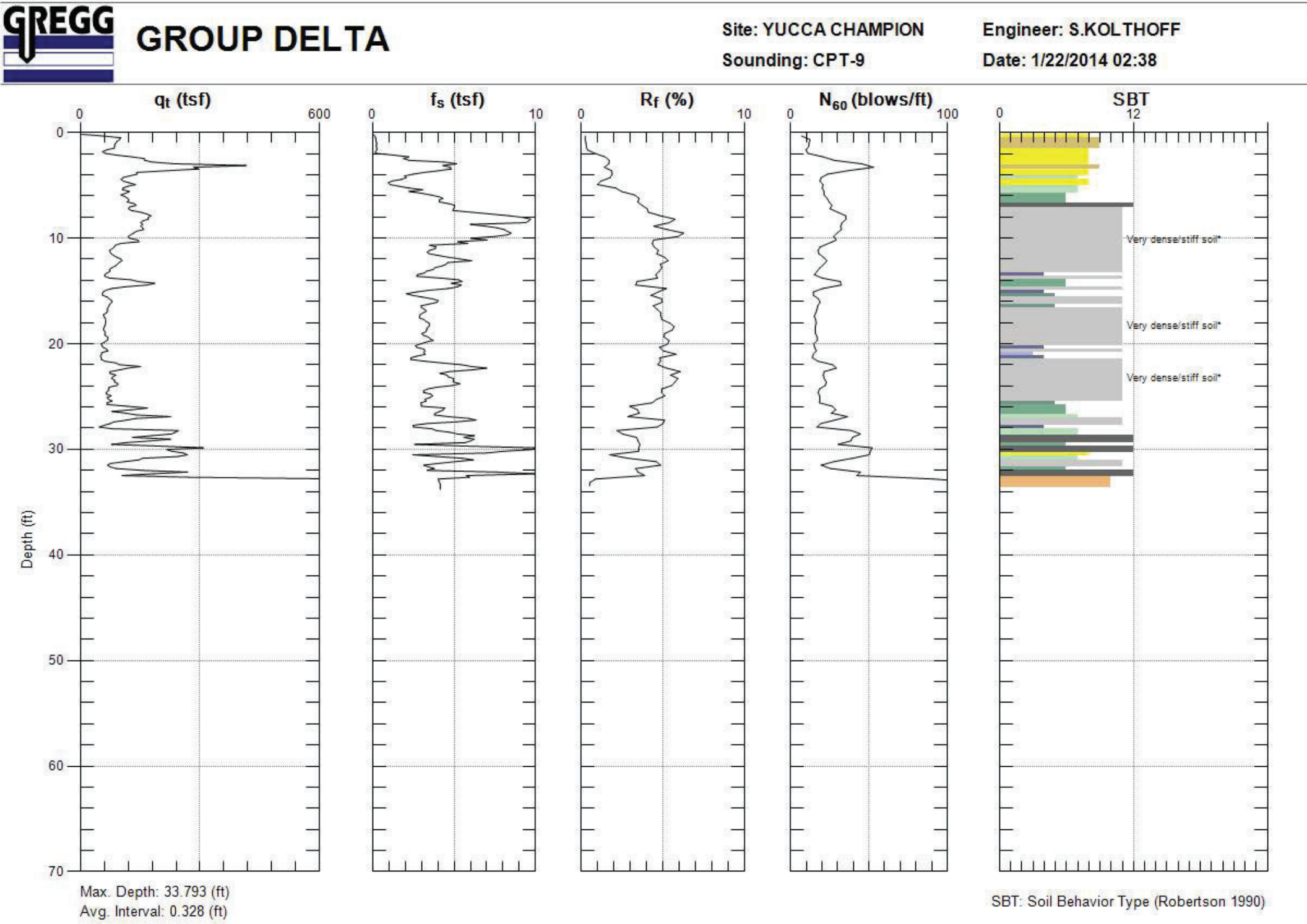

GREGG
GROUP DELTA
Site: YUCCA CHAMPION
Sounding: CPT-9
Engineer: S.KOLTHOFF
Date: 1/22/2014 02:38
q_t (tsf)
0
600
f_s (tsf)
0
10
R_f (%)
0
10
N_{60} (blows/ft)
0
100
SBT
0
12
Depth (ft)
0
10
20
30
40
50
60
70
Very dense/stiff soil*
Very dense/stiff soil*
Very dense/stiff soil*
Max. Depth: 33.793 (ft)
Avg. Interval: 0.328 (ft)
SBT: Soil Behavior Type (Robertson 1990)

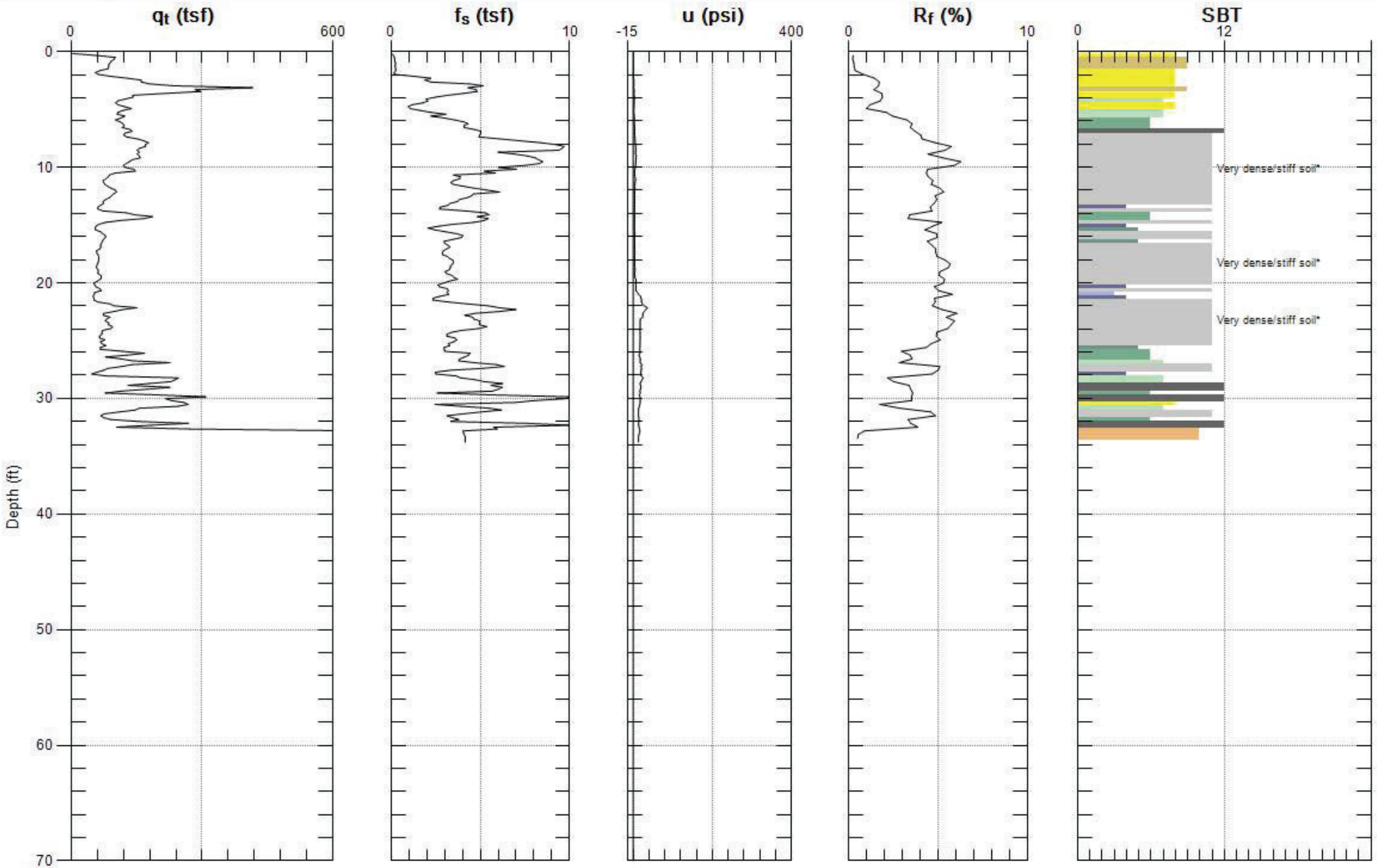
Figure A - 20

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-9

Engineer: S.KOLTHOFF
Date: 1/22/2014 02:38



Max. Depth: 33.793 (ft)
Avg. Interval: 0.328 (ft)

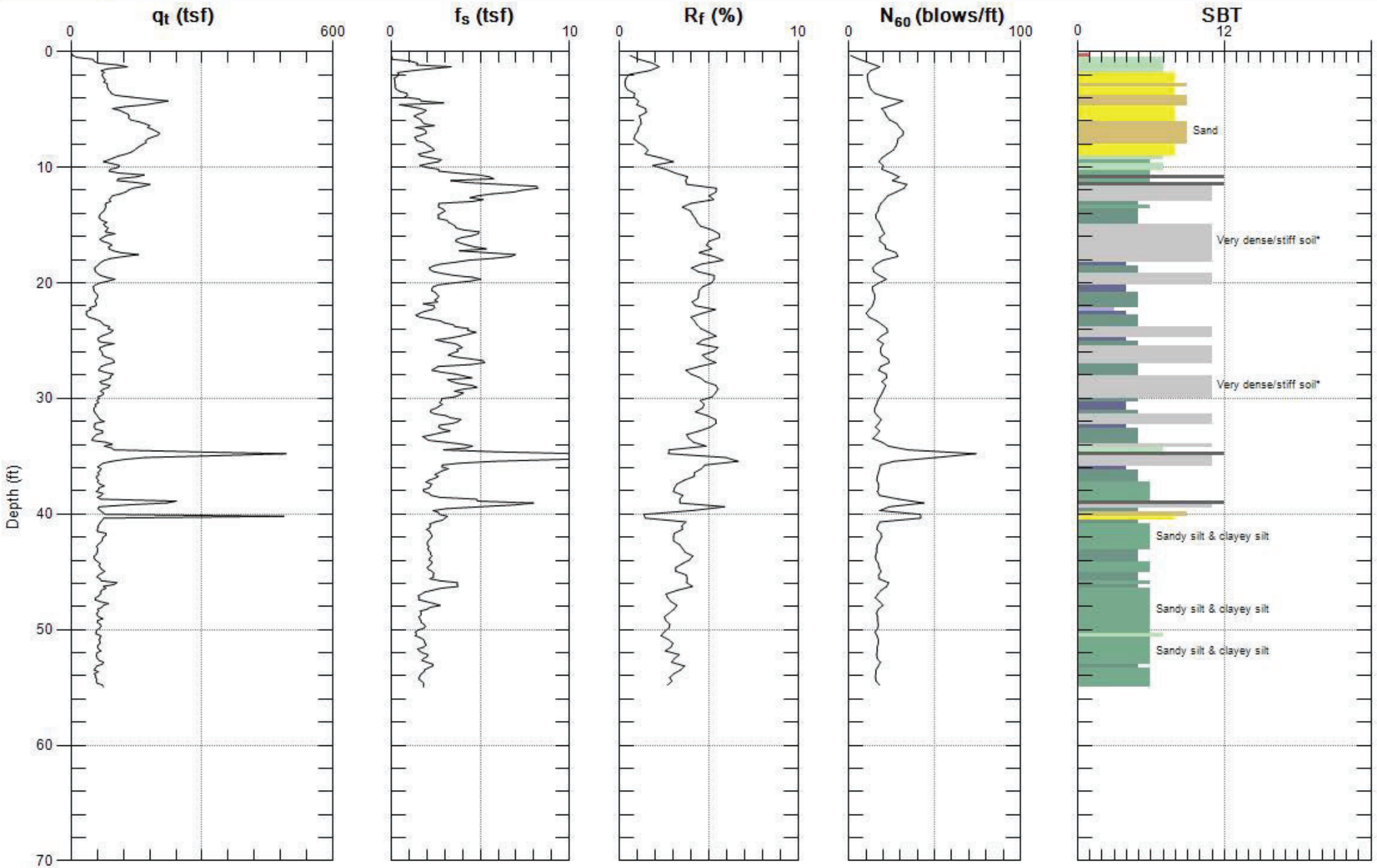
SBT: Soil Behavior Type (Robertson 1990)

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-10

Engineer: S.KOLTHOFF
Date: 1/22/2014 03:25



Max. Depth: 54.954 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

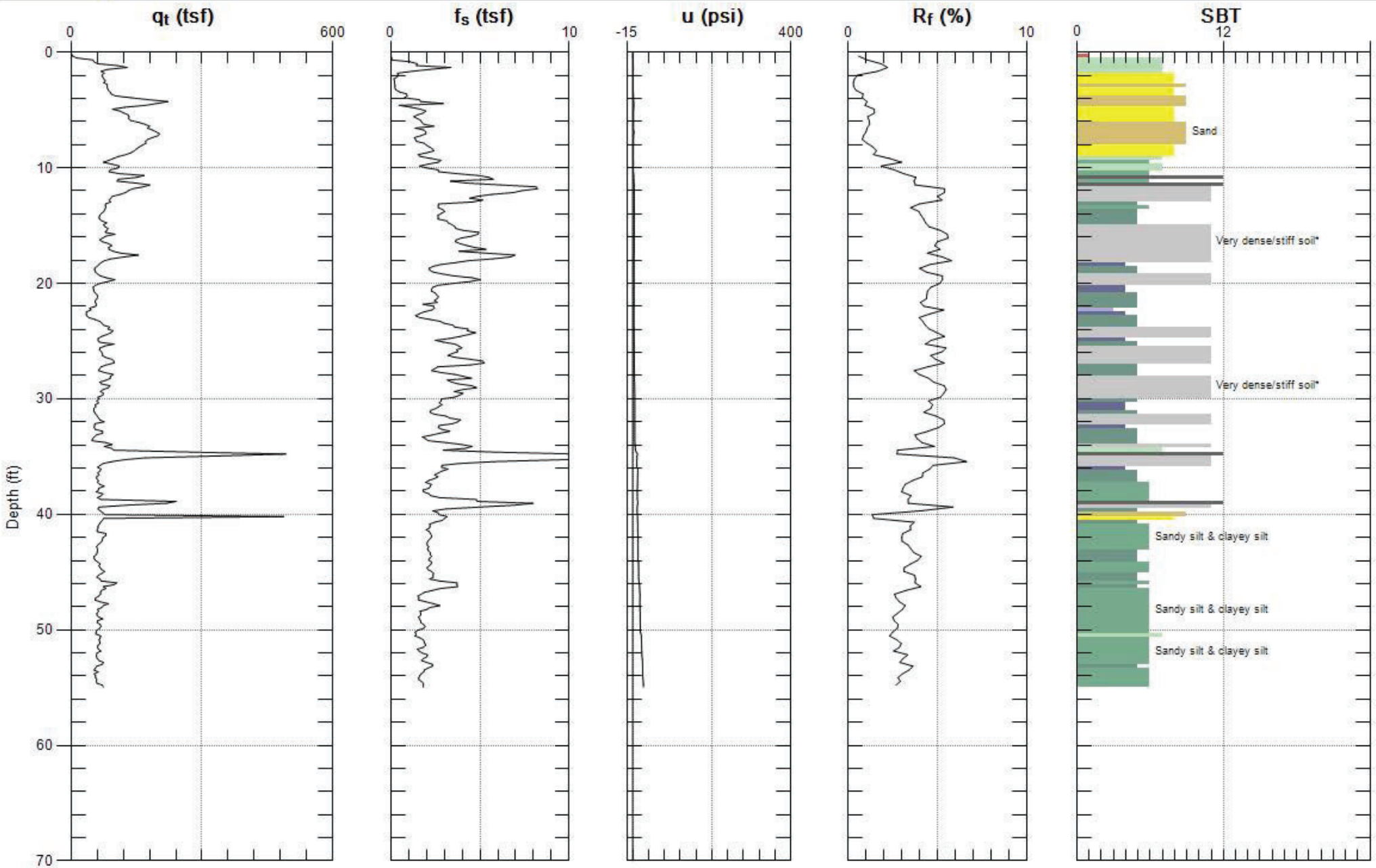
Figure A - 22

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-10

Engineer: S.KOLTHOFF
Date: 1/22/2014 03:25



Max. Depth: 54.954 (ft)
Avg. Interval: 0.328 (ft)

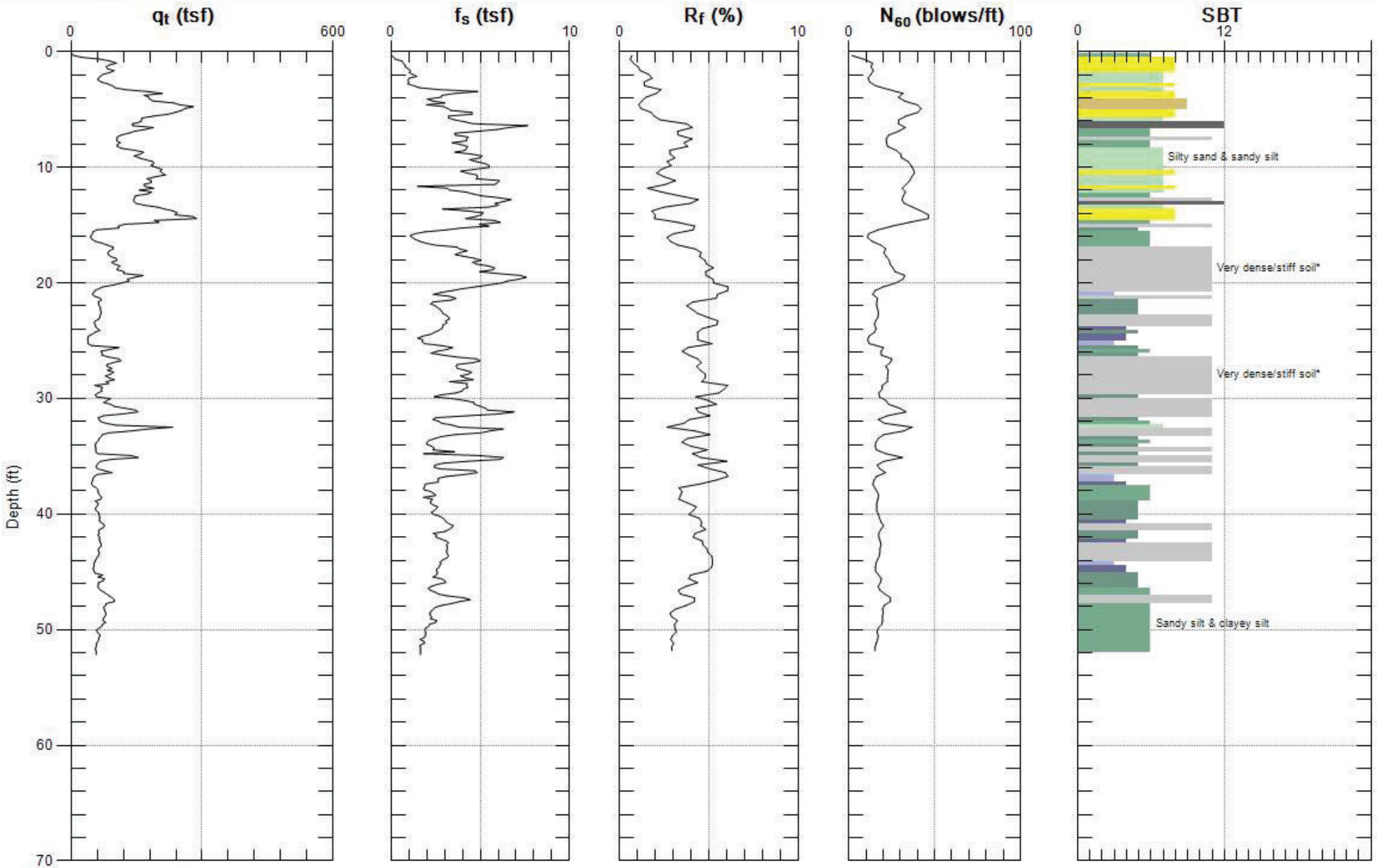
SBT: Soil Behavior Type (Robertson 1990)

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-11

Engineer: S.KOLTHOFF
Date: 1/22/2014 04:12



Max. Depth: 52.165 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

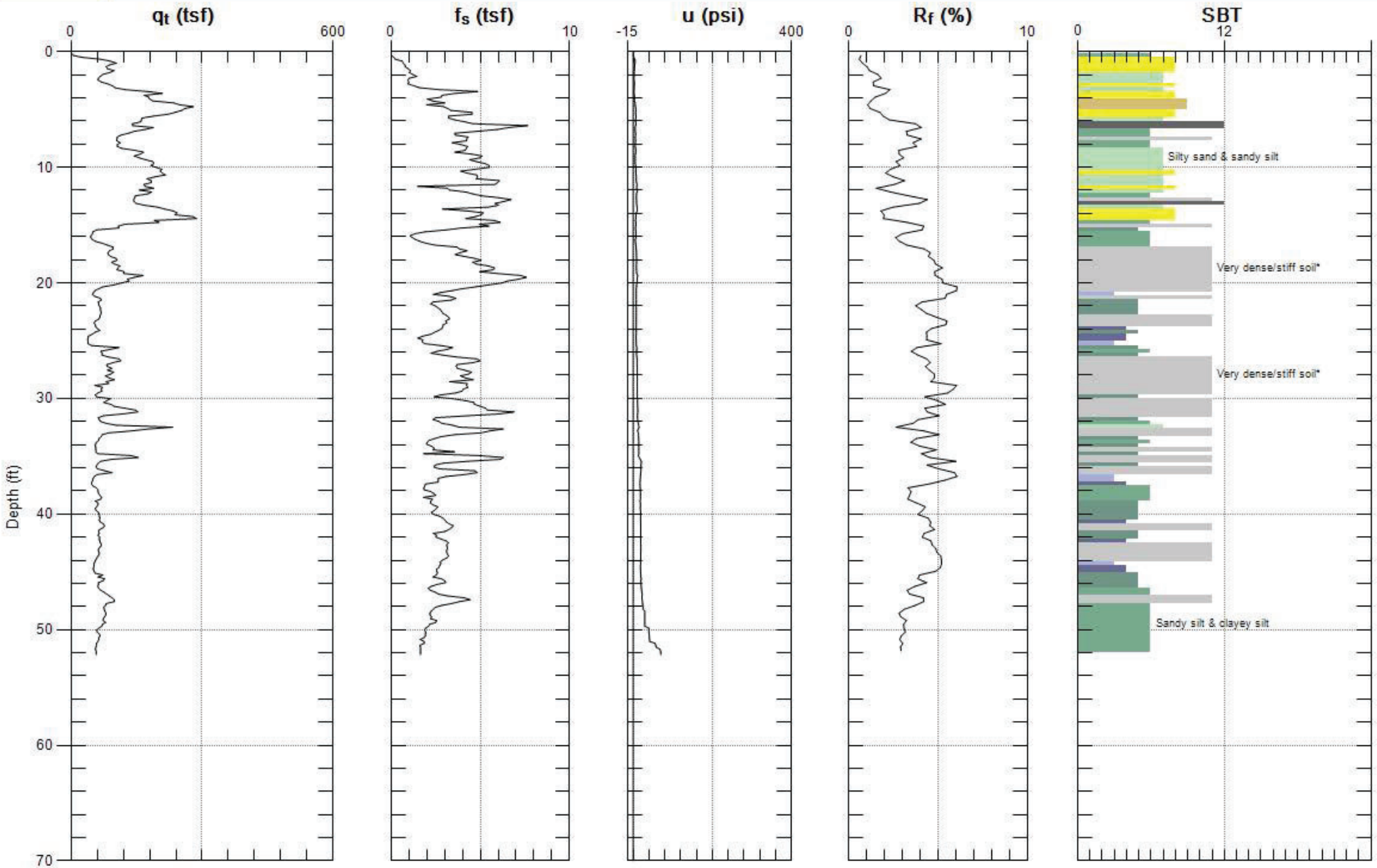
Figure A - 24

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-11

Engineer: S.KOLTHOFF
Date: 1/22/2014 04:12



Max. Depth: 52.165 (ft)
Avg. Interval: 0.328 (ft)

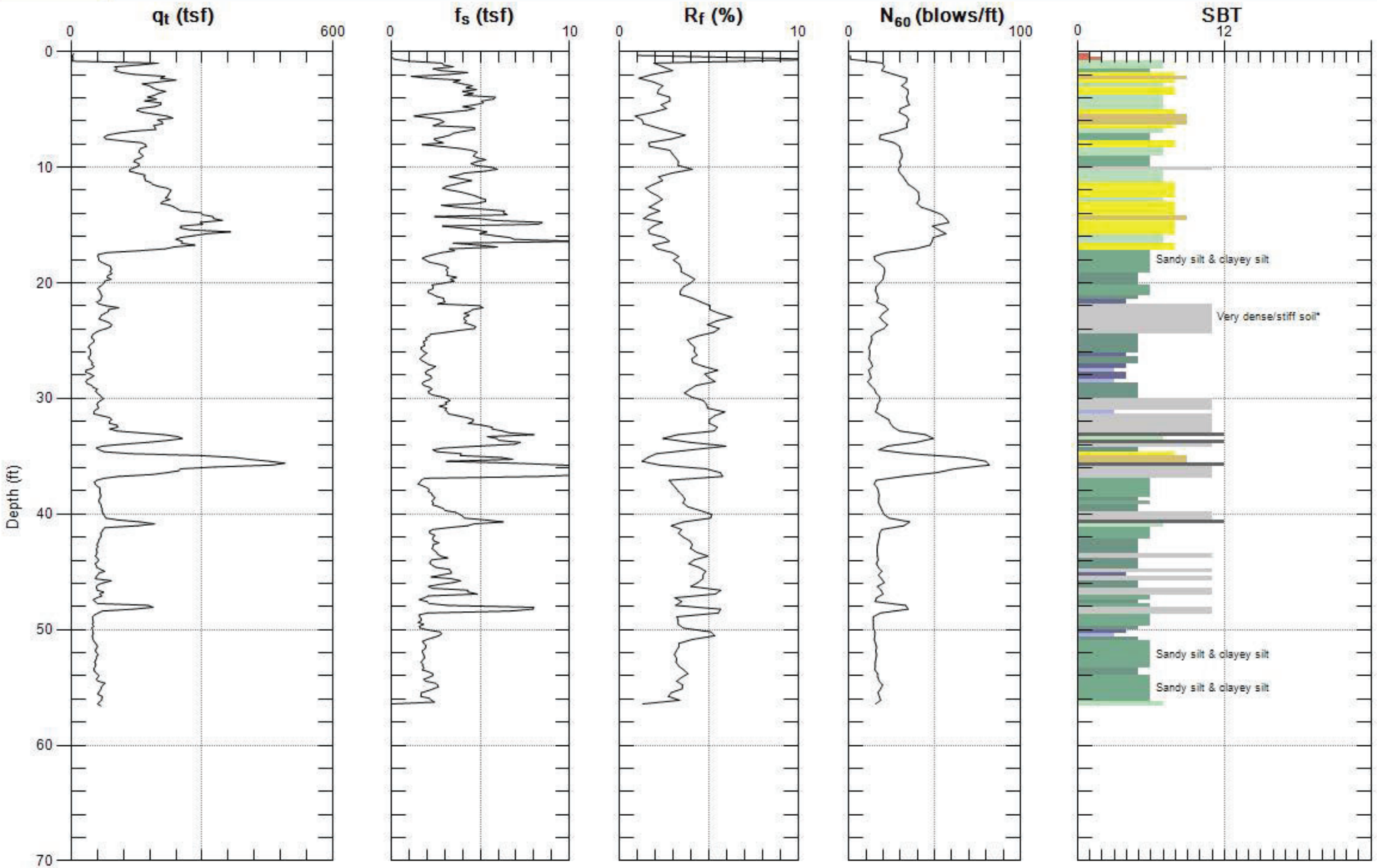
SBT: Soil Behavior Type (Robertson 1990)

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-12

Engineer: S.KOLTHOFF
Date: 1/22/2014 04:52



Max. Depth: 56.594 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

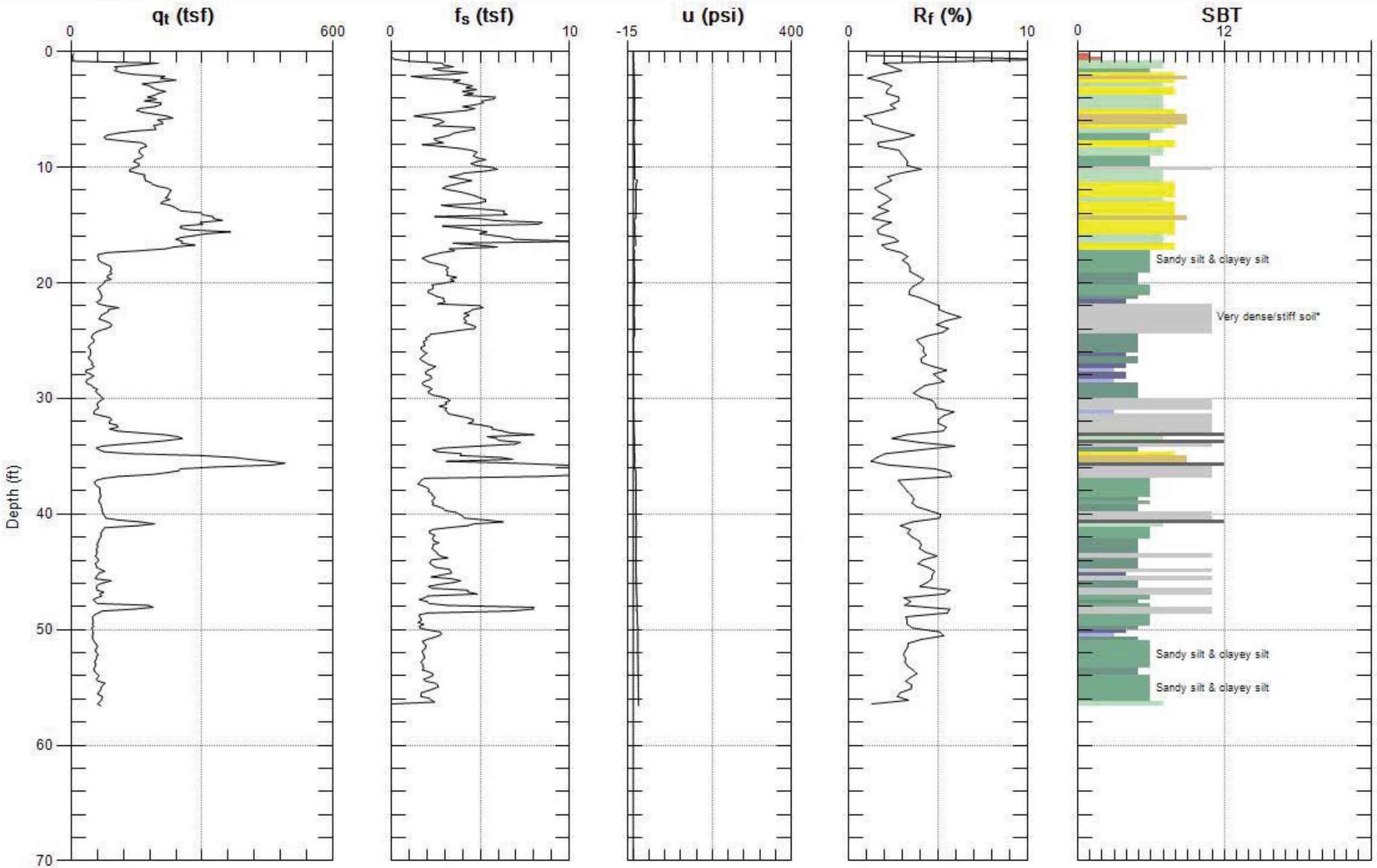
Figure A - 26

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-12

Engineer: S.KOLTHOFF
Date: 1/22/2014 04:52



Max. Depth: 56.594 (ft)
Avg. Interval: 0.328 (ft)

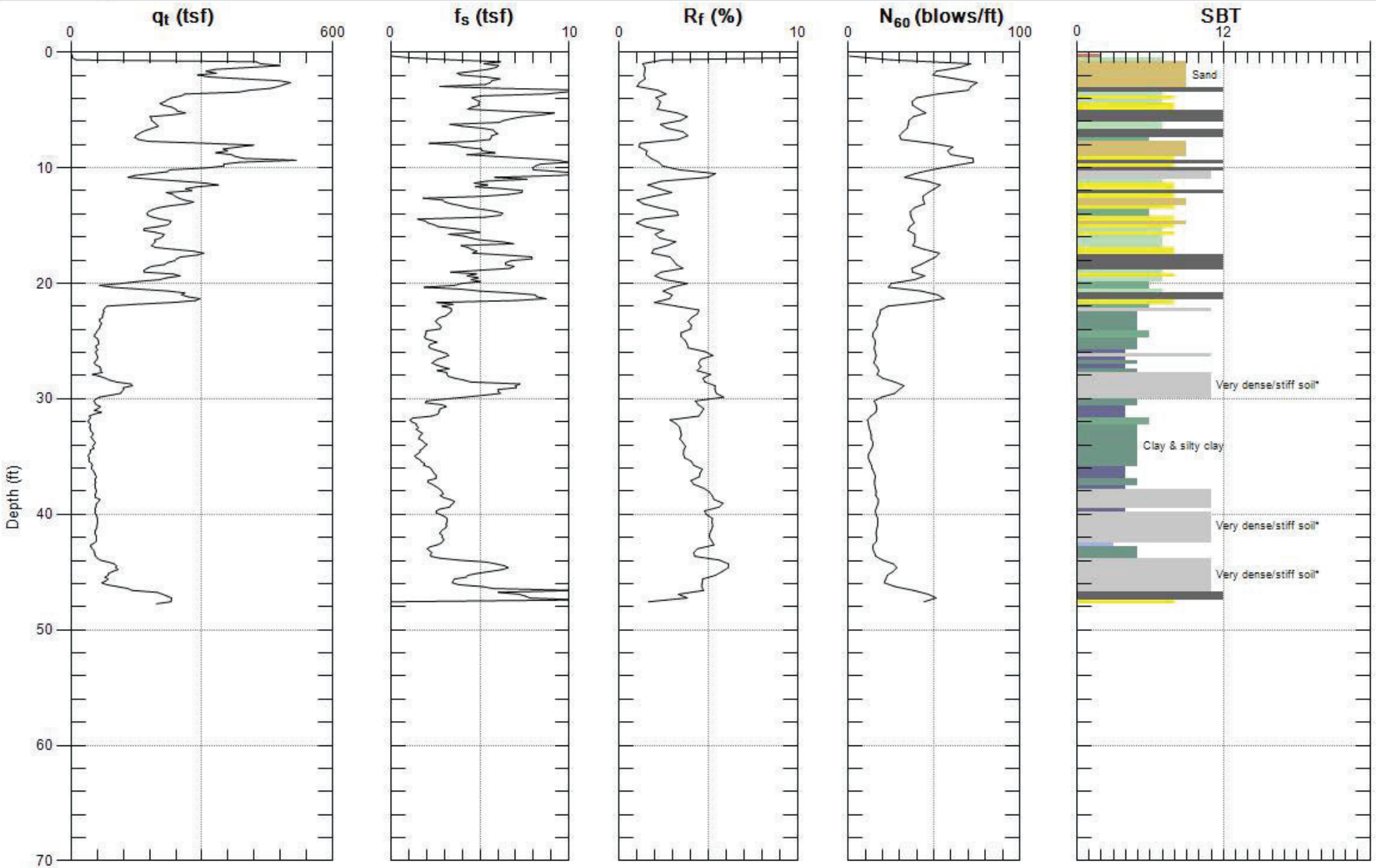
SBT: Soil Behavior Type (Robertson 1990)

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-13

Engineer: S.KOLTHOFF
Date: 1/22/2014 12:18



Max. Depth: 47.736 (ft)
Avg. Interval: 0.328 (ft)

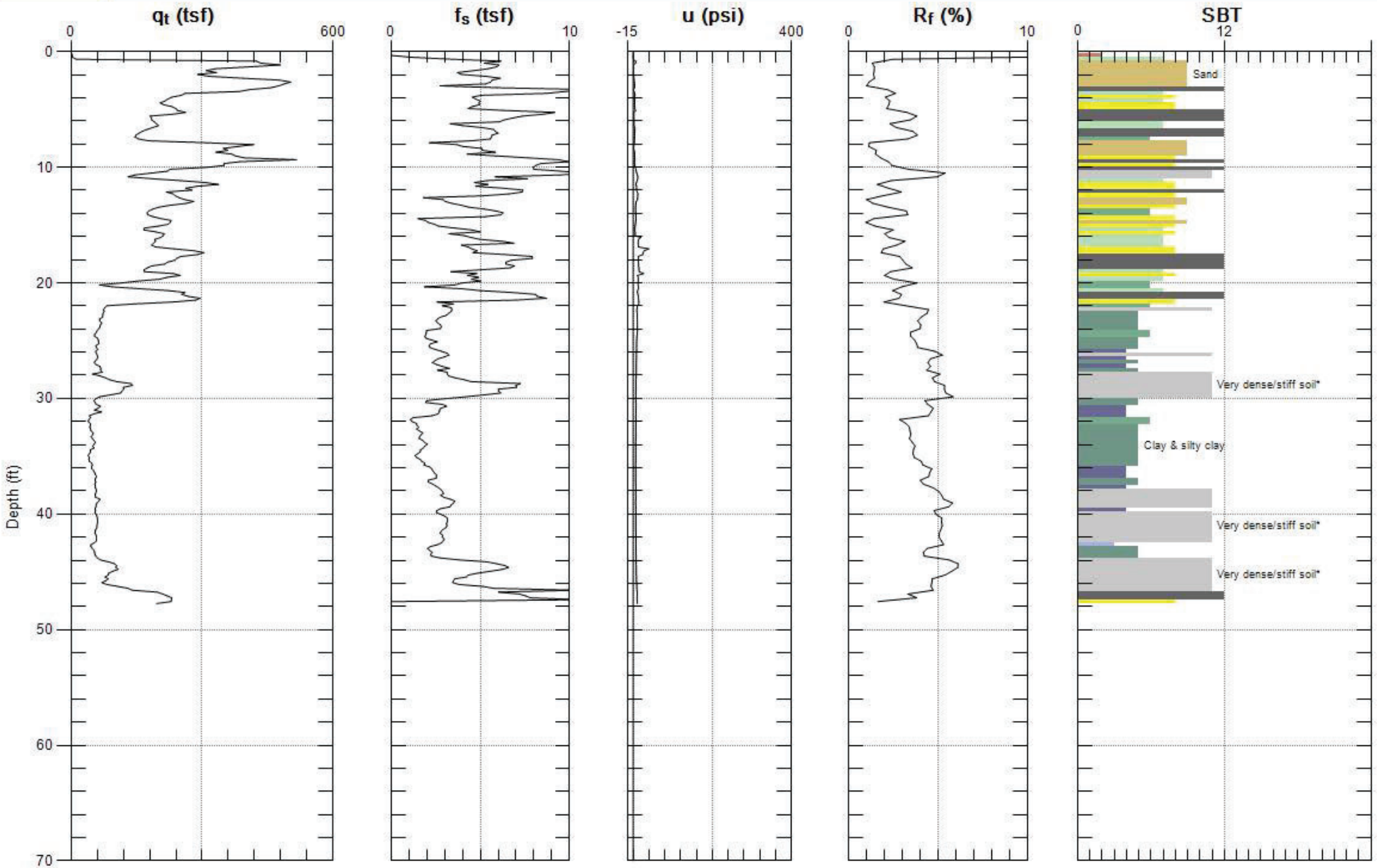
SBT: Soil Behavior Type (Robertson 1990)

GREGG

GROUP DELTA

Site: YUCCA CHAMPION
Sounding: CPT-13

Engineer: S.KOLTHOFF
Date: 1/22/2014 12:18



Max. Depth: 47.736 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

APPENDIX C
LABORATORY TESTING

APPENDIX C
LIMITED LABORATORY TESTING

C.1 General

The laboratory testing was performed using appropriate American Society for Testing and Materials (ASTM) and Caltrans Test Methods (CTM).

The samples of earth materials were obtained from the prior fault investigation. Laboratory testing for this investigation included:

- Expansion Index
- Soil Corrosivity:
    - pH (CTM 643);
    - Water-Soluble Sulfate (ASTM D 516, CTM 417);
    - Water-Soluble Chloride(Ion-Specific Probe, CTM 422);
    - Minimum Electrical Resistivity (CTM 643).

Brief descriptions of the laboratory testing program and test results are presented below.

C.2 Expansion Index

The Expansion Index of the soils was determined by testing a sample in accordance with the California Building Code Standard No. 29-2 method. The results of the tests is presented in the table below. The details of the tests results are included in this appendix.

Sample No.	Expansion Index
B-3@16’	106 (High)

C.3 Soil Corrosivity

Tests were performed in order to determine corrosion potential of site soils on concrete and ferrous metals. Corrosivity testing included minimum electrical resistivity and soil pH, water-soluble chlorides (Orion 170A+ Ion Probe), and water-soluble sulfates (ASTM D 516). The test results are presented in the table below. The details of the tests results are included in this appendix.

Boring No.	Depth (ft)	USCS Soil Type	Minimum Resistivity CTM 643 (ohm-cm)	pH CTM 643	Soluble Sulfate Content CTM 417 (%)	Soluble Chloride Content CTM 422 (%)
B-3	16	CL	495	7.22	0.02	0.01