

APPENDIX G

Geotechnical and Paleontological Resources Documentation

G-1 2015 Fault Activity Investigation

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GEOLOGY REPORT APPROVAL LETTER

July 7, 2015

LOG # 87496R
SOILS/GEOLOGY FILE - 2
AP

Millennium Hollywood Development, LLC
1680 N. Vine Street
Los Angeles, CA 90028

TRACT: 18237 / Hollywood
BLOCK: - / 21
LOT(S): 1 and 2 (arbs 2-4) / 3-5 and 21 (arbs 1&2)
LOCATION: 1731-1741 Argyle Ave, 1720-1750 N Vine St, 1746-1764 N Ivar Ave & 1749 N Vine St

<u>CURRENT REFERENCE REPORT/LETTER(S)</u>	<u>REPORT No.</u>	<u>DATE(S) OF DOCUMENT</u>	<u>PREPARED BY</u>
Geologic Response Report	3425	06/03/2015	Earth Consultants International
Oversized Doc(s).	"	"	"
Geologic Response Letter	LA-1191 A	05/17/2015	Group Delta
Third Party Review	3425	03/09/2015	Earth Consultants International
Geology Report	LA-1191 A	03/06/2015	"
Oversized Doc(s).	"	"	"

<u>PREVIOUS REFERENCE REPORT/LETTER(S)</u>	<u>REPORT No.</u>	<u>DATE(S) OF DOCUMENT</u>	<u>PREPARED BY</u>
Dept. Approval Letter	77007-01	01/31/2013	LADBS
Geology/Soils Report	700019502	12/03/2012	Langan
Fault Investigation Report		11/30/2012	"
Dept. Correction Letter	77007	05/23/2015	LADBS
Soils Report	700019501	11/22/2011	Langan

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that present a fault activity investigation at 1731-1741 Argyle Ave., 1720-1750 N. Vine St., 1746-1754 N. Ivar Ave. and 1749 N. Vine St. for the future development of the property (Millennium project). The site contains two non-contiguous portions; one east of Vine Street and the other on the west. The site is currently occupied mostly by parking lots and some offices, including the CapitaRecords building. The site is located within an Official Earthquake Fault Zone that was established (November 6, 2014) by the California Geological Survey (CGS) for the Hollywood fault (on the USGS 7.5 minute Hollywood Quadrangle). The current reports are considered "stand alone" and do not rely on data from the previous reports prepared by Langan.

The fault investigation conducted by Group Delta (GDC) concluded that no active (Holocene) faults are known to be present beneath the site.

This investigation included the following:

1. A large exploration trench, about 30 to 80 feet wide 12 to 35 feet deep and approximately 278 feet long, located on the eastern side of the site and extended into the property to the north (6230 Yucca Street).
2. Several transects of CPT soundings and continuous core borings, which included a total of 78 CPTs and 35 continuous core borings.
3. Data from fault investigations adjacent and nearby projects by GDC were incorporated in this investigation including another trench, entirely on 6230 Yucca Street site, about 60 feet wide, 130 feet long and 25 to 30 feet deep.
4. A detailed soil stratigraphic/pedological analysis to estimate the age of the soil horizons encountered in the trenches in the eastern part of the site, as well as in two of the continuous cores on the western part of the site by Dr. Roy Shlemon (a well-known expert in soil stratigraphy, age-dating of soils and assessment of geologic hazards).

In addition, Earth Consultants International (ECI), a company well experienced with fault investigations, provided a "Third Party Review" of the GDC report (Appendix E of the report).

Both the western and eastern portions of the Millennium site are underlain by alluvial deposits, which are divided into three general units (see Figure 5 of the report). These units include an upper sandy alluvium that is geologically young (Holocene in age: about 11,000 years old or less); a Pleistocene deposit (about 35,000 to 60,000 years old), referred to as "mudflow"; and, an older Pleistocene deposit, referred to as "older alluvium" (about 200,000 years or older). Bedrock was found below the alluvium in some of the borings.

The investigation documents ancient faulting and folding of Pleistocene older alluvium (about 200,000 years or older). Beneath the northern part of the site, the older alluvium is tilted, dipping southward. Investigations by GDC on nearby and adjacent sites indicate that the geologic structure forms a broad anticline with an axis trending roughly along Yucca Street. The older alluvium on the south side of the site is relatively horizontal and does not appear to be folded. GDC infers that an inactive fault is located between the folded and non-folded older alluvium, where the subsurface data show discontinuous bedding. The inactive fault traverses the site in an approximately east-west trend (see Plate 1 and Figure 8 of the report), roughly along the trend of the "Yucca Strand" as mapped by the California Geological Survey on the January 8, 2014 Preliminary Alquist-Priolo Earthquake Fault Zone map. The inactive fault projects eastward towards a suspected fault scarp on the north side of Carlos Avenue that is likely related.

The "older alluvium" and inactive fault are buried by Pleistocene "mudflow" and Holocene alluvial deposits. The "mudflow" deposits (judged to be at least 35,000 years old) were observed to be continuously overlying the inactive fault at the continuous core/CPT transects. In addition, the inactive fault projects beneath the exploratory trench at the eastern part of the site, where the "mudflow" Pleistocene deposits were observed to be undisturbed.

Two minor anomalies were noted in transect M-M'. The first anomaly is at the location of CPT-29. The second is just north of CPT-29 which was judged to be a possible inactive fault by ECI. As a result, LADBS requested GDC to re-evaluate their data at this southern locality.

Subsequently, both GDC and ECI produced response reports that address the possible anomalous data from the CPT/Continuous Core Boring transects (GDC report dated 05/17/2015 and ECI report dated 06/03/2015). The reports acknowledge inaccurate locations of CPTs shown in the original report (GDC

03/06/2015). The CPTs and borings were surveyed and the transects were refined accordingly, except for Transect M-M', which had since been re-graded and paved, and therefore the survey of its CPT locations was not possible. The data from CPT-29 in transect M-M' (the first anomaly) are inconsistent relative to data from adjoining CPTs and the elevation is reportedly ambiguous, and issue was thoroughly addressed in the ECI report.

The second anomaly consists of a minor inferred fault identified by ECI north of CPT-29 located within the older alluvium and lower part of the "mudflow" unit. This inferred fault does not displace the upper part of the "mudflow", which indicates that it would not have been active in the last 80,000 years (based on ECI's age estimate).

Based on the site exploration and analysis described above, no active (Holocene) faults are known to be present beneath the site. GDC, Dr. Roy Shlemon, and ECI concluded that there are no active faults at the site and that the main inferred inactive fault is estimated to be about 150,000 years old or older. *Note: The State of California Aquist-Priolo Earthquake Fault Zoning Act precludes construction of structures for human occupancy on "active" faults (those that have ruptured within about 11,000 years).*

Since exploration did not extend beyond the property boundary, GDC recommends two setback zones where buildings cannot be constructed at the site; one at the northern edge of the western property and another at the southern part of the eastern property. Construction of buildings within these setback zones will be considered if additional geologic exploration is conducted and the areas are found to be free from active faults.

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

1. During construction, the project engineering geologist shall observe and log in detail the proposed basement excavation where the natural alluvial soils are exposed. The project engineering geologist shall post a notice on the job site for the City Grading Inspector/Geologist 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 geologist has verified the documentation. If evidence of active faulting is observed, the Grading Division shall be notified immediately. (Code Section 91.7009)
2. A supplemental report that summarizes the geologist's observations (including photographs and logs of excavations) shall be submitted to the Grading Division of the Department upon completion of the excavations.
3. 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.

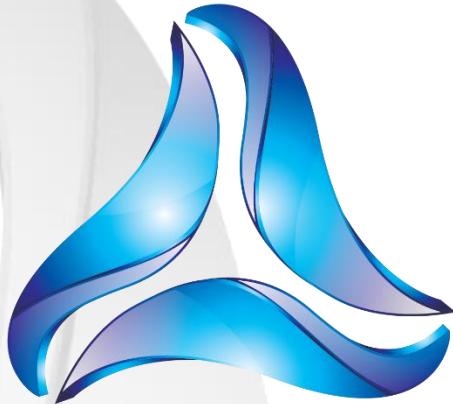


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GROUP



DELTA

Fault Activity Investigation

**East and West Millennium Sites
1733-1741 Argyle Avenue;
6236 and 6334 West Yucca Street;
1720-1730, 1740, 1745-1760, and 1762-1770 N. Vine Street;
1746, 1748-1754, 1760, and 1764 N. Ivar Avenue,
Hollywood Area
City of Los Angeles, California**

**Mr. Philip E. Aarons, VP
Millennium Hollywood Development LLC
1680 N. Vine Street
Los Angeles, California 90028**

**March 6, 2015
GDC Project No. LA-1191 A**



GROUP DELTA

Mr. Philip E. Aarons, VP
Millennium Hollywood Development LLC
1680 N. Vine Street
Los Angeles, California 90028

March 6, 2015
GDC Project. LA-1191 A

Subject: Fault Activity Investigation
East and West Millennium Sites
1733-1741 Argyle Avenue; 6236 and 6334 W. Yucca Street; 1720-1730, 1740,
1745-1760, and 1762-1770 N. Vine Street; 1746, 1748-1754, 1760, and 1764 N.
Ivar Avenue, Hollywood Area, City of Los Angeles, California

Mr. Aarons:

Group Delta Consultants (GDC) is pleased to submit this Fault Activity Investigation Report for the East and West Millennium Sites east and west of Vine Street between Argyle and Ivar Avenues in the Hollywood area of the City of Los Angeles. The legal descriptions of the sites are provided on Table 1. Both sites are within the California Geological Survey's (CGS) Alquist-Priolo (AP) fault study zone and the city of Los Angeles Preliminary Fault Rupture Study Area (PFRSA) for the Hollywood Fault. GDC completed a standard-of-practice geological investigation in accordance with the procedures required by the City of Los Angeles and the State of California Mining and Geology Board.

The enclosed report represents the most comprehensive subsurface study of any site in the City of Los Angeles. You will find that this comprehensive study has resulted in the following conclusions:

- The inferred Yucca Street Strand of the Hollywood Fault was not found within the East or West Millennium Sites or the other areas reviewed within this report;
- The East and West Millennium Sites are characterized by unbroken Holocene sediments and underlying un-faulted mudflow deposits that are at least 125,000 years old, thereby positively demonstrating that no active fault is present on or within the East and West Millennium Sites or the other areas reviewed within this report; and
- No surface rupture hazard exists on or within the East or West Millennium Sites;
- This report's study area encompasses approximately 187,912 square feet on both the East and West Millennium Site.
- Setback of 50 feet will be required for the southwest portion of the East Millennium Site and on the northern portion of the West Millennium Site. Upon submittal of a supplemental report, the setback line can be adjusted, upon approval from the LADBS.

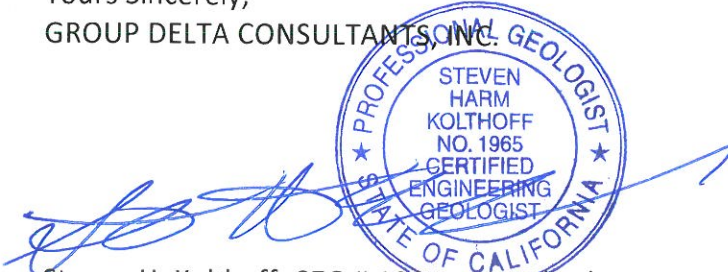


GROUP DELTA

GDC appreciates the opportunity to provide geotechnical and geological services for this project. Should you have any questions, please call at 310-320-5100.

Yours Sincerely,

GROUP DELTA CONSULTANTS, INC.



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1.0 INTRODUCTION

This report presents the results of the Group Delta Consultants, Inc. (GDC) Fault Activity Investigation for the East and West Millennium Sites (Plate 1), consistent with current geologic standards-of-practice applicable to an Alquist-Priolo Earthquake Fault Zone Investigation (AP) and the City of Los Angeles Preliminary Fault Rupture Study Areas (PFRSA).

This study was conducted to evaluate the presence or absence of an active fault within the subject sites in accordance with the procedures and guidelines specified by the Los Angeles Department of Building and Safety and the State Mining and Geology Board.

To achieve this goal, Group Delta Consultants, Inc:

1. Advanced 37 cone penetrometer tests (CPTs), and collected 19 continuous cores along two transects (Cross-sections M-M' and N-N') within and adjacent to the East Millennium Site in order to identify and date stratigraphic marker beds for local and regional correlation and continuity,
2. Advanced 41 CPT tests along two transects (Cross-sections O-O' and P-P'; Plate 1) within the West Millennium Site, as well as 16 boreholes along Cross-section O-O', to identify and date stratigraphic marker beds useful for interpreting geologic structure and the presence or absence of active faults,
3. Excavated the East Trench on the East Millennium Site, and the 6230 Yucca Street Site;
4. Reviewed and assessed, as appropriate, information from nearby and adjacent geological investigations,
5. Constructed cross-sections, geologic maps, trench logs and other standard-of-practice documentation to substantiate the technical conclusions presented in this report for submission to the City of Los Angeles Department of Building and Safety (LADBS), the designated lead agency under the AP act.

As documented in this report, the geologic and geotechnical investigations of the East and West Millennium Sites entail site-specific subsurface exploration, and also take advantage of recent trench exposures, CPTs and continuous cores collected from three adjacent or nearby sites (Plate 1). This report includes information compiled from investigations of other properties. For three of these properties, GDC conducted extensive subsurface investigations culminating in Fault Investigation Reports. These reports were recently approved by the Los Angeles Department of Building and Safety (LADBS). The referenced adjacent properties are the 6230 Yucca Street Site northeast of the East Millennium Site, the Champion Site at 1756 and 1760 Argyle Ave northeast of the East Millennium Site, and the Green Site at 1800 Argyle Avenue, also to the northeast of the East Millennium Site (Plate 1). Combined, these investigations document the most comprehensive geologic and geotechnical studies to date in Hollywood and provide more information about the possible presence and age (time of last surface or near-surface displacement) of the Hollywood Fault Strands than any other study within the City of Los Angeles.

As background to this study, based on a compilation of geotechnical reports and published literature interpretation, the California Geological Survey (CGS) issued a preliminary and supplementary Earthquake Fault Zones and Seismic Hazard Zones, Hollywood 7.5 Minute Quadrangle, Fault Evaluation Report (FER) in early and late 2014 respectively, that portrayed various strands of the Hollywood Fault as inferred "Earthquake Faults" (Holocene displacement) (CGS, 2014a; Plate 1). Two specific strands within or near the East and West Millennium Sites are identified as the "Argyle" and the "Yucca Street," strands respectively, projected across or near the East Millennium Site (Plate 1). However, a 6230 Yucca Street site trench exposure, interpretation of cores and cone penetrometer tests (CPT), and radiocarbon and soil-stratigraphic dating demonstrate that there were no active faults mapped 50 feet to the south of the northern East Millennium Site property line.

Further studies conducted on the East and West Millennium Sites included a trench exposure, analysis of soil cores and cone penetrometer tests, and radiocarbon and soil-stratigraphic dating which also demonstrated that there are no active faults on the East and West Millennium Sites.

This report did not address the geology northwest corner of the West Millennium Site (Enterprise Car Rental Site), a 50 foot setback zone from the furthest northern boring will be required. Further study will be completed when Millennium Hollywood Development LLC completes its acquisition of the Enterprise Car Rental Site. After further study the setback zone requirement will be reevaluated by the LADBS. Upon further study, to the south of the East Millennium Site property line, the setback zone requirement will be reevaluated by the LADBS. The further study for the West and East Millennium Site has not yet commenced due to lack of access to the properties.

2.0 SCOPE OF WORK

This investigation evaluates whether active traces of the Hollywood Fault or any other active faults exist at or in the subsurface of the East and West Millennium Sites. GDC reviewed pertinent aerial photographic, geologic and topographic maps, plus peer-reviewed published maps, papers, and geotechnical reports submitted to reviewing agencies. GDC also reconnoitered the two sites and their environs for tectonic geomorphic expression of fault rupture. The investigation followed current geologic standards-of-practice to demonstrate the possible presence and age of a fault that might impact the proposed development of the East and West Millennium Sites (Figure 1).

Based to a great degree on the CGS (2014a, b) Alquist-Priolo maps, GDC initially used Cone Penetrometer Tests (CPT) soundings and boreholes to evaluate to possible presence or absence of obvious breaks in the subsurface stratigraphy that could be interpreted as fault-related.

To supplement those cores and CPTs, a large (~134 ft. long by ~30 ft. deep) trench (West Trench) was excavated north to south on the 6230 Yucca St Site, GDC (2014a). An additional trench (East Trench) was excavated (~278 ft. long by ~30 ft. deep) east of the West Trench (Plate 1). The East Trench overlapped the West Trench by 95 feet to the north and trended south into the East Millennium Site for a combined total of 317 linear feet of trench exposures.

The trench exposures on the 6230 Yucca Street Site and the East Millennium Site were used to calibrate the cores and CPT lines and exposed the Holocene and late Pleistocene alluvial sequences and stratigraphy. This is useful for both numeric (radiocarbon) and relative soil dating (soil stratigraphy) and for reasonable extrapolation of stratigraphy across the entire East and West Millennium Site. With restrictions on entry to the property to the south of the East Millennium Site, it was not possible to extend the trench to achieve the 50-foot separation distance from the East Millennium Site. That area was investigated by a densely spaced collection of cores and CPT-soundings about 50 feet west of the trench footprint on the East Millennium Site (Plate 1). The cores and

In this report, GDC uses the term soil as a pedogenic (weathering) feature and as a tool for dating sediments, not as an engineering material.

In sum, the investigation included the following:

- Retention of Dr. Roy J. Shlemon to assist GDC with the analysis of the local Quaternary geology, soil stratigraphy and paleoseismology, and to provide an independent QA assessment of the investigation and report (Appendix B).
- GDC review and analysis of relevant geotechnical and geological investigations, and published geologic and geotechnical maps and reports pertaining to the East and West Millennium Site. Specific references are documented in Section 8.
- Interpretation of vertical stereo and oblique aerial photographs from the Continental Aerial Collection and the Spence Collection at UCLA.
- Coordination with the owner of the East and West Millennium Sites, Millennium Hollywood Development LLC, Underground Service Alert (USA), Subsurface Survey, Inc., the City of Los Angeles Department of Public Works and the engineering staff at Capitol Records, Inc., to locate utilities.
- Initial site observations to assess existing conditions relative to the planned development. Prior to drilling the cores or pushing the CPTs, initial advancement of a hand auger to 5 feet was performed to satisfy USA requirements.
- Advancement of 37 cone penetrometer tests (CPT), and collection of 19 continuous cores along two transects (Cross-sections M-M' and N-N') within and adjacent to the East Millennium Site in order to identify and date stratigraphic marker beds for local and regional correlation and continuity.
- Advancement of 41 CPT tests along two transects (Cross-sections O-O' and P-P'; Plate 1) within the West Millennium Site, as well as and collection of 16 continuous cores along Cross-section O-O' identification of and dating of stratigraphic marker beds useful for interpreting geologic structure and the presence or absence of active faults.
- Review and assessment of information from nearby and adjacent geological investigations.

- Excavating two trenches, the West Trench (on the 6230 Yucca Street Site) and East Trench (partially on the 6230 Yucca Street Site) with a continuation of the East Trench southward onto the East Millennium Site (Plate 3 and Plate 4a, 4b and Plate 5).
- Field preparation included brushing and scraping of the trench walls, setting up of level string lines, geologic logging and photographing both trenches across the East Millennium Site from north to south. Both trenches were periodically observed by geologists and staff from the City of Los Angeles Department of Building and Safety and geologists from the California Geological Survey.
- Two charcoal samples from the West Trench and nine from the East Trench were collected for potential radiocarbon dating. All eleven samples were submitted to Beta Analytic, Inc. (Miami, Florida; Appendix C). The Yucca 3 sample was not tested since it lacked datable carbon. The locations of the tested samples are plotted on the trench log (Plate 3, Plate 4A and Plate 5; Table 2).
- Construction of Cross-Sections A-A', E-E', M-M', N-N', O-O', P-P', Q-Q' (Plate 2, Plate 6, Plate 7, Plate 8, Plate 9 and Plate 10) with CPT and core logs and Cross-Sections B-B', C-C' and D-D' (Plate 3, Plate 4a, Plate 4b and Plate 5) trench logs.
- Preparation and summary of GDC findings and opinions with attachments and appendices compiled into this report.
- A third-party review of the data and report by Earth Consultants International, Inc. (ECI) will be presented separately.

3.0 GEOLOGIC INVESTIGATIONS

3.1 PREVIOUS INVESTIGATIONS

Previous geologic mapping and investigations were based mainly on a few outcrops in the area, on geomorphic expression, and on groundwater measurements from groundwater wells and geotechnical borings. Based on the limited, site-specific data (Hoots, 1930; Hoots and Kew, 1931; Dolan et al., 1997, 2000; Dibblee, 1988), the California Geological Survey published and submitted a Draft Fault Evaluation Report (FER 253, 2014b) to complement the Preliminary Alquist-Priolo Map for the Hollywood 7.5' Quadrangle (2014b). In that report, the CGS interpreted two strands of the Hollywood fault, identified as the Argyle and Yucca Street strands, which impacted the 6230 Yucca Street Site (GDC 2014 Yucca). In response, GDC presented preliminary investigation data (GDC 6230 Yucca Street Site report), and facilitated the CGS's review of open trenches at the 6230 Yucca Street Site, resulting in the CGS relocating the Argyle strand 70 feet to the south, just outside of the trench footprints (CGS, 2014b).

The Supplemental FER 253 (CGS, 2014a) still depicts two active (Holocene) traces of the Hollywood Fault (Argyle and Yucca Street Strands) as trending across the 6230 Yucca Street Site and the East Millennium Site respectively. Additionally, other geotechnical investigations in the area similarly addressed the potential impact of the Hollywood Fault and its secondary traces on the local area (Law, 2000; GeoPentech, 2001, 2005; Leighton, 2011; City of Los Angeles, 2009; Langan, 2011, 2012; GDC, 2006, 2014a, 2014b, and 2014c). Where relevant, data from these reports are also used in this analysis.

3.1.1 CONE PENETRATION TESTS

Conclusions and recommendations within this document are based in a large part on assessment of 103 CPT-soundings completed on the East and West Millennium Sites, the adjacent 6230 Yucca Street Site and the Green Site. Cross-section A-A' is a north-south transect on the 6230 Yucca Street Site. Cross-sections E-E', M-M' and N-N' are on the East Millennium site; and Cross-sections O-O', P-P' and Q-Q' are on the West Millennium site. GDC oriented the cross section transects perpendicular to the CGS (2014) inferred Argyle and Yucca strands, except for Cross-section Q-Q' which was constructed east to west. The CPT-soundings were pushed down to approximately 60 to 70 feet below ground surface (bgs) by Middle Earth, Inc. and Gregg In Situ, Inc. Logs and interpretations of the CPT data are given in (Appendix A) and (Plate 2, Plate 6, Plate 7, Plate 8, Plate 9, Plate 10) on Cross-Sections A-A', E-E', M-M', N-N', O-O', P-P' and Q-Q' locations are indicated on Plate 1.

3.1.2 CONTINUOUS CORES

Boreholes on the East Millennium site, including those placed on the 6230 Yucca Street Site and the Green Site, were initially advanced along the CPT traverses as shown on Plate 1 to calibrate and correlate the CPT data with site stratigraphy. GDC supplemented the initial borings with 16 additional boreholes to refine the interpretation of a stratigraphic unconformity near the C-5 of transect/cross-section O-O'.

Boreholes were typically advanced to approximately 60 feet bgs by Gregg Drilling, Inc., and ABC-Liovin Drilling, Inc., utilizing an 8.75-inch diameter hollow stem auger with a 3-inch diameter by 5-foot long split coring barrel down the auger annulus.

The recovered cores were placed in 2.5-foot long cardboard core boxes and transported to the GDC laboratory for further examination. Core logs are provided in Appendix A. Locations are indicated on Plate 1.

3.1.3 TRENCHING INVESTIGATIONS

Fault exploration trenches excavated on the east-adjacent 6230 Yucca Street Site proved useful to the GDC assessment of the absence of active faults on the East and West Millennium Sites in general and the East Millennium Site in particular.

3.1.3.1 WEST TRENCH

The trench was excavated on the 6230 Yucca Street Site. The top 13 feet along the west side of the trench were cut with a 1:1 slope to the first bench. Benches 2 through 4 were excavated with ~4 foot vertical and horizontal intervals to the bottom of the trench. This benching improved the stability of the trench and provided good exposures for logging (Cross-Section B-B'). The eastern side of the trench was sloped at 1:1 horizontal to vertical from top to bottom.

3.1.3.2 EAST TRENCH

The East Trench was excavated and logged in both the East Millennium Site and in the 6230 Yucca Street Site. This trench varied from about 30 to 80 feet wide, 12 to 35 feet deep increasing in depth to the south and around 278 feet long. The East Trench overlapped the southern portion of the West Trench and continued south into the East Millennium Site (Plate 4a, Plate 4b and Plate 5) for about 164 feet. The sides of the trench were benched to about 4 feet wide or greater and 4 feet high, horizontal to vertical (Plate 3, Plate 4a, Plate 4b and Plate 5).

4.0 GEOLOGIC FRAMEWORK

The Santa Monica Mountains began uplift in the Jurassic, and intermittent tectonic movement continues to the present (Hoots, 1930; Hoots and Kew, 1931; Dibblee, 1991). By the middle Miocene, transrotational deformation affected the Topanga sediments, resulting in simple, west-plunging folds. About 5 ma, in response to changes in relative movements of the North American and Pacific Plates and the resultant onset of transpressional stress along the San Andreas and related boundary faults, high-angle normal faults inverted to compression-driven reverse and thrust faults (for example, Wright, 1991). One of such faults/fault zones is the Hollywood Fault that has traditionally been judged to be a left-lateral-reverse feature near the base of the Hollywood Hills.

Transpressional deformation since inversion complicated the regional structural pattern. In the study area, the southeastern limbs of local folds were “down-dropped” along the Hollywood Fault Zone (Dibblee, 1991). By the onset of the Quaternary, many folds were buried by episodic, climatically controlled alluvial deposits that covered most of the study area. Starting at least by mid-Quaternary time, the surface expression of local left-lateral and thrust faults were generally buried by continuing region-wide alluviation. Great relief was generally expressed along major south-trending canyons that incised the alluvial cap(s), only to be filled and again partially filled in response to regional change in climate.

4.1.2 HOLLYWOOD FAULT

The Hollywood Fault Zone is one of several faults that, combined, form the general boundary separating the Transverse Ranges on the north from the Peninsular Ranges (and the Los Angeles Basin) on the south. The Hollywood Fault is generally divided into five segments all characterized by assumed left-lateral oblique (reverse) slip (Figure 4). The eastern terminus of Segment 2 and the western terminus of Segment 3 are northeast of the site that is the focus of this study (CGS, 2014a and b; FER 253). The CGS identified two inferred faults of Segment 2 as the “Argyle” and the “Yucca Street” strands, respectively. The Yucca Street Strand was inferred through the southern portion of the East Millennium Site and near the south boundary of the West Millennium Site; the Argyle inferred strand is north of the East and Millennium Sites and does not trend through the sites.

The locations of and relative activity estimates of the Hollywood Fault segments stem mostly from the interpretations of Dolan et al. (1997, 2000), who based their conclusions mainly on geomorphic expression of a series of interpreted fault scarps, on possible offset of alluvial fans flanking the southern Santa Monica Mountains, on previous geotechnical studies by LA Metro, and on differences in groundwater levels as depicted in geotechnical borings. The principal evidence for a Holocene surface rupturing event is documented in Dolan et al. (2000) where the fault was exposed in a series of overlapping bucket auger borings in front of Ozzie and Harriett’s house, 1822 Camino Palmero Road Hollywood, California, about 1.7 miles to the west of the East and West Millennium Sites (Figure 6). From those borings, Dolan and others (2000) estimated that at least one surface-rupturing earthquake took place about 8,500 years ago on the Hollywood Fault placing it within the Holocene (last ~11,500 yrs).

Based on the California Division of Mines and Geology (CDMG, 1999) the historic highest groundwater at the sites was more than 80 feet bgs. Because the sites are underlain by interbedded clayey to coarse sandy sediments, perched groundwater elevations vary widely from place to place. This is well illustrated by trench exposures and geotechnical borings (GDC, 2006) that show groundwater perched on variable-depth clayey sediments, usually old mud and debris-flows (Plate 3, Plate 4a, Plate 4b and Plate 5). The GDC recent investigations thus verify, from the continuous cores and trenches, that local groundwater levels in the 6230 Yucca Street, East Millennium and West Millennium Sites owe their origin to variable depths of clayey sediments and not a groundwater barrier due to fault offset.

5.1.3 TOPOGRAPHIC AND GEOMORPHIC ANALYSIS

GDC analyzed the topography of the East and West Millennium Sites and surrounding area as depicted on the USGS Burbank 7.5' Quadrangle, 1926 edition. Although substantial urban development has already taken place, the map shows a break in topography and ridges as the base of the Hollywood Hills. These ridges have been interpreted by various investigations (see CGS, 2014b) as evidence for active faulting associated with the Hollywood fault. Those truncated ridges, previously deemed to be fault-controlled and described by others as noted in the References, are shown on (Figure 3).

Prior to these investigations, there were no detailed subsurface geologic investigations that demonstrated the geologic origin of the breaks in slope previously attributed to active faulting. The GDC investigations now show that, alternatively, these breaks in slope could reasonably owe their origin at least in part to pre-Holocene uplift stemming from local and regional folding/faulting (GDC, 2014a). And, as the block uplifted, terrace surfaces were imprinted during periods of climatic and geomorphic stability.

The trenches and related subsurface data at the 6230 Yucca Street., Champion and Green Sites (Plate 1) allowed GDC to reconstruct the local paleo-geomorphic history of the area. Accordingly, in a reasonable scenario, GDC infers that the area was once covered by a regionally extensive blanket of alluvial deposits (Appendix B). An Argyle Channel then incised into the older alluvium (Qoal), forming the eastern side of the bluff south of the Champion Site that trends east-southeast away from the east side of the 6230 Yucca Street Site.

The mudflow (Qm) sediments were derived from the erosion of clayey sediments in the older alluvium deposits from distal upstream and local side slope sources. Down channel, the Mud Flow unit capped side slopes, and, locally, the Older Alluvium and Modelo Formation in the Argyle Channel.

4.2 LOCAL GEOLOGIC SETTING

The East and West Millennium Sites lie on five discrete geologic units: Artificial Fill (Af), Argyle and Cahuenga Sands (Qs), Mud Flow (Qm), Older Alluvium (Qoal), and the Modelo and Topanga Formations (Tm, Tt), youngest to oldest, respectively. These fluvial and alluvial fan sediments, excluding the artificial fill and marine Modelo and Topanga Formation, were derived from the

Hollywood Hills to the north (Figure 3). GDC describes the sequences starting from the youngest (artificial fill) to the oldest (Modelo and Topanga Formation) as documented in the trench logs, continuous cores and CPT's (Figure 5, Plates 1 through 10), and as referred to in Appendix D, Photos 9 through 12).

4.2.1 ARTIFICIAL FILL DEPOSITS (Qaf)

The East Millennium Site is capped by artificial fill composed of reworked native soils and detritus (Appendix D, Photo 9).

4.2.2 HOLOCENE SAND UNIT (Qs)

The Argyle Sand deposits consist of loose to moderately dense, gradationally bedded and sub-rounded to sub-angular sands with local, weakly cemented gravelly sands that were deposited into a channel excavated previously into the underlying Mud Flow and Older Alluvial units. The Argyle Sand deposits unconformably overlie the Mud Flow unit (informally designated as Qm) or sit directly atop the Older Alluvial unit where the pre-Argyle Sands' channelization has removed the mudflow deposits (Appendix D, Photo 10).

Several slightly to moderately developed paleosols occur within the sands and gravels (Appendix B). In the West Trench four paleosols reflect short periods of relative weathering and landscape stability (Table 2, Appendix B).

The East Trench exposures also provide calibration to more confidently identify the lithology and grain size of sediments in adjacent continuous cores and CPT transects. The GDC trench log and extrapolation to adjacent CPTs, cores, and trench logs illustrate that the Argyle Channel overlapping sediments and their underlying clayey marker-bed Mud Flow sediments are continuous and unbroken by any fault.

The Argyle Sands and gravels originated in the Hollywood Hills and were transported south down the Argyle Canyon as broad channel sand and alluvial deposits. The Argyle Sands are poorly to well sorted. The quartz sand grains are generally sub-rounded with frosted grain surfaces that indicate impact with other Argyle Channel sediments during fluvial transportation.

Five conventional radiocarbon samples from the East and West Trenches (Yucca-1, Yucca-2, Yucca-3, Yucca-4 and Mill-1) in the Argyle Channel sediments were collected and retained for the East Millennium Site and the 6230 Yucca Street Site (Plate 1), to evaluate the numeric age of the Argyle Channel sediments (Appendix C). The West Trench samples Y-1 and Y-2 are highly suspect as to the likely re-deposition of older organic sediment (~41,000 ybp) resulting in an unreliable old age. The Y-4 radiocarbon date was ~4170 ybp. The East Trench sample, Yucca-3, proved to be devoid of datable charcoal, and hence did not provide a useful age.

Table 2: Depth and the numerical age for radiocarbon samples from the Argyle Sands in the East Millennium Site (Appendix C).

Sample #	Depth (ft.)	Years (BP)	Sample #	Depth (ft.)	Years (BP)
Y-4	14	4,170	M-2	23	4,310
M-1	15	4,280	M-6	23	4,430
M-3	15	4,170	M-7	23	4,420
M-4	15	4,190	Y-2	25	4,310
M-5	20	4,330	-	-	-
			Y-1	25	41,000
			Y-3	15	No Datable Carbon

The West Millennium Site sand unit is described as the Cahuenga Sand deposits, which consist of loose to moderately dense, gradationally bedded and sub-rounded to sub-angular sands with interbedded silty sand and clayey sand units as well as clay and silt lenses. The Cahuenga Sand deposits uncomformably overlay the Mud Flow unit which was derived from the Cahuenga channel. On the north section of West Millennium Site, the Cahuenga Sand deposits uncomformably overlay or were deposited on top of the Older Alluvium unit. Based on the natures of the deposits observed in the continuous cores, the Cahuenga Sands originated in the Hollywood Hills to the north and were deposited to the south down the Cahuenga fan as broad alluvial deposits. The fan deposits generally are poorly sorted with some well sorted bedding. Frosted grains observed in the cores support our assessment that the depositional environment of this alluvial fan was fluvial in nature.

4.2.3 PLEISTOCENE MUD FLOW (Qm)

An intermediate deposit, labeled as Mud Flow (Qm), is locally present between the Older Alluvial unit (Qoal) and the overlying Argyle Sands (Qs). The Mud Flow unit (Qm) is enriched in clay compared to the Older Alluvium or the Argyle Sands. The mudflow deposits are typically firm with locally abundant sands, silts and few fine gravels within a clay-supported matrix (Appendix D, Photo 11). General grain-size and stratigraphic position indicate the Mud Flow unit mainly consists of mudflows and interbedded sands that filled a previously incised canyon. The mudflows were derived from both the slopes adjacent to the canyon, and from sources upstream, as illustrated on Cross-Section E-E' (Plate 6). The mudflow deposits that comprise the Mud Flow unit are internally horizontal, and thus unconformable with the underlying Older Alluvium. More recent Argyle Channel incision has eroded the upper part of the mud flow unit.

A soil section developed near the top of the Mud Flow unit has pedogenic characteristics consistent with that unit having been exposed to soil-forming processes for a minimum of ~30-

40 ka prior to it being incised into and then buried by the Argyle Sand. This estimate of soil development is a minimum, because the better-developed argillic soil horizons have been eroded (Appendix B). Where the Argyle Sand unit has eroded deeply into the Mud Flow unit, as seen in Cross-Sections A-A' and B-B', and in the West Trench, only the lowest portion of the Mud Flow unit remains. This section of the Mud Flow unit has a poorly preserved, remnant soil section with pedogenic characteristics that suggest between about 12 ka and 15 ka of soil development prior to burial by the mudflow deposits capped with the ~30 ka paleosol (Appendix B). Combined, these paleosols provide a minimum estimate of the Mud Flow unit's exposure to soil forming processes of ~42-55 ka.

Within the East Millennium Site, the mudflow deposits were exposed in the bottom of the East Trench, but at an elevation of 35 feet lower than exposed to the northern portion of the trench. Although it cannot be confirmed that it is the same deposit based on the trench evidence alone, the stratigraphic continuity of the Mud Flow unit in the CPT/Boring transects suggests that this was continuous and at a minimum 12- to 15-foot thick before the last incision of an Argyle Channel. We interpret that the mudflow sediments filled the channel to an elevation similar to the current Argyle Sands. Furthermore we interpret that the remnant mudflow capping the bedding plane fault within the Old Alluvium as near the top of the Mud Flow Unit. Therefore, the original thickness can be constrained by that elevation and the base of the remaining mudflow deposit as recorded in the CPT transect (20 + 15 = 35 feet). This is still a minimum thickness because it is unknown how much was removed from original surface. But relative paleosol development indicates that erosion was not much more than a few feet as documented by the presence of remnant argillic (Bt) horizons. (Plate 2, Plate 6 and Appendix B).

The conceptual model of alternating cutting and filling to essentially the same elevation, verified by the trench exposures, does not support causation by local tectonic activity; but is better explained by regional climatic fluctuations (Chart 1).

CHART 1:

Chart 1 shows generalized sea level curves for the last 200,000 years, showing the rise and fall of marine sea levels reflected by fluctuations of glacial alpine and continental ice sheets (Martinson, and others, 1987). Major coastal stream drainages responded to sea level change by initial channel incision during glacial period followed by channel backfilling and deposition during interglacial periods. Chart 1 shows the timing of the last glacial maximum at 20 ka, the likely maximum incision of Argyle Creek and Cahuenga Creek, followed by deposition of the Argyle Sands and Cahuenga Sands.

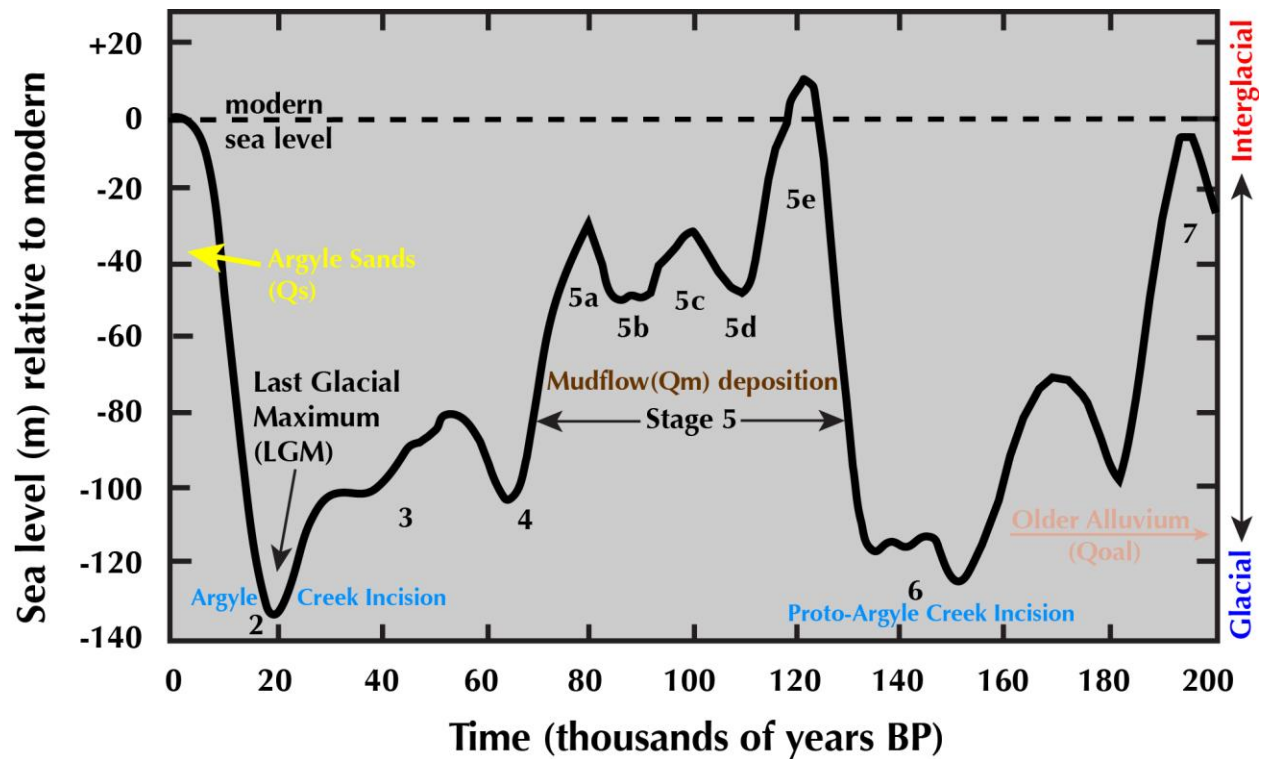


Chart 1 also illustrates the likely age of deposition of Qm, (approx. 80-125 ka) and incision of a proto-Argyle Creek Channel about 150 ka ago. Also shown is an inferred minimal age for the Old Alluvium (Qaol), interpreted as greater than 200 ka

As illustrated in this generalized sea level curve, about 20,000 years ago during the last glacial maximum, Argyle Creek and other major fluvial systems emanating from the Santa Monica Mountains likely responded to the ~450 foot lowering of worldwide sea levels. At this time of regional incision (base level lowering), mudflow deposits were eroded from the original channel. Reflecting worldwide climatic warming and resulting deglaciation, sea level began to rise ~18,000 years ago. Inland from the coast, the basal Argyle gravel lenses and interbedded coarse sand began to fill the old channel about 12,000 years ago (Appendix B). This far inland, it would likely have been 10,000 years at the earliest before the base level changes would have occurred, so most of the Argyle Sand deposition would have occurred in the 8,000 – 3,000 year range, an interpretation borne out by the pedogenic and radiocarbon age estimates (Appendices B and C).

By mid-Holocene time, the original Argyle Channel (thalweg) was essentially filled with coarse to medium-grained sands. About this time, based on the trench exposures and ~4,500 year radiocarbon dates, the Argyle sediments bifurcated into at least two distinct distributary channels, unconformably overlying old mudflow deposits as exposed in the East Trench, and conformably with the early Holocene deposits in the main channel as observed in the West Trench (Plate 4a, Plate 4b and Plate 3, respectively).

As shown on Chart 1 two alternative hypotheses reasonably give the approximate time for deposition of the mudflow deposits and for incision of an earlier Argyle channel. On the one

hand, incision of a paleo-Argyle channel may have started with the onset of isotope stage 4 (Last Glacial Maximum; Chart 1). Ostensibly, therefore, the mudflows, emanating from the channel slopes and from upstream, would have then filled the channel during stage 3, about 35,000-40,000 years ago (Chart 1). This comports well with pedogenic age estimates of at least ~30,000 years for the (mudflows) as documented from the East Trench.

On the other hand, and more realistically, the earliest recognized Argyle Channel incision took place during the glacio-eustic lowstand of isotope stage 6, about 150,000 years ago. The stage 6 sea level was comparable in depth to that of stage 2 (Last Glacial Maximum; Chart 1). Accordingly, in this scenario, most regionally extensive mudflows and local debris flows were episodically laid down between ~150,000 and 125,000 years ago as sea level (regional base level) was rising to the substage 5e (last major interglacial) about 120,000 year ago (Chart 1). The age interpretation is better supported by the pedogenic estimates of *at least* ~30,000 years for the mudflow deposits, an age which is inherently minimal owing to erosion of most argillic (Bt) soil horizons (Appendix B).

Based on the similarity in thicknesses of the Mud Flow and Argyle Creek sediment packages, the older scenario is preferred for timing of channel incision and mudflow deposition. Accordingly, as particularly exposed in the East Trench, located to the north of the East Millennium Site, the last local faulting event most likely took place prior to about 125,000 years ago (Chart 1).

The Cahuenga Channel incision possibly formed in a similar manner as the Argyle channel incision, but the Cahuenga Channel was not exposed in CPT or continuous coring transects on the West Millennium Site. Based on the continuous core data, GDC interprets that it is on a distal edge of the fan, based on the inter-fingering sand, clay and silt beds and by comparison of the silt and clay content observed in the Cahuenga Channel sand with the Argyle Channel sand.

4.2.4 PLEISTOCENE OLDER ALLUVIUM (Qoal) DEPOSITS

The Older Alluvium is mostly capped by the Mud Flow unit, except where the mudflow deposits have been eroded by the Argyle Channel and where the Cahuenga fan covers Older Alluvium in the northern area of the West Millennium Site. The Older Alluvium includes many tens of thousands of years of interfingering mudflows, debris flows and local channel fining-upward sequences, with gradational contacts between the beds. The anticline north of Yucca Street (Plate 1) indicates that the Older Alluvium becomes younger and dips more steeply to the south, on the south flank of the anticline (Appendix D, Photo 12). The age of the Older Alluvium is at least 200 ka (Chart 1) and predates the Mud Flow unit and the Argyle Sands.

4.2.5 MIOCENE BEDROCK (Tm and Tt)

The bedrock in the East Millennium Site is the Miocene Modelo Formation as mapped by Hoots and Kew (1931). The Modelo Formation within the Santa Monica Mountains is generally soft, light-gray to brown, well-bedded shale with isolated hard platy siliceous shale and massive to thin beds of sandstone, siltstone, and massive conglomeratic sandstones. The occurrence of volcanic ash beds has been documented by Hoots et al. (1931). At the 6230 Yucca St Site, the

Modelo Formation was observed in cores with thin sequences of gray to greenish gray sandstone, siltstone, and claystone.

Typically, the Modelo was observed about 40 feet bgs between CPT-13a north to CPT-17, at B-4, and deeper from B-5 to B-6 (Plate 2). The Modelo Formation is unconformably overlain by Older Alluvium (Qoal) in the East Millennium Site and by Mud Flow (Qm) deposits north of B-5 (where the Older Alluvium was eroded away) (Cross-Section A-A'). At its upper contact, the Modelo is a strongly weathered clayey to silty clayey shale, dipping about 40 degrees. The direction of dip, however, was not determined since the cores that encountered the Modelo Formation were not orientated. The Upper Modelo sediments are plastic to stiff and lack sedimentary structure. At depth, the Modelo Formation is less weathered, grading to dark gray to black, thinly bedded fine sands and clay, and hard clayey shale. Carbonate-filled macro-fractures were not evident. North of the East Millennium Site, as identified in the CPT's and cores, the Modelo Formation is unconformably overlain by the Mud Flow (Plate 7; Figure 10 and 11).

The bedrock in the West Millennium site is the middle Miocene Topanga Formation as mapped by Hoots and Kew (1931). The Topanga Formation within the Santa Monica Mountains generally consists of a tan to grey conglomerate and sandy conglomerate that is well-cemented and resistant to erosion. The upper section of the Formation consists mostly of light tan to grey, medium to coarse grained, poorly sorted sandstone, concretionary and conglomerate beds with interbeds of massive to poorly bedded olive grey siltstone with basalt clasts.

The Topanga Formation was observed at approximately 50 feet bgs to 65 feet bgs between B-12 and C-9, respectively, to the south across the site (Plate 9). Since the Topanga Formation encountered in the West Millennium site's cores consisted of fractured basalt and olive grey siltstones, the true orientation of the Topanga beds could not be determined.

4.3 LOCAL STRUCTURE

4.3.1 YUCCA STREET ANTICLINE

The Yucca Street Anticline, was interpreted from NE-dipping older alluvial strata at the Green Site (1800 Argyle Avenue), and south-dipping strata at the Champion (1756 and 1760 Argyle Avenue) and 6230 Yucca Street Sites. The crest of the fold trends WNW-ESE approximately through the intersection of Argyle and Yucca Street (Plate 1).

Based on the un-orientated cores at the 6230 Yucca Street Site, the Modelo beds (B-3, B-5, and B-8) have inclinations ranging from about 25 degrees in B-3, to about 20 degrees in B-5, to 35 degrees in B-8. Faulting logged in the three Green Site trenches showed beds in the Older Alluvium dipping in a northeasterly direction at ~21 degrees or less.

The dips of the Modelo beds on the 6230 Yucca Street Site are about the same when projected along strike and correlated to the Qoal beds in the East Trench. This is a good indication that the Modelo and Qoal were folded at the same time. The Modelo beds in core samples along Argyle Avenue (north of Yucca Street) are highly fractured with bedding vertical to near vertical. The older alluvium beds above the Modelo beds along Argyle Avenue have un-orientated core dips of around 20 degrees farthest north and near horizontal close to Yucca Street. Since the

upper Qm overlying the Qoal is not deformed by the folding, this deformation of the older beds ceased before deposition of Qm, at least ~150 ka but likely older as indicated in Section 4.3.2.

4.3.2 ANTICLINE-RELATED FAULTS

Recent explorations on the Green Site at 1800 Argyle Avenue and the Champion Site at 1756 and 1760 Argyle Avenue demonstrate that the normal faulting along the Yucca Street Anticline crest show a series of normal faults that dip toward the anticline axis (GDC, 2014b, 2014c Figure 12). As such, faults terminated in the un-deformed >200 ka upper old alluvium deposits. Accordingly, as documented in Appendix B, a representative soil-stratigraphic section was measured and described on the north wall at Station 00+26.

Two systems of faults rise from a gravelly sand bed at the bottom of the trench and flower upward (Plate 18) until they are truncated in the Pleistocene upper older alluvium and side slope colluvium. In places along their surfaces the faults are clay filled with occasional carbonate coatings which may be post depositional other than fault-cast veins. Slickensides and gouge zones are absent.

On the west and east walls of the East Trench of the 6230 Yucca Street Site, GDC identified a south dipping bedding-plane fault, with apparent reverse movement (Appendix D, Photo 8, west wall, Station 0+79). The fault strikes N34°W and dips 49°S. It is characterized by a thin black clay with modern roots following the sheared bedding plane. The fault does not propagate into the Mud Flow unit, and terminates beneath a remnant paleosol formed within the Mud Flow unit. Since the slip took place along bedding, the total slip could not be determined. No post-pedogenic shearing was present within the secondary paleosol clays, demonstrating that any slip on the fault pre-dated (perhaps significantly pre-dated) the development of the pedogenic weathering horizon, estimated by the remnant pedogenic development to a minimum age of ~30 ka, and a total about of at least 50 ka.

To summarize, the anticline-related faults are shown to be pre-Holocene and > 150 ka, most likely > 200 ka. This conclusion is consistent with earlier studies (GDC, 2014b, 2014c) and the GDC local structural model that shows the faults as pre-Holocene. Further, this test of the GDC (2014c) interpretation validates the inactive anticline-fault model of this area. The anticline and the associated faults are not active according to the State of California Alquist-Priolo definitions and the City of Los Angeles Fault Rupture Study Areas.

Additionally, the faults did not produce any topographic expression on the base of the Mud Flow unit and thus could not have moved vertically since the erosion of the channel was subsequently filled by the Mud Flow unit.

4.3.3 INFERRED SOUTHERN FAULT

The inferred southern fault was interpreted from a structural and stratigraphic unconformity observed on the south end of the East and West Millennium Sites. This unconformity has a break in stratigraphy and bedding structure as seen on Plate 7, Plate 8 and Plate 9 at location B-5, B-4 and C-104 respectively. The unconformity is located on Cross-section O-O' at B-4, Cross-section P-P' at C-104 and on Cross-section M-M' at C-20.

To the north of the aforementioned CPT and borings, the bedding of the lower sediments have an apparent dip of ~20 degrees while the south side sediments are nearly horizontal. The sediments to the north are granular with abundant sands, gravels and some clays and cobbles. To the south, the sediments in the horizontal beds have more abundant silt to clay.

An unbroken mudflow deposit was found overlying the unconformity in both the East and West Millennium Sites. Channels and marine terracing are potential explanations for the unconformity found in Plates 7, 8 and 9. However, to be conservative, the unconformity is assumed to be a north dipping reverse fault.

There are two sources for the mudflow deposit that originated during the deposition of the Cahuenga alluvium in the West Millennium Site and the Argyle alluvium in the East Millennium Site. Both deposits have a pedogenetic soil development with a relative weathering age of ~35 ka to ~40 ka which cumulatively is ~ 80 ka to ~125 ka years old and are therefore pre-Holocene in age. Since the inferred southern fault does not break the mudflow deposit, its last movement must have occurred at least ~150ka years ago. It is therefore not active according to City of Los Angeles Fault Rupture Study Areas and the State of California Alquist-Priolo definitions.

5.0 EVALUATION OF FAULT ACTIVITY

5.1 CPT/CORES – EAST MILLENNIUM SITE

Geologic observations of the CPT soundings and cores document the subsurface geology across the East Millennium Site from north to south (Appendix A). The upper 5 feet was not sampled due to the excavation with a hand auger to satisfy USA requirements.

Below the surface, from approximately 3 to 5 feet, the hand-auger encountered silty sands and silts with scattered sand, gravels, and fill consisting of debris from its demolition of the previous building. This sub-unit was weak to moderately dense.

The Argyle Sand deposits (Qs) predominate the upper 25 feet in the northern area but are thin to ~20 feet in the south (Plate 3, Cross-Section B-B'; Station 0+0 to 1+15). This sand, part of the Argyle Channel, unconformably overlies Mud Flows (Qm) and Older Alluvium (Qoal). The Argyle Sands are typically well graded. The cut and fill channels were evident in the trench exposures, but not detectable in the cores.

Both the CPT and continuous core cross-sections and the East Trench encountered the Older Alluvium (Qoal) near the surface in the northern portion of the property but not Older Alluvium at 35 feet in the West Trench. The upslope sediments below the Argyle Sand consist of mudflows deposits over Modelo Formation, whereas the downslope (south) side of the slope has mudflow deposits over Older Alluvium (Qoal). The upper Pleistocene Mud Flow deposits are continuous and clearly unbroken where they overlie the paleoslope. Additionally, the mudflows (between CPT-11 and CPT-13) mark the thalweg of the Argyle Channel and are traceable southwest across the site, eventually observed in the West Trench exposures (Appendix D; Photo 5).

The mudflow deposit depicted on north-south Cross-Section A-A', (Plate 2), is rising in elevation and thinning to the south. Since the Argyle Channel thalweg is trending to the south-southwest, or westerly from the southern portion of Cross-Section A-A', the mudflow is ascending up the

eastern Argyle Channel paleoslope which results are an increase in the elevation and thinning of the Mud Flow deposit along the southern section of the cross-section line.

The CGS Supplemental FER 253 (2014a) moved the inferred trace of the Yucca Street Strand of the Hollywood Fault to the south side of the East Trench and through the alley between the Pantages Theater and the East Millennium Site (Plate 1). To explore the existence of or date the last movement of the supplemental trace of the Yucca Street Strand, a series of CPT's and continuous cores was conducted across the western boundary of the alley to the south of the East Millennium Site and across the inferred fault trace. After plotting the sub-surface data across the alley, the stratigraphy was found to be continuous and not broken by fault activity in the Holocene Argyle Sands and the pre-Holocene Mud Flow unit (Plate 7, Cross-Section N-N').

5.2 CPT/CORES – WEST MILLENNIUM SITE

Two CPT transects were also conducted within the West Millennium Site, (Plate 1 and Figure 8 and Figure 9). The western most transect included 25 CPTs, and the eastern transect included 16 CPTs. Our analysis of these transects indicates that there is an unconformity near the south end of this site referenced in Section 4.3.3 of this report. The Cahuenga sands and mudflow deposits are continuous and unbroken within the cross-section transects (Plate 8, Plate 9 and Plate 10). These preliminary findings are consistent with the detailed data of the East Millennium Site. Accordingly, our assessments indicate that no active faults exist on the West Millennium Site.

6.0 CONCLUSIONS

This report summarizes the results of the geological investigations for the East and West Millennium Sites, incorporating results from the adjacent 6230 Yucca Street Site as well as data from other surrounding sites.

The geologic investigation summarized in this report was based upon 42 continuous-cored borings, 103 Cone Penetrometer probes, and 316 feet of geologically-logged trench walls. In summary, no Holocene-age faults were found on the East and West Millennium Sites. The details of the findings and conclusions are:

1. Sediments at the East and West Millennium Sites range downward from the uppermost Holocene Cahuenga and Argyle sands to a Late Pleistocene Mud Flow units unconformably overlying a Mid-Late Pleistocene Older Alluvial unit, all overlying the Modelo and Topanga Formation bedrock.
2. Radiocarbon dating and soil pedogenic analysis indicate 8-12 ka maximum age for the Argyle Sands, a minimum age of 50 ka (80-125 ka preferred) for the Mud Flow unit, and an estimate of greater than 200 ka for the Older Alluvial unit.
3. An anticlinal structure was defined with the crest trending north of the East Millennium Site but with the southern limb of the fold underlying the East Millennium Site.
4. The mudflow unconformably overlies the dipping older alluvial beds, demonstrating the folding predates the channel incision that contains the mudflow deposits.
5. Four parallel north-south boring and CPT transects show continuity of the top and bottom of the Mud Flow unit extending across the entire East and West Millennium Sites, including 50+ feet to the north in the east site.
6. A bedding plane fault on the adjacent 6230 Yucca Street Site does not extend or affect the East Millennium Site. Furthermore this fault has been shown to be not active.
7. An unconformity was found on the south ends of the boring and CPT transects on the West Millennium Site. To be conservative, the unconformity is considered to be a fault although channels and marine terraces are other potential explanations. The fault is pre-Holocene in age, approximately 150 ka and therefore inactive.
8. Boring and trench data show that the differential groundwater levels are not fault related, but rather owe their origin to local water perched on underlying impermeable deposits.

9. No surface rupture hazard exists on or within the East or West Millennium Sites.
10. On the southwest portion of the East Millennium Site and on the northern portion of the West Millennium Site, a 50 foot setback zone is required (see Plate 1 and Figure 8, Boring, CPT, Cross-Section, and Trench Locations and geology map). Additional exploration will need to be conducted south of the East Millennium Site property line and north of B-12 on cross-section O-O', on the West Millennium Site, as shown on the figure and plate. Upon submittal of a supplemental report, the setback line can be adjusted, upon approval from the LADBS.

7.0 LIMITATIONS

The overall assessment of the geologic and fault hazard conditions, in this report, reflects GDC's professional opinions and is intended for use by Millennium Hollywood Development LLC, and its design consultants. This report has been prepared solely for assessing seismic impact of the proposed development and may not contain sufficient information for environmental (hazardous waste) and geotechnical (foundation) purposes. The recommendations shall not be extrapolated to areas not covered by this report, or used for other facilities, without the review and approval of GDC and Millennium Hollywood Development, LLC. This report or any portion of this report may be provided to state, county or city agencies.

GDC's investigation and evaluations were performed in accordance with generally accepted local standards using that degree of care and skill ordinarily exercised under similar circumstances by reputable engineering geology and geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report.

8.0 REFERENCES

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TABLE 1: MILLENNIUM HOLLYWOOD PROJECT PROPERTY LEGAL ADDRESSES

Table 1: Millennium Hollywood Project Property Legal Addresses			
Address	Tract Number	Block	Lot Number
1746 North Ivar Avenue	Hollywood	21	5
1748 North Ivar Avenue			
1754 North Ivar Avenue	Hollywood	21	4
1760 North Ivar Avenue	Hollywood	21	3
1764 North Ivar Avenue			
1745 North Vine Street	Hollywood	21	19
1749 North Vine Street			
1751 North Vine Street	Hollywood	21	20
1753 North Vine Street	Hollywood	21	21
6334 West Yucca Street	Hollywood	21	2
No Address	Hollywood	21	1
6236 West Yucca Street	TR 18237	--	LT 1
1740 North Vine Street			
1750 North Vine Street			
1760 North Vine Street	Central Hollywood Tract No. 2	--	12
1762 North Vine Street			
1764 North Vine Street			
1766 North Vine Street			
1768 North Vine Street			
No Address	Central Hollywood Tract No. 2	--	13
1770 North Vine Street	Central Hollywood Tract No. 2	--	13
1733 Argyle Avenue	TR 18237	--	LT 1
1741 Argyle Avenue			
1720 Vine Street	Central Hollywood Tract No. 2	--	6
1722 Vine Street			
1724 Vine Street			
1730 Vine Street	TR 18237	--	LT 1

FIGURES

Figure 1	Site Map Showing Proposed AP Zone
Figure 2	CGS Quaternary Geologic Map
Figure 3	Local Geology Map, Hoots and Kew, (1931)
Figure 4	Hollywood Fault Geomorphic Segments, FER 253
Figure 5	Generalized Stratigraphic Column
Figure 6	Locations of Previous Studies in Reference to the Millennium Sites
Figure 7	Map Illustrating Geomorphic Features near the Millennium Sites
Figure 8	Geology Map

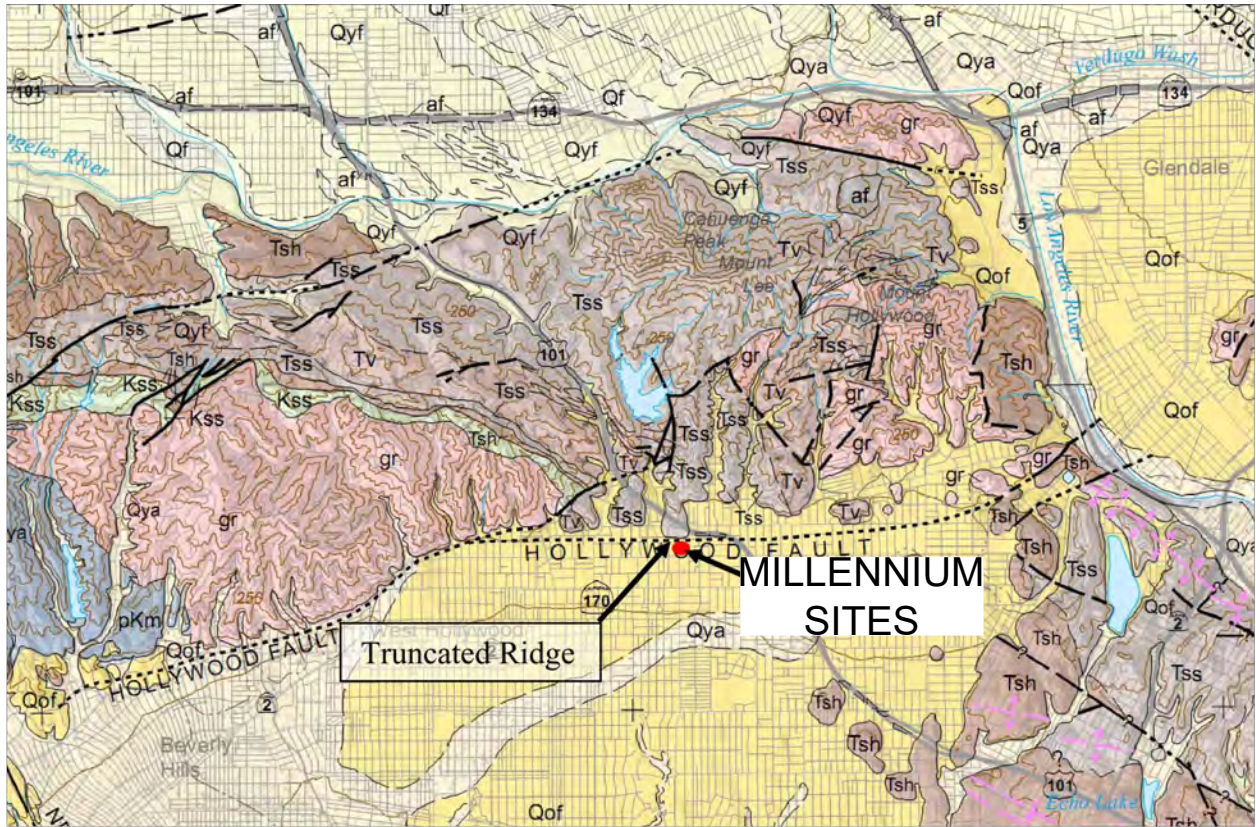


Figure 2: Regional geologic map of the area. Scale ~1:100,000. (California Geological Survey., 2003, "Quaternary Geology Map of the Los Angeles 30x60 Quadrangle").



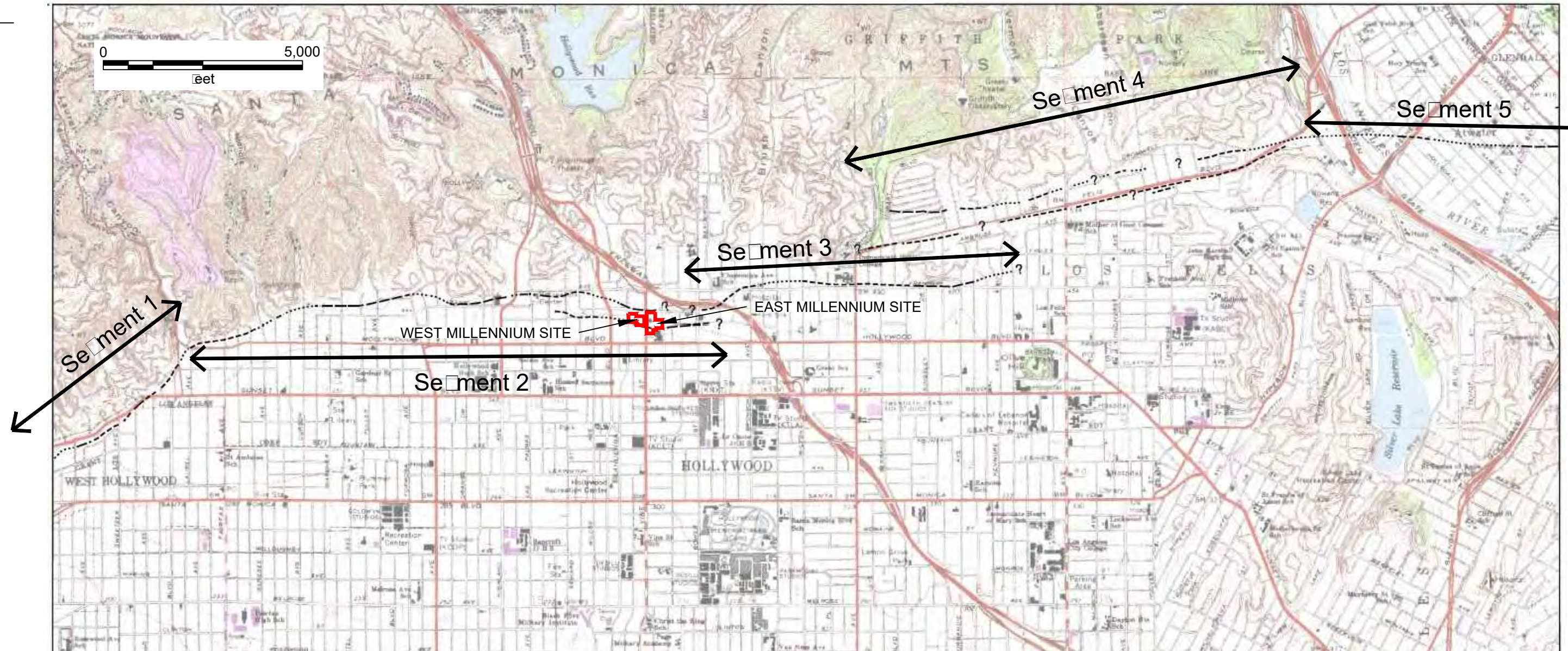
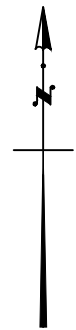
DATE: 4/21/2014	DRAWN BY: KM		GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	CGS QUATERNARY GEOLOGIC MAP	PROJECT NUMBER: LA1191A
REVISION: 10/31/2014	APPROVED BY: SK				SCALE: NO SCALE
REVISION: 1/28/2015	Modified from GDC, 2014a			WEST/EAST MILLENNIUM SITES	FIGURE NUMBER: 2




Figure 3: Geologic map of Millennium site and vicinity (after Hoots and Kew, 1931) showing inferred trace of a Hollywood Fault separating Modelo (T_m), and Topanga (T_t) Formations, granite rocks (gr), and alluvium (Q_{al}).

DATE: 4/11/2014	DRAWN BY: KM		GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	LOCAL GEOLOGIC MAP		PROJECT NUMBER: LA1191A
REVISION: 10/31/2014	APPROVED BY: SK					SCALE: NO SCALE
REVISION: 1/28/2015	Modified from GDC, 2014a			WEST/EAST MILLENNIUM SITES		FIGURE NUMBER: 3



Map Reference: Fault Segments From Supplemental CGS, 2014b

DATE: 4/9/2014	DRAWN BY: KM		GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	HOLLYWOOD FAULT SEGMENT MAP		PROJECT NUMBER: LA1191A
REVISION: 10/31/2014	APPROVED BY: SK					SCALE: NO SCALE
REVISION: 1/28/2015	Modified from GDC, 2014a			WEST/EAST MILLENNIUM SITES		FIGURE NUMBER: 4

GENERALIZED STRATIGRAPHIC SECTION

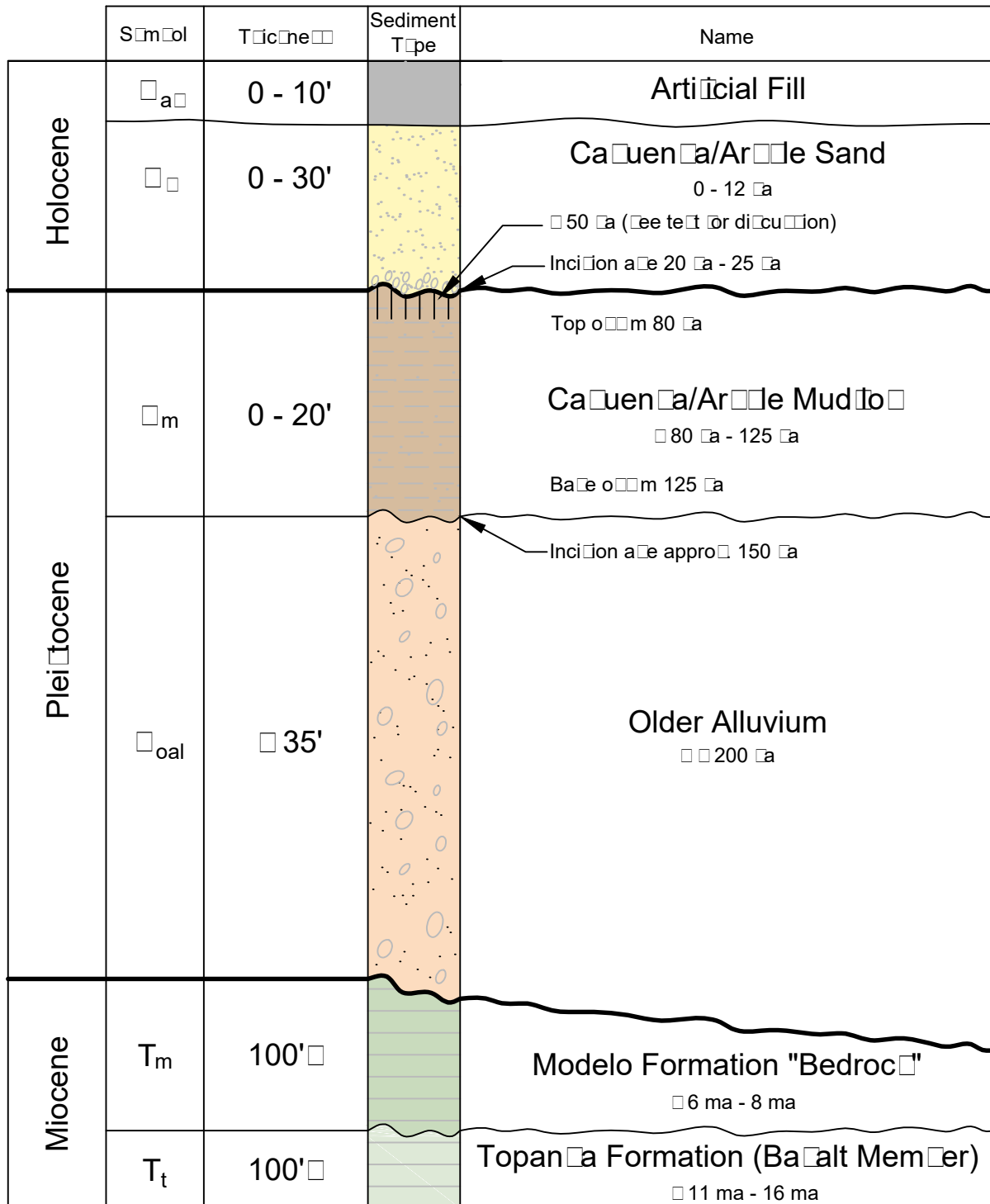
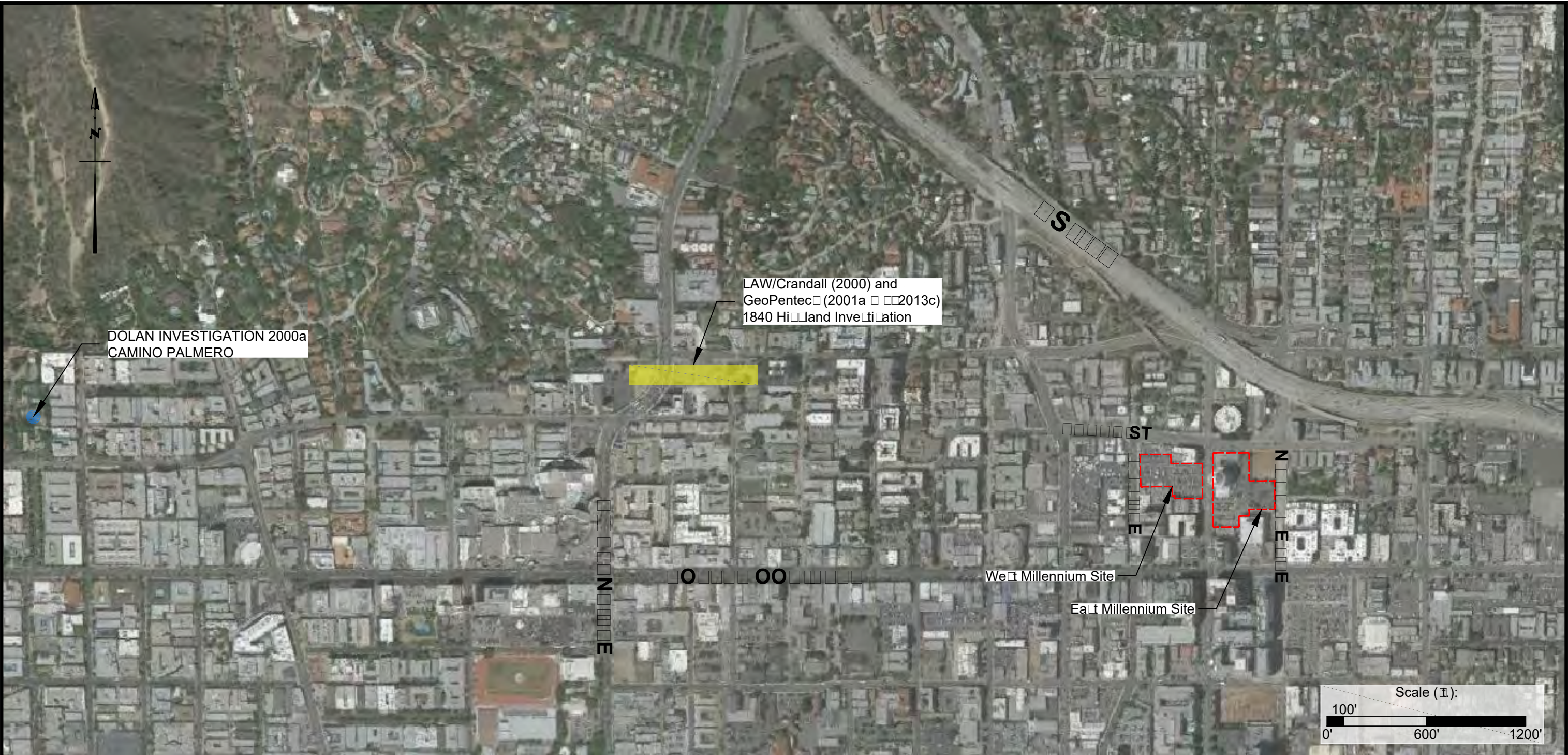


Figure 5

Modified from G. [unclear]




Map Reference: Google Earth
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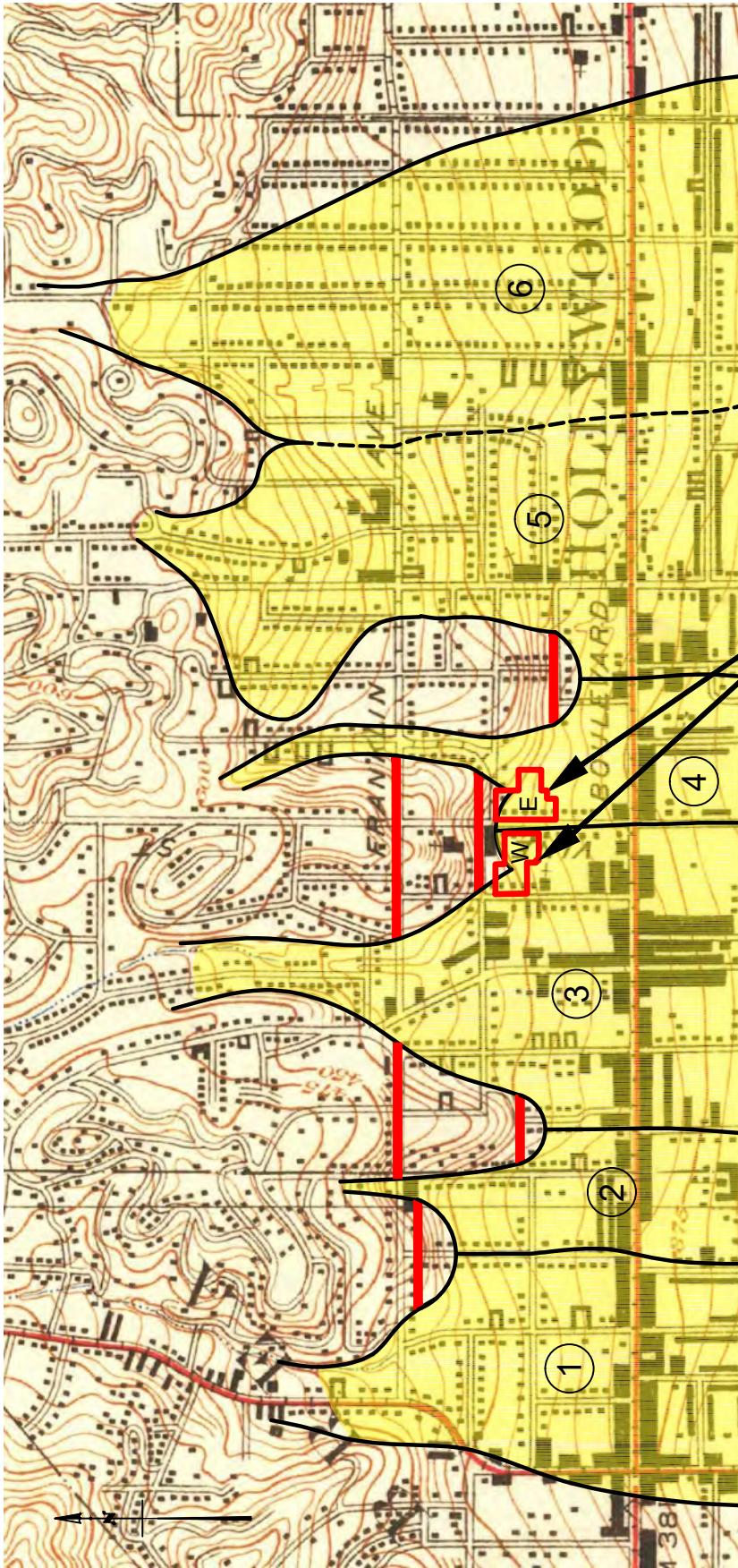
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DATE: 1/12/2015	DRAWN BY: JMT		GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	LOCATIONS OF PREVIOUS STUDIES IN REFERENCE TO THE MILLENNIUM SITES	PROJECT NUMBER: LA1191A
REVISION: 2/23/2015	APPROVED BY: SK				SCALE: AS SHOWN
REVISION:				WEST/EAST MILLENNIUM SITES	FIGURE NUMBER: 6




Ref: [Urban](#) [Road](#) [Water](#) [Vegetation](#) [Topography](#) [Infrastructure](#) [Land Use](#) [Soil](#) [Geology](#) [Climate](#) [Biology](#) [History](#) [Culture](#) [Economics](#) [Politics](#) [Law](#) [Education](#) [Health](#) [Environment](#) [Energy](#) [Transportation](#) [Communication](#) [Technology](#) [Science](#) [Art](#) [Literature](#) [Music](#) [Dance](#) [Theater](#) [Film](#) [Television](#) [Radio](#) [Internet](#) [Mobile](#) [Social](#) [Gaming](#) [Sports](#) [Recreation](#) [Religion](#) [Philosophy](#) [Ethics](#) [Law](#) [Politics](#) [Economics](#) [History](#) [Culture](#) [Education](#) [Health](#) [Environment](#) [Energy](#) [Transportation](#) [Communication](#) [Technology](#) [Science](#) [Art](#) [Literature](#) [Music](#) [Dance](#) [Theater](#) [Film](#) [Television](#) [Radio](#) [Internet](#) [Mobile](#) [Social](#) [Gaming](#) [Sports](#) [Recreation](#) [Religion](#) [Philosophy](#) [Ethics](#)

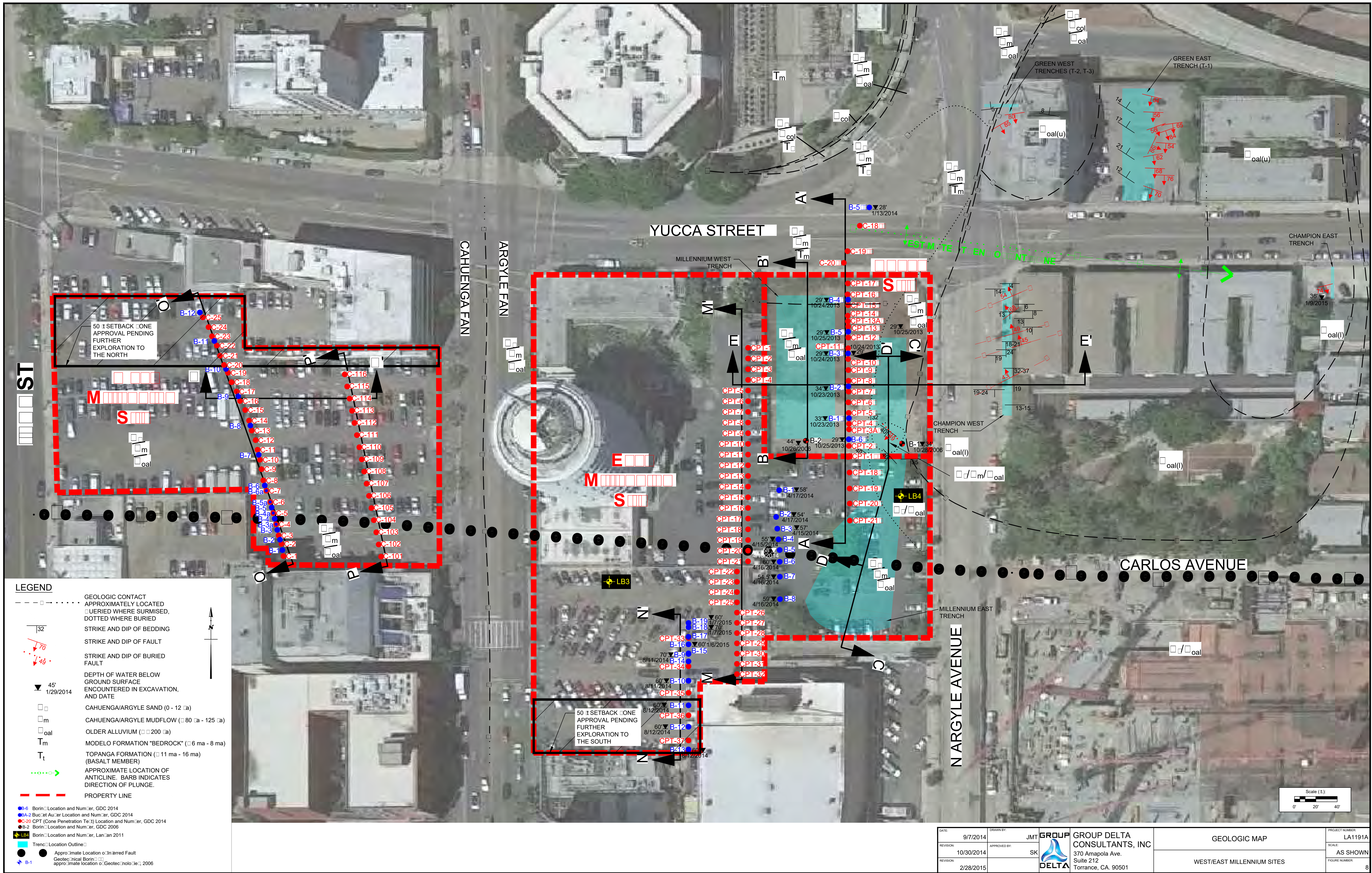
MILLENNIUM SITES

Legend

- ① Highland Fan
- ② Whitley Fan
- ③ Cahuenga Fan
- ④ Argyle Fan
- ⑤ Beechwood Fan
- ⑥ Brush Fan

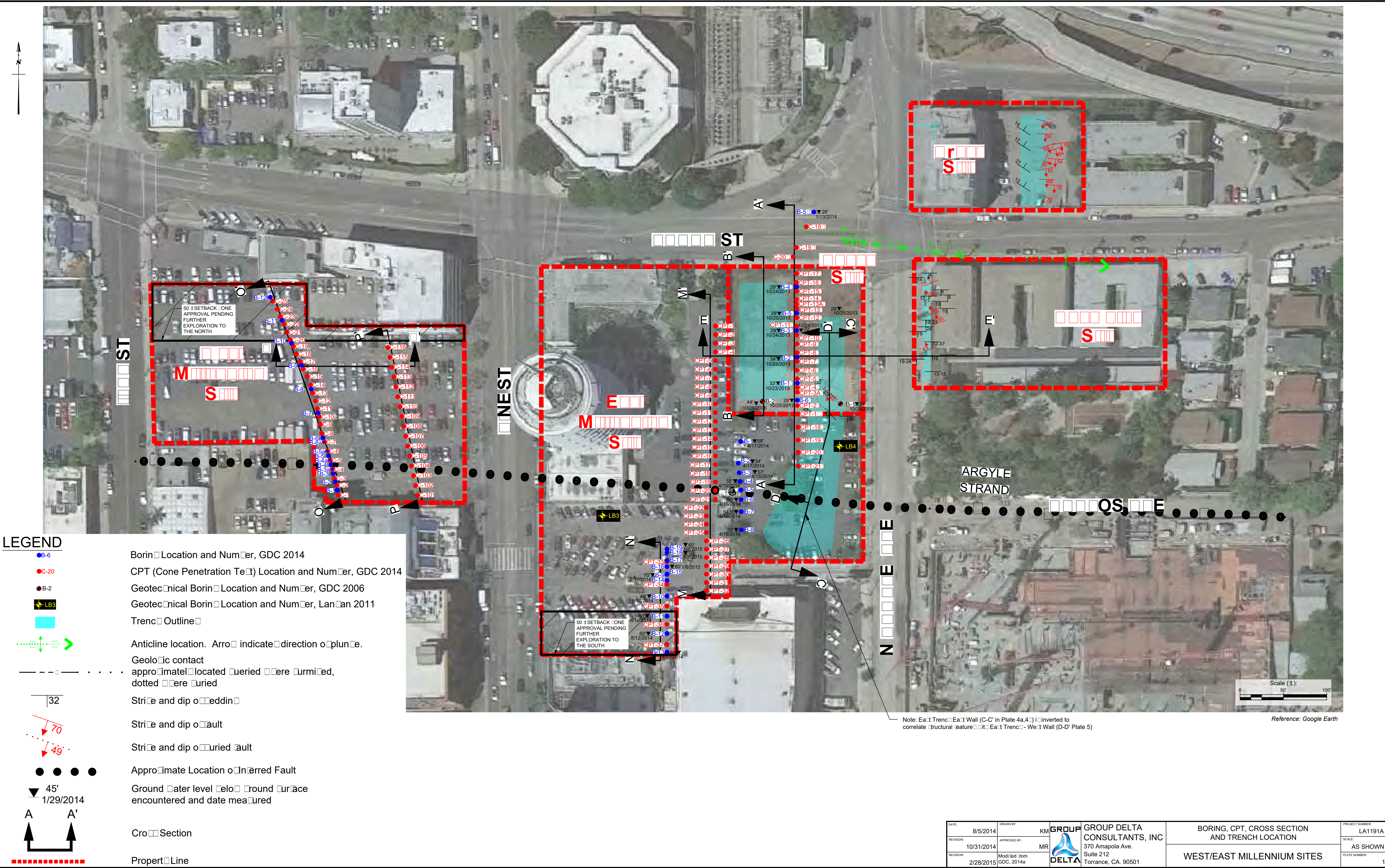
— Geomorphic Breaks in Slope

DATE: 4/21/2014	DRAWN BY: JMT	 GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	MAP ILLUSTRATING GEOMORPHIC FEATURES NEAR THE MILLENNIUM SITE	PROJECT NUMBER: LA1191A
REVISION: 10/31/2014	APPROVED BY: SK			SCALE: NO SCALE
REVISION: 2/6/2015	Modified from GDC, 2014a		WEST/EAST MILLENNIUM SITES	FIGURE NUMBER: 7



PLATES

Plate 1	Boring, CPT and Trench Locations: (Back Pocket of Report)
Plate 2	Cross-Section A-A' (CPT/Core): (Back Pocket of Report)
Plate 3	Cross-Section B-B' (West Trench): (Back Pocket of Report)
Plate 4a, 4b	Cross-Section C-C' (East Trench – East Side): (Back Pocket of Report)
Plate 5	Cross-Section D-D' (East Trench – West Side): (Back Pocket of Report)
Plate 6	Cross-Section E-E' (East-West)
Plate 7	Cross-Section M-M' and N-N' (Back Pocket of Report)
Plate 8	Cross-Section O-O' (CPT/Core) West Millennium Site
Plate 9	Cross-Section P-P' (CPT) West Millennium Site
Plate 10	Cross-Section Q-Q' West Millennium Site



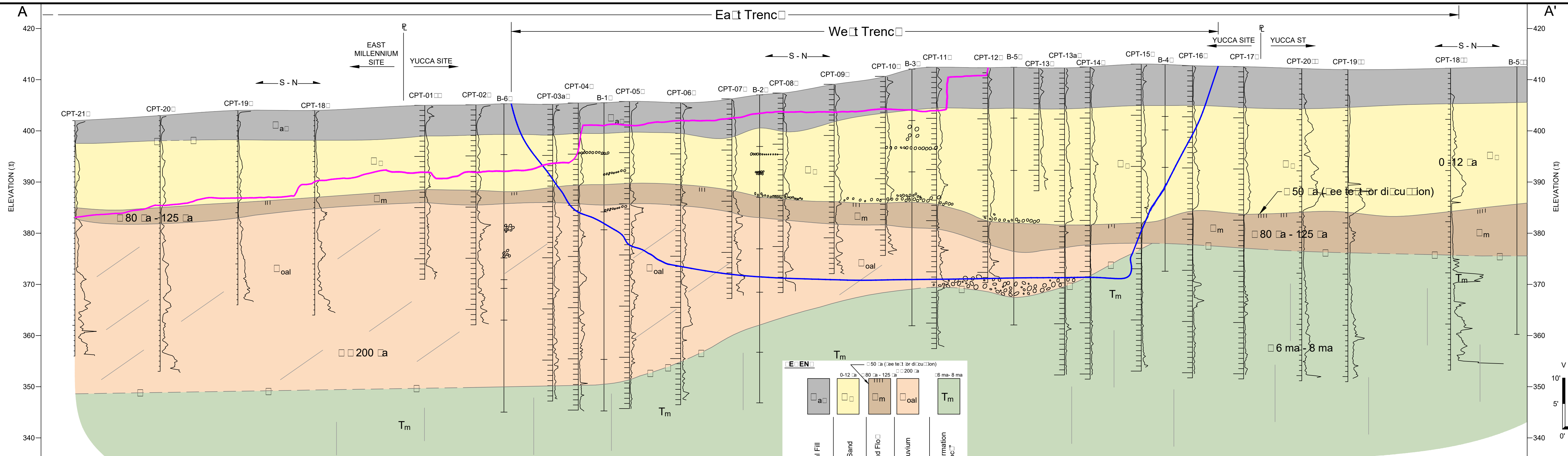
LEGEND

- B-6
- C-20
- B-2
- LB3
- Trench Outline
- Anticline location. Arrow indicate direction of plunge.
- Geologic contact
- approximately located buried or buried, dotted or buried
- Street and dip of bedding
- Street and dip of fault
- Street and dip of buried fault
- Approximate Location of Inferred Fault
- Ground water level below ground surface encountered and date measured
- Cross Section
- Property Line

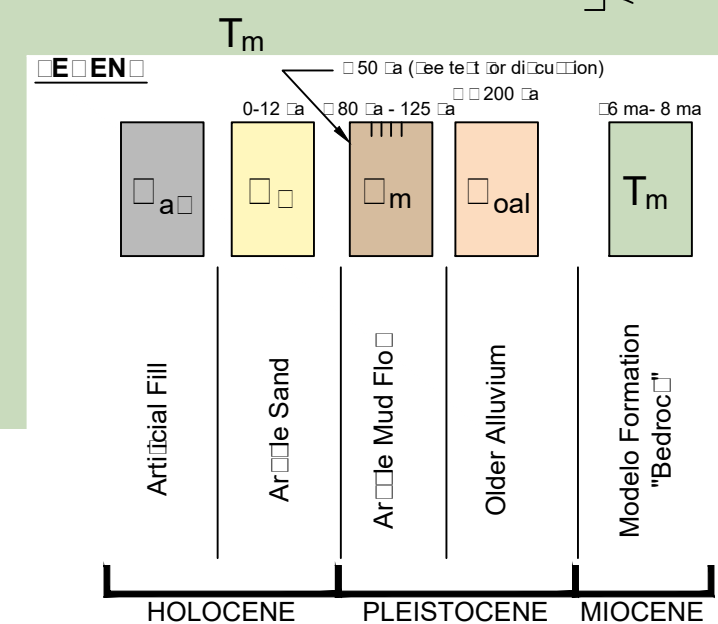
Note: East Trench (Ea1 Wall (C-C' in Plate 4a, 4b) is inverted to correlate structural feature with East Trench - West Wall (D-D' Plate 5)

Reference: Google Earth

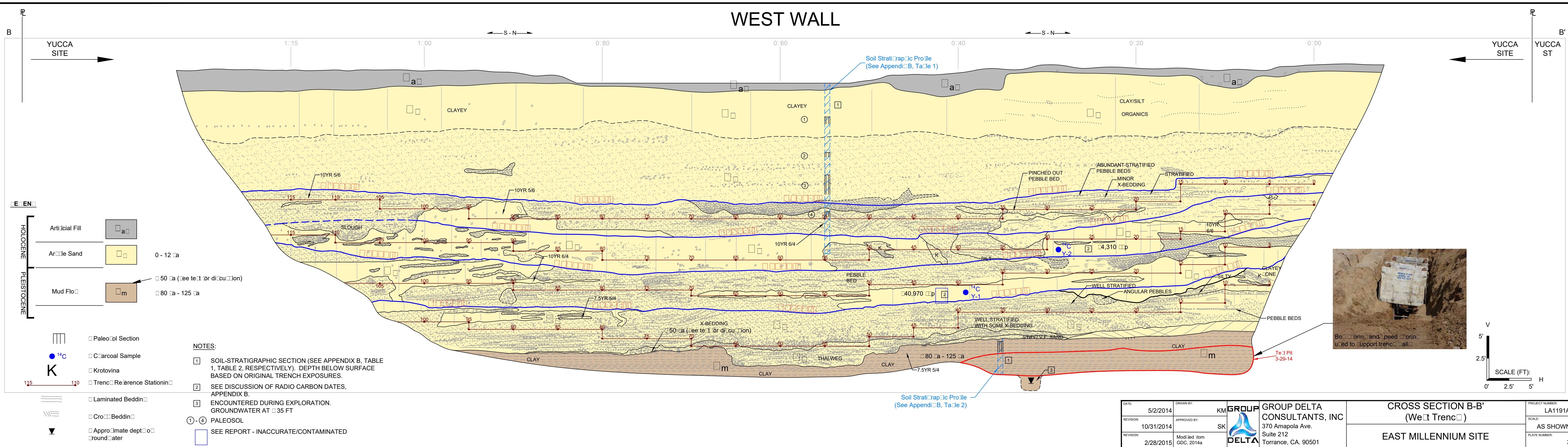
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REVISION:	10/31/2014	APPROVED BY:	MR	DELTA	370 Amapola Ave.		SCALE:
REVISION:	2/28/2015	Modified from GDC, 2014a			Suite 212	WEST/EAST MILLENNIUM SITES	AS SHOWN
					Torrance, CA, 90501		PLATE NUMBER:
							1

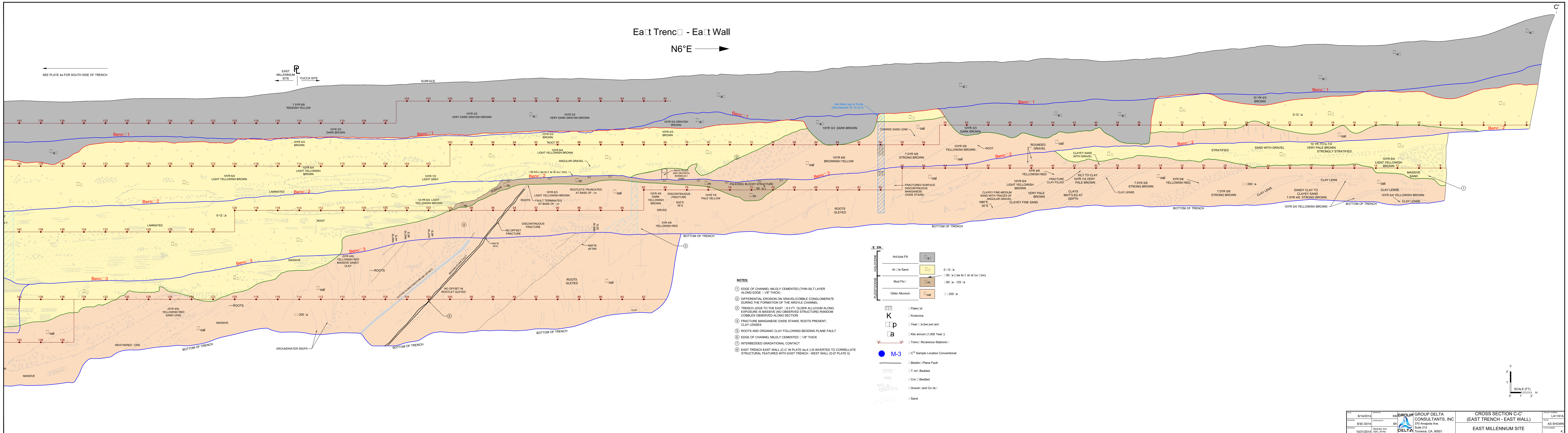


- Legend**
- Data interpreted from site boring and CPT logs to project cross-section to the north
 - Buried Paleo-channel
 - Represented Bedding
 - East Trench Projected onto A-A'
 - West Trench Projected onto A-A'

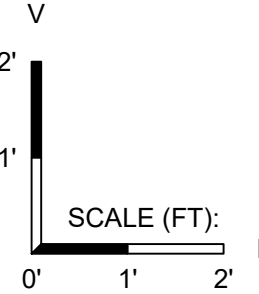


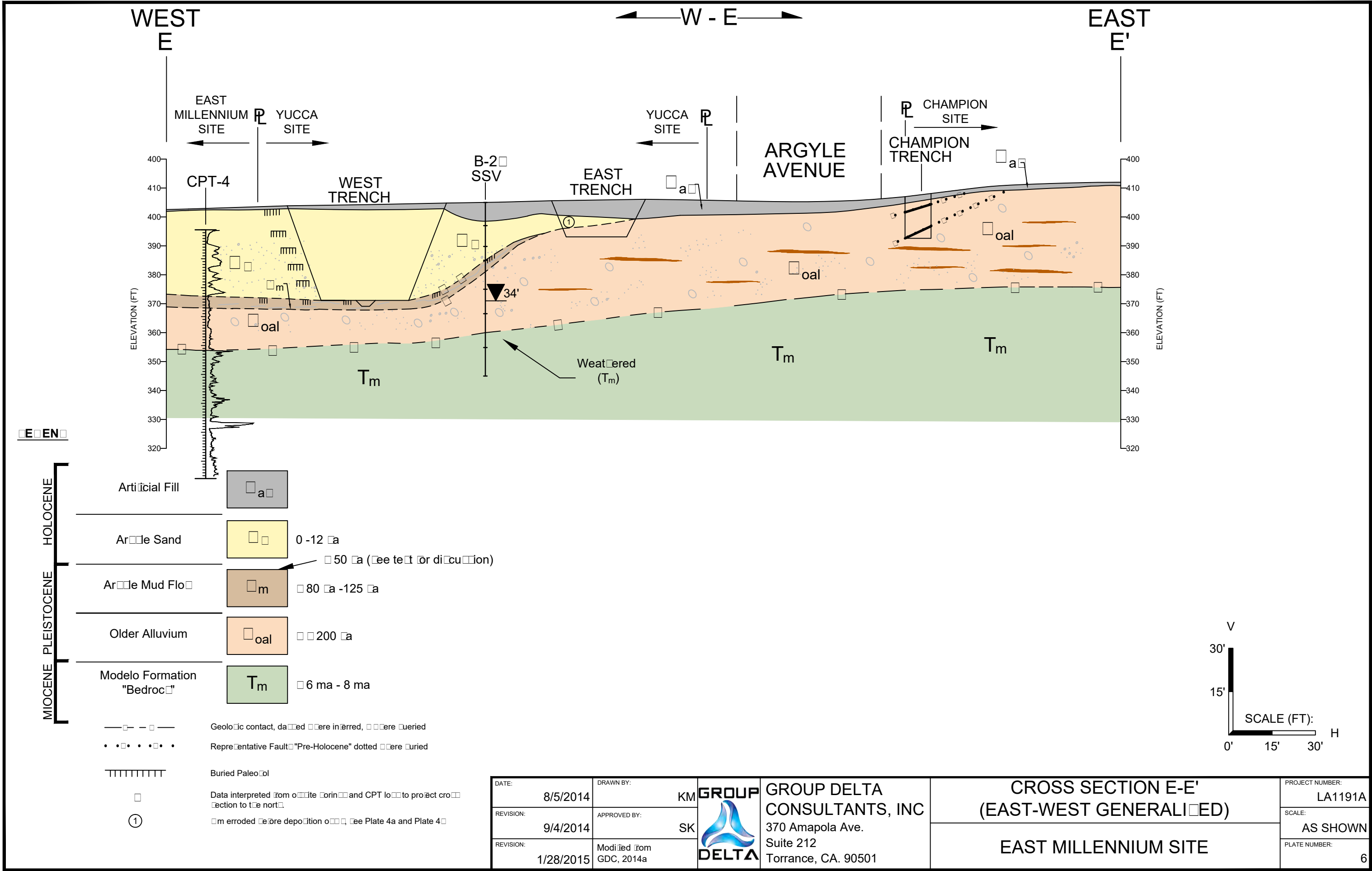
DATE: 10/23/2013	DRAWN BY: KM		GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	CROSS SECTION A-A' (CPT/SOIL CORE)		PROJECT NUMBER: LA-1191A
REVISION: 4/18/2014	APPROVED BY: SK			EAST MILLENNIUM SITE		SCALE: AS SHOWN
REVISION: 2/28/2015	Modified from GDC, 2014a					PLATE NUMBER: 2

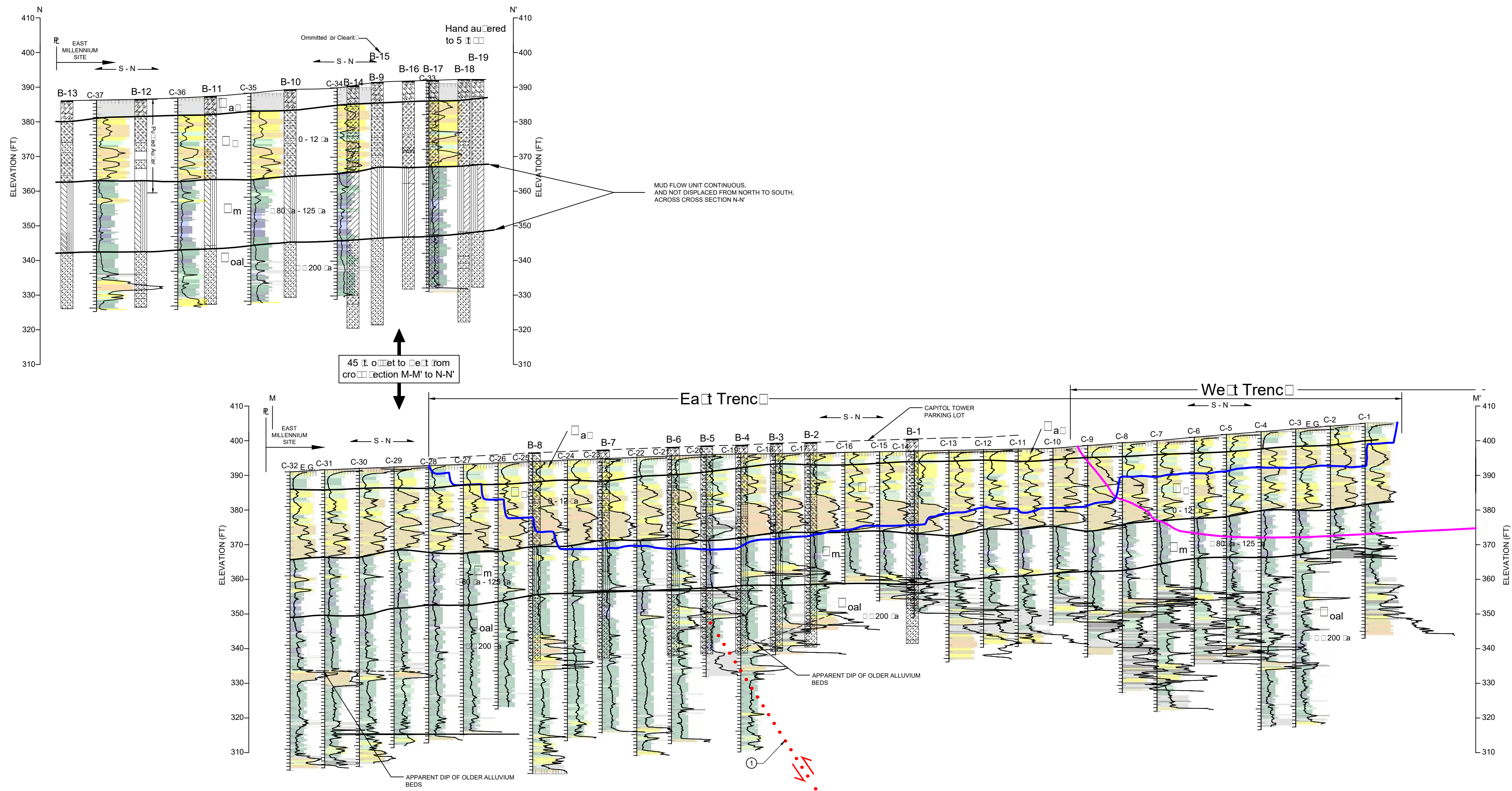




N6°E



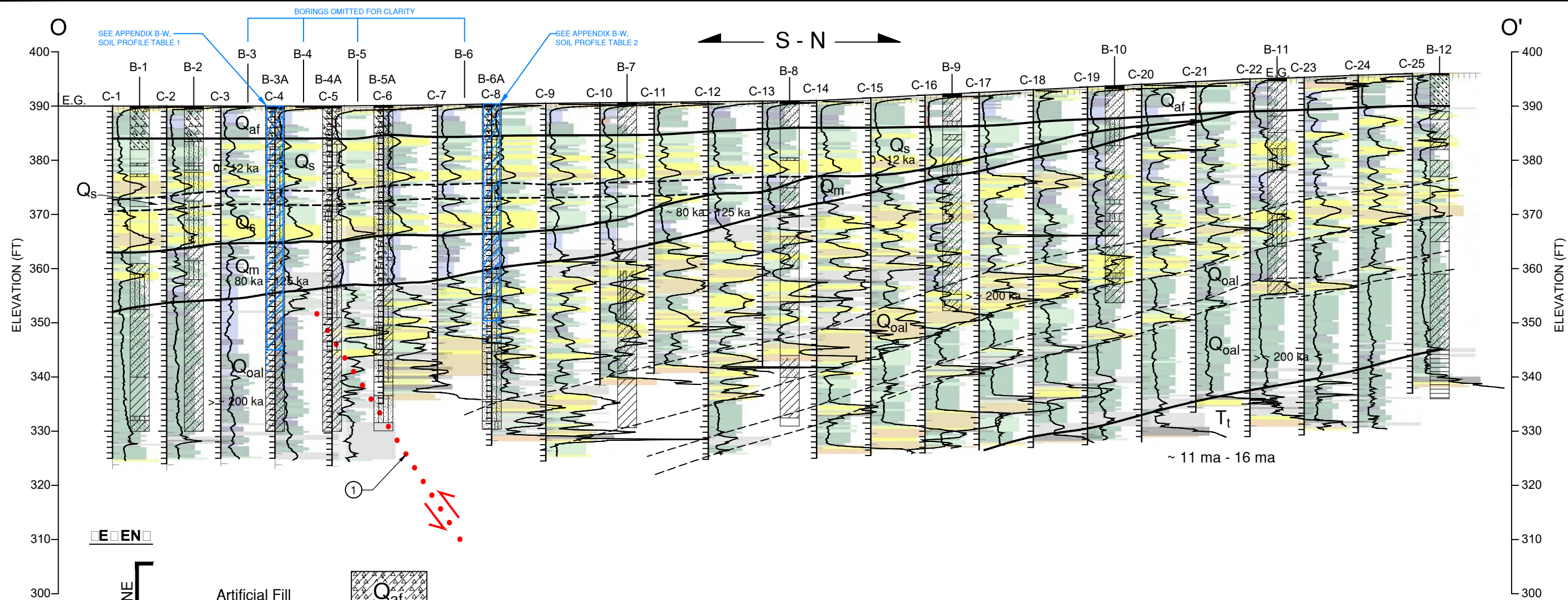




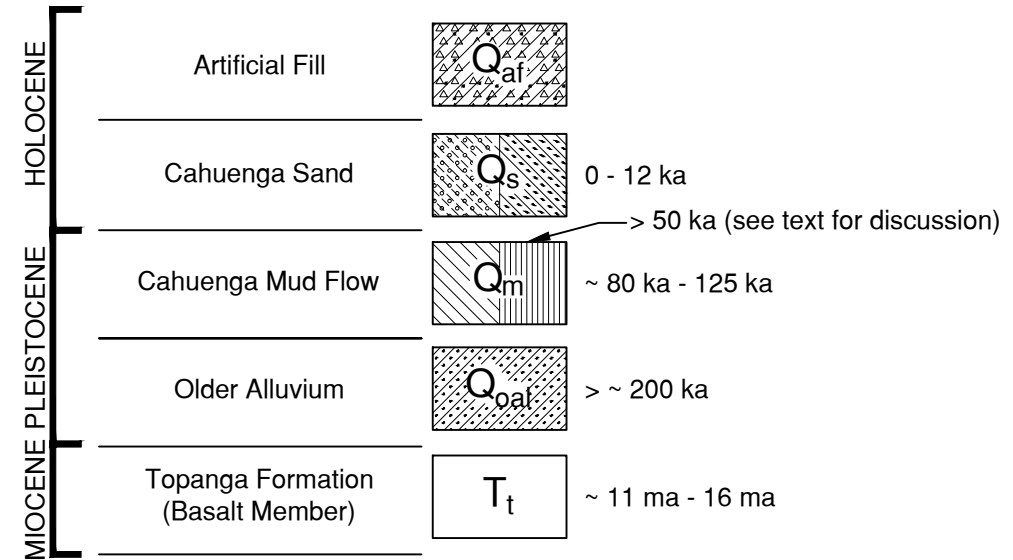
- Legend:**
- E.G. Elevation Grade
 - C-32 CPT Location and Number
 - B-8 Borehole Location and Number
 - Bedding Contact
 - Unit Contact
 - West Trench Projected onto M-M'
 - East Trench Projected onto M-M'
 - (Sensor Motion Uncertain)
 - Approximate Location of Inferred Fault

HOLOCENE	
Artificial Fill	a
Arable Sand	0 - 12 a
Arable Mud Flo	m
Older Alluvium	oal
PLEISTOCENE	
	50 a (See text for discussion)
	80 a - 125 a
	200 a

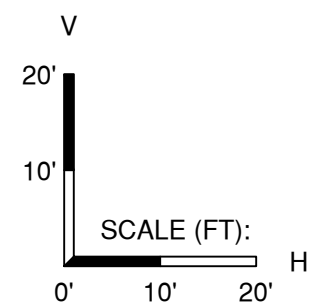
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REVISION: 10/31/2014	APPROVED BY: SK				SCALE: AS SHOWN
REVISION: 1/28/2015					PLATE NUMBER: 7




E EN



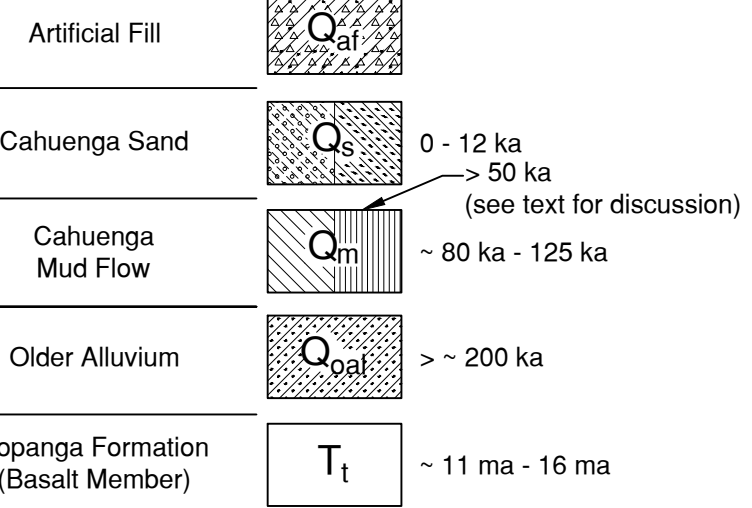
- BEDDING CONTACT
- UNIT CONTACT
- E.G. EXISTING GRADE
- C-1 CPT (CONE PENETRATION TEST) LOCATION AND NUMBER
- B-1 BORING LOCATION AND NUMBER
- ① (SENSE OF MOTION UNCERTAIN)
- APPROXIMATE LOCATION OF INFERRED FAULT



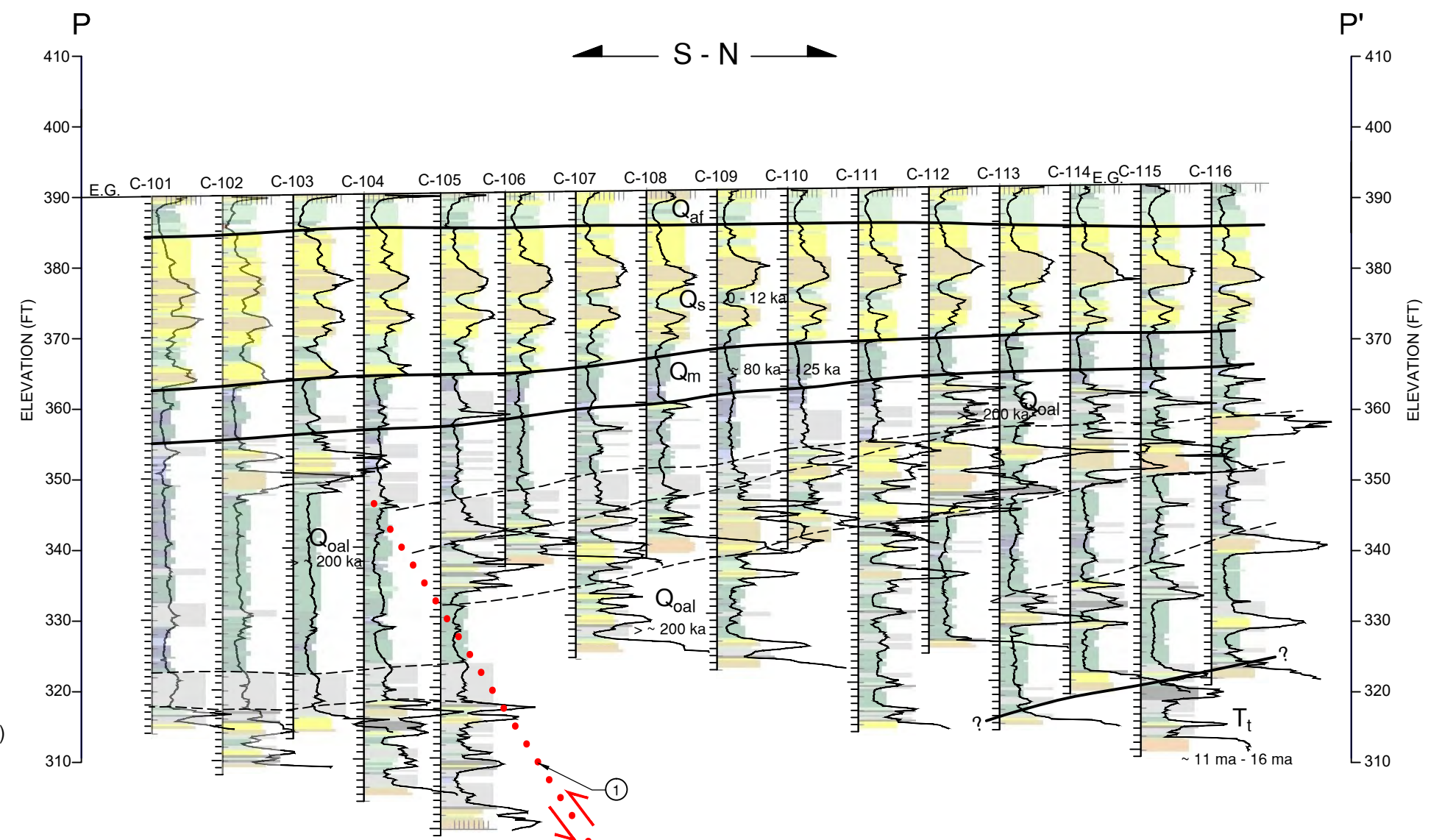
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REVISION: 1/20/2015	APPROVED BY: SK			WEST MILLENNIUM SITE	SCALE: AS SHOWN	
REVISION: 2/28/2015					PLATE NUMBER: 8	

E EN

HOLOCENE
MIOCENE PLEISTOCENE

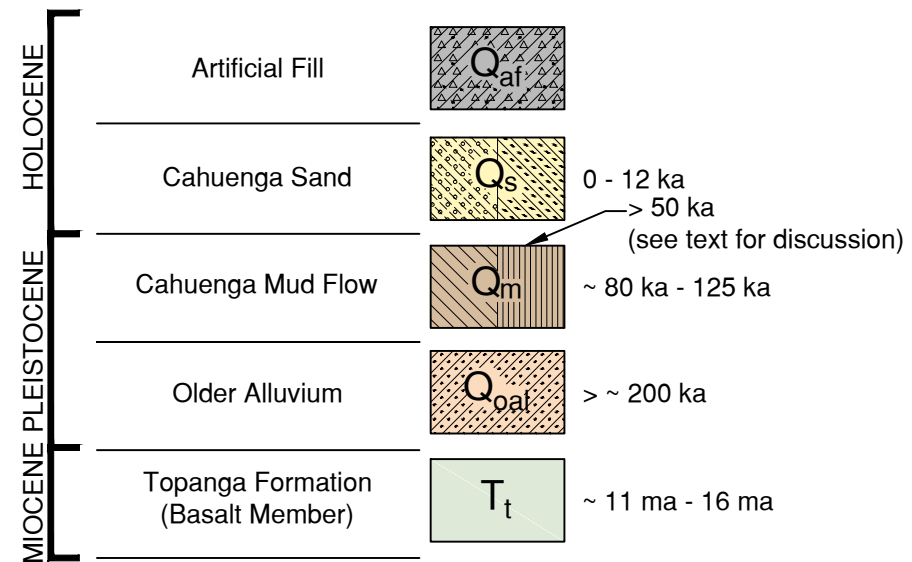


- BEDDING CONTACT
- UNIT CONTACT
- E.G. EXISTING GRADE
- C-1 CPT (CONE PENETRATION TEST) LOCATION AND NUMBER
- B-1 BORING LOCATION AND NUMBER
- ① (SENSE OF MOTION UNCERTAIN)
- APPROXIMATE LOCATION OF INFERRED FAULT

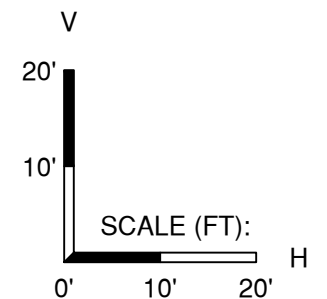
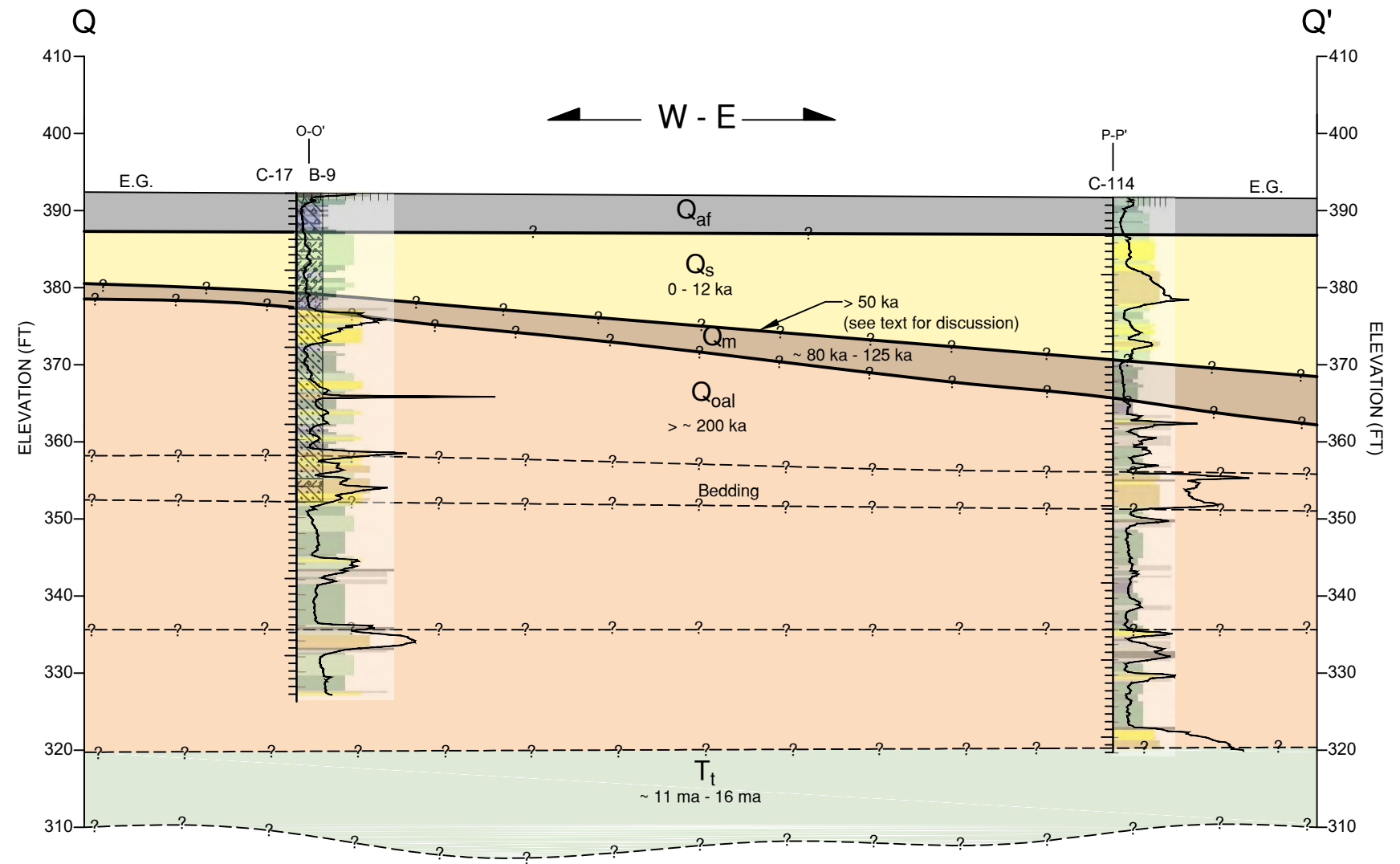



DATE: 11/18/2014	DRAWN BY: KM		GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	WEST MILLENNIUM SITE CROSS SECTION P-P' (CPT)	PROJECT NUMBER: LA1191A
REVISION: 1/14/2015	APPROVED BY: SK				SCALE: AS SHOWN
REVISION: 2/28/2015				WEST MILLENNIUM SITE	PLATE NUMBER: 9

E E N

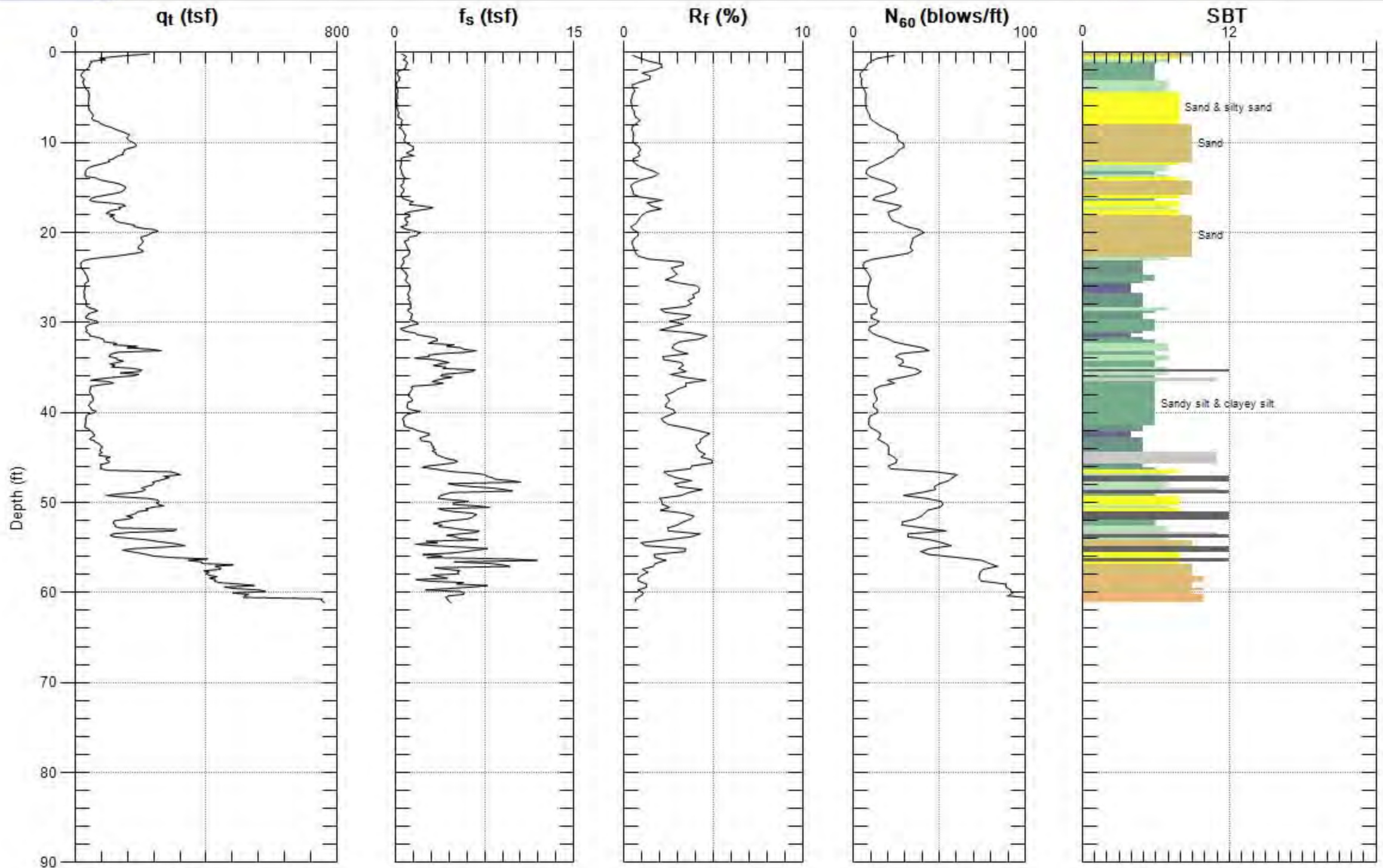


--- BEDDING CONTACT
— UNIT CONTACT
E.G. EXISTING GRADE
C-1 CPT (CONE PENETRATION TEST) LOCATION AND NUMBER
B-1 BORING LOCATION AND NUMBER



DATE: 2/28/2015	DRAWN BY: KM		GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	WEST MILLENNIUM SITE CROSS SECTION E-E' (CPT/SOIL CORE)		PROJECT NUMBER: LA1191A
REVISION: --	APPROVED BY: KN			WEST MILLENNIUM SITE		SCALE: AS SHOWN
REVISION: --						PLATE NUMBER: 10

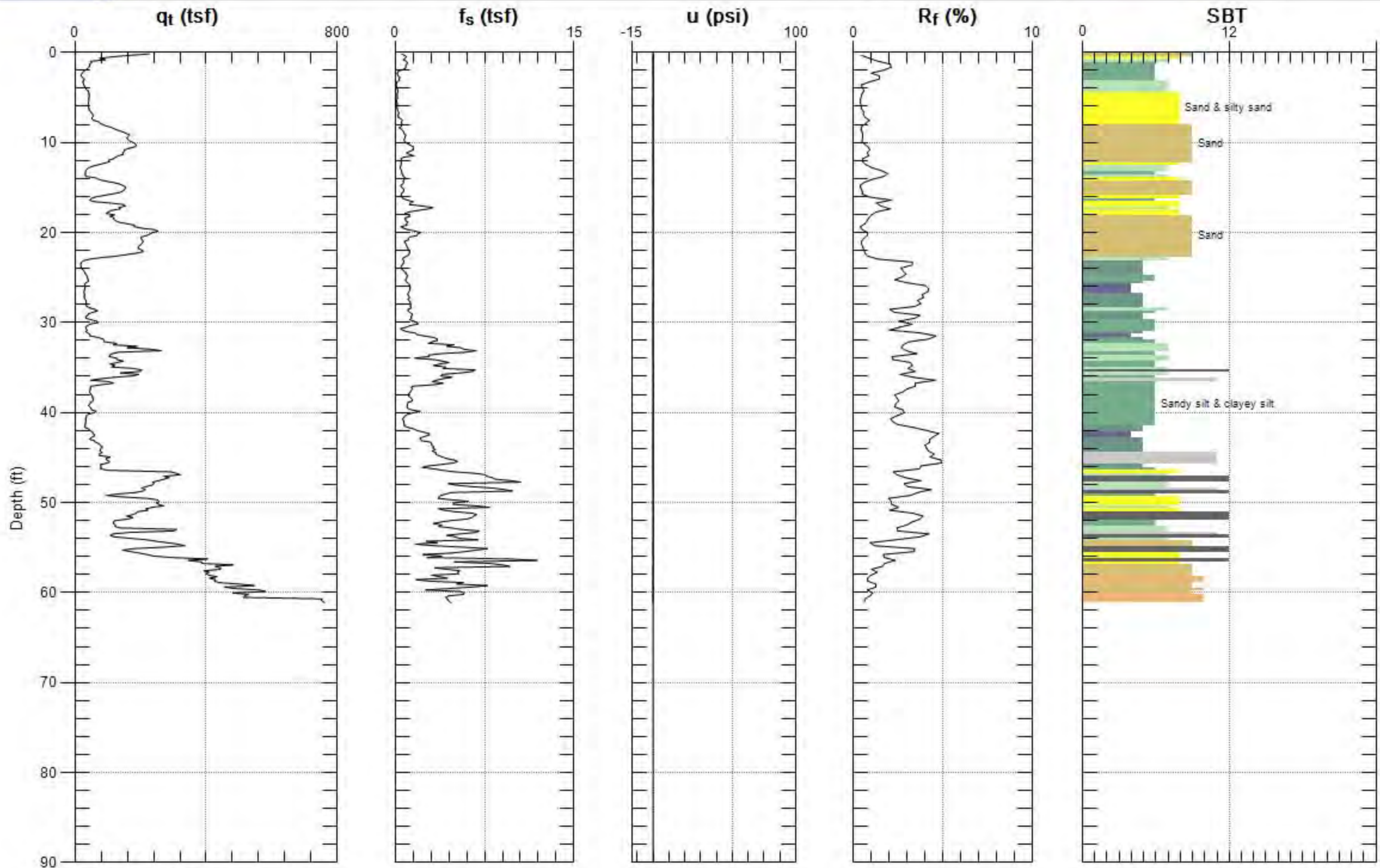
APPENDIX A: FIELD EXPLORATION – CPT DATA AND CORE LOGS



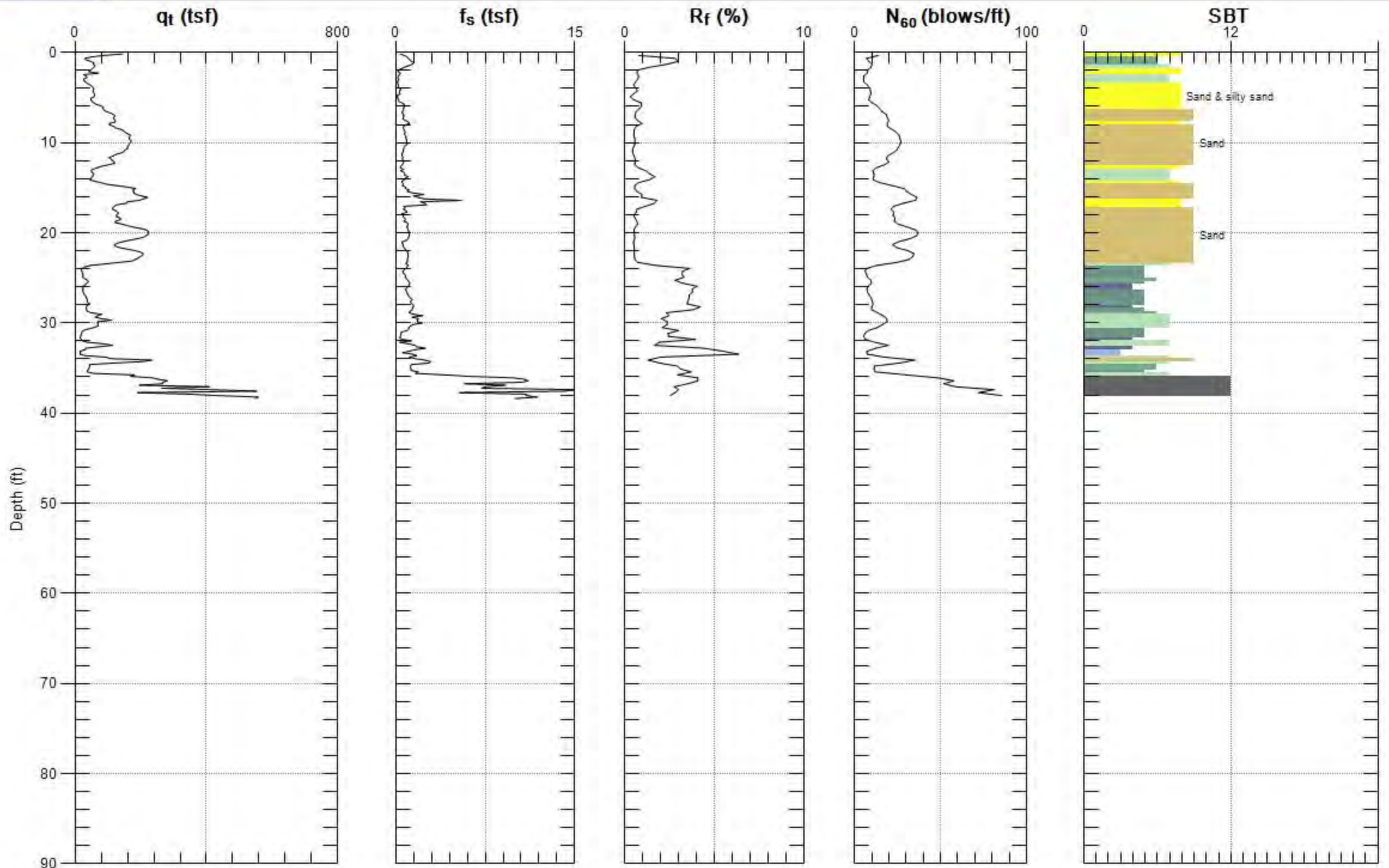
Max. Depth: 61.188 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-1

SBT: Soil Behavior Type (Robertson 1990)



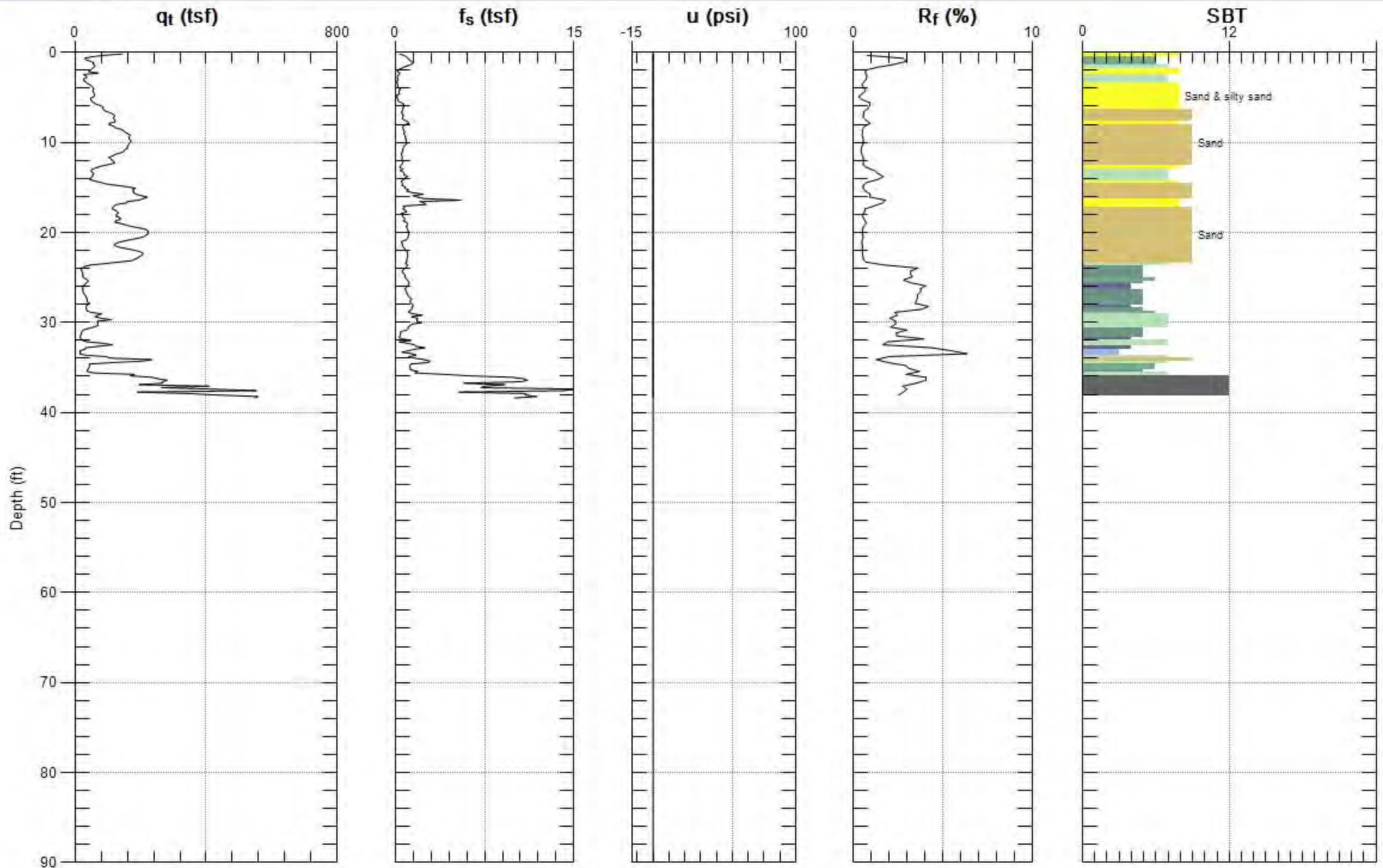
Max. Depth: 61.188 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 38.386 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-3

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 38.386 (ft)
Avg. Interval: 0.328 (ft)

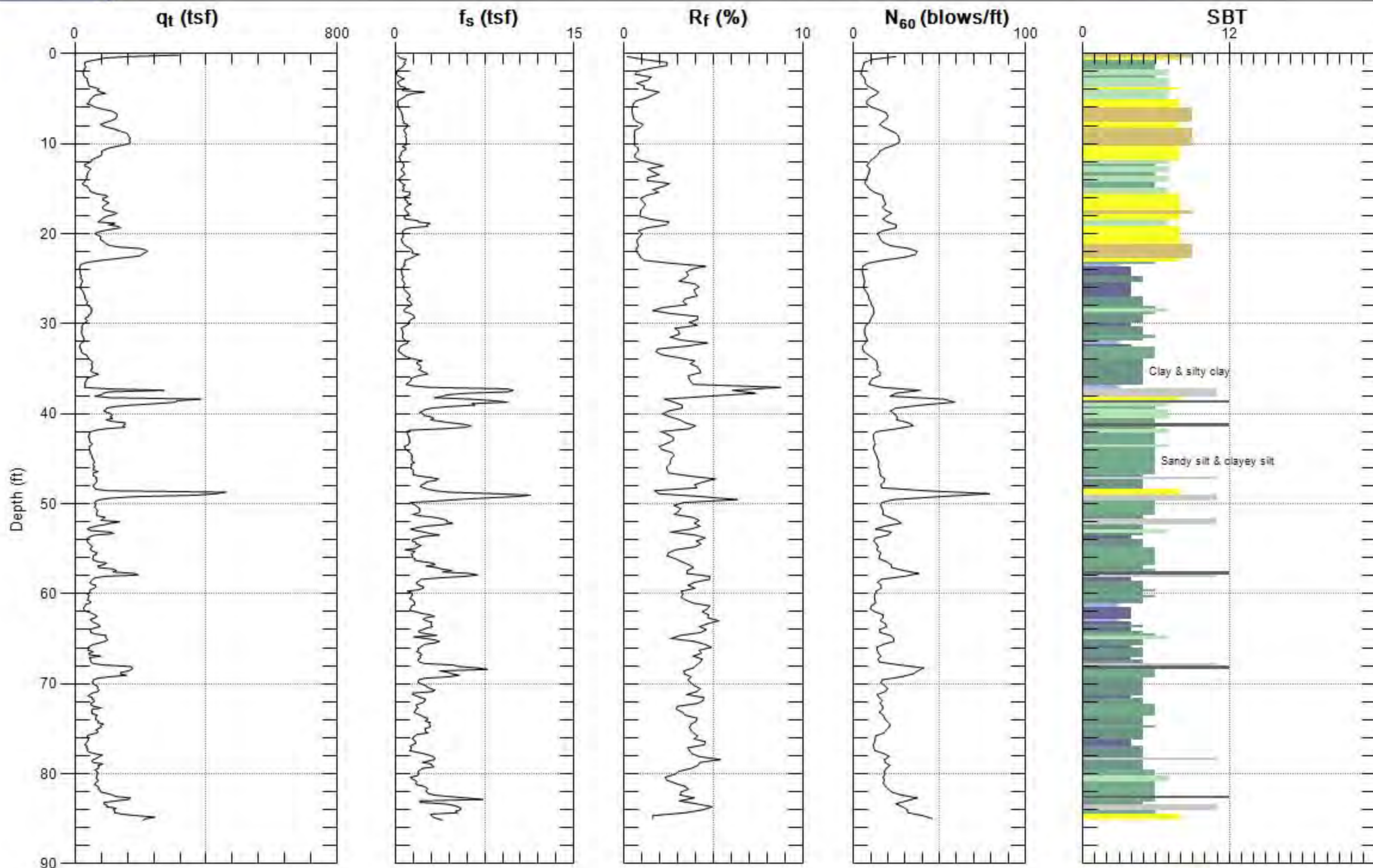


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-3

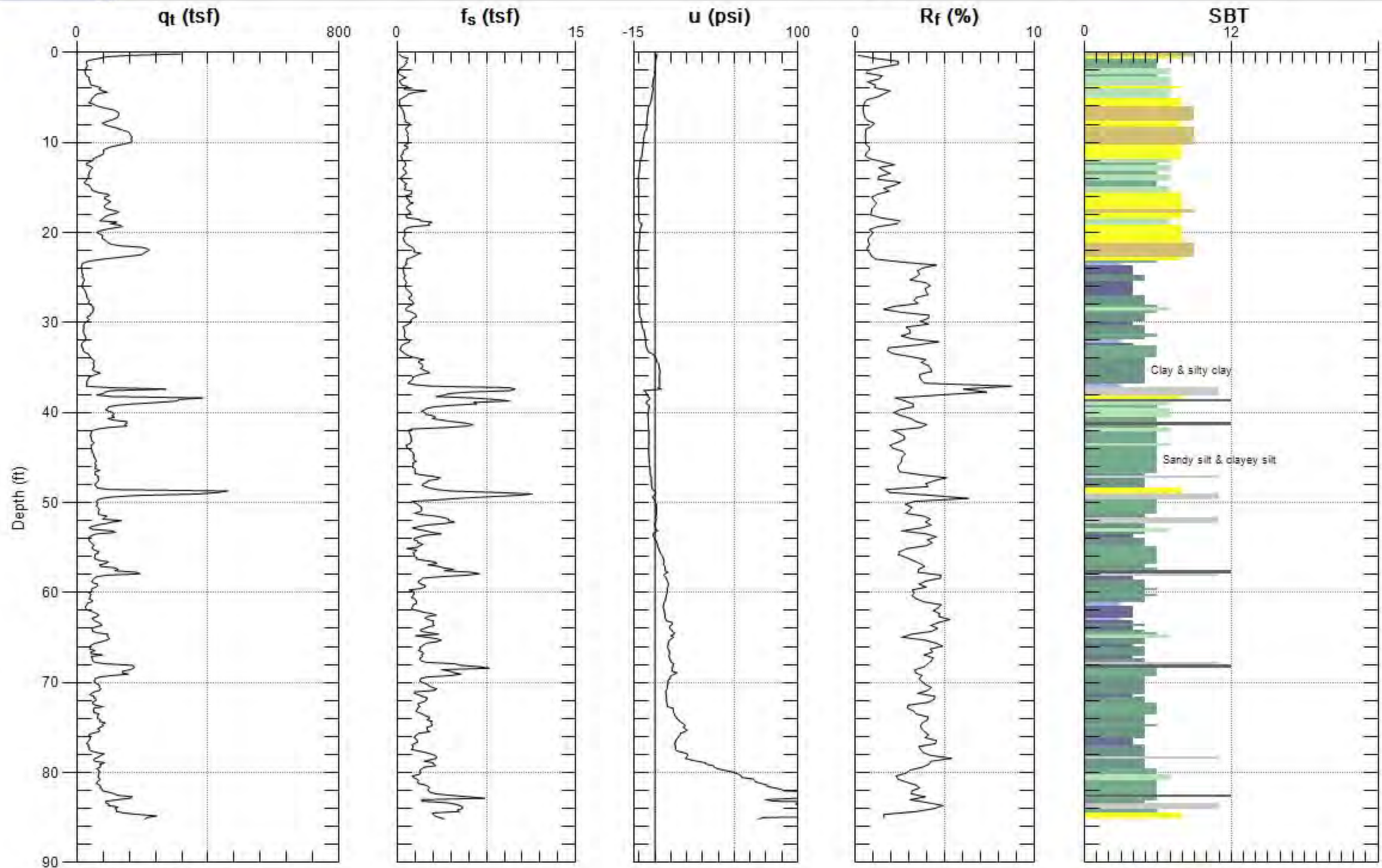
Date: 8/1/2012 11:08



Max. Depth: 85.138 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-5

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 85.138 (ft)
Avg. Interval: 0.328 (ft)

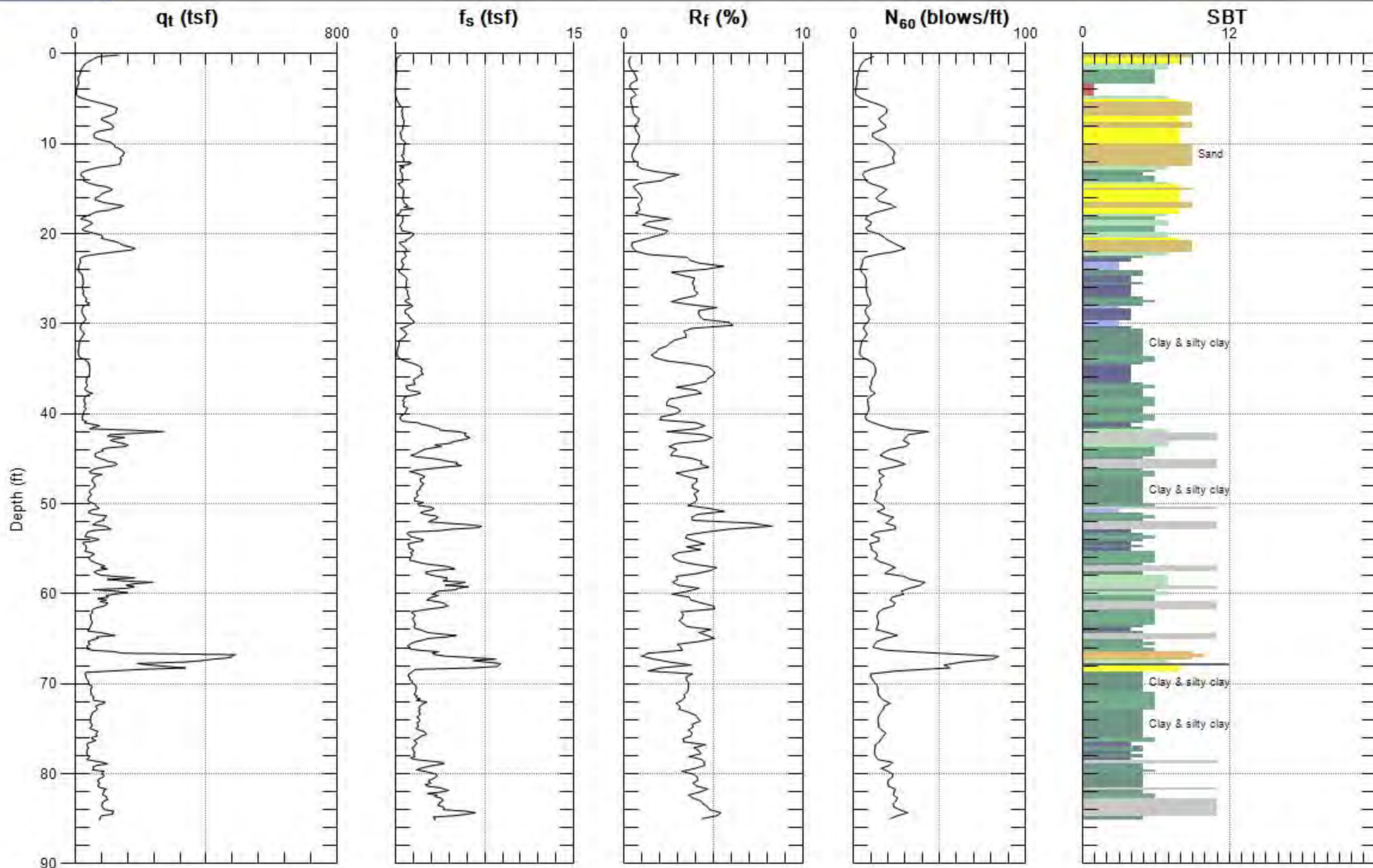


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-4

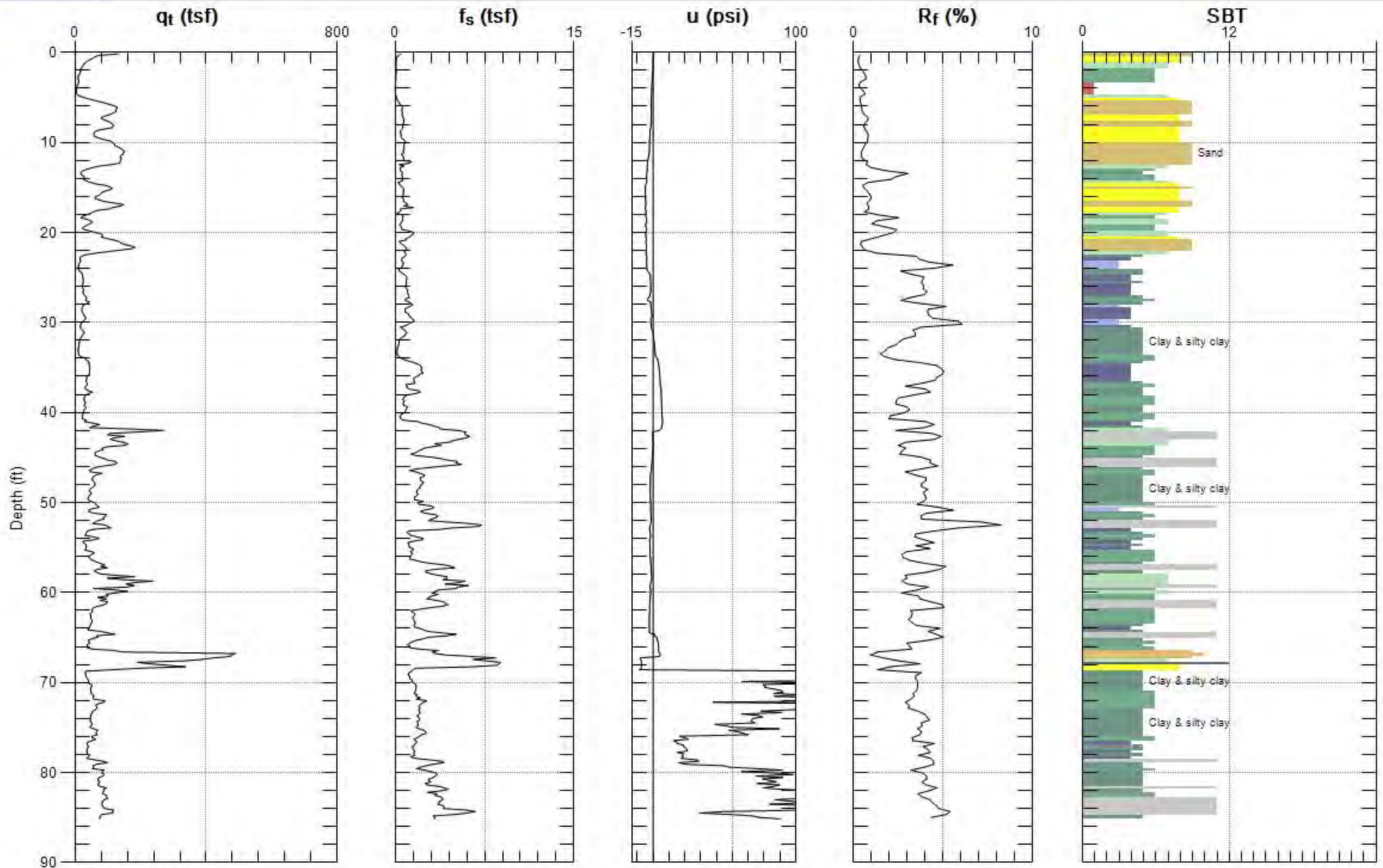
Date: 8/1/2012 11:59



Max. Depth: 85.138 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-7

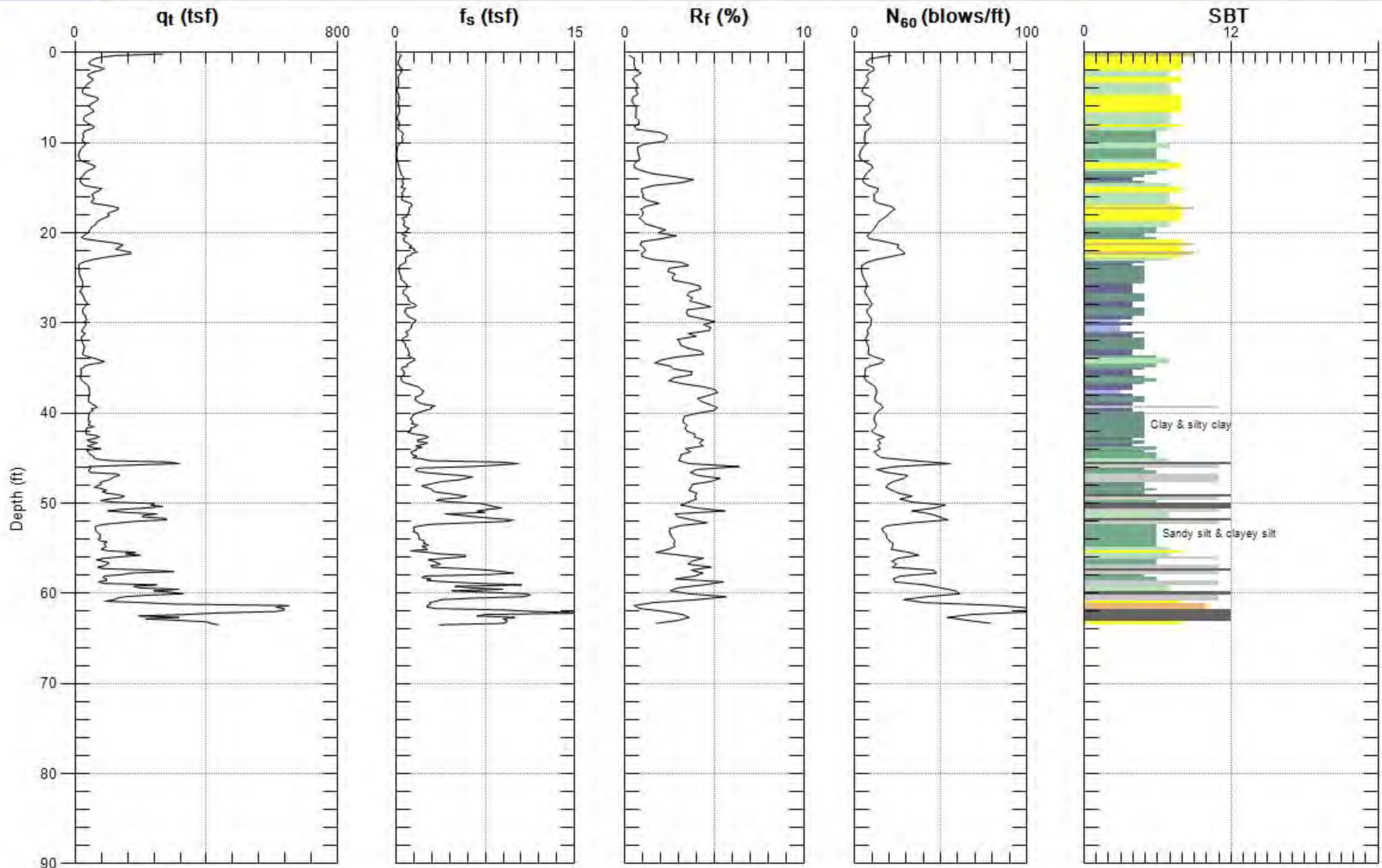
SBT: Soil Behavior Type (Robertson 1990)



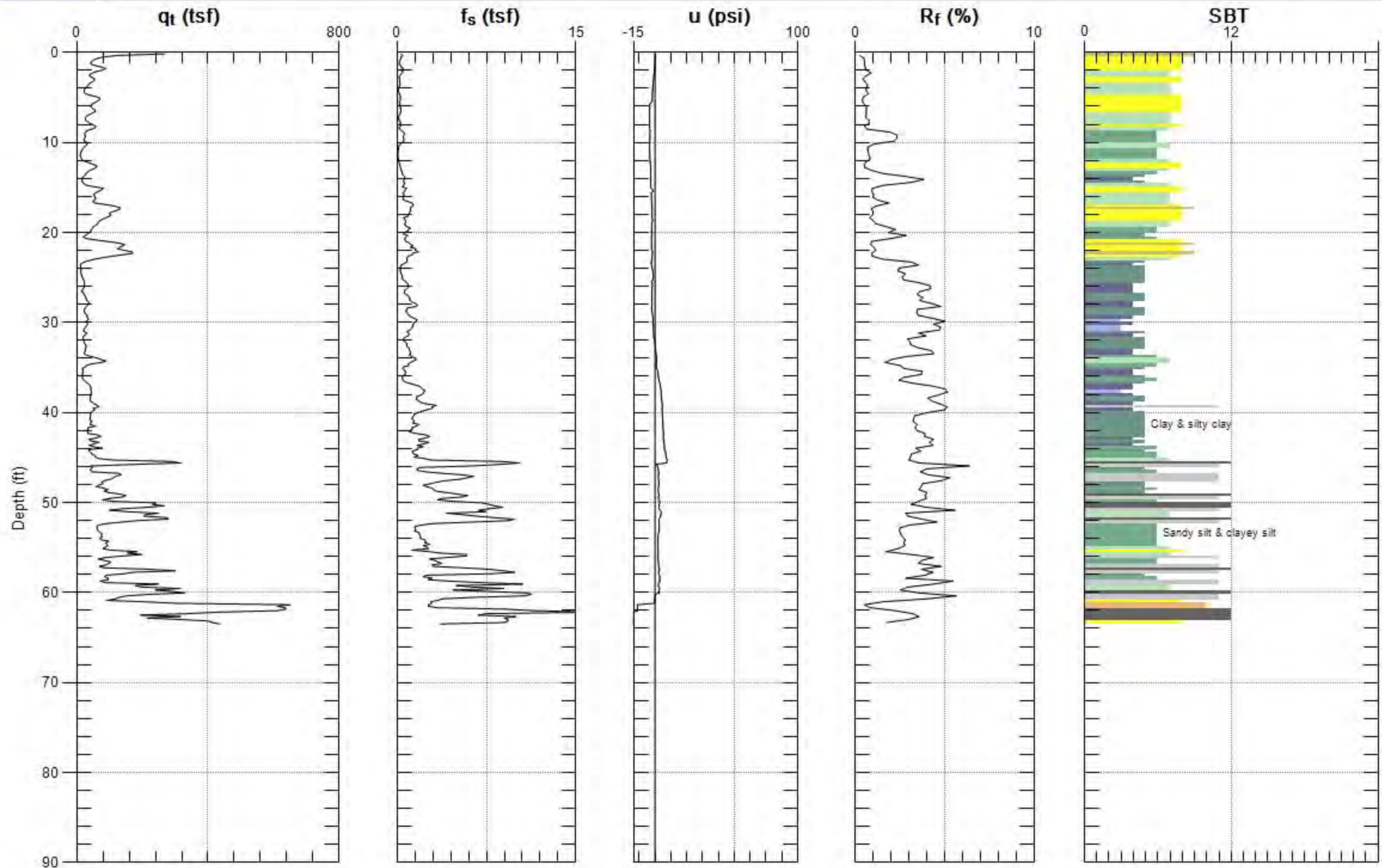
Max. Depth: 85.138 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-8

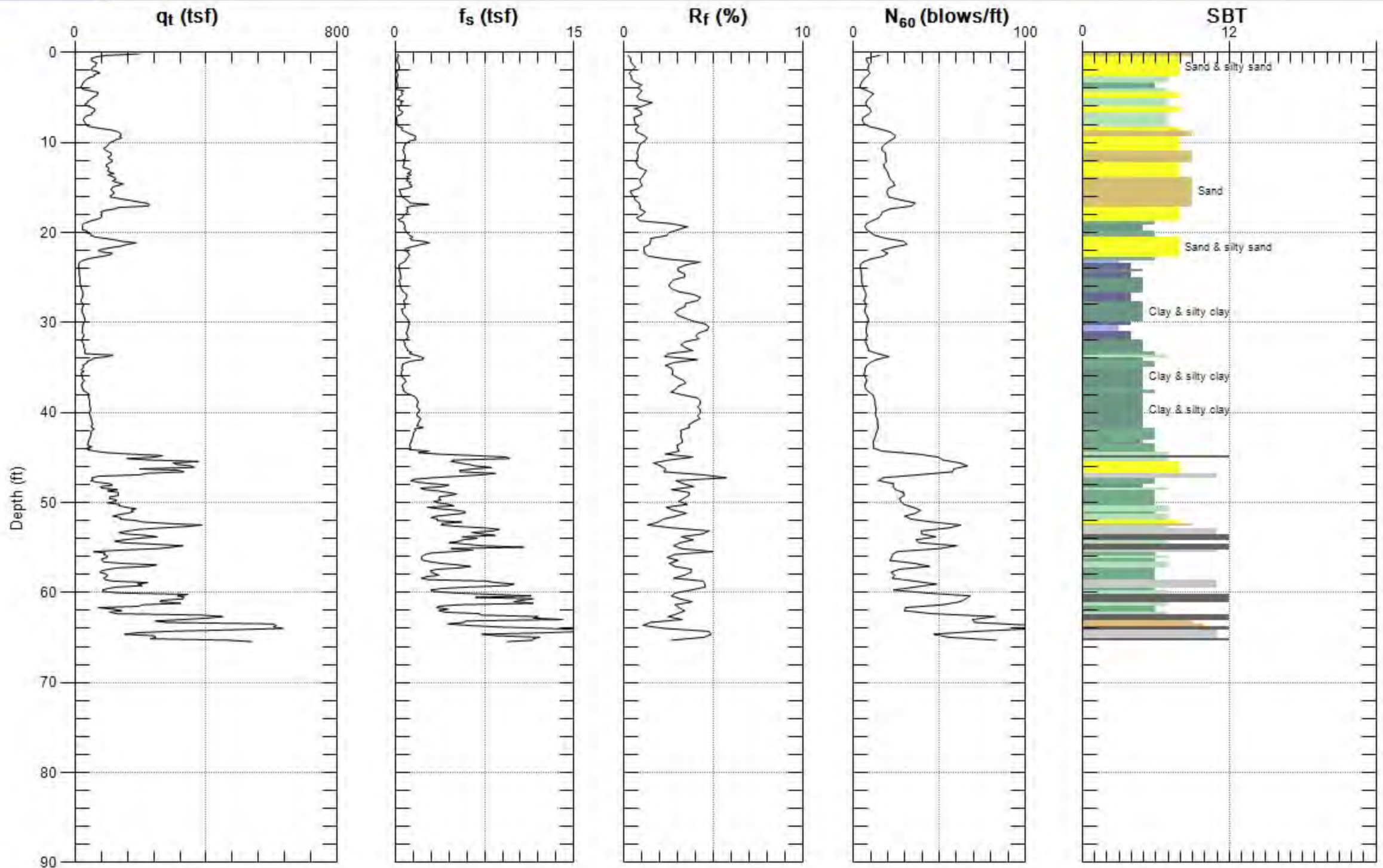
SBT: Soil Behavior Type (Robertson 1990)



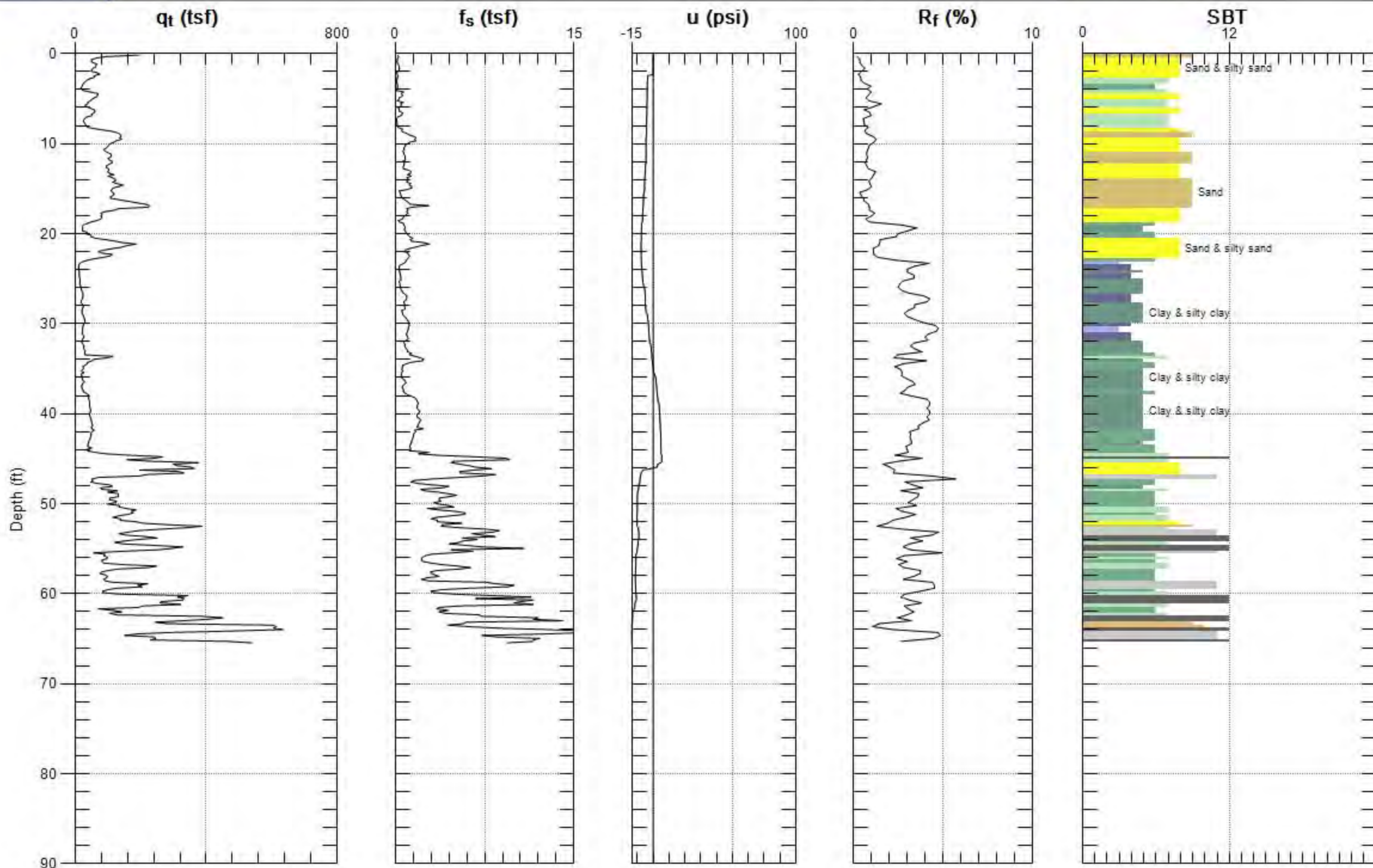
Max. Depth: 63.484 (ft)
Avg. Interval: 0.328 (ft)



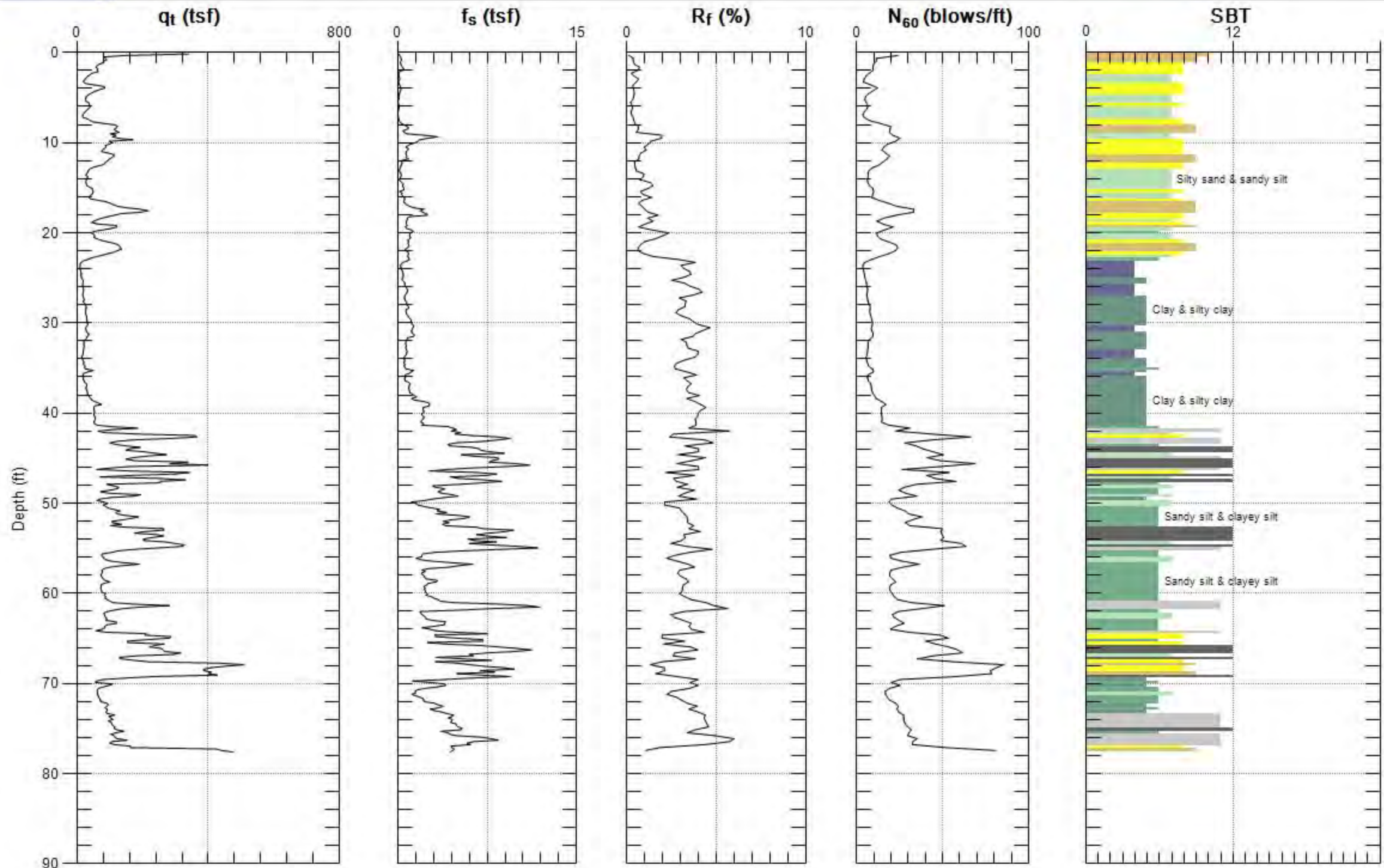
Max. Depth: 63.484 (ft)
Avg. Interval: 0.328 (ft)



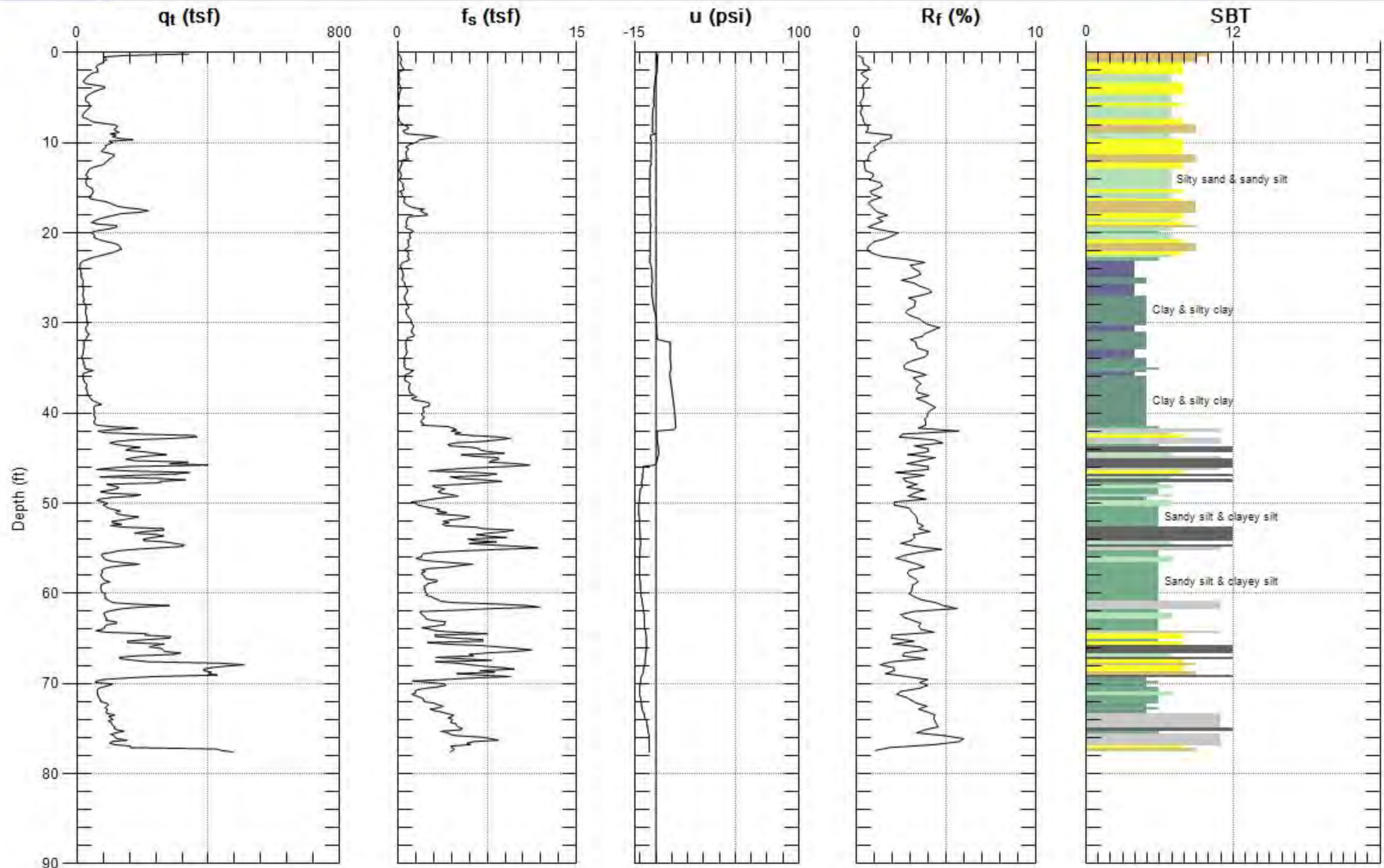
Max. Depth: 65.453 (ft)
Avg. Interval: 0.328 (ft)



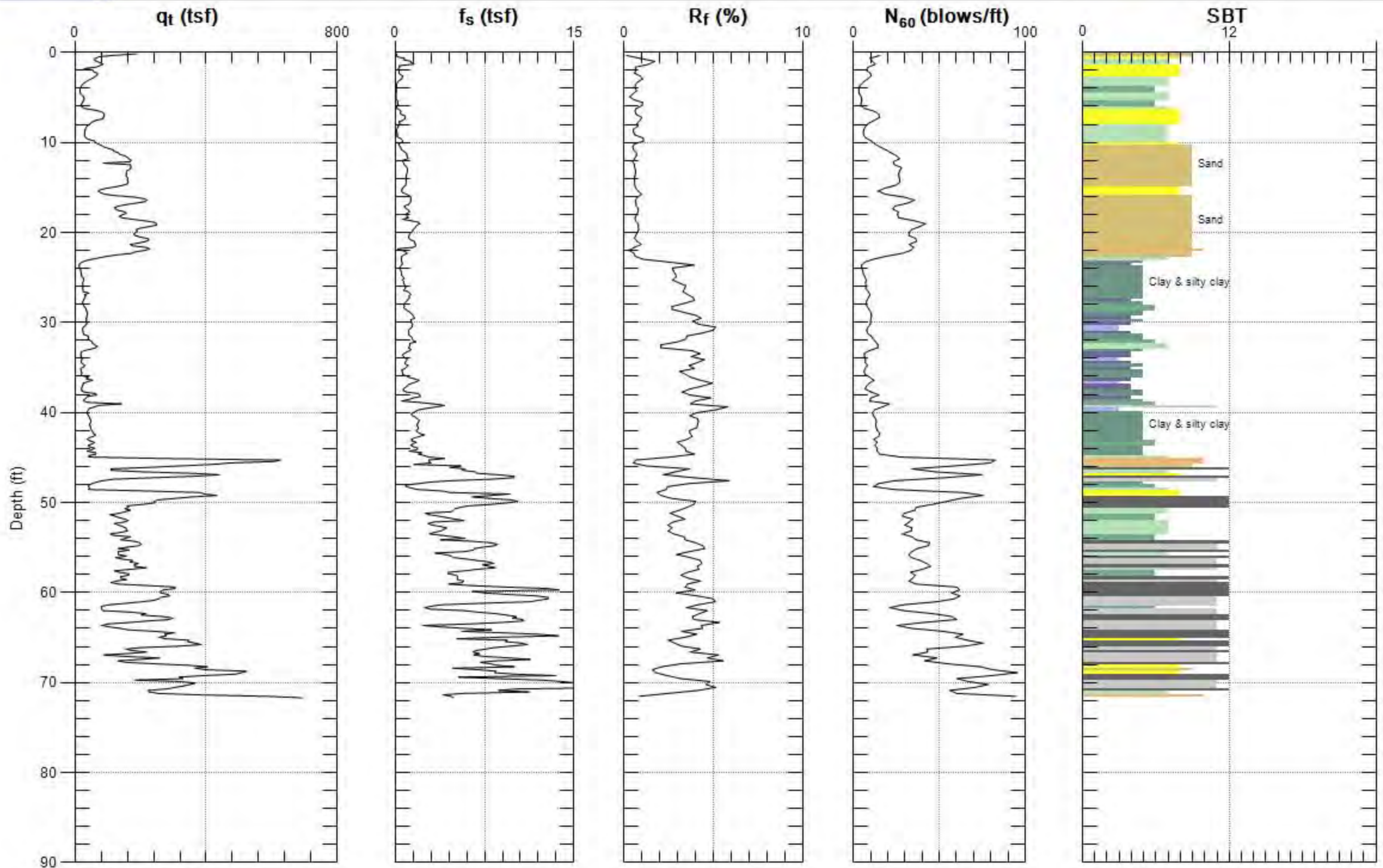
Max. Depth: 65.453 (ft)
Avg. Interval: 0.328 (ft)



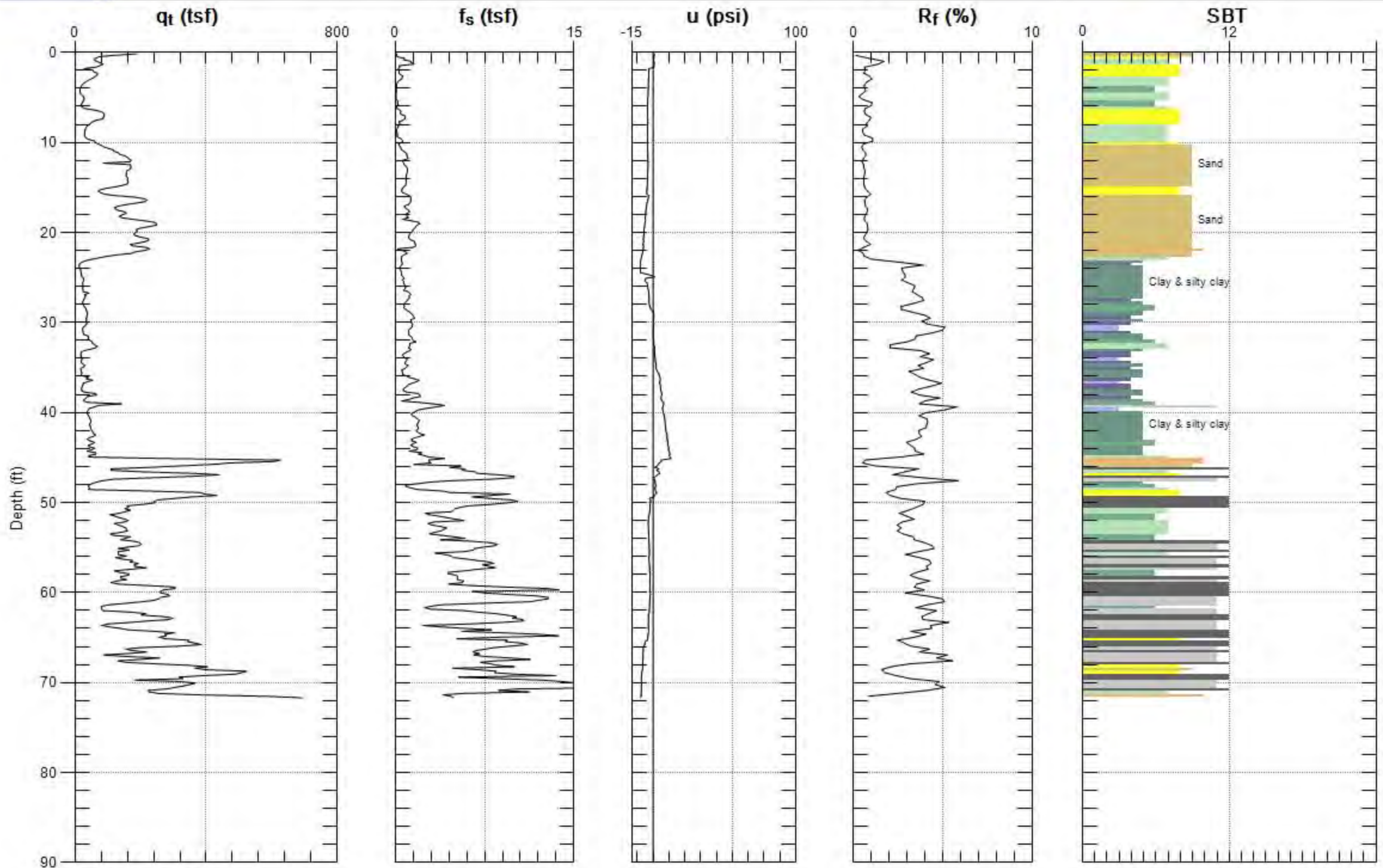
Max. Depth: 77.592 (ft)
Avg. Interval: 0.328 (ft)



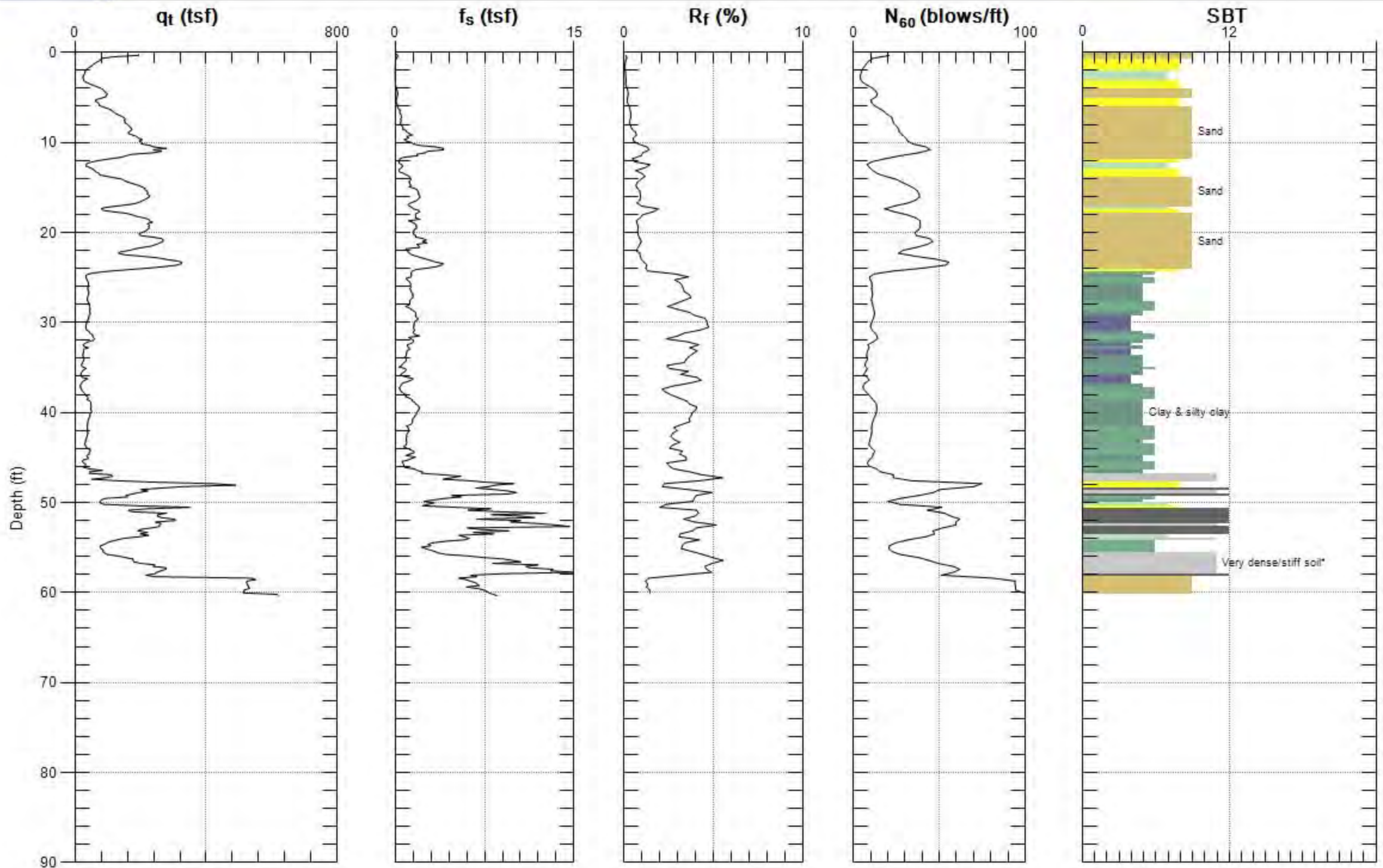
Max. Depth: 77.592 (ft)
Avg. Interval: 0.328 (ft)



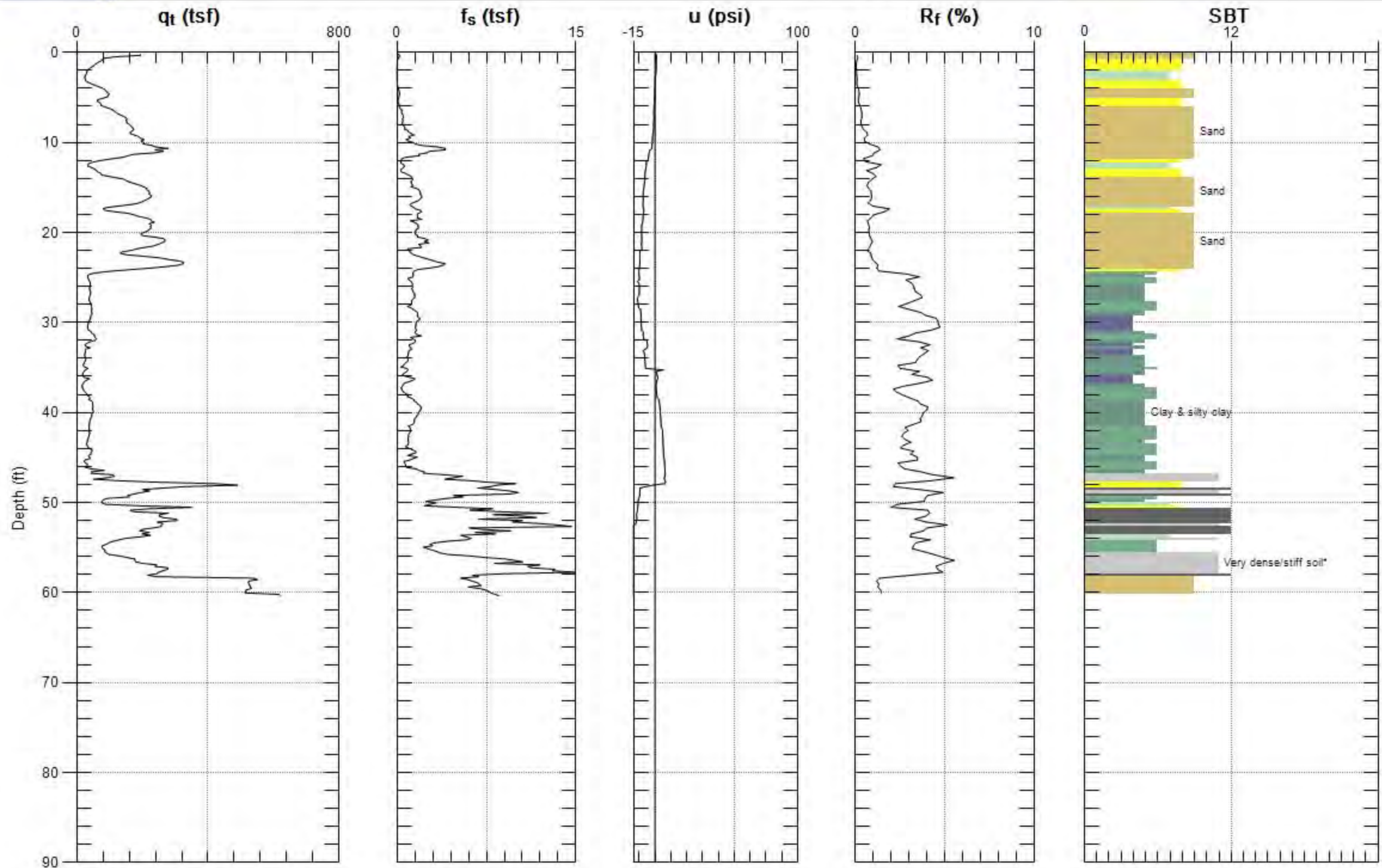
Max. Depth: 71.686 (ft)
Avg. Interval: 0.328 (ft)



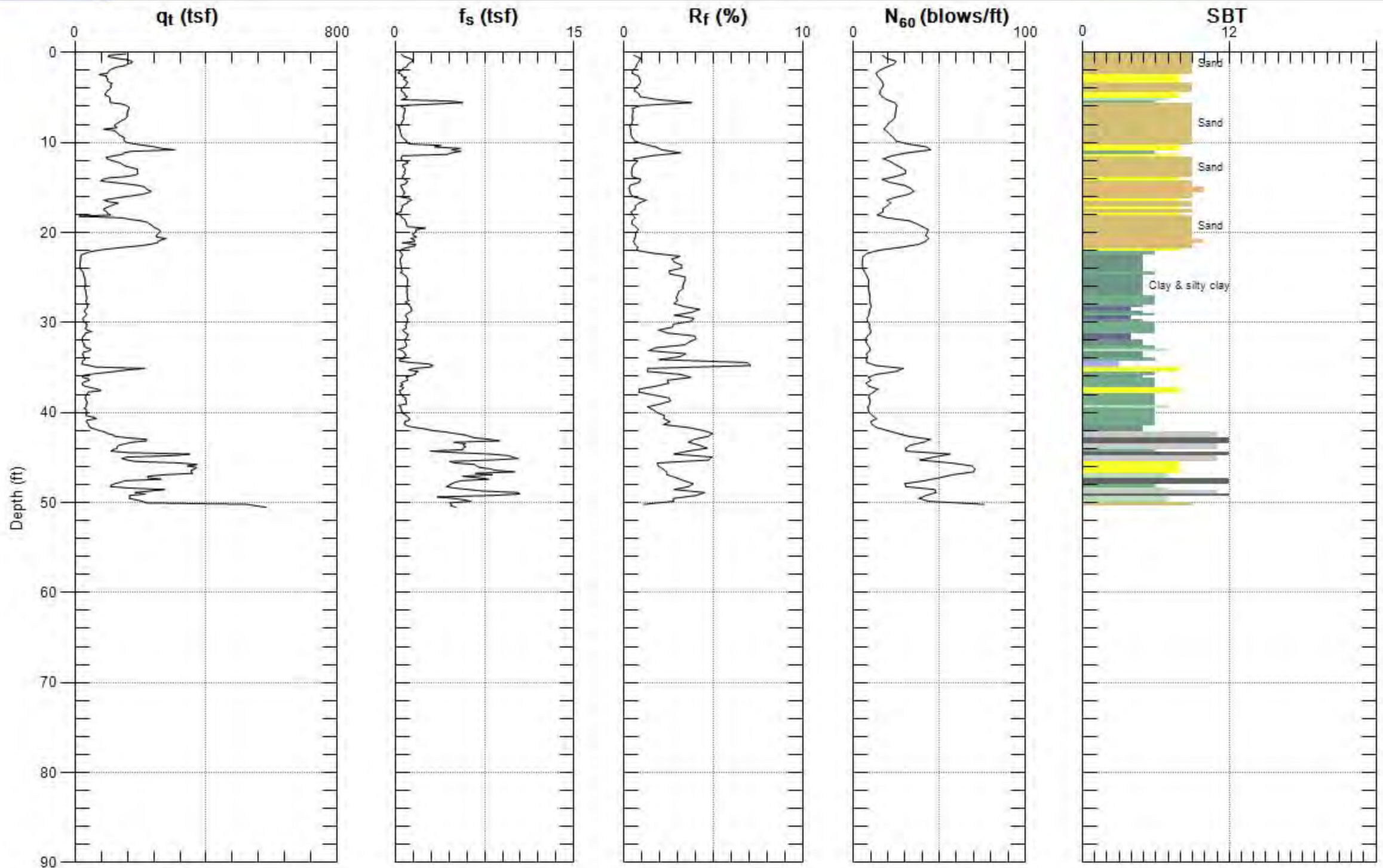
Max. Depth: 71.686 (ft)
Avg. Interval: 0.328 (ft)



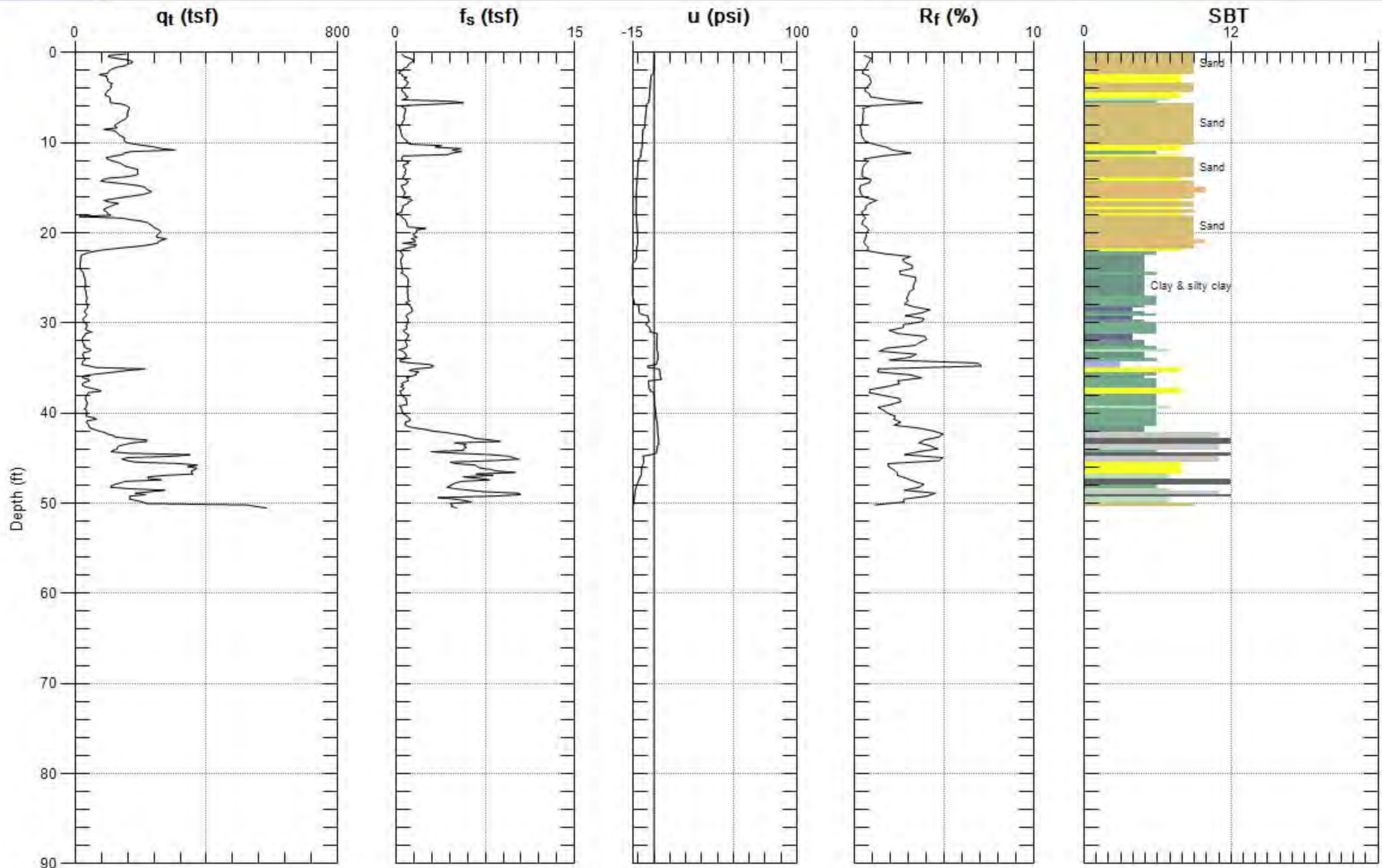
Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)



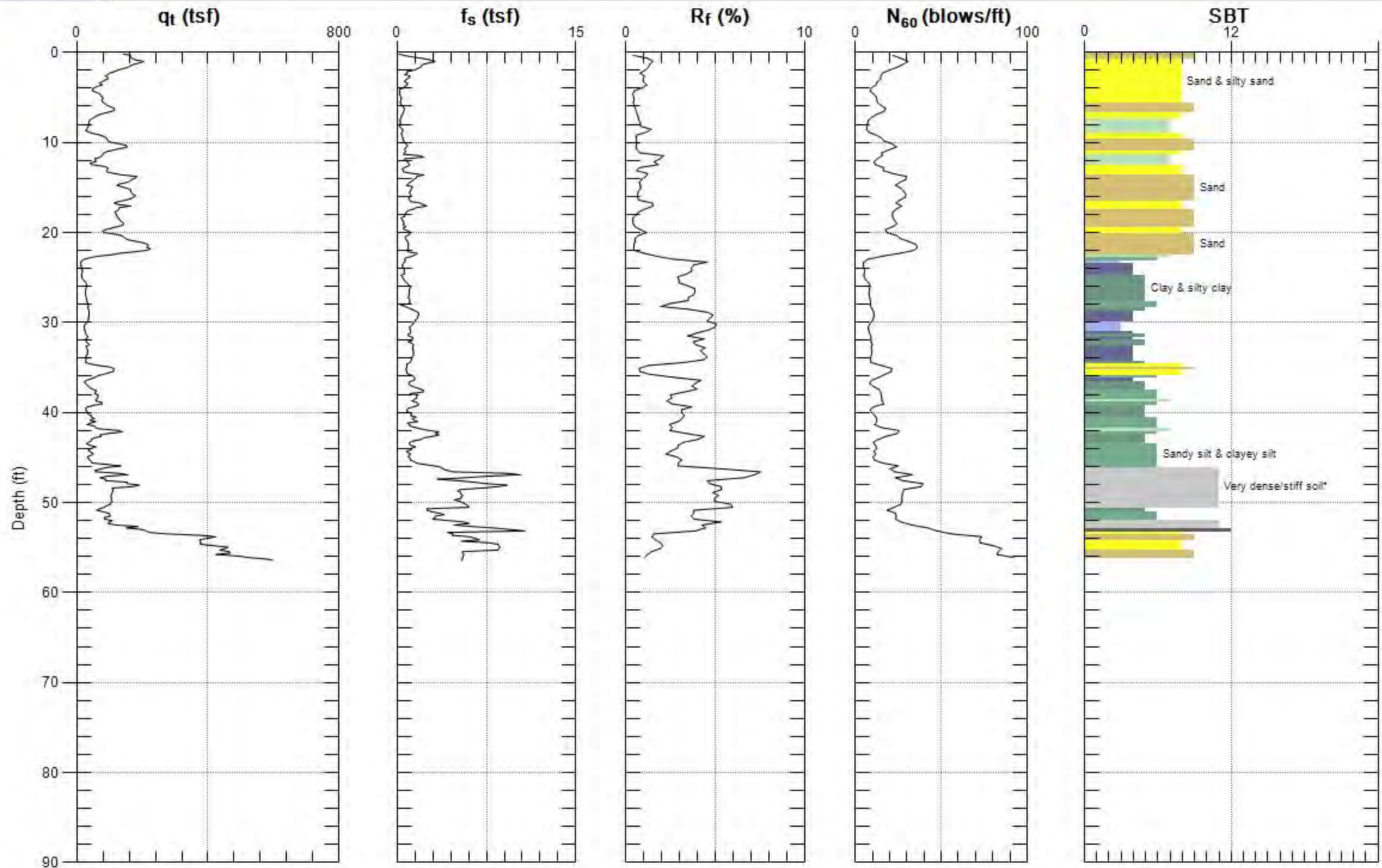
Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)



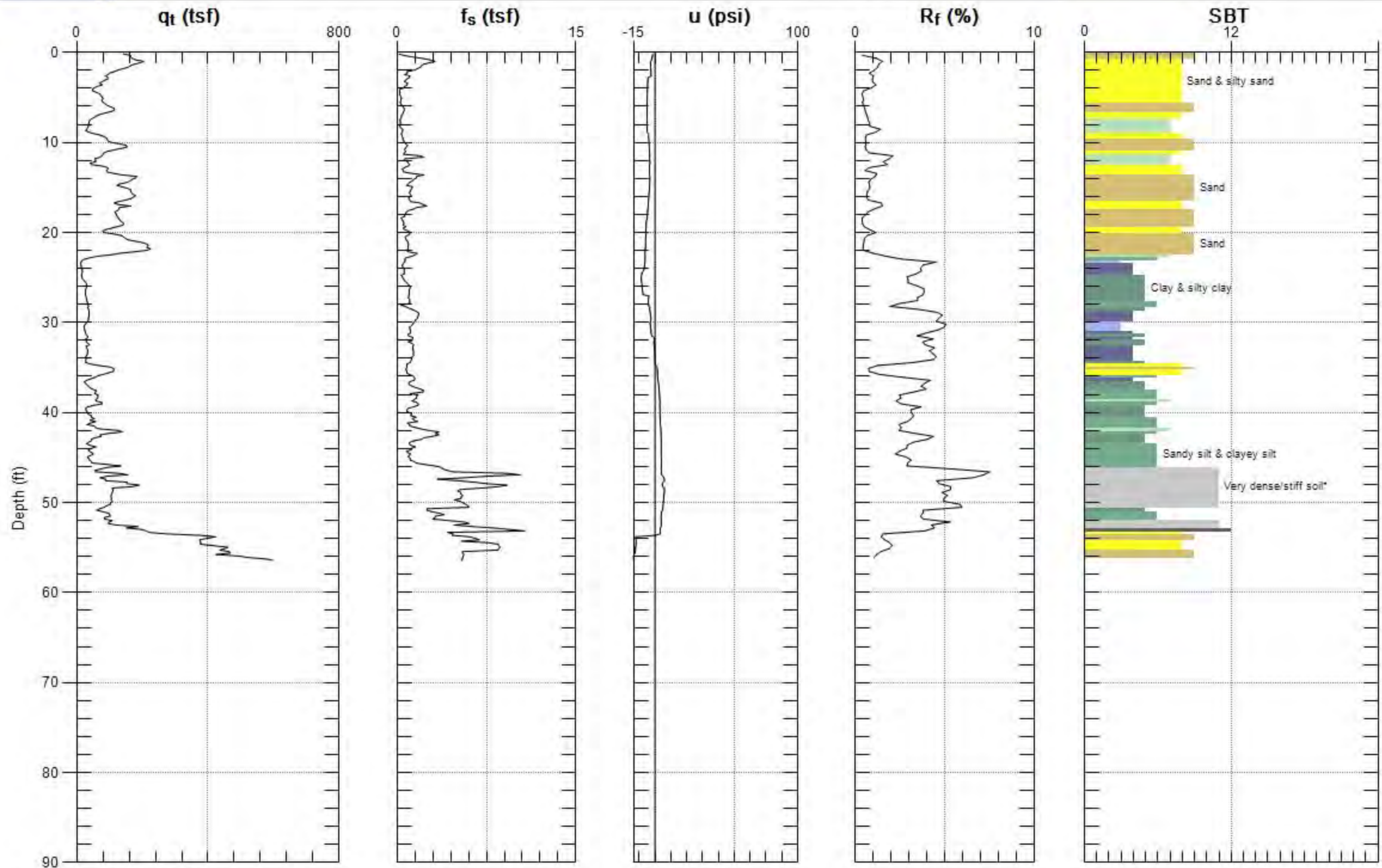
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)



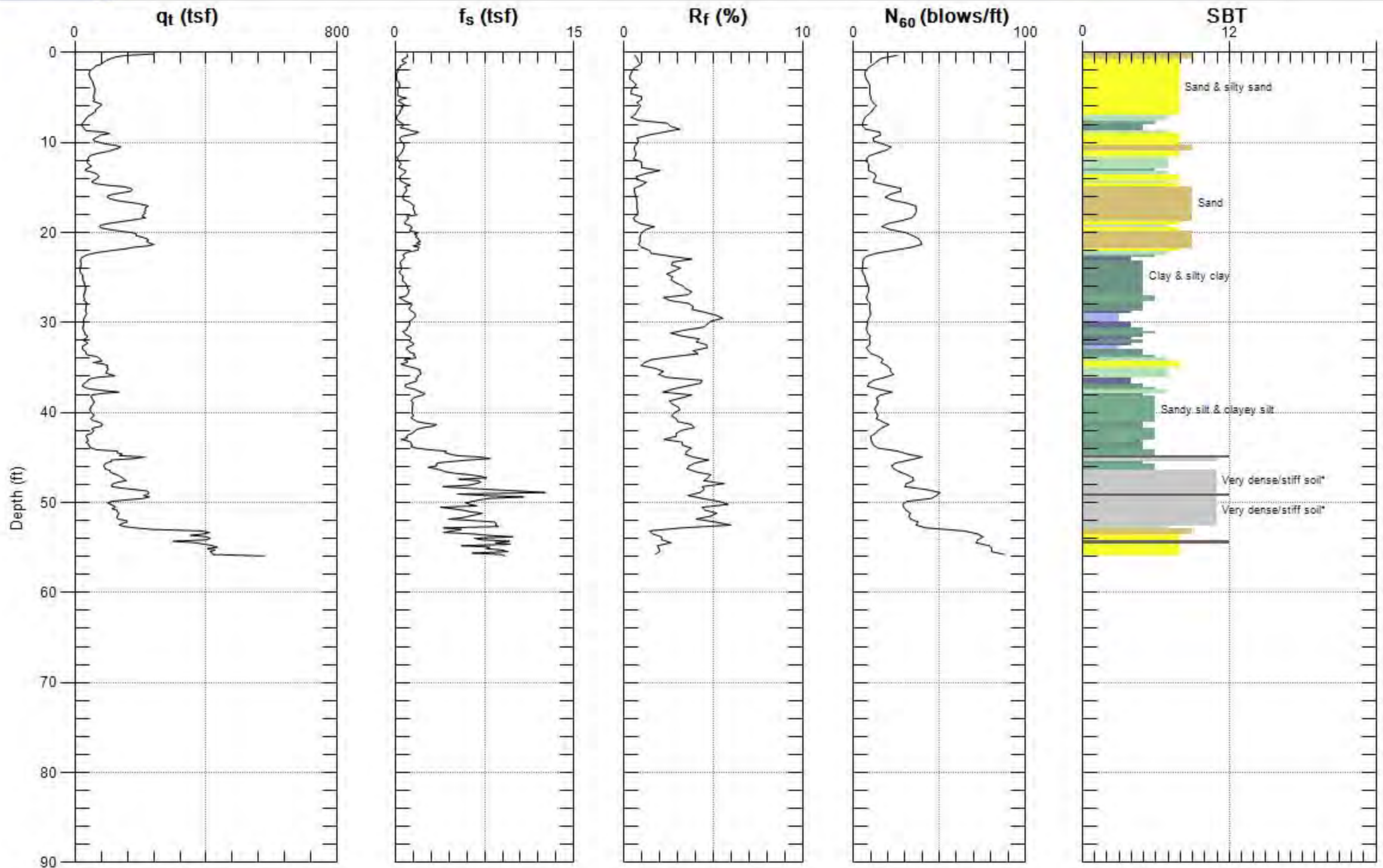
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)



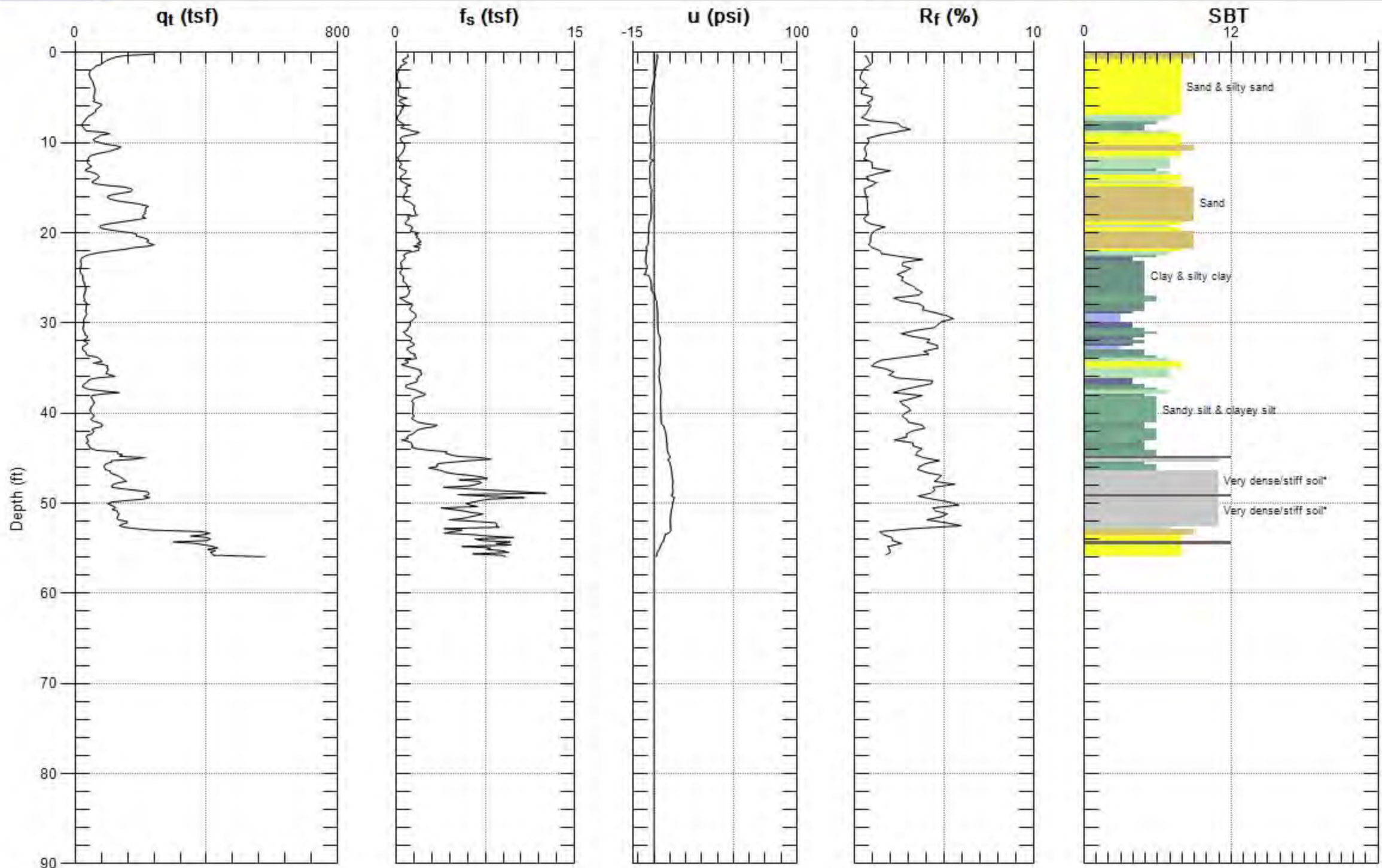
Max. Depth: 56.430 (ft)
Avg. Interval: 0.328 (ft)



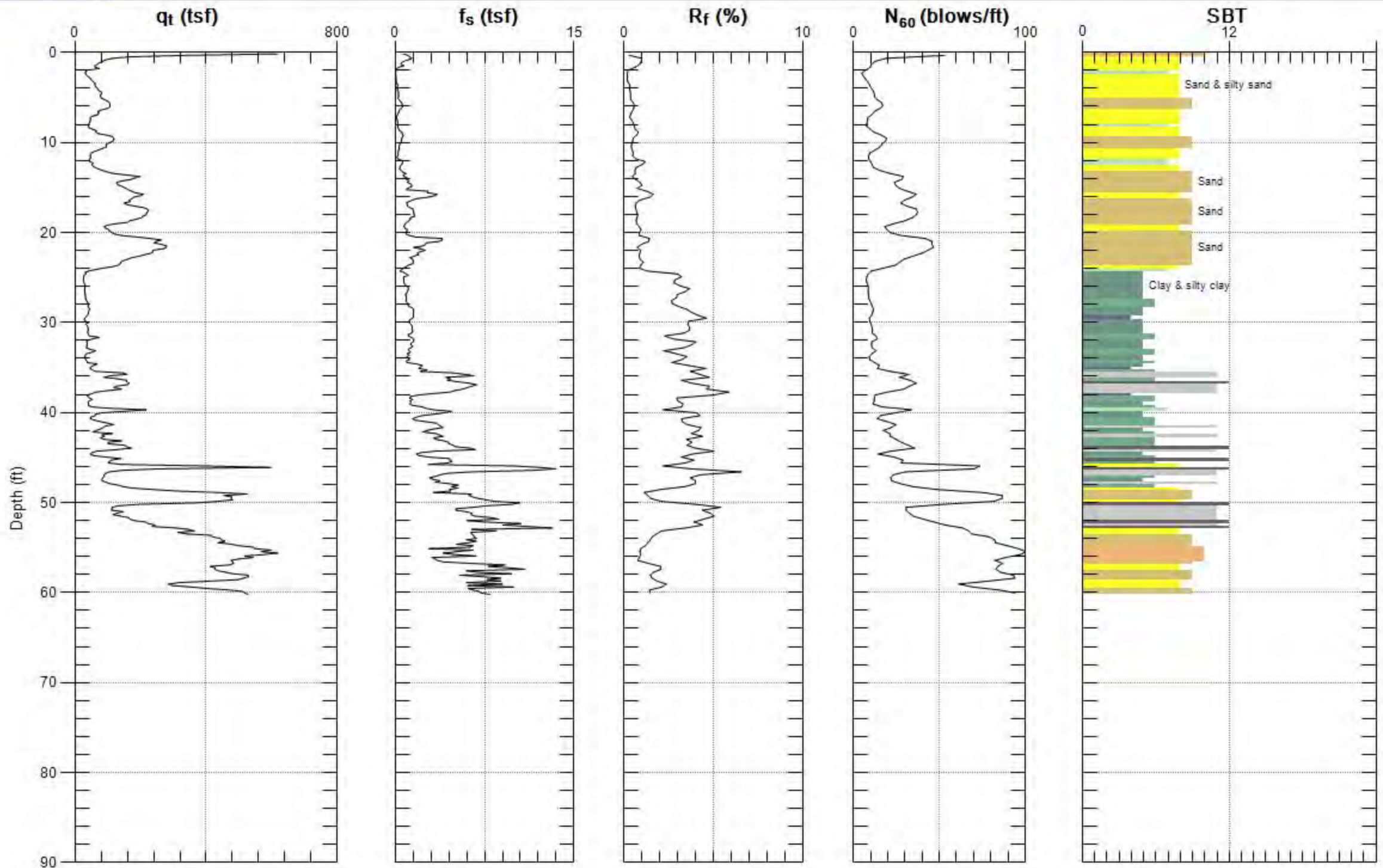
Max. Depth: 56.430 (ft)
Avg. Interval: 0.328 (ft)



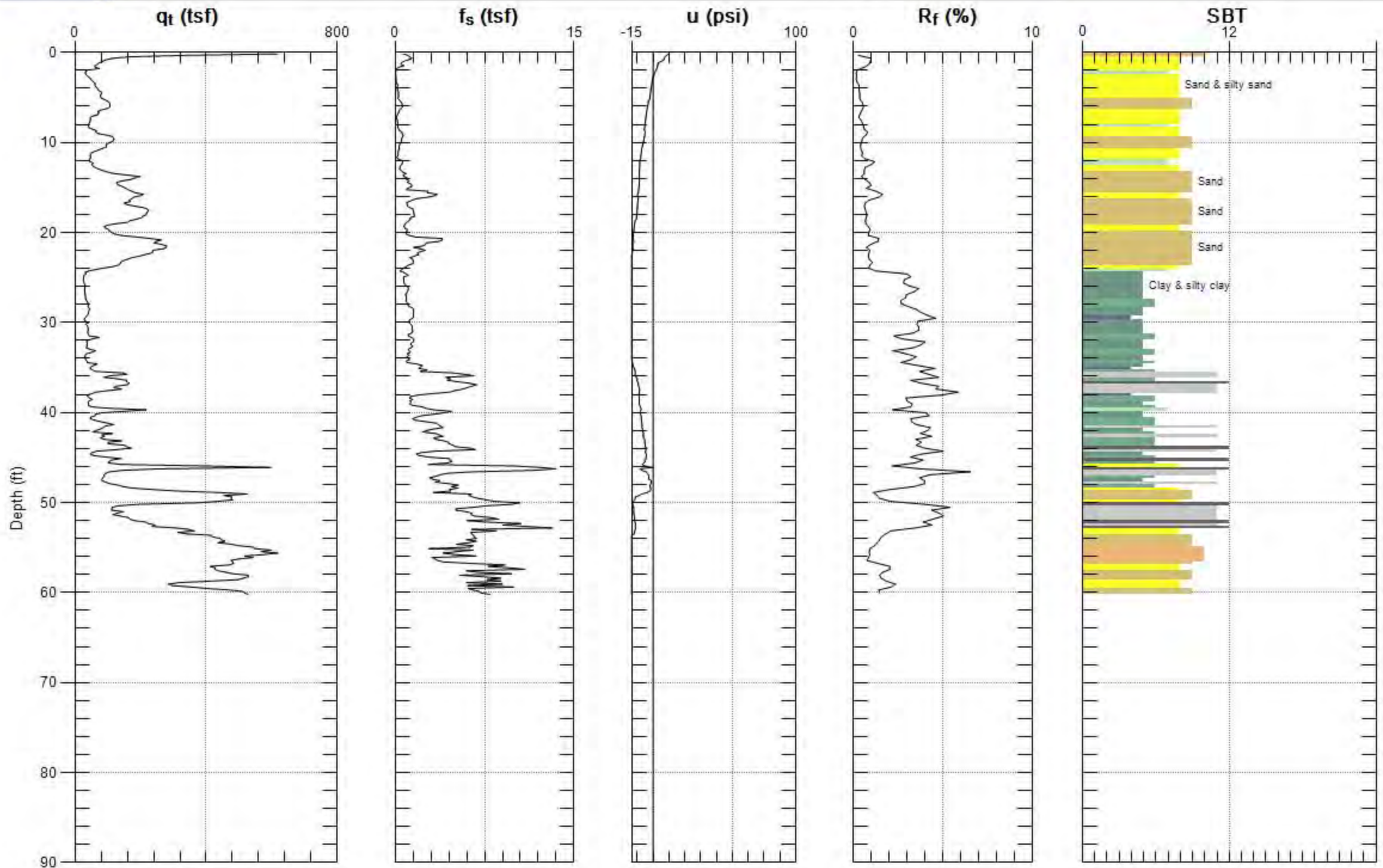
Max. Depth: 55.938 (ft)
Avg. Interval: 0.328 (ft)



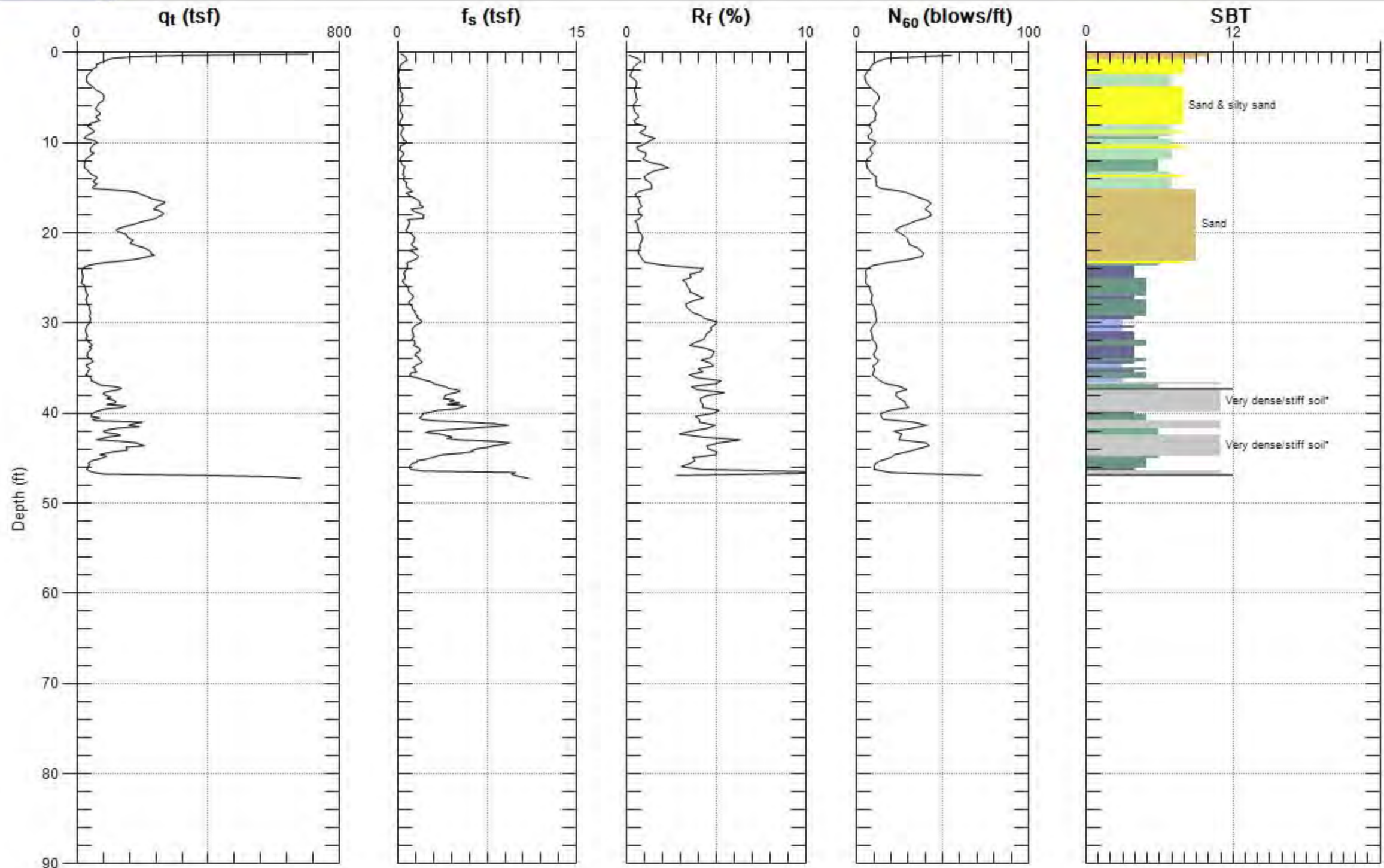
Max. Depth: 55.938 (ft)
Avg. Interval: 0.328 (ft)



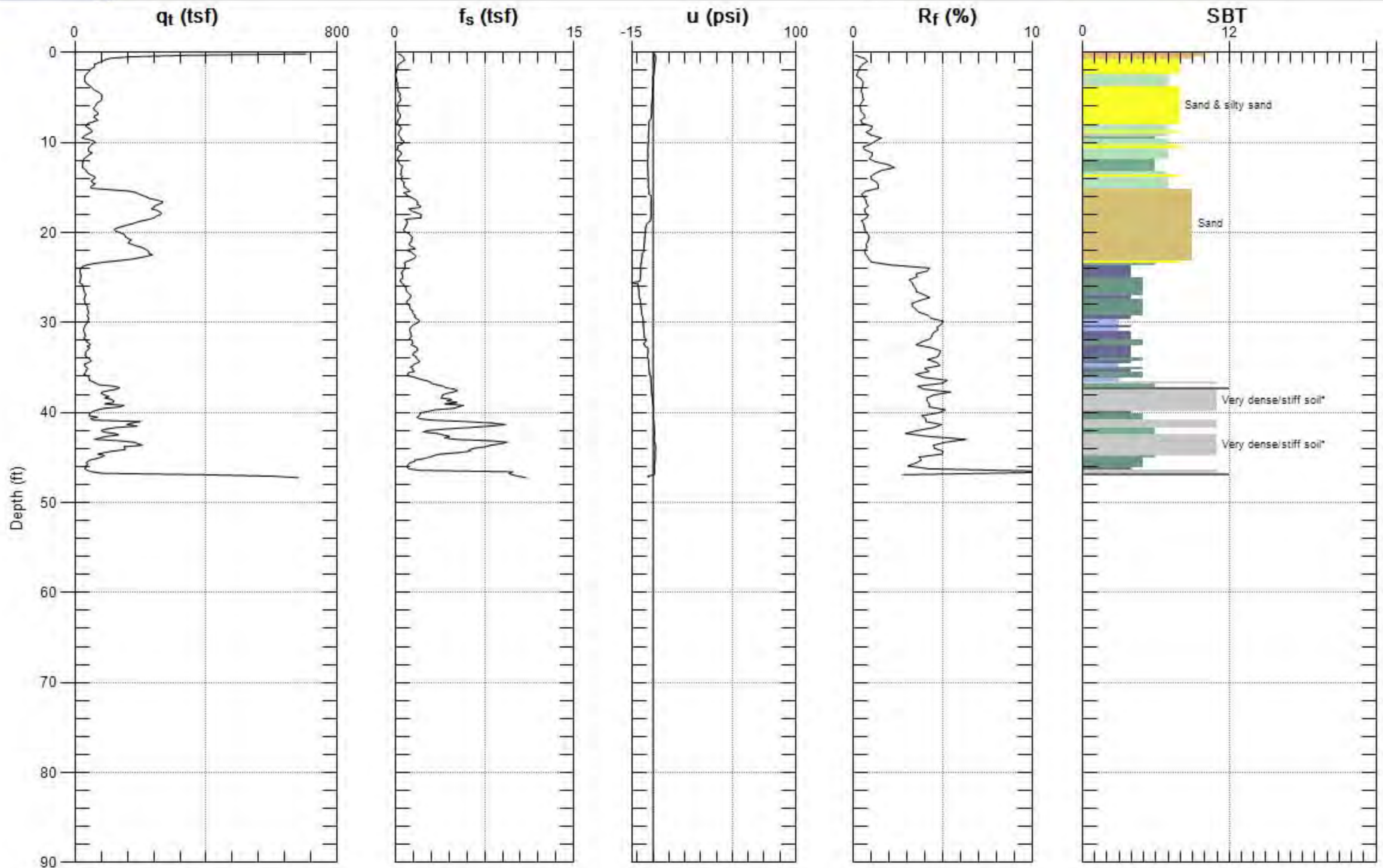
Max. Depth: 60.203 (ft)
Avg. Interval: 0.328 (ft)



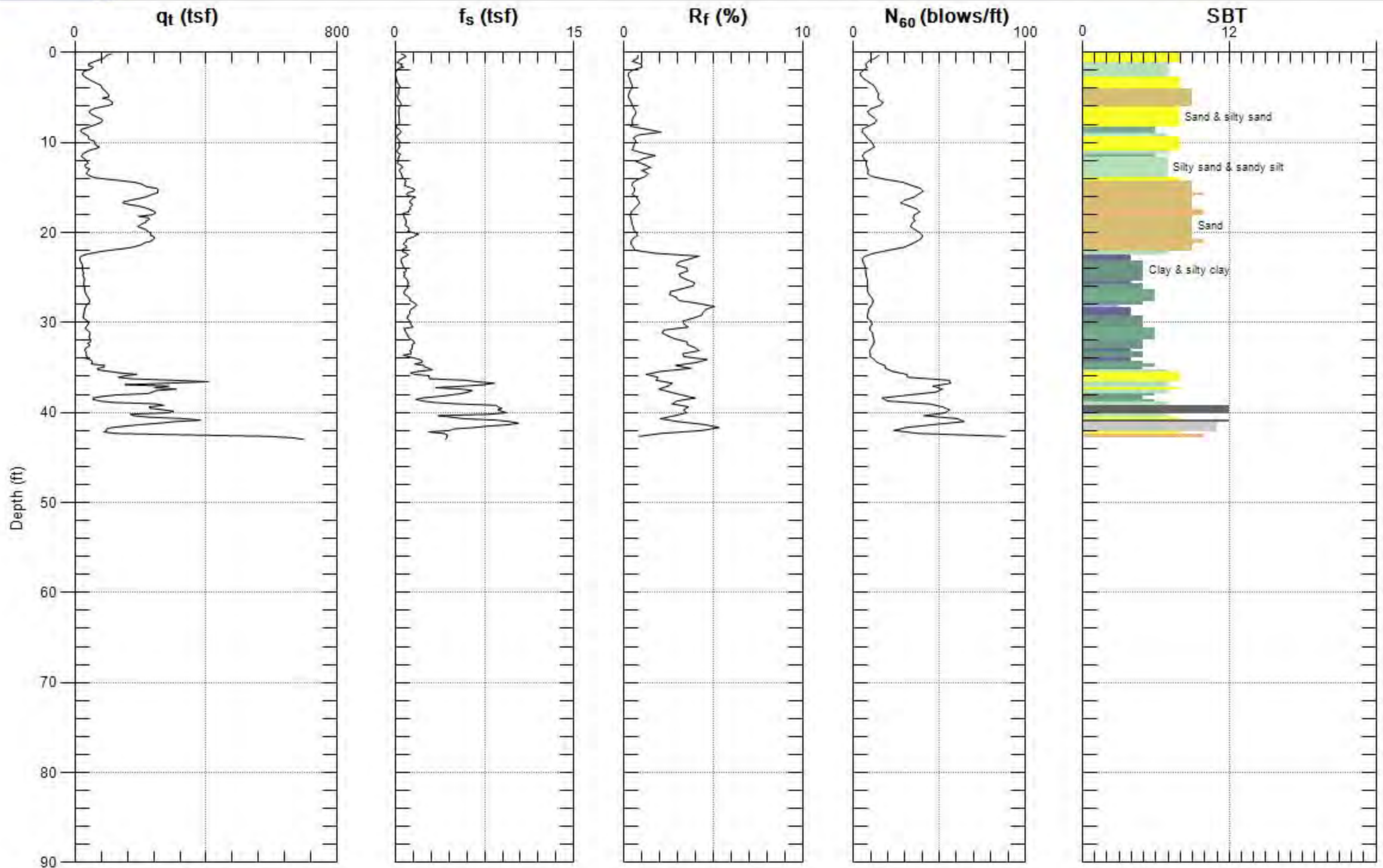
Max. Depth: 60.203 (ft)
Avg. Interval: 0.328 (ft)



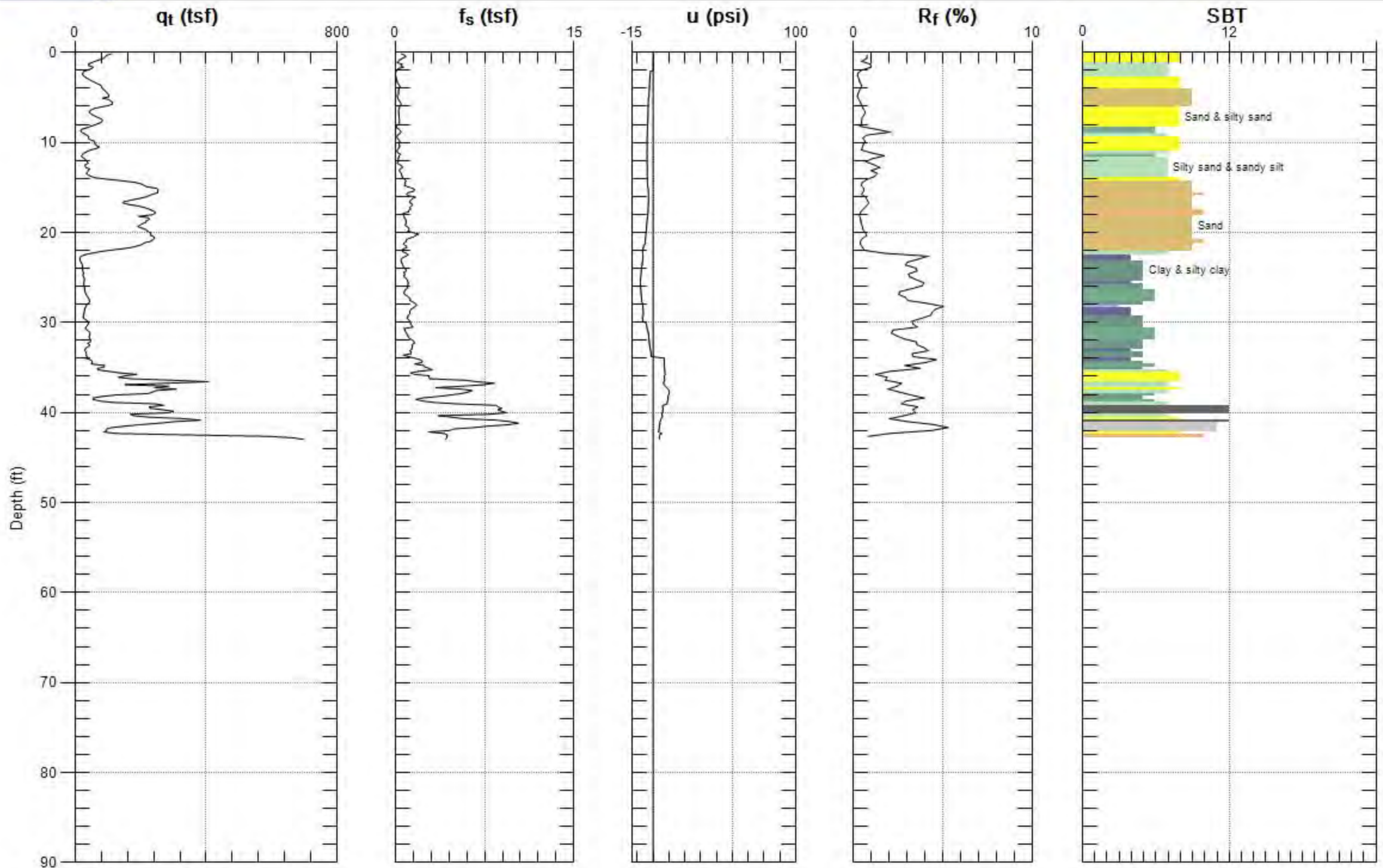
Max. Depth: 47.244 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 47.244 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 42.979 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 42.979 (ft)
Avg. Interval: 0.328 (ft)

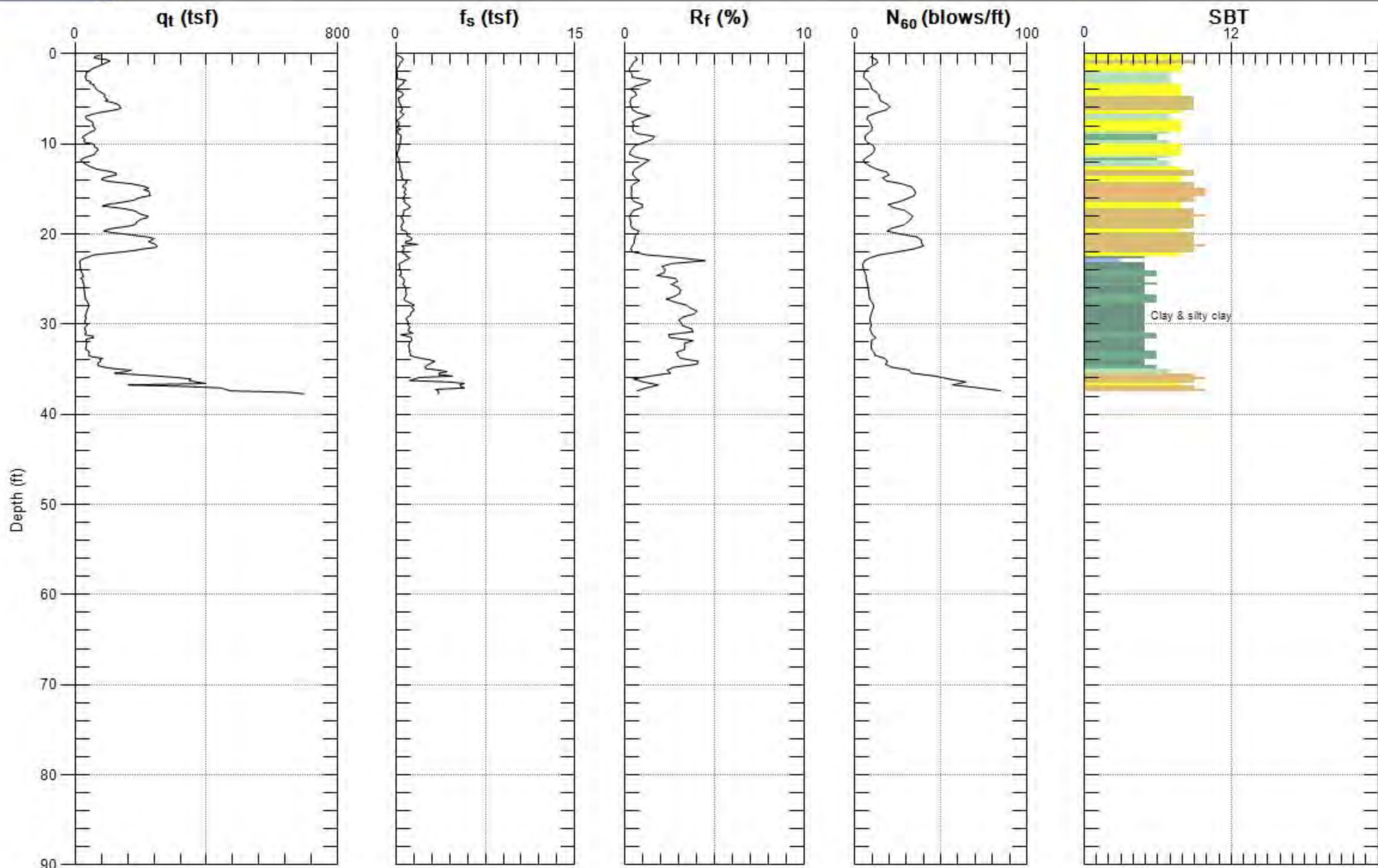


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-16

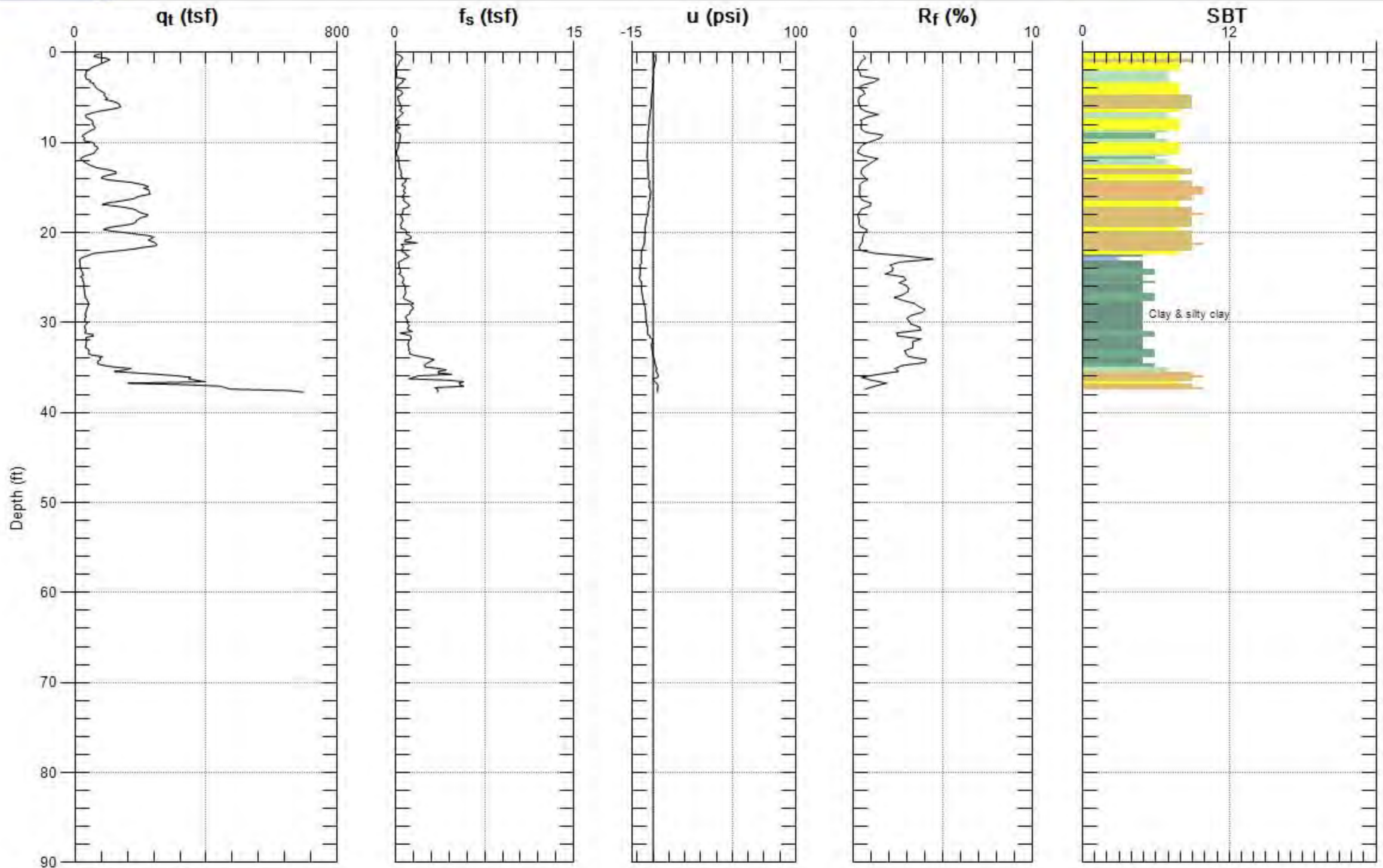
Date: 8/2/2012 12:48



Max. Depth: 37.730 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-31

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 37.730 (ft)
Avg. Interval: 0.328 (ft)

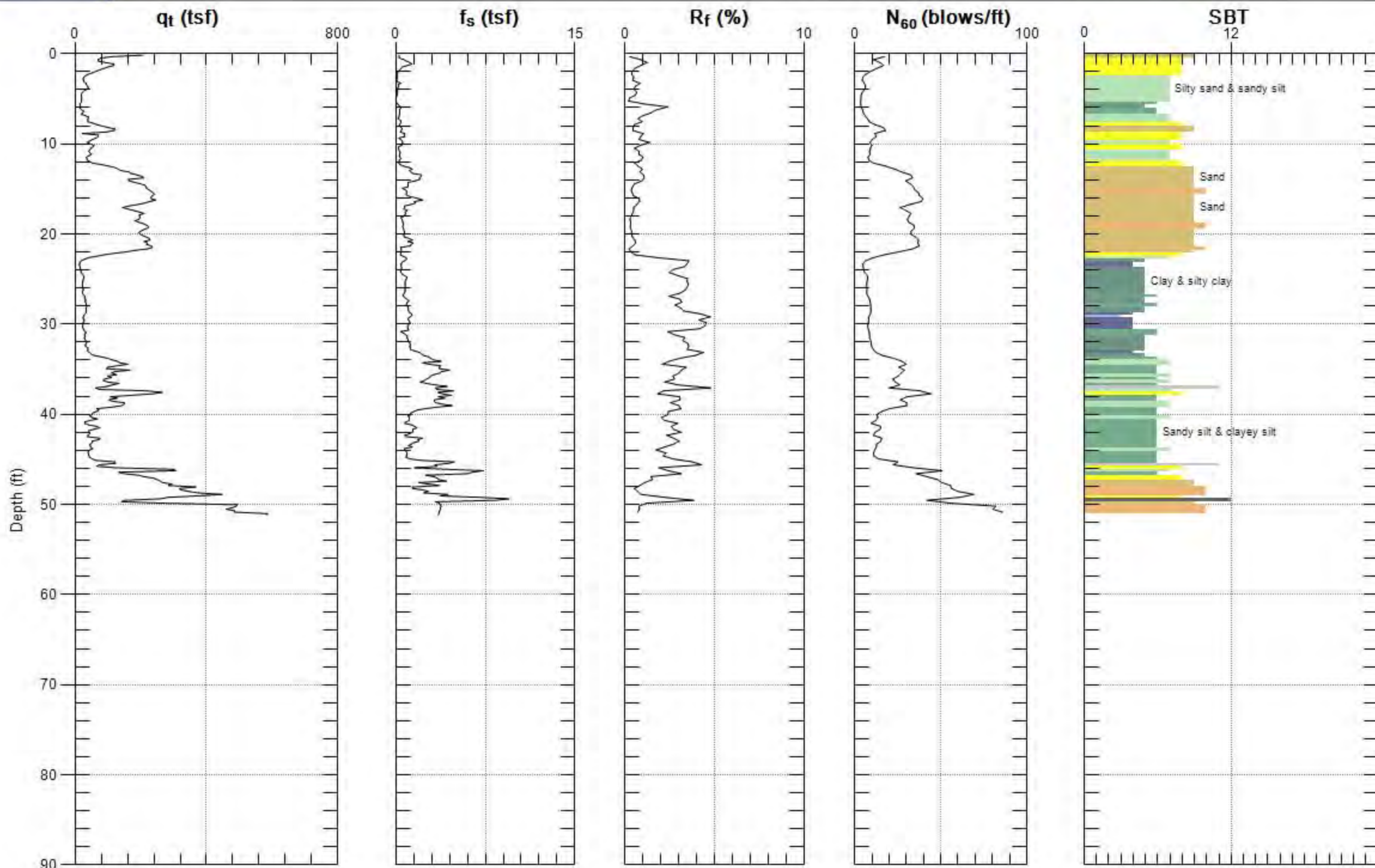


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-17

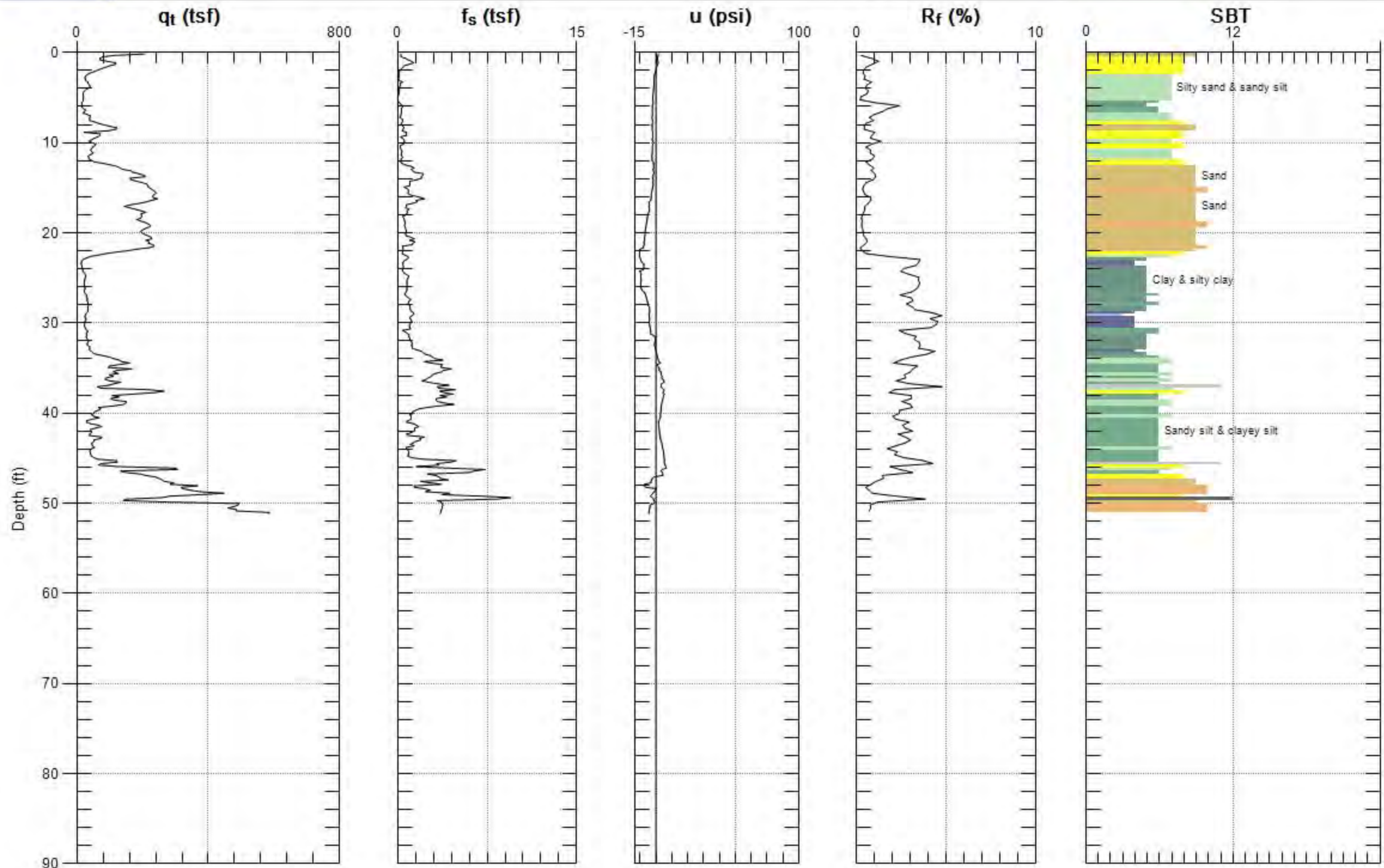
Date: 8/2/2012 12:00



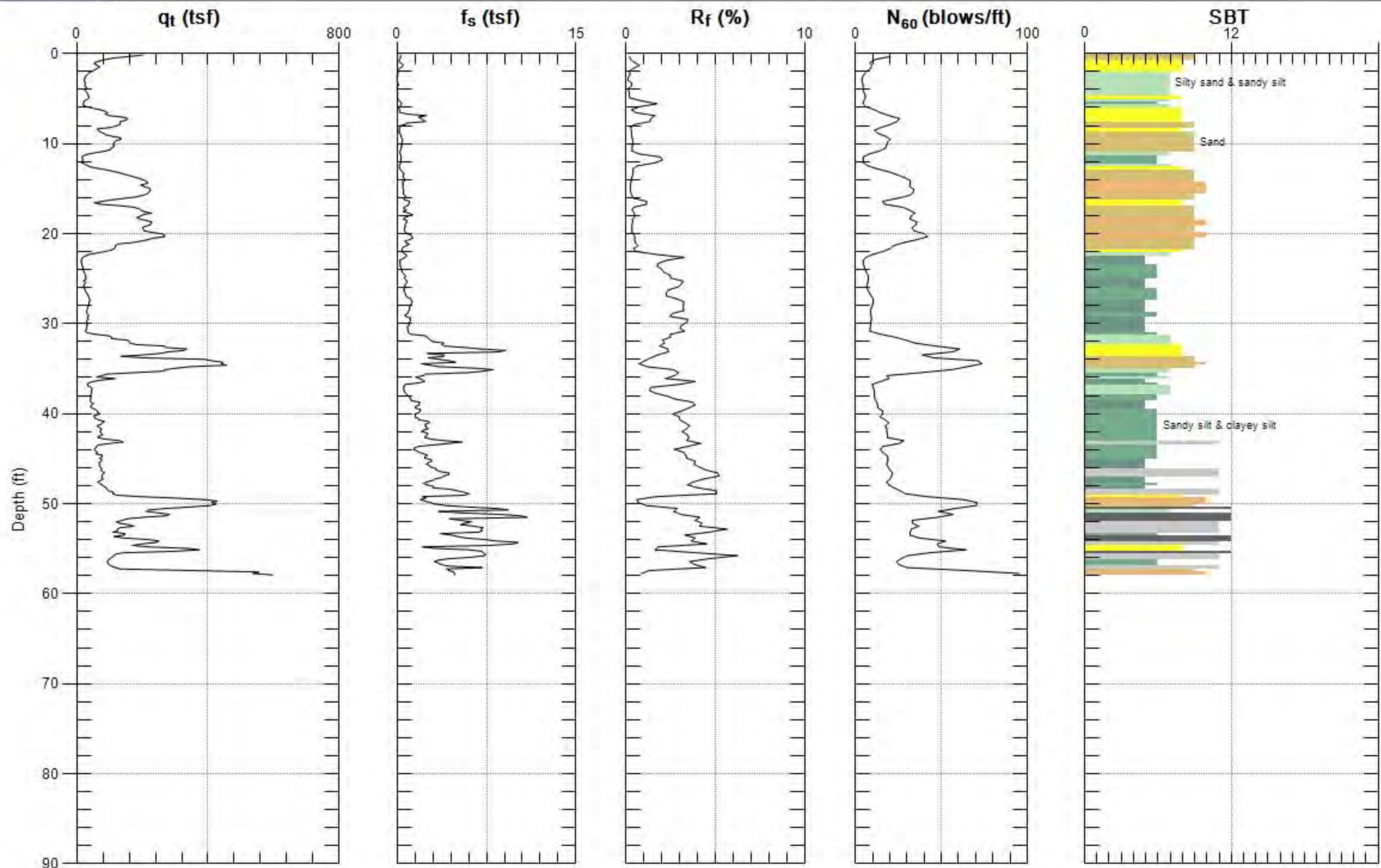
Max. Depth: 51.181 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-33

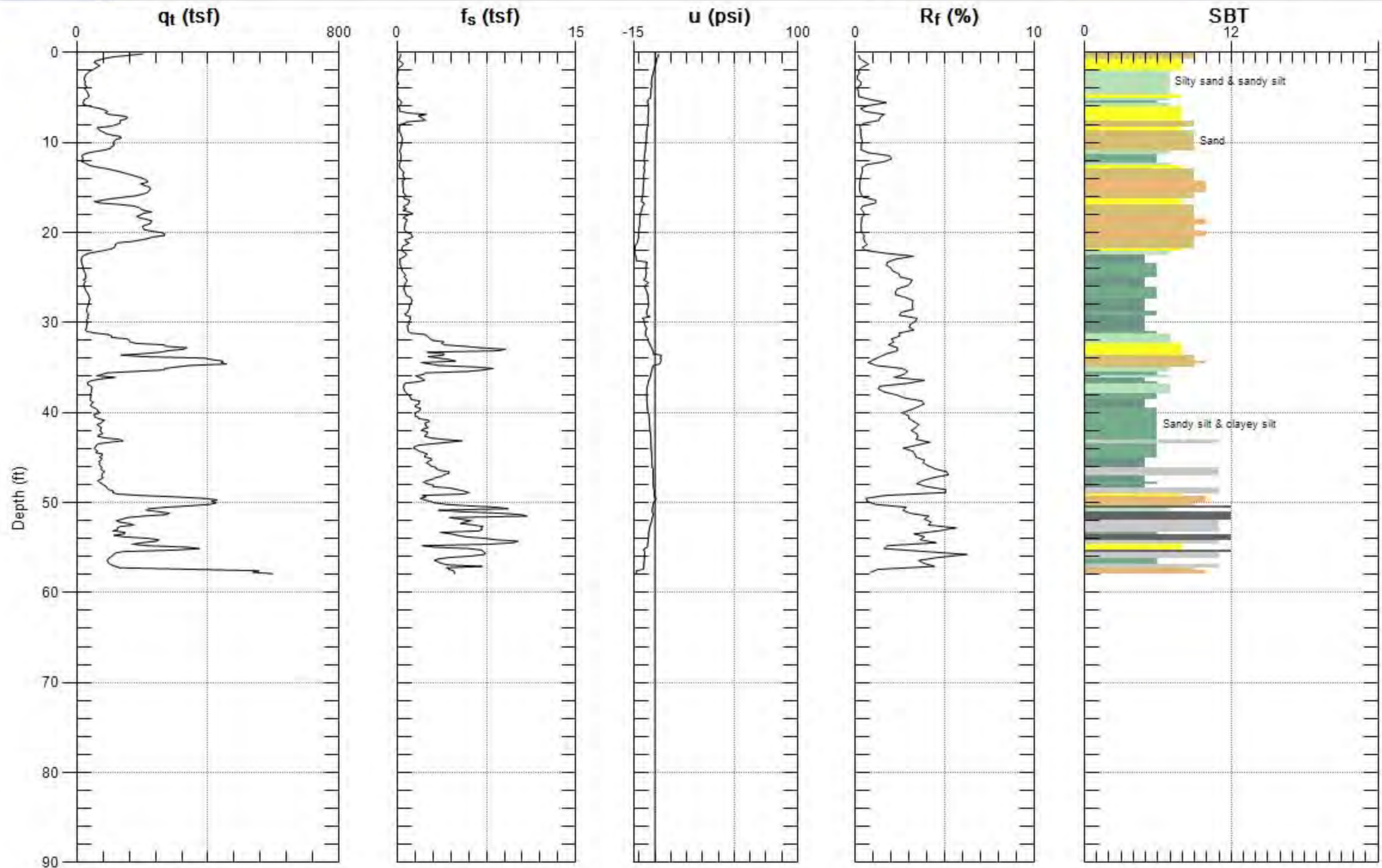
SBT: Soil Behavior Type (Robertson 1990)



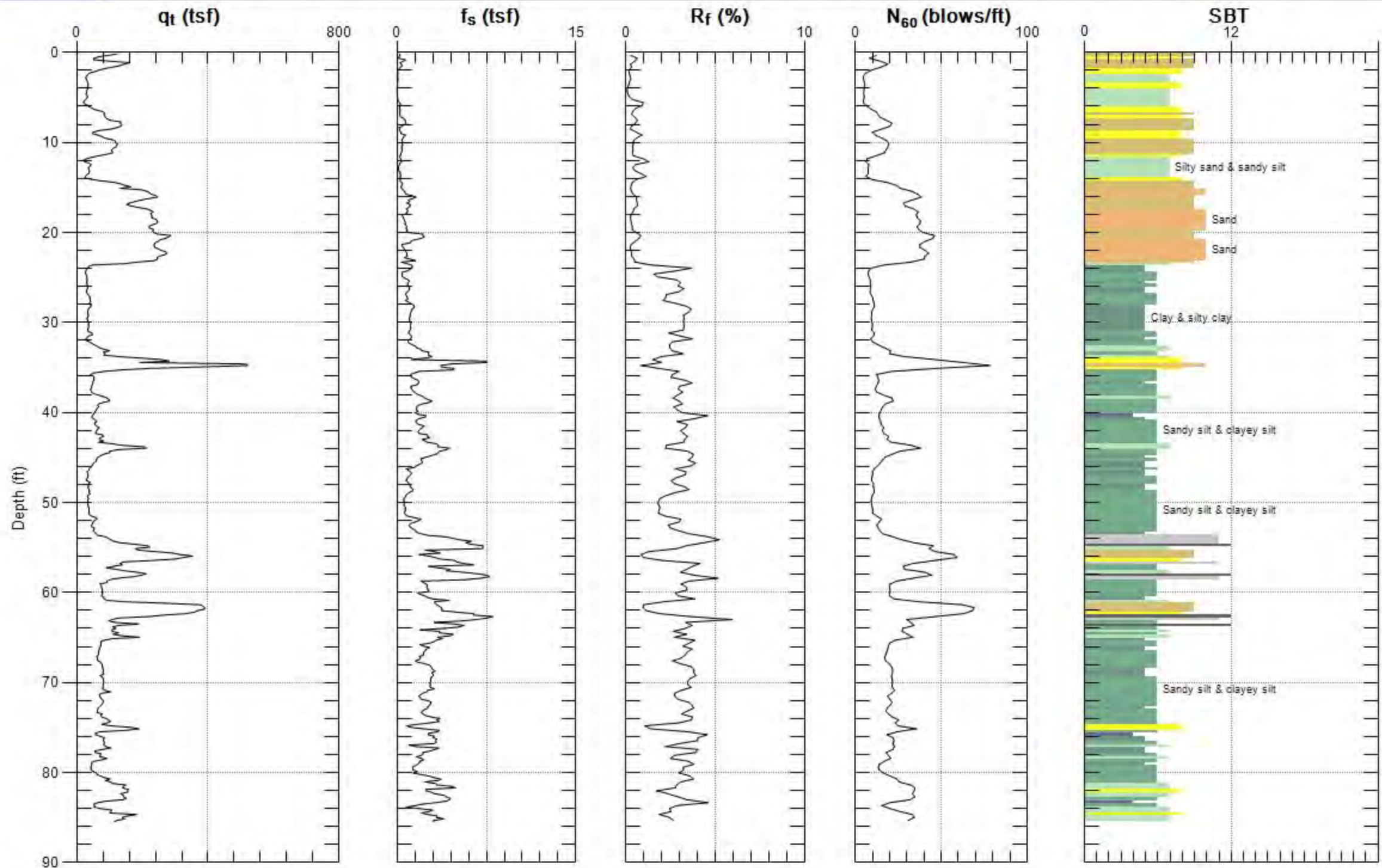
Max. Depth: 51.181 (ft)
Avg. Interval: 0.328 (ft)



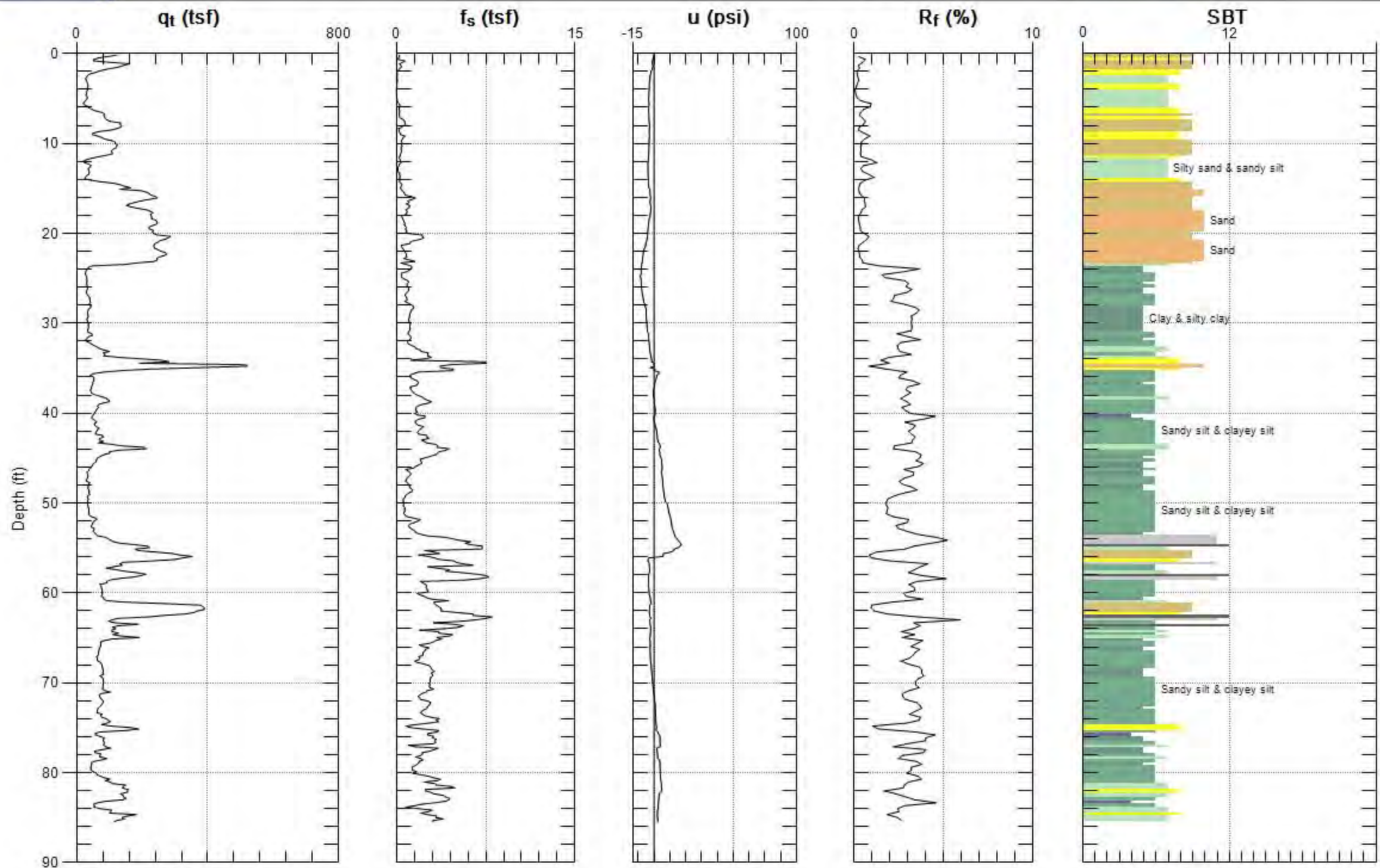
Max. Depth: 57.907 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 57.907 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 85.466 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 85.466 (ft)
Avg. Interval: 0.328 (ft)

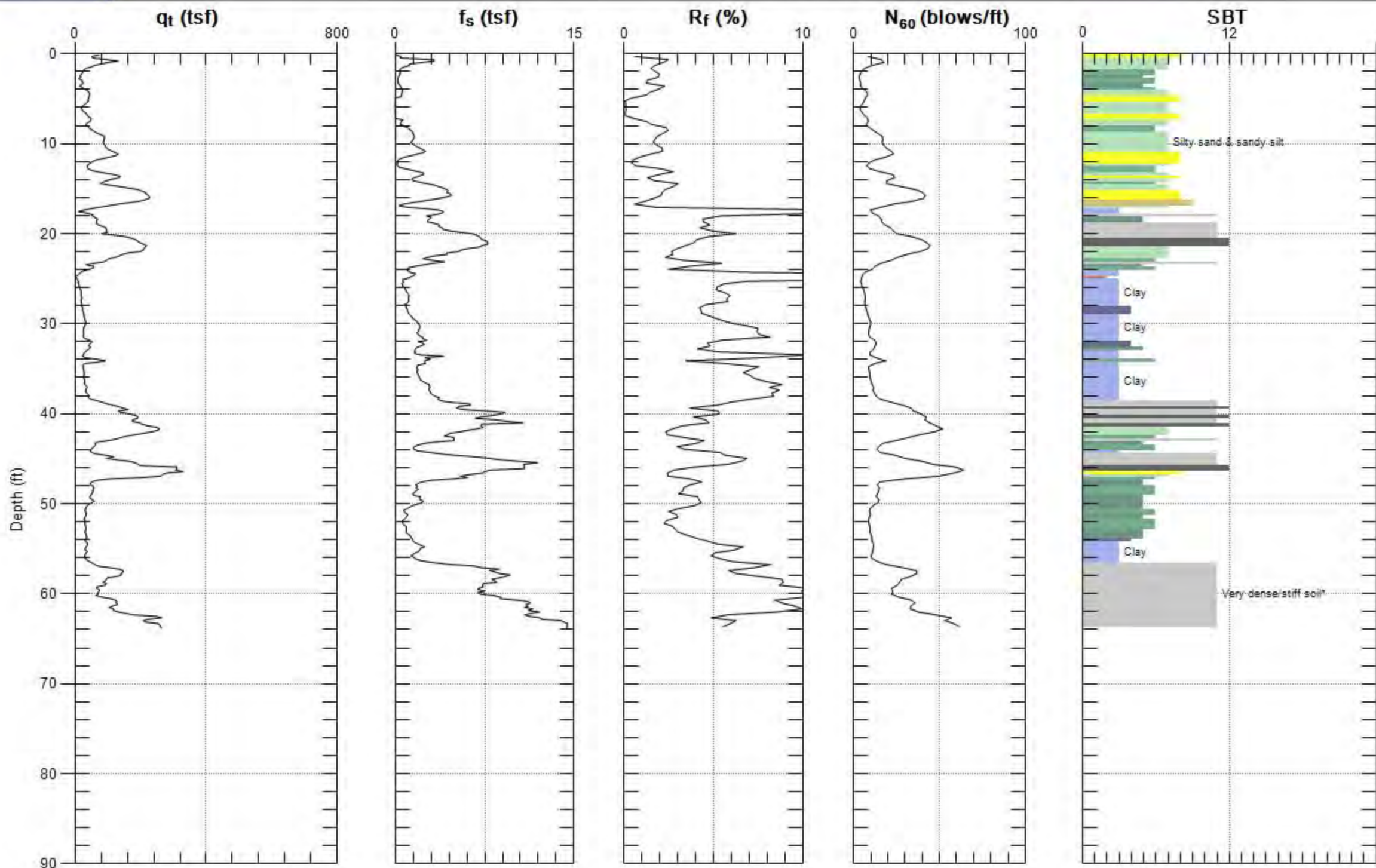


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-20

Date: 8/2/2012 09:19



Max. Depth: 63.812 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-39

SBT: Soil Behavior Type (Robertson 1990)

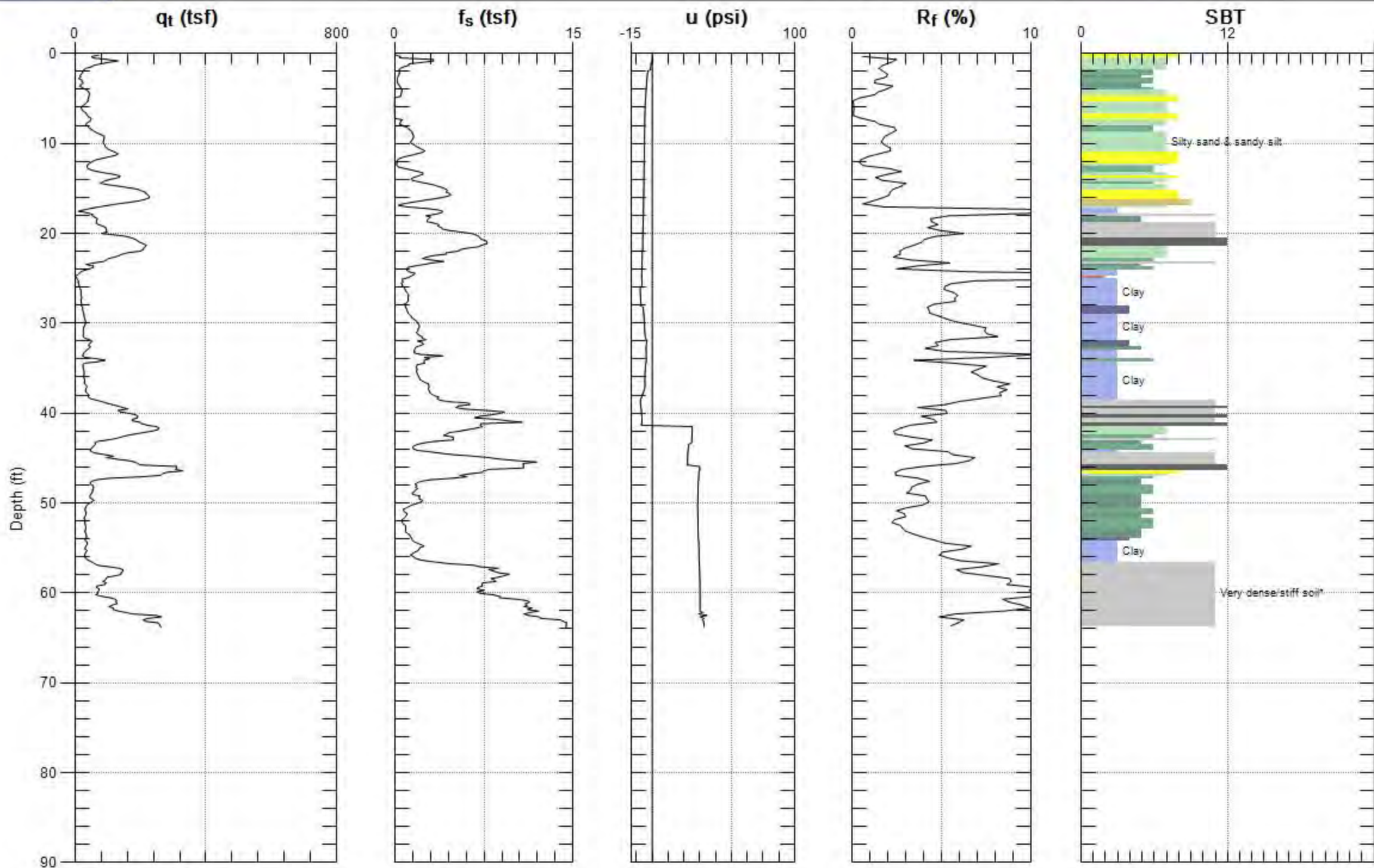


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-20

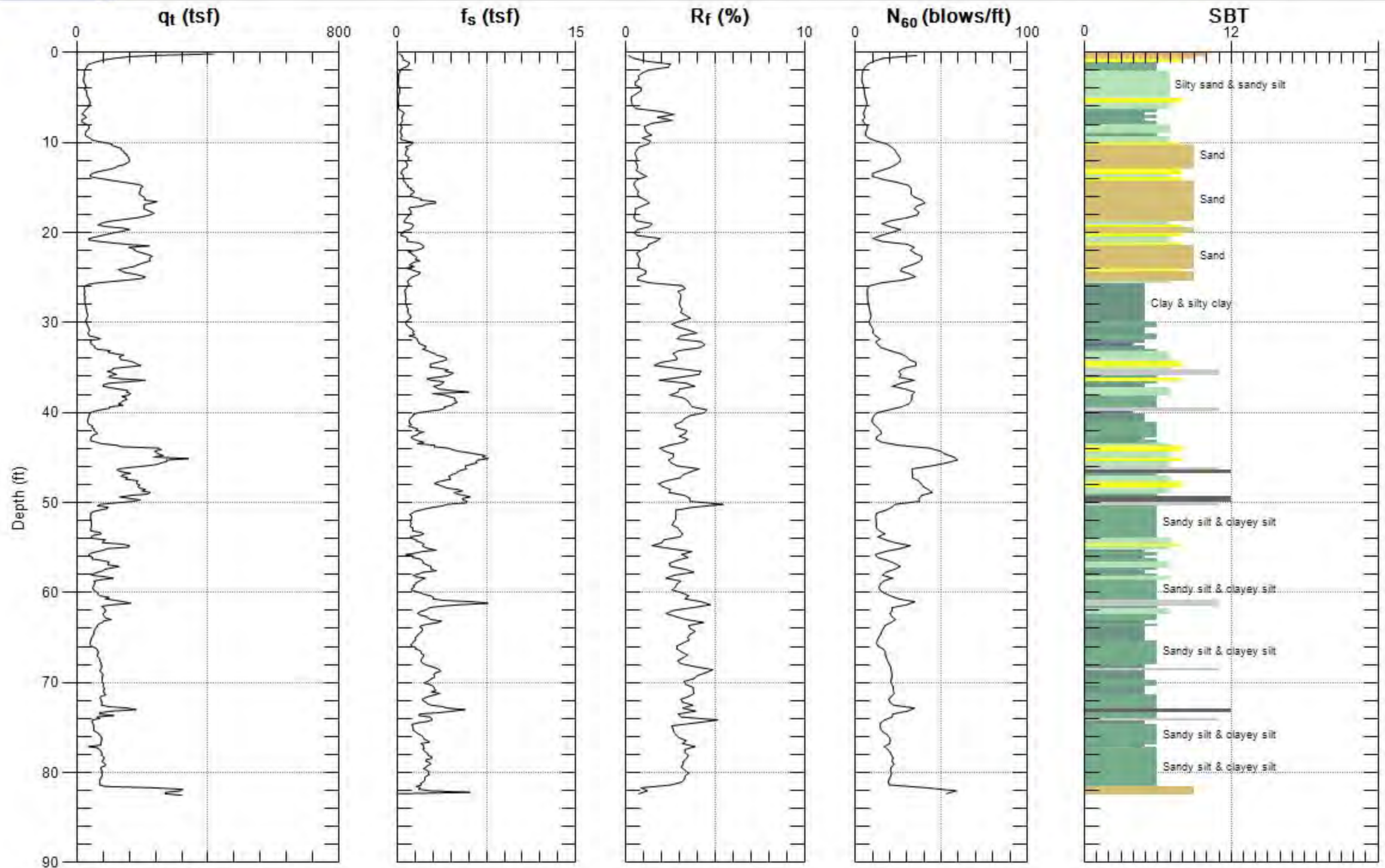
Date: 8/2/2012 09:19



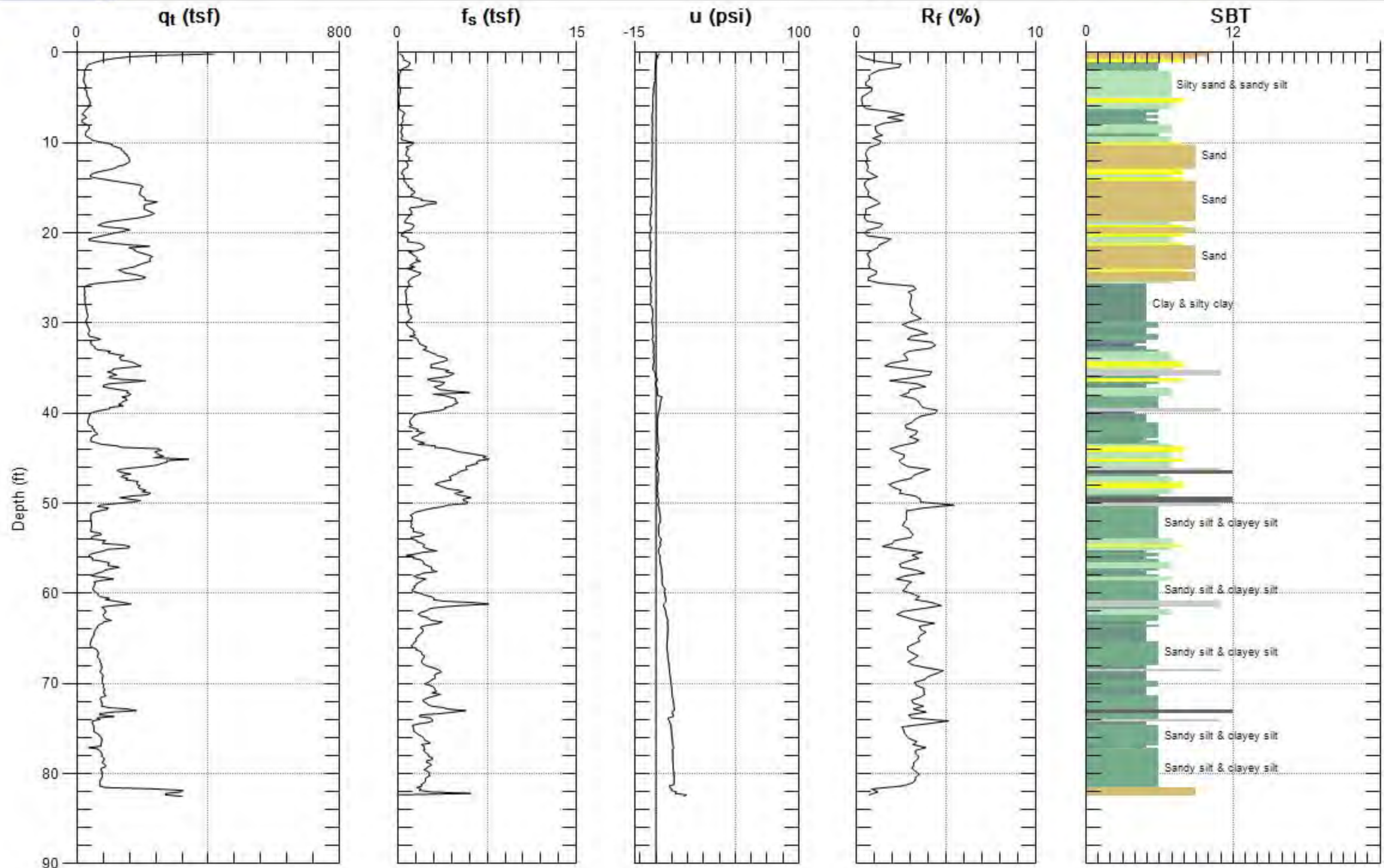
Max. Depth: 63.812 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-40

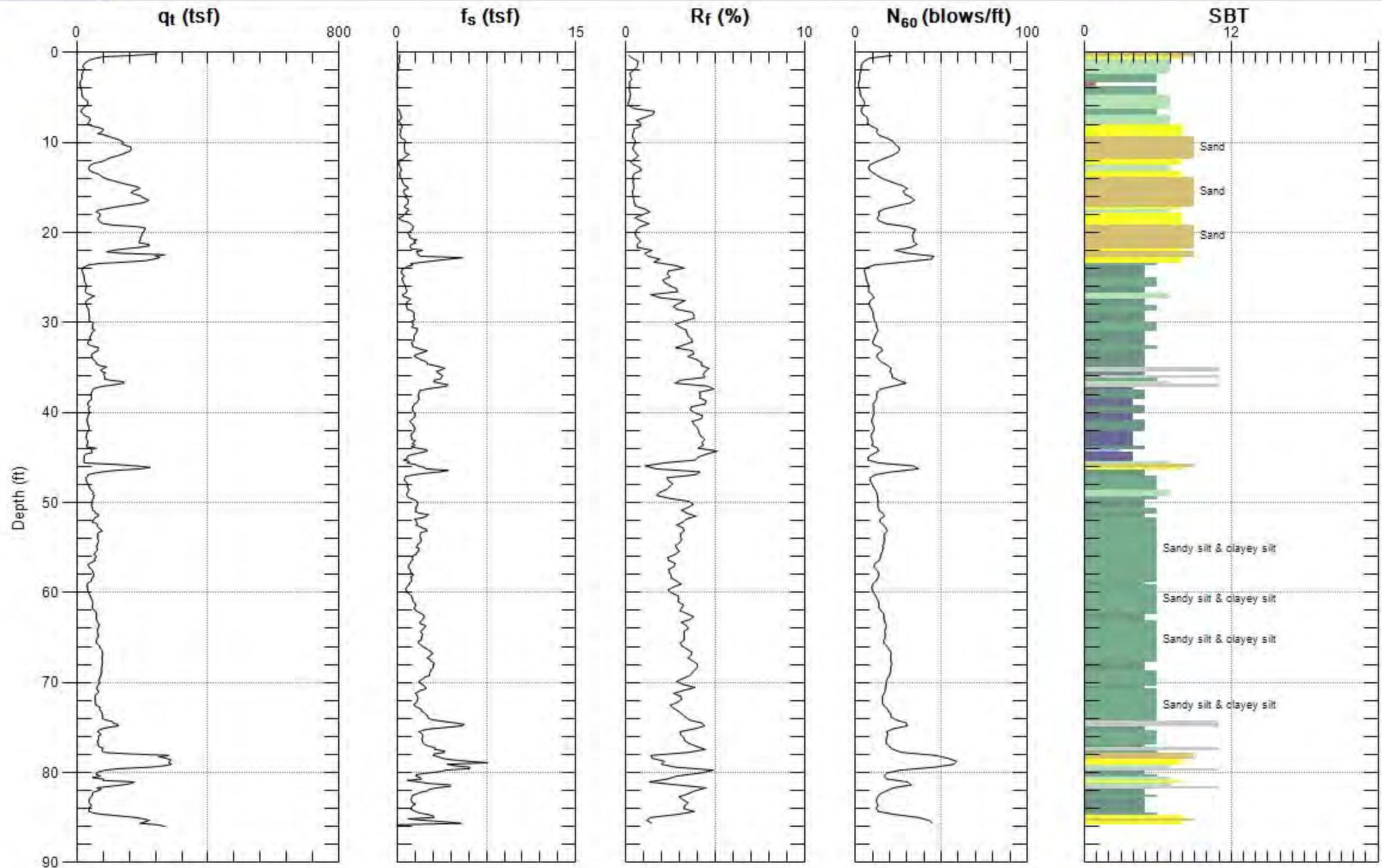
SBT: Soil Behavior Type (Robertson 1990)



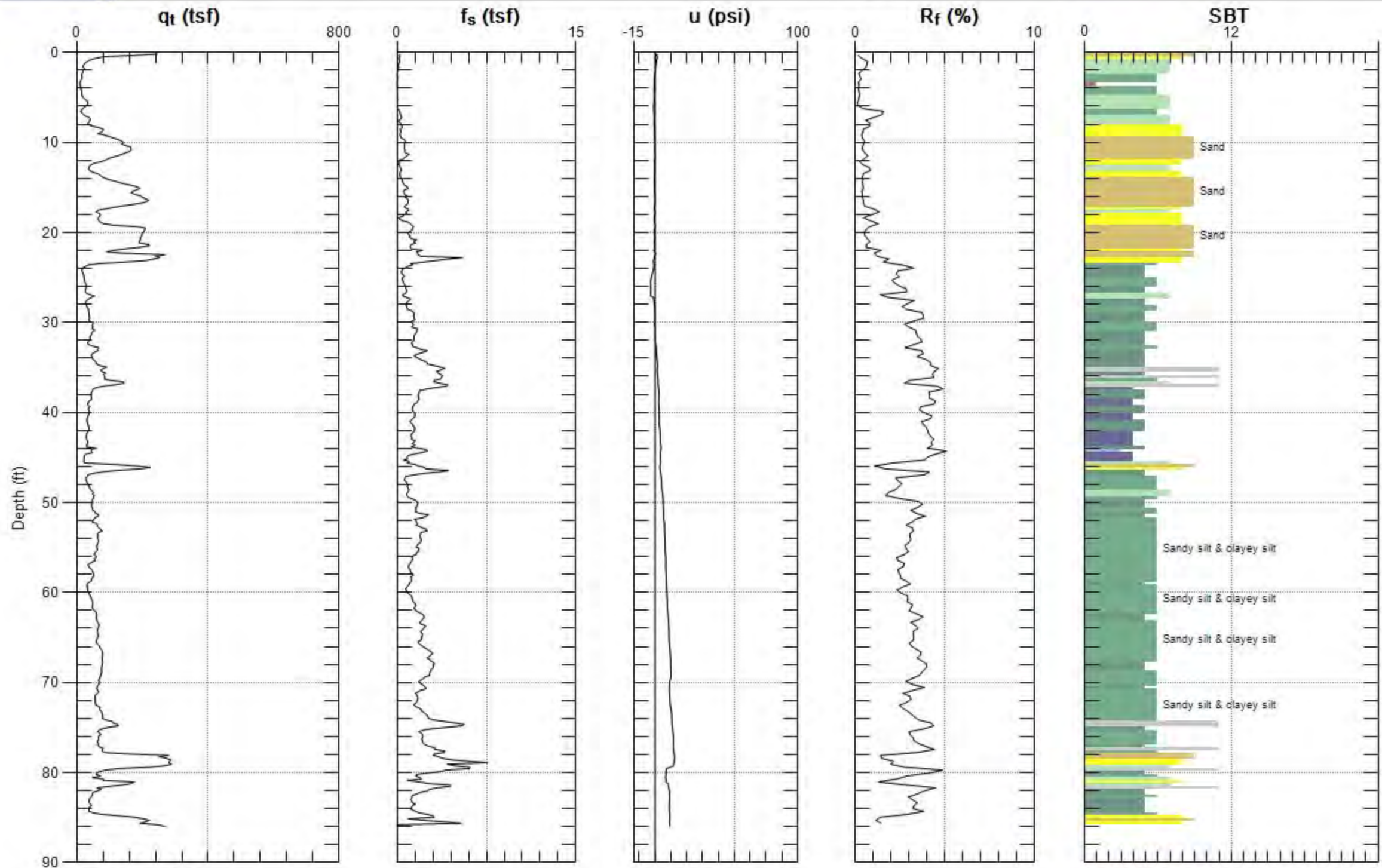
Max. Depth: 82.513 (ft)
Avg. Interval: 0.328 (ft)



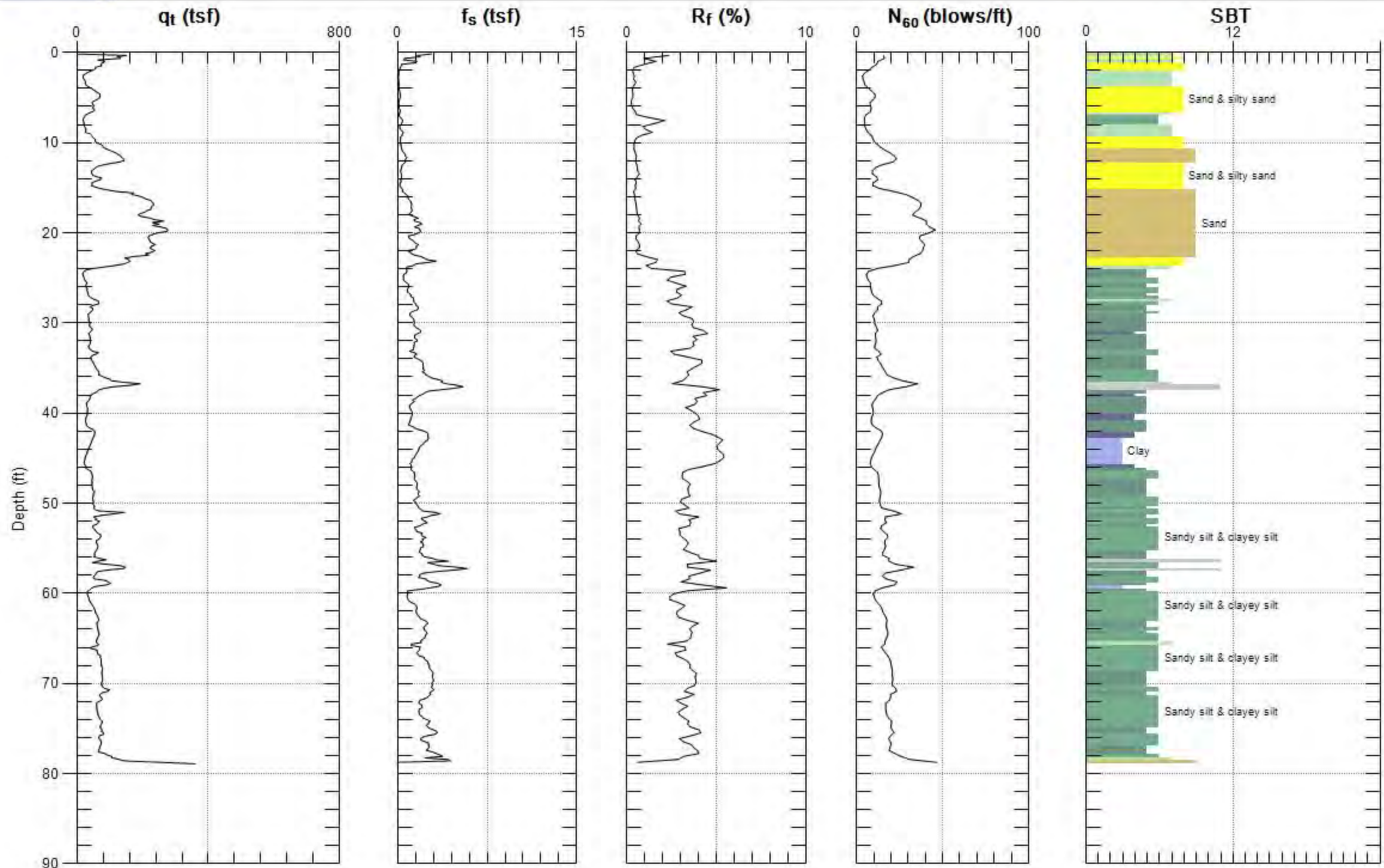
Max. Depth: 82.513 (ft)
Avg. Interval: 0.328 (ft)



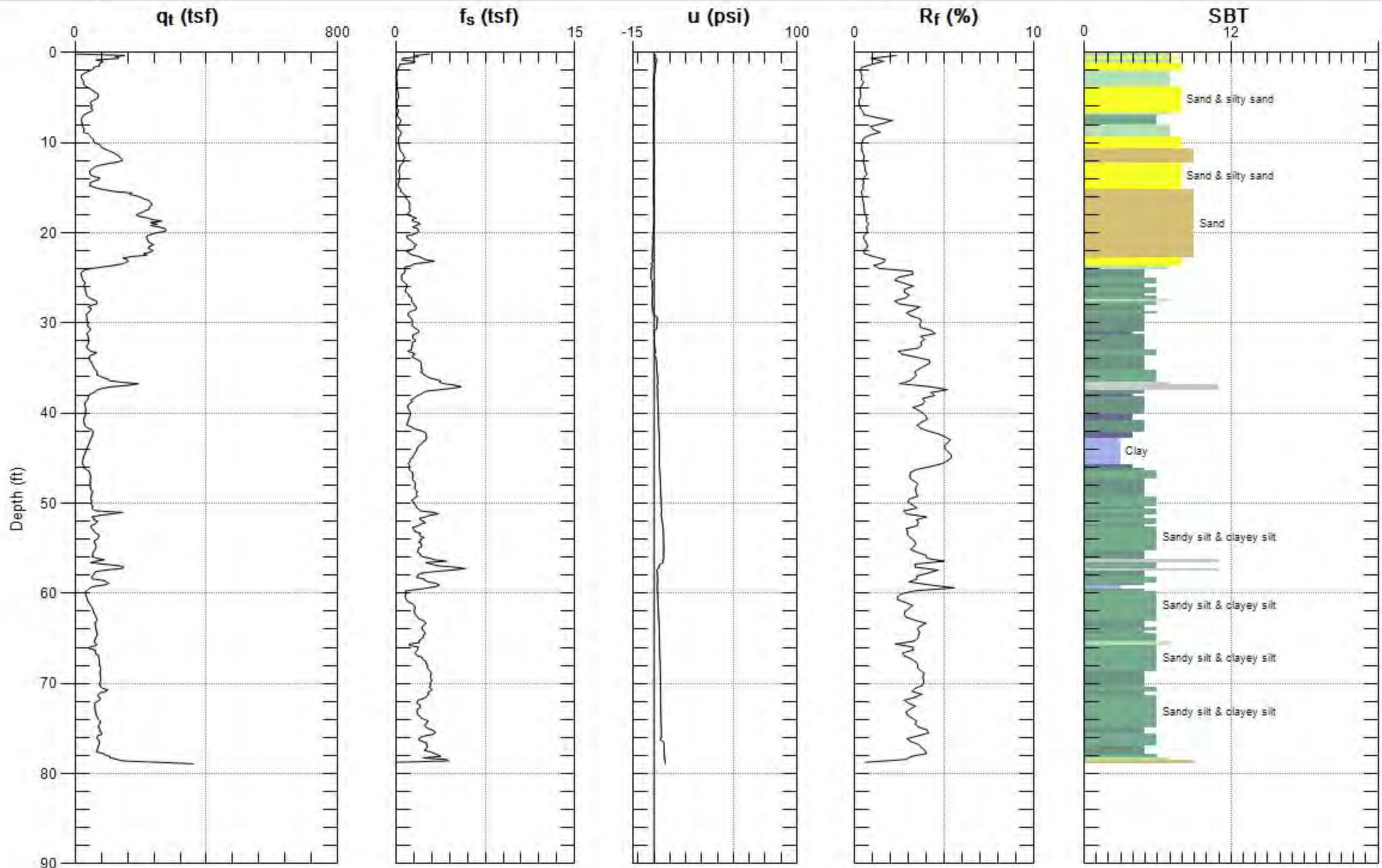
Max. Depth: 85.958 (ft)
Avg. Interval: 0.328 (ft)



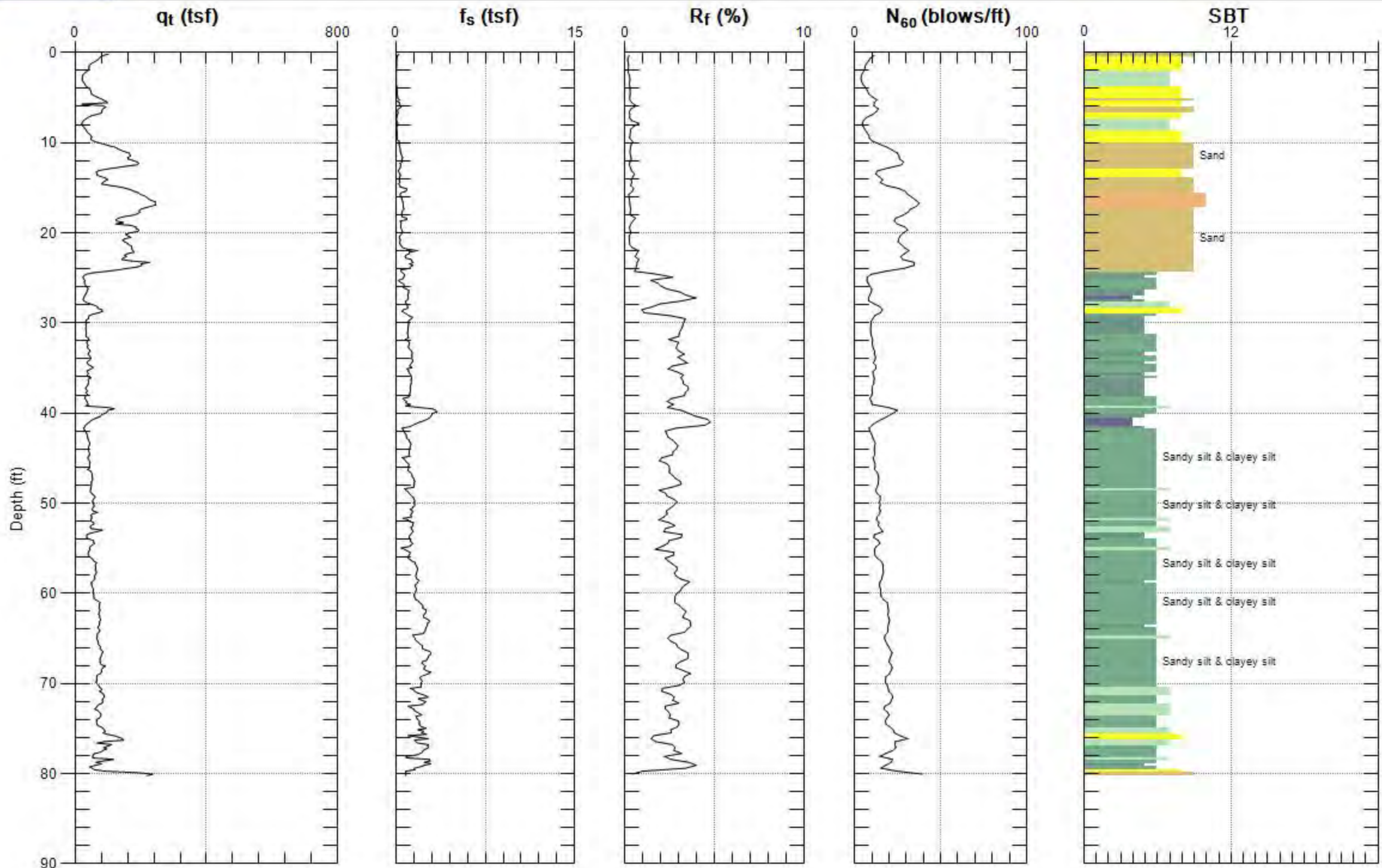
Max. Depth: 85.958 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 78.904 (ft)
Avg. Interval: 0.328 (ft)



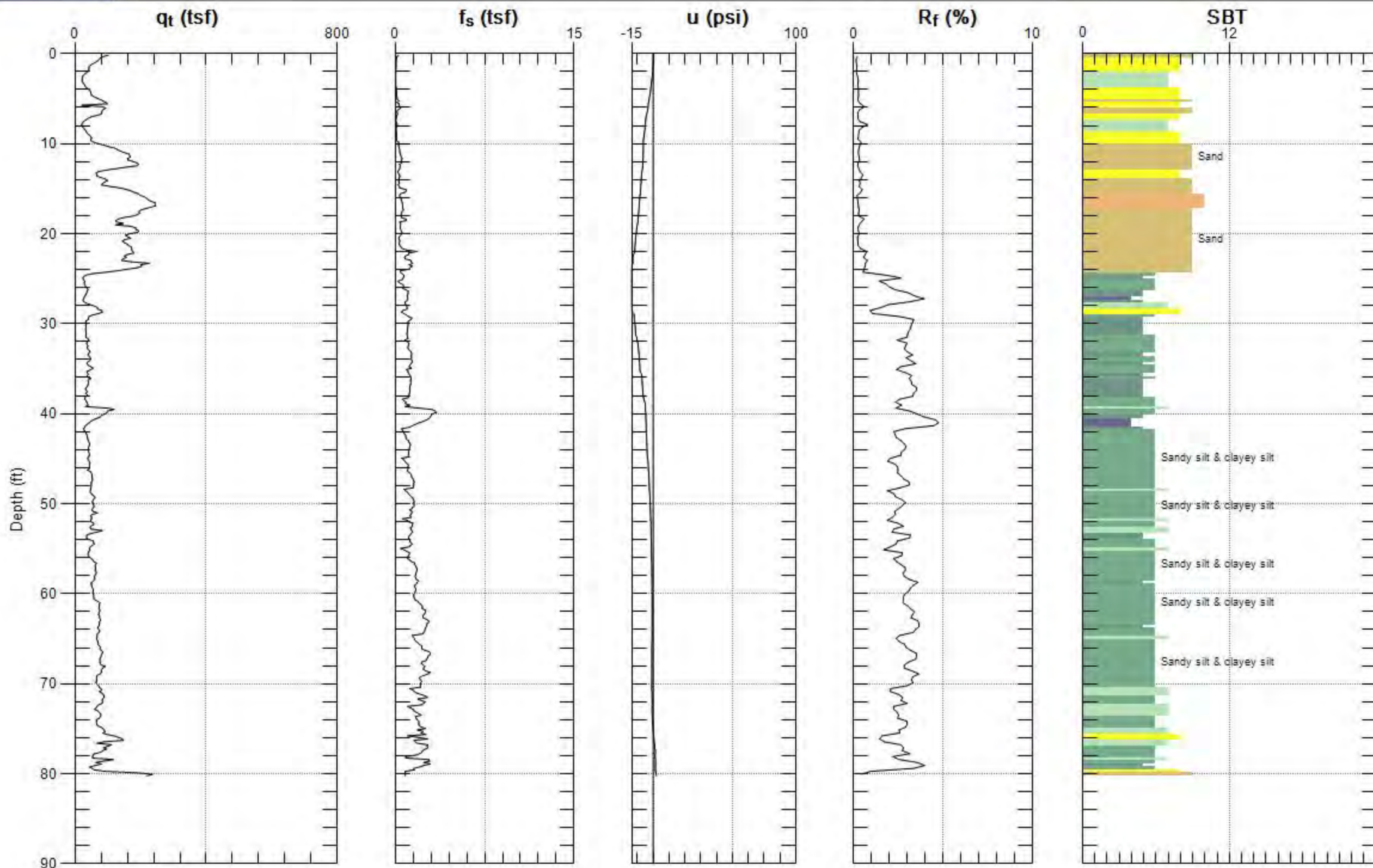
Max. Depth: 78.904 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 80.217 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-47

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 80.217 (ft)
Avg. Interval: 0.328 (ft)

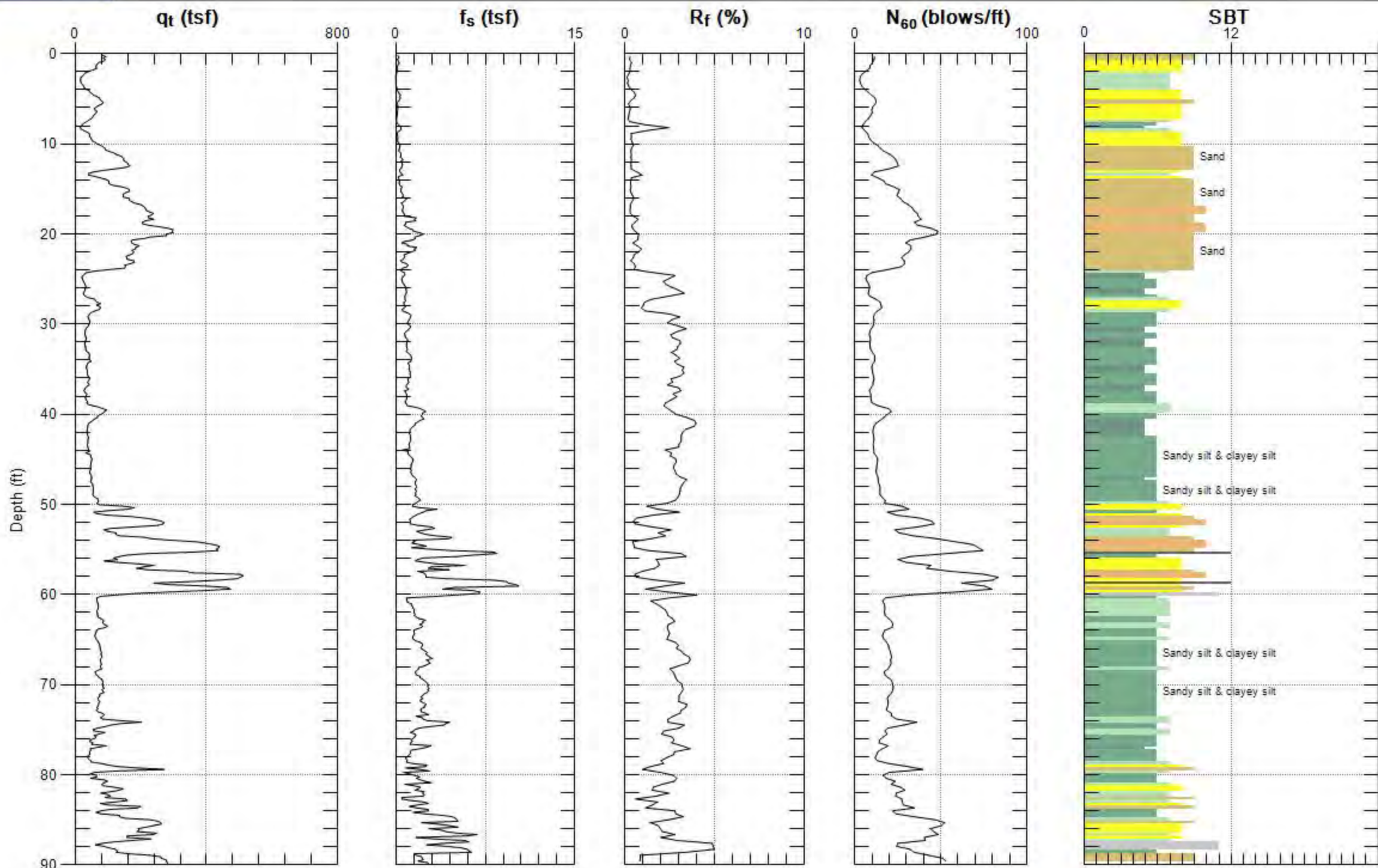


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-25

Date: 8/3/2012 08:42



Max. Depth: 89.895 (ft)

Avg. Interval: 0.328 (ft)

Appendix A-49

SBT: Soil Behavior Type (Robertson 1990)

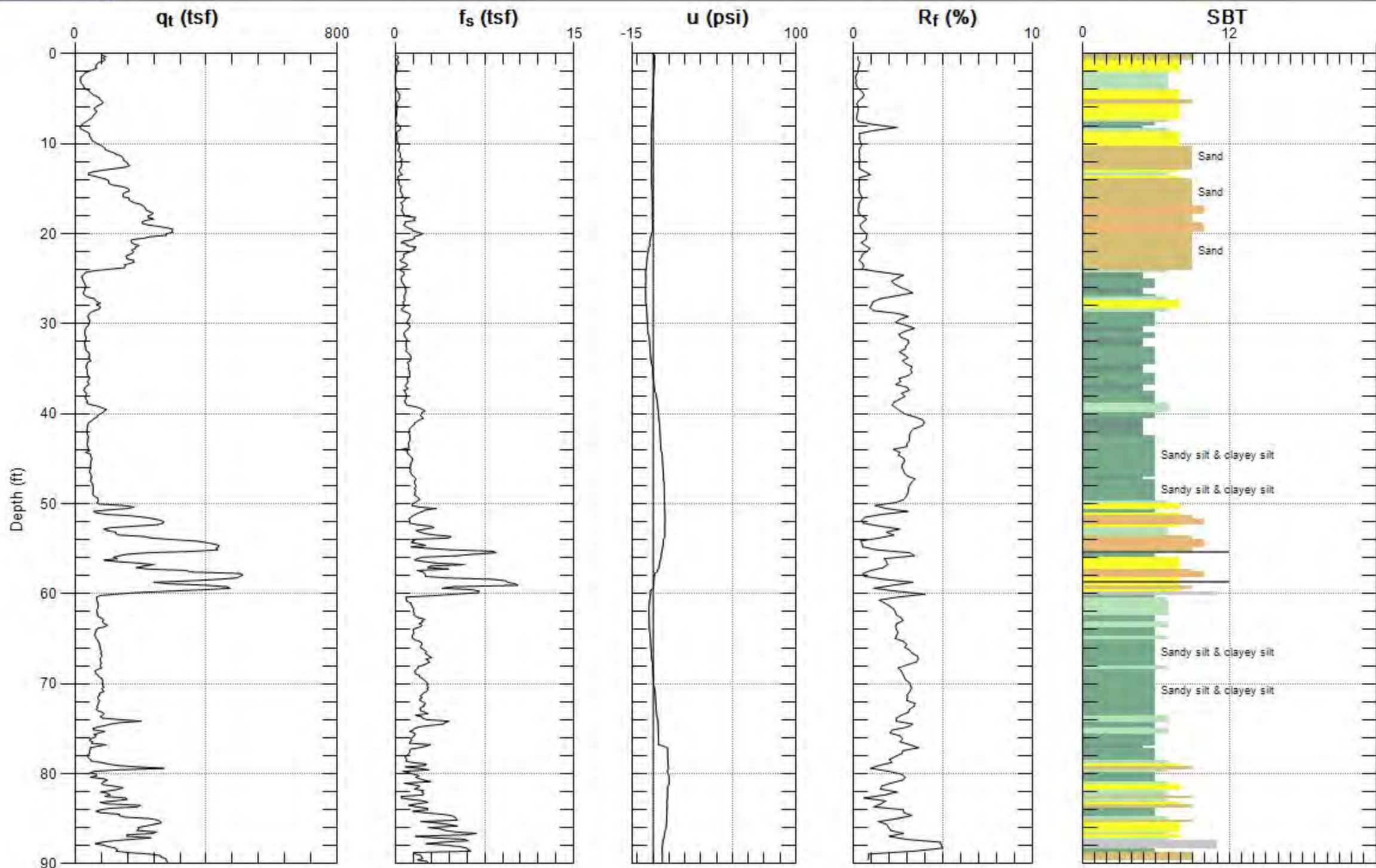


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-25

Date: 8/3/2012 08:42



Max. Depth: 89.895 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-50

SBT: Soil Behavior Type (Robertson 1990)

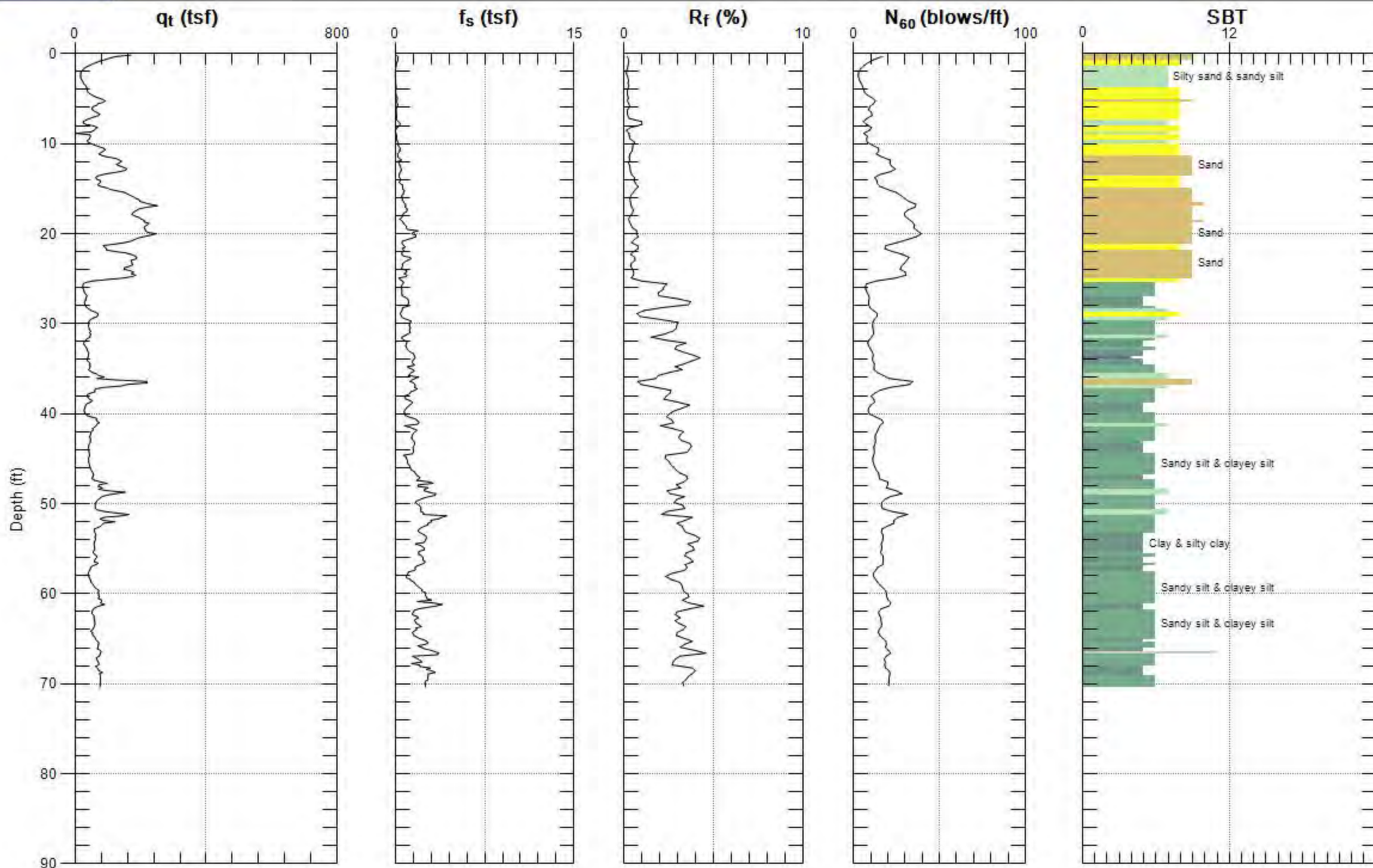


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-26

Date: 8/3/2012 09:36



Max. Depth: 70.374 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-51

SBT: Soil Behavior Type (Robertson 1990)

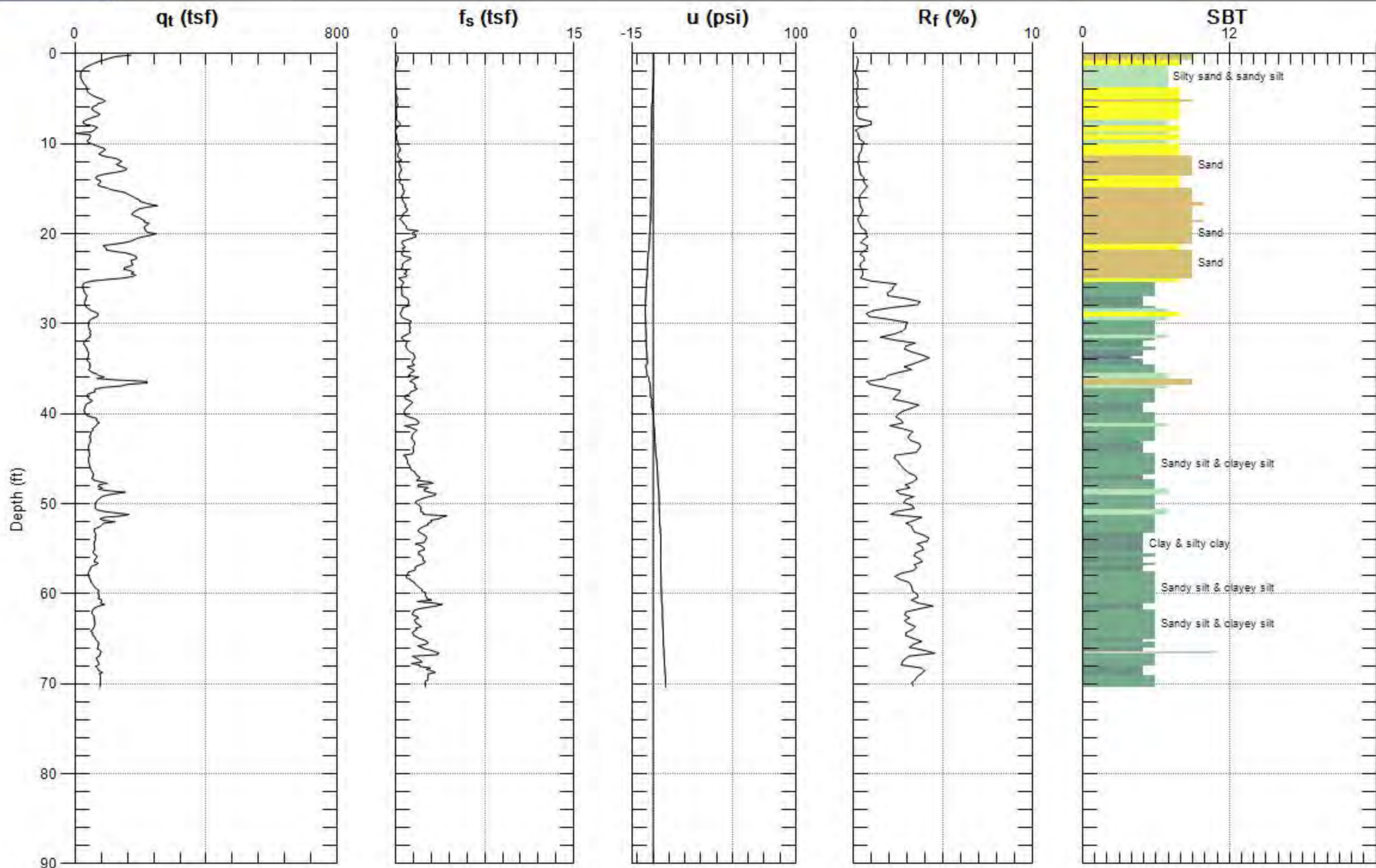


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-26

Date: 8/3/2012 09:36



Max. Depth: 70.374 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-52

SBT: Soil Behavior Type (Robertson 1990)

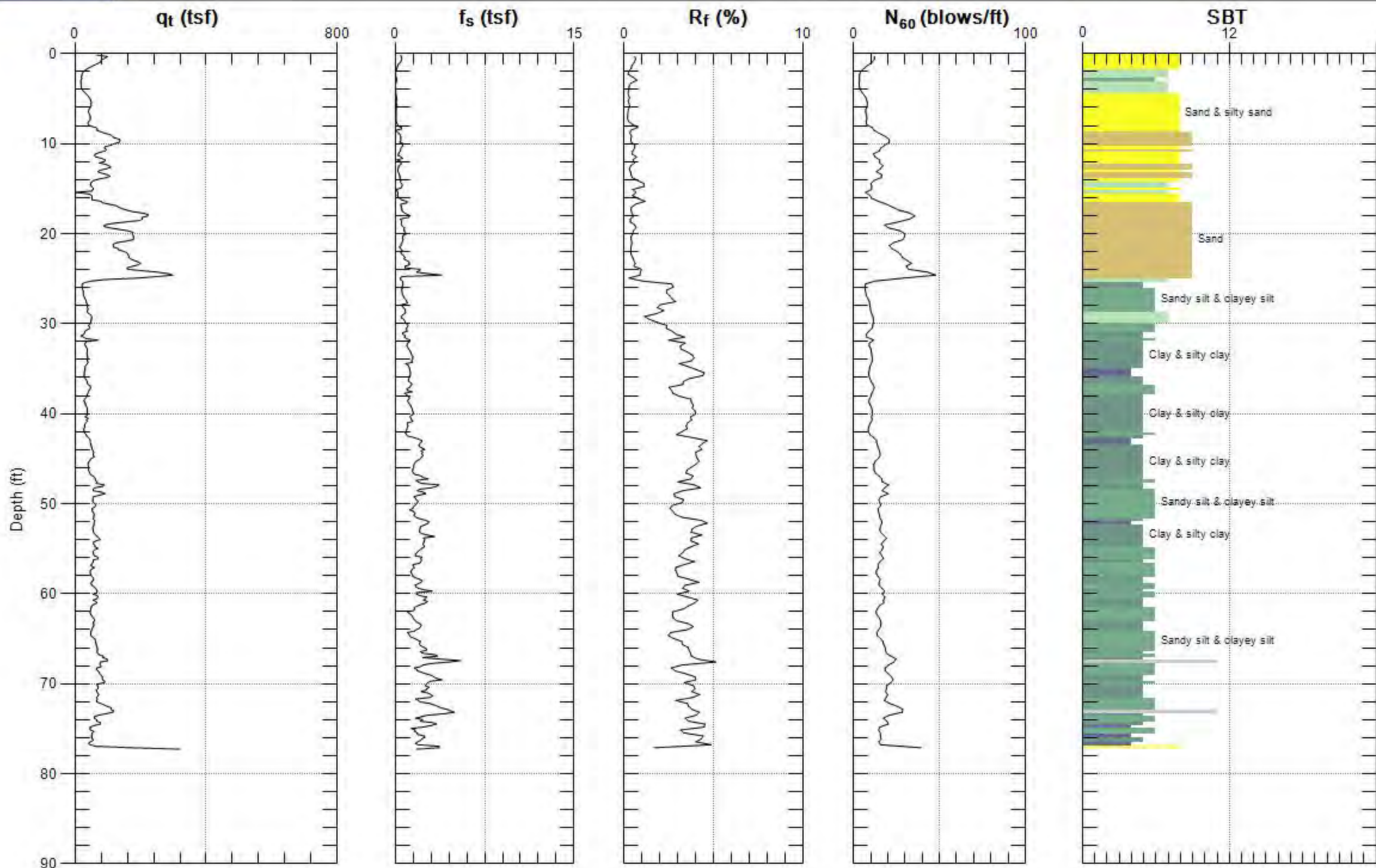


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-27

Date: 8/3/2012 10:12



Max. Depth: 77.264 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-53

SBT: Soil Behavior Type (Robertson 1990)

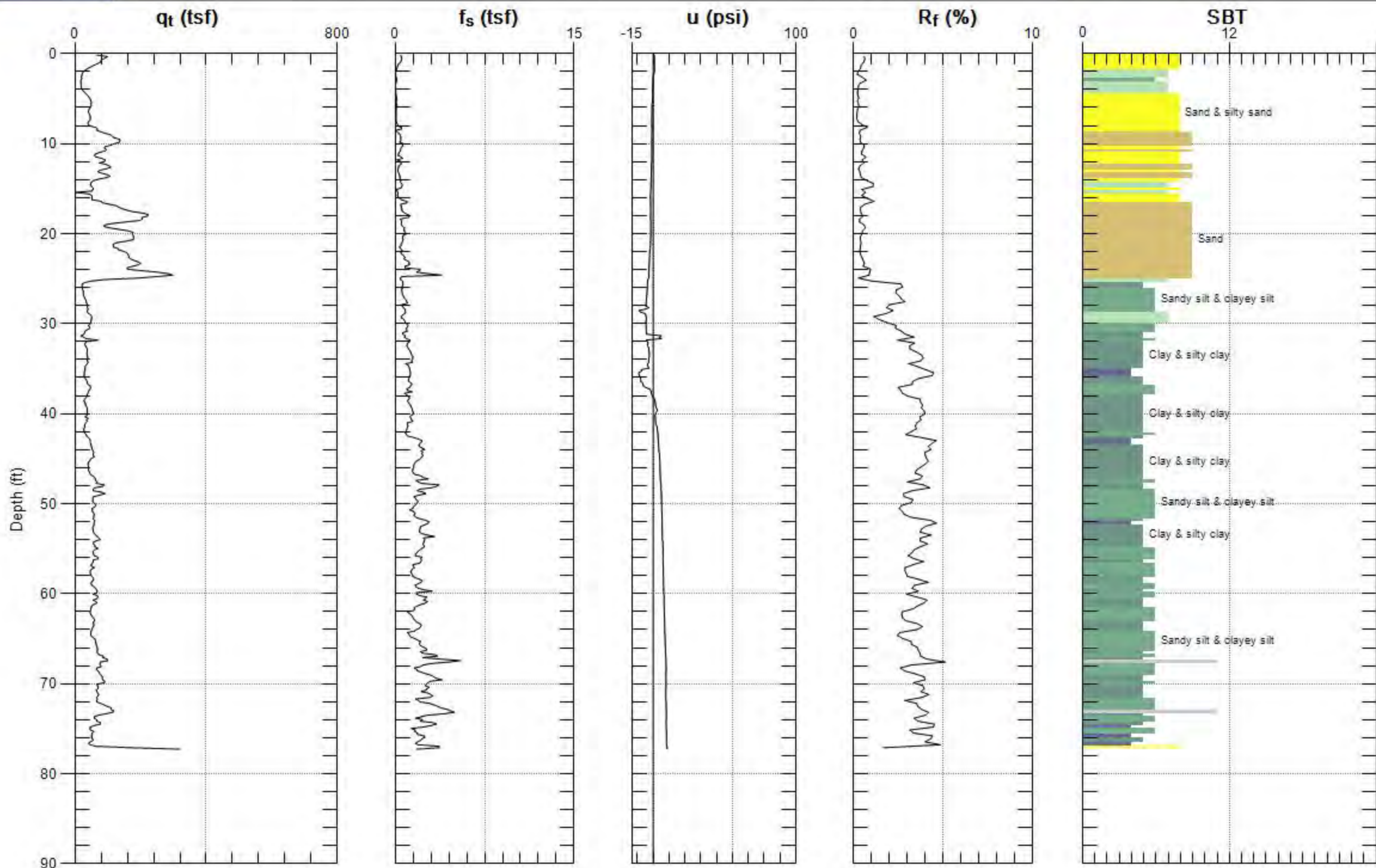


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-27

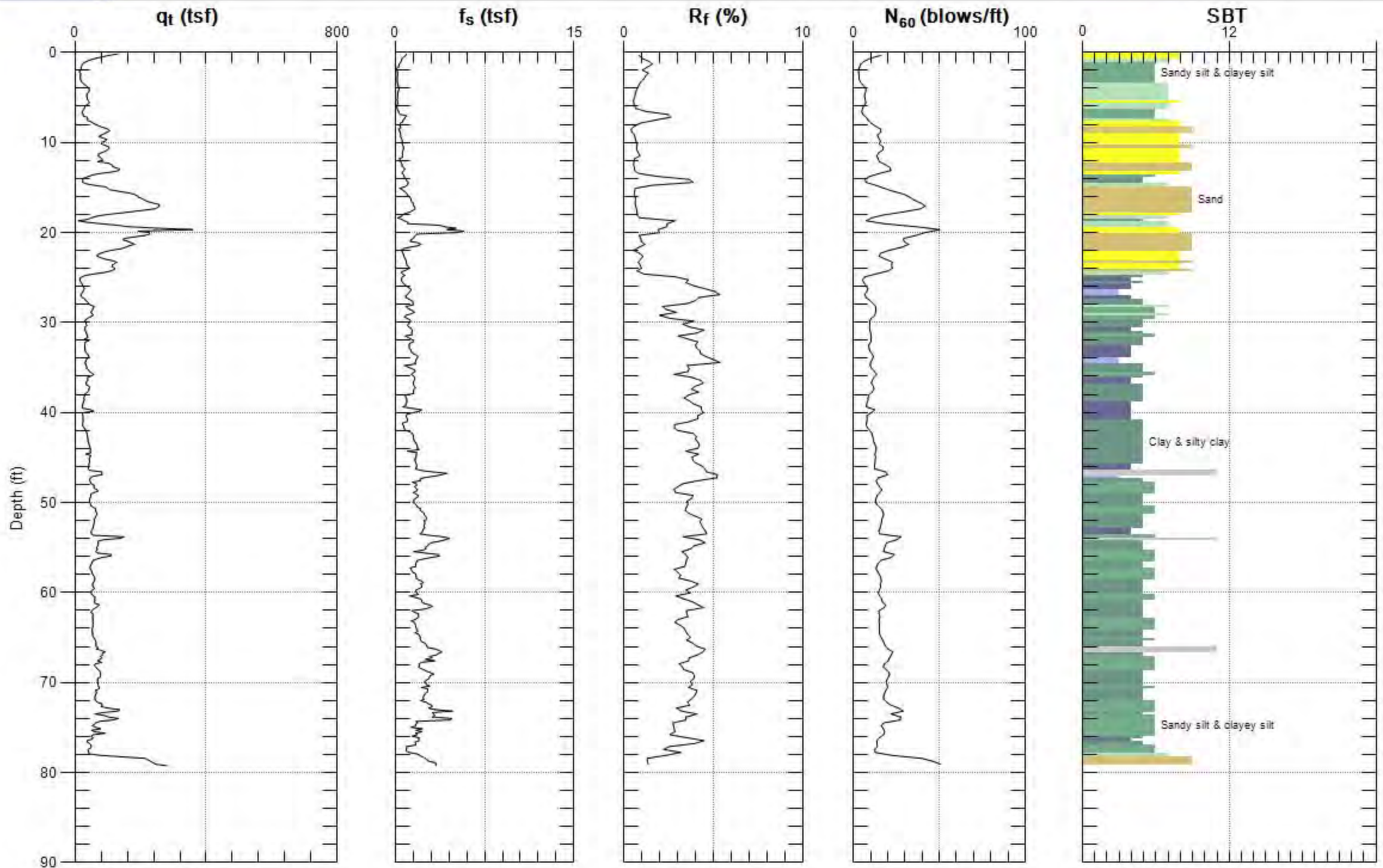
Date: 8/3/2012 10:12



Max. Depth: 77.264 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-54

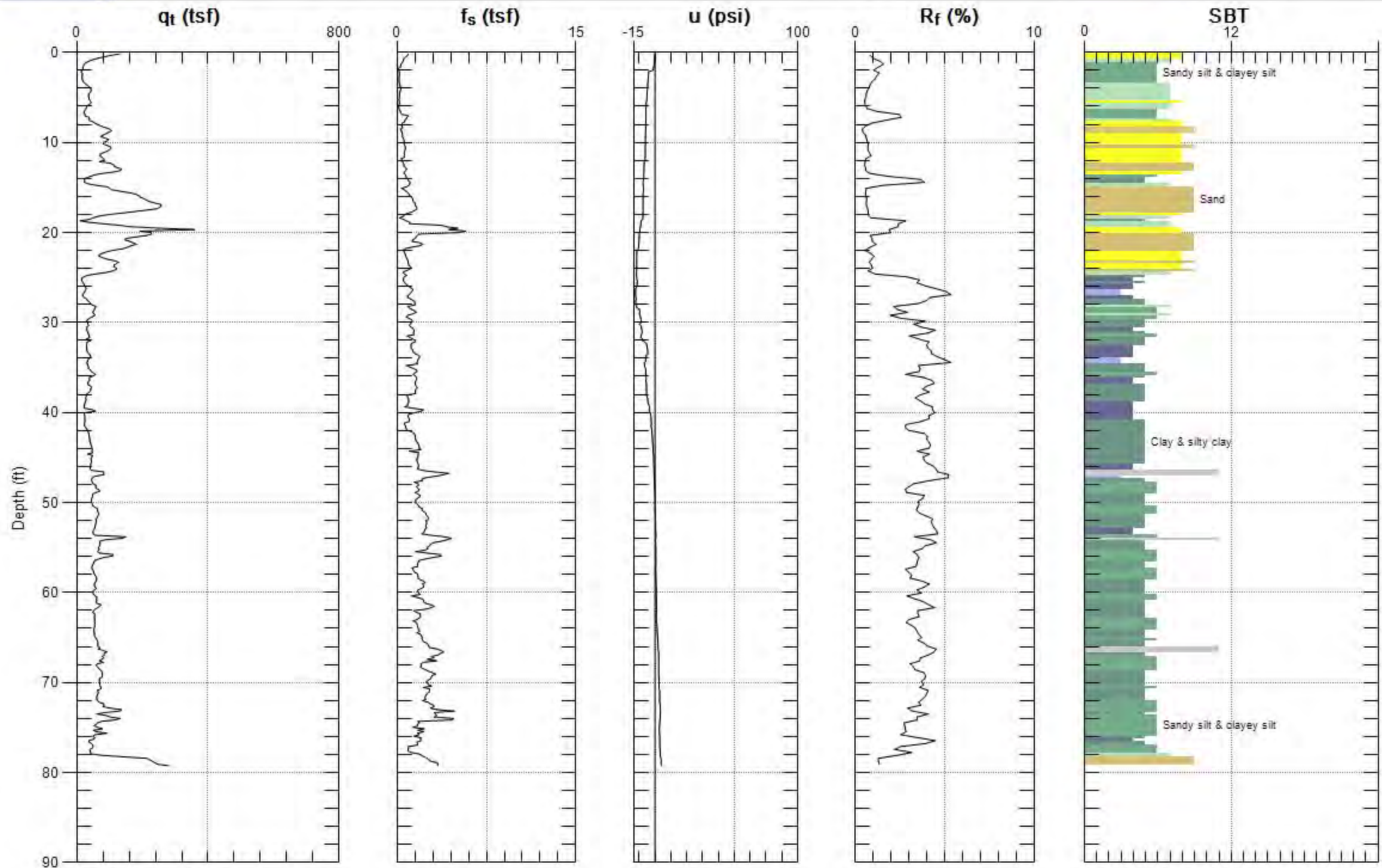
SBT: Soil Behavior Type (Robertson 1990)



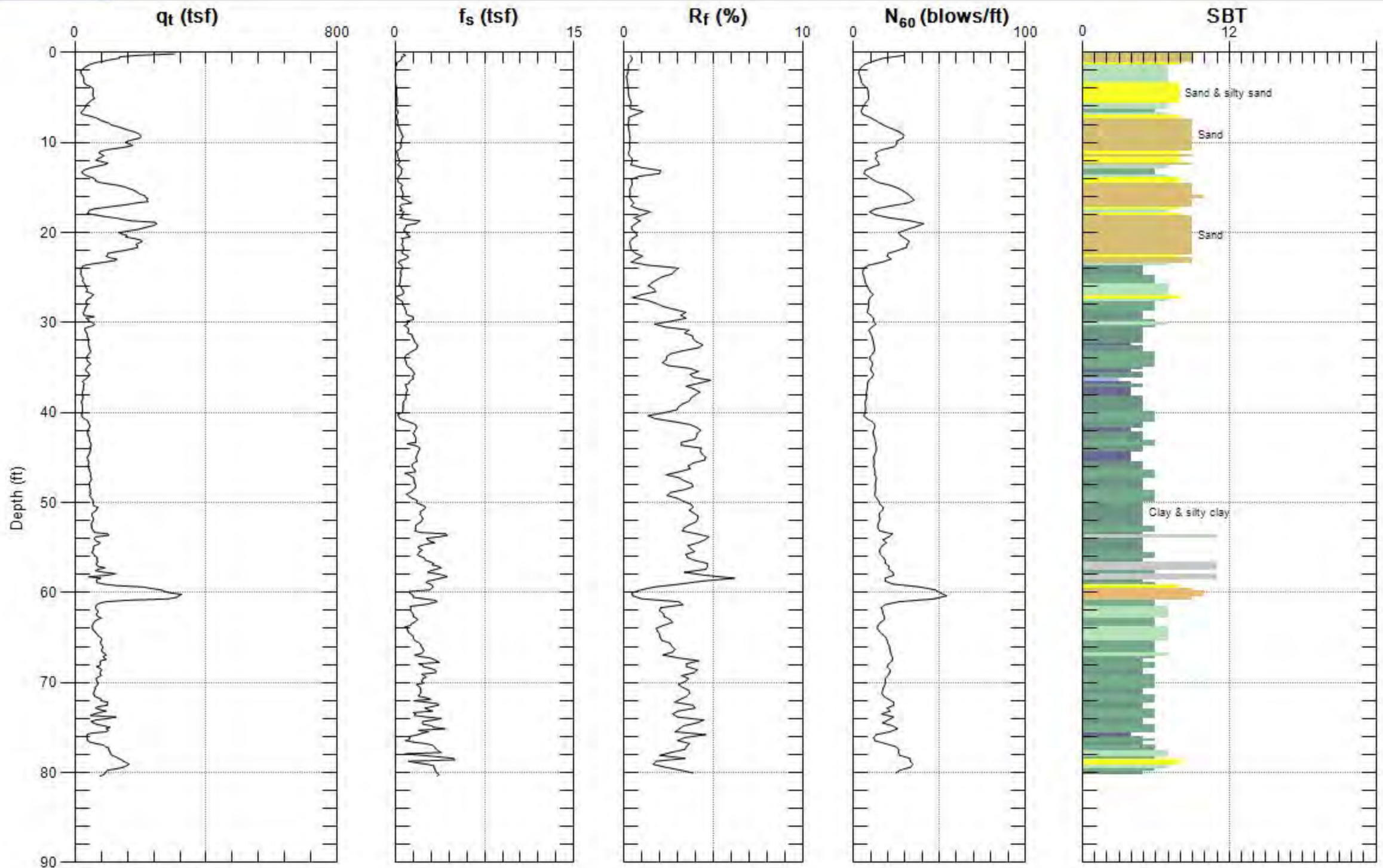
Max. Depth: 79.232 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-55

SBT: Soil Behavior Type (Robertson 1990)



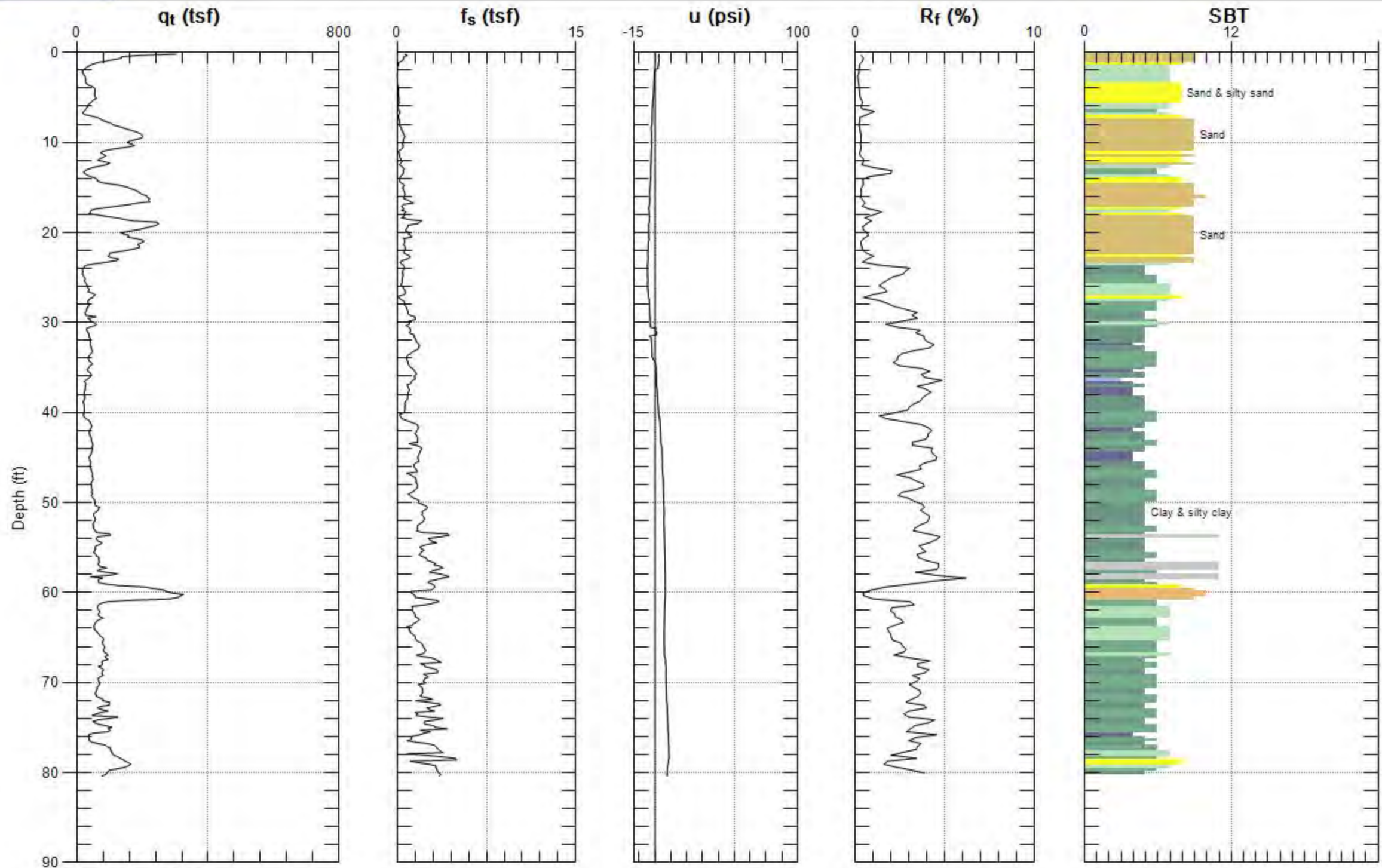
Max. Depth: 79.232 (ft)
Avg. Interval: 0.328 (ft)



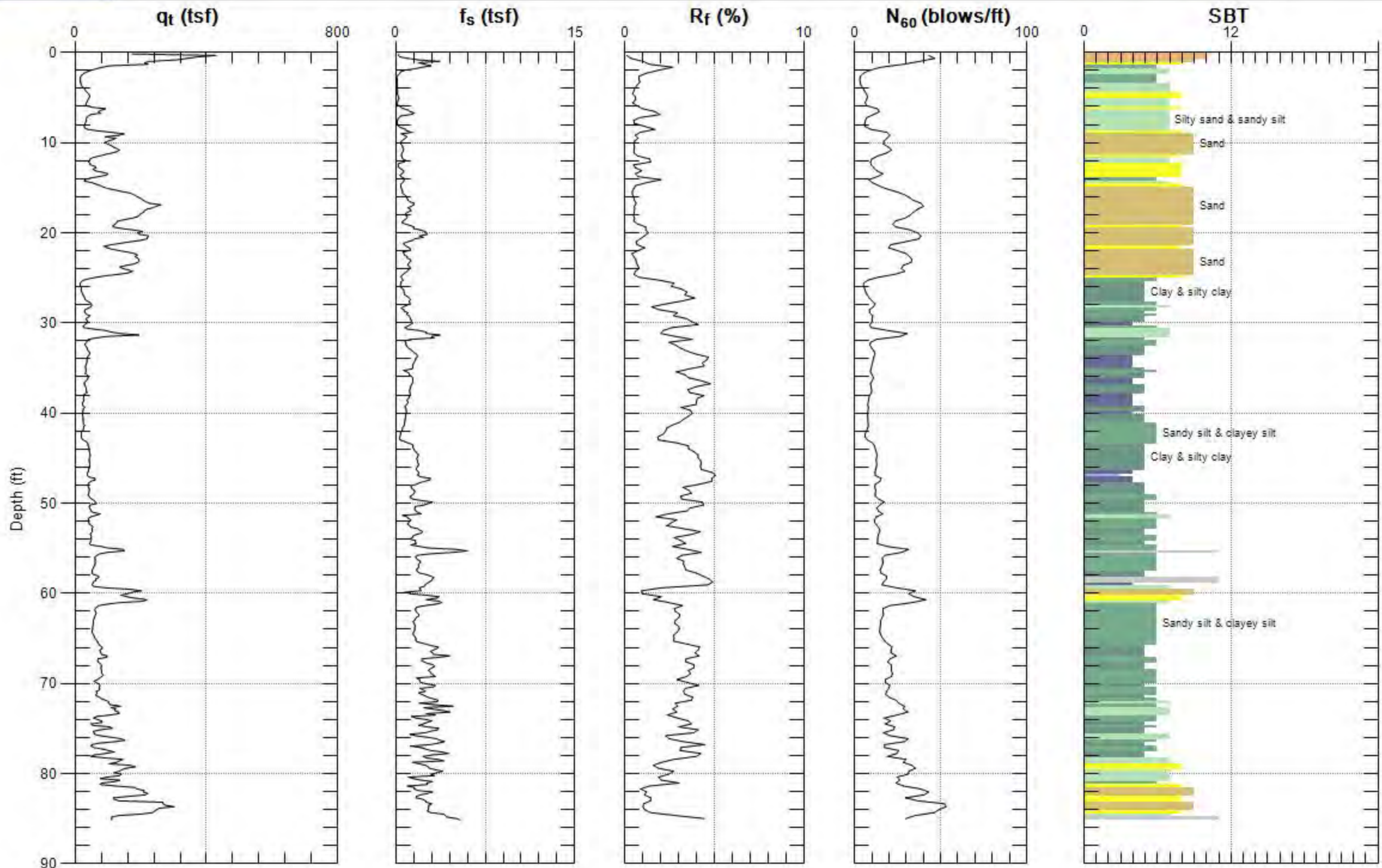
Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-57

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)



Max. Depth: 85.138 (ft)
Avg. Interval: 0.328 (ft)

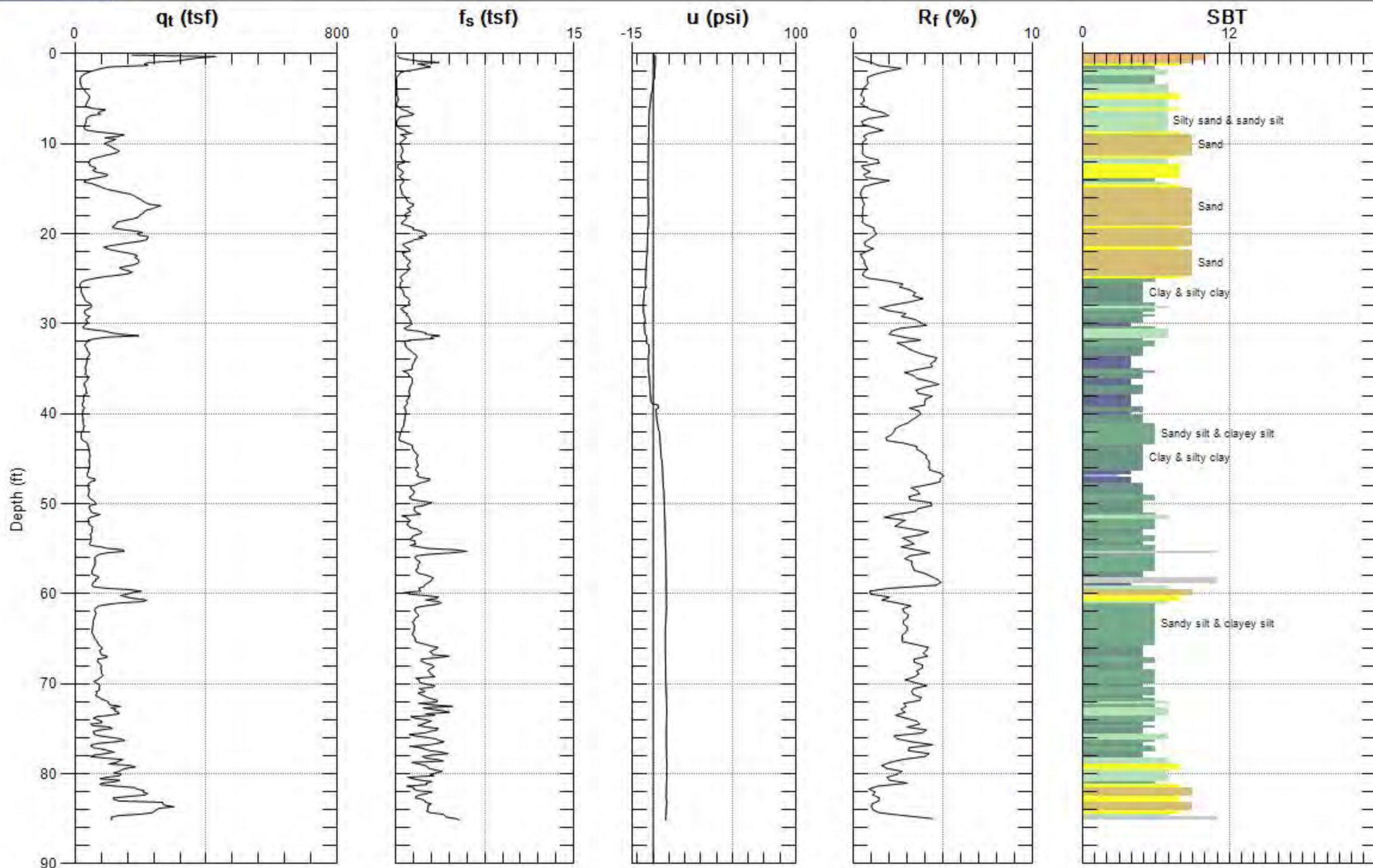


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-30

Date: 8/3/2012 11:49



Max. Depth: 85.138 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-60

SBT: Soil Behavior Type (Robertson 1990)

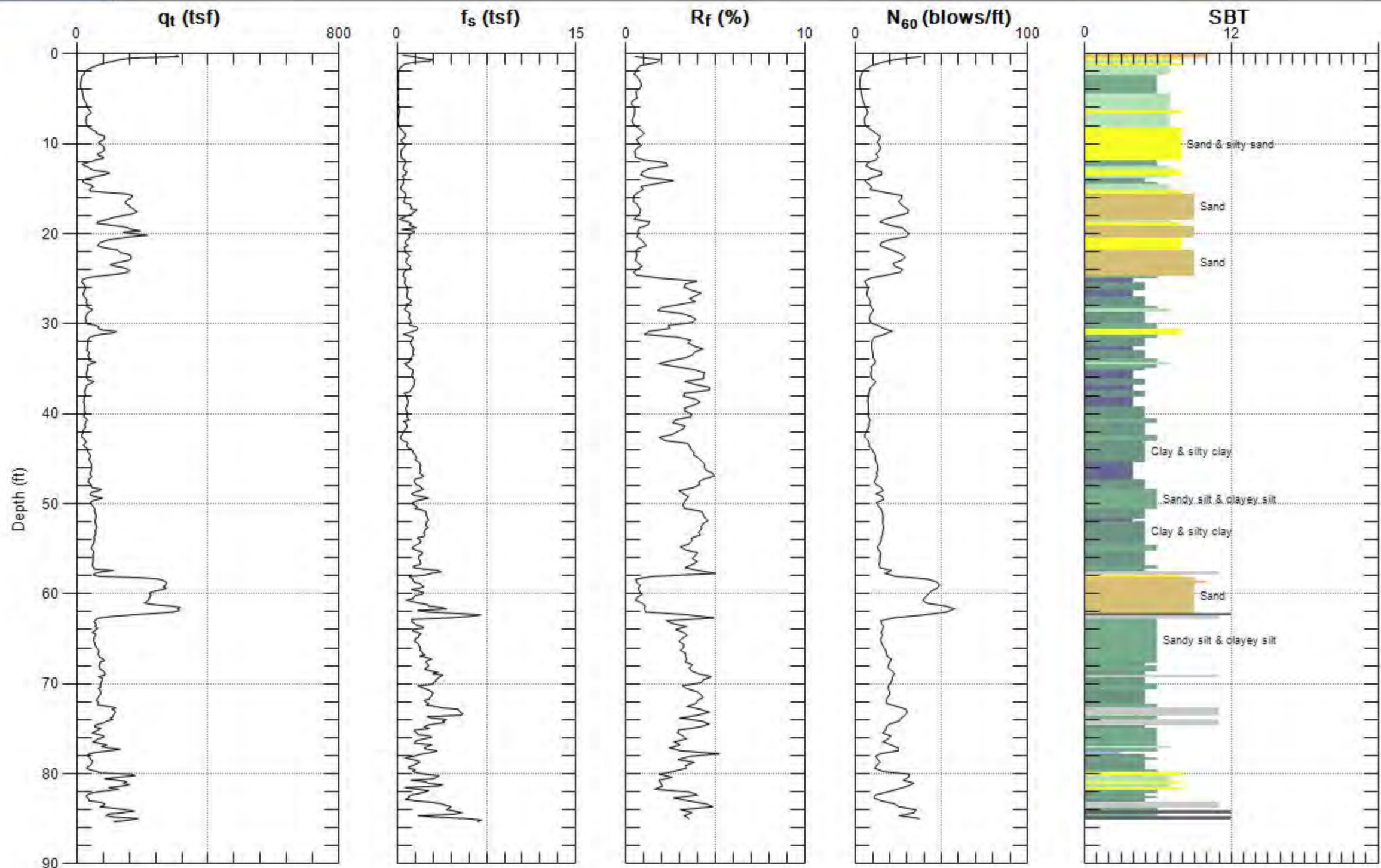


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-31

Date: 8/3/2012 12:31



Max. Depth: 85.302 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-61

SBT: Soil Behavior Type (Robertson 1990)

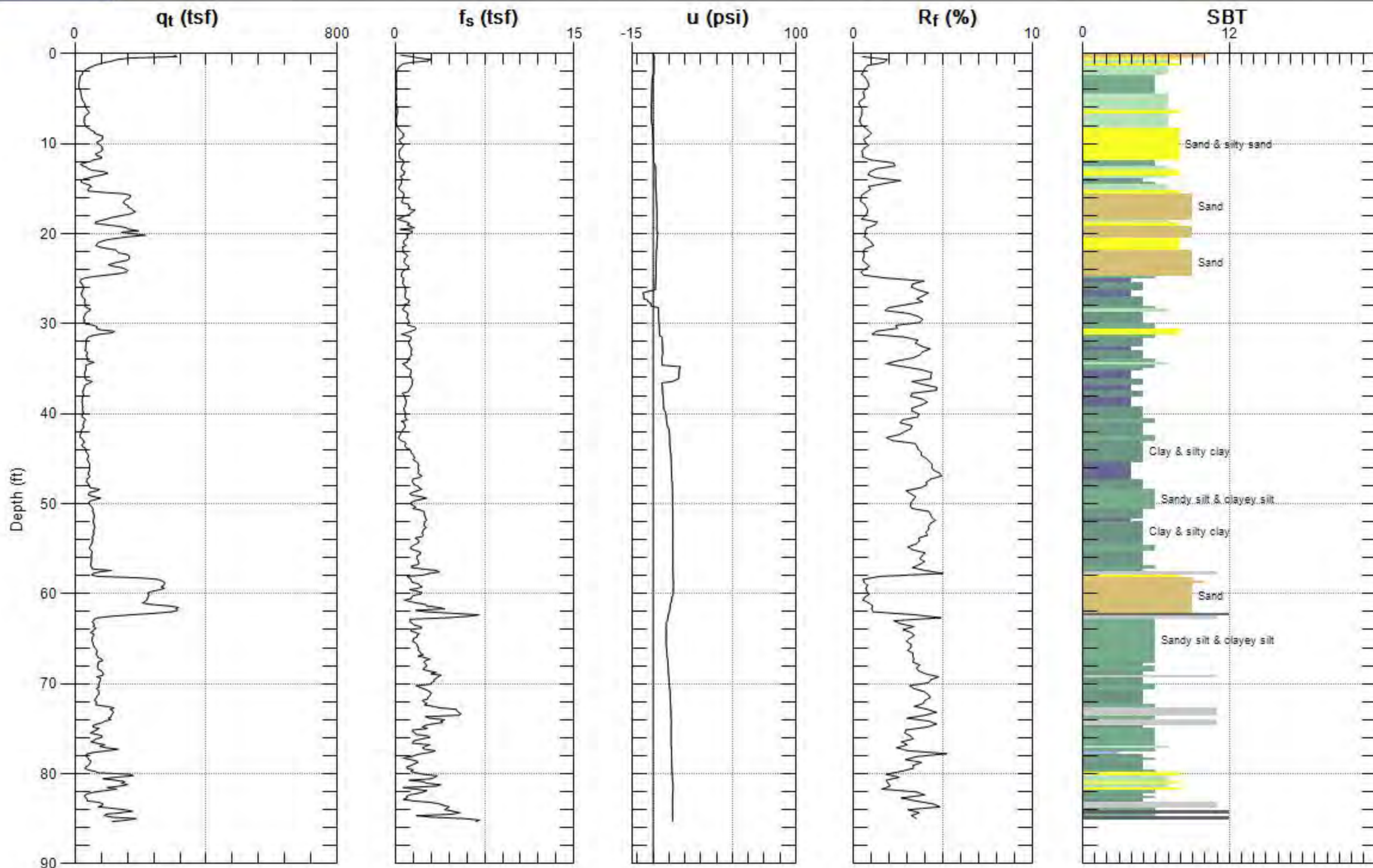


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-31

Date: 8/3/2012 12:31



Max. Depth: 85.302 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-62

SBT: Soil Behavior Type (Robertson 1990)

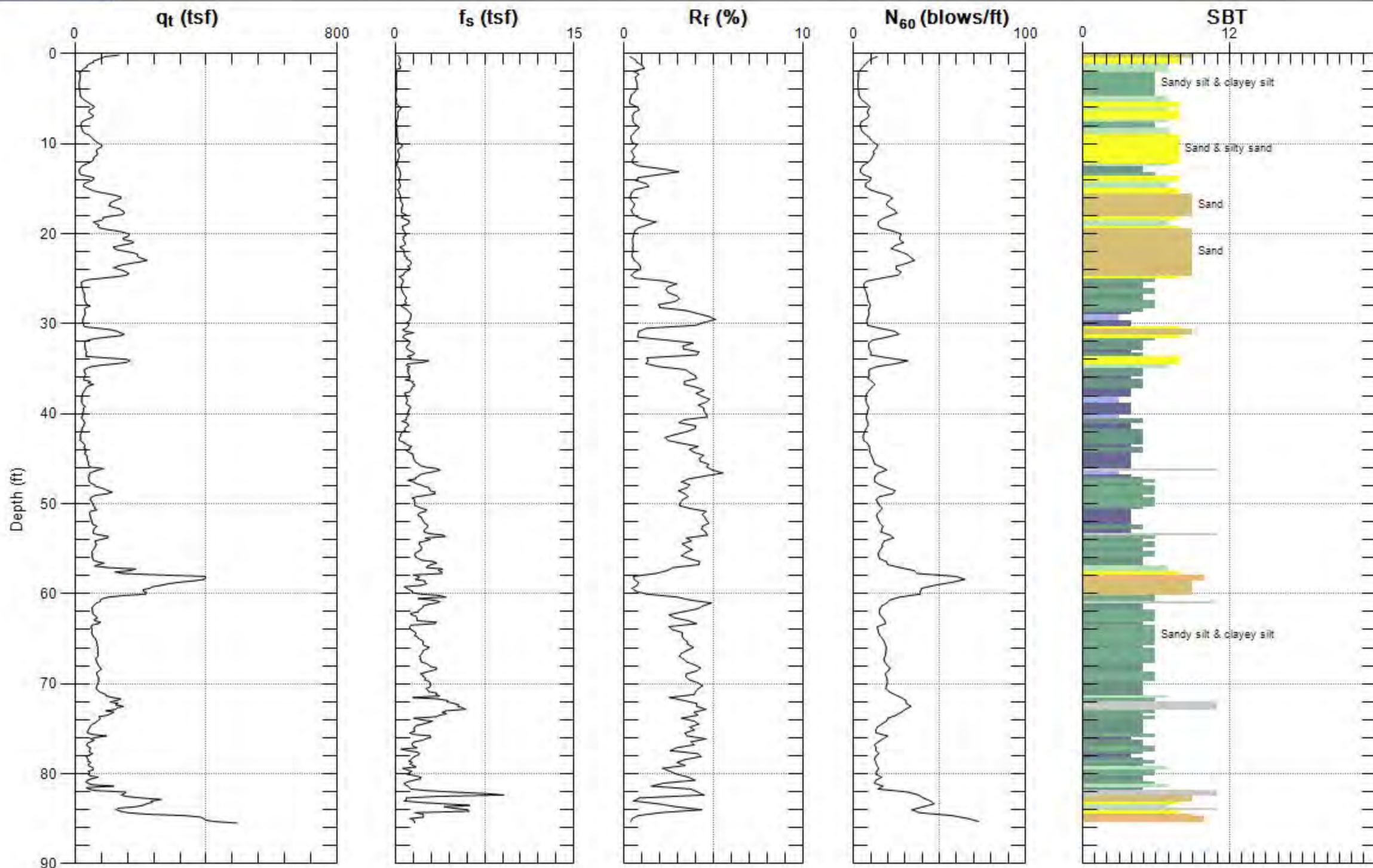


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-32

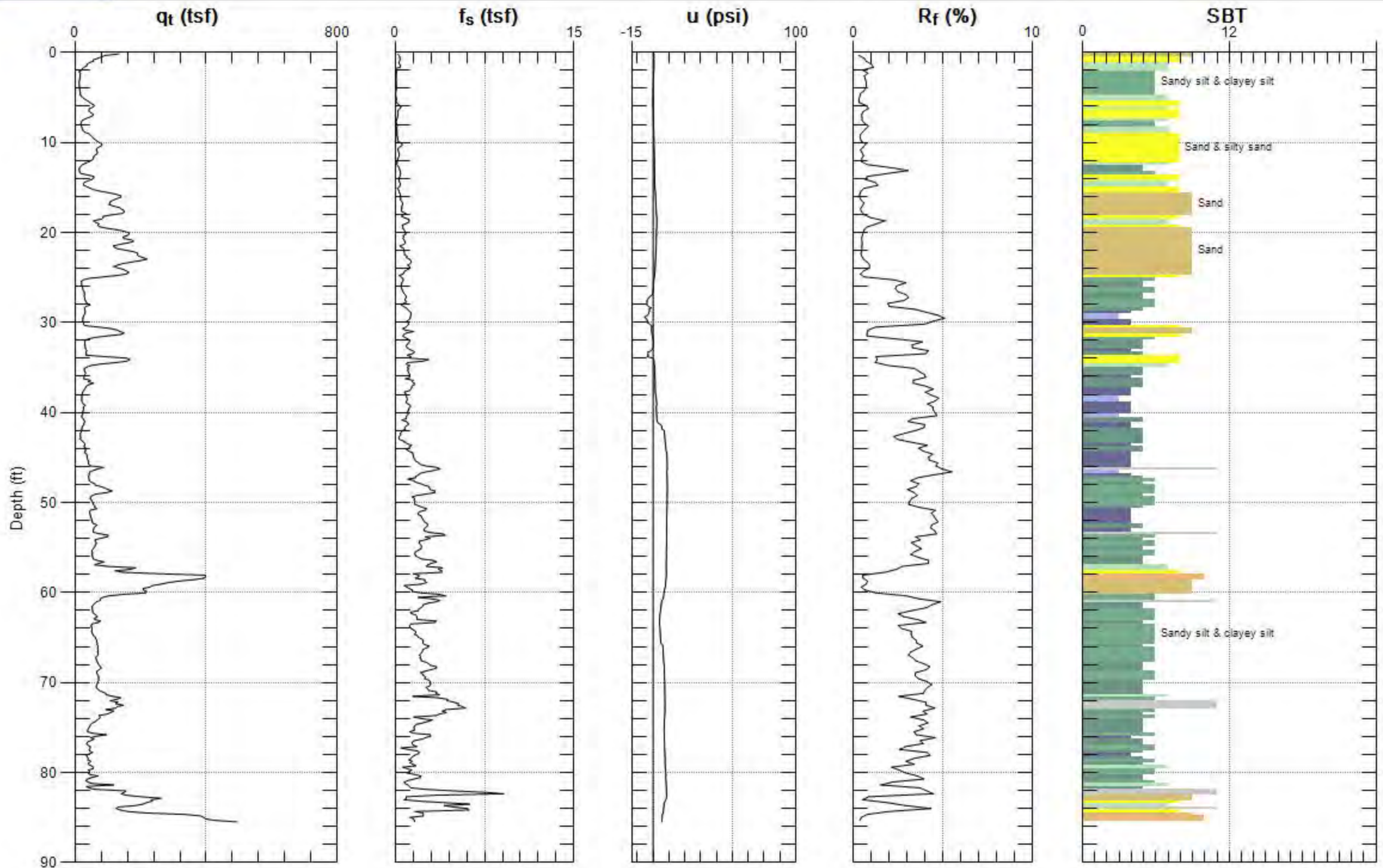
Date: 8/3/2012 01:09



Max. Depth: 85.466 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-63

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 85.466 (ft)
Avg. Interval: 0.328 (ft)



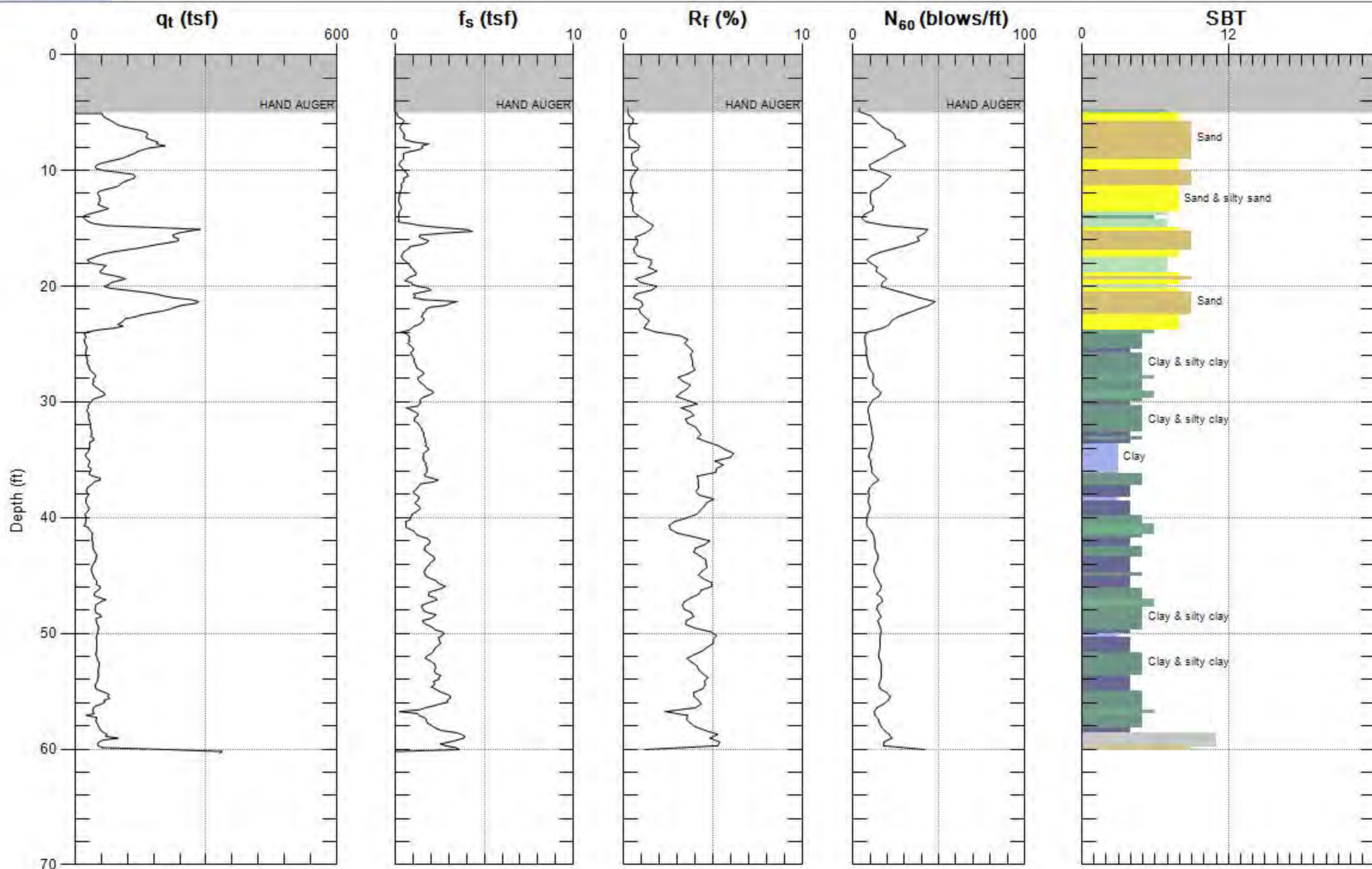
GREGG GROUP DELTA

Site: PARKING LOT S

Sounding: CPT-33

Engineer: S.KOLTHOFF

Date: 8/14/2014 11:56



Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-65

SBT: Soil Behavior Type (Robertson 1990)



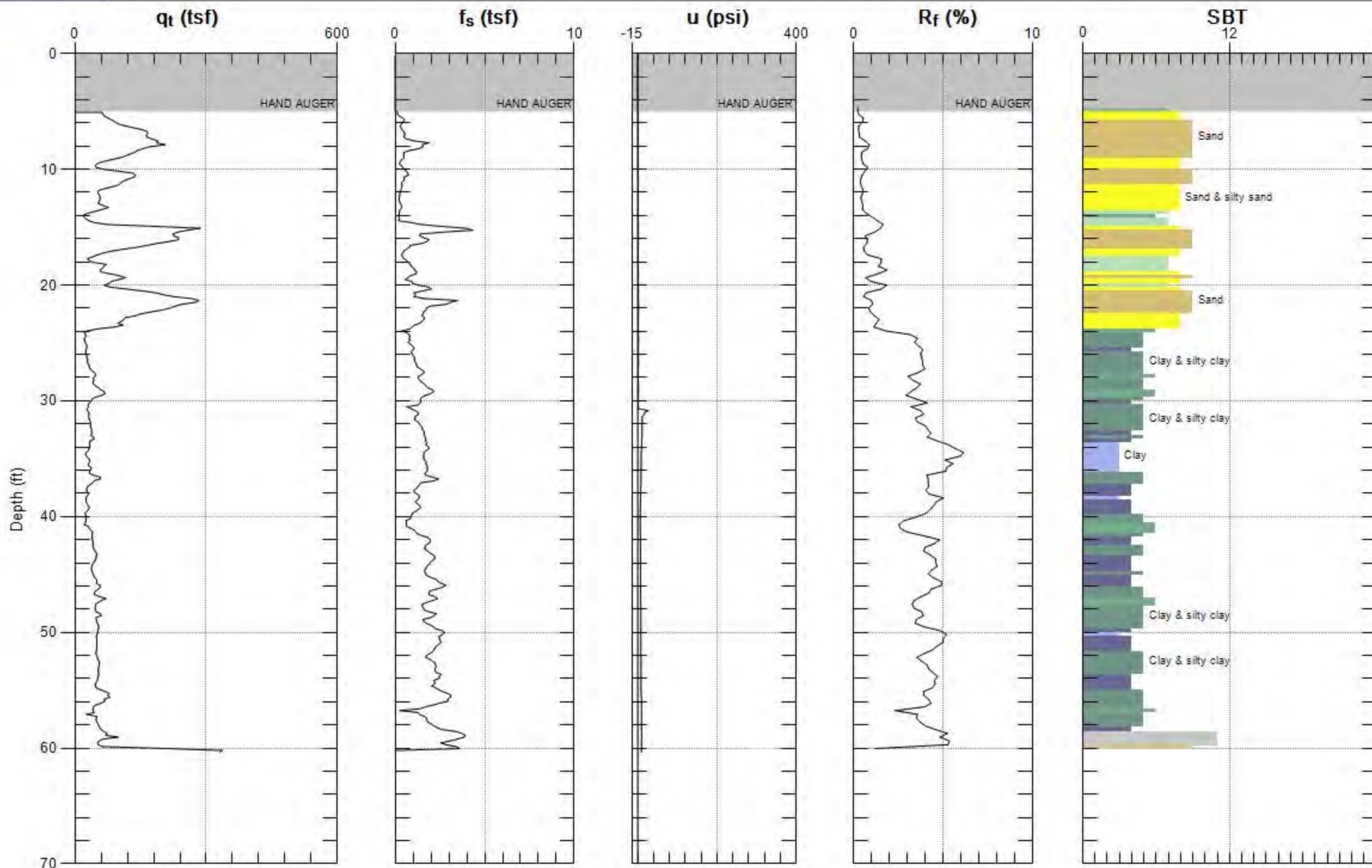
GREGG GROUP DELTA

Site: PARKING LOT S

Sounding: CPT-33

Engineer: S.KOLTHOFF

Date: 8/14/2014 11:56



Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-66

SBT: Soil Behavior Type (Robertson 1990)



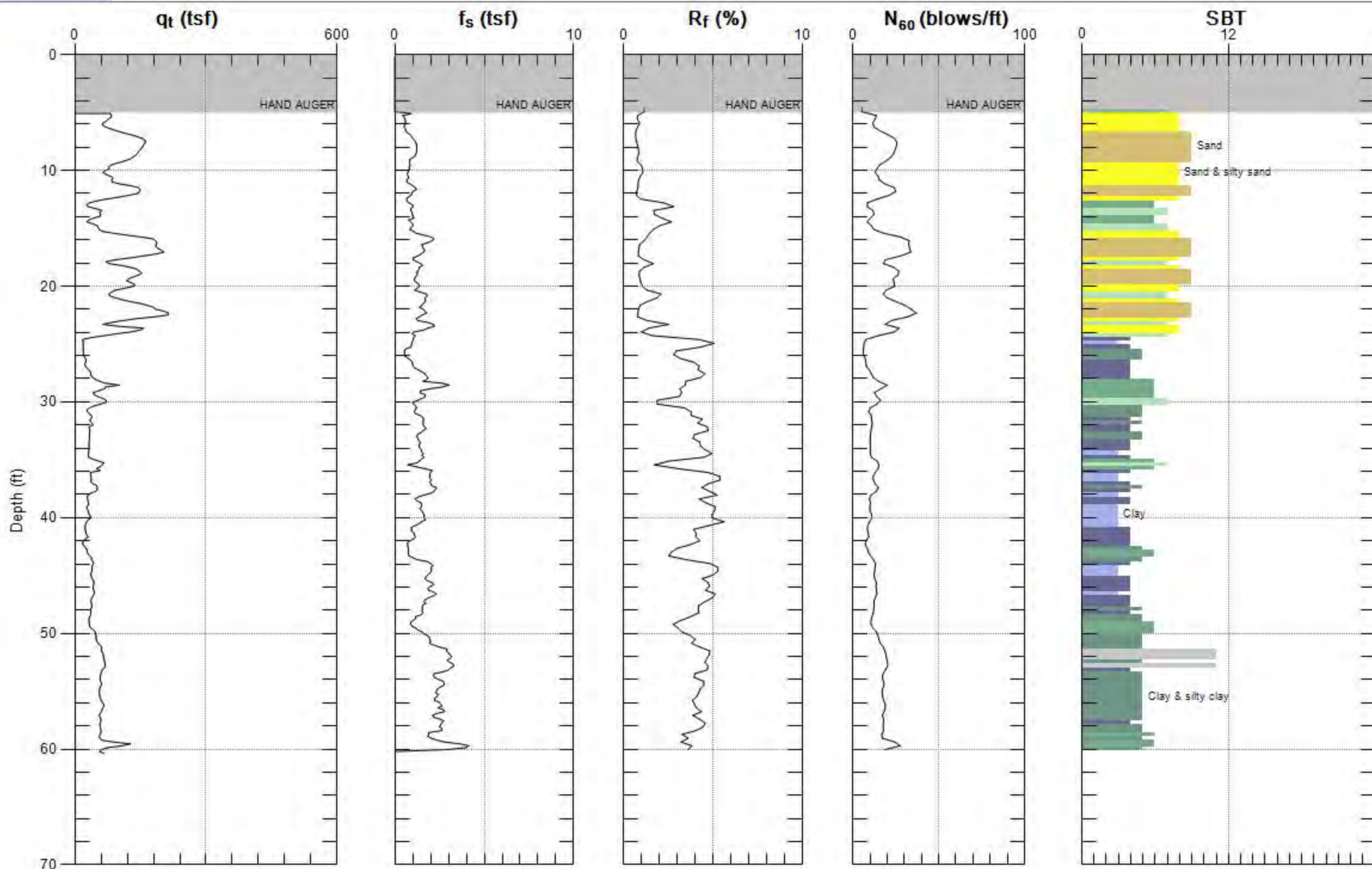
GREGG GROUP DELTA

Site: PARKING LOT S

Sounding: CPT-34

Engineer: S.KOLTHOFF

Date: 8/14/2014 10:19



Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-67

SBT: Soil Behavior Type (Robertson 1990)



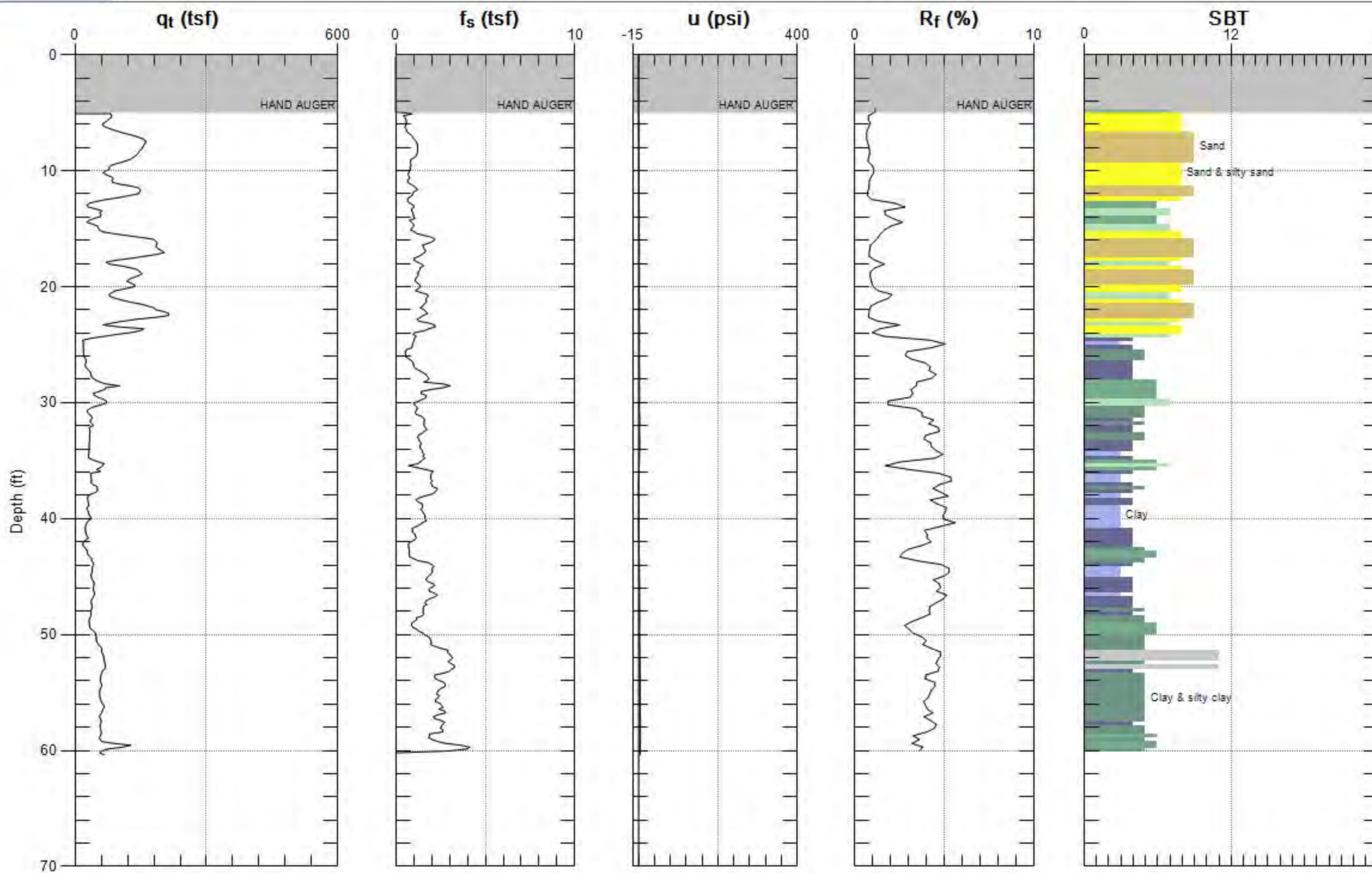
GREGG GROUP DELTA

Site: PARKING LOT S

Sounding: CPT-34

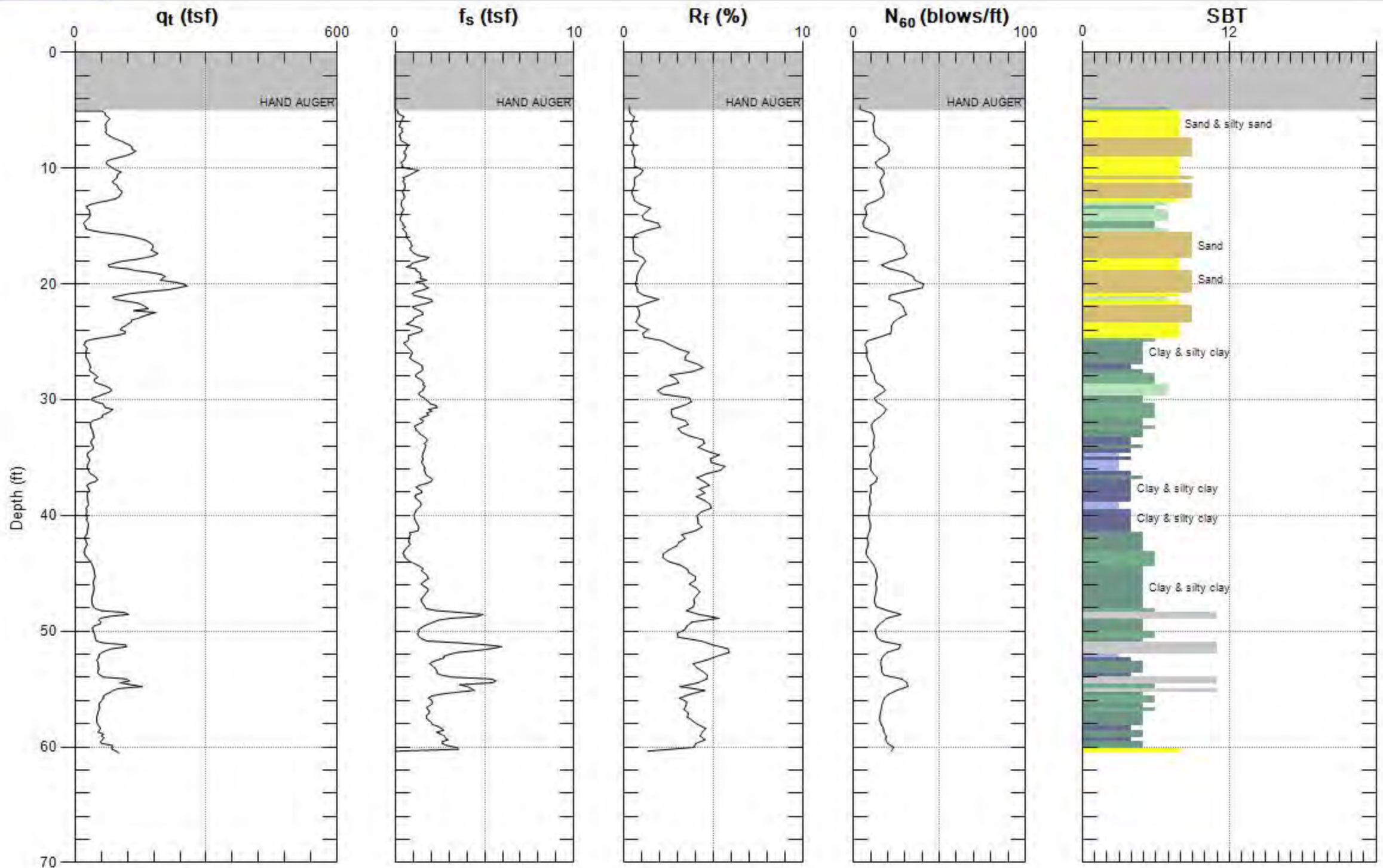
Engineer: S.KOLTHOFF

Date: 8/14/2014 10:19



Appendix A-68

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 60.531 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-69

SBT: Soil Behavior Type (Robertson 1990)



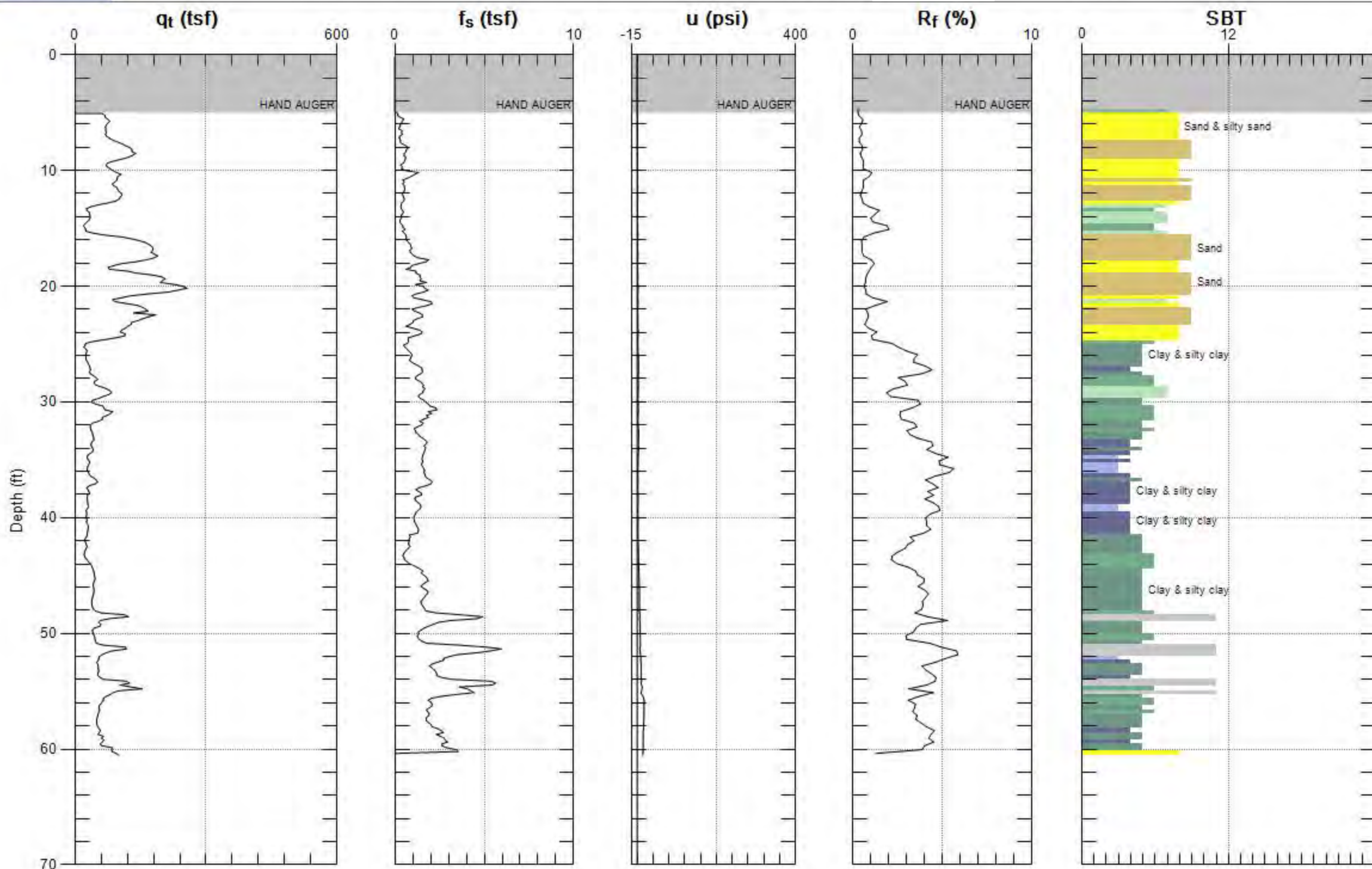
GREGG GROUP DELTA

Site: PARKING LOT S

Sounding: CPT-35

Engineer: S.KOLTHOFF

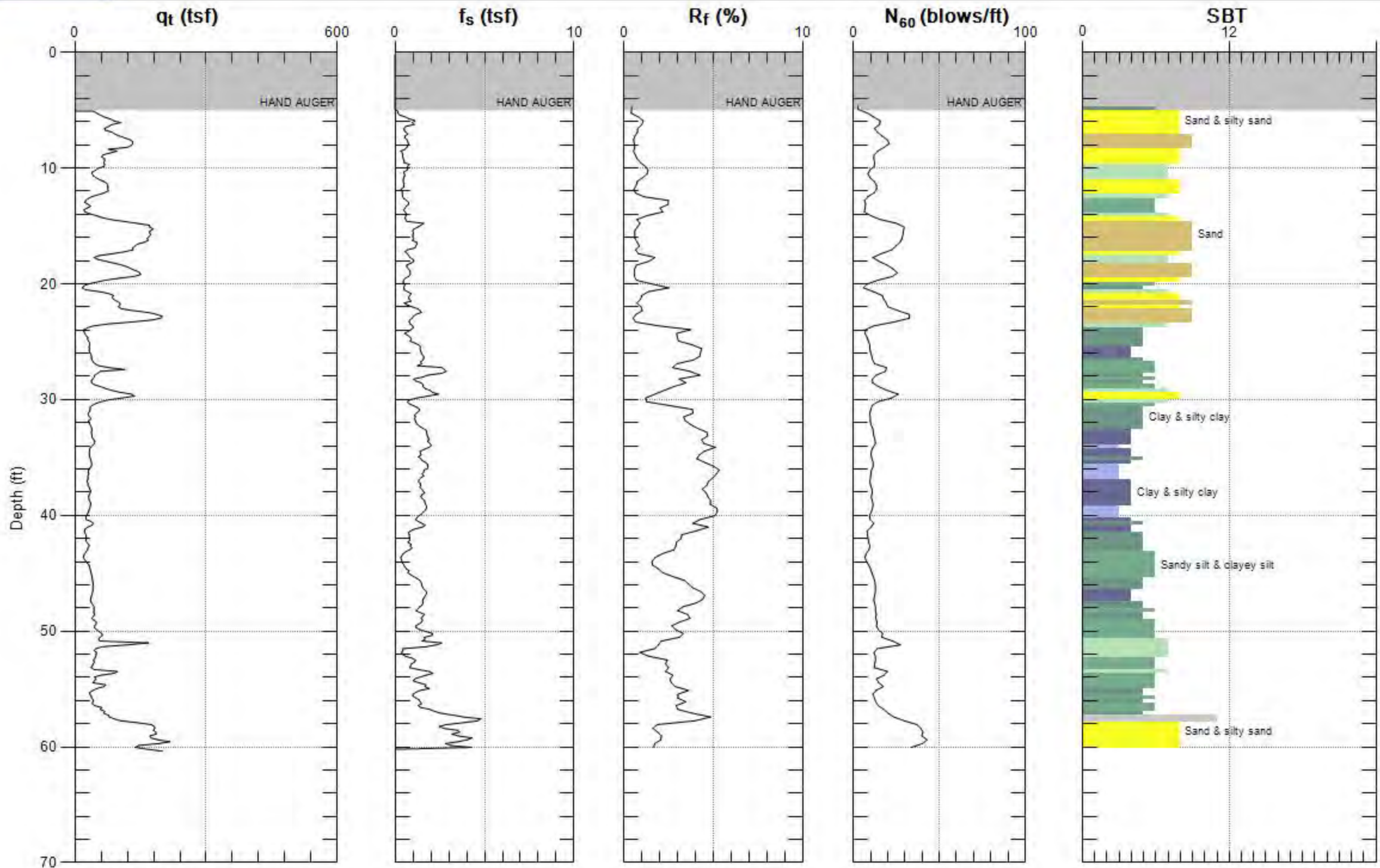
Date: 8/14/2014 09:32



Max. Depth: 60.531 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-70

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-71

SBT: Soil Behavior Type (Robertson 1990)



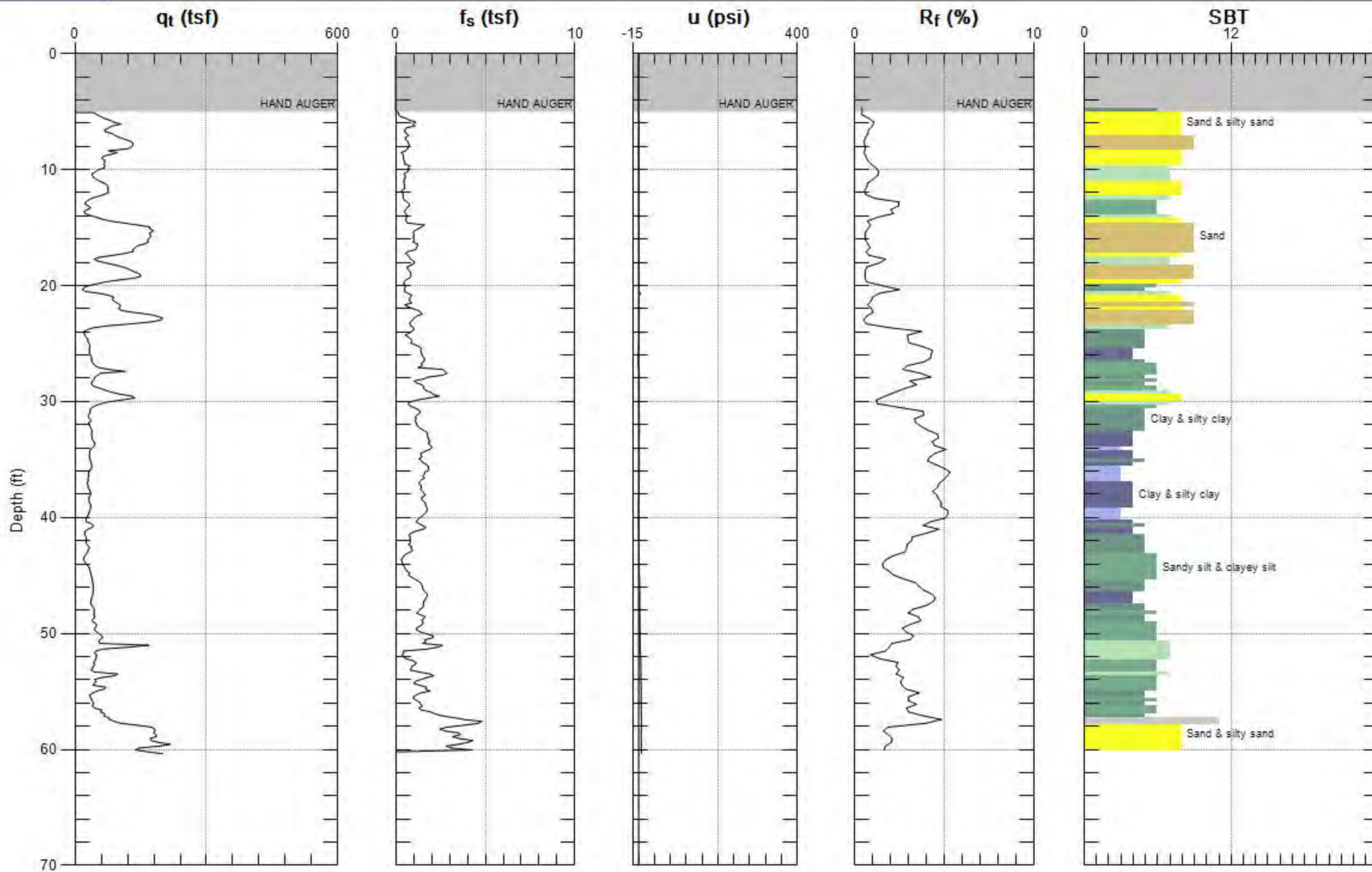
GREGG GROUP DELTA

Site: PARKING LOT S

Sounding: CPT-36

Engineer: S.KOLTHOFF

Date: 8/14/2014 08:43



Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-72

SBT: Soil Behavior Type (Robertson 1990)



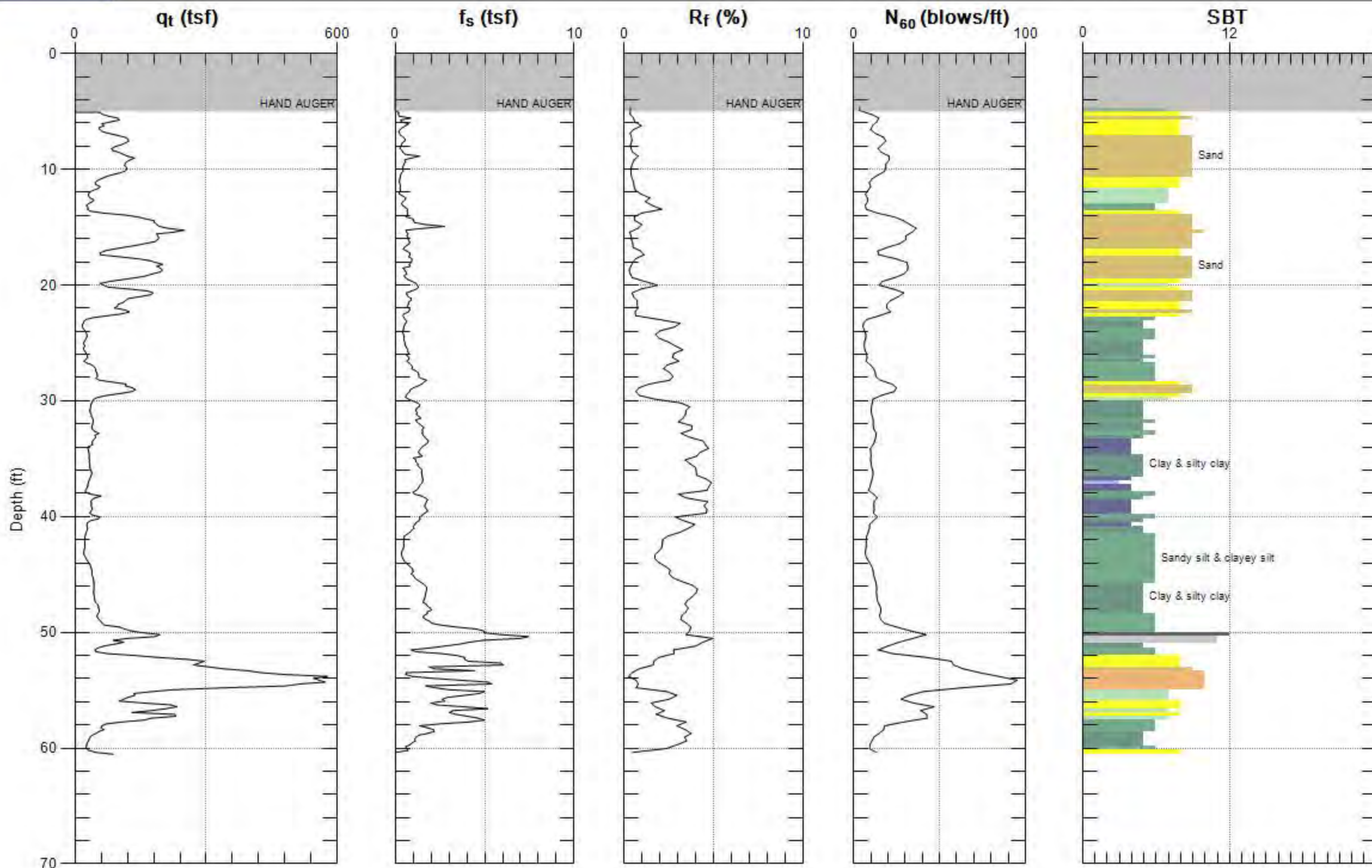
GREGG GROUP DELTA

Site: PARKING LOT S

Sounding: CPT-37

Engineer: S.KOLTHOFF

Date: 8/14/2014 07:45



Max. Depth: 60.531 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-73

SBT: Soil Behavior Type (Robertson 1990)



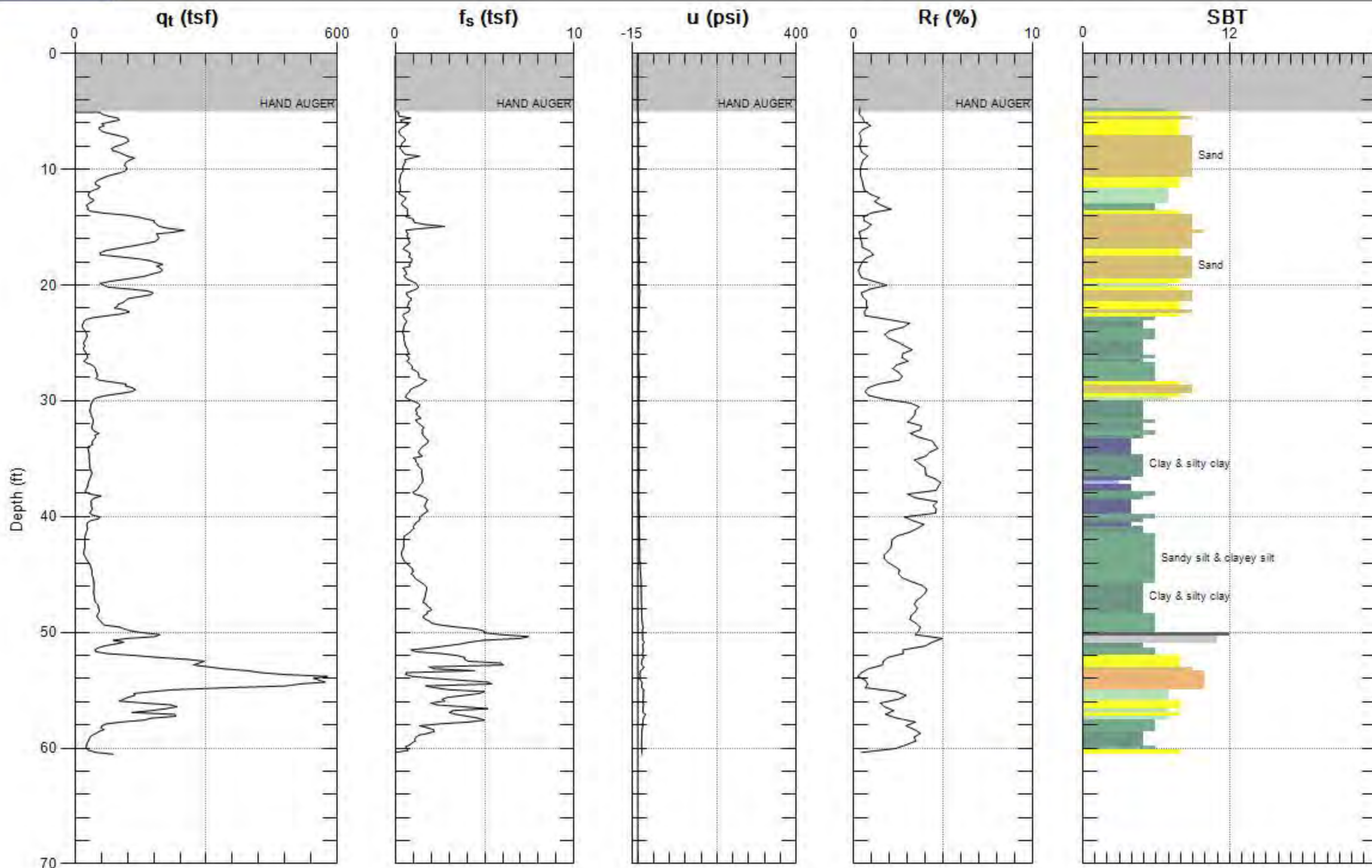
GREGG GROUP DELTA

Site: PARKING LOT S

Sounding: CPT-37

Engineer: S.KOLTHOFF

Date: 8/14/2014 07:45




Max. Depth: 60.531 (ft)
Avg. Interval: 0.328 (ft)

Appendix A-74

SBT: Soil Behavior Type (Robertson 1990)

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-1
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/17/2014	LOGGED BY TO	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 59
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 401	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	400								Asphalt at surface. Hand augered to 5 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown, moist, fine to medium sand.				
5	395	1	1	8/30									
		2		15/30					UPPER SAND UNIT (Qs) Silty SAND 10 YR 5/6 (yellowish brown); dry to moist; mostly fine SAND; few medium SAND; trace coarse SAND; trace fine GRAVEL; SAND with SILT 10 YR 6/4 (light yellowish brown); dry to moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL. Moist; increase in coarse SAND.				
10	390	3	2	21/30									
		4		14/30									
15	385	5	3	12/30					Clayey SAND 10 YR 5/4 (yellowish brown); moist; mostly fine SAND; trace medium SAND.				
		6		12/30					Silty SAND 10 YR 5/6 (yellowish brown); moist; mostly fine SAND; trace medium SAND.				
20	380	7	4	12/30					Sandy CLAY to Clayey SAND 10 YR 4/4 (dark yellowish brown); moist; mostly fine SAND; some medium SAND; trace coarse SAND. SAND with SILT 10 YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL. Clayey SAND 10 YR 5/6 (yellowish brown); moist; mostly fine SAND.				
		8		18/30									
		9	5	26/30					Silty SAND 10 YR 5/6 (yellowish brown); moist; mostly fine SAND; trace medium SAND; trace fine GRAVEL.				

GROUP GROUP DELTA CONSULTANTS, INC.  370 Amapola Ave. Suite 212 Torrance, California 90501		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
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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-1	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/17/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 59
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 401		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	375								SAND with SILT 10 YR 6/6 (brownish yellow); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
		10		25/30					MUD FLOW (Qm)				
									Sandy CLAY 5 YR 4/3 (reddish brown); moist; some fine SAND. Sharp contact with sand above. Fine gravel along contact.				
30	370	11	6	60/60									
		12	7	60/60									
35	365												
		13	8	36/60					Sandy CLAY to Clayey SAND 7.5 YR 4/4 (brown); moist; some fine SAND; few medium SAND; trace fine GRAVEL.				
40	360								Silty SAND 10 YR 5/6 (yellowish brown); moist; mostly fine SAND; some medium SAND; trace coarse SAND; trace fine GRAVEL.				
									OLDER ALLUVIUM (Qoal)				
									Clayey SAND 7.5YR 4/4 (brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND; trace GRAVEL.				
45	355	14	9	59/60					Cobble layer (Clayey GRAVEL matrix).				
		15	10	58/60					Clayey SAND 7.5YR 4/4 (brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND; trace GRAVEL.				

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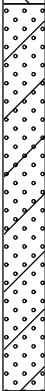

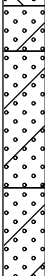

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-1	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/17/2014		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 59
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 401		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
350									Sandy CLAYmottled, 7.5 YR 4/1 (dark gray), 7.5 YR 5/8 (strong brown), 7.5YR 3/1 (very dark gray); moist; some fine SAND; trace medium to coarse SAND.				
									@ 53': Cobble lense.				
55		16	11	54/60					Clayey SAND10 YR 4/6 (strong brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
345									Cobble present				
									Silty SAND10 YR 4/6 (strong brown); wet; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
60									-Ground Water				
340									Total Depth: 59 feet below ground surface.				
65													
335													
70													
330													

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-2	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/17/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 59
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 400		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
5	395	1	1	17/30					Asphalt at surface. Hand augered to 5 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown; moist; fine to medium sand.				
		2		10/30									
10	390	3	2	16/30					UPPER SAND UNIT (Qs) Silty SAND 10 YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
		4		15/30									
15	385	5	3	22/30					Clayey SAND 10YR 5/6 (yellowish brown); moist; mostly fine SAND; few medium SAND.				
		6		12/30									
20	380	7	4	24/30					Silty SAND 10 YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL. SAND with SILT 10 YR 5/4 (yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
		8		17.5/30									
	375								Silty SAND 10 YR 4/4 (dark yellowish brown); moist; mostly fine SAND; trace medium SAND; trace fine GRAVEL. SAND with SILT 10 YR 5/4 (yellowish brown); moist; mostly fine to medium SAND; few coarse SAND.				
		9	5	18/30									

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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-2
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 4/17/2014		LOGGED BY TO	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 59
DRILL RIG TYPE CME 85	DRILLED BY ABC Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 400	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

[illegible]

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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 b


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-2	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/17/2014		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 59
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 400		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
55	345	16	11	56/60					Clayey GRAVEL5 YR 4/6 (yellowish red); moist; mostly fine to coarse GRAVEL; fine to medium SAND with some coarse SAND. Sandy CLAY7.5 YR 4/6 (strong brown); moist; some fine to medium SAND; trace coarse SAND; trace fine GRAVEL; Clayey SANDmottled, 2.5 YR 4/6 (strong brown), 7.5YR 5/1 (gray); wet; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL. @ 54': groundwater				
60	340								Total Depth: 59 feet below ground surface.				
65	335												
70	330												
	325												

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-3	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/15/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 399		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
5	395								Asphalt at surface. Hand augered to 5 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown; moist; fine to medium sand.				
		1	1	15/30									
10	390	2		22/30					UPPER SAND UNIT (Qs) Silty SAND 7.5 YR 5/6 (strong brown); moist; mostly fine to medium SAND; few coarse SAND; few fine GRAVEL; trace cobbles. SAND 10 YR 6/8 (brownish yellow); moist; mostly fine to medium SAND; some coarse SAND; few fine GRAVEL; trace coarse GRAVEL; trace SILT.				
		3	2	17/30									
		4		17/30									
		5	3	26/30									
20	380	6		25/30					Silty SAND 10 YR 5/6 (yellowish brown); moist; mostly fine SAND; some medium to coarse SAND; few fine GRAVEL. Sand with SILT 10 YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
		7	4	19/30									
		8		25/30					Silty SAND 7.5 YR 4/6 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND. SAND with SILT 10 YR 6/6 (brownish yellow); moist; mostly fine to medium SAND; some coarse SAND; trace fine GRAVEL.				
	375												

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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-3	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/15/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 399		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		9	5	20/30									
		10		31/30									
370													
30		11	6	32/60									
365													
35		12	7	33/60									
360													
40		13	8	37/60									
355													
45		14	9	32/30									
		15		21/30									
350													

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-3	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/15/2014		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 399		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		16	10	34/60									
345									@ 53.5': 7.5 YR 4/6 (strong brown).				
55		17	11	34/60					@ 57': water lense of Silty SAND approximately 8" thick; wet; groundwater.				
340									@ 59': some coarse SAND.				
60									Total Depth: 60 feet below ground surface.				
335													
65													
330													
70													
325													

LOG OF CORE BORING								PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-4	
SITE LOCATION Capitol Parking Lot								DATE(S) DRILLED 4/15/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger								DRILL BIT SIZE TYPE 8"		CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60	
DRILL RIG TYPE Marl M-12								DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees			
APPARENT GROUNDWATER DEPTH None encountered								APPROXIMATE SURFACE ELEVATION (feet) 399					
COMMENTS								BOREHOLE BACKFILL Soil Cuttings					
DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
5	395								<p>Asphalt at surface. Hand augered to 5 feet bgs.</p> <p>ARTIFICIAL FILL (Qaf)</p> <p>Sandy SILT dark brown; moist; fine to medium sand.</p>				
		1	1	31/30									
		2		19/30									
	390												
	10	3	2	20/30									
		4		18/30									
	385												
	15	5	3	29/30									
20		6		21/30									
	380												
	7	4	26/30										
	375												
		8		21/30									




GROUP DELTA CONSULTANTS, INC.
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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 a

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-4
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/15/2014	LOGGED BY TO	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 399	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		9	5	16/30					fine to coarse GRAVEL.				
		10		27/30					MUD FLOW (Qm) Sandy CLAY , 5 YR 4/4 (reddish brown); moist; some fine SAND; trace medium to coarse SAND.				
370		11	6	60/60									
365		12	7	60/60					Clayey SAND 10 YR 4/6 (dark yellowish brown); moist; mostly fine to medium SAND; some coarse SAND; few fine GRAVEL; trace coarse GRAVEL; trace cobbles.				
360		13	8	54/60					@ 40': clayey GRAVEL layer; approximately 8" thick.				
355		14	9	33/60					OLDER ALLUVIUM (Qoal) Sandy CLAY mottled, 10 YR 4/4 (dark yellowish brown), 10 YR 6/8 (brownish yellow); moist; some fine SAND; few medium SAND; trace coarse SAND; trace fine GRAVEL.				
350									@ 49': cobble layer.				

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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-4	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/15/2014		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 399		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		15	10	60/60					@ 50': 7.5 YR 4/6 (strong brown).				
345													
55		16	11	30/60					Sandy CLAY to Clayey SAND 7.5 YR 4/6 (strong brown); some fine SAND; trace coarse SAND; few medium SAND; trace fine GRAVEL. Clayey SAND 7.5 YR 4/6 (strong brown); wet; mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL. @ 55': groundwater				
340													
60													
									Total Depth: 60 feet below ground surface.				
335													
65													
330													
70													
325													

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-5	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/15/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 398		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
									Asphalt at surface. Hand augered to 5 feet bgs.				
									ARTIFICIAL FILL (Qaf)				
									Silty SAND 7.5 YR 4/4 (brown); moist; mostly fine to medium SAND; trace fine GRAVEL.				
5	395												
		1	1	28/30					@ 6.5': 7.5R YR 4/6 (strong brown).				
	390	2		24/30					UPPER SAND UNIT (Qs)				
									Clayey SAND 10 YR 4/6 (dark yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
10		3	2	29/30					@ 11': 10 YR 5/6 (yellowish brown).				
									@ 12': sand becomes more coarse.				
	385	4		23/30									
15		5	3	29/30					SAND 10 YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; some coarse SAND.				
									Sandy CLAY 10 YR 4/6 (dark yellowish brown); moist; some fine SAND.				
									Silty SAND 10 YR 4/6 (dark yellowish brown); moist; mostly fine to medium SAND; some coarse SAND; trace fine GRAVEL.				
	380	6		20/30					Sand with SILT 10 YR 6/6 (brownish yellow); mostly fine to medium SAND; few coarse SAND.				
									SAND 10 YR 4/4 dark (yellowish brown); mostly fine to coarse SAND; few fine GRAVEL.				
20		7	4	28/30					Clayey SAND 10 YR 5/6 (yellowish brown); mostly fine SAND; few medium SAND; trace coarse SAND.				
									Silty SAND 10 YR 4/6 (dark yellowish brown); mostly fine to coarse SAND; few fine GRAVEL; trace coarse GRAVEL.				
	375	8		24/30					Clayey SAND 10 YR 5/6 (yellowish brown); moist; mostly fine SAND.				
									Silty SAND 10 YR 4/6 (dark yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND;				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-5	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/15/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 398		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		9	5	23/30					trace fine GRVEL.				
									MUD FLOW (Qm)				
	370	10		32/30					Sandy CLAY 10 YR 4/4 (dark yellowish brown); moist; some fine SAND; trace medium SAND.				
30		11	6	74/60									
	365												
35		12	7	37/60					@ 34': increase in fine to medium SAND; trace cobbles.				
	360								Clayey SAND 10 YR 4/4 (dark yellowish brown); moist; mostly fine SAND; trace medium SAND; trace fine GRAVEL.				
40		13	8	35/60									
	355								@ 40.5': cobble lense.				
									OLDER ALLUVIUM (Qoal)				
									Sandy CLAY 10 YR 4/4 (dark yellowish brown); moist; some fine SAND; trace medium SAND; trace fine GRAVEL.				
45		14	9	26/30					@ 44.5': cobble; fine grained sand stone.				
	350												
									No recovery due to very hard drilling.				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-5	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/15/2014		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 398		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		15	10	32/60					Clayey SAND 5 YR 4/4 (reddish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL. @ 51': 7.5 YR 4/6 (strong brown).				
345													
55		16	11	30/60					SAND with SILT 7.5 YR 5/6 (strong brown); moist to wet; mostly medium to coarse SAND; little fine SAND; few fine GRAVEL.				
340													
60									Clayey SAND 7.5 YR 4/6 (strong brown); wet; mostly fine SAND; few medium SAND; trace coarse SAND; trace fine GRAVEL. @ 59.9': groundwater				
335									Total Depth: 60 feet below ground surface.				
65													
330													
70													
325													

GROUP GROUP DELTA CONSULTANTS, INC.  370 Amapola Ave. Suite 212 Torrance, California 90501		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
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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-6	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/16/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 396		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
5 													

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-6	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/16/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 396		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	370	9	5	22/30					<p><u>MUD FLOW (Qm)</u></p> <p>Sandy CLAY5 YR 4/4 (reddish brown); moist; some fine SAND. Sharp contact with sand above.</p>				
		10		32/30									
30	365	11	6	43/60									
		12	7	28/30									
35	360												
		13	8	29/60					SAND and GRAVEL layer, approximately 5" thick. No recovery-Contact inferred from CPT lines.				
40	355												
									<u>OLDER ALLUVIUM (Qoal)</u>				
									Clayey SAND to Sandy CLAY 7.5 YR 4/6 (strong brown);				
45	350	14	9	53/60					Sandy CLAY 5 YR 4/4 (reddish brown).				
									Clayey SAND 5 YR 4/4 (reddish brown); moist; mostly fine to medium SAND; few coarse SAND.				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-6
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 4/16/2014	LOGGED BY TO		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 396	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

[illegible]

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-7	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/16/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"		CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60	
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees			
APPARENT GROUNDWATER DEPTH None encountered				APPROXIMATE SURFACE ELEVATION (feet) 394			
COMMENTS				BOREHOLE BACKFILL Soil Cuttings			

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
5	390								Asphalt at surface. Hand augered to 5 feet bgs. ARTIFICIAL FILL (Qaf) Silty SAND 10 YR 4/4 (dark yellowish brown); dry to moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
		1	1	24/30									
10	385								UPPER SAND UNIT (Qs)				
		2	1	30/30									
15	380								Clayey SAND 10 YR 4/4 (dark yellowish brown); dry to moist; mostly fine SAND; trace medium SAND. Silty SAND 10 YR 5/6 (yellowish brown); dry to moist; mostly fine SAND; few medium SAND; trace coarse SAND; trace fine GRAVEL.				
		3	2	18/30									
20	375								Clayey SAND 10 YR 5/6 (yellowish brown); dry to moist; mostly fine SAND; few medium SAND; trace fine GRAVEL. Silty SAND 10 YR 5/6 (yellowish brown); dry to moist; mostly fine SAND; few medium SAND; trace coarse SAND; trace fine GRAVEL. @ 15': 10 YR 4/4 dark (yellowish brown). SAND with SILT 10 YR 6/6 (brownish yellow); moist; mostly medium to coarse SAND; little fine SAND; few fine GRAVEL.				
		4	2	27/30									
	370								Clayey SAND 10 YR 4/4 (dark yellowish brown); moist; mostly fine SAND. Silty SAND 10 YR 6/6 (brownish yellow); moist; mostly fine to medium SAND; trace coarse SAND.				
		5	3	25/30									
		6	3	22/30									
		7	4	24/30									
		8	4	20/30					SAND with SILT 10 YR 5/4 (yellowish brown); dry to moist; mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL.				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-7	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/16/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 394		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		9	5	18/30									
		10	5	32/30									
365													
30		11	6	42/60									
360													
35		12	7	29/60									
355													
40		13	8	42/60									
350													
45		14	9	42/60									
345													

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-7	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/16/2014		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 394		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		15	10	45/60									
340													
55		16	11	60/60					@ 54.5': SAND lense; wet; mostly fine to medium SAND. Approximately 2" thick; groundwater				
335													
60													
									Total Depth: 60 feet below ground surface.				
330													
65													
325													
70													
320													

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-8	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/16/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 392		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	390								Asphalt at surface. Hand augered to 5 feet bgs. ARTIFICIAL FILL (Qaf)				
5		1	1	28/30					Silty SAND 10 YR 5/4 (yellowish brown); dry to moist; mostly fine SAND; few medium SAND; trace coarse SAND; trace fine GRAVEL.				
	385	2		21/30									
10		3	2	31/30					UPPER SAND UNIT (Qs) Clayey SAND 10 YR 5/6 (yellowish brown); dry to moist; mostly fine SAND; trace medium SAND.				
	380	4		22/30					Silty SAND 10 YR 5/4 (yellowish brown); dry to moist; mostly fine SAND; trace medium to coarse SAND; trace fine GRAVEL.				
15		5	3	29/30					SAND with SILT dry to moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL. Clayey SAND 10 YR 6/6 (brownish yellow) to 10 YR 4/4 (dark yellowish brown); dry to moist; mostly fine SAND.				
	375	6		19/30					Silty SAND 10 YR 5/4 (yellowish brown); dry to moist; mostly fine SAND; trace medium to coarse SAND; trace fine GRAVEL. SAND with SILT 10 YR 6/4 (light yellowish brown); dry to moist; mostly fine the medium SAND; few coarse SAND; trace fine and coarse GRAVEL; trace cobbles.				
20		7	4	29/30					@ 19.5': Sand becomes finer. Silty SAND 10 YR 7/4 (very pale brown); dry to moist; mostly fine SAND.				
	370	8		21/30					SAND with SILT to Silty SAND 10 YR 6/4 (light yellowish brown); dry to moist; mostly fine to medium SAND; trace coarse SAND. Silty SAND 10 YR 5/4 (yellowish brown); dry to moist; mostly fine SAND; few medium to coarse SAND. @ 23': 10 YR 5/6 (yellowish brown).				

 <p>GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501</p>	<p>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.</p>	<p>FIGURE a</p>
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LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-8	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/16/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 392		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
		9	5	25/30					<p>SAND with SILT10 YR 5/4 (yellowish brown); dry to moist; mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL.</p> <p>@ 25': Sand becomes more coarse.</p> <p>MUD FLOW (Qm)</p> <p>Sandy CLAY5 YR 4/4 (reddish brown); moist; some fine SAND; trace medium to coarse SAND; sharp contact.</p> <p>@ 33': Cobble.</p> <p>OLDER ALLUVIUM (Qoal)</p> <p>SILT or CLAY10 YR 6/8 (reddish yellow); dry; cemented, pourous, with a green mierzalization lining, pour spaces.</p> <p>Sandy CLAY5 YR 4/4 (reddish brown); moist; some fine SAND; trace medium to coarse SAND; sharp contact.</p>				
	365	10		28/30									
30		11	6	60/60									
	360												
35		12	7	38/60									
	355												
40		13	8	60/60									
	350												
45		14	9	44/60									
	345												

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-8	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 4/16/2014		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 392		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		15	10	60/60									
340													
55		16	11	27/60									
335													
60									@ 59': Wet; charcoal fragments; groundwater.				
330									Total Depth: 60 feet below ground surface.				
65													
325													
70													
320													

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-9	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/11/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 70
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 390.8		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	390								Asphalt at surface. Hand augered to 5 feet bgs. Artificial Fill (Qaf) Sandy SILT dark brown; moist; fine to medium sand.				
5	385	1	1	22/30					UPPER SAND UNIT (Qs) Silty SAND 10YR 5/6 (yellowish brown); moist, fine to medium SAND; trace coarse SAND and fine GRAVEL SAND with SILT moist; fine to medium SAND with few coarse SAND; trace fine GRAVEL				
		2	1	22/30					Silty SAND 10YR 4/4 (dark yellowish brown); moist; fine to medium SAND; few coarse SAND; trace fine GRAVEL				
10	380	3	2	23/30					@ 12.5': Cobble @ 13.5': 10YR 4/6 (dark yellowish brown) SAND is fine with trace medium SAND; no GRAVEL @ 15': Sand becomes coarser				
		4	2	23/30					SAND with SILT 10YR 5/4 (yellowish brown); moist; fine to medium SAND, some coarse SAND, few fine GRAVEL				
		5	3	24/30					Silty SAND 10YR 5/4 (yellowish brown); moist; fine to medium SAND, some coarse SAND, few fine GRAVEL				
		6	3	21/30					SAND with SILT 10YR 5/4 (yellowish brown); moist; fine to medium SAND; few coarse SAND and fine GRAVEL, trace coarse GRAVEL				
20	370	7	4	22/30					Clayey SAND to Sandy CLAY 7.5YR 3/4 (dark brown); moist; fine SAND; trace medium SAND and fine GRAVEL				
		8	4	19/30									
									MUD FLOW (Qm)				

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-9	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/11/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 70
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 390.8		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
30	365	9	5	22/30					Silty SAND 7.5YR 4/6 (strong brown); moist; fine to medium SAND; few coarse SAND, small lenses of CLAY; trace fine GRAVEL @ 27': 7.5YR 4/4 (brown)				
		10	5	37/30									
	360	11	6	60/60									
35	355	12	7	57/60					Clayey SAND to Silty SAND 7.5YR 4/6 (strong brown); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL Color change to 5YR 4/4 (reddish brown)				
	350	13	8	60/60									
45	345	14	9	60/60					OLDER ALLUVIUM (Qoal) Clayey SAND to Silty SAND 5YR 3/3 (dark reddish brown); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL @ 48': 5YR 4/4 (reddish brown) and 5YR 5/1 (gray)				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-9
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 8/11/2014		LOGGED BY TO	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 70
DRILL RIG TYPE Marl M-12	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.8	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
55	340	15	10	60/60					Sandy CLAY 5YR 3/3 (dark reddish brown); moist, fine SAND; trace medium SAND and fine GRAVELS				
	335	16	11	60/60									
	330	17	12	25/60									
	325	18	13	60/60									
70	320								Total Depth: 70 feet below ground surface.				

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FIGURE c

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-10	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/11/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 390.2		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
5	385	1	1	25/30					Asphalt at surface. Hand augered to 5 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown, moist, fine to medium sand.				
		2		22/30					UPPER SAND UNIT (Qs) Silty SAND 10YR 5/6 (yellowish brown); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL @ 7': 10YR 3/6 (dark yellowish brown)				
10	380	3	2	22/30					SAND with SILT 10YR 6/6 (brownish yellow); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL				
		4		24/30					Silty SAND 10YR 4/4 (dark yellowish brown); moist; fine SAND; trace coarse SAND and fine GRAVEL				
15	375	5	3	27/30					Clayey SAND 10YR 4/4 to 4/6 (dark yellowish brown); moist; fine SAND; few medium SAND, trace coarse SAND and fine GRAVEL				
		6		23/30					SAND with SILT 10YR 6/6 (brownish yellow); moist; fine to medium SAND with some coarse SAND, trace fine GRAVEL				
20	370	7	4	26/30					Silty SAND 10YR 5/6 (yellowish brown); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL				
		8		23/30					@ 21': 10YR 4/6 (dark yellowish brown)				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-10	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/11/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 390.2		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
30	360	9	5	28/30					MUD FLOW (Qm) Sandy CLAY 5YR 4/3 (reddish brown) to 7.5YR 4/4 (brown); moist, fine SAND, few medium SAND, trace coarse SAND and fine GRAVEL				
		10		31/30									
		11	6	52/60									
35	355	12	7	60/60					OLDER ALLUVIUM (Qoal) Clayey SAND to Silty SAND 7.5YR 4/6 (strong brown); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL @ 41': 7.5YR 3/3 (dark brown)				
		13	8	58/60									
45	345	14	9	60/60					OLDER ALLUVIUM (Qoal) Clayey SAND to Silty SAND 7.5YR 4/6 (strong brown); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL @ 48': 7.5YR 4/4 (brown) and 7.5YR 5/1 (gray)				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-10
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 8/11/2014	LOGGED BY TO		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.2	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-10
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 8/11/2014	LOGGED BY TO		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.2	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

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FIGURE c

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-11	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/12/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"		CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60	
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees			
APPARENT GROUNDWATER DEPTH None encountered				APPROXIMATE SURFACE ELEVATION (feet) 388.3			
COMMENTS				BOREHOLE BACKFILL Soil Cuttings			

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
5	385								Asphalt at surface. Hand augered to 5 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown, moist, fine to medium sand.				
		1	1	21/30					UPPER SAND UNIT (Qs) Silty SAND 10YR 5/6 (yellowish brown); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL				
	380	2		24/30					SAND with SILT 10YR 6/6 (brownish yellow); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL				
		3	2	23/30									
	375	4		24/30					Silty SAND 10YR 4/6 (dark yellowish brown); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL				
		5	3	20/30					@ 14.5': sand becomes coarser				
	370	6		21/30					SAND with SILT 10YR 5/6 (yellowish brown); moist, fine to medium SAND; few coarse SAND and fine GRAVEL, trace coarse GRAVEL				
		7	4	24/30					Silty SAND 10YR 5/6 (yellowish brown); moist; fine to medium SAND, few coarse SAND; trace fine GRAVEL				
20									@ 19': gravel becomes coarser				
									@ 20': 10YR 4/4 (dark yellowish brown); sand becomes finer.				
	365	8		25/30					@ 21': 10YR 5/6 (yellowish brown); sand becomes coarser				
									SAND with SILT 10YR 5/6 (yellowish brown); moist; fine to medium SAND; few coarse SAND; trace fine GRAVEL				
									MUD FLOW (Qm)				

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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-11	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/12/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 388.3		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		9	5	60/60					Sandy CLAY 7.5YR 4/4 (brown) to 5YR 4/4 (reddish brown); moist; fine SAND; trace fine GRAVEL				
360													
30		10	6	60/60									
355													
35		11	7	59/60					Clayey SAND to sandy CLAY 7.5YR 4/6 (strong brown); moist; fine SAND; few medium SAND, trace coarse SAND and fine GRAVEL				
									@ 38': 7.5YR 4/4 (brown)				
350													
40		12	8	58/60					@ 40': 7.5YR 5/4 (brown)				
345													
45		13	9	59/60					OLDER ALLUVIUM (Qoal) Clayey SAND to sandy CLAY 7.5YR 3/2 (dark brown); moist; fine SAND; few medium SAND, trace coarse SAND and fine GRAVEL				
340									Color change to 7.5YR 3/2 (dark brown); 7.5YR 4/4 (brown) and 7.5 YR 5/1 (gray)				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-11
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 8/12/2014	LOGGED BY TO		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 388.3	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

GDC ROCK CORE ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

FIGURE c

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-12	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/12/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 387.5		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	385								Asphalt at surface. Hand augered to 5 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown, moist, fine to medium sand.				
5		1	1	23/30					UPPER SAND UNIT (Qs) Silty SAND 10YR 5/6 (yellowish brown); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL				
	380	2		16/30									
10		3	2	19/30									
	375	4		15/30					@ 12': very soft drilling Clayey SAND 10YR 4/4 to 4/6 (dark yellowish brown); moist; fine to coarse SAND; trace coarse sand and fine GRAVEL				
15		5	3	12/60					No Recovery contact inferred using CPT data.				
	370	6							Clayey SAND 10YR 4/4 to 4/6 (dark yellowish brown); moist, dense, mostly fine to medium SAND, few coarse SAND and GRAVEL, micas.				
20		7	4	0/30					No Recovery contact inferred using CPT data.				
	365	8		0/30									
									MUD FLOW (Qm) Silty SAND 7.5YR 4/4 (brown), moist, medium dense.				

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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-12	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/12/2014		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 387.5		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		9	5	24/30					fine to medium SAND, trace coarse SAND, fine GRAVEL and coarse GRAVEL.				
									Drilling becomes harder				
360		10		30/30					CPT data used to place Qm contact				
									Silty SAND 7.5YR 4/4 (brown), moist, dense, mostly fine to medium SAND,				
30		11	6	29/30									
355													
35		12	7	60/60									
350									Clayey SAND 10YR 4/6 (dark yellowish brown); moist, fine SAND; trace coarse SAND and fine GRAVEL				
									Sandy CLAY moist; fine SAND; trace medium and coarse SAND, and fine GRAVEL				
40		13	8	60/60									
345													
45		14	9	60/60					OLDER ALLUVIUM (Qoal)				
									Sandy CLAY 5YR 4/3 (reddish brown), moist; fine SAND; trace medium and coarse SAND, and fine GRAVEL				
340													

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-12
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/12/2014	LOGGED BY TO	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 387.5	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
335 55 330 60 325 65 320 70 315		15	10	42/60					Clayey SAND 10YR 4/6 (dark yellowish brown) and 10YR 5/2 (grayish brown); moist; fine to medium SAND; trace coarse and fine GRAVEL				
									Sandy CLAY 10YR 4/6 and 10YR 5/2 (mottled); moist; fine SAND; trace fine GRAVEL				
		16	11	54/60					Clayey SAND 10YR 4/4 (dark yellowish brown); moist; fine SAND				
									Silty SAND 10YR 5/6 (yellowish brown); moist; fine SAND; trace fine GRAVEL				
									Total Depth: 60 feet below ground surface.				

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LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-13	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/12/2014		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"		CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60	
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees			
APPARENT GROUNDWATER DEPTH None encountered				APPROXIMATE SURFACE ELEVATION (feet) 387			
COMMENTS				BOREHOLE BACKFILL Soil Cuttings			

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	385								Asphalt at surface. Hand augered to 5 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown, moist, fine to medium sand.				
5		1	1	23/60									
	380								UPPER SAND UNIT (Qs) Silty SAND 10YR 5/8 (yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL				
		2		19/30									
10		3	2	25/30									
	375								Clayey SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and GRAVEL				
		4		30/30									
15		5	3	26/30					SAND with SILT 10YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL				
	370												
		6		20/30					Silty SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND; few medium SAND; trace fine GRAVEL				
20		7	4	27/30									
	365								SAND with SILT 10YR 4/6 (dark yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace GRAVEL; occasional silty sand lenses				
		8		18/30									
									MUD FLOW (Qm) Clayey SAND 7.5YR 4/4 (brown); moist; mostly fine				

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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-13
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 8/12/2014	LOGGED BY TO		SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 387	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE					LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %						
30	360	9	5	32/30				SAND; few medium SAND; trace coarse and fine GRAVEL				
		10		28/30				Clayey SAND7.5YR 4/4 (brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL				
	355	11	6	58/60								
35	350	12	7	59/60								
40	345	13	8	58/60				Sandy CLAY7.5YR 3/4 (dark brown) interbedded 5YR 4/4 (reddish brown); moist; mostly fine SAND; some medium SAND; few coarse SAND; trace fine to coarse GRAVEL				
45	340	14	9	58/60				OLDER ALLUVIUM (Qoal) Sandy CLAY5YR 3/3 (dark reddish brown), moist; mostly fine SAND; some medium SAND; few coarse SAND; trace GRAVEL				

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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 b


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-13	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 8/12/2014		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE Marl M-12		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 387		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
335		15	10	59/60					Sandy CLAY to Clayey SAND 7.5YR 4/4 (brown) interbedded 7.5YR 5/1 (gray); moist; mostly fine SAND; trace medium to coarse SAND; trace fine GRAVEL; mottled				
55		16	11	34/60									
330									Total Depth: 60 feet below ground surface.				
60													
325													
65													
320													
70													
315													

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-14	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/5/2015		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 70
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 390		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
5	385								Asphalt at surface. Approximately 7". Hand augered to 10 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown, moist, fine to medium sand.				
10	380	1	1	26/30					UPPER SAND UNIT (Qs) Silty SAND yellowish brown (10YR 5/8); moist, fine to medium SAND; trace fine GRAVEL. @ 7': few fine GRAVEL; trace coarse GRAVEL and COBBLES.				
15	375	2		23/30									
		3	2	22/30					Clayey SAND strong brown (7.5TR 4/6); moist, fine SAND with few medium SAND; trace coarse SAND and fine GRAVEL.				
		4		20/30					SAND with SILT (SP-SM) yellowsih brown (10YR 5/6); fine to medium SAND; few coarse SAND; few fine GRAVEL; trace coarse GRAVEL.				
20	370	5	3	22/30					Clayey SAND strong brown (7.5 YR 5/6); moist; fine SAND; trace medium SAND; trace coarse SAND. SAND with SILT yellowish brown (10YR 5/6); fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
		6		26/30					SAND with SILT 10YR 4/6; dark yellowish brown; moist; loose; mostly medium to fine SAND; few coarse SAND; trace GRAVEL. Clayey SAND 7.5YR 5/8; strong brown; moist; medium dense; mostly fine SAND; trace medium SAND; soil development.				
	365												

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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-14
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/5/2015	LOGGED BY TO	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 70
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
30	360	7	4	32/30					SAND with SILT 10YR 5/6; yellowish brown; loose; moist; mostly medium SAND; sone fine and coarse SAND; few GRAVEL at 22.5-23.0. MUD FLOW (Qm) Clayey SAND 7.5YR 4/6; strong brown; moist; firm; mostly fine SAND; trace coarse SAND; medium plasticity; no dilitancy; medium toughness. SAND with SILT and GRAVEL strong brown; 7.5YR 5/6; moist; fine to medium SAND; few coarse SAND; fine GRAVEL; trace coarse GRAVEL. Silty Sandy CLAY strong brown (7.5YR 5/6); moist; fine SAND; trace medium SAND. Silty SAND strong brown (7.5YR 5/6); moist; fine SAND; few medium SAND; trace fine GRAVEL. Clayey SAND strong brown (7.5YR 5/6); moist; fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL; soil development.				
		8		30/30									
		9	5	32/30									
		10		41/30									
35	355	11	6	55/60									
		12	7	56/60					@ 41': Increase in clay content; dark reddish brown (5YR 3/3); moist.				
45	345	13	8	60/60					OLDER ALLUVIUM (Qoal) Sandy CLAY brown (7.5YR 4/4); moist; fine SAND; trace medium SAND; trace coase SAND; Iron oxide straining on grains; mild to moderate soil development.				
340													

GROUP GROUP DELTA CONSULTANTS, INC.  370 Amapola Ave. Suite 212 Torrance, California 90501		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 b
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GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-14
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 1/5/2015	LOGGED BY TO		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 70
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

<p>GROUP GROUP DELTA CONSULTANTS, INC.</p>  <p>370 Amapola Ave. Suite 212 Torrance, California 90501</p>	<p>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.</p>	<p>FIGURE c</p>
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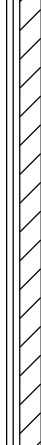

GDC ROCK CORE ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-15	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/5/2015		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 390.8		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	390								Asphalt at surface. Approximately 7". Hand augered to 10 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT, dark brown, moist, fine to medium sand.				
5	385								UPPER SAND UNIT (Qs) Silty SAND brownish yellow (10YR 5/8); moist; fine to medium SAND; few coarse SAND; few fine GRAVEL; trace coarse GRAVEL.				
	380	1	1	25/30									
		2		27/30									
10													
	375	3	2	24/30					Clayey SAND strong brown (7.5YR 4/6); moist; fine sand; few medium SAND; trace coarse SAND and fine GRAVEL.				
		4		25/30					SAND with SILT yellowish brown (10YR 5/4), moist; fine to medium SAND; some coarse SAND; trace fine GRAVEL.				
									Silty SAND dark yellowish brown (10YR 4/6); moist; fine to medium SAND; trace coarse SAND; trace fine GRAVEL.				
20	370	5	3	25/30					@ 21': cobble				
		6		22/30									
									SAND with SILT strong brown (7.5YR 4/6); moist; fine to coarse SAND; trace fine GRAVEL.				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-15	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/5/2015		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 390.8		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
30	365	7	4	30/30					Clayey SAND dark brown (7.5YR 3/4); moist; fine to coarse SAND; trace fine GRAVEL. MUD FLOW (Qm) Sandy CLAY brown (10YR 4/4); moist; fine SAND; few medium SAND; trace coarse SAND; trace fine GRAVEL. Clayey SAND to Sandy CLAY strong brown (7.5YR 4/6); moist; fine SAND; few medium SAND; trace coarse SAND.				
		8		31/30									
	360	9	5	56/60									
35	355	10	6	57/60					@ 36.5': trace cobbles and fine gravels.				
	350	11	7	53/60					@ 40': gray mottling (7.5YR 6/1)				
45	345	12	8	60/60					OLDER ALLUVIUM (Qoal) Sandy CLAY brown (7.5YR 4/4); moist; fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL; few dark gray (7.5YR 6/1); carbon modules.				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-15
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 1/5/2015	LOGGED BY TO		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.8	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-15
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 1/5/2015	LOGGED BY TO		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.8	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

FIGURE c


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-16	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/6/2015		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 391		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	390								Asphalt at surface. Approximately 7". Hand augered to 10 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown, moist, fine to medium sand.				
5	385								UPPER SAND UNIT (Qs) Silty SAND dark yellowish brown (10YR 4/6); moist; fine to medium SAND; few coarse SAND; trace fine to coarse GRAVEL.				
	380	1	1	26/30									
		2		26/30									
15	375	3	2	22/30					Clayey SAND dark yellowish brown (10YR 4/6); moist; fine SAND; few medium SAND; trace fine GRAVEL.				
		4		26/30					SAND with SILT brownish yellow (10YR 6/6); moist; fine to medium SAND; some coarse SAND; few fine GRAVEL.				
20	370	5	3	21/30					Clayey SAND brownish yellow (10YR 6/6); moist; fine to medium SAND; some coarse SAND; few fine GRAVEL.				
		6		24/30					Sand with SILT yellowish brown (10YR 5/8); moist; fine to medium SAND; some coarse SAND; few fine GRAVEL. From 20.5 to 21 Silty Clayey Sand lense; dark yellowish brown (10YR 4/6); moist; fine SAND; few medium SAND.				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-16	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/6/2015		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 391		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	365	7	4	31/30					MUD FLOW (Qm) Sandy CLAY strong brown (7.5YR 4/6); moist; fine SAND; trace medium SAND.				
		8		29/30									
30	360	9	5	60/60					Clayey SAND dark yellowish brown (10YR 4/6); moist; fine SAND; trace medieme to coarse SAND; trace fine GRAVEL.				
35	355	10	6	60/60									
40	350	11	7	60/60					@ 40': higher SAND content; few medium to coarse SAND; trace carbon modules.				
45	345	12	8	60/60					OLDER ALLUVIUM (Qoal) Sandy CLAY to Clayey SAND strong brown (7.5YR 4/6); moist; fine SAND; trace medium to coarse SAND; trace fine GRAVEL. @ 47': mottled gray (7.5YR 5/1); strong brown (7.5YR 4/6) and very dark gray (7.5YR 3/1); dark gray likely carbon. @ 49': higher clay content and fine SAND; trace				

	GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501	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 b


GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-16	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/6/2015		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 391		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	340	13	9	56/60					medium SAND; moderate soil development.				
									@ 51.5': trace fine GRAVEL.				
55	335	14	10	58/60					@ 55.5': increase in SAND content fine to coarse grained.				
									@ 57': less SAND; increase in CLAY content and fine SAND; trace medium and coarse SAND.				
60	330								Total Depth: 60 feet below ground surface.				
65	325												
70	320												


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-17	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/6/2015		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 391		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	390								Asphalt at surface. Approximately 7". Hand augered to 10 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown; moist; fine to medium sand.				
5	385								UPPER SAND UNIT (Qs) Silty SAND dark yellowish brown (10YR 4/6); moist; fine to medium SAND; few coarse SAND; trace fine to coarse GRAVEL.				
	380	1	1	22/30					@ 11': Silty Clayey SAND; strong brown (7.5YR 4/6); fine SAND.				
		2		22/30					@ 13.5': Silty Clayey SAND; (7.5YR 4/6); same as above.				
15	375	3	2	23/30					@ 15': Silty SAND; yellowish brown (10YR 5/6); moist; fine to medium SAND; few coasre SAND; trace fine GRAVEL.				
		4		22/30					Clayey SAND strong brown (7.5YR 4/6); moist; fine SAND.				
20	370	5	3	22/30					Silty SAND dark yellowish brown (10YR 4/6); moist; fine to medium SAND; few coarse SAND; trace fine to coarse GRAVEL.				
		6		20/30									

	GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501		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

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-17
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 1/6/2015	LOGGED BY TO		SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 391	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

<p>GROUP GROUP DELTA CONSULTANTS, INC.</p> <p> 370 Amapola Ave. Suite 212 Torrance, California 90501</p>	<p>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.</p>	<p>FIGURE b</p>
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GDC ROCK CORE ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-17	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/6/2015		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 391		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	340	13	9	60/60					@ 50': higher clay content				
55	335	14	10	39/60									
60	330								Total Depth: 60 feet below ground surface.				
65	325												
70	320												

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-18	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/7/2015		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 70
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 392		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	390								Asphalt at surface. Approximately 7". Hand augered to 10 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown; moist; fine to medium sand. @ 5': dark yellowish brown (10YR 4/6).				
5													
	385								UPPER SAND UNIT (Qs) Silty SAND dark brown (7.5YR 3/4); moist; fine SAND; some medium SAND; trace coarse SAND and fine GRAVEL. @ 11': yellowish brown (10YR 5/4).				
10		1	1	23/30									
	380	2		24/30									
15		3	2	19/30									
	375	4		24/30									
20		5	3	19/30					Clayey SAND dark yellowish brown (10YR 4/6); moist; fine to medium SAND; few coarse SAND; trace fine GRAVEL. Silty SAND (SM) yellowish brown (10YR 4/6); moist; fine to medium SAND; few coarse SAND; trace fine GRAVEL. 21 to 21.5 clayey SAND lense.				
	370	6		22/30									

	GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501	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

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-18	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/7/2015		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 70
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 392		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		7	4	26/30					MUD FLOW (Qm)				
	365								Clayey SAND to Sandy CLAY (SC:CL) strong brown (7.5YR 4/6); moist; fine SAND; few medium SAND; trace coarse SAND.				
		8		31/30					@ 28': trace fine GRAVEL.				
30		9	5	46/60									
	360												
35		10	6	58/60					@ 35': few fine GRAVEL.				
	355												
40		11	7	60/60					@ 40': mottled Gray (7.5 YR 5/1); strong brown (7.5YR 4/6) and brown (7.5YR 4/3); mild to moderate soil development.				
	350								Silty SAND dark yellowish brown (10YR 4/6); moist; fine SAND.				
45		12	8	60/60					OLDER ALLUVIUM (Qoal)				
	345								Clayey SAND to Sandy CLAY mottled Gray (7.5 YR 5/1); strong brown (7.5YR 4/6) and brown (7.5YR 4/3).				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-18	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/7/2015		LOGGED BY TO		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 70
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 392		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
		13	9	60/60									
	340								Sandy CLAY, reddish brown (5YR 4/4); moist; fine SAND; trace coarse SAND. @ 52': strong brown (7.5YR 4/6).				
									Clayey SANDstrong brown; (7.5YR 4/6); moist; fine to medium SAND; trace coarse SAND and fine GRAVEL.				
55		14	10	60/60					Sandy CLAYreddish brown (5YR 4/4) moist; fine SAND; few medium SAND; moderate soil development; some carbon modules.				
	335												
60		15	11	60/60									
	330												
65		16	12	60/60									
	325												
70													
	320								Total Depth: 70 feet below ground surface.				

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING								PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-19	
SITE LOCATION Capitol Parking Lot								DATE(S) DRILLED 1/7/2015		LOGGED BY TO		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger								DRILL BIT SIZE TYPE 8"		CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60	
DRILL RIG TYPE CME 95								DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees			
APPARENT GROUNDWATER DEPTH None encountered								APPROXIMATE SURFACE ELEVATION (feet) 393					
COMMENTS								BOREHOLE BACKFILL Soil Cuttings					
DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
390 5 385 10 380 15 375 20 370								Asphalt at surface. Approximately 7". Hand augered to 10 feet bgs. ARTIFICIAL FILL (Qaf) Sandy SILT dark brown; moist; fine to medium sand.					
								UPPER SAND UNIT (Qs) Silty SAND yellowish brown (10YR 4/6); moist; fine to medium SAND; few coarse SAND; trace fine GRAVEL.					
	1	1	28/30					@ 15': strong brown (7.5YR 4/6).					
	2		19/30					@ 17.5': yellowish brown (10YR 4/6).					
	3	2	25/30					@ 19.5': lense of clayey SAND; strong brown in color (7.5YR 4/6); fine SAND.					
	4		21/30										
	5	3	25/30										
	6	19/30											
								MUD FLOW (Qm)					
 GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501								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	

GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave		PROJECT NUMBER LA-1191A		BORING B-19	
SITE LOCATION Capitol Parking Lot		DATE(S) DRILLED 1/7/2015		LOGGED BY TO		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 Degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 393		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		7	4	30/30					Clayey SAND to Sandy CLAY strong brown (7.5YR 4/6) moist; fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL.				
	365	8		33/30									
30		9	5	60/60									
	360												
35		10	6	60/60					OLDER ALLUVIUM (Qoal) Clayey SAND to Sandy CLAY reddish brown (5YR 4/4) moist; fine SAND; few medium SAND; trace coarse SAND and GRAVEL.				
	355												
40		11	7	56/60									
	350												
45		12	8	60/60									
	345												

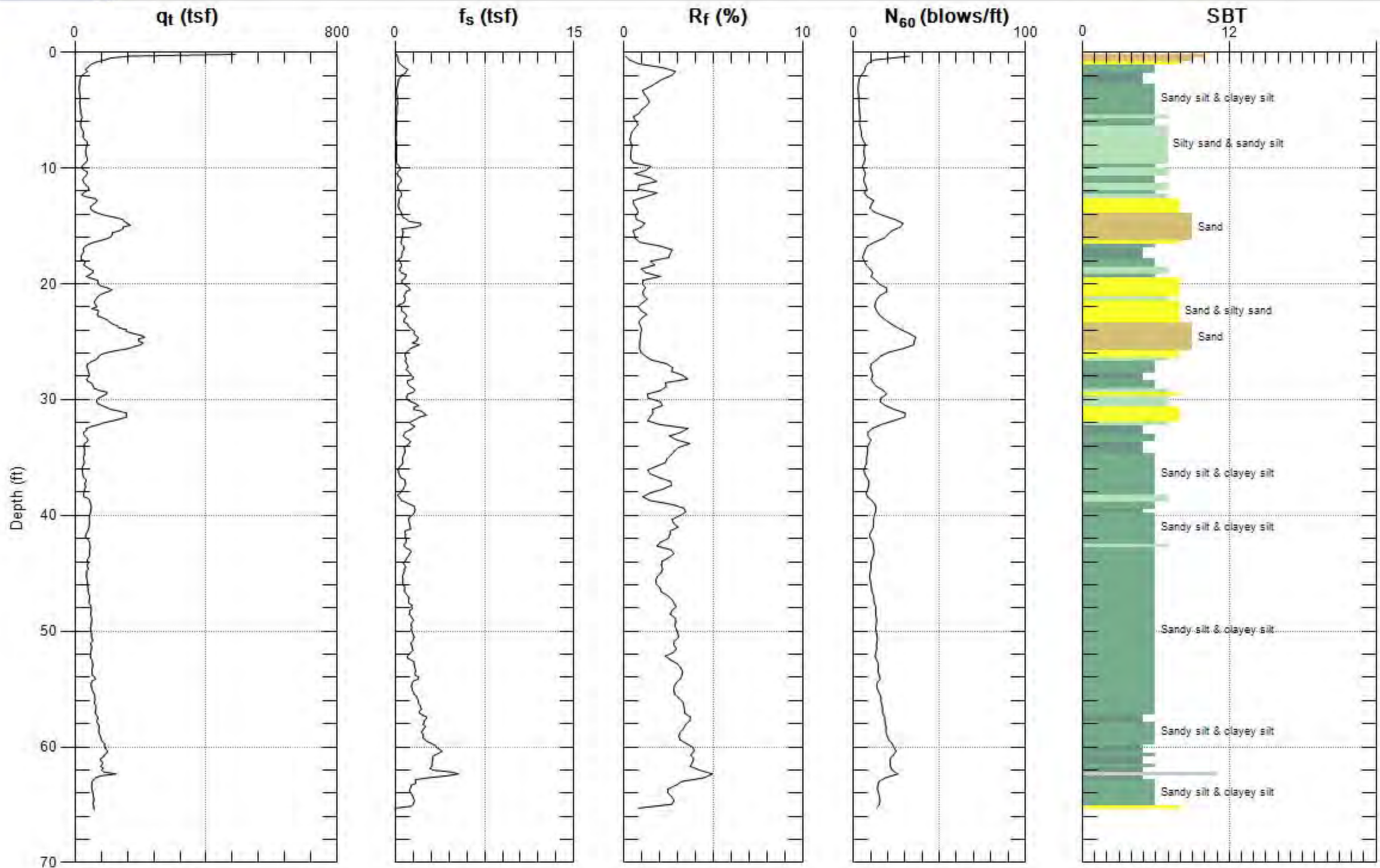
GDC_ROCK_CORE_ENG LA1191 BORING LOGS B-1 TO B-13.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-19
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 1/7/2015	LOGGED BY TO		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 393	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

LOG OF CORE BORING		PROJECT NAME Millenium Trench W Argyle Ave	PROJECT NUMBER LA-1191A	BORING B-19
SITE LOCATION Capitol Parking Lot	DATE(S) DRILLED 1/7/2015	LOGGED BY TO		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 Degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 393	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

FIGURE c

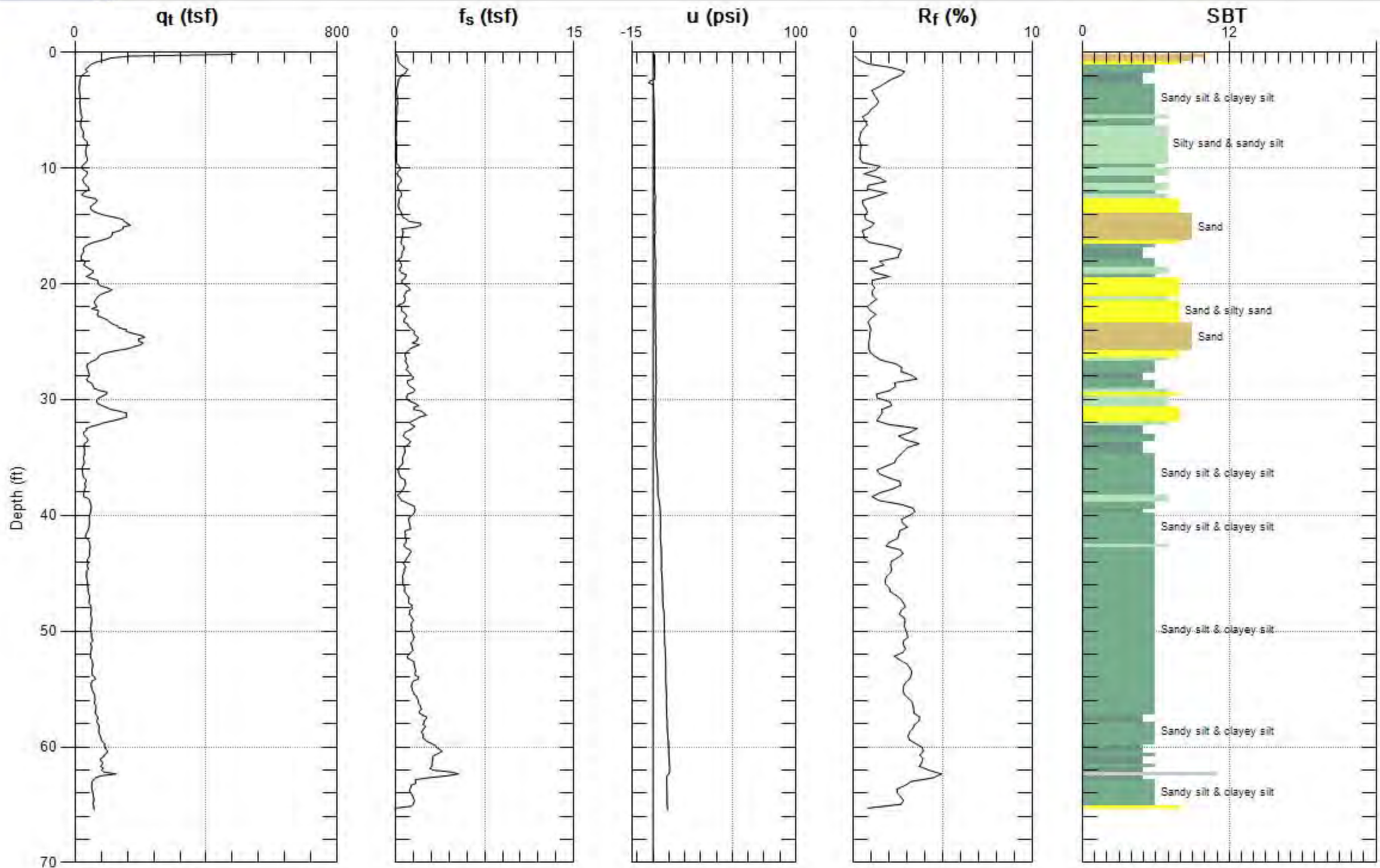
WEST MILLENNIUM FAULT ACTIVITY INVESTIGATION, 1757 VINE
STREET, HOLLYWOOD AREA, CITY OF LOS ANGELES,
CALIFORNIA. WEST MILLENNIUM PARKING LOT CPT'S and BORINGS.



Max. Depth: 65.453 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.453 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

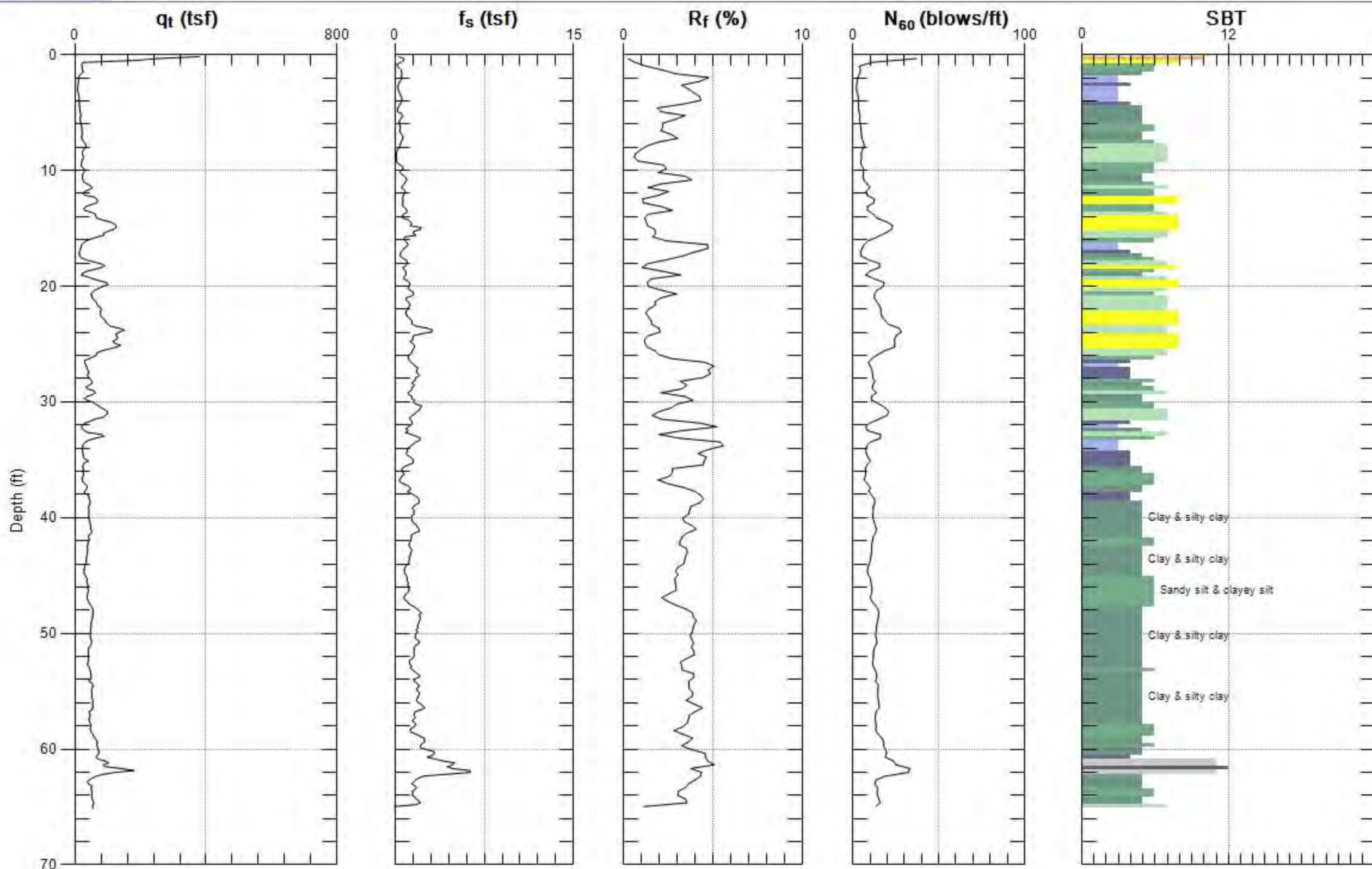


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-2

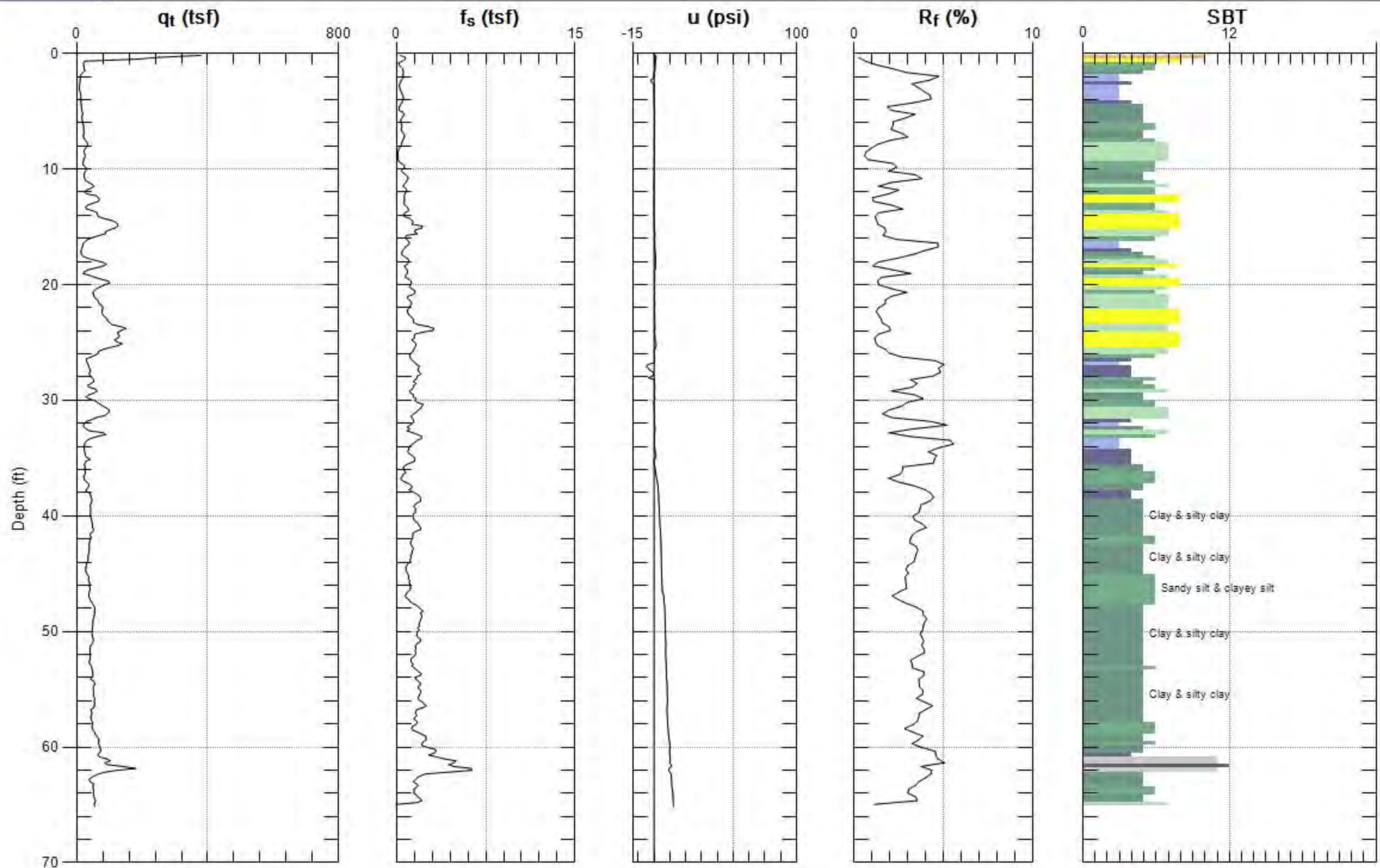
Date: 6/6/2012 08:14



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

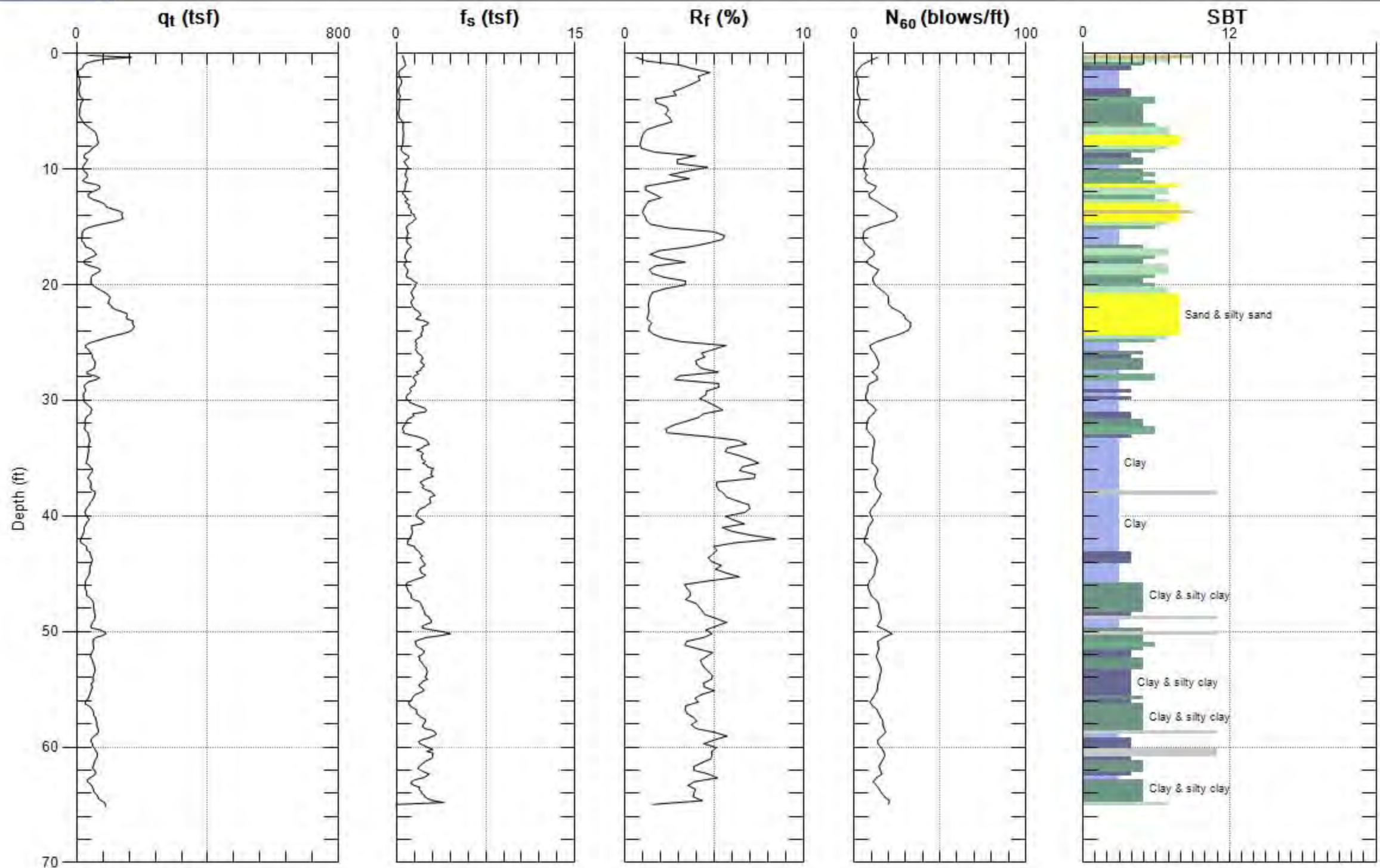
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

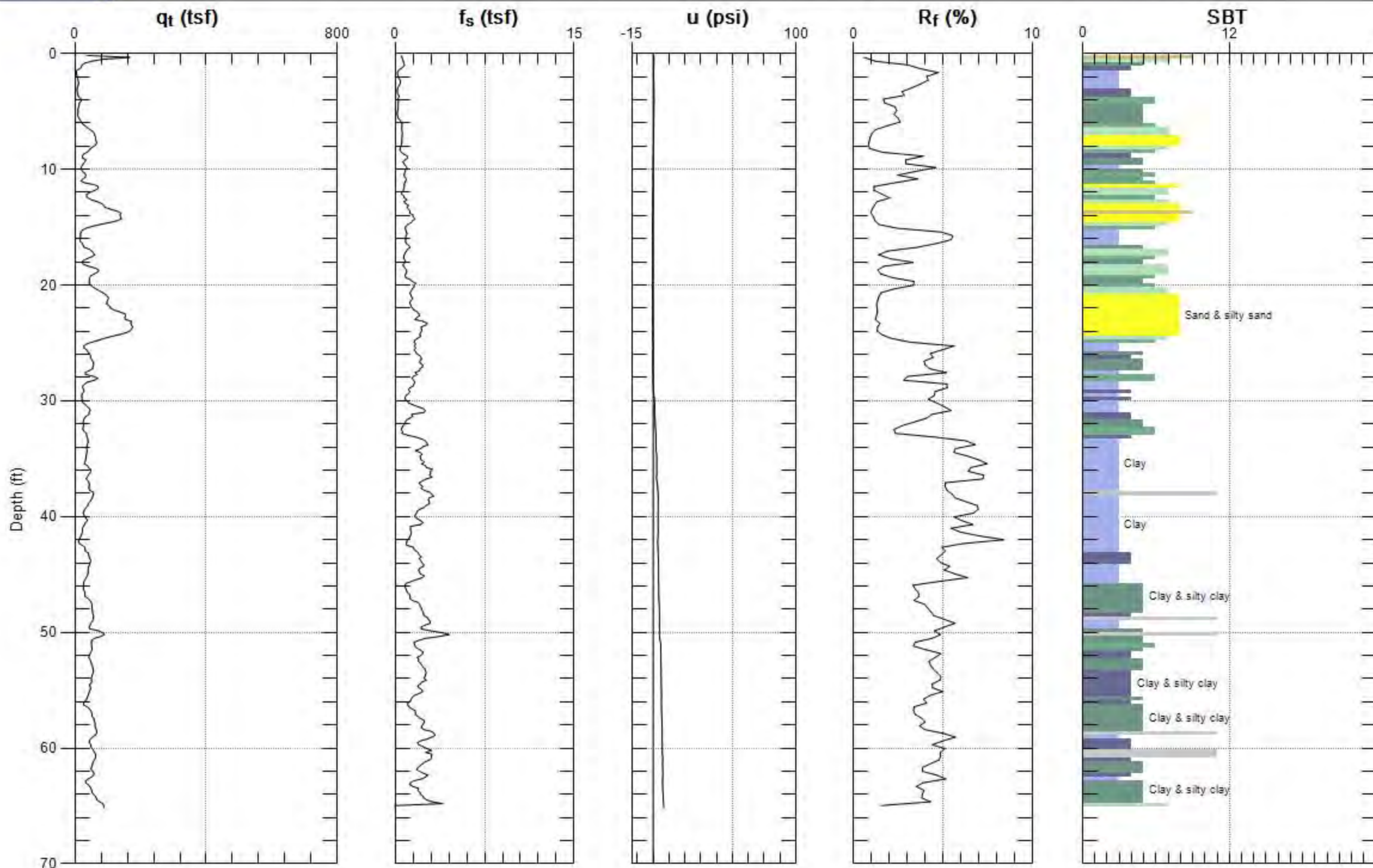


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-3

Date: 6/6/2012 08:44



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

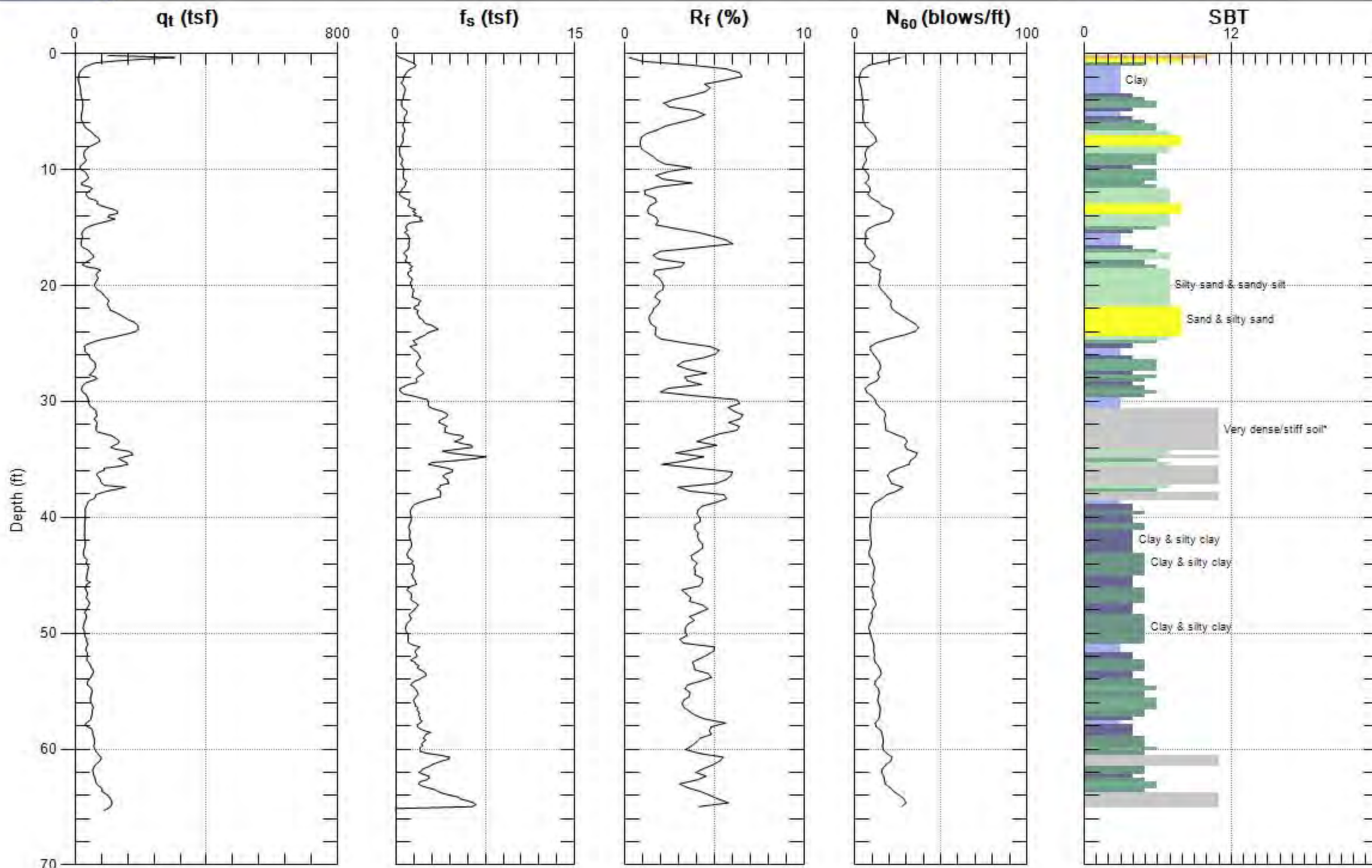


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-4

Date: 6/6/2012 09:16



Max. Depth: 65.289 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

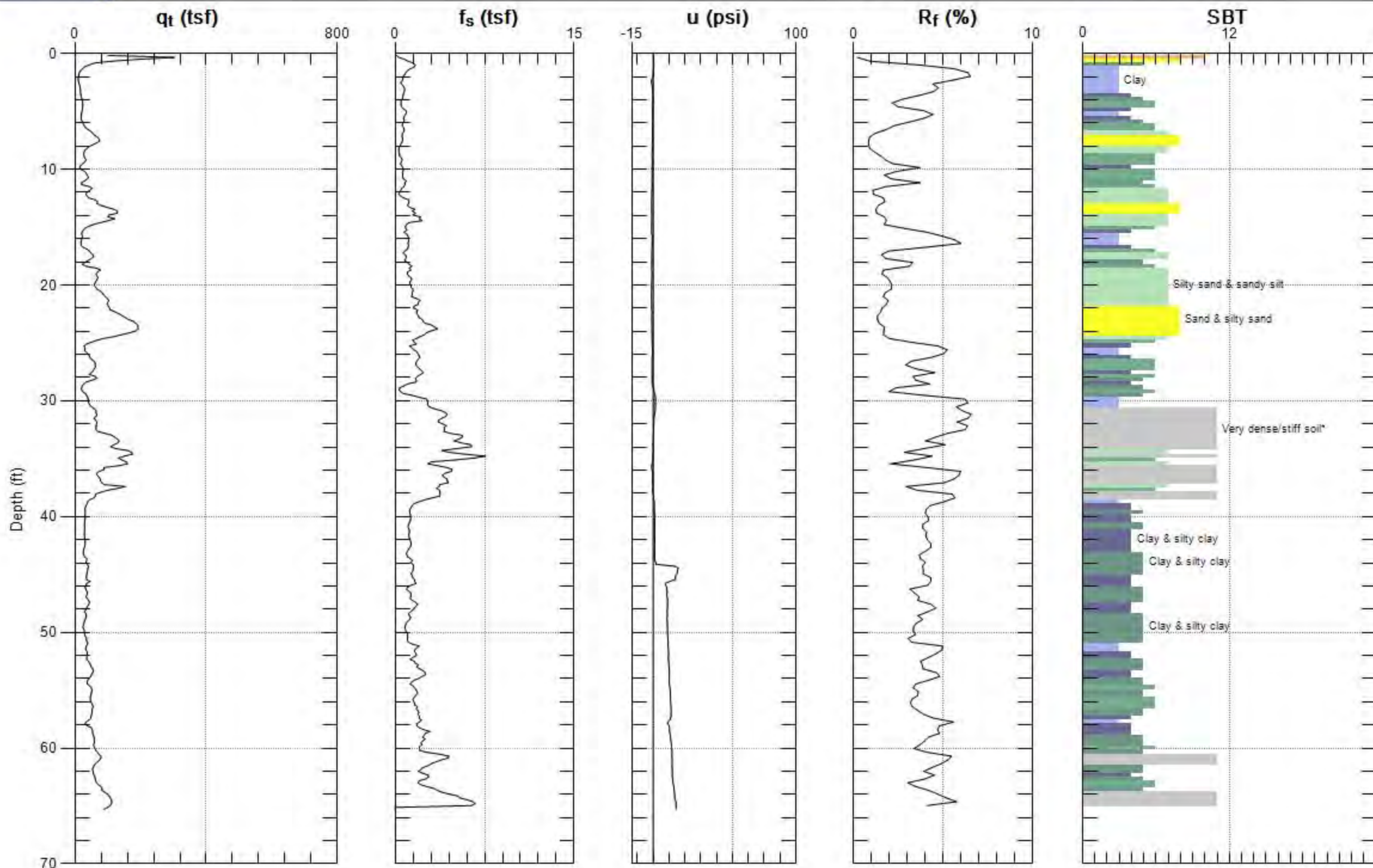


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-4

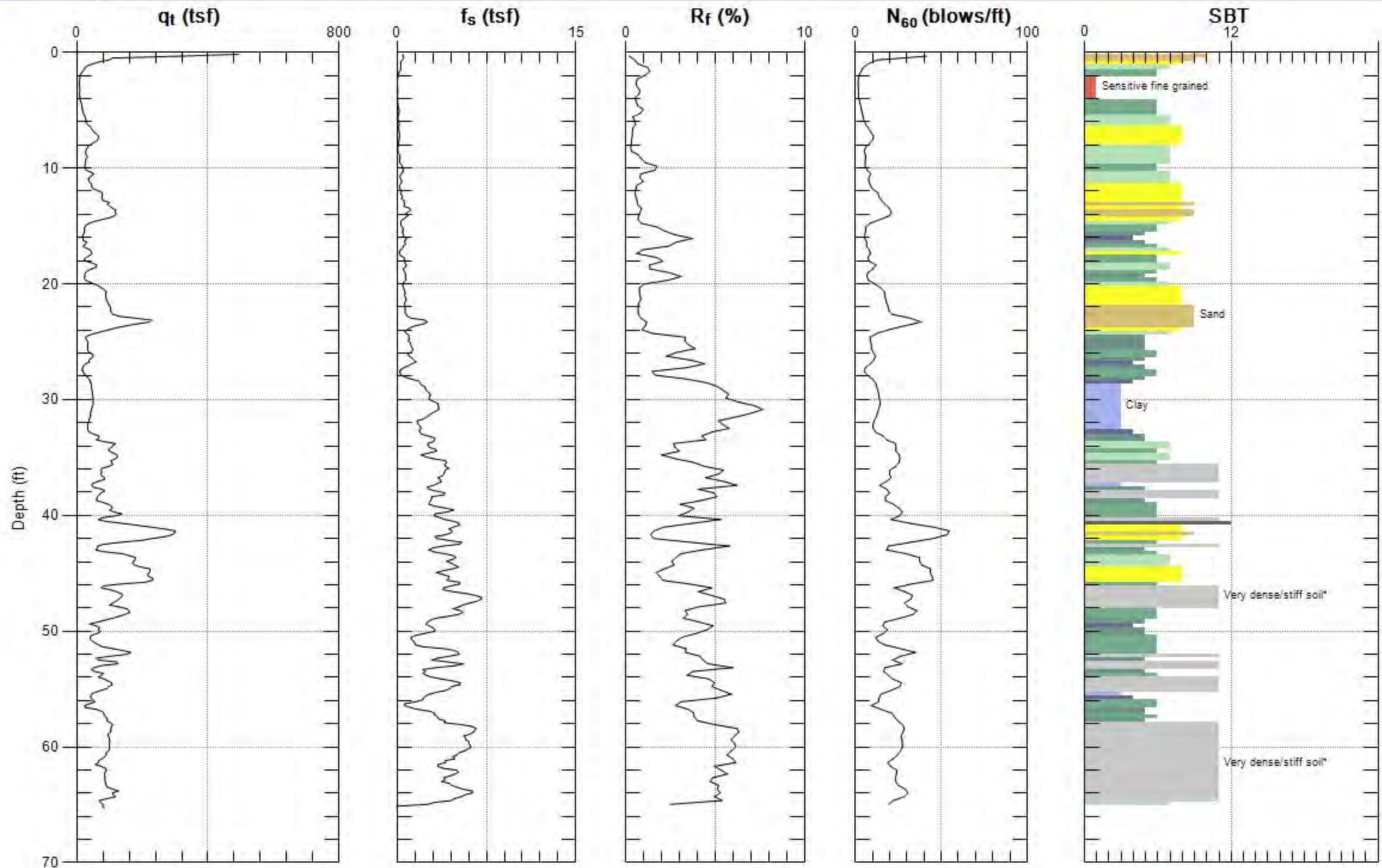
Date: 6/6/2012 09:16



Max. Depth: 65.289 (ft)

Avg. Interval: 0.328 (ft)

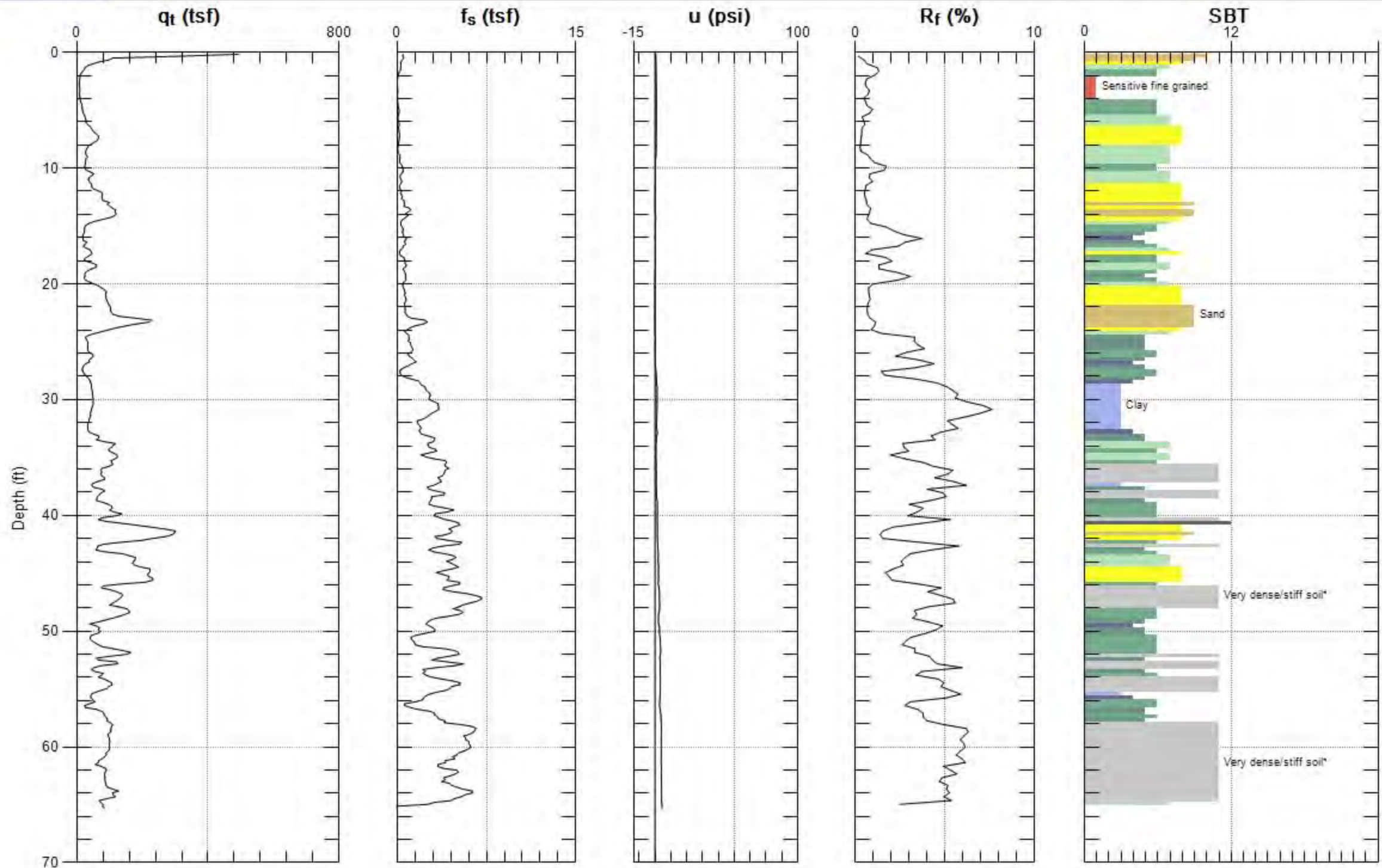
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.289 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.289 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

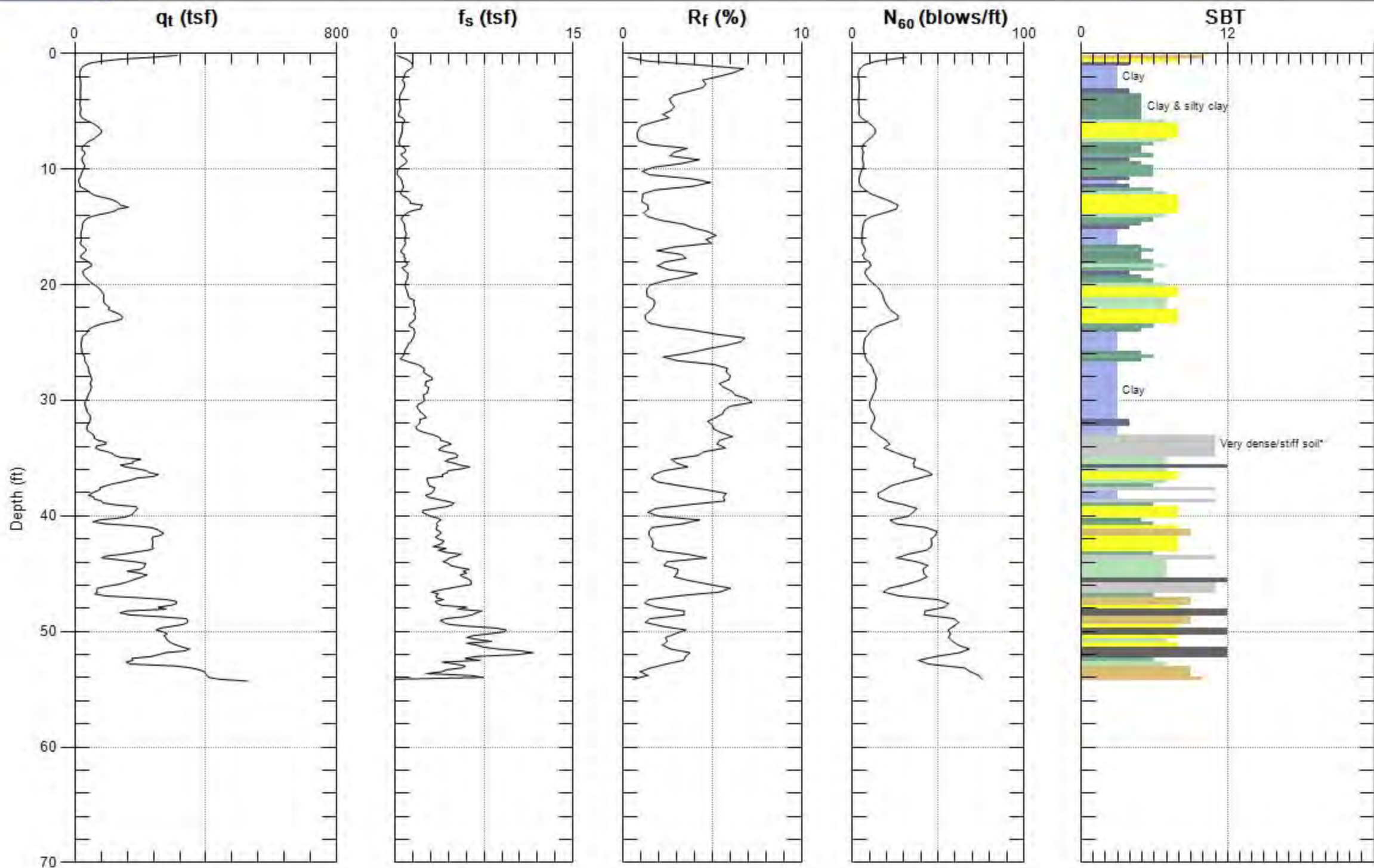


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-6

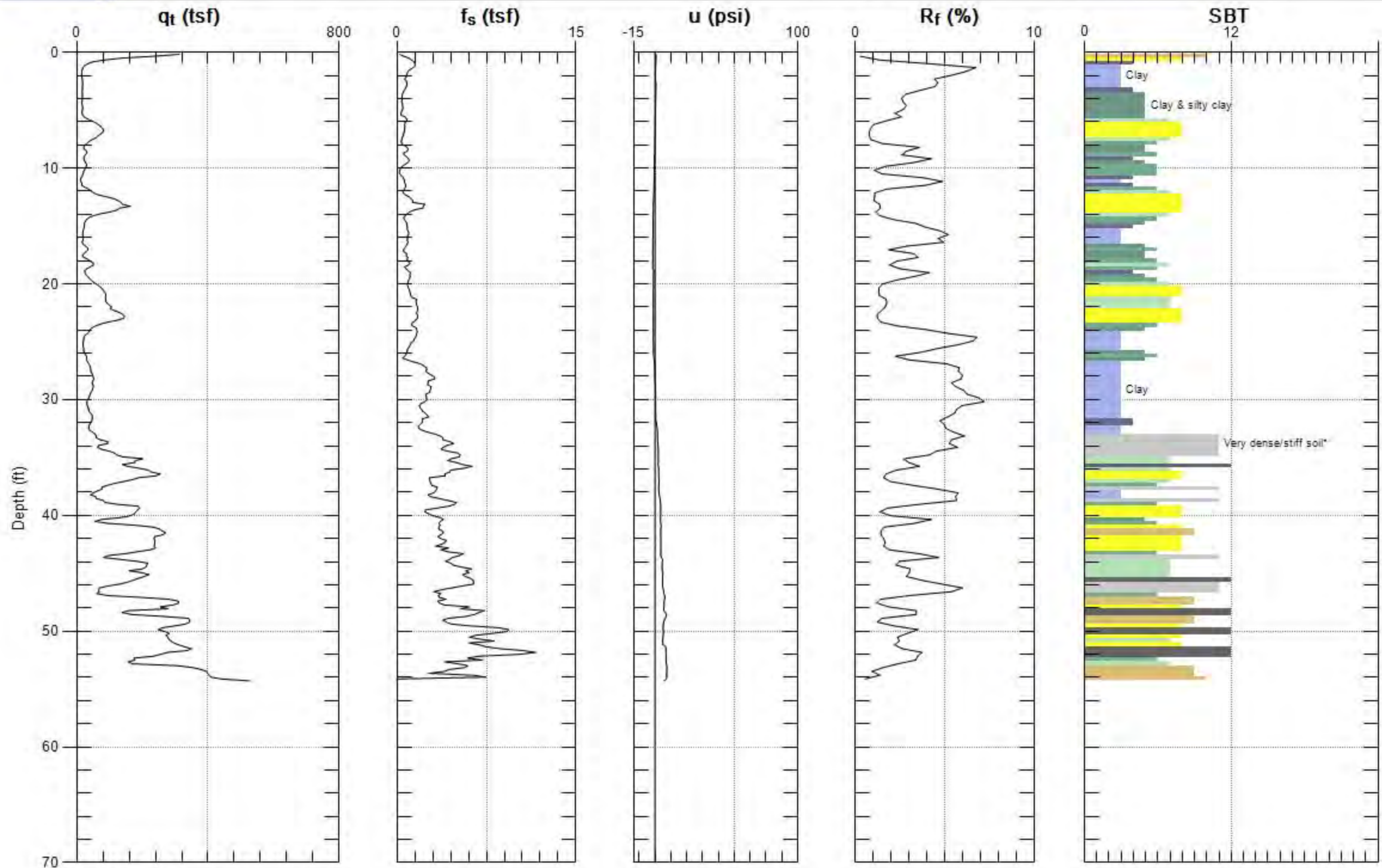
Date: 6/6/2012 10:23



Max. Depth: 54.298 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 54.298 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

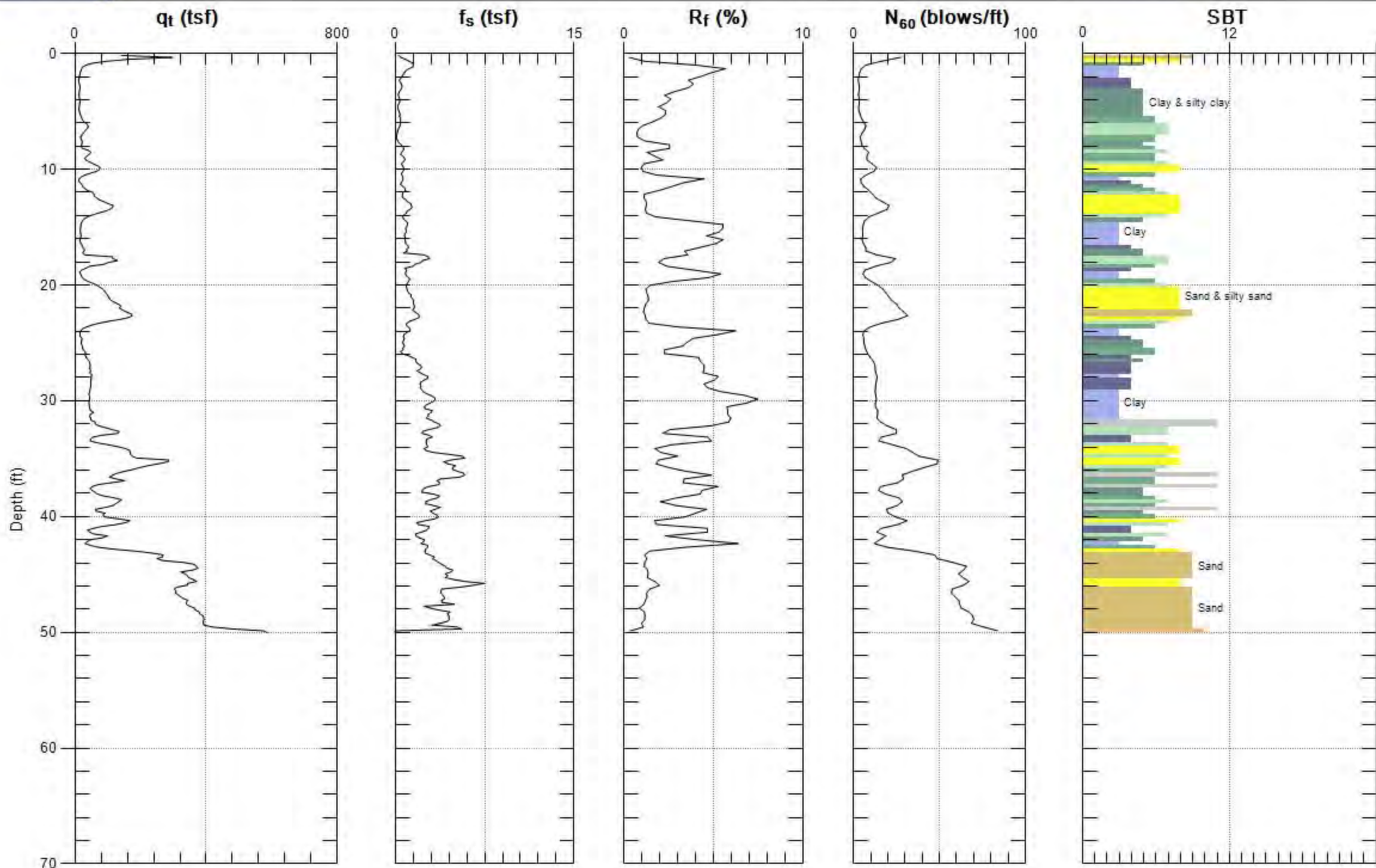


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-7

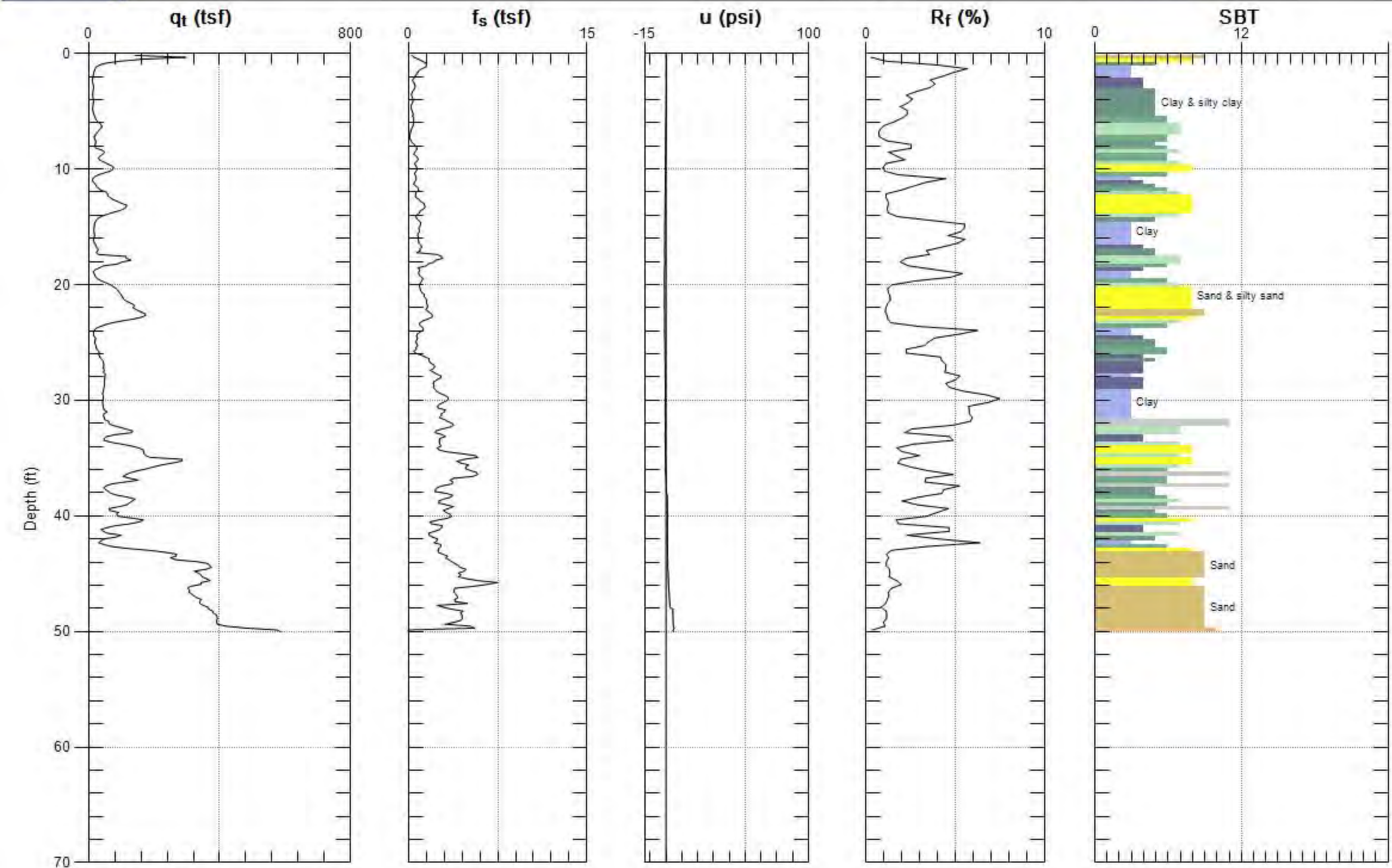
Date: 6/6/2012 10:46



Max. Depth: 50.033 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 50.033 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

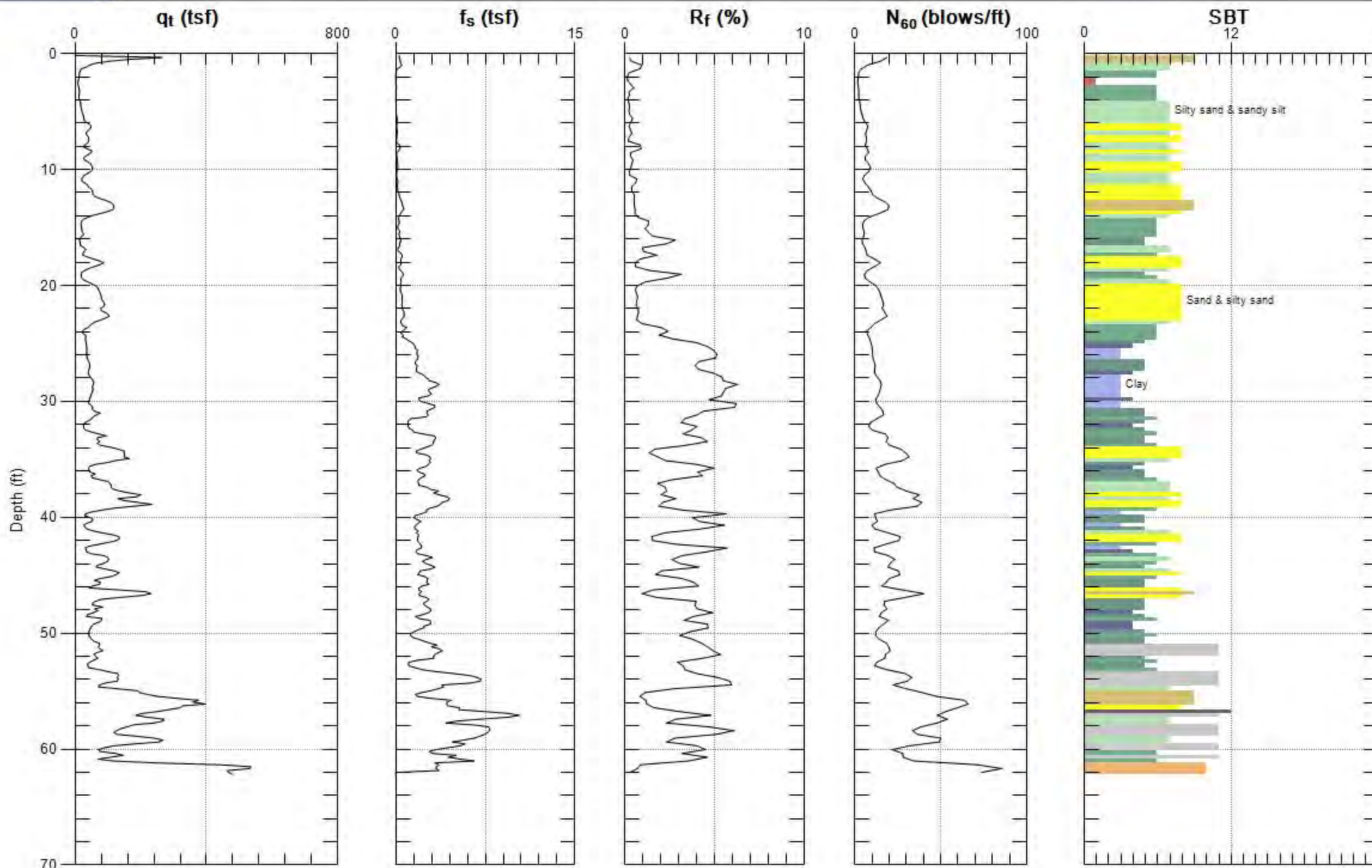


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-8

Date: 6/6/2012 11:11



Max. Depth: 62.172 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

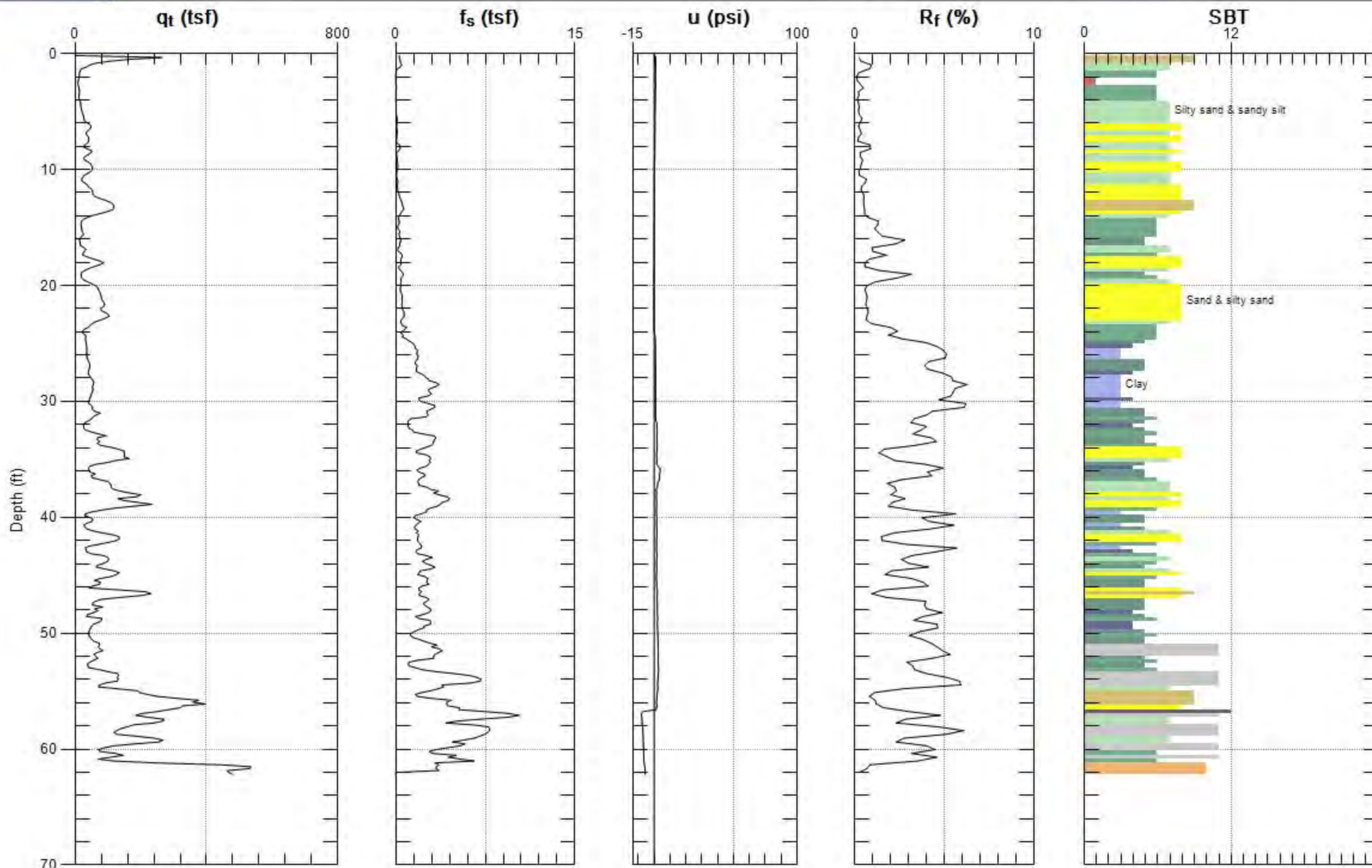


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-8

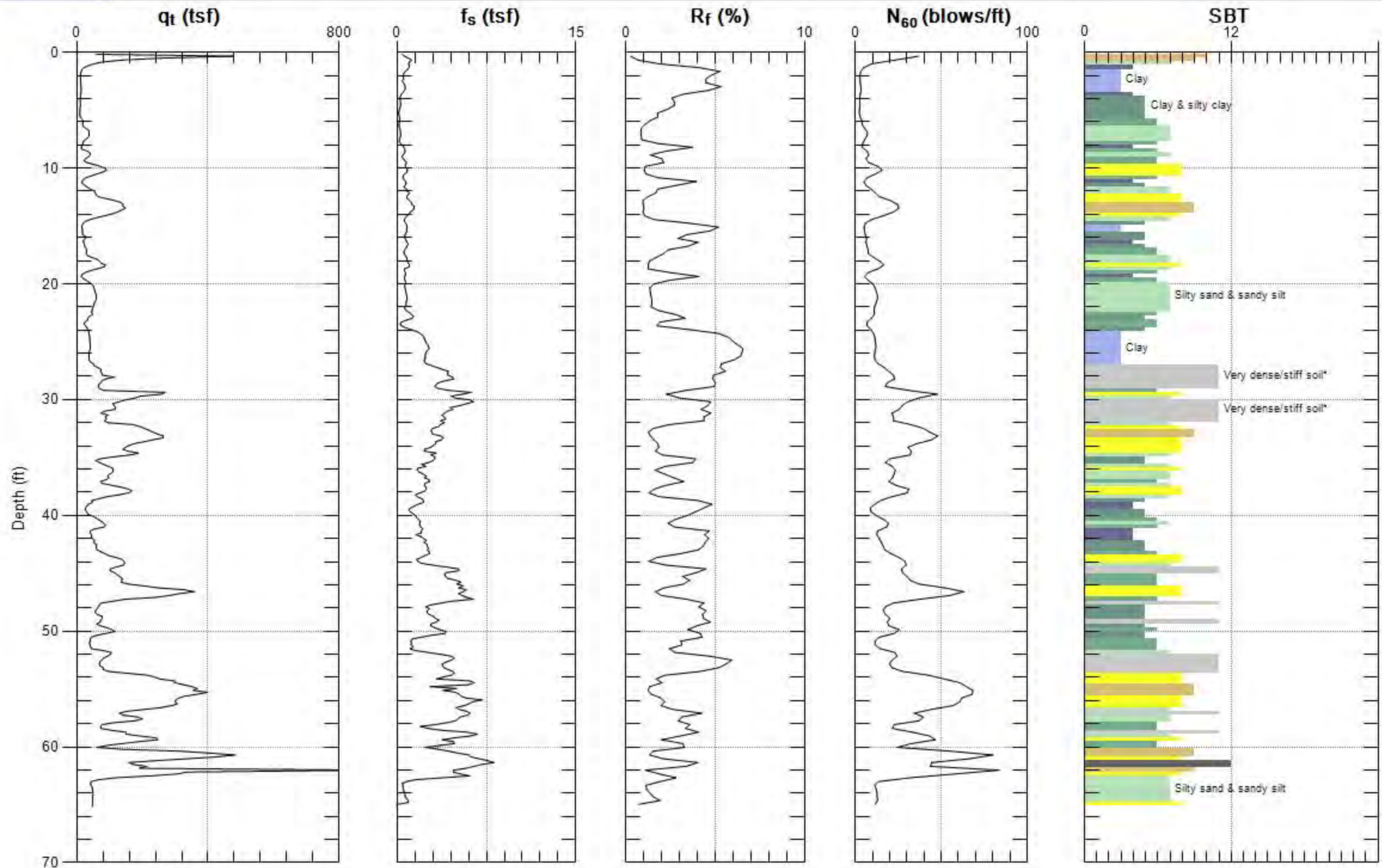
Date: 6/6/2012 11:11



Max. Depth: 62.172 (ft)

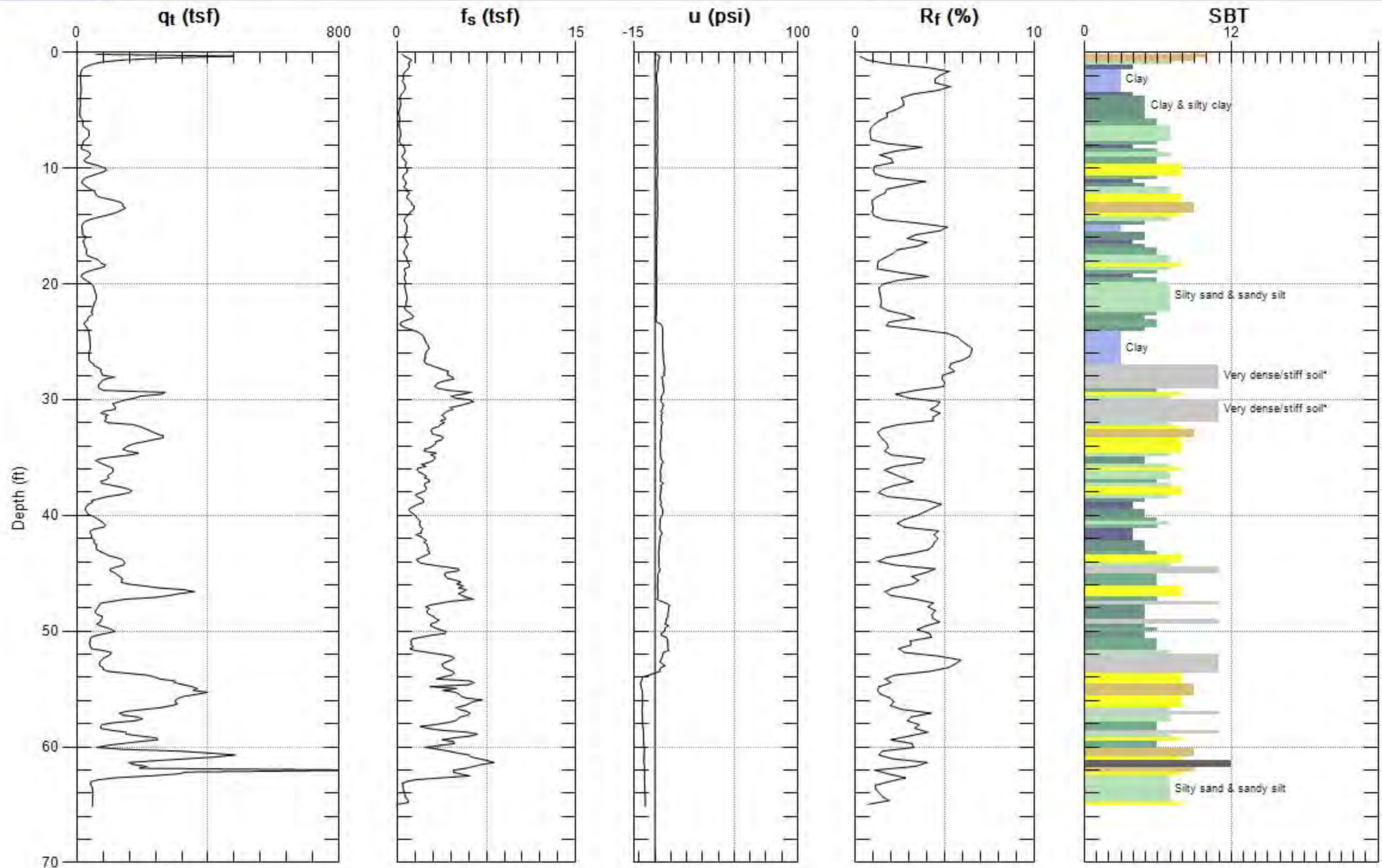
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

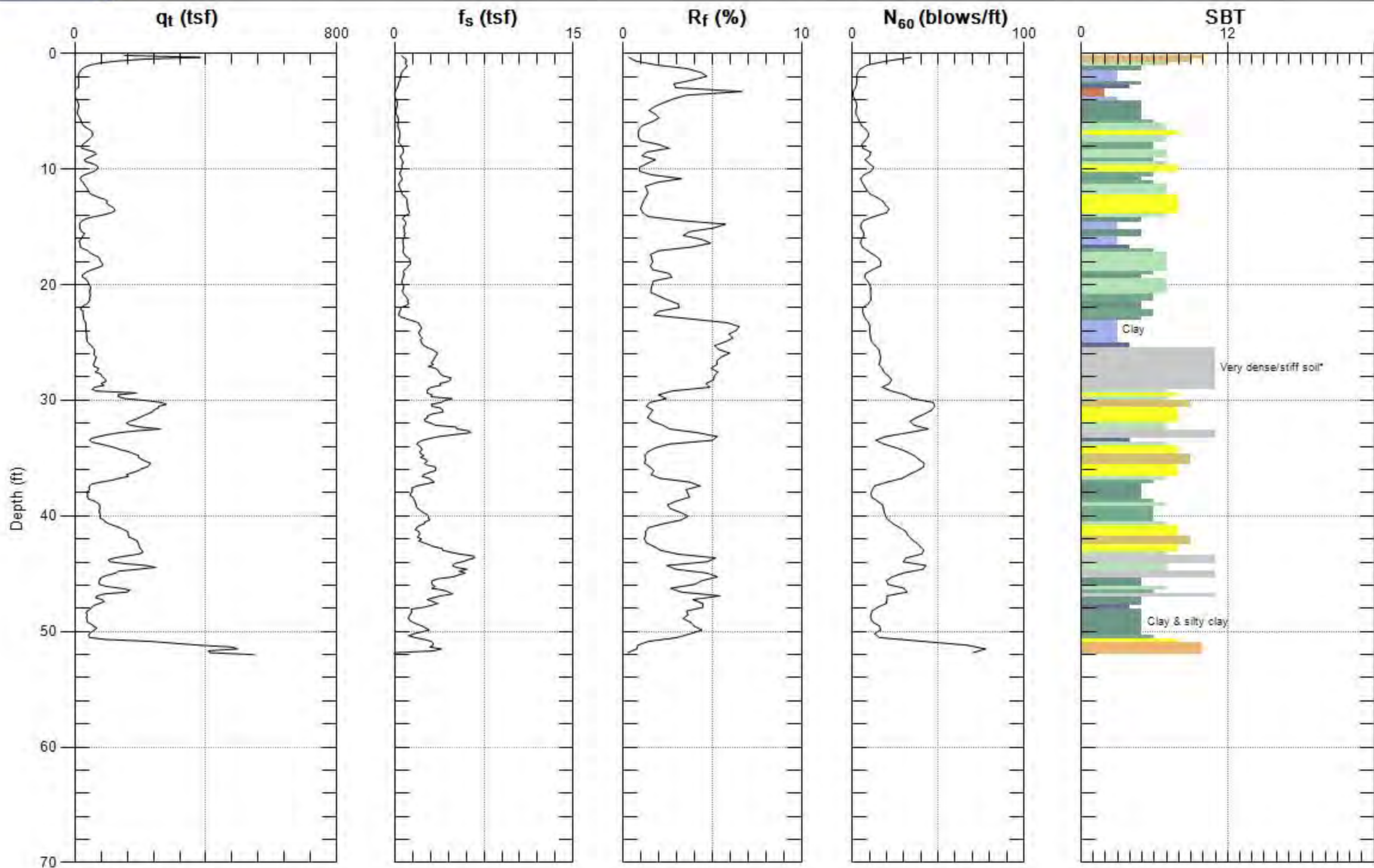


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-10

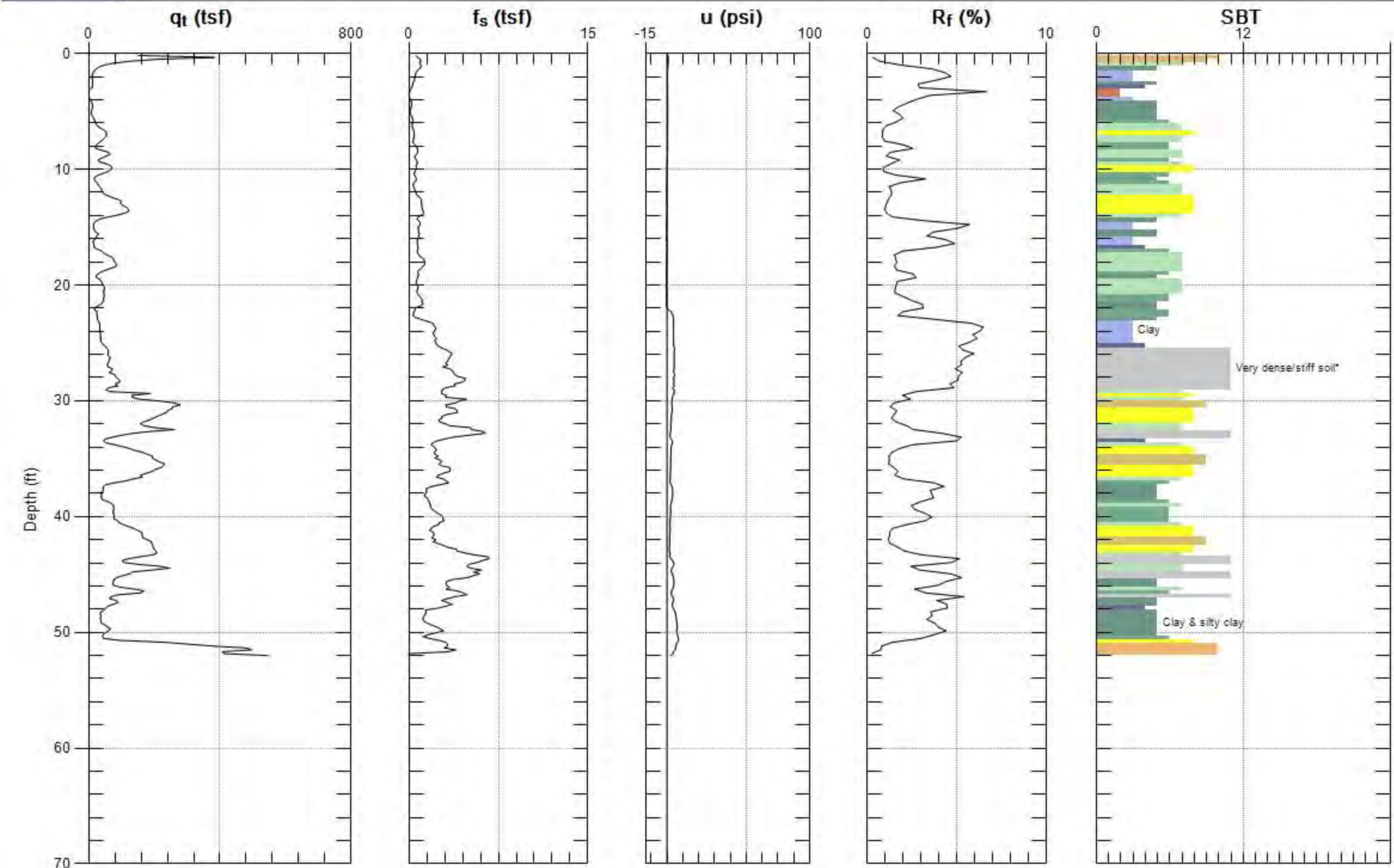
Date: 6/6/2012 12:23



Max. Depth: 52.001 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 52.001 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

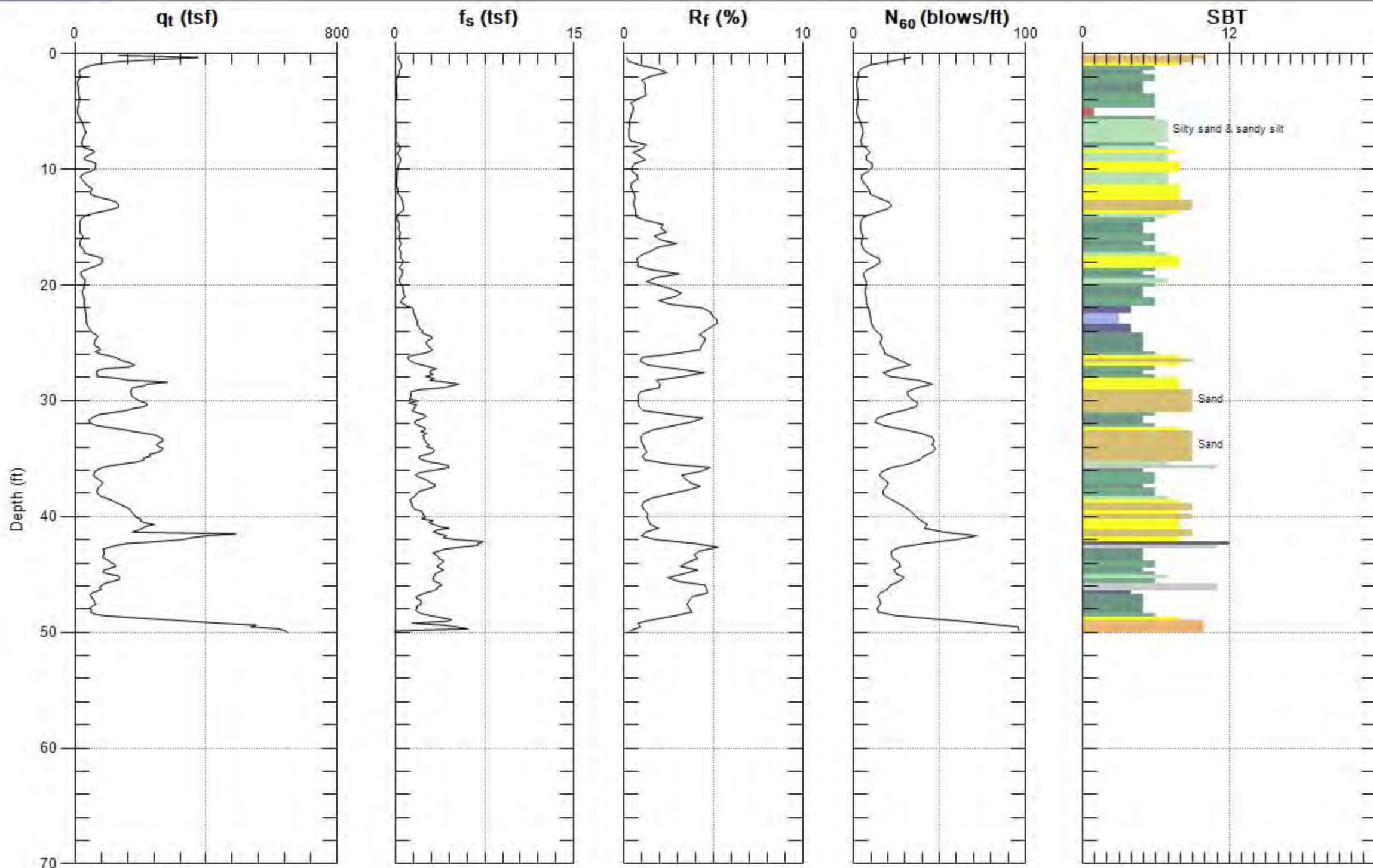


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-11

Date: 6/6/2012 12:50



Max. Depth: 50.033 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

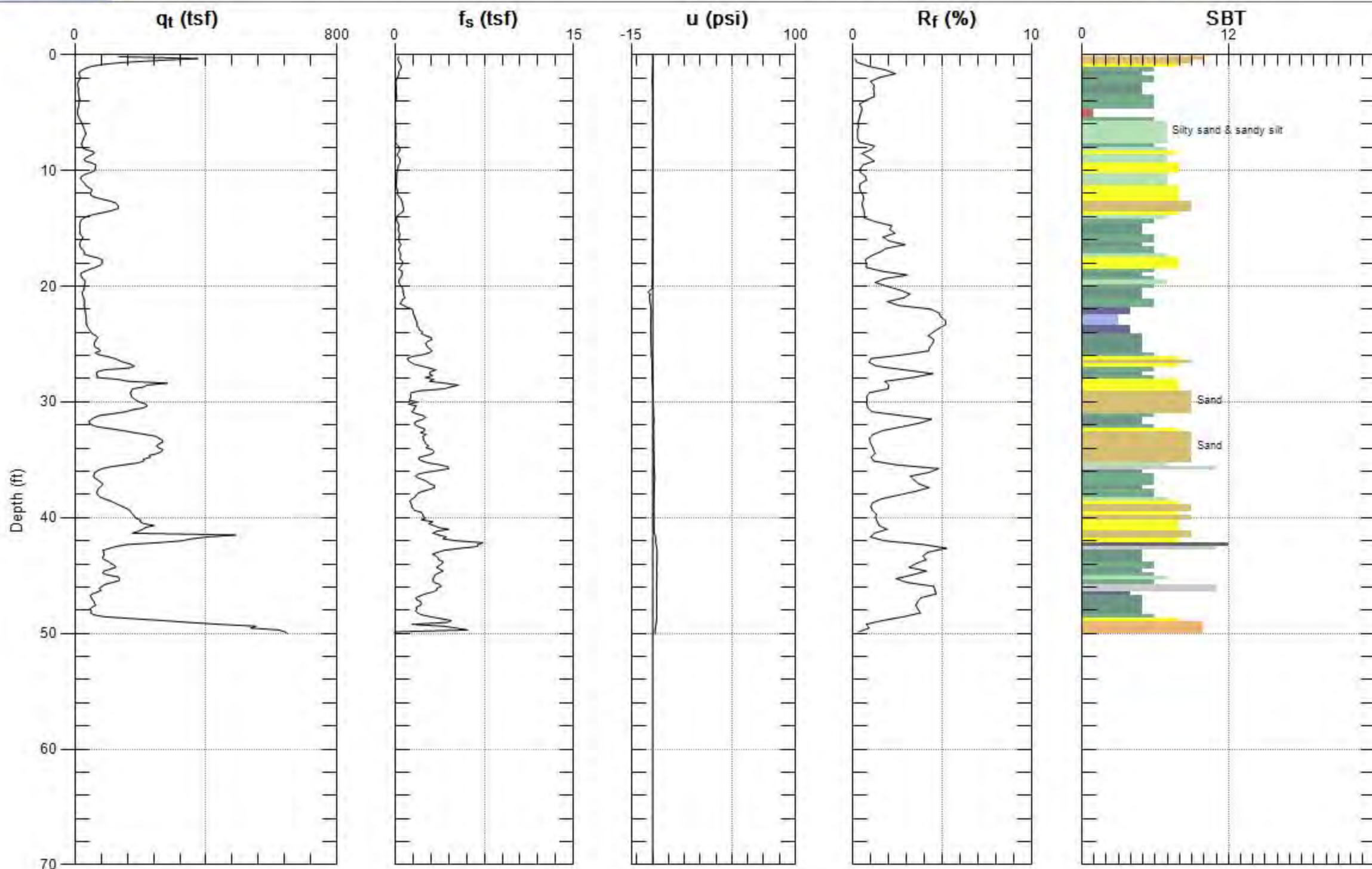


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-11

Date: 6/6/2012 12:50



Max. Depth: 50.033 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

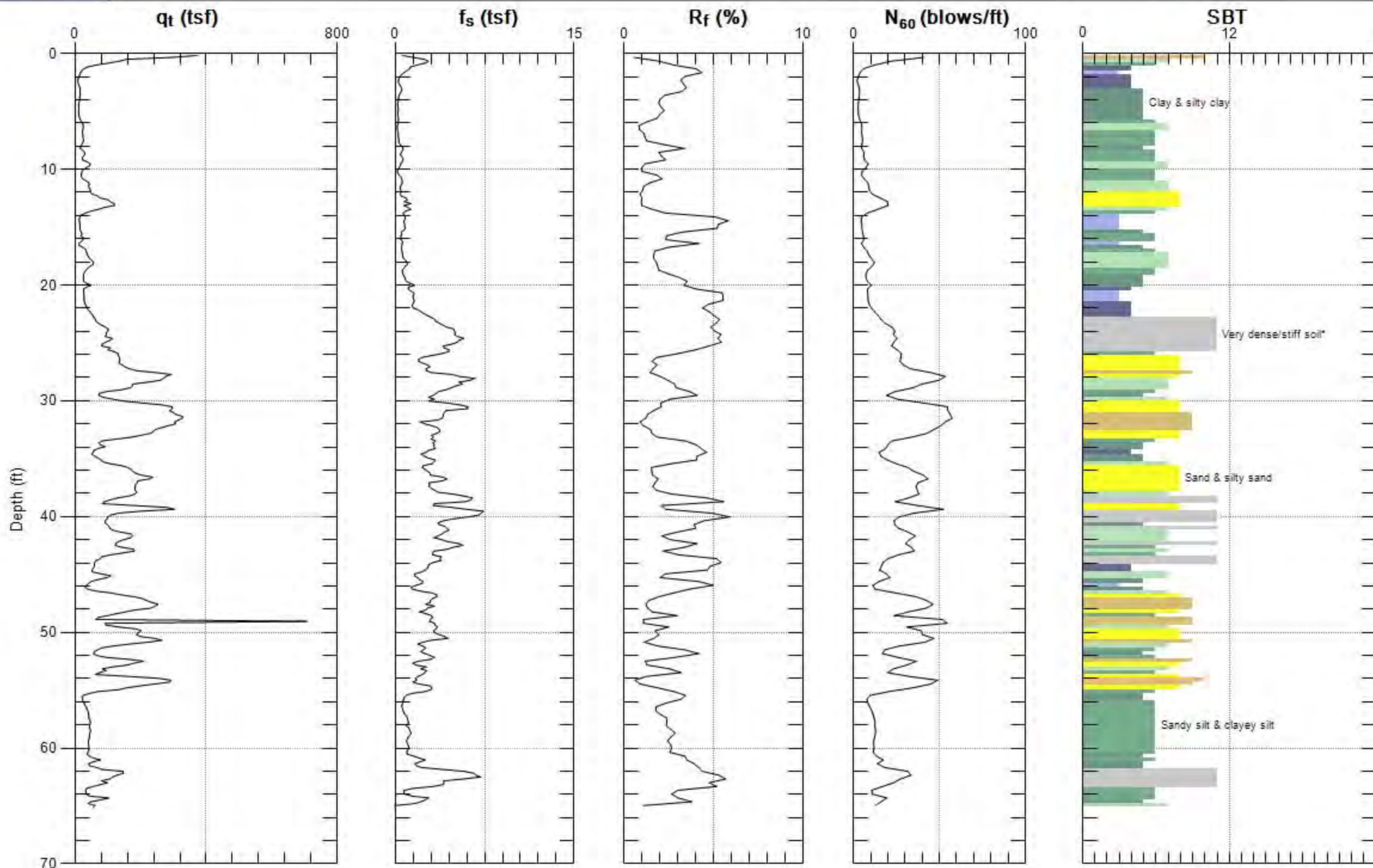


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-12

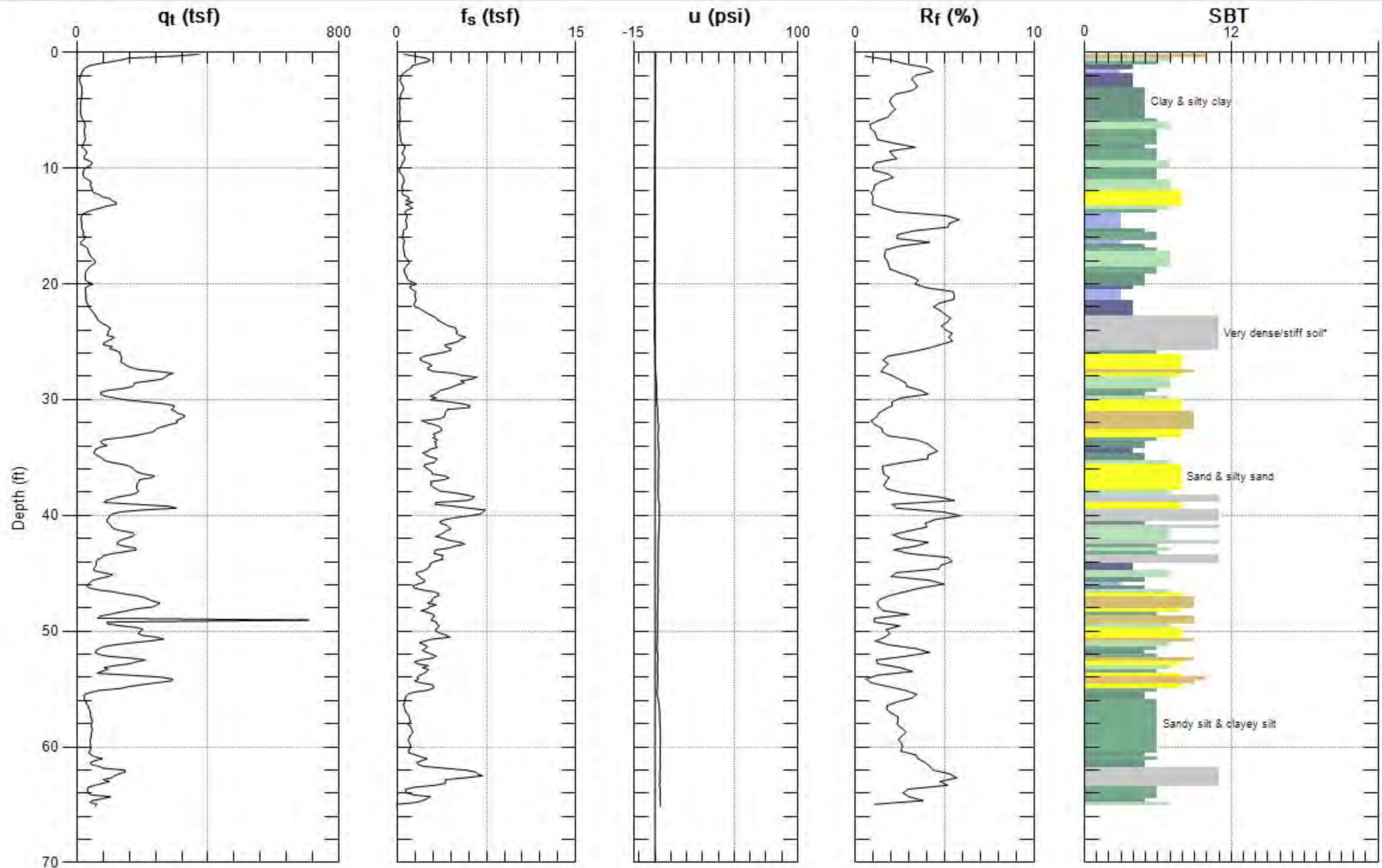
Date: 6/6/2012 01:17



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

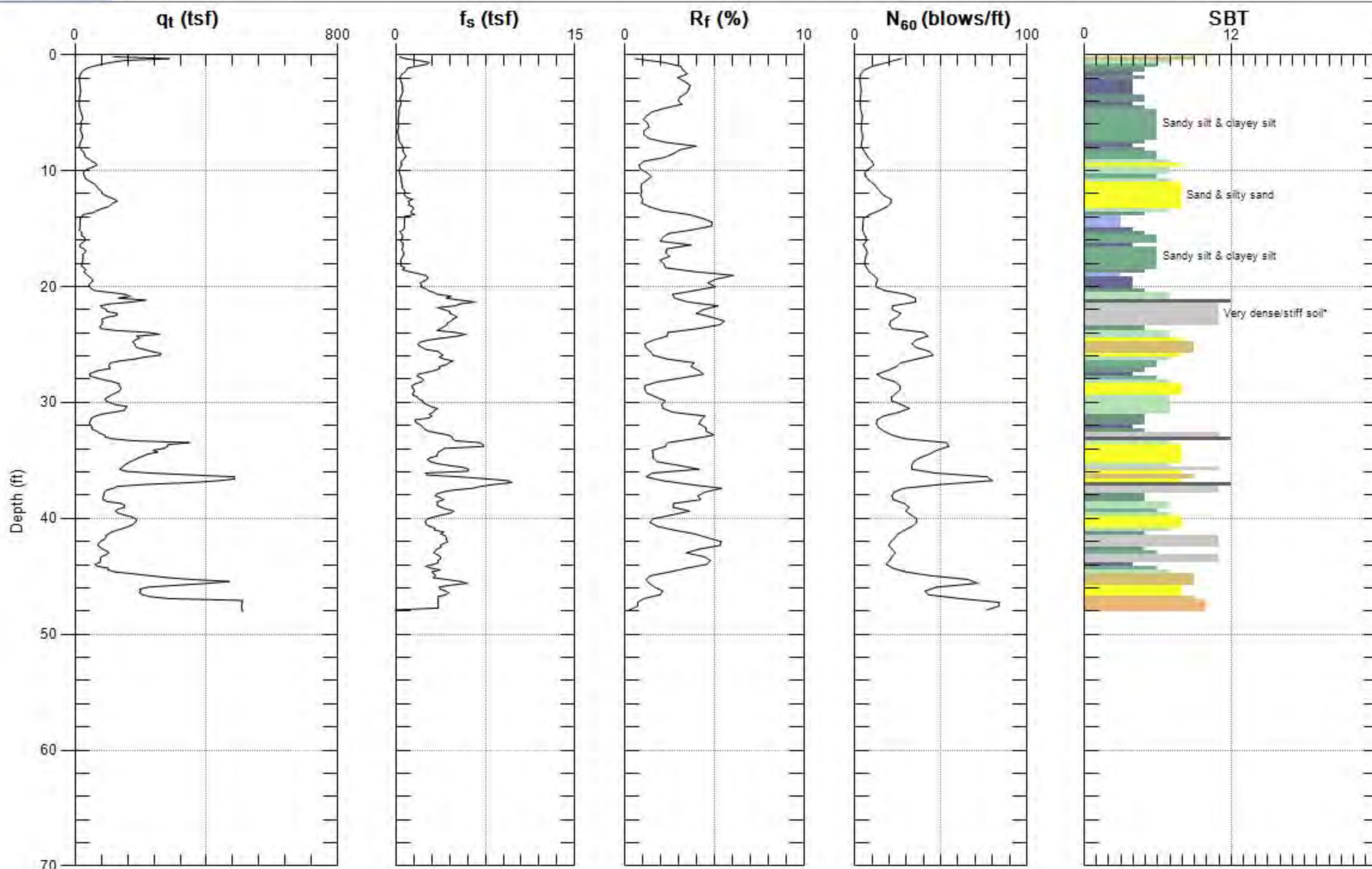


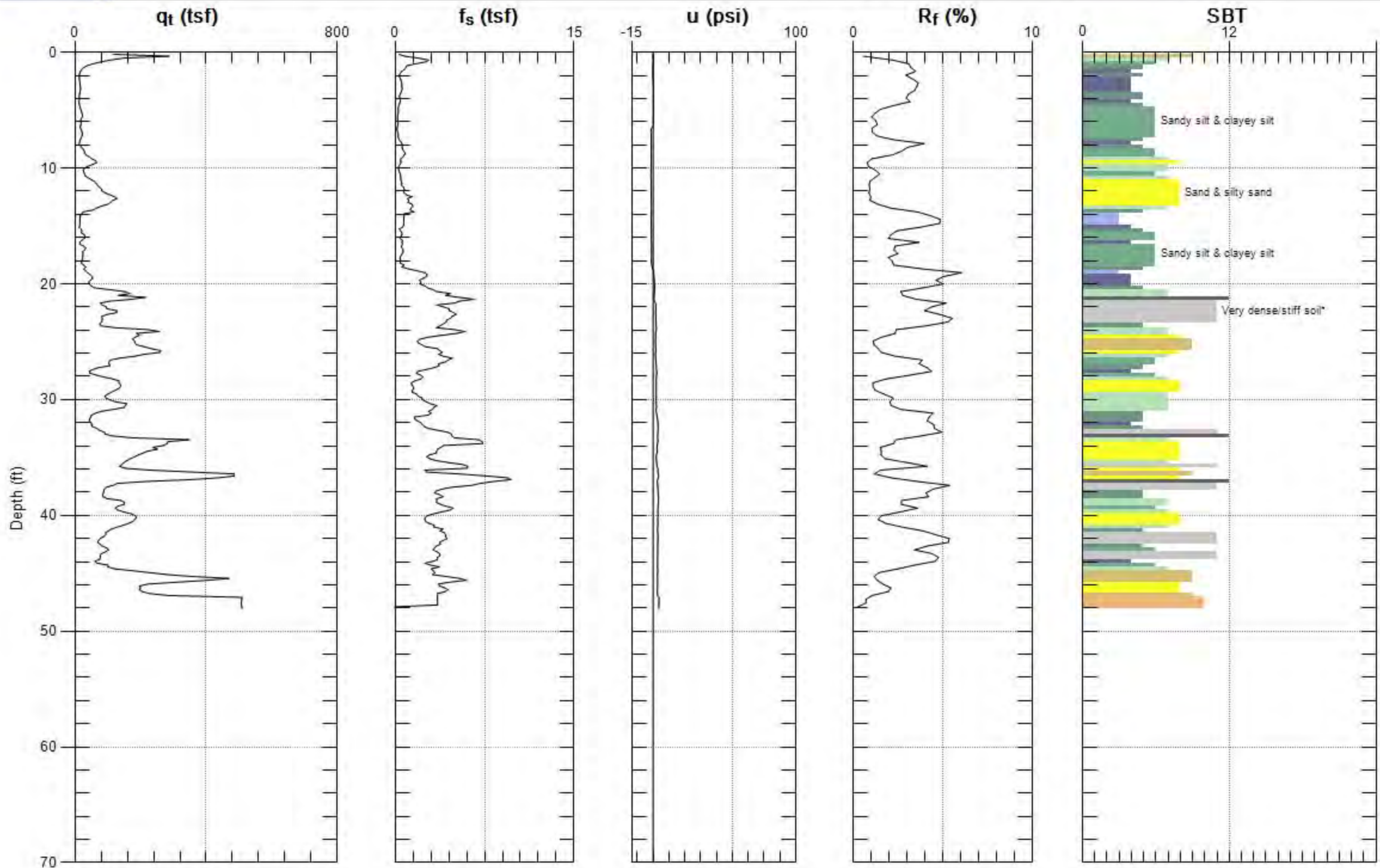
GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-13

Date: 6/6/2012 01:45

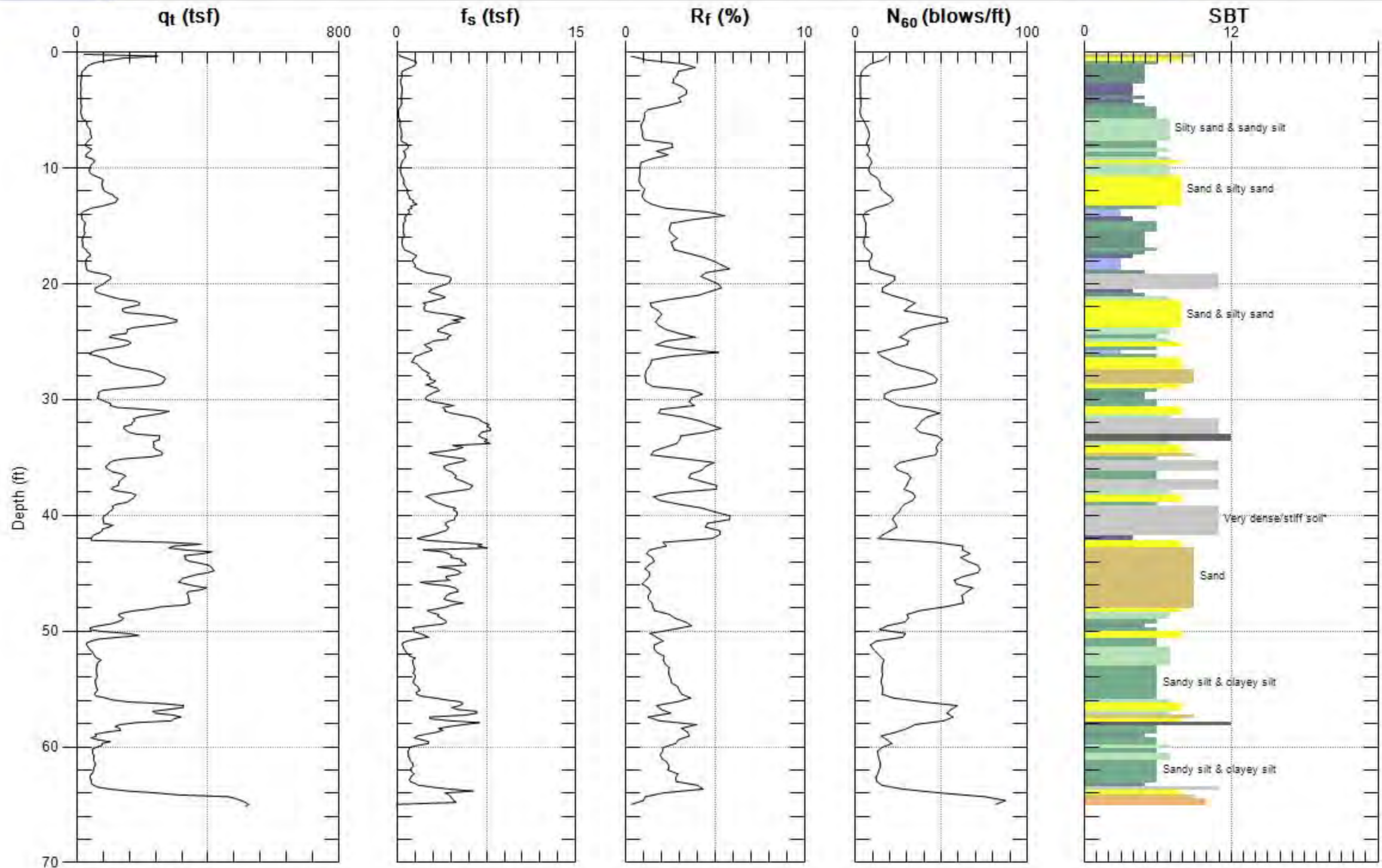




Max. Depth: 48.064 (ft)

Avg. Interval: 0.328 (ft)

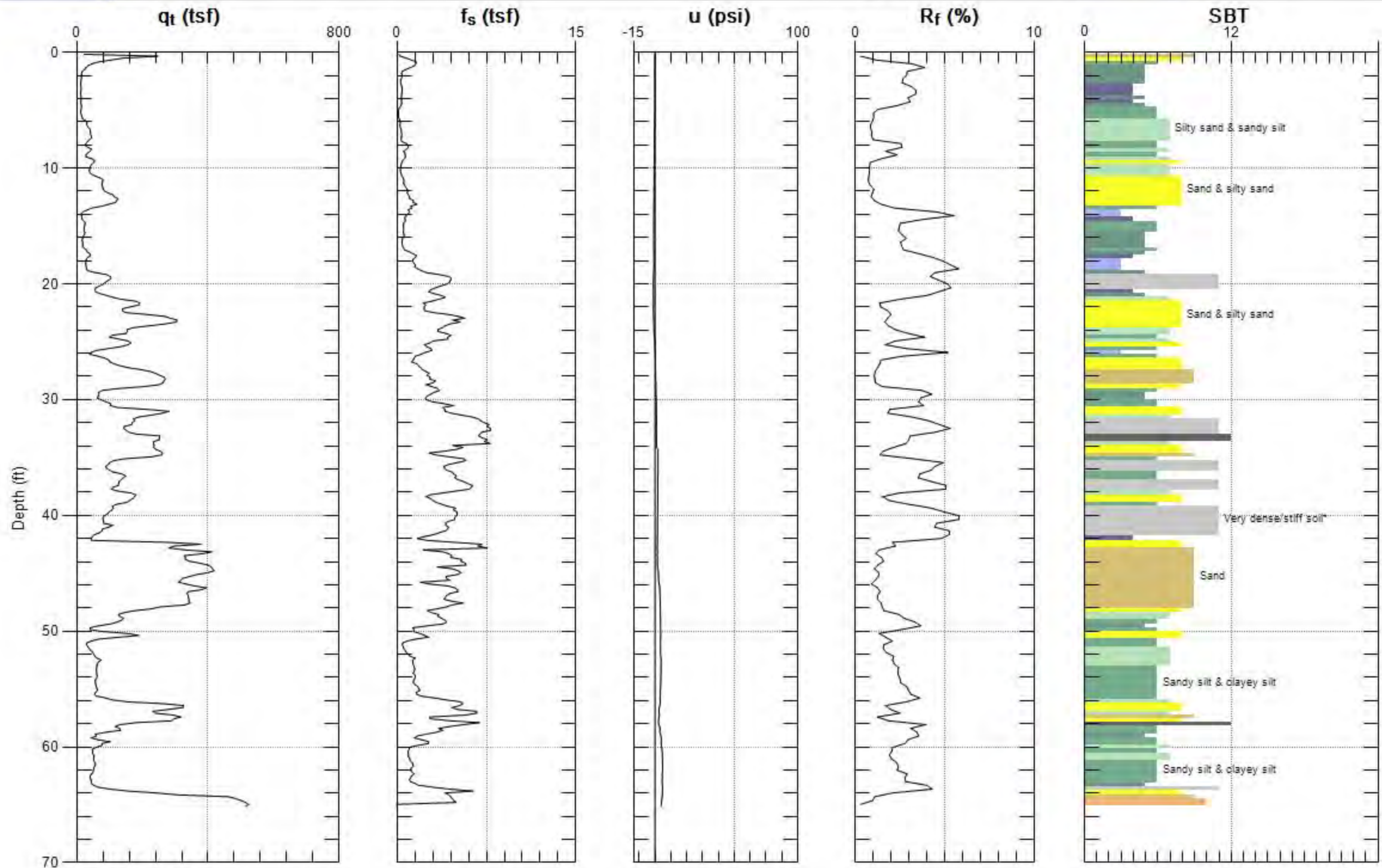
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

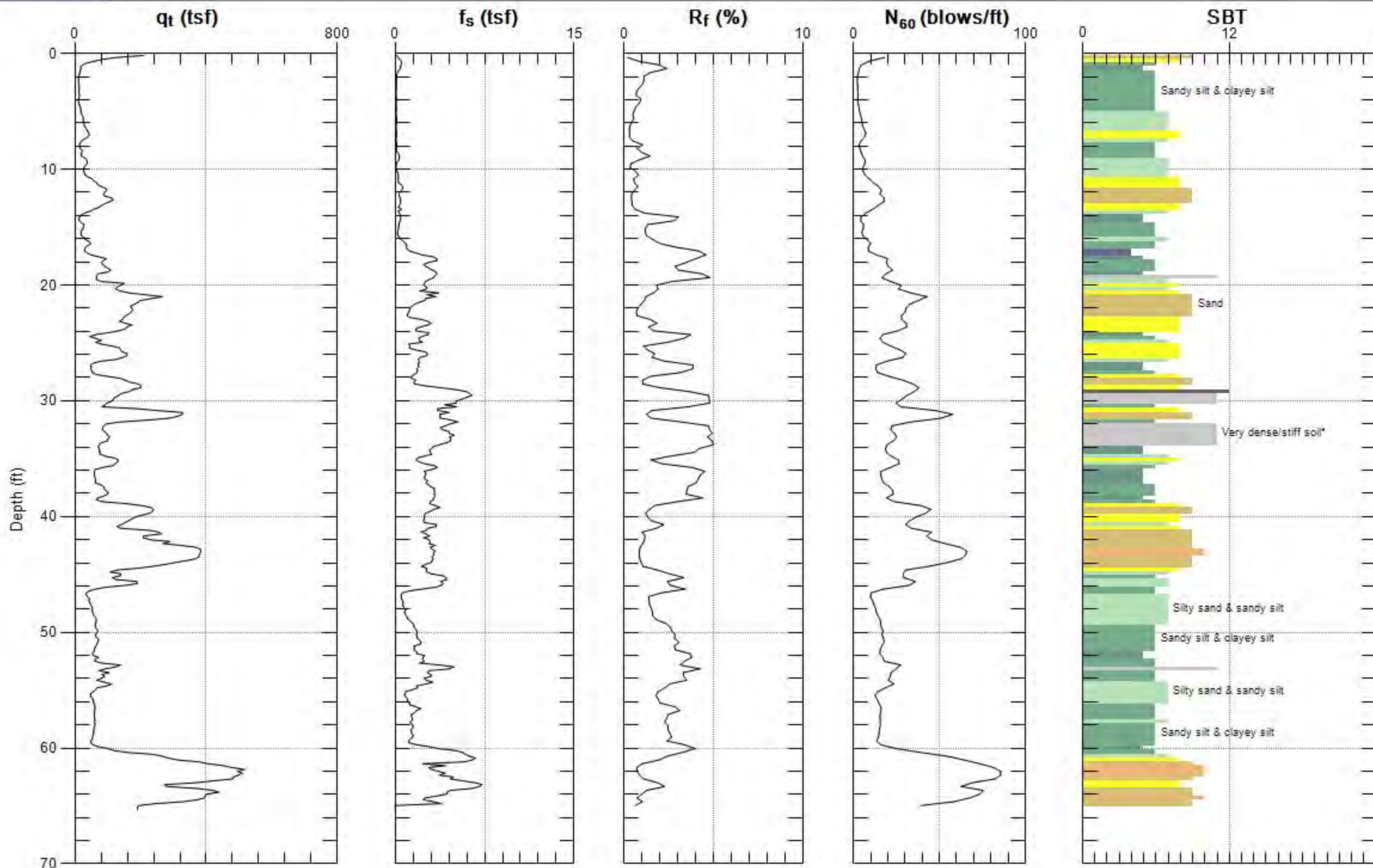


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-15

Date: 6/7/2012 06:37



Max. Depth: 65.289 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

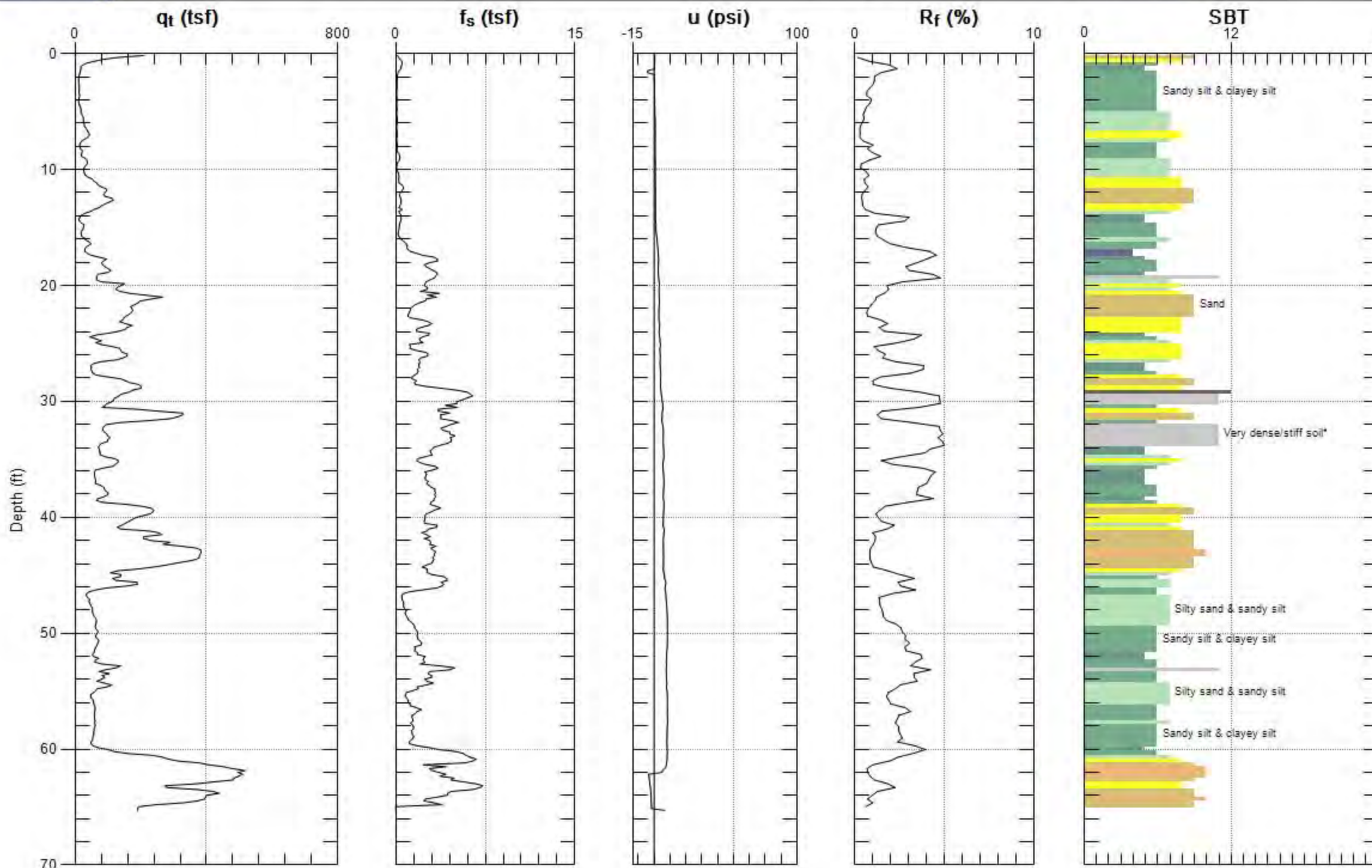


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-15

Date: 6/7/2012 06:37



Max. Depth: 65.289 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

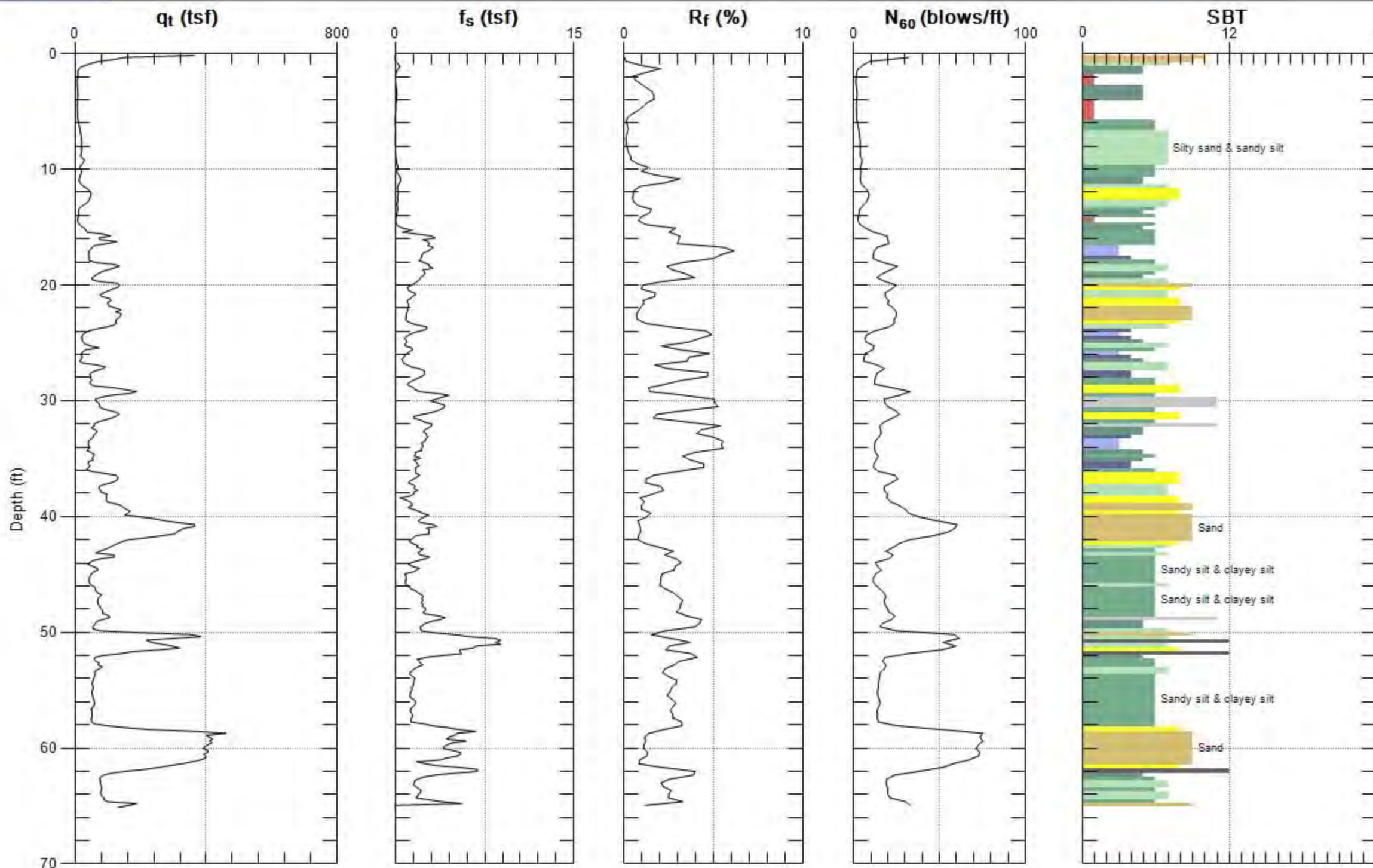


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-16

Date: 6/7/2012 07:25



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

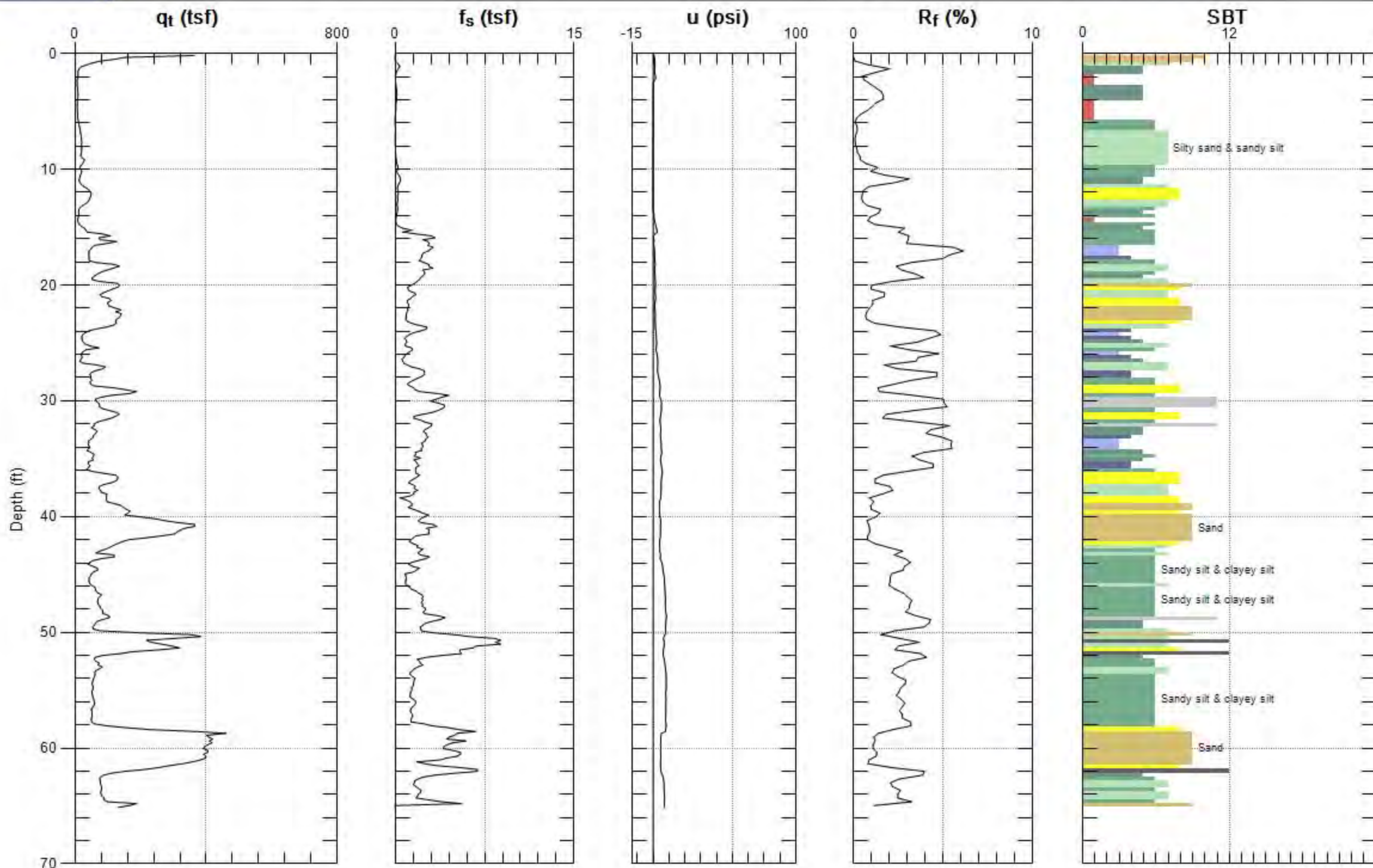


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-16

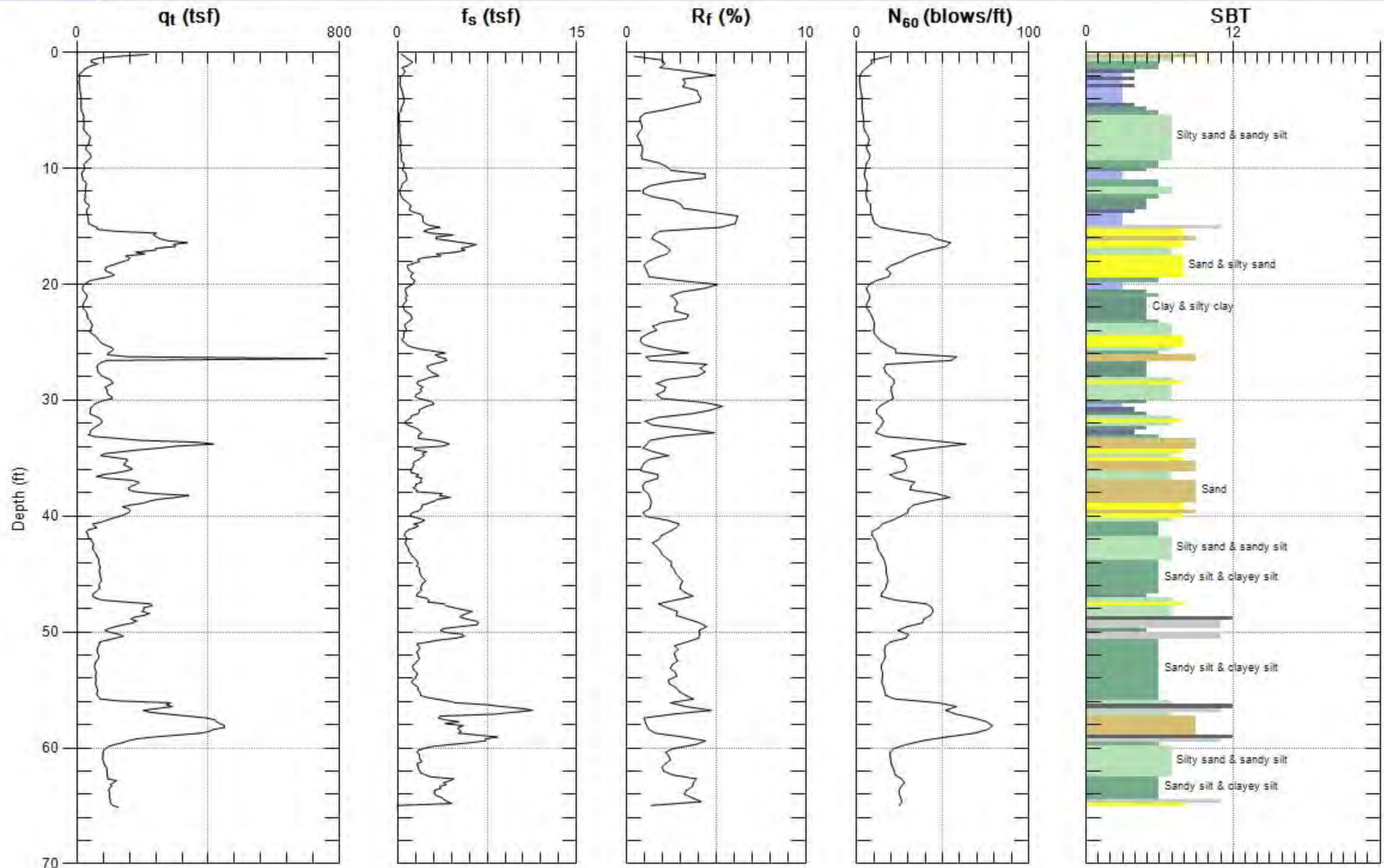
Date: 6/7/2012 07:25



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

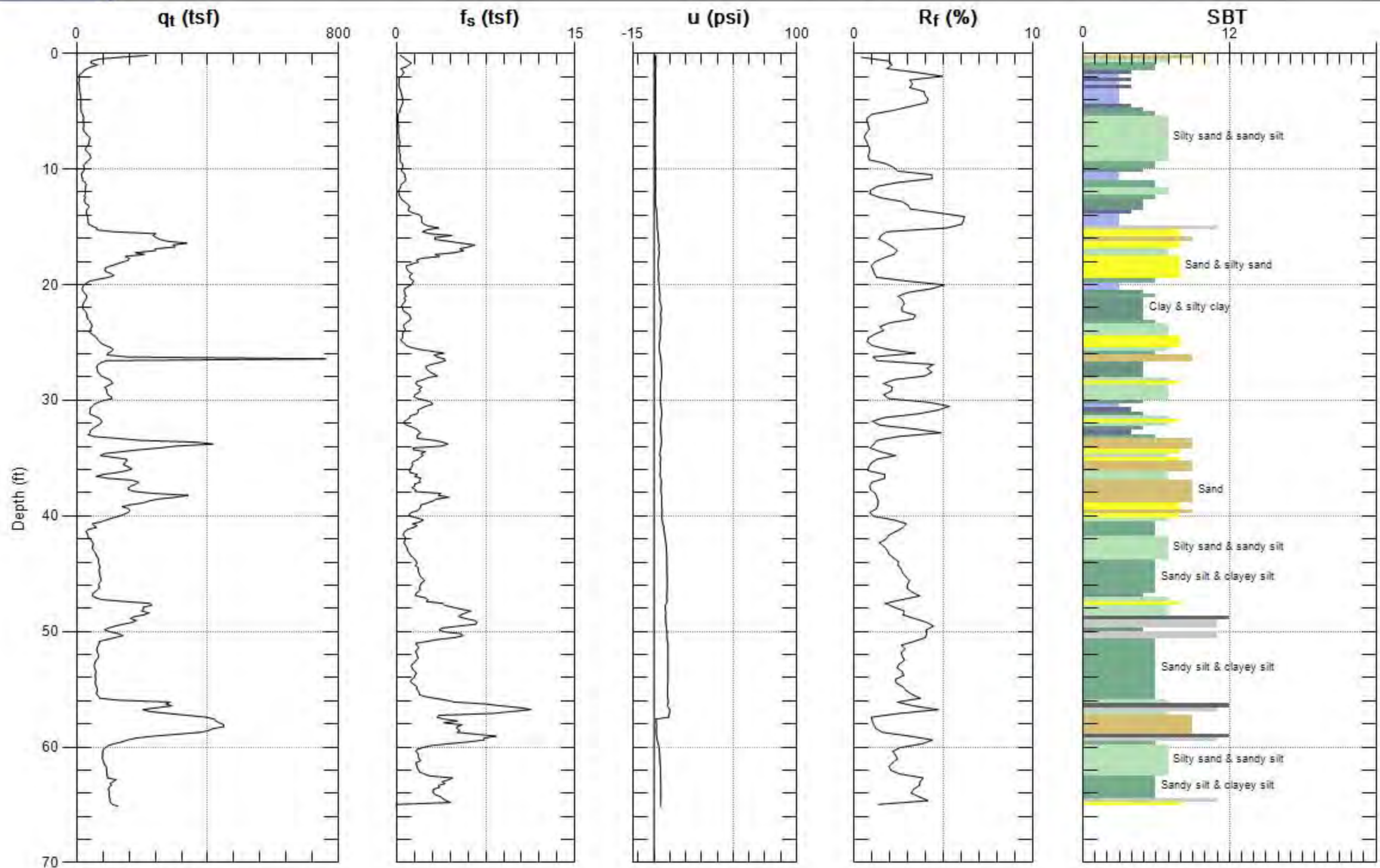
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

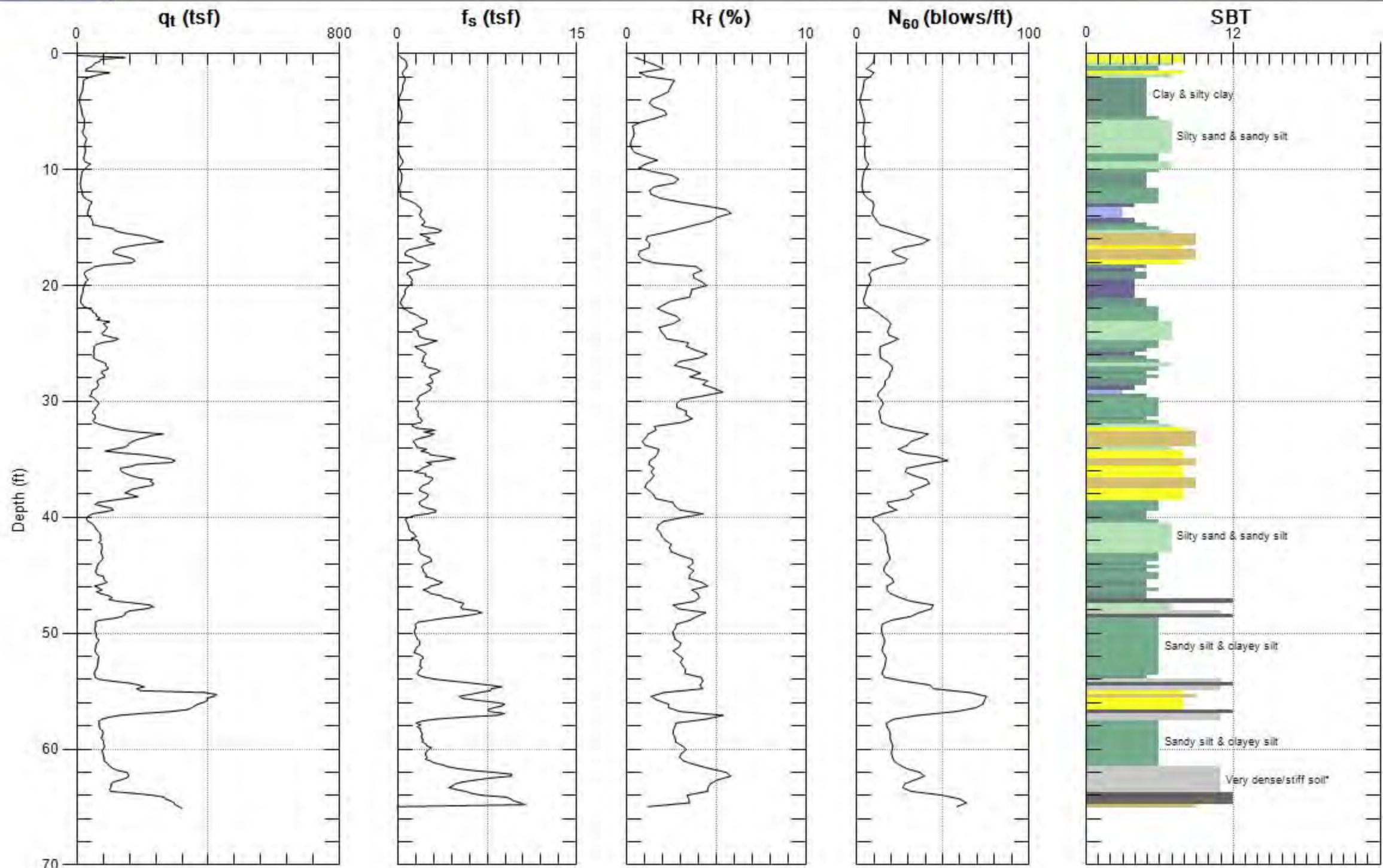


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-18

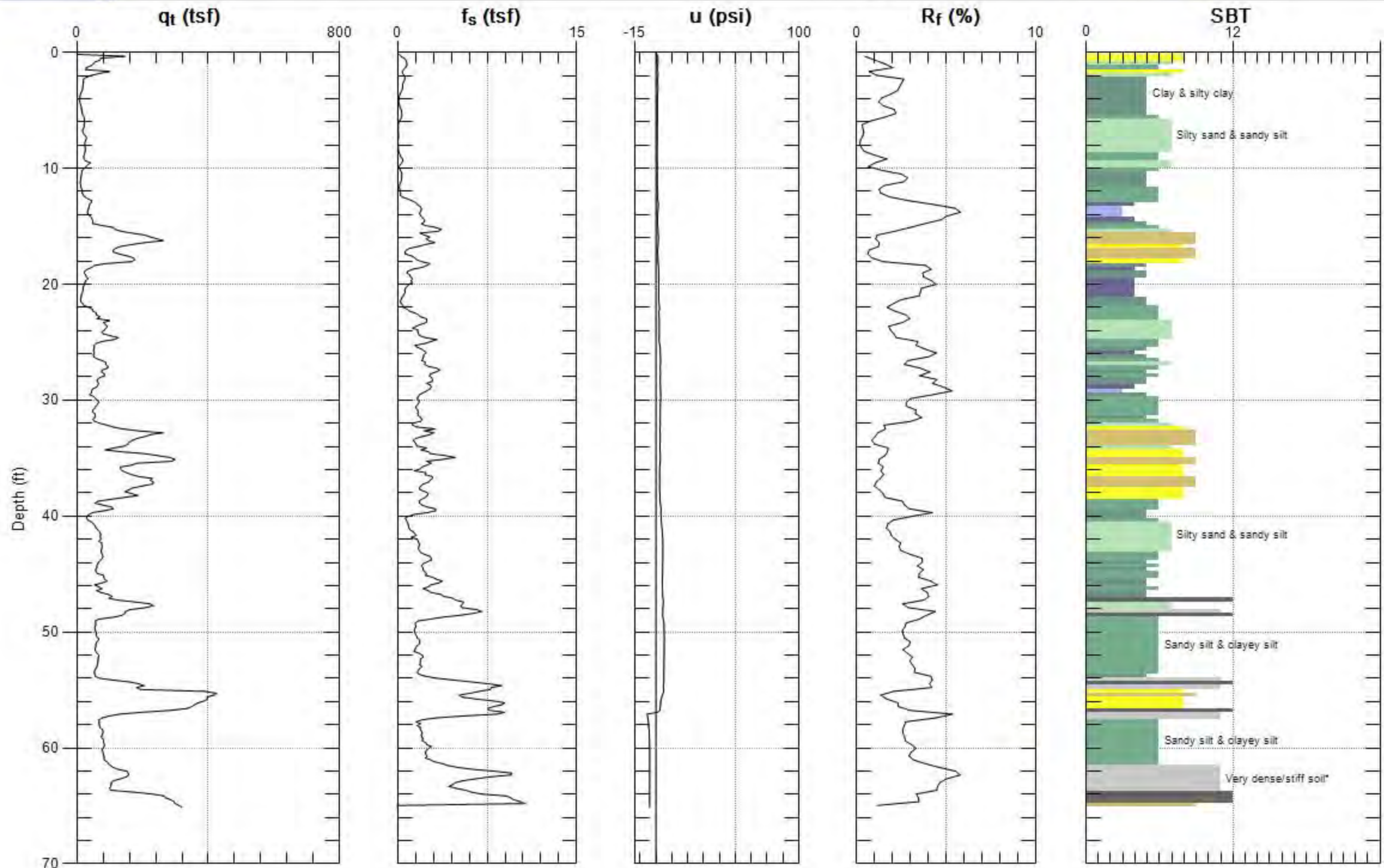
Date: 6/7/2012 08:24



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

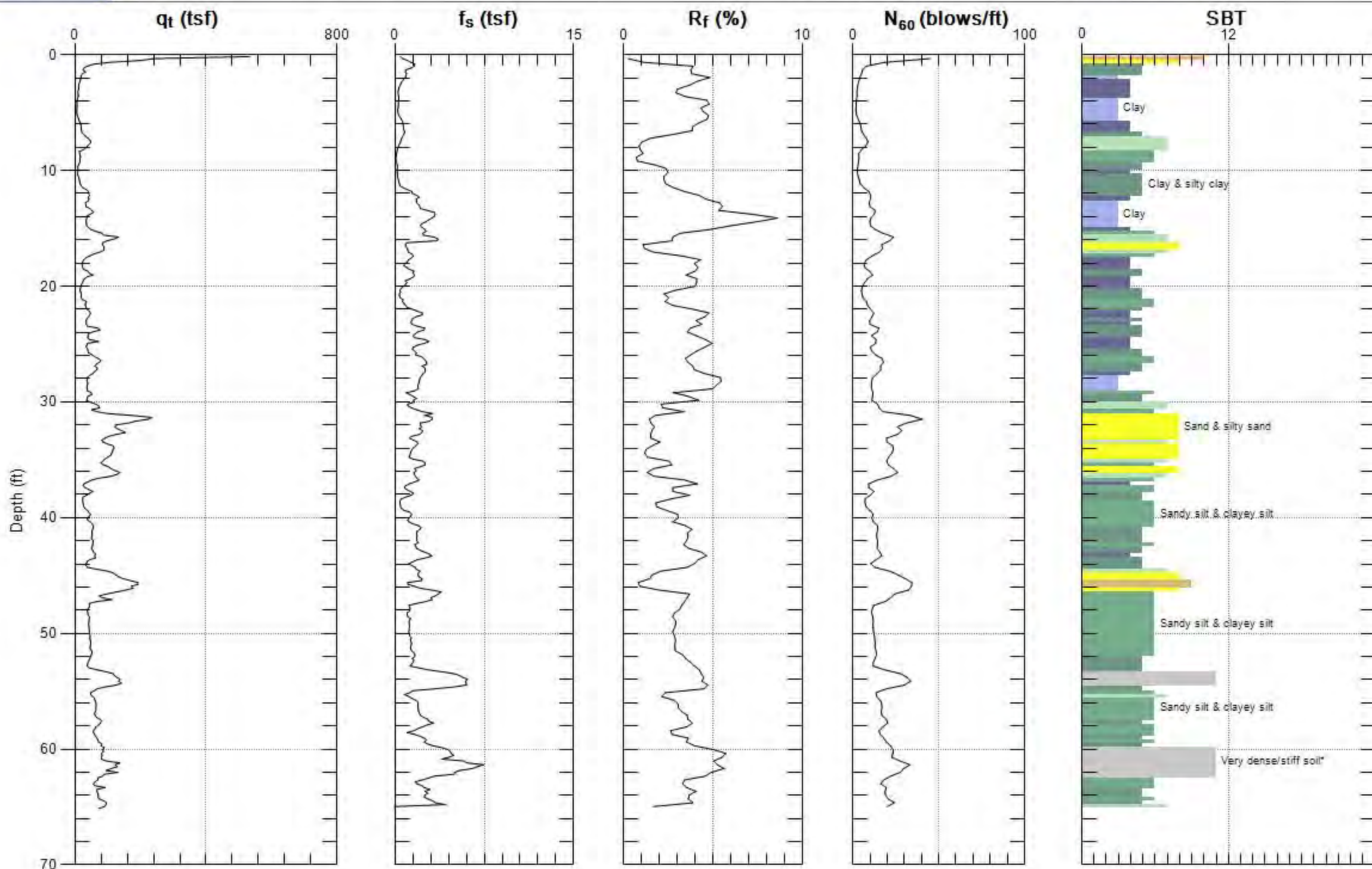
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

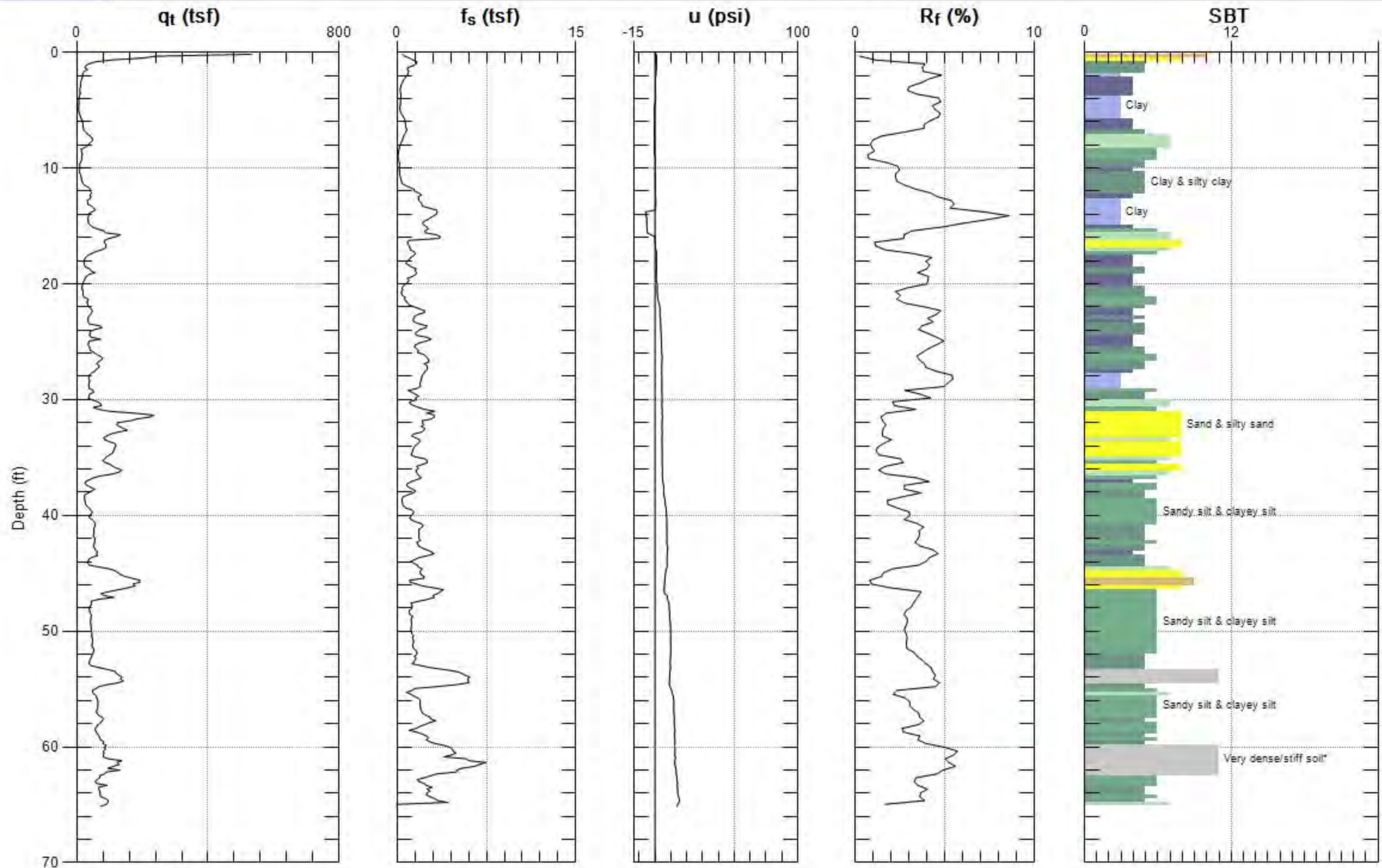
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

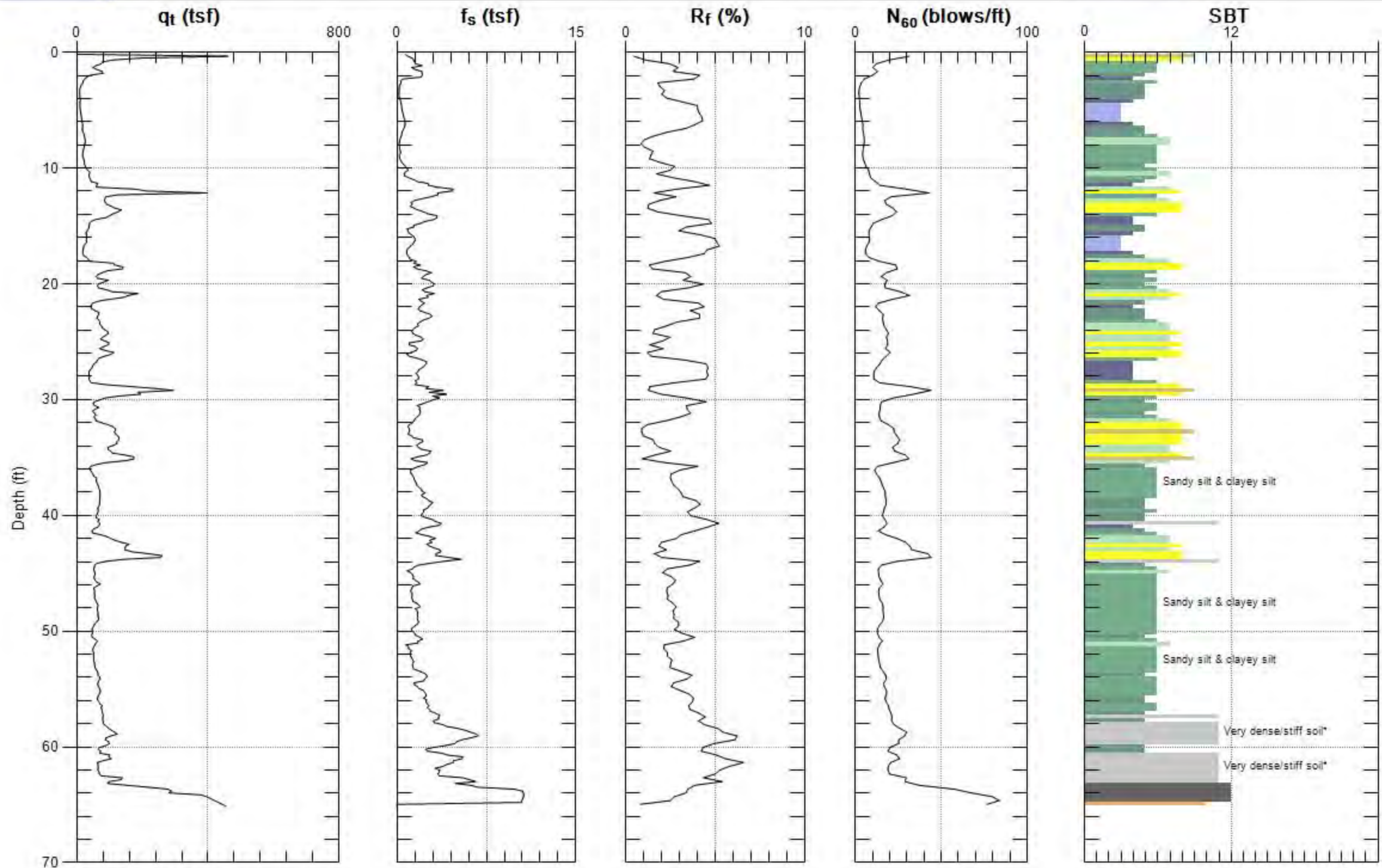
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

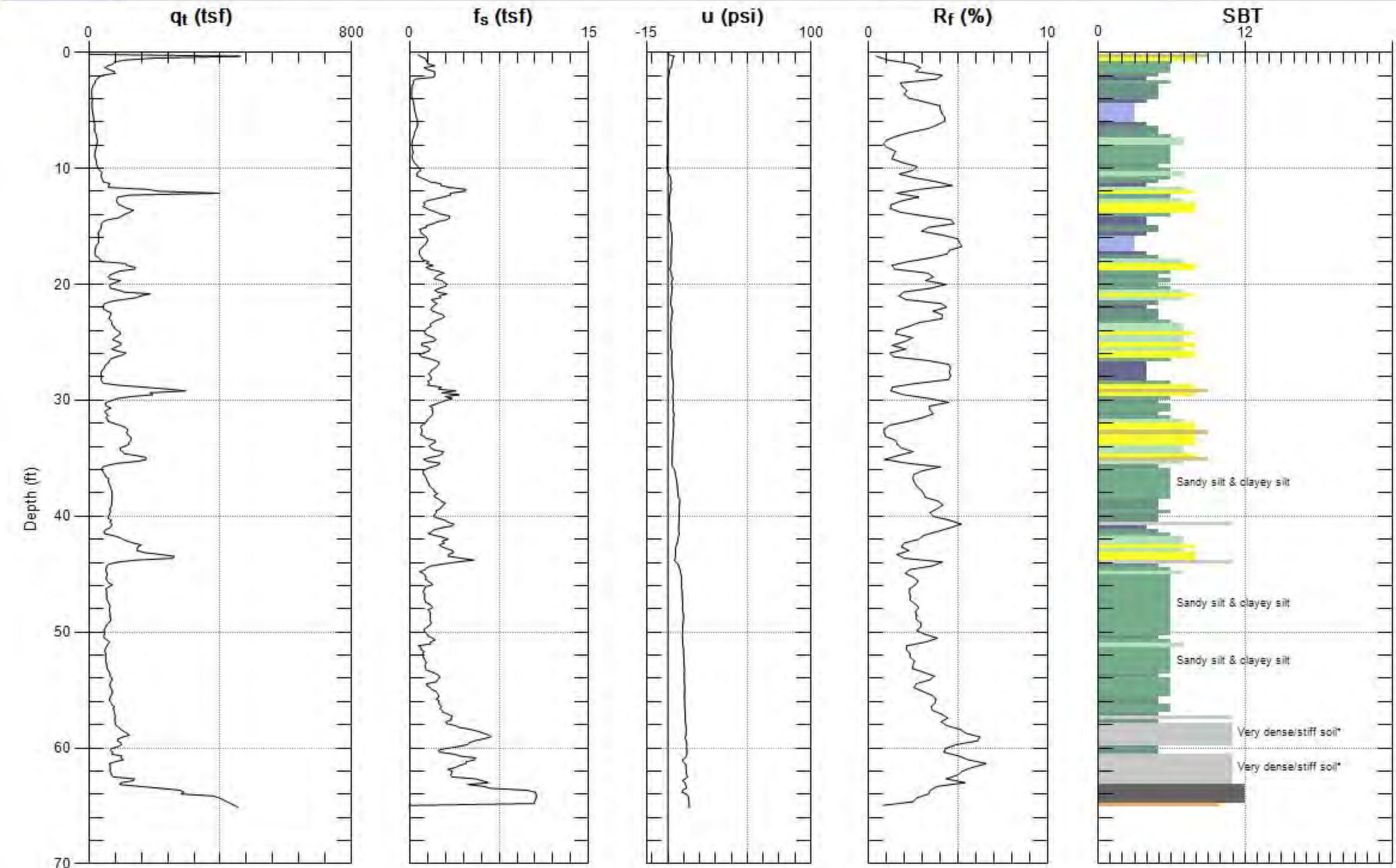
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

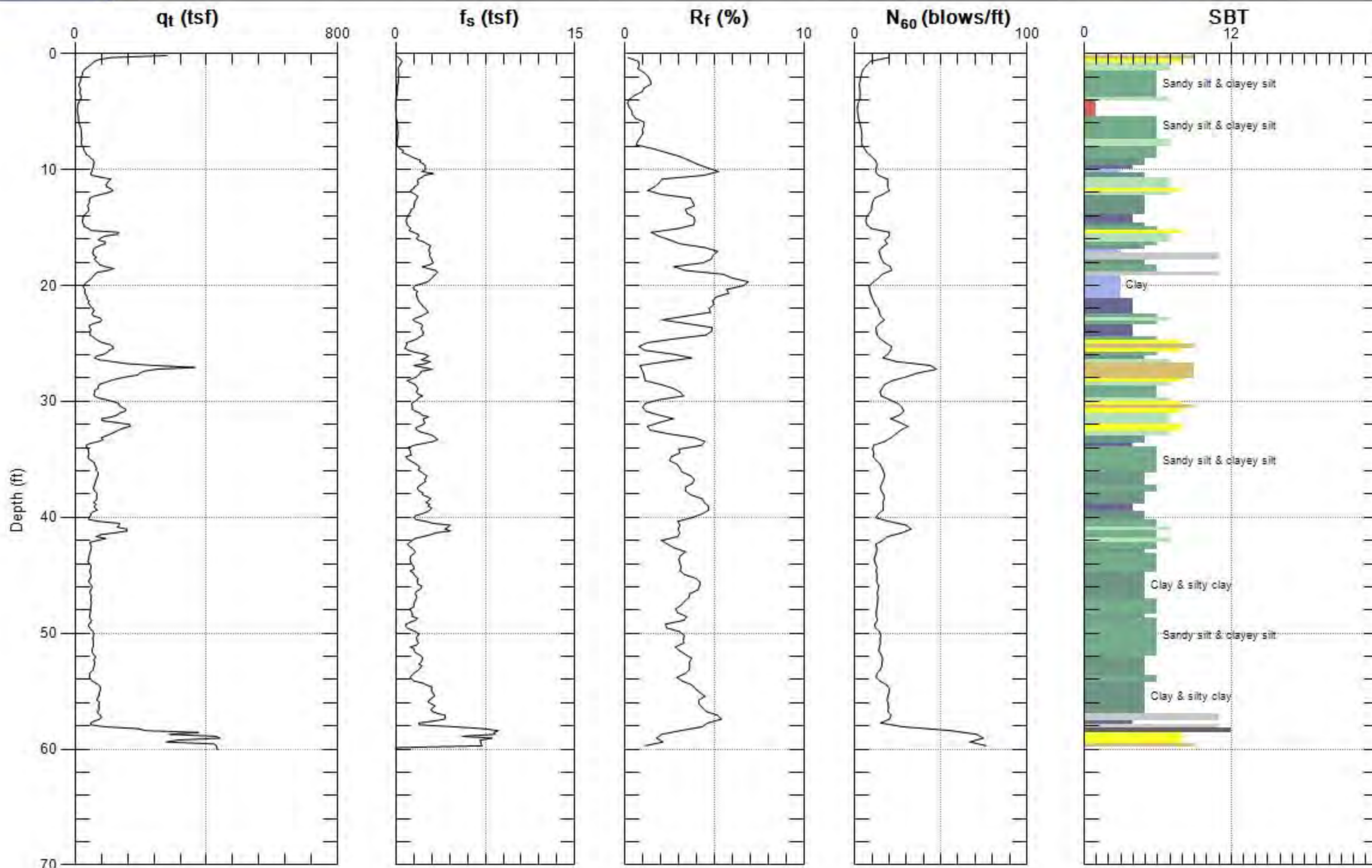


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-21

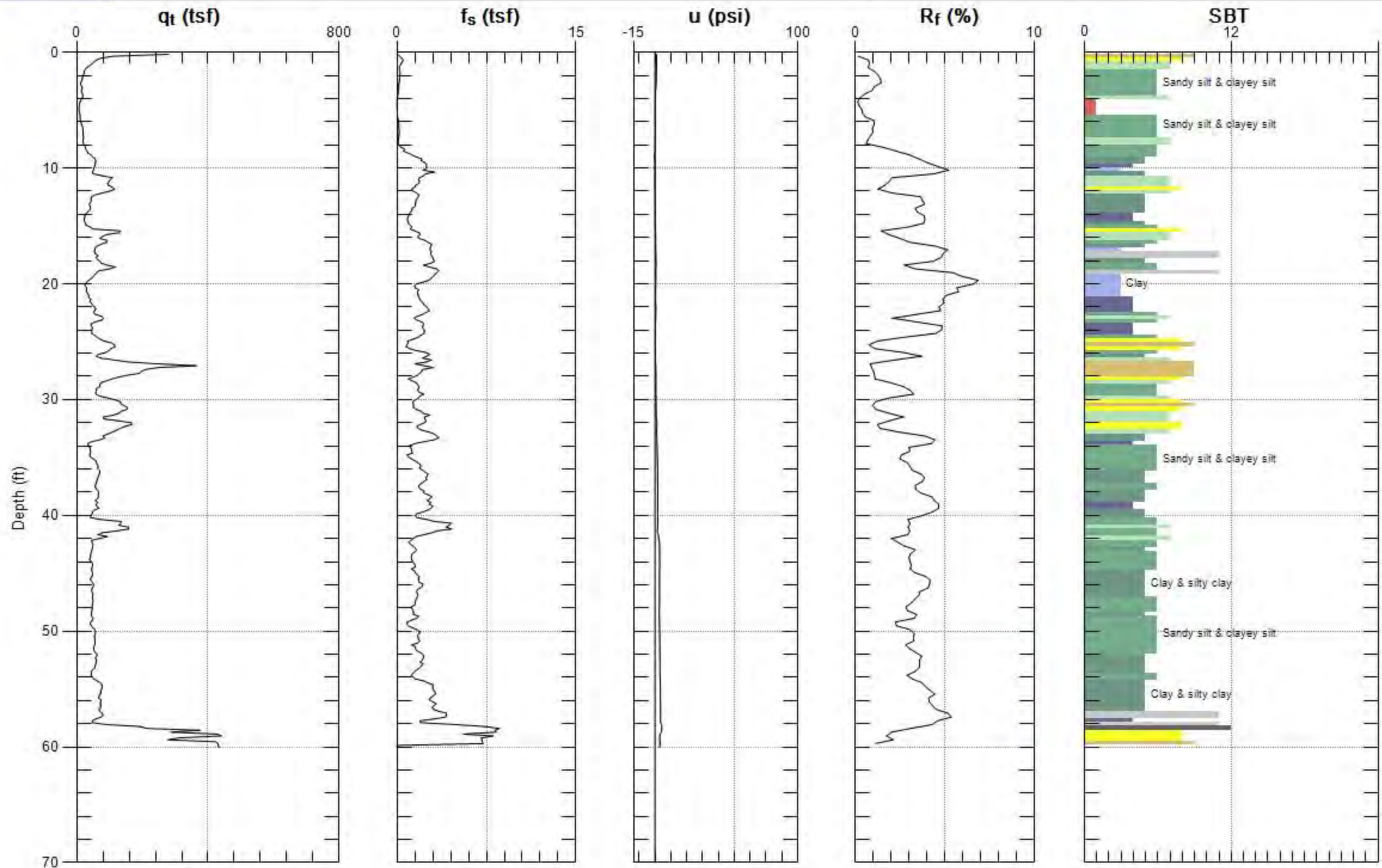
Date: 6/7/2012 09:45



Max. Depth: 60.039 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 60.039 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

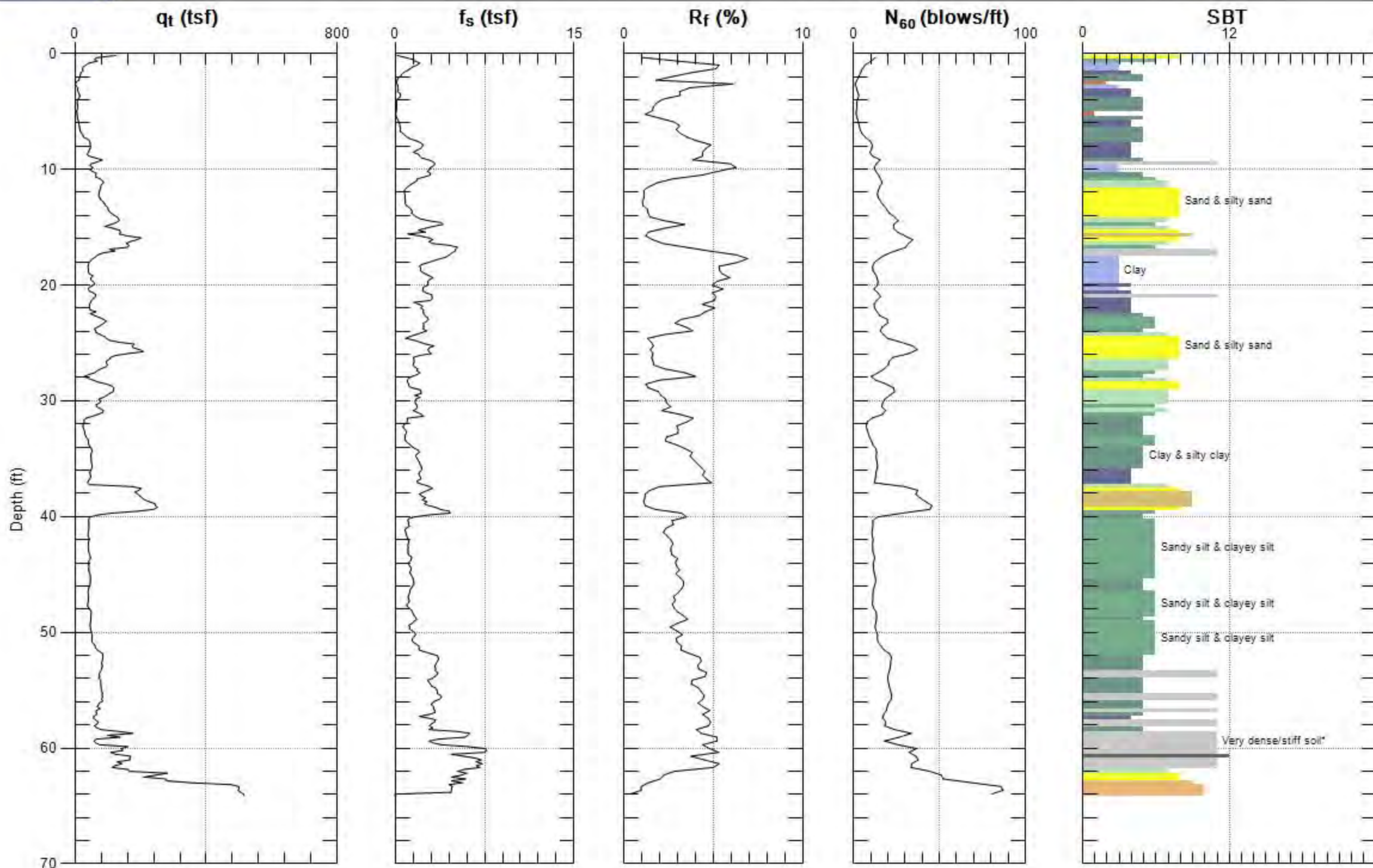


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-22

Date: 6/7/2012 10:12



Max. Depth: 64.140 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

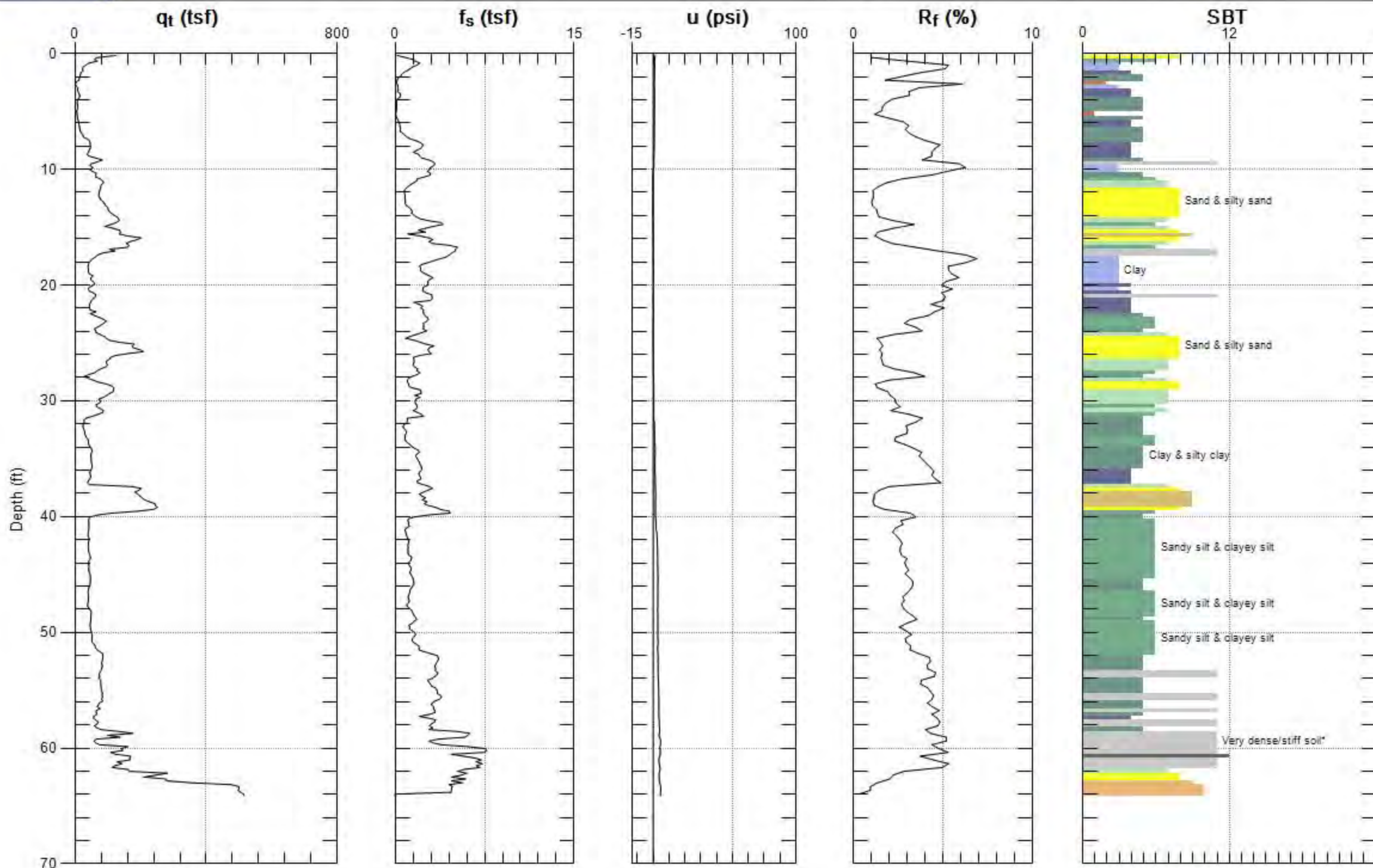


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-22

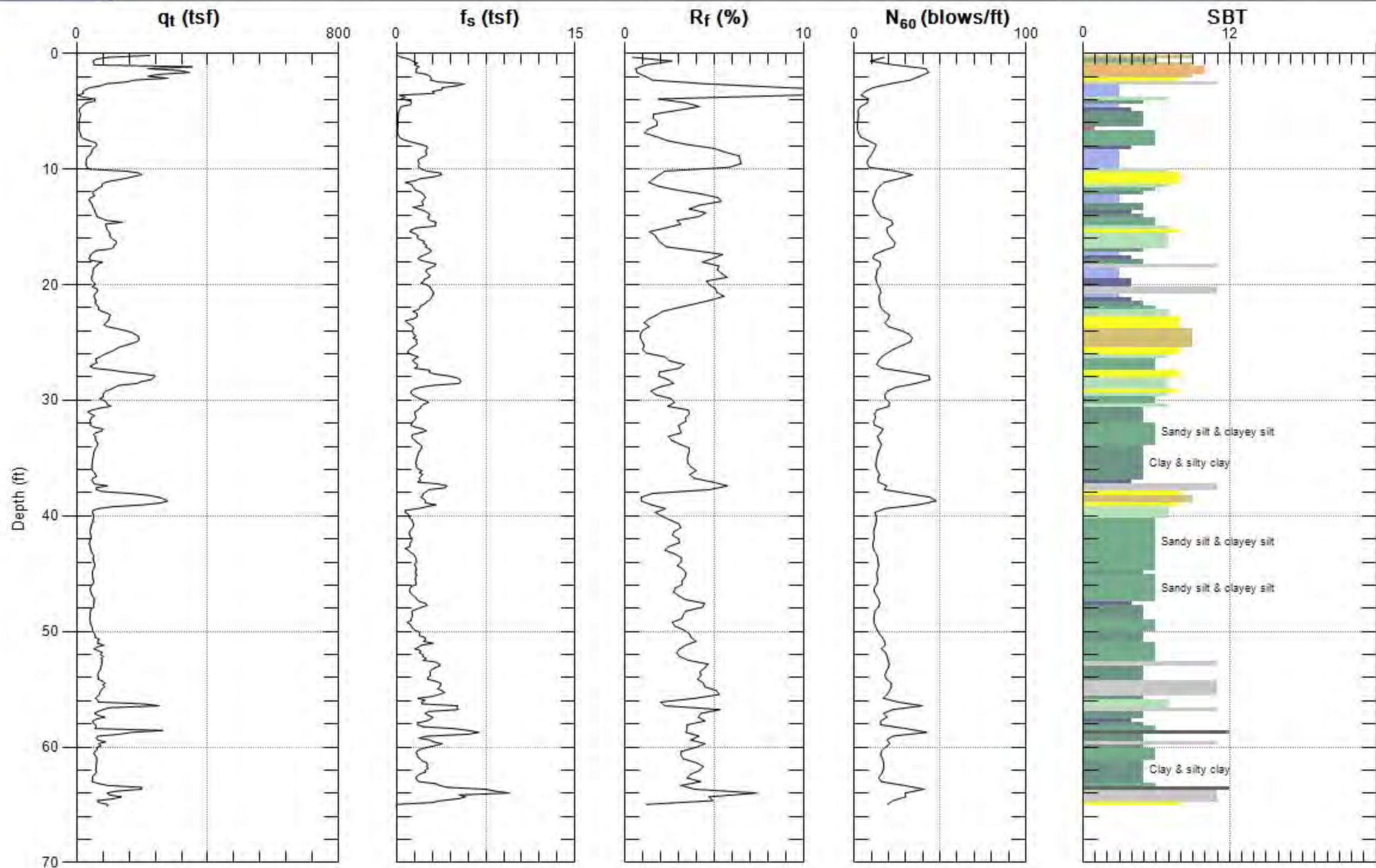
Date: 6/7/2012 10:12



Max. Depth: 64.140 (ft)

Avg. Interval: 0.328 (ft)

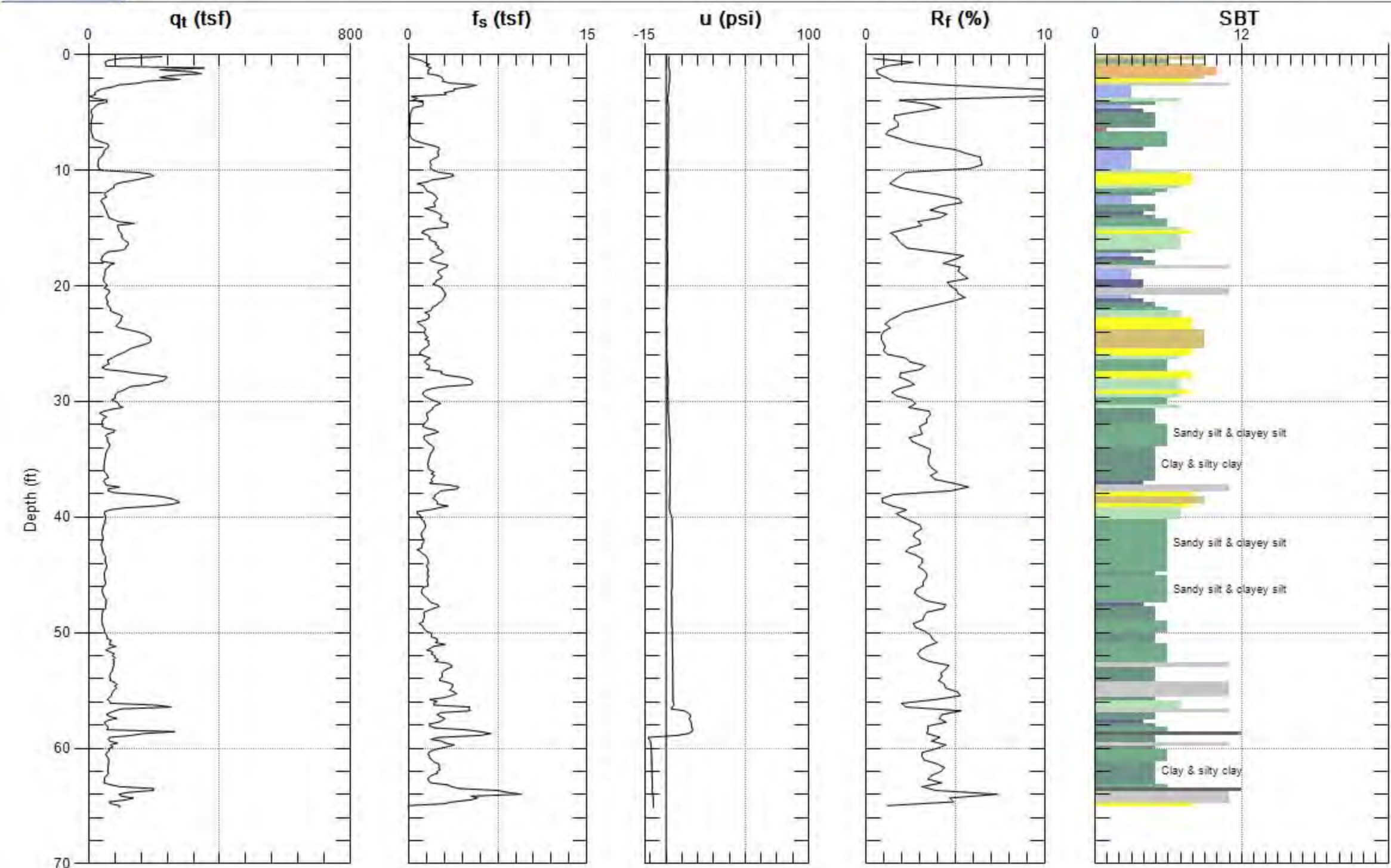
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.125 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

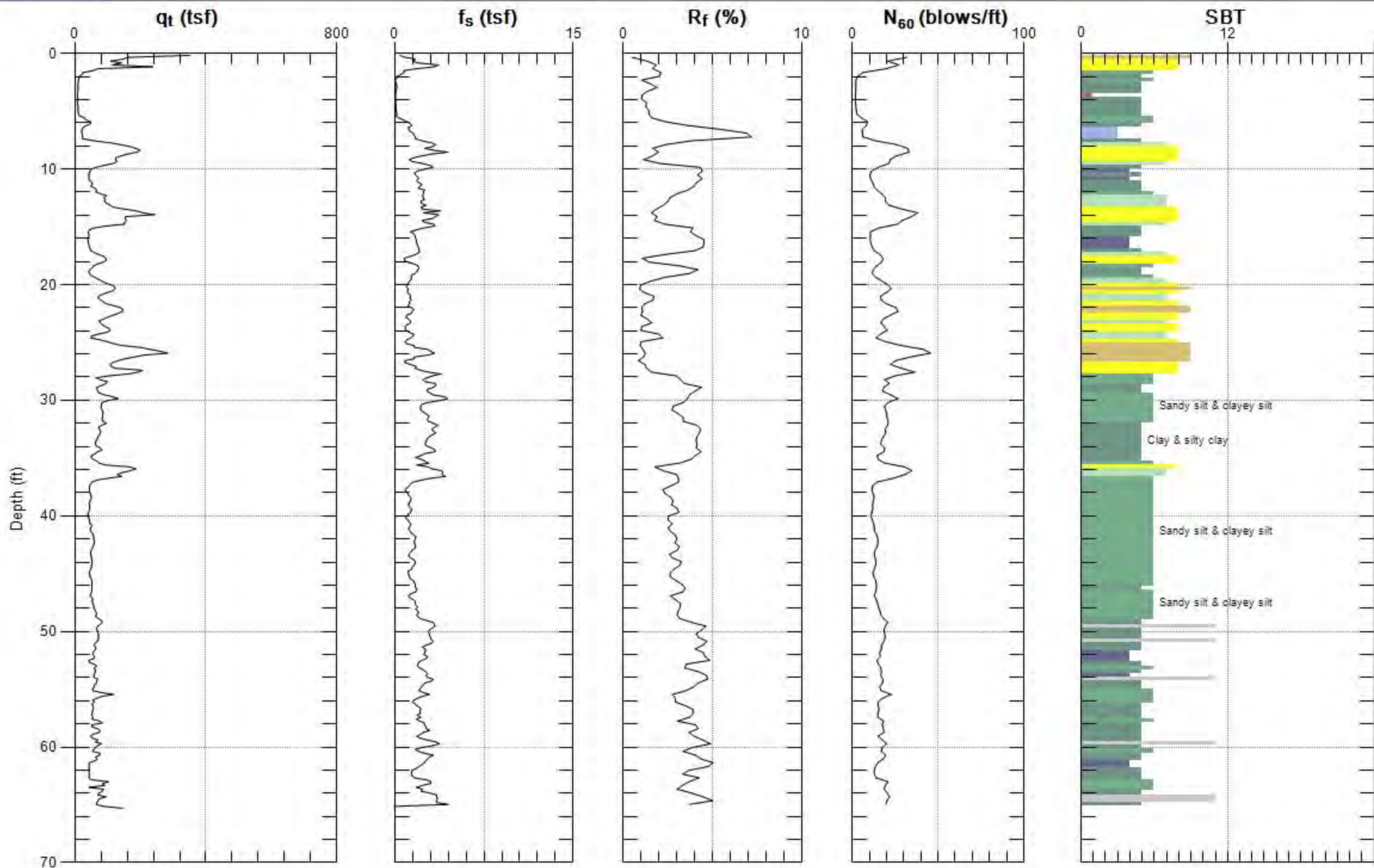


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-24

Date: 6/7/2012 11:15



Max. Depth: 65.289 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

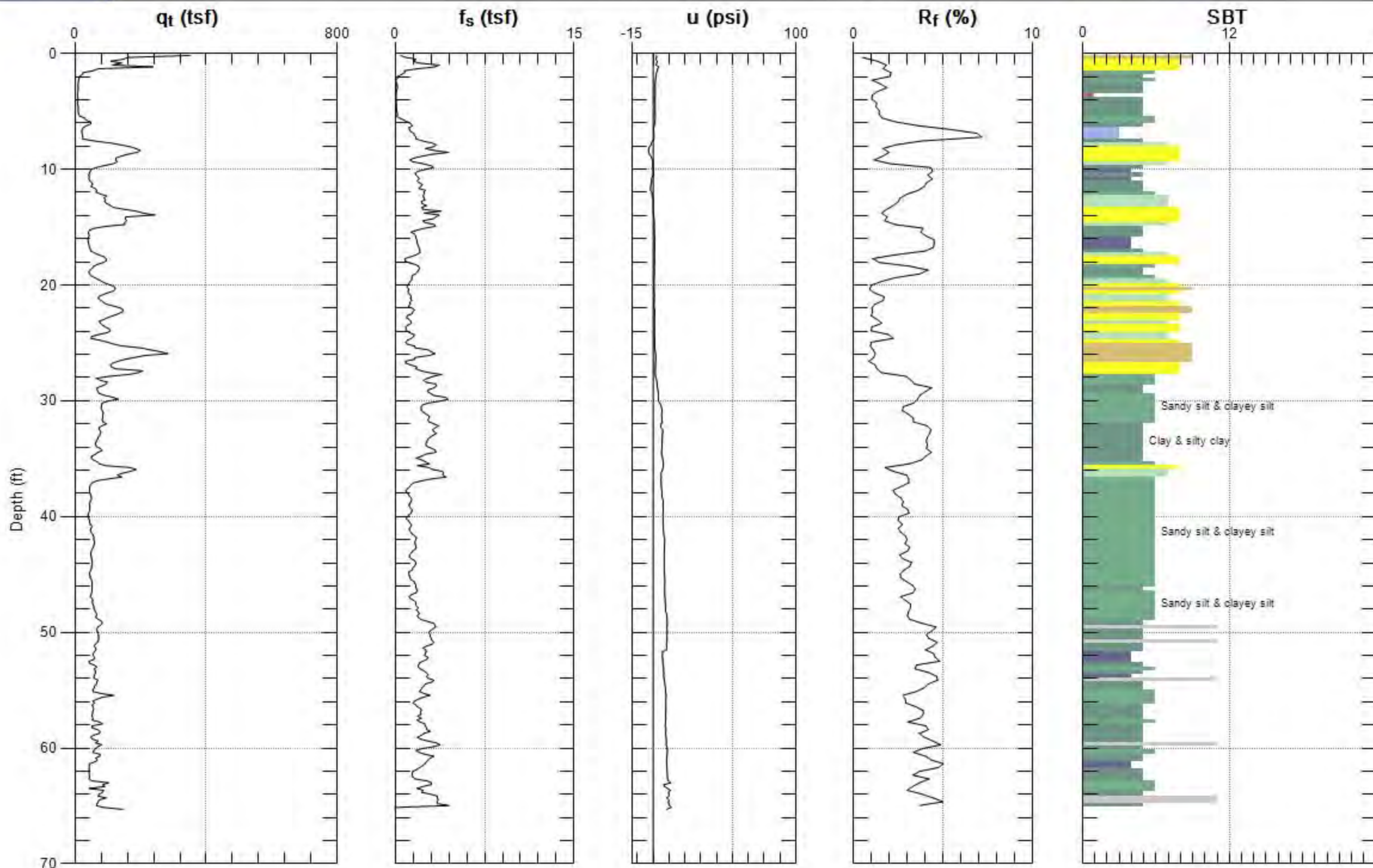


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-24

Date: 6/7/2012 11:15



Max. Depth: 65.289 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

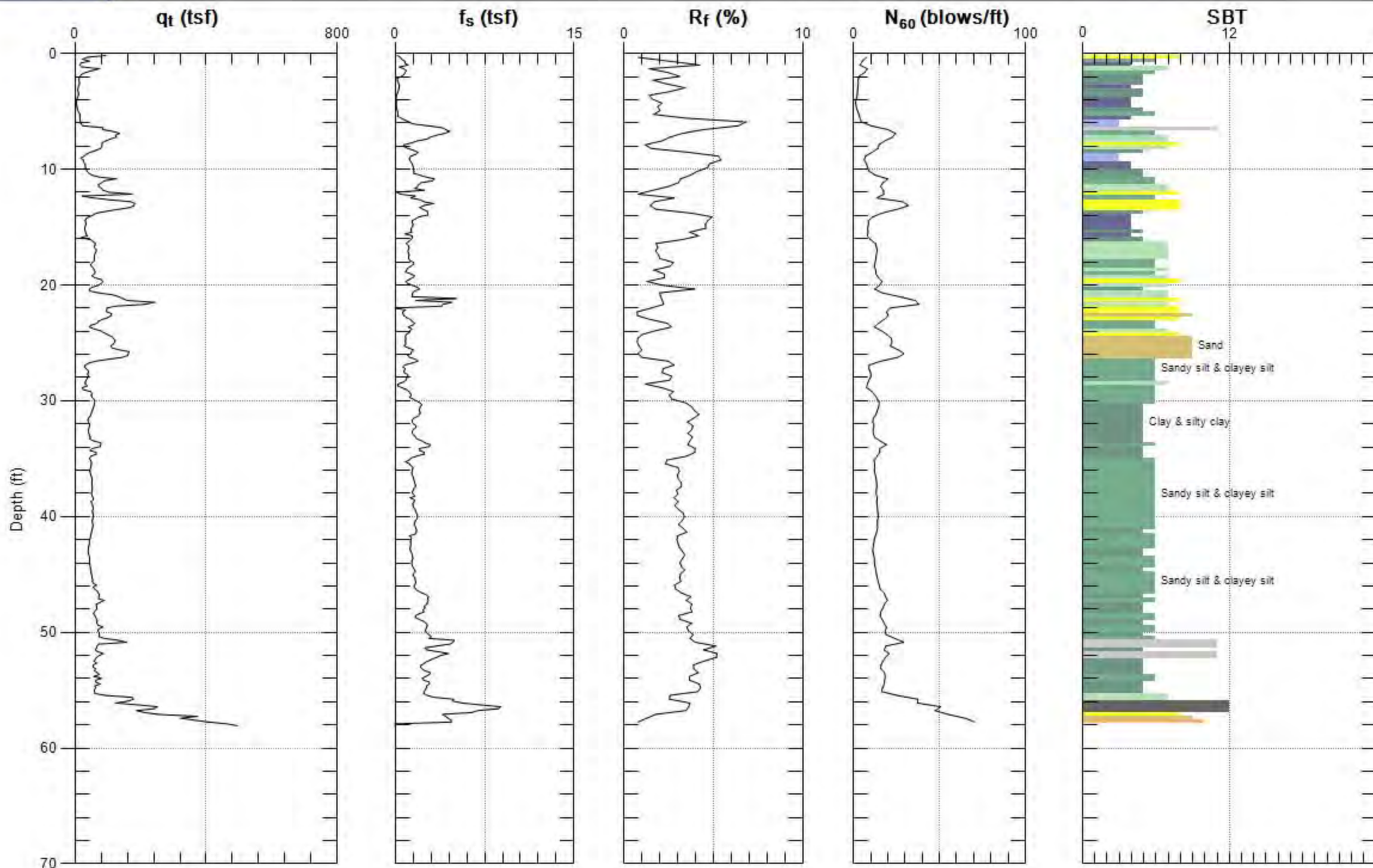


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-25

Date: 6/7/2012 11:39



Max. Depth: 58.071 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

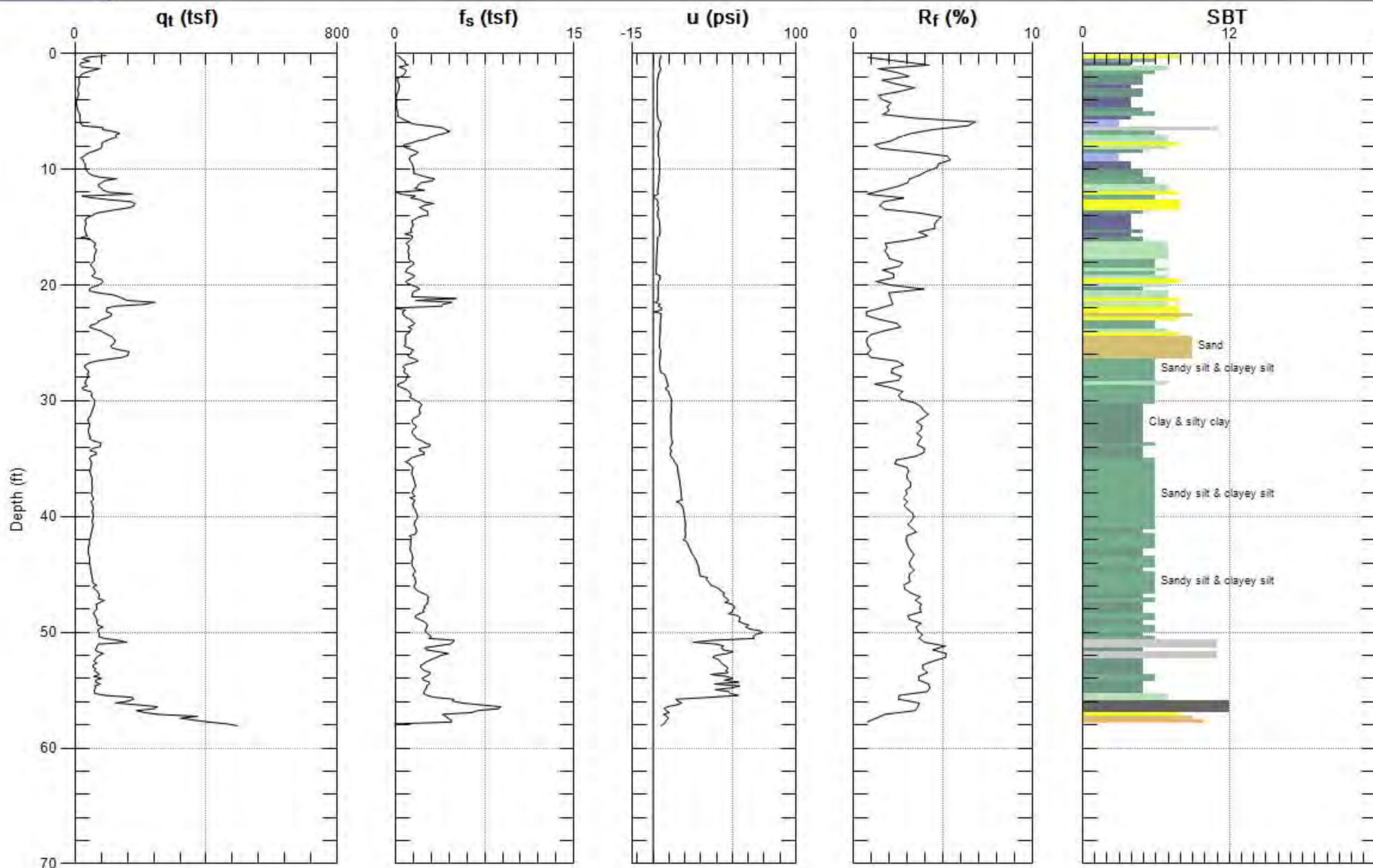


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: C-25

Date: 6/7/2012 11:39



Max. Depth: 58.071 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

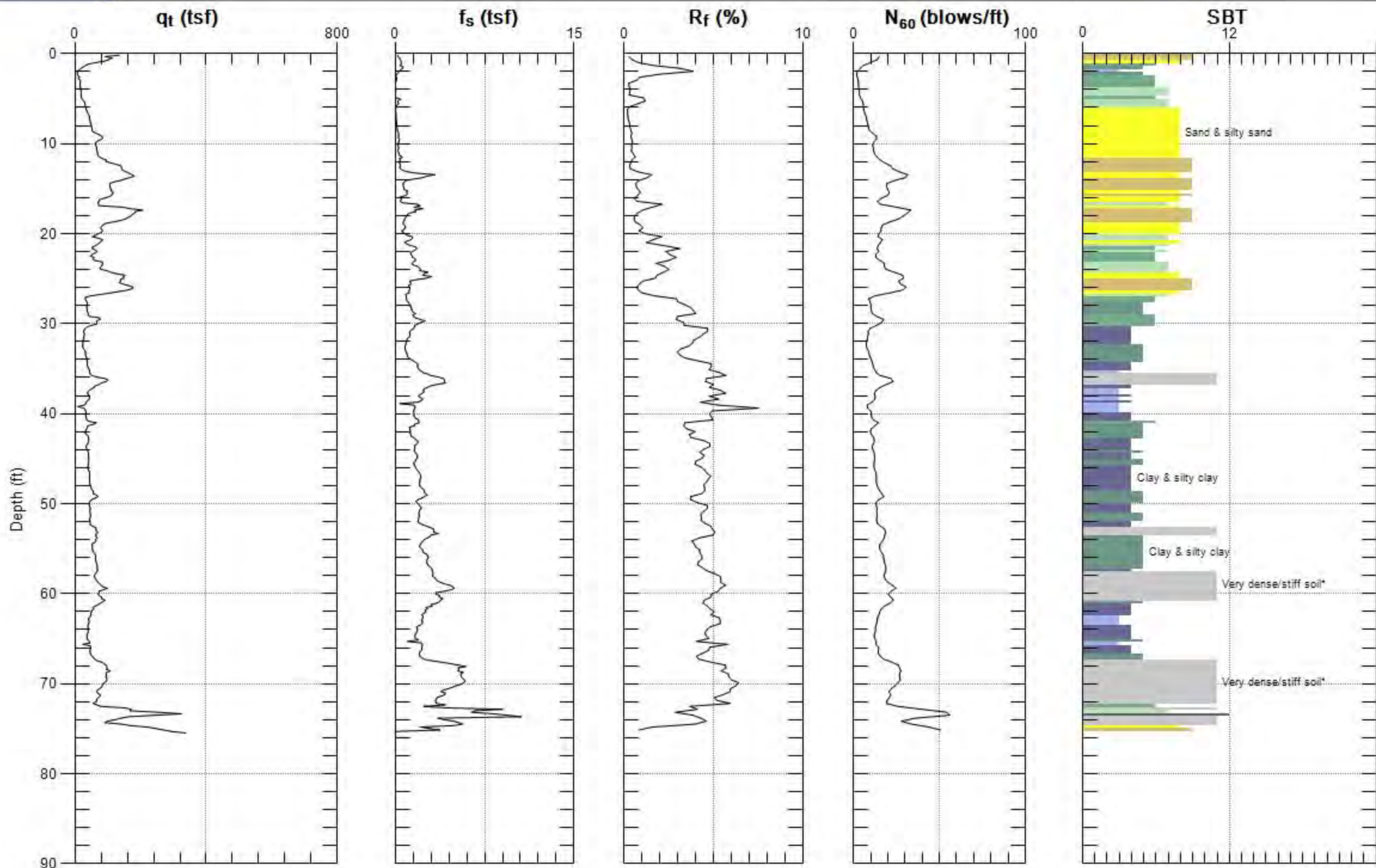


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-101

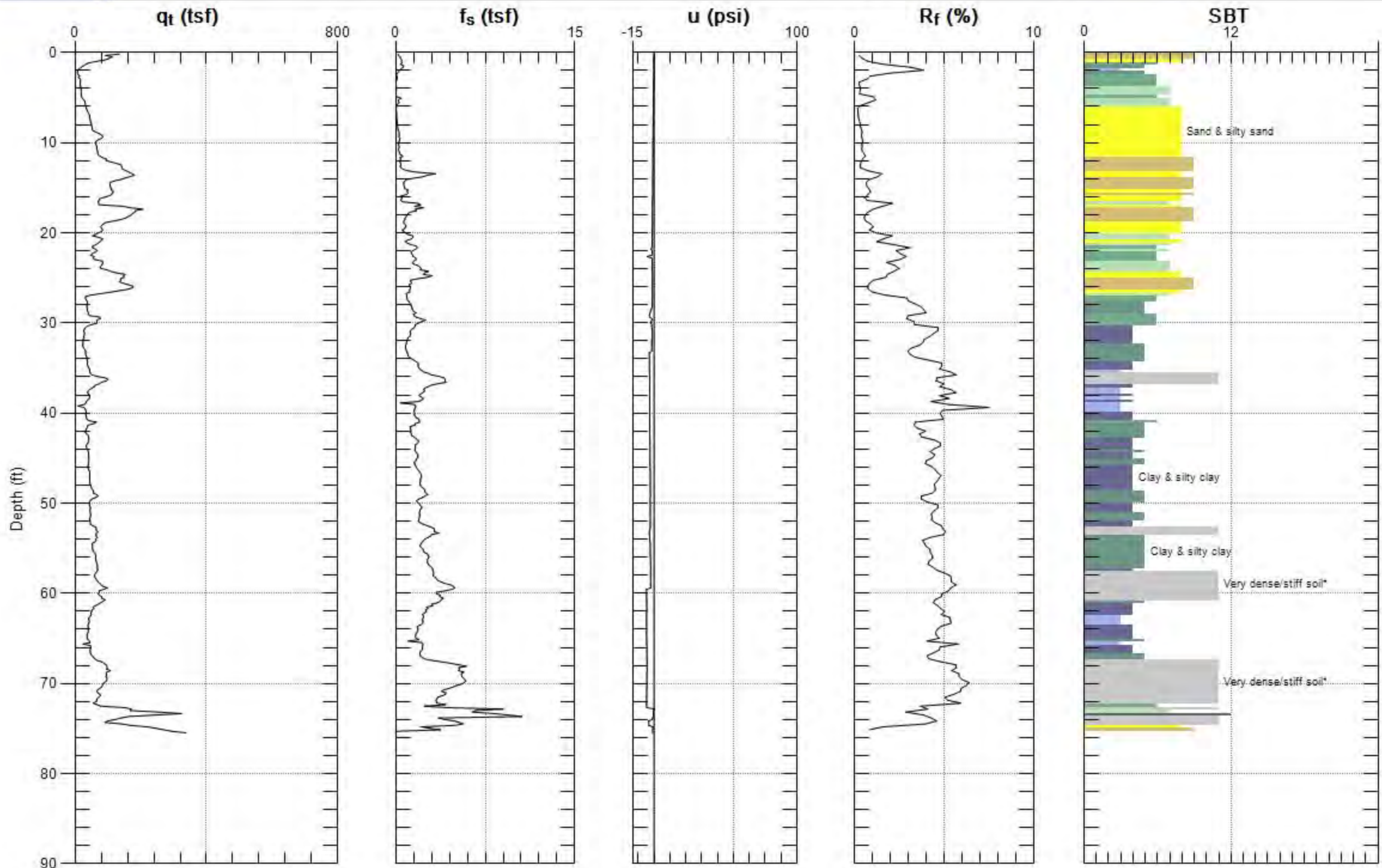
Date: 8/3/2012 11:01



Max. Depth: 75.459 (ft)

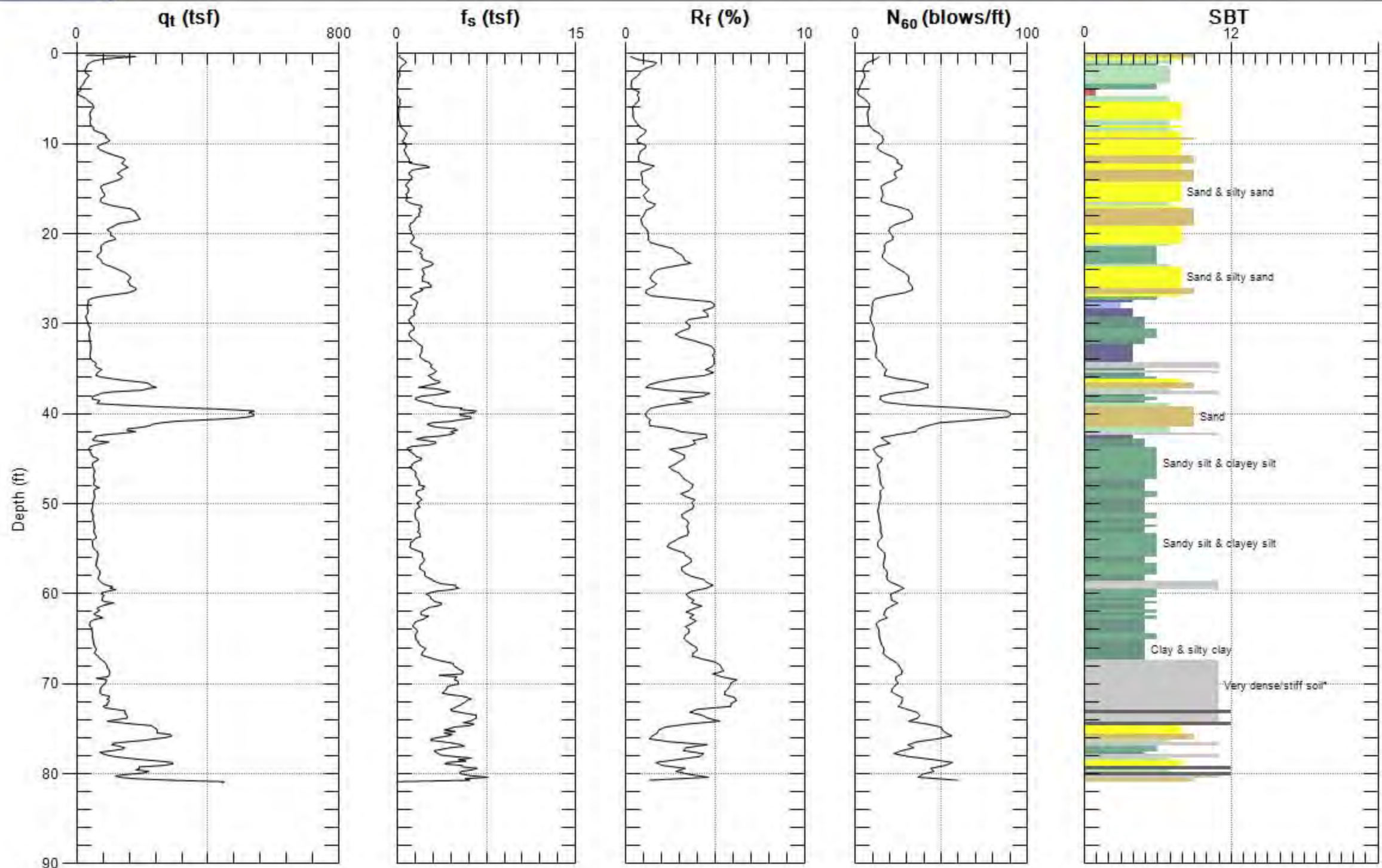
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



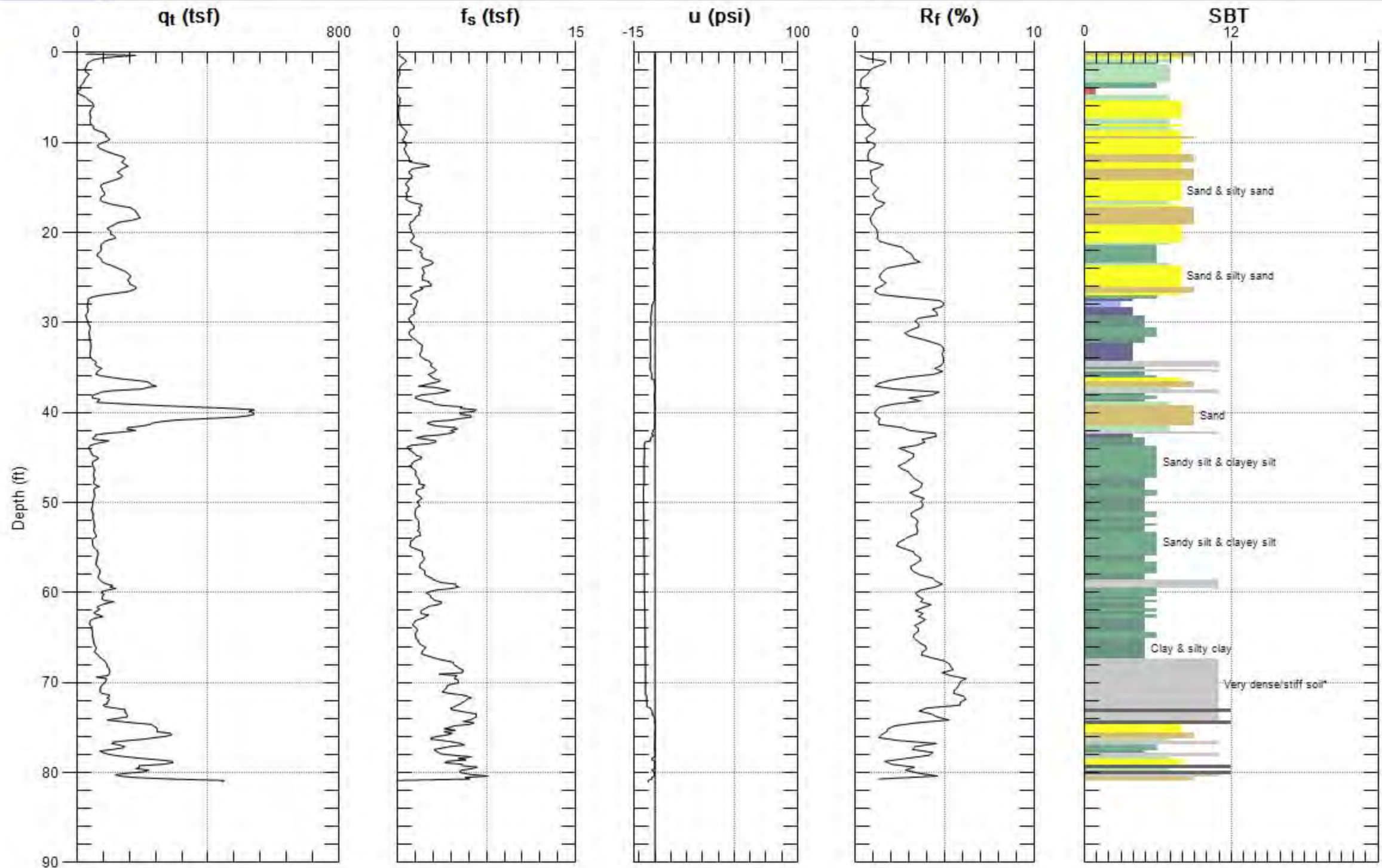
Max. Depth: 75.459 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 81.037 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 81.037 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

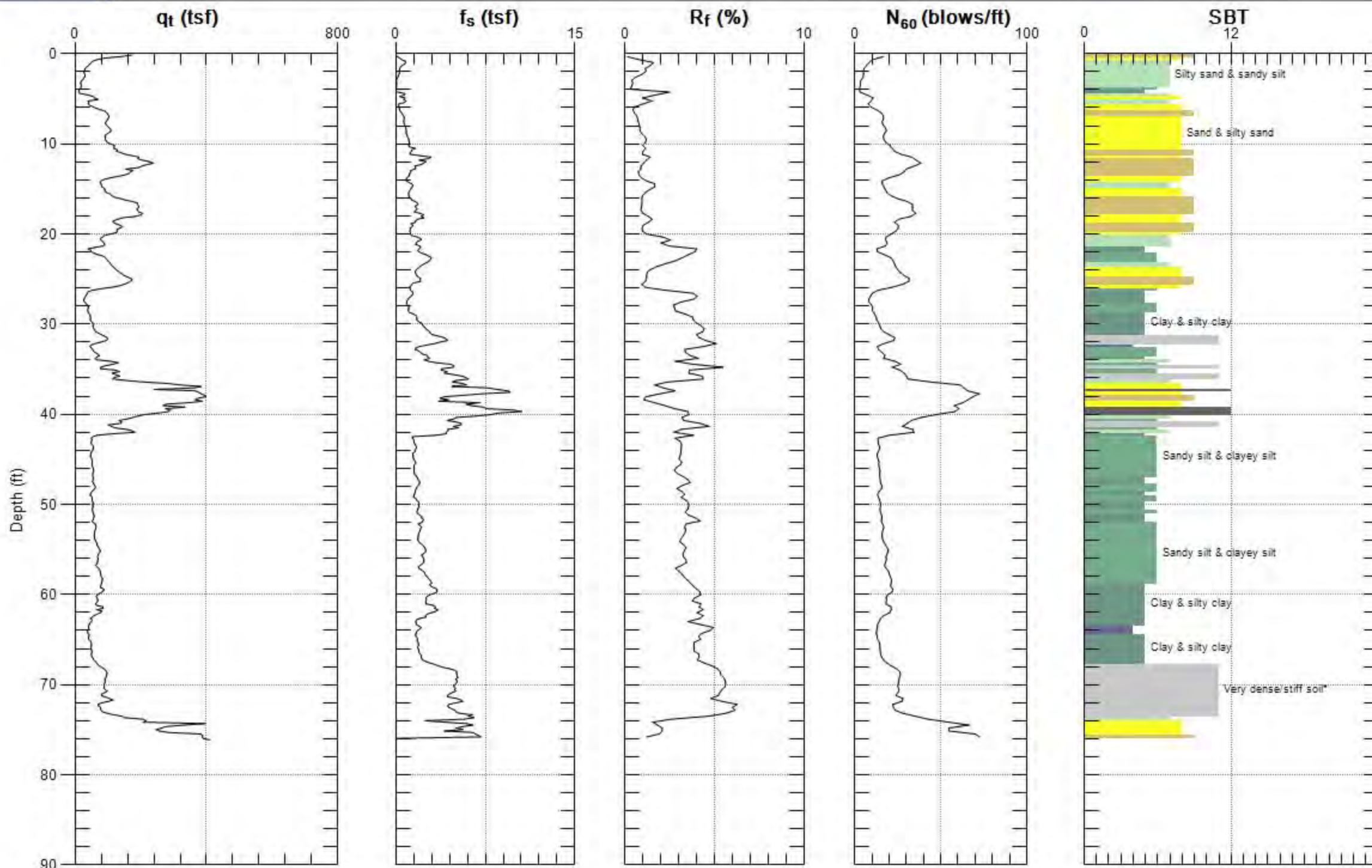


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-103

Date: 8/3/2012 12:28



Max. Depth: 76.115 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

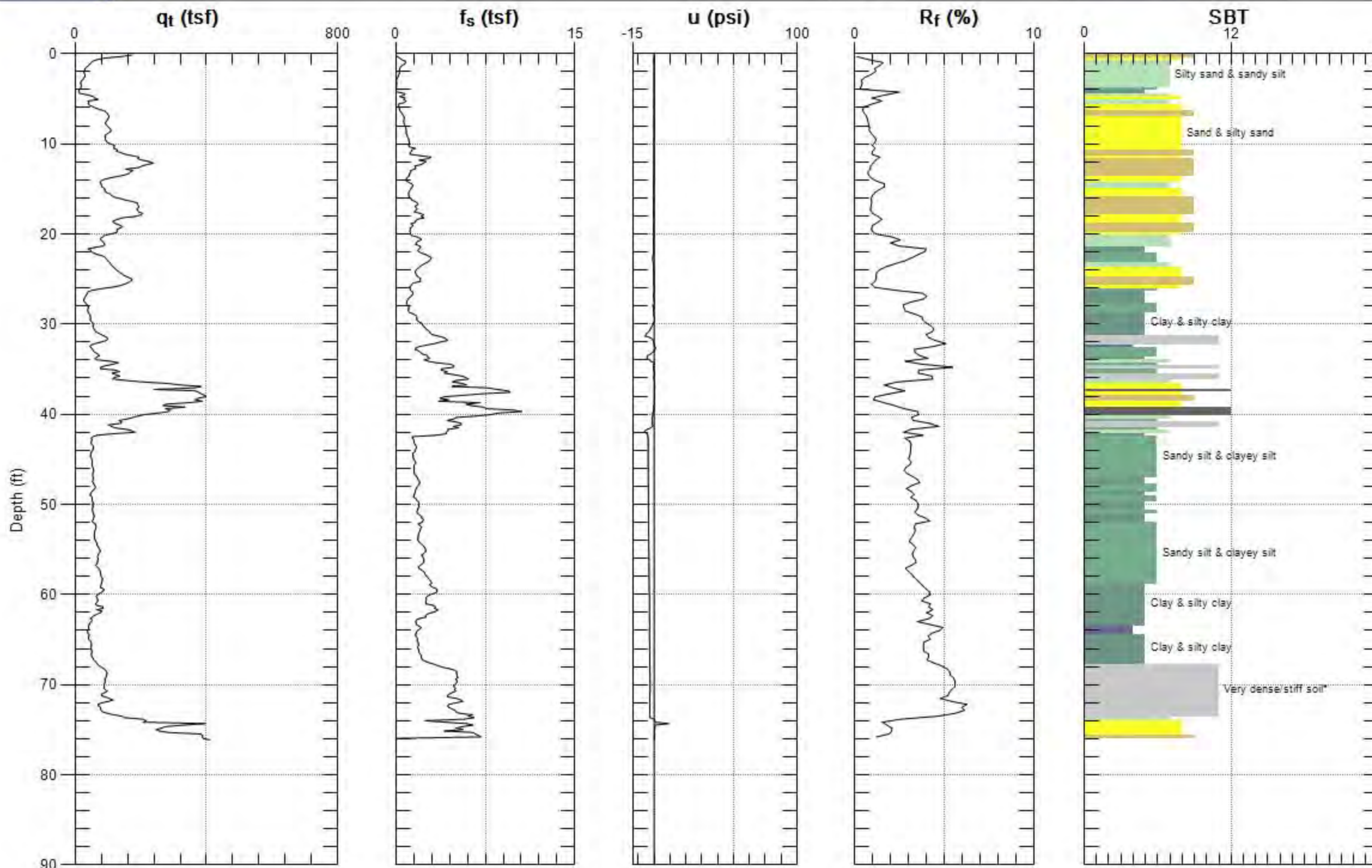


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-103

Date: 8/3/2012 12:28



Max. Depth: 76.115 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

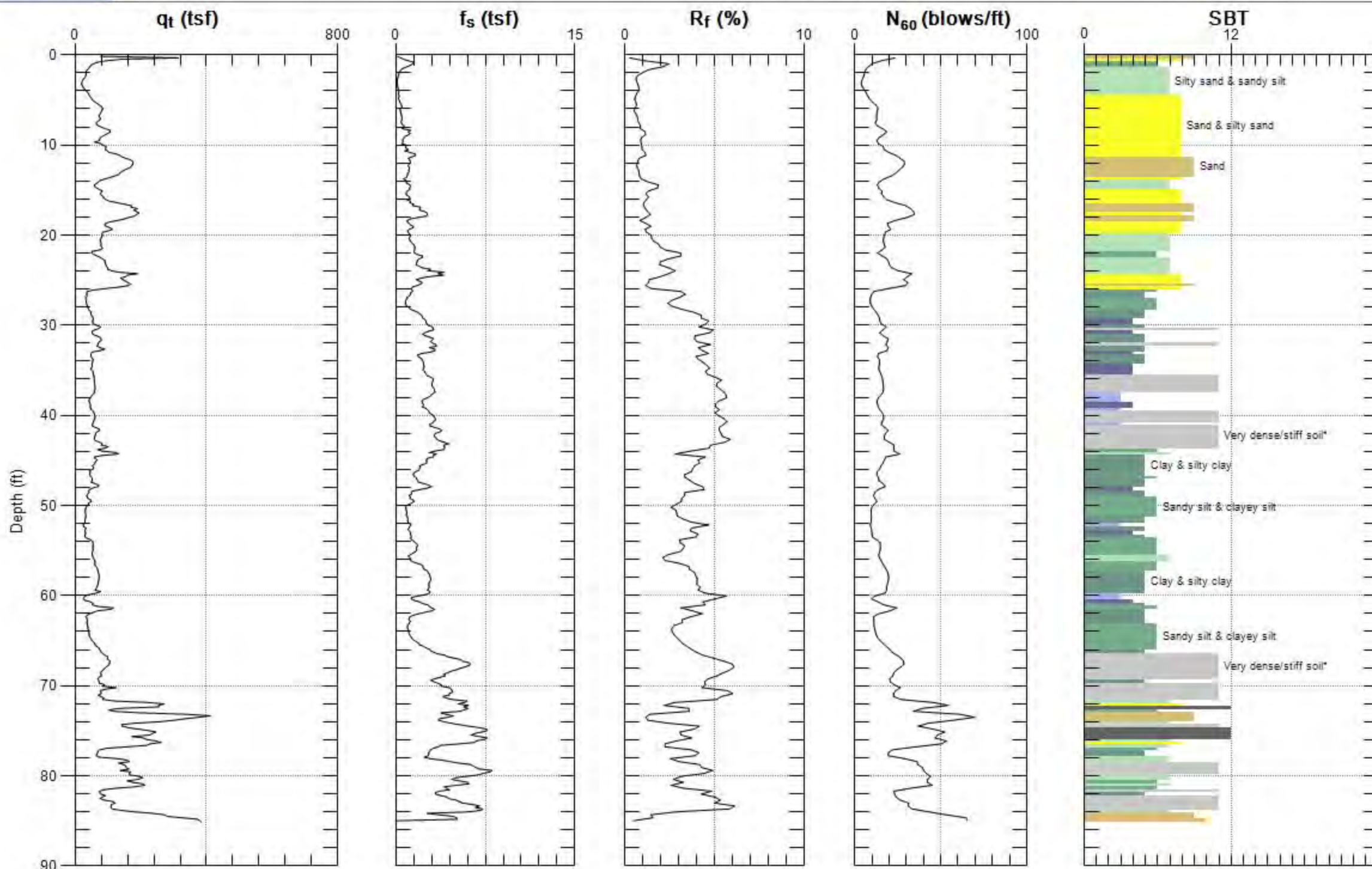


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-104

Date: 8/3/2012 01:10



Max. Depth: 85.138 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

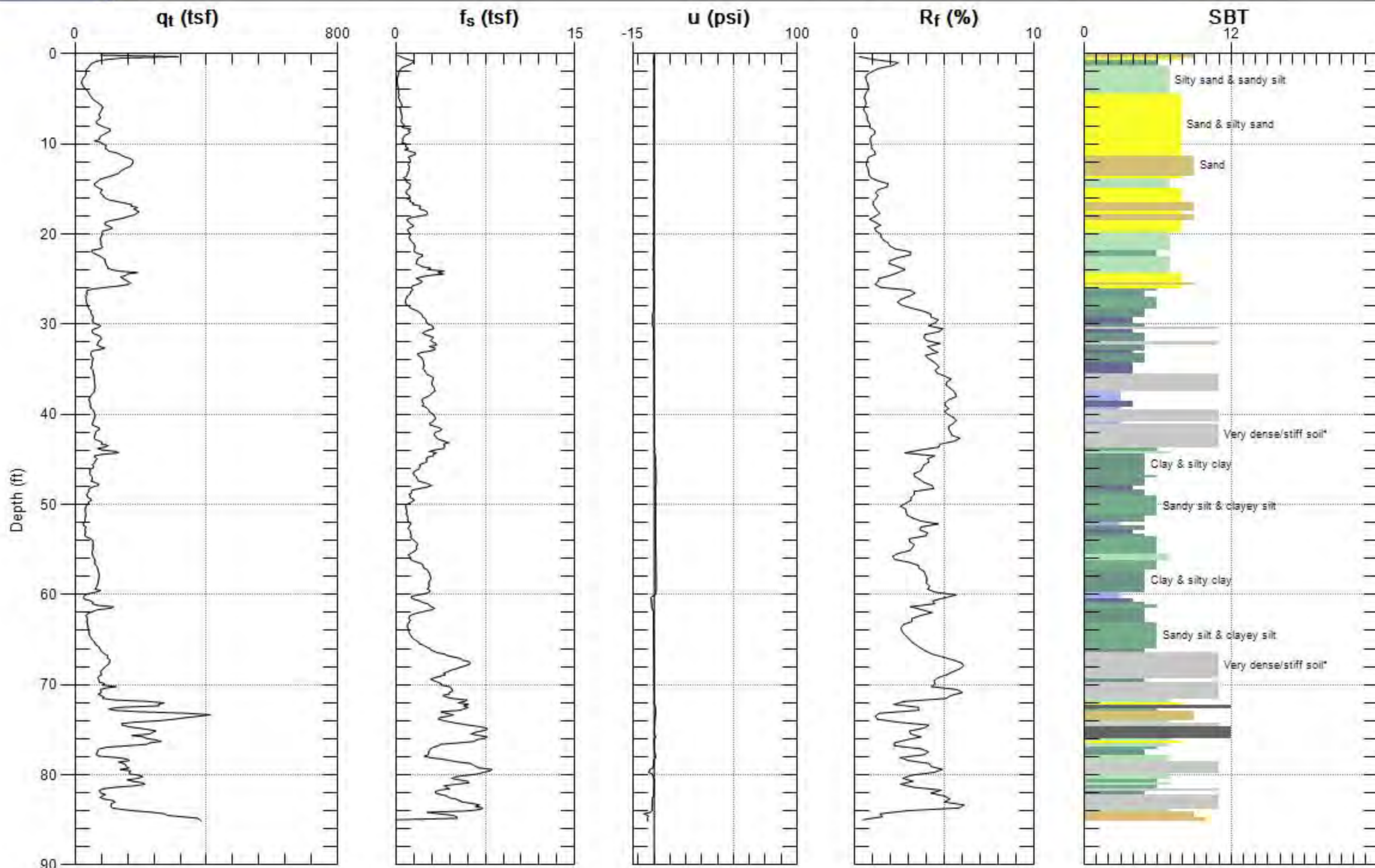


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-104

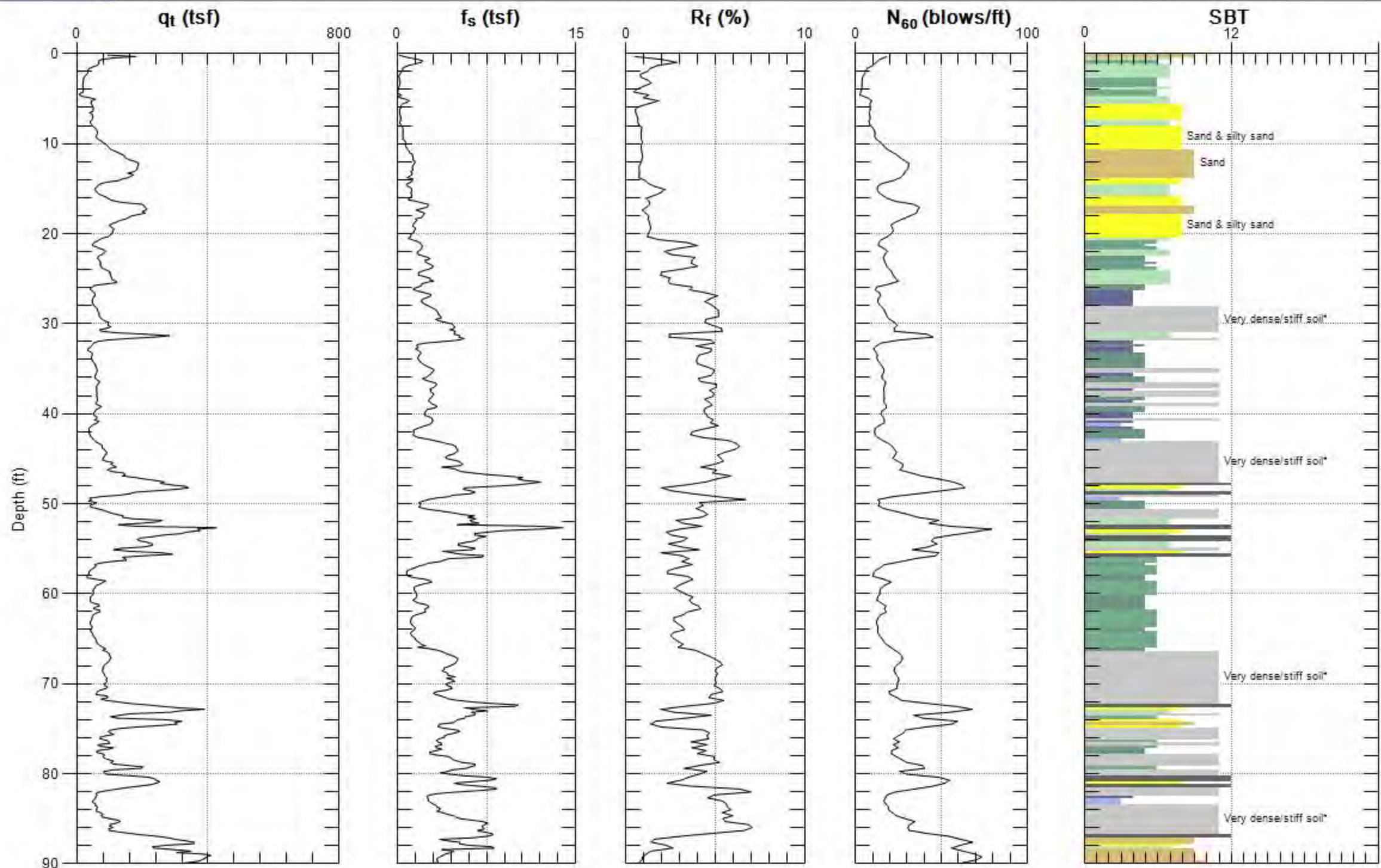
Date: 8/3/2012 01:10



Max. Depth: 85.138 (ft)

Avg. Interval: 0.328 (ft)

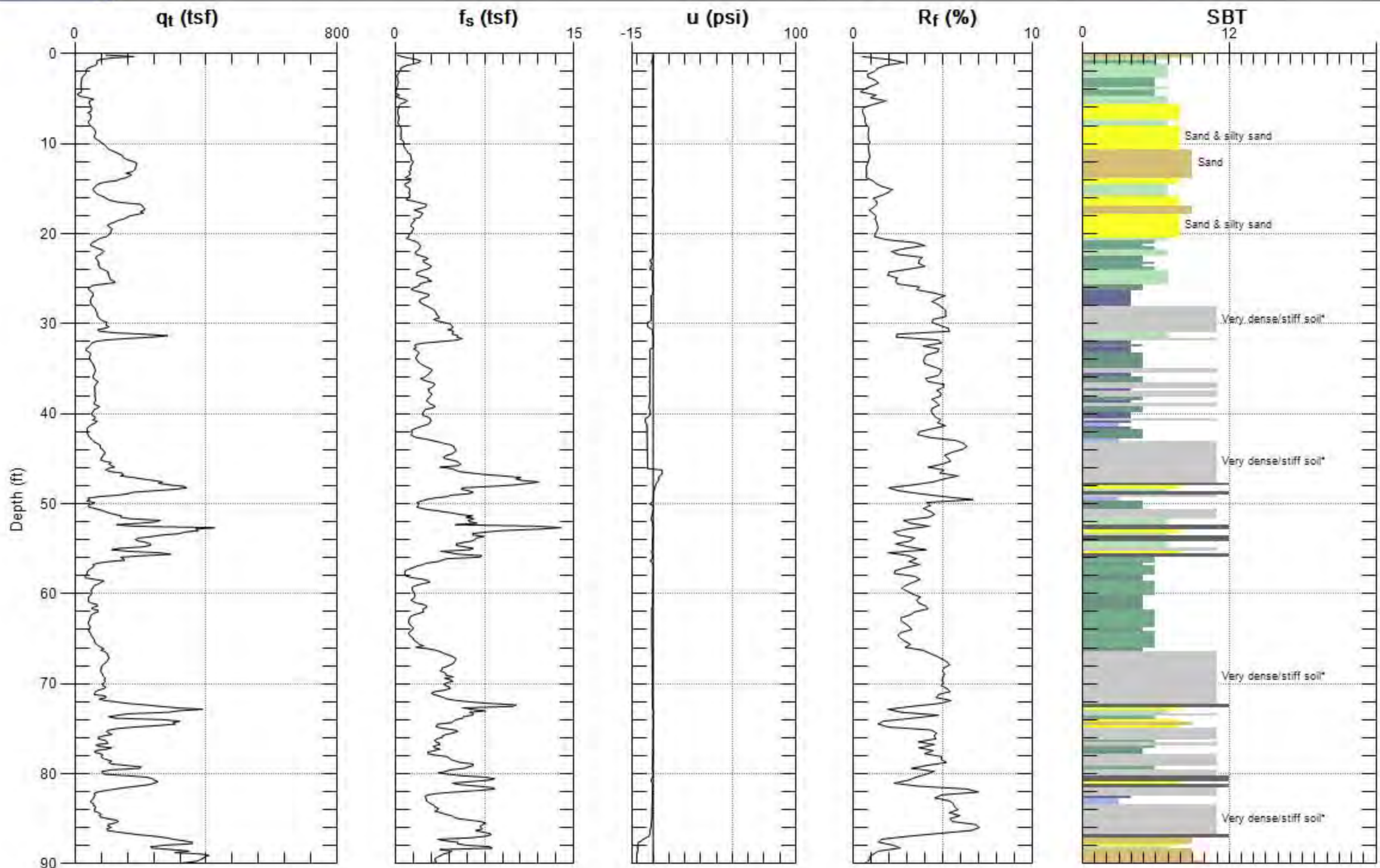
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 90.223 (ft)

Avg. Interval: 0.328 (ft)

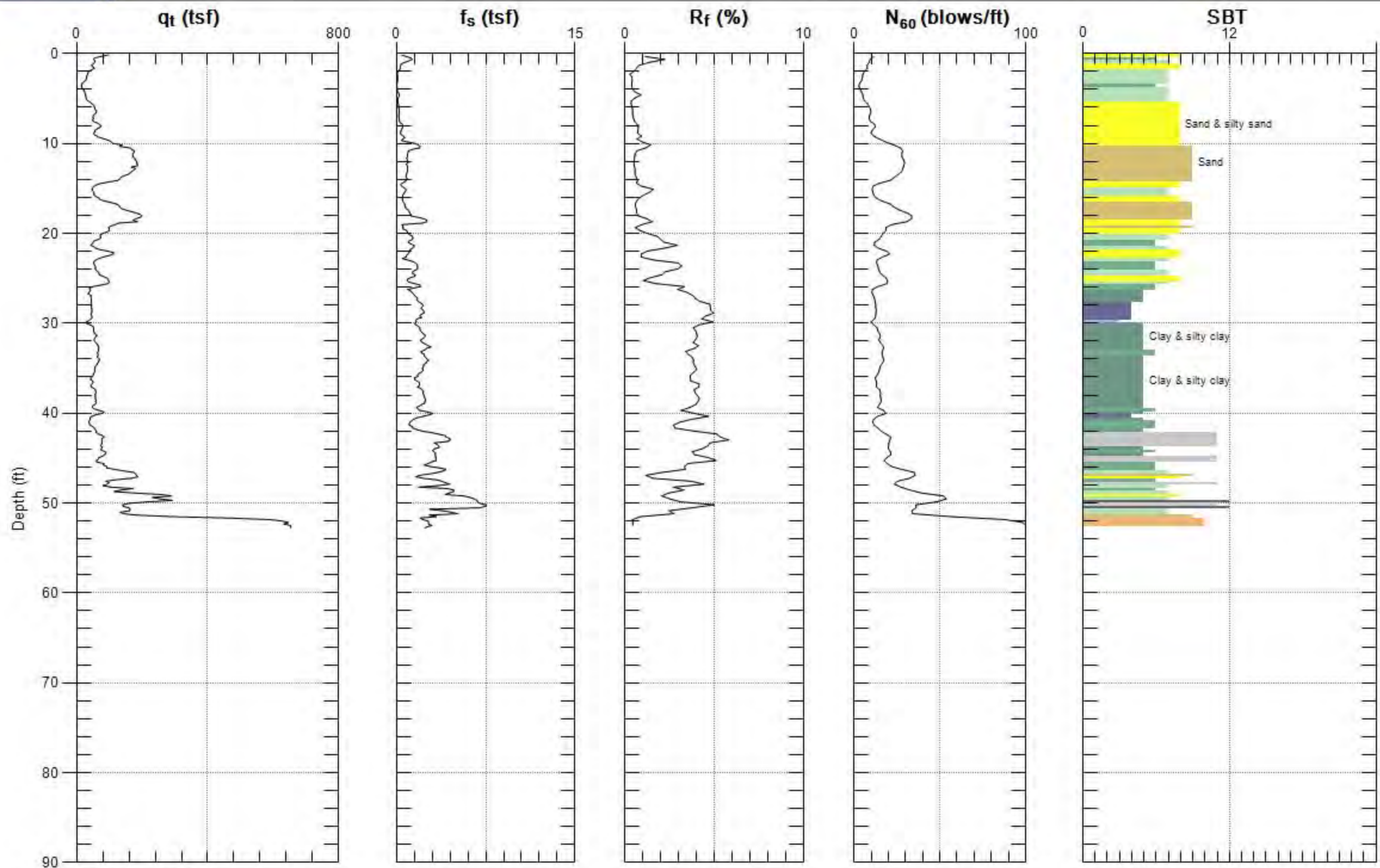
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 90.223 (ft)

Avg. Interval: 0.328 (ft)

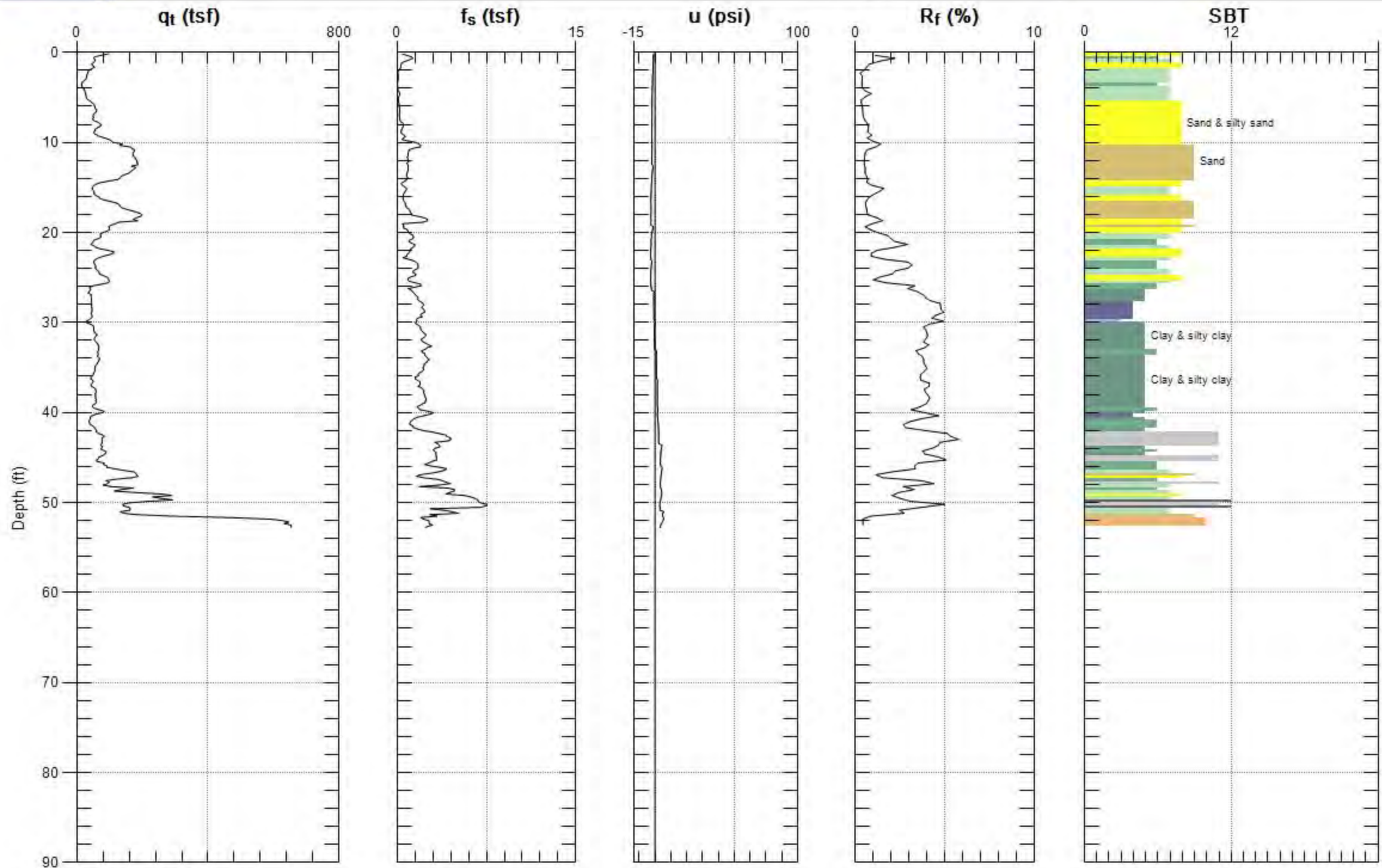
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 52.822 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 52.822 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

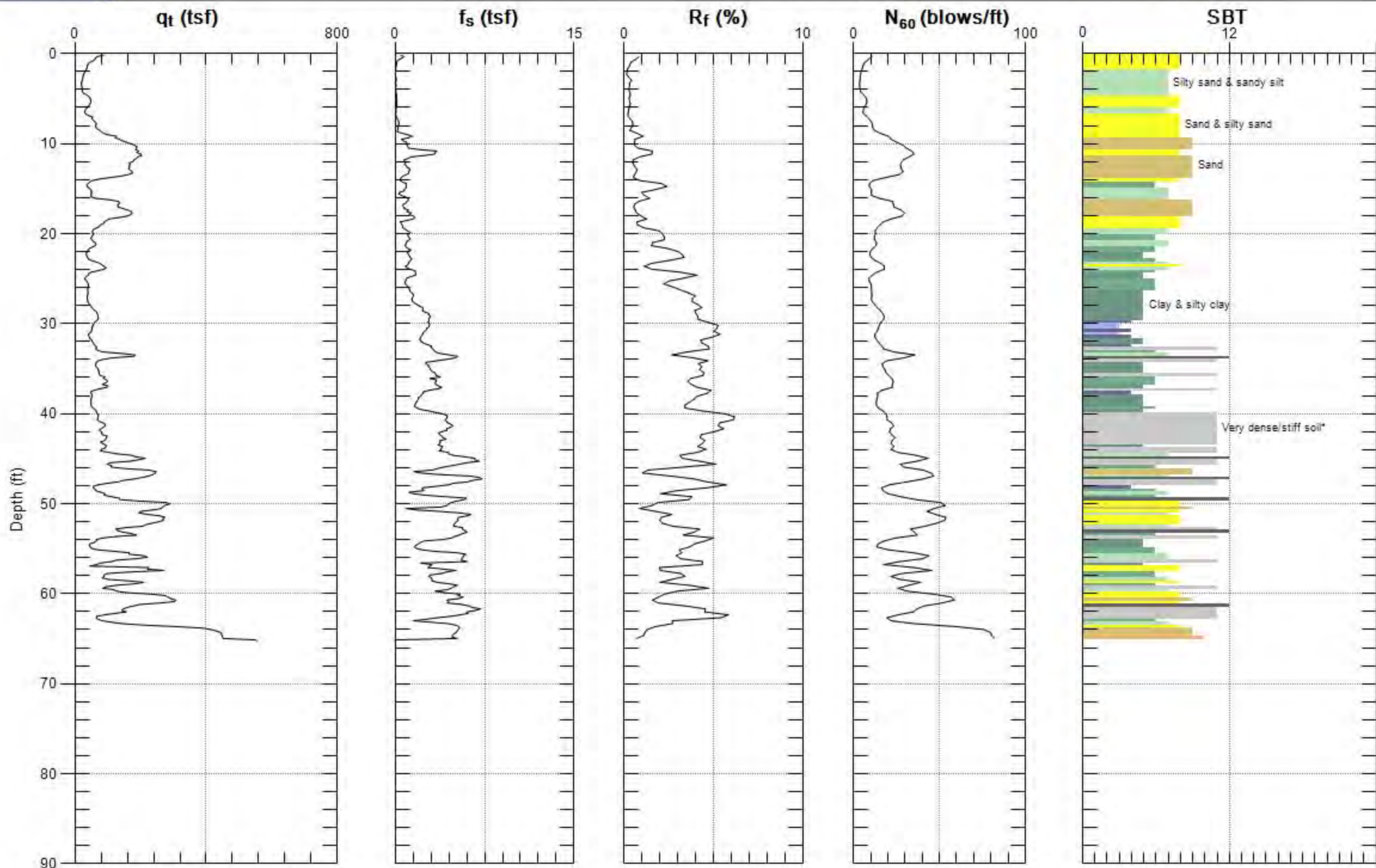


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-107

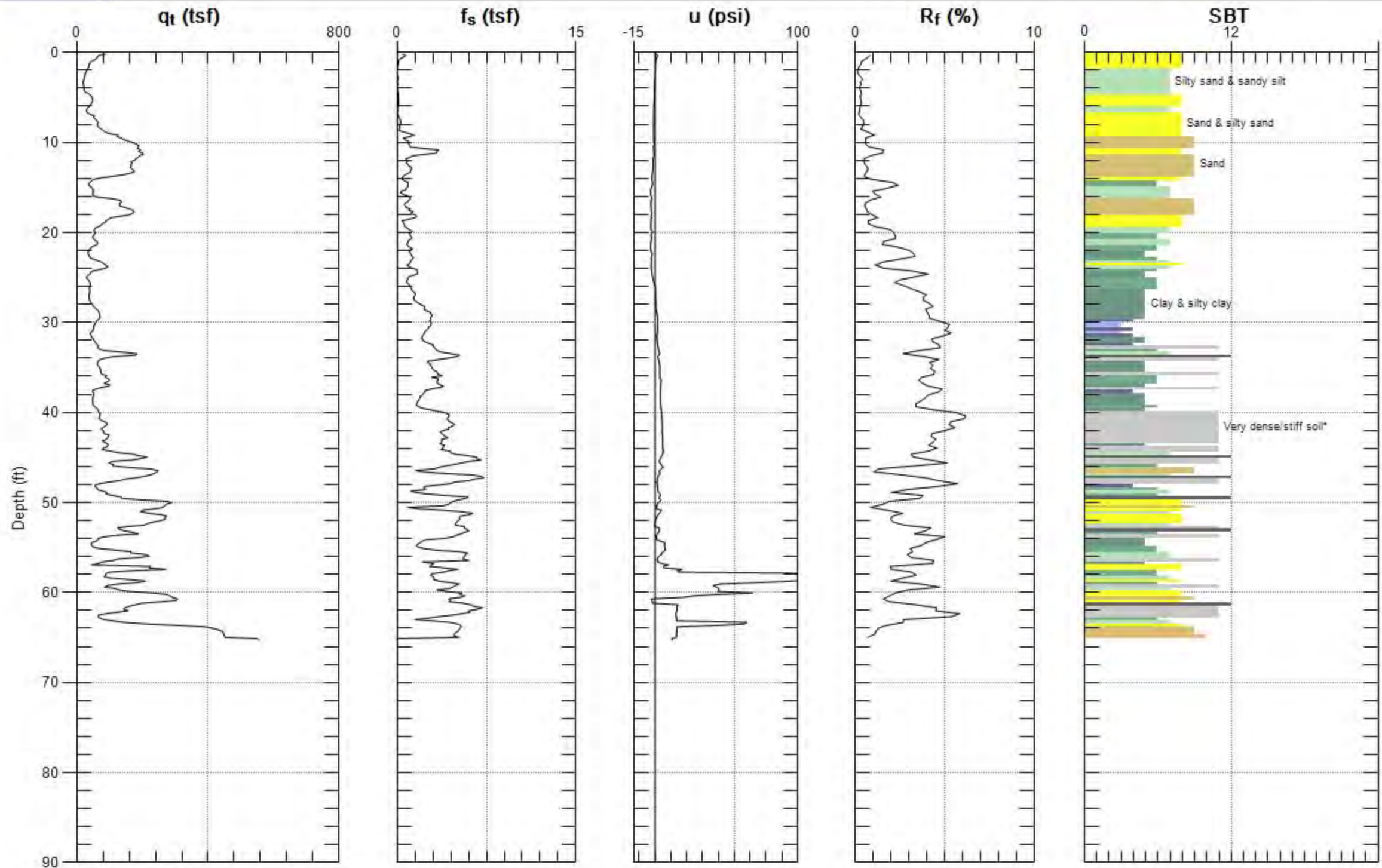
Date: 8/6/2012 10:32



Max. Depth: 65.289 (ft)

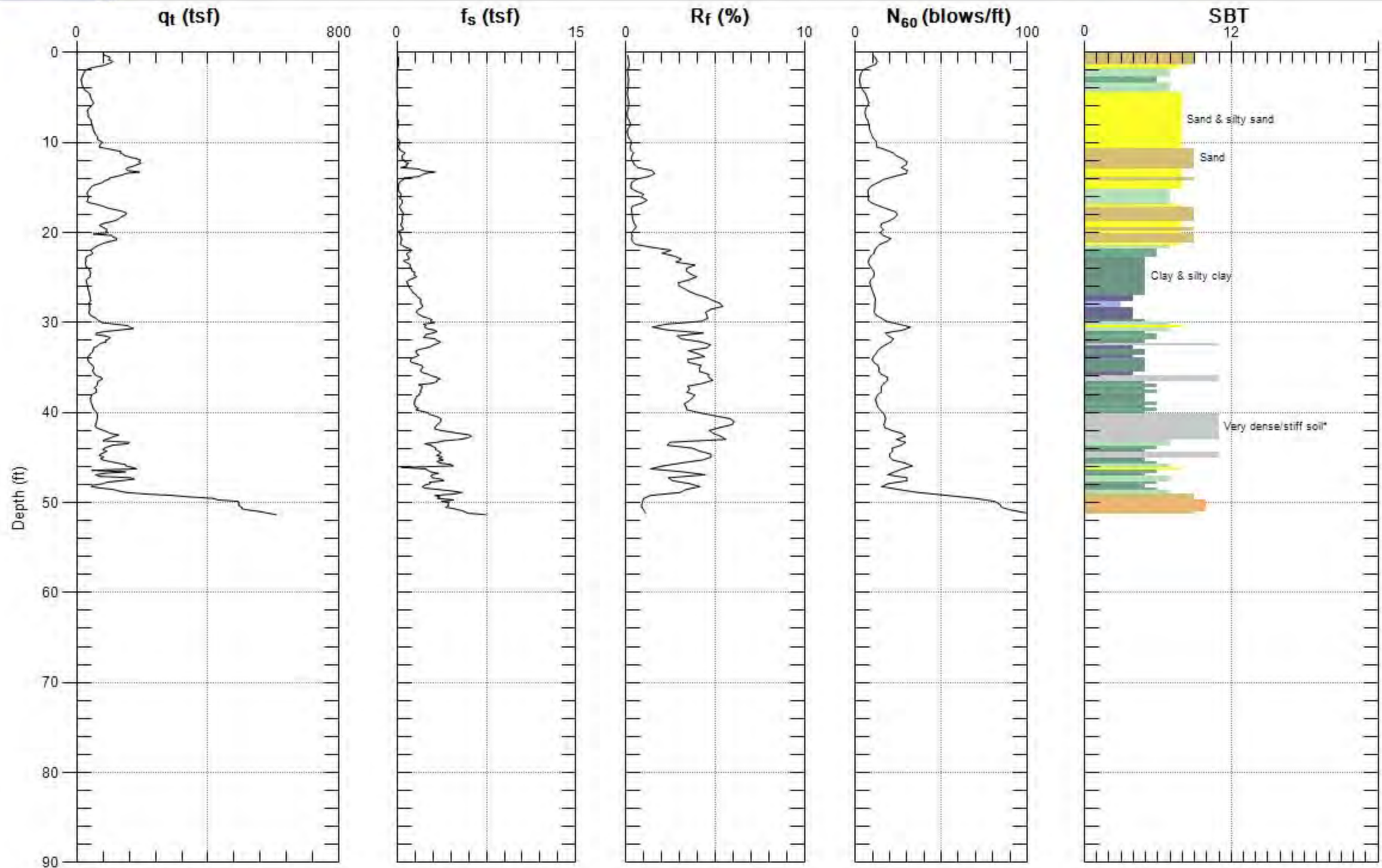
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.289 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 51.345 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

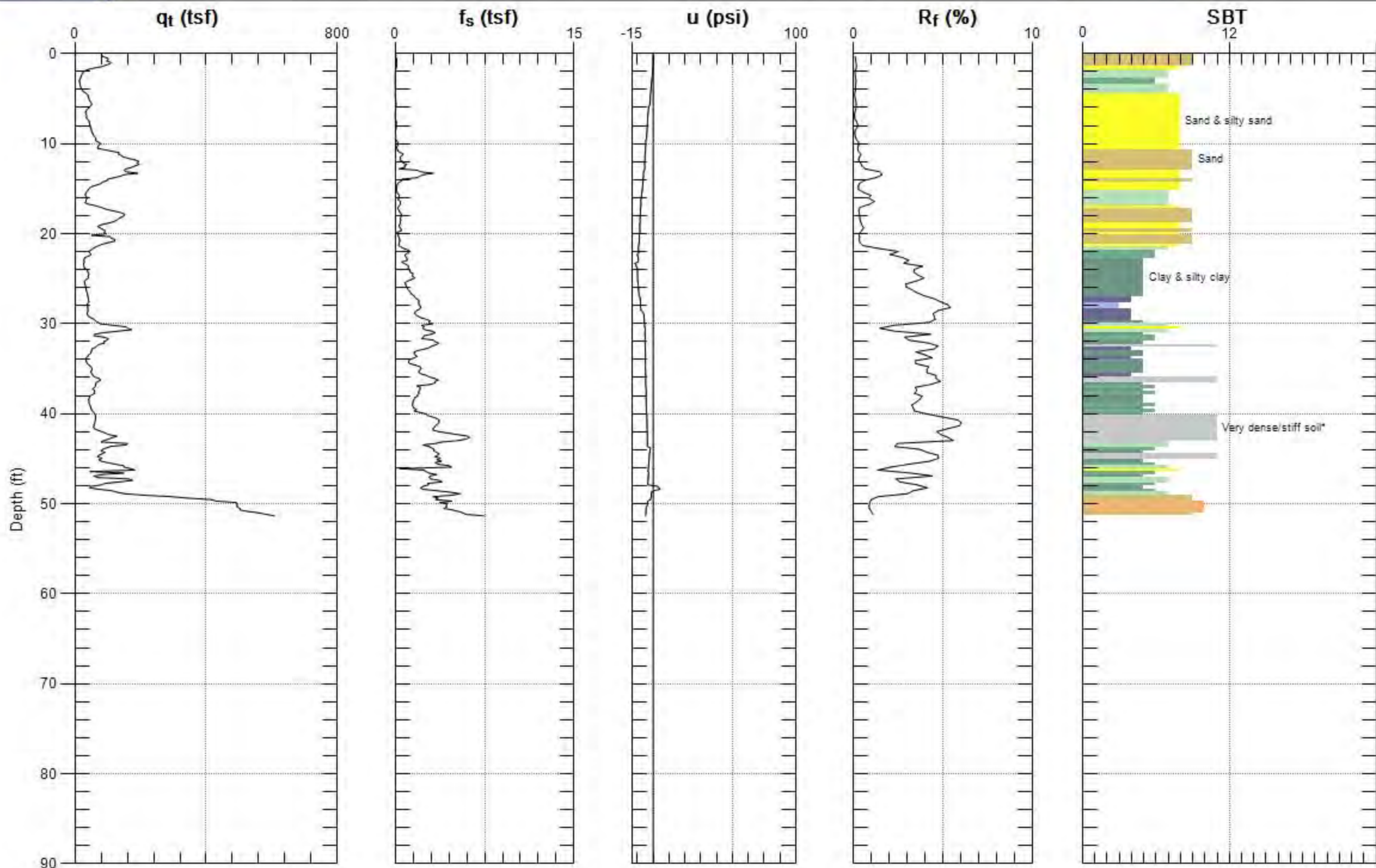


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-108

Date: 8/6/2012 12:03



Max. Depth: 51.345 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

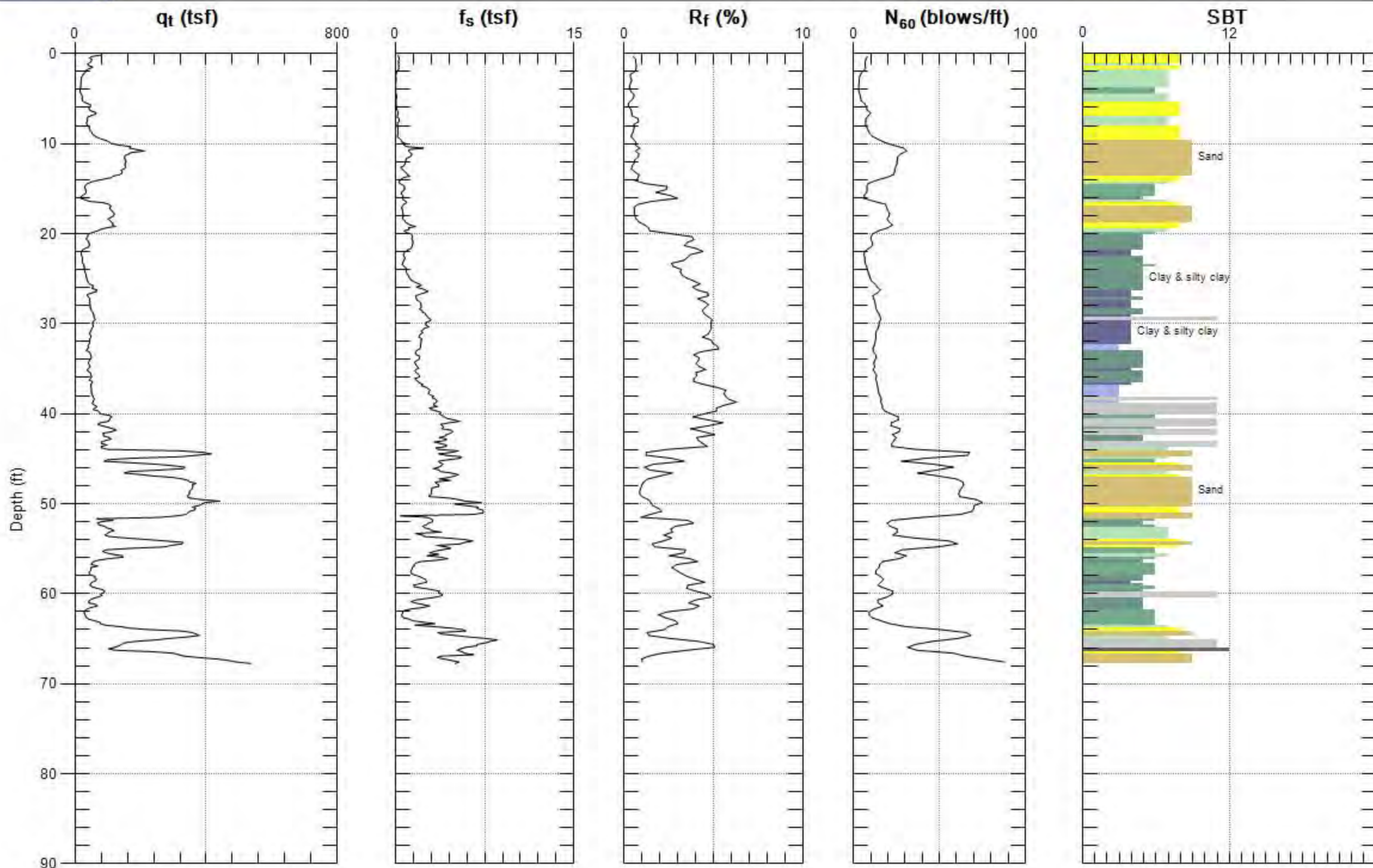


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-109

Date: 8/6/2012 12:32



Max. Depth: 67.749 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

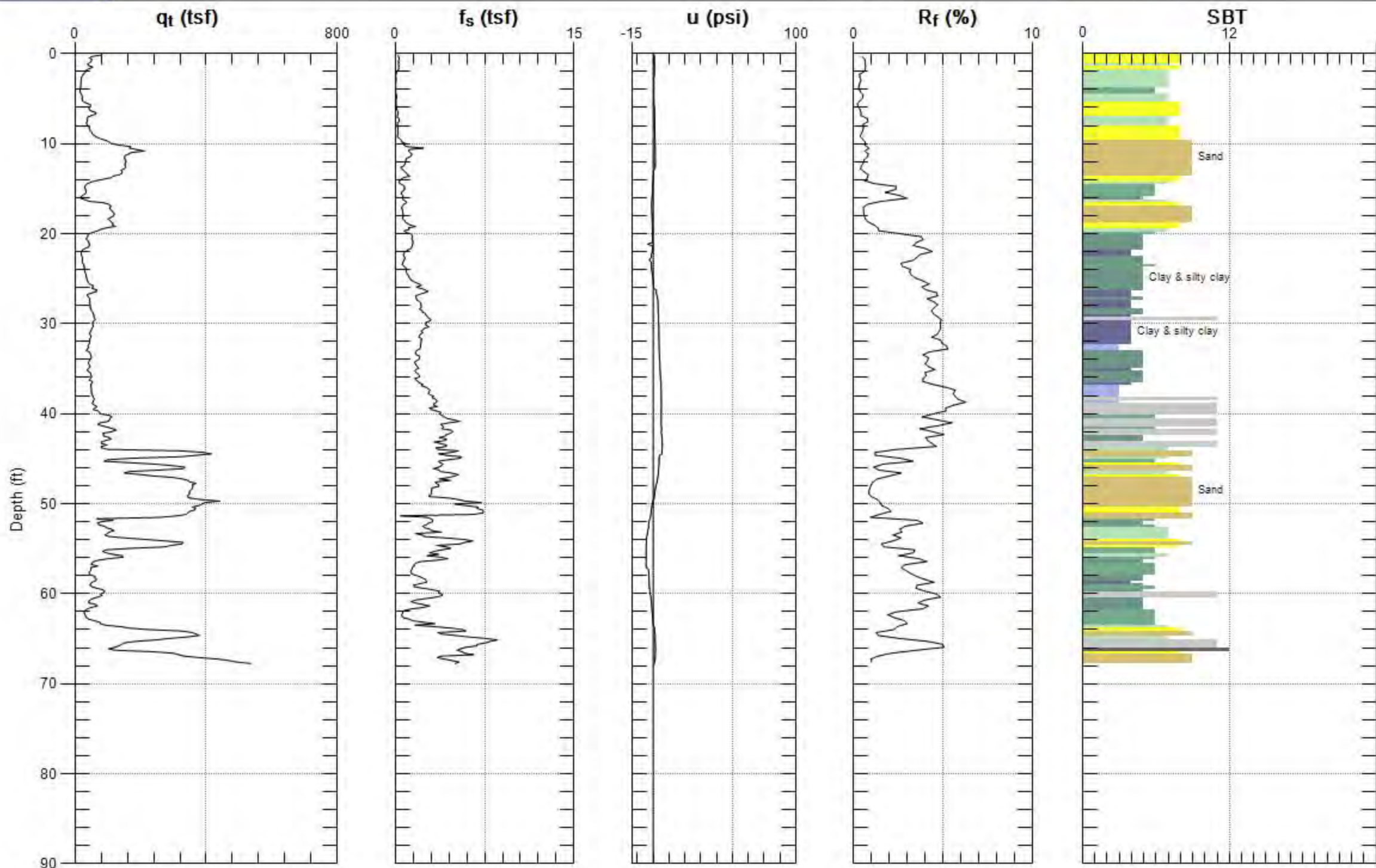


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-109

Date: 8/6/2012 12:32



Max. Depth: 67.749 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

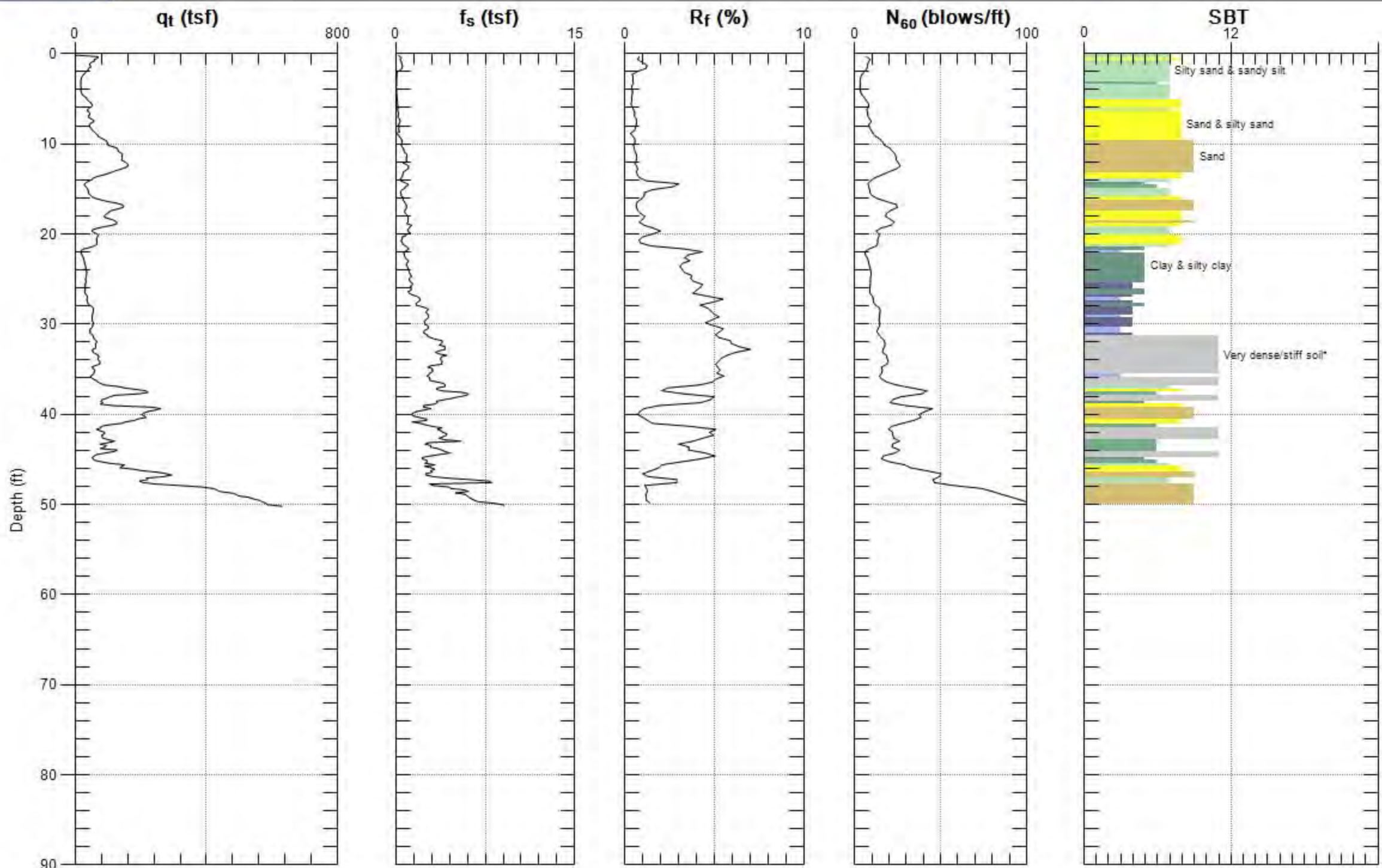


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-110

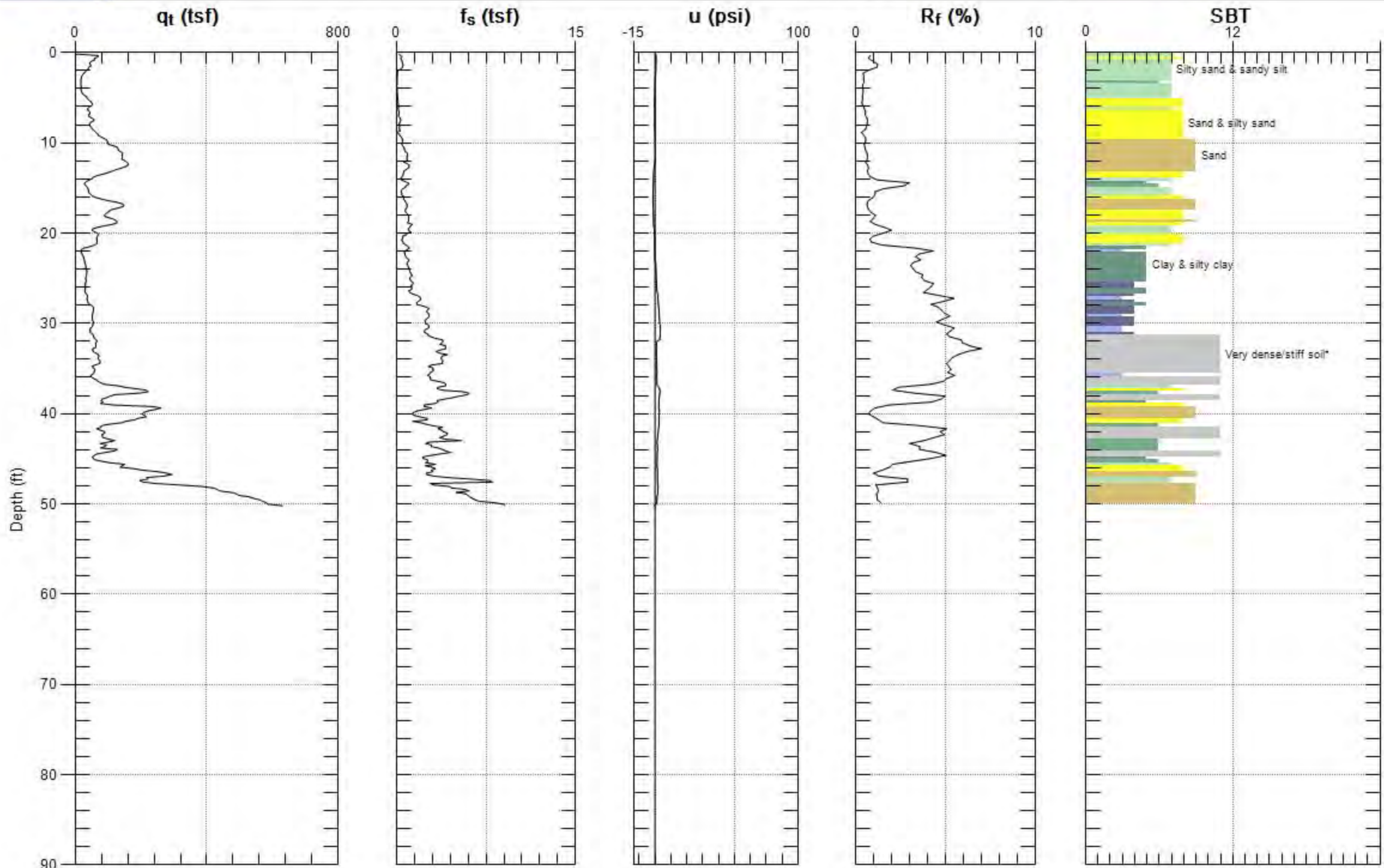
Date: 8/6/2012 01:10



Max. Depth: 50.197 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 50.197 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

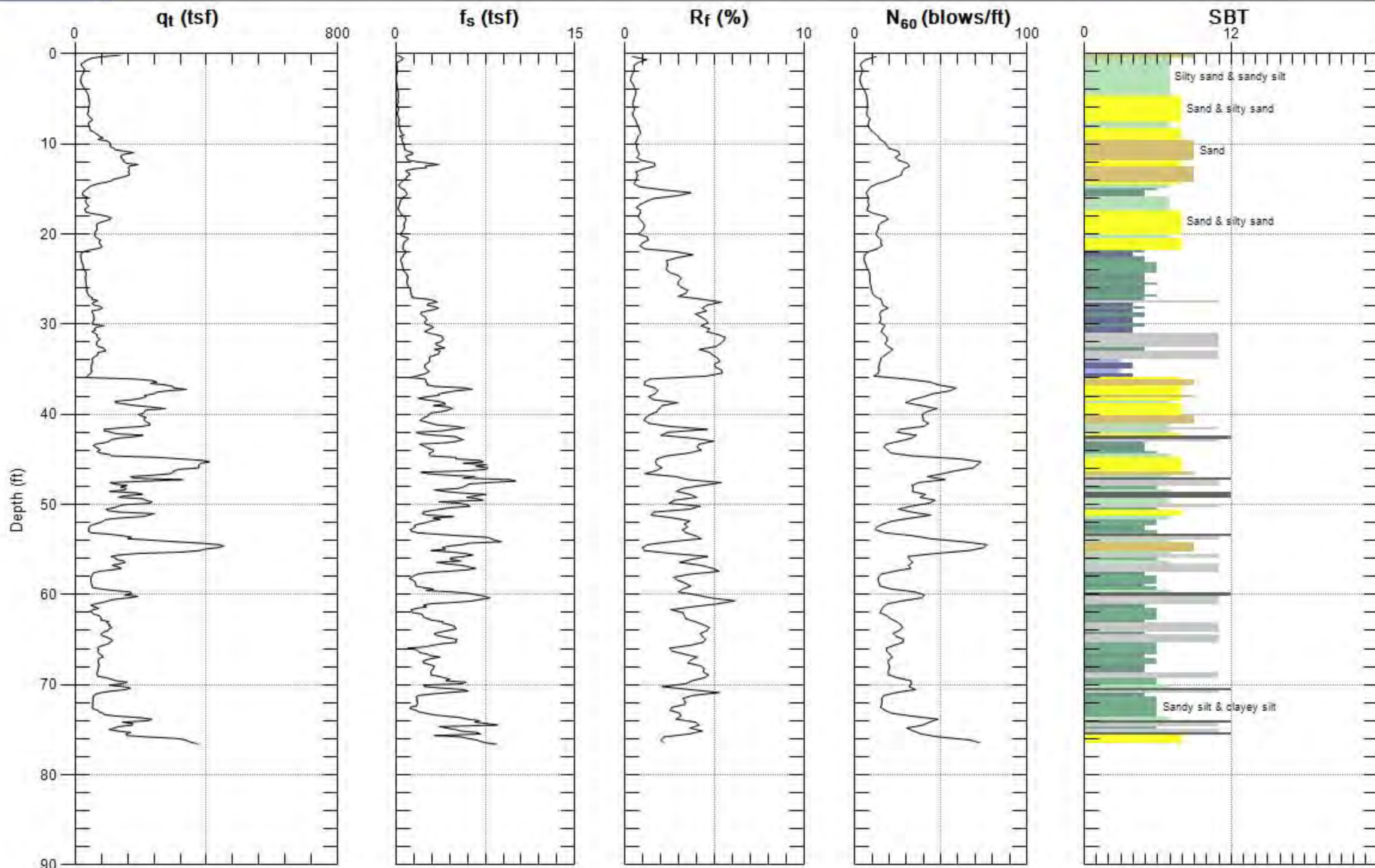


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-111

Date: 8/6/2012 01:36



Max. Depth: 76.608 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

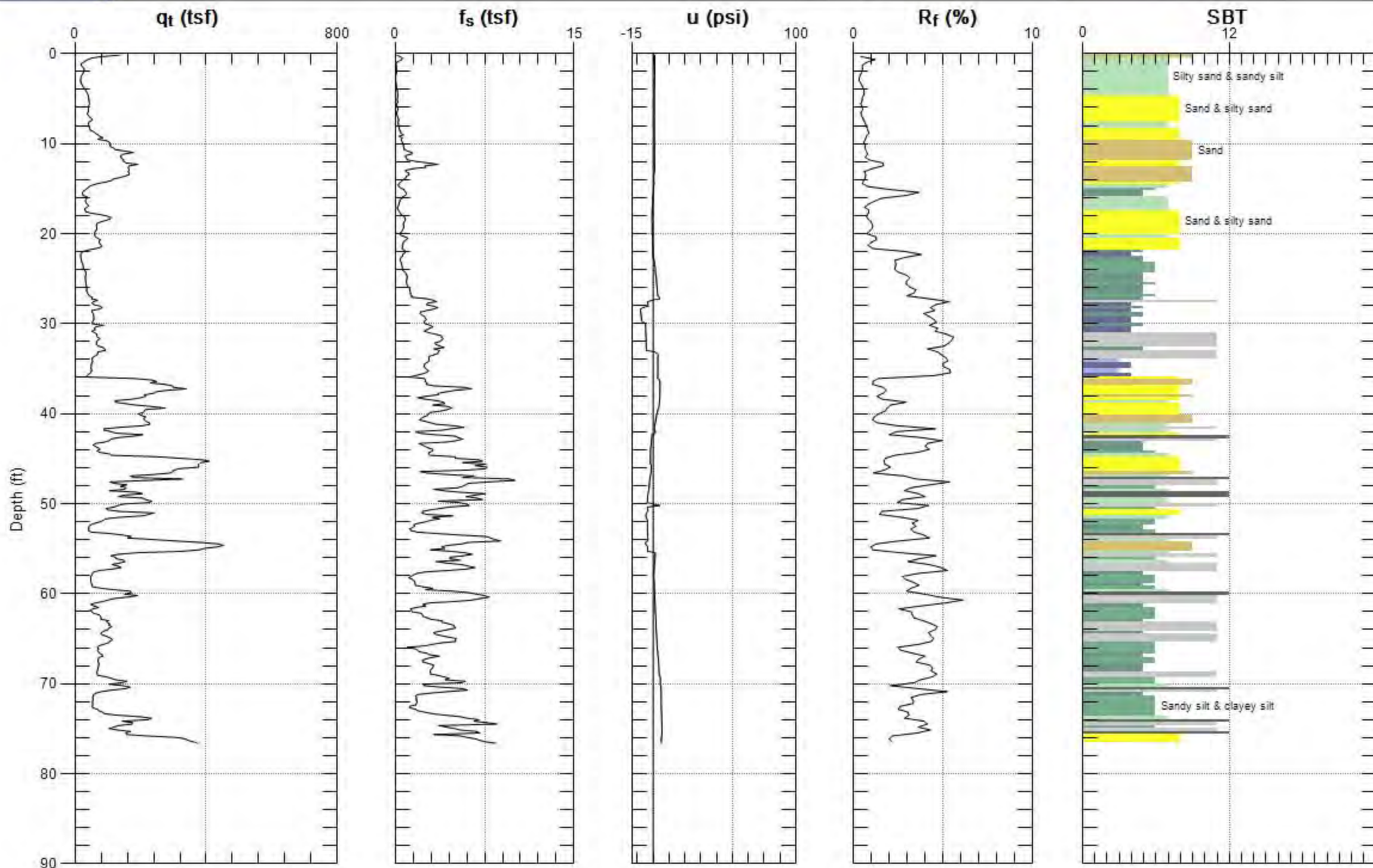


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-111

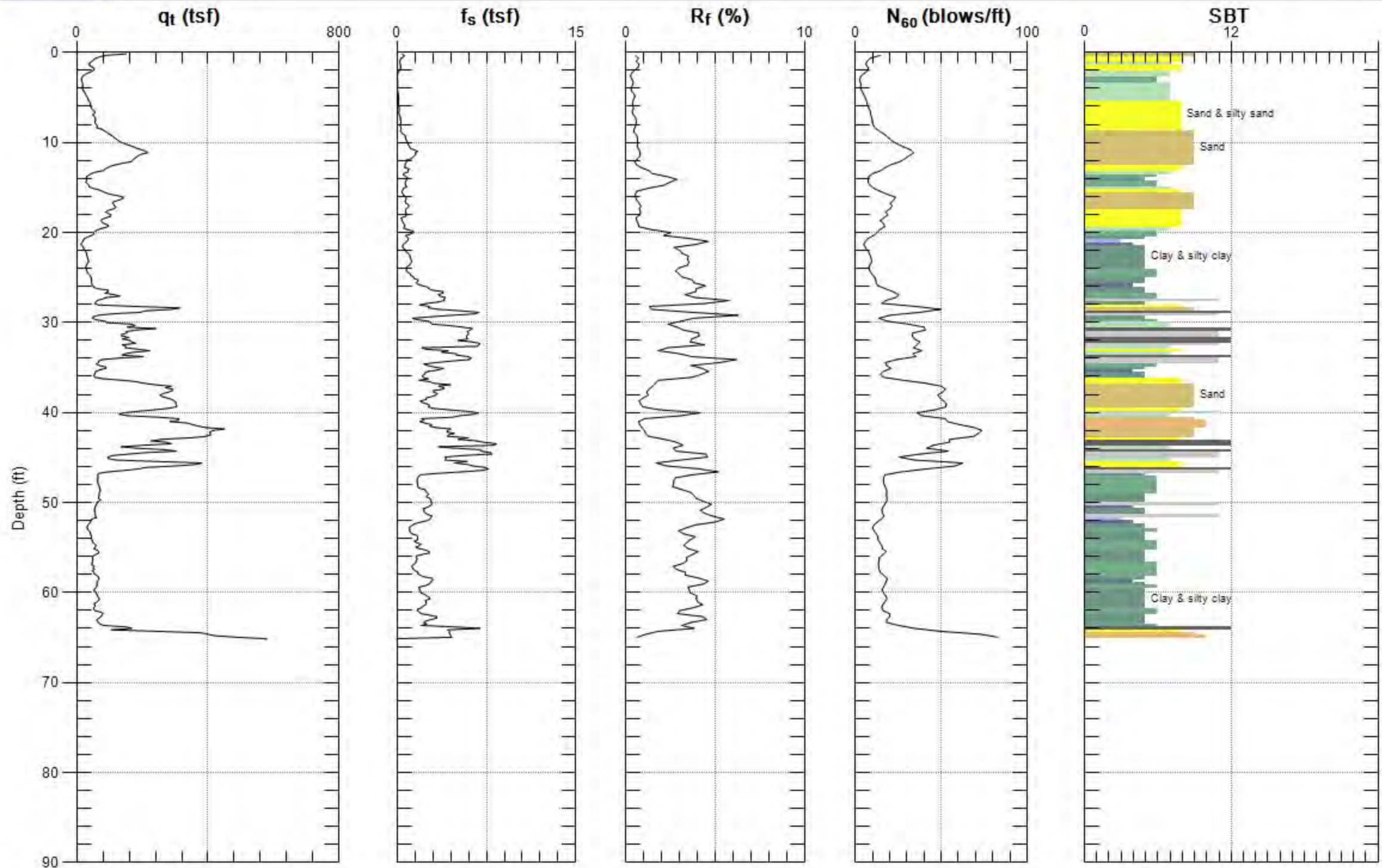
Date: 8/6/2012 01:36



Max. Depth: 76.608 (ft)

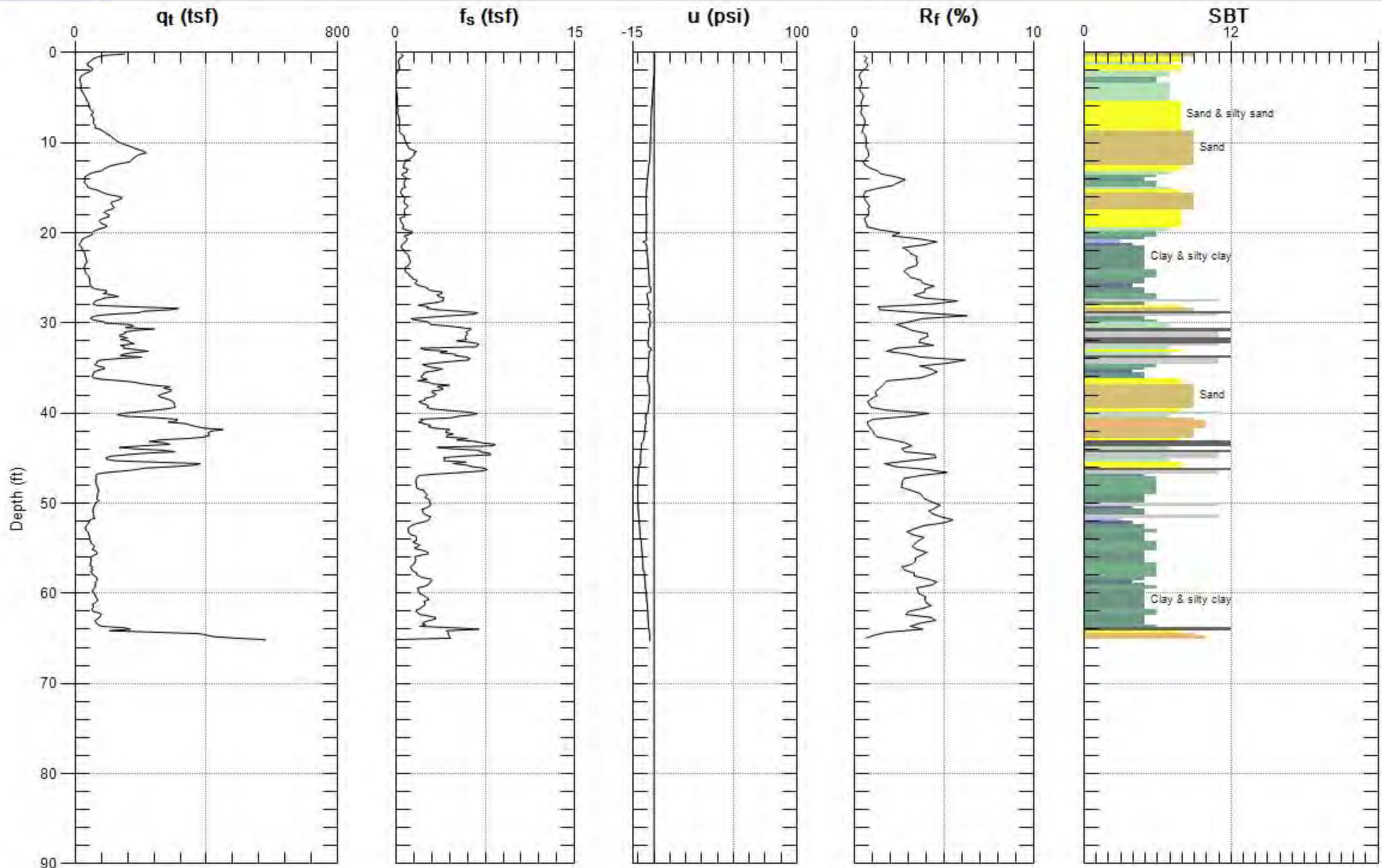
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.289 (ft)
Avg. Interval: 0.328 (ft)

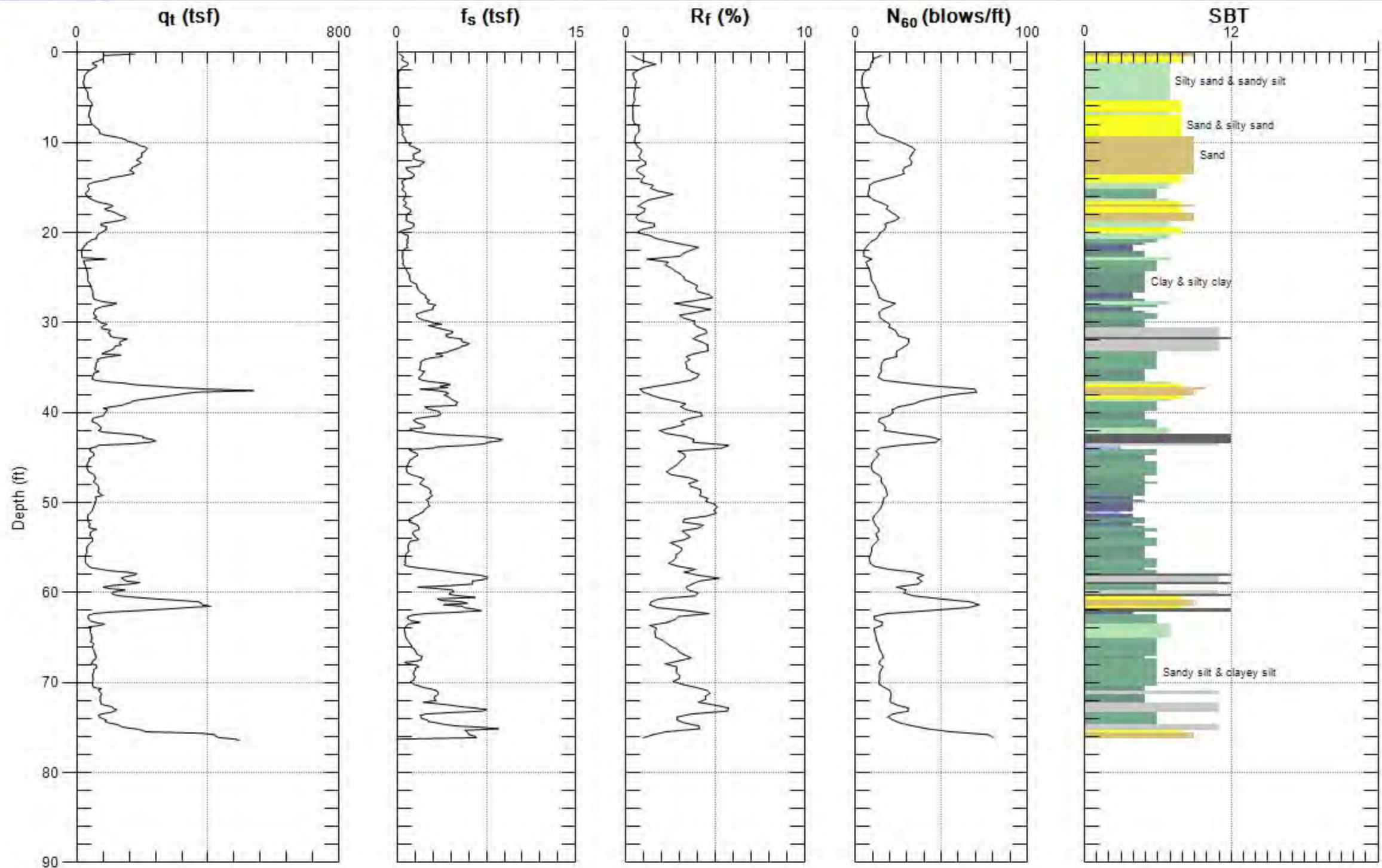
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 65.289 (ft)

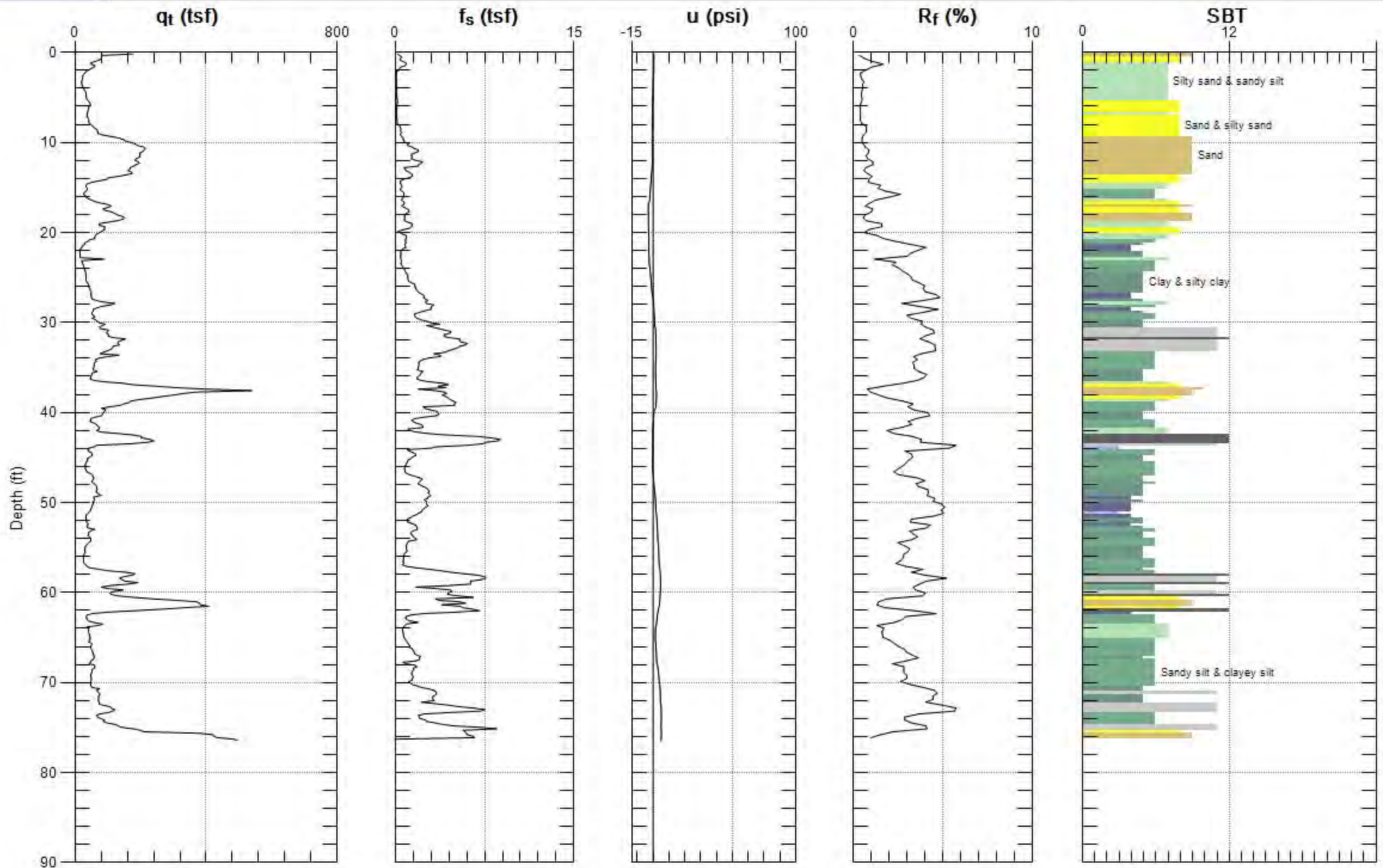
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



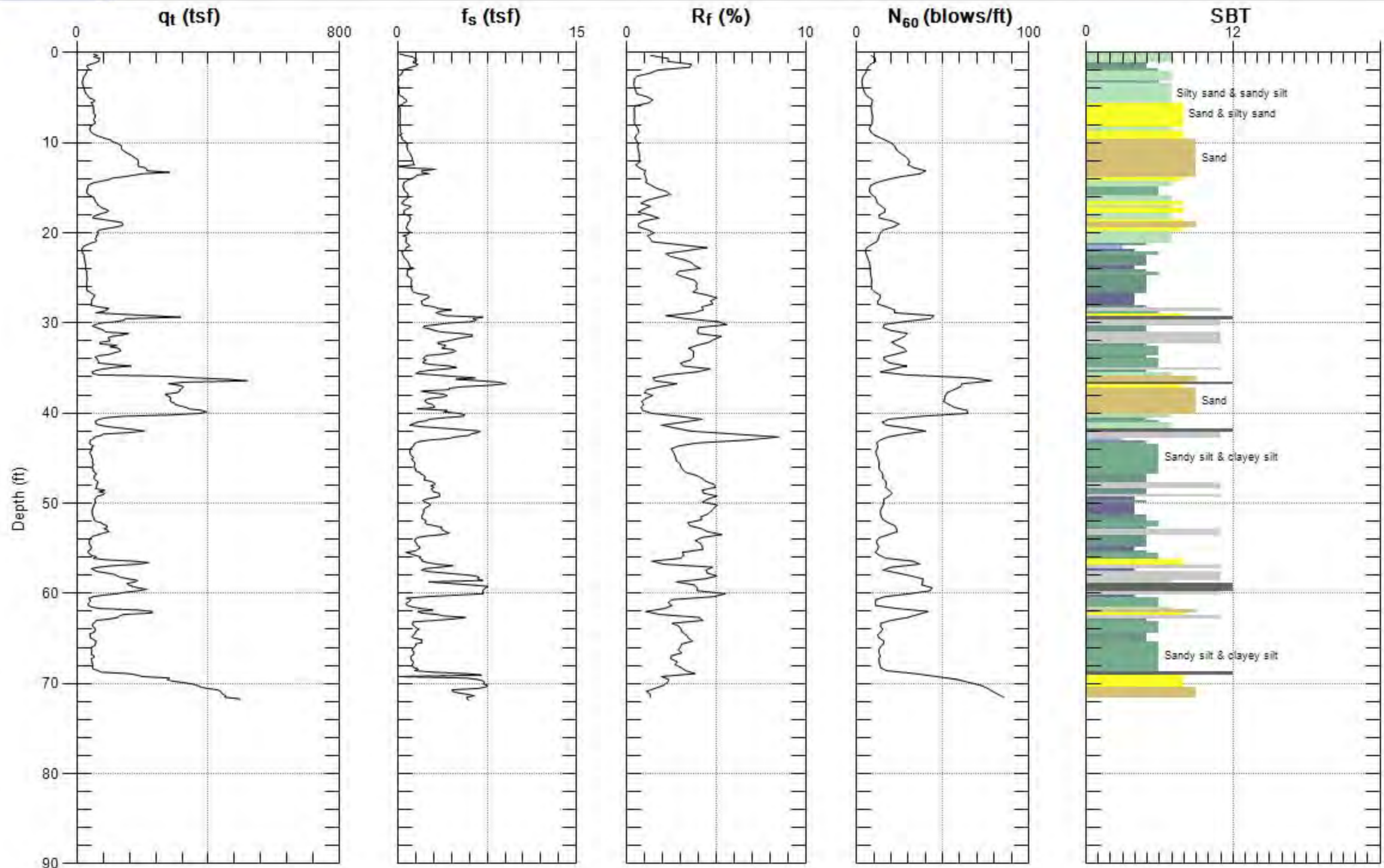
Max. Depth: 76.444 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 76.444 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 71.850 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

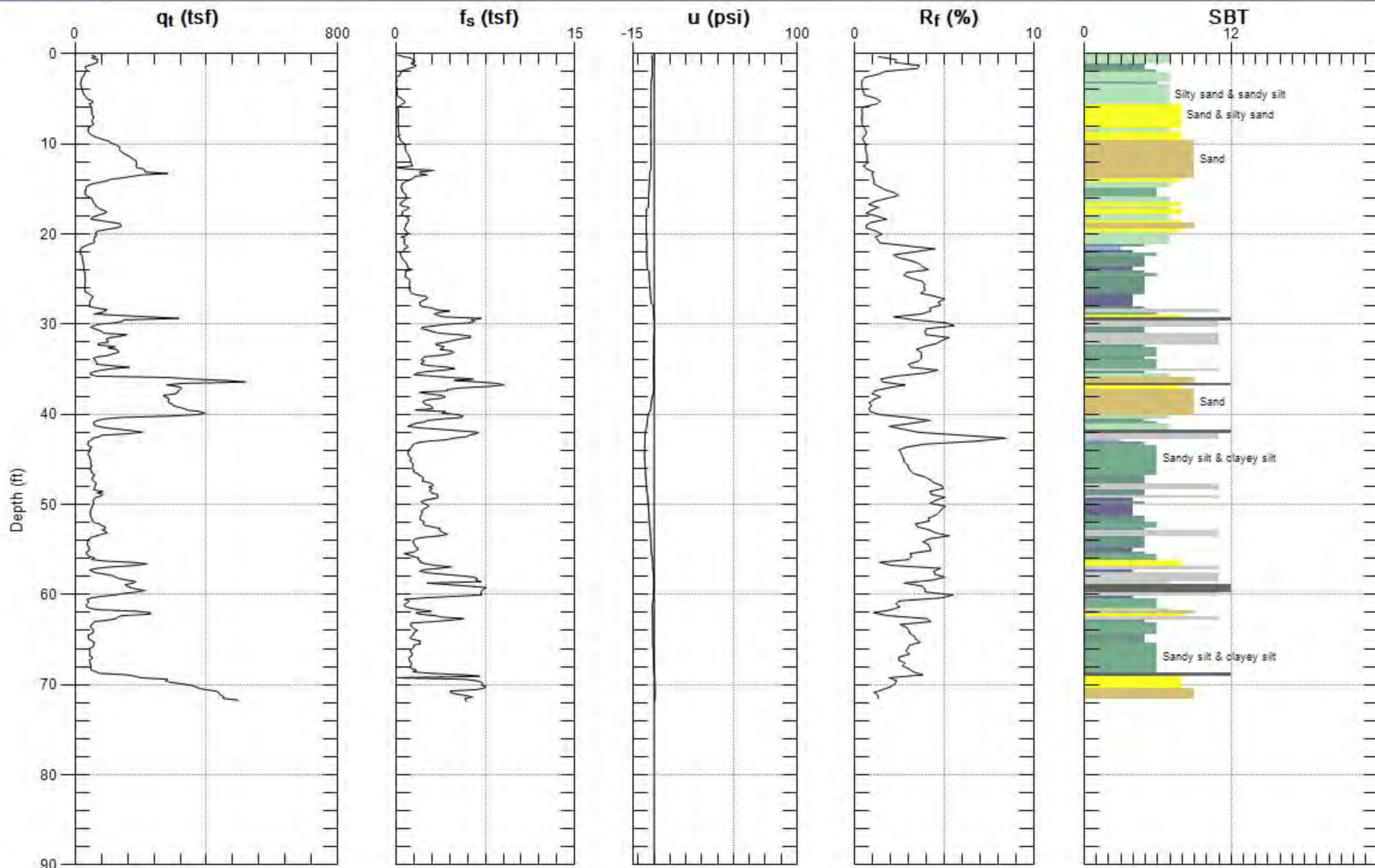


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-114

Date: 8/6/2012 03:43



Max. Depth: 71.850 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

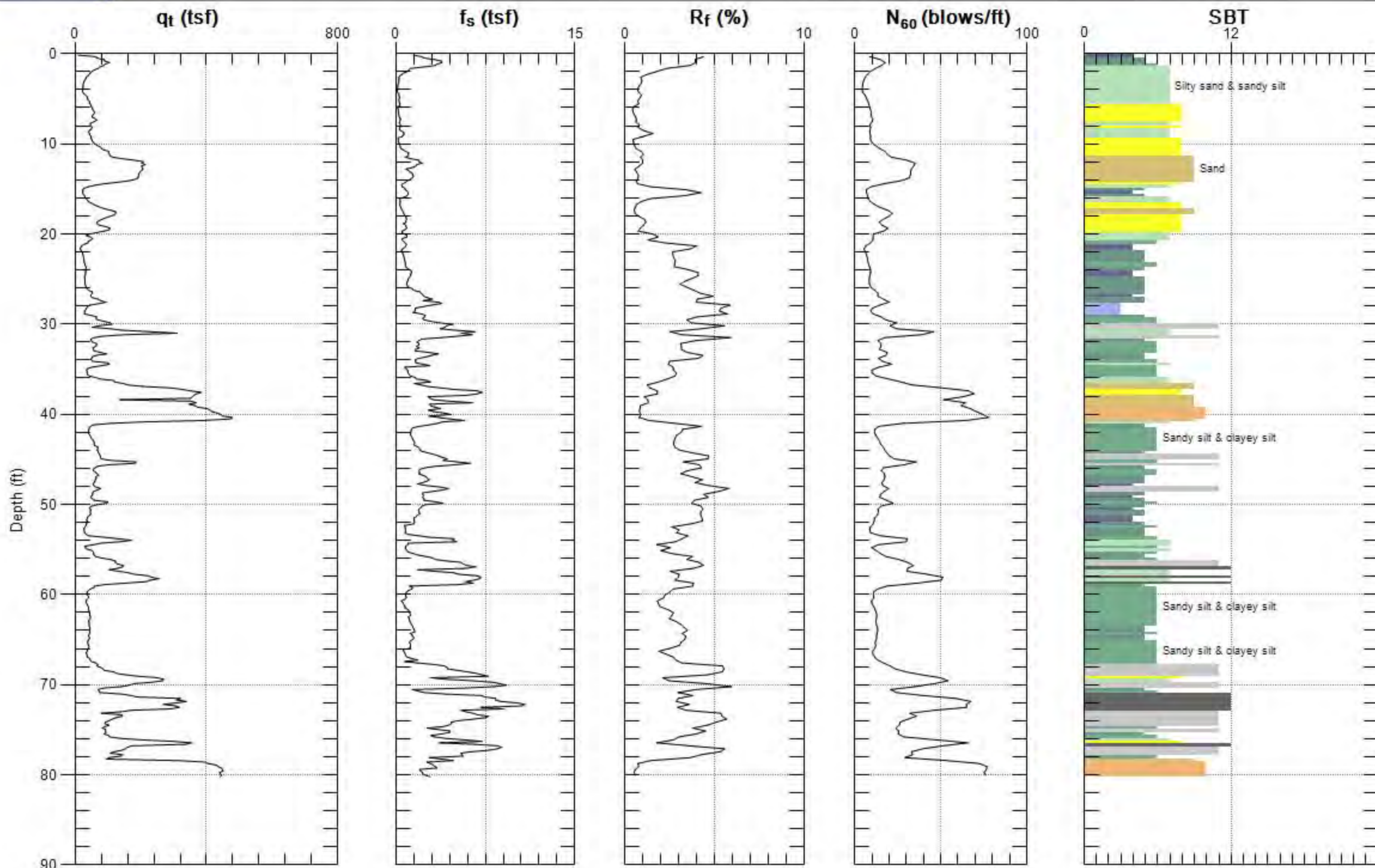


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-115

Date: 8/6/2012 04:45



Max. Depth: 80.217 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

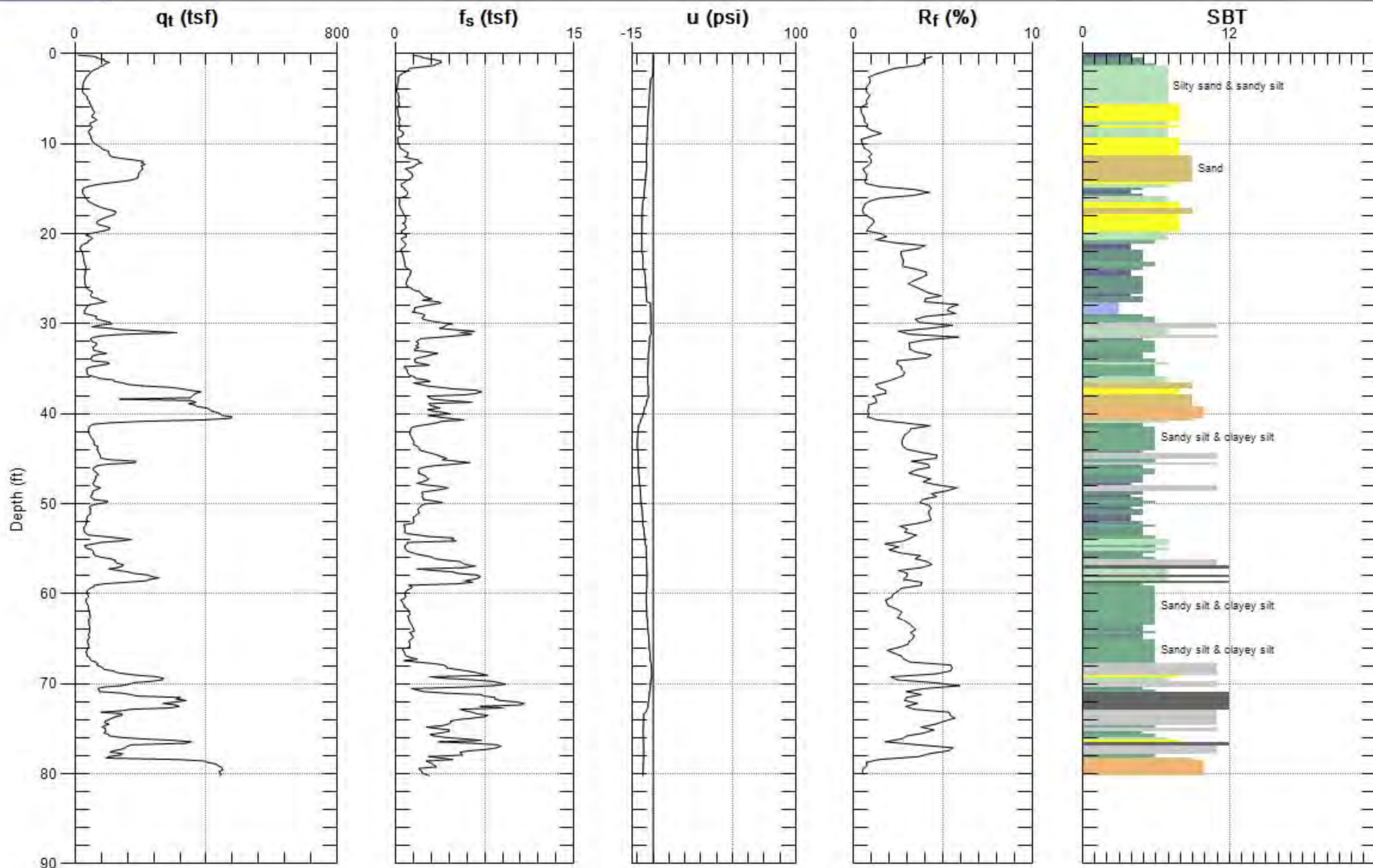


GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-115

Date: 8/6/2012 04:45



Max. Depth: 80.217 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

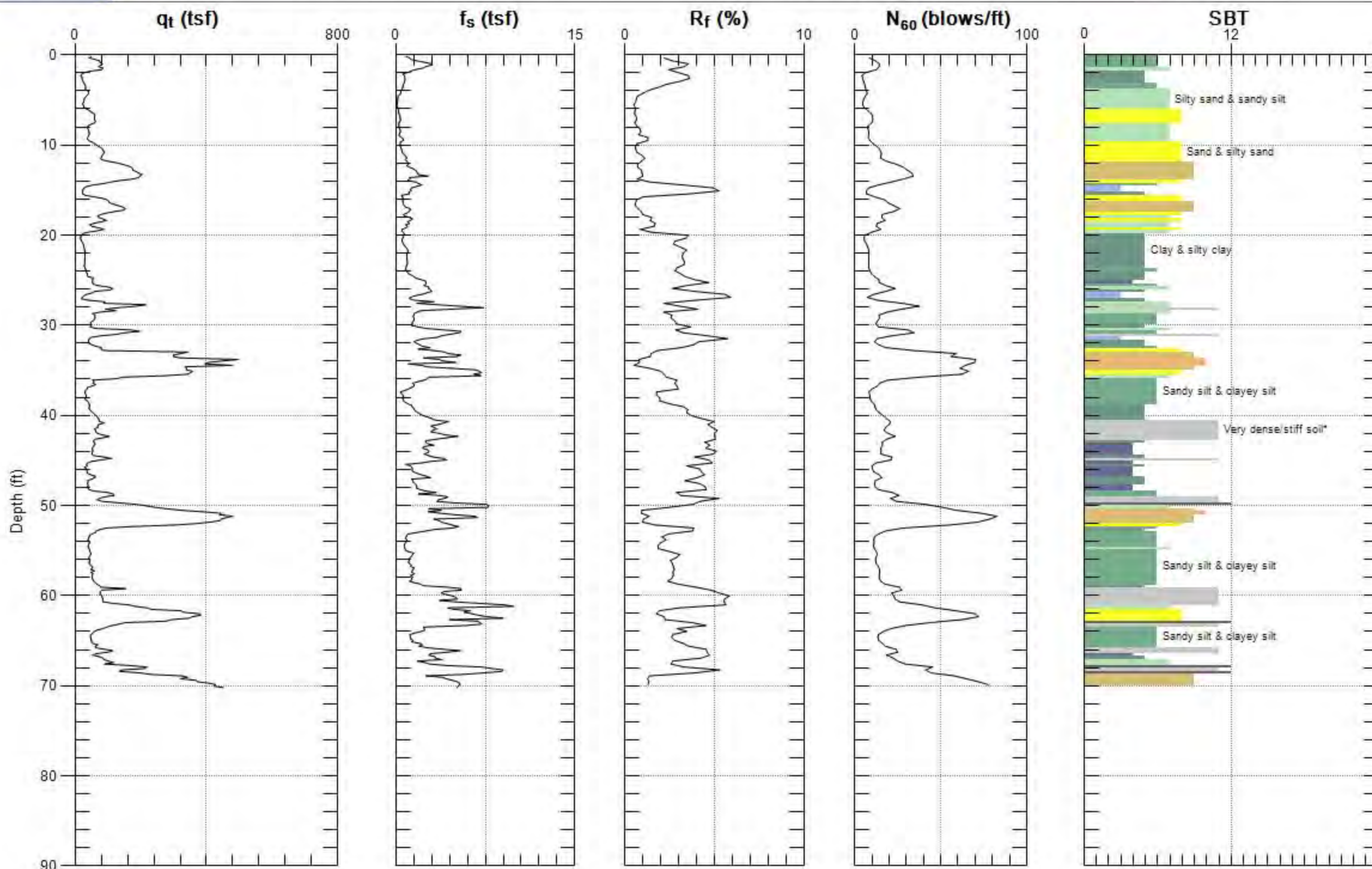


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-116

Date: 8/6/2012 05:34



Max. Depth: 70.210 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

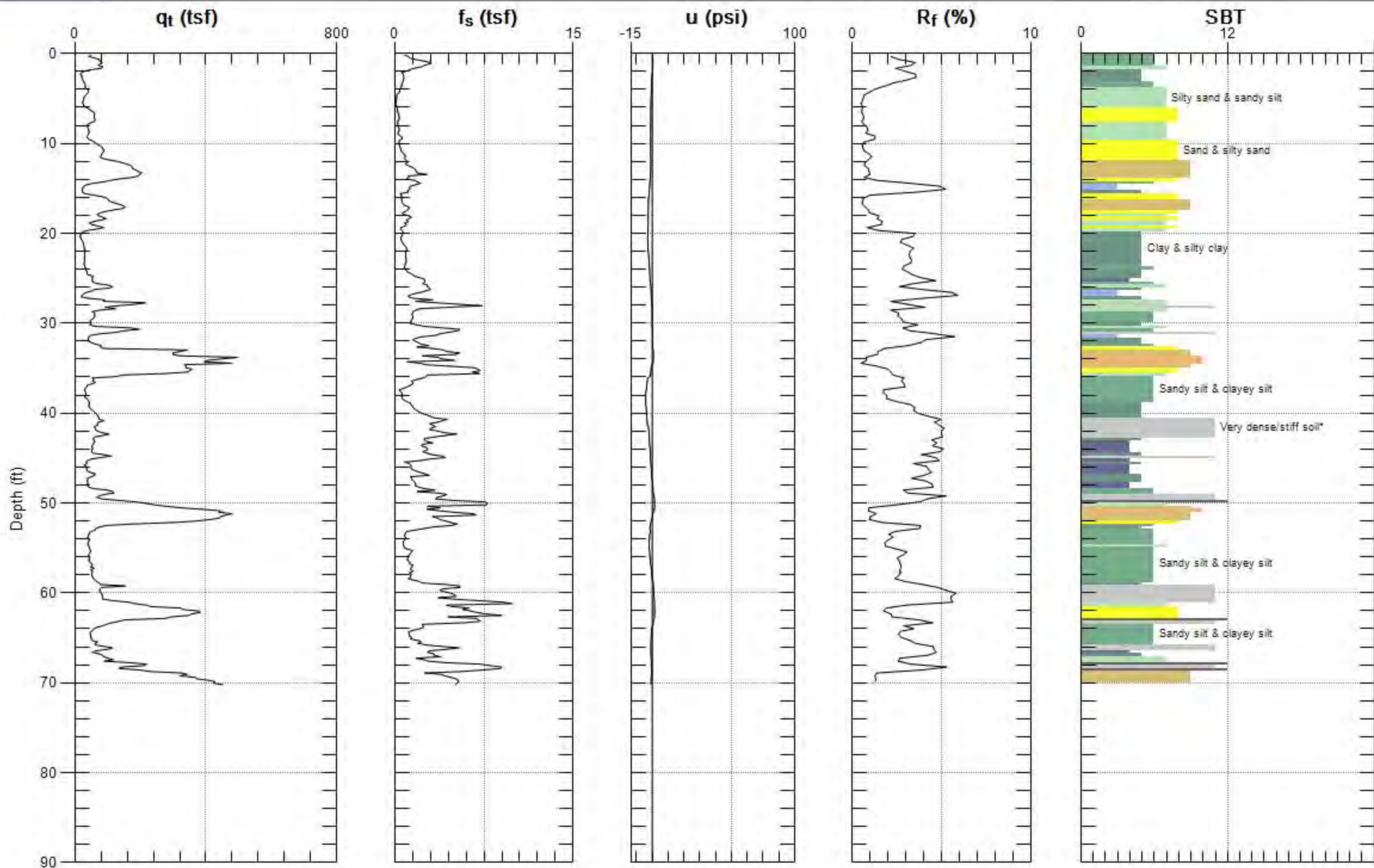


GREGG GROUP DELTA

Site: HOLLYWOOD MILLENNIUM Engineer: E.HOLLIDAY

Sounding: CPT-116

Date: 8/6/2012 05:34




Max. Depth: 70.210 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-1
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
5	385	1	1	1.0/1.0					Asphalt ~ 4in Artificial Fill (Qaf) Silty SAND with Clay Mottled 7.5YR 4/6 (Brown); 5YR 4/1 (Gray); moist; mostly fine to medium SAND; few fine angular GRAVEL.				
		2		2.2/2.5					CAHUENGA SAND (Qs) Clayey SAND 10YR 4/3 (brown); moist; mostly fine to medium SAND. Silty SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND.				
10	380	3		2.2/2.5					Clayey SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND; few medium and coarse SAND; trace carbon fragments. Silty SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND.				
		4	2	2.5/2.5					Clayey SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND; trace medium SAND. Silty SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND; with few medium SAND and trace sub-angular GRAVEL. □ 15': sub-rounded GRAVELS				
15	375	5		1.9/2.5					Clayey SILT 10YR 4/4 (dark yellowish brown); moist; some very fine SAND; trace medium SAND. Silty SAND 7.5YR 4/4 (brown); moist; fine to medium SAND. □ 19.5': Sandy SILT - 3 in lense				
		6	3	2.5/2.5					Silty SAND 7.5YR 4/4 (brown); moist; fine to medium SAND. □ 21': trace coarse GRAVEL				
20	370	7		2.4/2.5									
		8	4	2.1/2.5									
		9		2.2/2.5									
	365												

GROUP GROUP DELTA CONSULTANTS, INC.  370 Amapola Ave. Suite 212 Torrance, California 90501		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
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GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12 GPJ ROCK2.GDT 3/3/15



LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-1
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
		10	5	2.5/2.5									
		11		2.5/2.5									
30	360	12	6	2.5/2.5									
		13		2.5/2.5									
35	355	14	7	2.5/2.5									
		15		2.5/2.5									
40	350	16	8	2.5/2.5									
		17		2.5/2.5									
45	345	18	9	2.5/2.5									
		19		2.5/2.5									
340													

 GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501	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 b

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-1
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Eguene Lewis	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
55	335	20	10	2.5/2.5					Sandy CLAY 5YR 3/4 (Dark Reddish Brown); moist; few fine and medium SAND; trace coarse SAND. -Pin hole casts <div> <div></div> 55.5': 5YR 2.5/2 (dark reddish brown) </div>				
		21		2.5/2.5									
		22	11	2.5/2.5									
		23		1.5/1.5									
60	330								Silty SAND 7.5YR 4/6 (Strong Brown); moist; mostly fine SAND. Clay with Sand 5YR 3/4 (Dark Reddish Brown); moist; few fine SAND.				
Boring terminated at 60 ft. Boring back filled with soil cuttings. No groundwater observed.													
65	325												
70	320												
	315												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-2
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
5	385	1	1	1.0/1.0					Asphalt ~ 4in Artificial Fill (Qaf) Sandy CLAY7.5YR 3/3 (dark brown) and 7.5YR 3/1 (black); moist; few fine to medium SAND.				
		2		2.5/2.5									
10	380	3		2.2/2.5					CAHUENGA SAND (Qs) Silty SAND10YR 5/6 (yellowish brown); moist; fine to medium SAND.				
		4	2	2.5/2.5					Sandy SILT10YR 4/4 (dark yellowish brown); moist; mostly fine SAND.				
		5		2.4/2.5					Silty SAND10YR 5/6 (yellowish brown); moist; fine to medium SAND.				
15	375	6	3	2.5/2.5					Sandy CLAY10YR 4/6 (dark yellowish brown); moist; few fine SAND.				
		7		2.4/2.5					Silty SAND10YR 5/6 (yellowish brown); moist; mostly fine SAND.				
		8	4	2.1/2.5					Clay 10YR 3/6 (dark yellowish brown); moist; few fine SAND.				
20	370	9		2.5/2.5					Silty SAND10YR 4/6 (dark yellowish brown); moist; mostly fine SAND.				
	365								Silty SAND10YR 4/4 (dark yellowish brown); moist; mostly fine SAND.				
									<div> <input type="checkbox"/> 13.5': sub angular fine GRAVEL lense </div> <div> <input type="checkbox"/> 15': increase in fine to very fine SAND </div> <div> <input type="checkbox"/> 24': sub angular fine to coarse GRAVEL lenses </div>				

	GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501	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

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12 GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-2
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
		10	5	2.4/2.5					<u>MUD FLOW (Qm)</u>				
									Clayey SAND10YR 4/4 (dark yellowish brown); moist; fine to medium SAND.				
		11		2.5/2.5					Silty SAND10YR 5/6 (yellowish brown); moist; mostly fine SAND.				
30	360												
		12	6	2.5/2.5					CLAY with Sand7.5YR 4/6 (strong brown); moist; few fine SAND.				
		13		2.5/2.5									
35	355												
		14	7	2.2/2.5					<u>Older Alluvium (Qoal)</u>				
									Sandy CLAY5YR 3/4 (dark reddish brown); moist; some fine SAND.				
		15		2.5/2.5					□ 38.5': 5YR 3/2 (dark reddish brown)				
40	350												
		16	8	2.5/2.5									
		17		2.5/2.5									
45	345												
		18	9	2.5/2.5									
		19		2.5/2.5									
	340												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-2
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Eguene Lewis	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
		20	10	2.5/2.5									
		21		2.5/2.5									
55	335												
		22	11	4.0/4.0					<div> <div></div> 56': mottled 5YR 3/4 (dark reddish brown) to 5Y 5/1 (Gray) with black ash in a clay matrix </div> <div> <div></div> 57.5': 5YR 3/2 (dark reddish brown) </div>				
60	330												
									<div> <div></div> Boring Terminated at 60 ft. Boring backfilled with soil cuttings. Ground Water not encountered during drilling. </div>				
65	325												
70	320												
	315												

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-3
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/7/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in		CHECKED BY Steve Kolthoff
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling		TOTAL DEPTH DRILLED (feet) 60
		INCLINATION FROM VERTICAL BEARING 0		
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	





[illegible]

GROUP GROUP DELTA CONSULTANTS, INC.
370 Amapola Ave. Suite 212
Torrance, California 90501

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FIGURE a

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-3
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/7/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltzoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
30	360	10	5	2.5/2.5					<u>MUD FLOW (Qm)</u> Sand with Clay 10YR 3/4 (dark yellowish brown); moist; mostly fine SAND; some coarse SAND; trace fine GRAVELS; sub rounded.				
		11		2.5/2.5					<u>CLAY with Sand</u> 10YR 3/6 (dark yellowish brown); moist; some fine SAND.				
		12	6	2.5/2.5									
35	355	13		2.5/2.5									
		14	7	2.5/2.5					<u>Older Alluvium (Qoal)</u> Sandy CLAY 5YR 3/3 (dark reddish brown); moist; some medium to coarse SAND.				
		15		2.5/2.5									
40	350	16	8	2.5/2.5									
		17		2.5/2.5					-□ 43.5': 5YR 3/3 (dark reddish brown)				
		18	9	2.5/2.5									
45	345	19		2.5/2.5					□ 48': dark charcoal dispersed within clay matrix.				
									□ 49.5': root casts filled in with clay.				
340													

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-3
SITE LOCATION 1720-1750 N. Vine St.	DATE(S) DRILLED 2/7/2015	LOGGED BY Eguene Lewis		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8 in		CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85	DRILLED BY ABC Drilling		INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

[illegible]

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FIGURE c

GDC ROCK CORE ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-3A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Terry Otis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
5	385								Asphalt ~ 6 in				
									<u>Artificial Fill (Qaf)</u>				
		1	1	23/30									
		2		26/30					<u>CAHUENGA SAND (Qs)</u>				
									Clayey SAND 7.5YR 4/4 to 4/6 (strong brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
									Silty SAND 10YR 4/6 (dark yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND.				
10	380	3	2	23/30					Clayey SAND 10YR 5/6 (yellowish brown); moist; mostly fine sand; trace medium to coarse SAND; trace carbon fragments; micaceous.				
									Silty SAND 10YR 4/6 (yellowish brown) moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL.				
		4		26/30									
15	375								□ 14': Grussified granitic cobble clast; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				
		5	3	24/30									
									Clayey SAND to Sandy SILT 10YR 4/6 (yellowish brown); moist; mostly fine SAND; trace medium and coarse SAND.				
20	370	6		27/30					Silty SAND 10YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				
									□ 18.5': lenses of Clayey SAND to Sandy SILT; approximately 4 in thick.				
		7	4	41/30									
	365												

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GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-3A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Terry Otis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltzoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	



DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
30	360	8	5	28/30					MUD FLOW (Qm) Clayey SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVELS. <div> <div></div> 28.5': 5YR 4/4 (Reddish Brown); trace carbon fragments. </div>				
		9		29/30									
		10	6	31/30									
35	355	11	7	31/30					<div> <div></div> 33': 10YR 5/6 (yellowish brown); mostly fine to medium SAND; few coarse SAND. </div> <div> <div></div> 44': Cobble clast (basalt) moderately weathered </div>				
		12	8	27/30					OLDER ALLUVIUM (Qoal) Clayey SAND 7.5YR 5/6 (reddish brown); mostly fine SAND; trace medium to coarse SAND and fine GRAVEL; trace carbon fragments.				
		13		30/30									
40	350	14	9	35/30									
		15		34/30									
		16	10	32/30									
45	345	17		38/30									
	340												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-3A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Terry Otis	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
55	335	18	11	31/30									
		19		34/30									
		20	12	54/60									
60	330								Boring terminated at 60 ft. Boring backfilled with soil cuttings. No ground water encountered during drilling.				
65	325												
70	320												
	315												

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-4
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/7/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
5	385	1	1	1.0/1.0					Asphalt ~ 4in Artificial Fill (Qaf) Sandy CLAY Mottled 10YR 3/1 (Very Dark Gray) and 7.5YR 3/3 (Dark Brown), moist, mostly fine SAND, trace red brick chips and asphalt debris.				
		2		1.2/2.5									
10	380	3	2	2.0/2.5					QUHUENGA SAND (Qs) Silty SAND 10YR5/6 (yellowish brown); moist; mostly fine SAND; few coarse SAND.				
		4		1.3/2.5									
		5	3	NR					<input type="checkbox"/> 12': increase in coarse quartzite grains <input type="checkbox"/> 13.5': no sample recovery for 2.5 feet.				
15	375	6		1.3/2.5									
		7	4	1.4/2.5					<input type="checkbox"/> 18.5': 7.5YR 4/4 (brown); mostly fine to medium SAND; few coarse SAND.				
		8		1.7/2.5									
		9	5	2.5/2.5									
	365												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-4
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/7/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltzoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
30	360	10		2.5/2.5					<u>MUD FLOW (Qm)</u> Sandy CLAY 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND. <input type="checkbox"/> 30': mottled 7.5YR 4/4 (brown) to 5YR 4/6 (yellowish brown); micaceous; few coarse SAND; trace fine GRAVEL. <input type="checkbox"/> 31': 10YR 4/4 (reddish brown)				
		11	6	2.5/2.5									
		12		2.5/2.5									
35	355	13	7	2.5/2.5					<u>Older Alluvium (Qal)</u> Sandy CLAY 5YR 3/3 (dark reddish brown); moist; mostly fine SAND.				
		14		2.5/2.5					Silty SAND 7.5YR 5/6 (strong brown); moist; mostly fine SAND.				
		15	8	2.5/2.5					Clayey SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND.				
40	350	16		2.5/2.5					Silty SAND 5YR 5/8 (yellowish red); moist; mostly fine SAND.				
		17	9	2.5/2.5					Clayey SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND; some medium to coarse SAND.				
		18		2.5/2.5					Sandy CLAY 7.5YR 5/6 (strong brown); moist; mostly fine SAND, trace medium SAND.				
45	345	19	10	2.3/2.5					<input type="checkbox"/> 47': 5YR 3/3 (dark reddish brown)				
	340												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-4
SITE LOCATION 1720-1750 N. Vine St.	DATE(S) DRILLED 2/7/2015	LOGGED BY Eugene Lewis		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8 in		CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85	DRILLED BY ABC Drilling		INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

[illegible]


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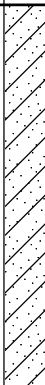


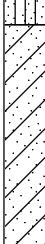
FIGURE c


LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-4A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Terry Otis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltzoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
5	385	1	1	23/30					Asphalt ~ 4in <u>Artificial Fill (Qaf)</u>				
									<u>CAHUENGA SAND (Qs)</u>				
		2		28/30					Clayey SAND 7.5YR 3/4 (dark brown); moist; mostly fine SAND; few medium to coarse SAND; trace fine GRAVEL.				
10	380	3	2	30/30					Silty SAND 10YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				
		4		21/30					Clayey SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND.				
									Silty SAND 10YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				
15	375	5	3	32/30					Clayey SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND.				
		6		24/30					Silty SAND 10YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				
20	370	7	4	26/30					Clayey SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND.				
		8		27/30					Silty SAND 10YR 5/4 (yellowish brown); moist; mostly fine SAND; trace medium SAND.				
									Clayey SAND to Sandy SILT 10YR 5/6 (yellowish brown); moist; mostly fine SAND.				
	365								Silty SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND; trace medium to coarse SAND and fine GRAVEL; trace weathered basalt.				


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LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-4A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Terry Otis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES	
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER							
30	360	9	5	30/30					<u>MUD FLOW (Qm)</u> Clayey SAND 10YR 4/6 (dark yellowish brown); moist; mostly fine SAND; trace medium to coarse SAND and trace fine GRAVEL; trace weathered basalt and grussified granite clasts. -□ 27.5': 5YR 4/4 (reddish brown) □ 31': mottled 10YR 5/4 (yellowish brown) to 10YR 8/1 (gray) □ 32.5 7.5YR 4/6 (strong brown)					
		10		31/30										
		11	6	34/30										
		12		26/30										
	35	355	13	7	28/30				<u>OLDER ALLUVIUM (Qoa)</u> Silty SAND 10YR 4/6 (dark yellowish brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL; trace weathered basalt.					
			14		24/30									
		40	350	15	8	31/30								Clayey SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL; trace carbon fragments.
				16		28/30								
	45		345	17	9	32/30								Silty SAND 10YR 4/6 (dark yellowish brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL; trace weathered basalt. Clayey SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL; trace weathered basalt.
				18		33/30								□ 47.5': higher Clay content, trace carbon fragments.
340														

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LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-4A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Terry Otis	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
55	335	19	10	33/30					<div>50': 5YR 4/4 (reddish brown)</div> <div>52.5': 10YR 4/6 (strong brown)</div> <div>56': 5YR 3/3 (dark reddish brown)</div> <div>58': 5YR 4/4 (reddish brown)</div>				
		20		33/30									
		21	11	36/30									
		22		34/30									
60	330								<div>Boring terminated at 60 ft.</div> <div>Boring back filled with soil cuttings.</div> <div>No ground water encountered during drilling.</div>				
65	325												
70	320												
	315												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-5
SITE LOCATION 1720-1750 N. Vine St.	DATE(S) DRILLED 2/5/2015	LOGGED BY Eguene Lewis		SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8 in		CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85	DRILLED BY ABC Drilling		INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE					LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %						
5 												

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FIGURE a

GDC ROCK CORE ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-5
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/5/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
									<p>Sandy CLAY7.5YR 3/3 (dark brown); moist; mostly fine SAND</p> <p>Sandy CLAY7.5YR 4/3 (brown); moist; mostly fine to medium SAND; few coarse SAND.</p> <p>□ 30': increase in clay content</p>				
		10	3	2.5/2.5									
30	360	11		2.9/2.5									
		12		2.5/2.5									
									<p>OLDER ALLUVIUM (Qoal)</p> <p>Silty SAND10YR 5/6 (yellowish brown); moist; mostly fine SAND; trace fine GRAVEL.</p> <p>-trace fine to coarse GRAVEL.</p>				
35	355	13		2.5/2.5									
		14	4	2.5/2.5									
40	350	15		2.3/2.5					<p>□ 41': 7.5YR 4/6 (strong brown); mostly fine to medium SAND; little coarse SAND and fine GRAVEL; trace COBBLES</p>				
		16		2.2/2.5									
45	345	17	5	2.4/2.5					<p>□ 46': few coarse SAND and fine GRAVEL; trace COBBLES.</p>				
		18		2.3/2.5									
340									<p>□ 49.5': wet.</p>				

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING								PROJECT NAME West Millennium Site		PROJECT NUMBER LA-1191B		BORING B-5	
SITE LOCATION 1720-1750 N. Vine St.								DATE(S) DRILLED 2/5/2015		LOGGED BY Eguene Lewis		SHEET NO. 3 of 3	
DRILLING METHOD Hollow Stem Auger								DRILL BIT SIZE TYPE 8 in		CHECKED BY Steve Koltthoff		TOTAL DEPTH DRILLED (feet) 60	
DRILL RIG TYPE CME 85								DRILLED BY ABC Drilling		INCLINATION FROM VERTICAL BEARING 0			
APPARENT GROUNDWATER DEPTH None encountered								APPROXIMATE SURFACE ELEVATION (feet) 390					
COMMENTS								BOREHOLE BACKFILL Soil Cuttings					

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
		19		0/5					<div> <div></div> 50.5': No recovery for 5 feet. </div>				
55	335	20		2.0/2.5					Clayey SAND 5YR 4/6 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND; micaceous.				
		21	6	3.0/2.5									
60	330								Boring terminated at 60 ft. Boring back filled with soil cuttings. Ground water encountered at approximately 49.5 ft during drilling.				
65	325												
70	320												
	315												



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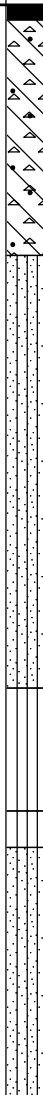
Torrance, California 90501

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

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-5A
SITE LOCATION 1720-1750 N. Vine St.	DATE(S) DRILLED 2/10/2015	LOGGED BY Eguene Lewis		SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8 in		CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85	DRILLED BY ABC Drilling		INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE					LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %						
5	385	1	1	0/1.0				Asphalt ~ 4in Artificial Fill (Qaf)				
		SILT with Sand 7.5YR 3/3 (dark brown); moist; mostly fine SAND; few medium SAND; trace subrounded coarse SAND.										
	2		2.5/2.5			CAHUENGA SAND (Qs) Silty SAND 7.5YR 4/4 (brown); moist; some fine SAND; little medium SAND; few coarse subrounded-subangular SAND; micaceous.						
	3		2.5/2.5									
10	380	2						Silty SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND; few medium SAND; trace subrounded coarse SAND; micaceous.				
	4		1.8/2.5									
	5		1.9/2.5									
15	375	3				Sandy SILT 7.5YR 4/4 (strong brown); moist; little fine SAND; few medium SAND; trace coarse SAND; micaceous. -SAND fine to coarse lenses with trace subangular fine GRAVEL Sandy SILT 7.5YR 4/6 (strong brown); moist; little fine SAND; few medium SAND; trace subangular fine GRAVEL coated in clay. Silty SAND 10YR 5/6 (yellowish brown); moist; mostly fine SAND; few medium SAND. -increase in SILT						
	6		2.4/2.5									
	7		2.5/2.5									
20	370	4										
		8		2.5/2.5			Silty SAND 10YR 4/6 (dark yellowish brown); moist; some fine SAND; little medium SAND; few coarse SAND; trace angular find GRAVEL; micaceous.					
	365	9		2.5/2.5								



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FIGURE a

GDC ROCK CORE ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-5A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
30	360		5						<u>MUD FLOW (Qm)</u> Sandy SILT5YR 3/4 (dark reddish brown); moist; some fine SAND. -increase in plasticity				
			10	2.5/2.5									
			11	2.5/2.5									
			6						-Color change to 5YR 4/3 (reddish brown) -Weathered Quartzite - mostly fine to medium SAND				
35	355		12	2.5/2.5									
			13	2.5/2.5					<u>OLDER ALLUVIUM (Qoa)</u> Sandy CLAY5YR 3/4 (dark reddish brown); moist; some very fine SAND. Sandy CLAY5YR 4/6 (yellowish red); moist; some fine to medium SAND; trace coarse and subrounded fine GRAVEL.				
			7						Silty SAND5YR 4/3 (reddish brown); moist; mostly fine to medium SAND.				
			14	2.5/2.5									
40	350		8						Sand with Silt5YR 3/4 (dark reddish brown); moist; mostly fine to medium SAND; grussification; basalt clasts.				
			15	2.5/2.5					Silty SAND5YR 4/3 (reddish brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL.				
			16	2.5/2.5					-Quartzite and basalt clasts				
			9						Clayey SAND5YR 3/3 (Dark Reddish Brown), moist, mostly fine SAND.				
45	345		17	2.5/2.5					SAND 5YR 4/4 (Reddish Brown), moist, mostly fine to medium SAND, some coarse SAND, few fine GRAVELS.				
			18	2.5/2.5					Silty SAND5YR 4/4 (reddish brown); moist; mostly fine SAND; few medium SAND; trace coarse subrounded SAND; micaceous.				
	340								-Color change to 7.5YR 4/3 (brown)				

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GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-5A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Eguene Lewis	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
			10										
									No recovery from 51.0 to 53.5' bgs				
55	335	19		0/2.5					Silty SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND; little medium SAND; few coarse SAND; weathered quartzite and basalt clasts; micaceous.				
		11											
		20		1.4/2.5									
		21		1.5/1.5					No recovery from 58.5 to 60.0' bgs				
60	330								Boring terminated at 60 ft. Boring back filled with soil cuttings. Ground water encountered at approximately 50 ft during drilling.				
65	325												
70	320												
	315												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15





LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-6
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Terry Otis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.5	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
5	390								Asphalt, approximately 6 inches thick. <u>ARTIFICIAL FILL (Qaf)</u>				
	385	1	1	40/60					<u>CAHUENGA SAND (Qs)</u> Clayey SAND to Sand CLAY10YR 3/3 (dark brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL; micaceous. Silty SAND10YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL. □ 10': mostly fine SAND with trace medium SAND. □ 11': mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL. Clayey SAND to Sand CLAY7.5YR 5/6 (strong brown); moist; mostly fine SAND; track medium SAND. Silty SAND10YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL. Clayey SAND7.5YR 5/6 (strong brown); moist; mostly fine SAND; trace medium to coarse SAND; micaceous. Silty SAND10YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND; micaceous. clayey SAND7.5YR 5/6 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL. Silty SAND7.5YR 5/6 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL.				
	380	2	2	24/30									
		3		26/30									
	375	4	3	14/30									
		5		24/30									
	370	6	4	26/30									
		7		20/30					<u>MUD FLOW (Qm)</u> Clayey SAND7.5YR 5/6 (strong brown); moist;				

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GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-6
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Terry Otis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.5	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
30	365	8	5	31/30					mostly fine SAND; trace medium and coarse SAND; trace fine GRAVEL; micaceous. □ 25': 5YR 4/4 (reddish brown)increase in clay content.				
		9		32/30									
35	360	10	6	57/60					-becomes more yellowish brown, SAND content increased <u>OLDER ALLUVIUM (Qoal)</u> SAND with Silt 10YR 5/6 (Yellowish Brown), moist, fine to medium SAND, trace coarse SAND and fine GRAVEL. Reddish weathered basalt fragments, trace gruficied granite. -mottled with Gray				
	355	11	7	25/60					Silty SAND 10YR 5/6 (Yellowish Brown) to 7.5YR 5/6 (Strong Brown), moist, mostly fine SAND, trace medium SAND, trace carbon.				
40	350	12	8	30/30					-increase fine to medium SAND, few coarse SAND, trace fine GRAVEL - increase to mostly fine SAND, few medium SAND -minor clay content				
		13		24/30									
45	345	14	9	23/30					SAND with Silt 10YR 5/4 (Yellowish Brown) to 7.5YR 5/6 (Strong Brown), moist, mostly fine to medium SAND, few coarse SAND, trace fine GRAVEL				
		15		22/30					Silty SAND 10YR 5/6 (Yellowish Brown) to 7.5YR 5/8 (Strong Brown), moist, mostly fine to medium SAND, few coarse SAND, trace fine GRAVEL.				

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-6
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Terry Otis	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.5	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
55	340	16	10	22/30					SAND with Silt 10YR 5/4 (Yellowish Brown), wet, mostly fine to medium SAND, few coarse SAND, trace fine GRAVEL.				
		17		22/30									
	335	18	11	30/30									
		19		28/30									
60	330								Boring terminated at 60 ft. Boring back filled with soil cuttings. Ground water encountered at approximately 50 ft during drilling.				
65	325												
70	320												

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-6A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.5	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

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LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-6A
SITE LOCATION 1720-1750 N. Vine St.	DATE(S) DRILLED 2/10/2015	LOGGED BY Eguene Lewis		SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8 in		CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85	DRILLED BY ABC Drilling		INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.5	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

GDC ROCK CORE ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

FIGURE b

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-6A
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/10/2015	LOGGED BY Eguene Lewis	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltzoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 390.5	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
55	340								fine to medium SAND; few angular coarse SAND; micaceous.				
		20		2.5/2.5					- Weathered basalt in Silty Sand maxtix.				
		21	11	2.5/2.5									
	335								SAND 7.5YR 4/6 (strong brown); moist; mostly fine to coarse SAND; indurated.				
		22		1.4/2.5					Silty SAND 7.5YR 4/6 (strong brown); moist; mostly fine to coarse SAND; trace fine angular GRAVEL; micaceous.				
60		23	12	1.5/1.5					SAND with Silt 7.5YR 4/6 (strong brown); moist; mostly fine to coaruse SAND; trace fine angular GRAVEL, micaceous.				
	330								Boring terminated at 60 ft. Boring back filled with soil cuttings. Ground water encountered at approximately 49 ft during drilling.				
65	325												
70	320												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-7
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/6/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltzoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 391	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	390								Ashpalt, approximately 6 inches thick. Artificial Fill (Qaf)				
5	385	1	1	1.0/1.0									
		2		1.8/2.5					CAHUENGA SAND (Qs)				
									Silty SAND 7.5YR 5/8 (strong brown); moist; mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL.				
		3		2.0/2.5									
10	380	4		2.1/2.5					□ 12': 10YR 5/6 (yellowish brown); mostly fine SAND; few medium SAND; trace fine GRAVEL.				
		5		2.4/2.5									
15	375	6	2	2.2/2.5					Sandy SILT 10YR 4/4 (dark yellowish brown); moist; fine SAND.				
		7		2.5/2.5					□ 19': 7.5YR 5/6 (strong brown); little CLAY.				
20	370	8		2.5/2.5					MUD FLOW (Qm)				
		9		2.5/2.5					Clayey SAND 10YR 5/6 (yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL.				

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-7
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/6/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 391	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	365		3										
	10			2.5/2.5									
	11			2.5/2.5									
30													
	360												
	12			2.1/2.5									
	13			2.1/2.5									
35			4										
	355												
	14			0.4/2.5									
	15			2.5/2.5									
40													
	350												
	16			2.5/2.5									
	17			2.5/2.5									
45													
	345		5										
	18			2.5/2.5									
	19			2.5/2.5									

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LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-7
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/6/2015	LOGGED BY Eguene Lewis	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 391	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	340	20		2.5/2.5					fine to medium SAND; trace coarse SAND; trace fine GRAVEL.				
		21		1.6/2.5					Clayey SAND 7.5YR 4/6 (strong brown); moist; fine SAND; trace fine GRAVEL.				
			6						53.5': 10YR 5/6 (yellowish brown); wet.				
55	335	22		2.4/2.5									
		23		1.5/1.5					58': 10YR 4/4 (dark yellowish brown)				
60	330								Total depth 60 feet below ground surface. Groundwater encountered during drilling at approximately 49 feet below ground surface. Backfilled with soil cuttings and patched with cold patch.				
65	325												
70	320												






GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-8
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/6/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 391	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	390								Asphalt approximately 6 inches thick Artificial Fill (Qaf)				
5	385	1	1	0.9/1.0					CAHUENGA SAND (Qs)				
		2		0.3/2.5					Silty SAND 7.5YR 5/8 (strong brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				
		3		2.5/2.5									
10	380	4		2.3/2.5					Clayey SAND 7.5YR 5/8 (strong brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL. Silty SAND 7.5YR 5/8 (strong brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				
		5		2.5/2.5					MUD FLOW (Qm)				
15	375	6	2	1.8/2.5					Clayey SAND 7.5YR 5/8 (strong brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL. Clayey SAND 5YR 4/4 (reddish brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				
		7		3.7/2.5									
20	370	8		2.5/2.5					Older Alluvium (Qoal)				
		9	3	2.3/2.5					Silty SAND 10YR 5/4 (yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				

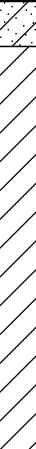
GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-8
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/6/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 391	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
30	365	10		2.5/2.5					Clayey SAND 5YR 5/4 (reddish brown); moist; mostly fine SAND; few medium SAND.				
		11		2.5/2.5									
35	360	12		2.5/2.5					Silty SAND 7.5YR 5/8 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND and fine GRAVEL.				
		13	4	1.9/2.5					<input type="checkbox"/> 35': trace cobbles				
40	355	14		2.1/2.5					Clayey SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine SAND; trace medium and coarse SAND; trace fine GRAVEL.				
		15		2.5/2.5					Silty SAND 7.5YR 4/6 (strong brown); moist; mostly fine to medium SAND.				
45	350	16	5	2.5/2.5									
		17		1.4/2.5									
	345	18		2.3/2.5					<input type="checkbox"/> 45.5': rounded granitic cobble.				
		19		2.5/2.5					Clayey SAND 7.5YR 4/6 (strong brown); moist; mostly fineSAND; trace medium to coarse SAND; trace fine GRAVEL.				
									<input type="checkbox"/> 49.5': Wet; groundwater encountered during drilling.				

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LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-8
SITE LOCATION 1720-1750 N. Vine St.	DATE(S) DRILLED 2/6/2015	LOGGED BY Eguene Lewis		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8 in		CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85	DRILLED BY ABC Drilling		INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 391	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
55	340	20		2.5/2.5					Sandy CLAY 7.5YR 3/4 (dark brown); wet; fine SAND; few pinhole pores.				
	21		2.1/2.5										
	335	22		2.0/2.5									
	23		1.5/1.5										
	330												
65	325								Total depth □ 60 feet below ground surface. Groundwater encountered during drilling at approximately 49.5 feet below ground surface. Backfilled with soil cuttings and patched with cold patch.				
	320												



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Torrance, California 90501

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

GDC ROCK CORE ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-9
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/8/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 2
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltzoff	TOTAL DEPTH DRILLED (feet) 40
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 392.5	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
									Asphalt, approximately 6-inches thick <u>Artificial Fill (Qaf)</u>				
390													
5		1	1	1.0/1.0					<u>CAHUENGA SAND (Qs)</u>				
		2		2.3/2.5					Clayey SAND 10YR 4/3 (brown); moist; mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL				
385									Silty SAND 10YR 4/3 (brown); moist; mostly fine to medium SAND; trace coarse SAND.				
		3	2	2.5/2.5					Clayey SAND 7.5YR 4/4 (brown); moist; mostly fine to medium SAND; trace fine SAND.				
10									Silty SAND 10YR 4/4 (dark yellowish brown); moist; mostly fine to medium SAND; trace coarse SAND; few fine GRAVEL.				
		4		2.5/2.5									
380									<u>MUD FLOW (Qm)</u>				
		5	3	2.5/2.5					Clayey SAND 7.5YR 4/4 (brown); moist mostly fine SAND; trace medium and coarse SAND.				
15									<u>OLDER ALLUVIUM (Qoa)</u>				
		6		2.5/2.5					Clayey SAND 7.5YR 4/4 (brown); moist; mostly fine to medium SAND; trace coarse SAND and fine GRAVEL.				
375													
		7	4	2.5/2.5									
20													
		8		2.3/2.5									
370													
		9	5	2.3/2.5									

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-9
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/8/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 2
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 40
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 392.5	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	365	10		2.3/2.5									
30		11	6	2.1/2.5									
	360	12		2.5/2.5									
35		13	7	2.2/2.5									
	355	14		2.3/2.5									
40		15	8	1.5/1.5					<div> <div></div> <div>Silty SAND10YR 4/4 (dark yellowish red); moist; mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL.</div> <div></div> <div>Clayey SAND7.5YR 4/4 (brown); moist; mostly fine to medium SAND; few coarse SAND and fine GRAVEL.</div> </div>				
	350								<div>Total depth 40 feet below ground surface.</div> <div>No groundwater.</div> <div>Backfilled with soil cuttings and capped with cold patch.</div>				
45													
	345												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-10
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/8/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 2
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 40
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 394	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
									Asphalt, approximately 6 inches thick. <u>Artificial Fill (Qaf)</u>				
5	390	1	1	1.0/1.0									
		2		2.2/2.5					<u>CAHUENGA SAND (Qs)</u>				
									Silty SAND 10YR 4/4 (dark yellowish brown); mostly fine to medium SAND.				
									<u>MUD FLOW (Qm)</u>				
10	385	3	2	2.5/2.5					Clayey SAND 5YR 4/4 (reddish brown); moist; mostly fine SAND; trace medium SAND; few coarse SAND, trace fine GRAVEL.				
		4		2.5/2.5					<u>OLDER ALLUVIUM (Qoal)</u>				
									Clayey SAND 5YR 4/4 (reddish brown); moist; mostly fine to medium SAND; few coarse SAND; trace fine GRAVEL.				
15	380	5	3	2.5/2.5					Clayey SAND 5YR 4/5 (yellowish red); mostly fine sand.				
		6		2.5/2.5									
20	375	7	4	2.5/2.5									
		8		2.5/2.5					Sandy SILT 5YR 4/4 (reddish brown); moist; mostly fine to medium SAND; trace fine GRAVEL.				
									Sandy CLAY 5YR 4/4 (reddish brown); moist; fine SAND; trace medium SAND.				
	370	9	5	2.5/2.5					Silty SAND 5YR 4/6 (yellowish red); moist; mostly fine SAND.				

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GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-10
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/8/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 2
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 40
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 394	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
		10		2.5/2.5					Clayey SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND; trace medium SAND. <input type="checkbox"/> 26': trace fine to medium SAND; trace oxidation staining.				
365		11	6	2.5/2.5					<input type="checkbox"/> 29.5': trace fine GRAVEL.				
30		12		2.5/2.5					<input type="checkbox"/> 31': trace COBBLES.				
		13	7	2.0/2.5					SAND 10YR 5/4 (yellowish brown); moist; mostly fine to medium SAND.				
360		14		2.5/2.5					Clayey SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND.				
35		15	8	1.5/1.5									
355													
40									Total depth <input type="checkbox"/> 40 feet below ground surface. No groundwater. Backfilled with soil cuttings and patched with cold patch.				
350													
45													
345													

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-11
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Terry Otis	SHEET NO. 1 of 2
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Kolthoff	TOTAL DEPTH DRILLED (feet) 40
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 395	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
									Asphalt, approximately 6-inches thick <u>Artificial Fill (Qaf)</u>				
5	390	1	1	30/30									
		2		30/30					<u>OLDER ALLUVIUM (Qoa)</u> Clayey SAND5YR 3/2 (dark reddish brown); moist; mostly fine SAND; trace medium to coarse SAND; trace fine GRAVEL; trace red weathered weathered basalt fragments. Clayey SAND to sandy CLAY5YR 4/4 (reddish brown); moist; mostly fine SAND; trace medium and coarse SAND; trace fine GRAVEL; trace red weathered basalt fragments. Clayey SAND7.5YR 3/4 (dark reddish brown); moist; mostly fine SAND; trace medium to coarse SAND; trace fine GRAVEL; trace red weathered weathered basalt fragments. Silty SAND7.5YR 4/6 (strong brown); moist; mostly fine SAND; trace medium and coarse SAND; trace fine GRAVEL.				
10	385	3	2	28/30									
		4		23/30									
15	380	5	3	26/30					16': trace red weathered basalt fragments.				
		6		28/30					Clayey SAND7.5YR 4/6 (strong brown); moist; mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL; trace red weathered basalt fragments. 18': increase in clay content; mostly fine SAND; trace medium to coarse SAND; trace fine GRAVEL. 21': trace red weathered basalt fragments; trace black carbon fragments. 22.5': increase in sand content; mostly fine SAND; with trace medium to coarse SAND; trace fine GRAVEL.				
20	375	7	4	33/30									
		8		20/30									
	370												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-11
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/9/2015	LOGGED BY Terry Otis	SHEET NO. 2 of 2
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 40
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 395	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
30	365	9	5	27/30					Silty Clayey SAND 7.5YR 4/6 (strong brown); moist; mostly fine SAND; little medium SAND; trace coarse SAND; trace fine GRAVEL. <input type="checkbox"/> 26': trace medium to coarse SAND; trace fine gravel; trace carbon fragments. <input type="checkbox"/> 27': trace red weathered basalt fragments. <input type="checkbox"/> 29.5': mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL.				
		10		21/30									
		11	6	31/30									
		12		36/30									
35	360	13	7	36/30					Clayey SAND 7.5YR 4/4 (strong brown); moist; mostly fine SAND; few medium SAND; trace coarse SAND; trace fine GRAVEL.				
		14		21/30									
40	355								<input type="checkbox"/> 39': Wet; groundwater encountered during drilling.				
45	350								Total depth <input type="checkbox"/> 40 feet below ground surface. Groundwater encountered during drilling at approximately 39 feet below ground surface. Backfilled with soil cuttings and patched with cold patch.				
	345												

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-12
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/5/2015	LOGGED BY Eguene Lewis	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 396	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	395								Asphalt approximately 3 inches thick <u>Artificial Fill (Qaf)</u>				
		1	1	1.4/2.5									
5	390	2		1.7/2.5					<u>OLDER ALLUVIUM (Qoa)</u>				
									<u>Clayey SAND</u> 7.5YR 5/6 (strong brown); moist; mostly fine to medium SAND; trace coarse SAND.				
		3		1.9/2.5					<u>Sandy CLAY</u> 7.5YR 5/6 (strong brown); moist; mostly fine SAND.				
10									<u>Clayey SAND</u> 7.5YR 4/4 (brown); moist; mostly fine to medium SAND; trace coarse SAND; trace fine GRAVEL.				
	385	4		2.1/2.5									
		5		3.0/2.5									
15		2							<u>Silty SAND</u> 7.5YR 4/4 (brown); moist; mostly fine to medium SAND; trace coarse SAND.				
	380	6		2.5/2.5					<u>Clayey SAND</u> 7.5YR 4/4 (brown); moist; mostly fine to medium SAND; trace coarse SAND.				
		7		2.1/2.5									
20		3							<u>Silty SAND</u> 7.5YR 4/4 (brown); moist; mostly fine SAND; trace medium SAND and fine GRAVEL.				
	375	8		2.3/2.5									
		9		2.4/2.5									
									<div> <div></div> <div>22': mostly fine to medium SAND.</div> </div> <div> <div></div> <div>23.5': mostly fine SAND</div> </div>				

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GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-12
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/5/2015	LOGGED BY Eguene Lewis	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 396	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	370	10		2.5/2.5									
		11		3.0/2.5									
30			4										
	365	12		2.3/2.5									
		13		2.3/2.5									
35													
	360	14		2.4/2.5									
		15	5	4.5/5.0									
40													
	355												
		16		2.3/2.5									
45													
	350	17		2.5/2.5									
			6										
		18		2.5/2.5									

	GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501	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 b

GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME West Millennium Site	PROJECT NUMBER LA-1191B	BORING B-12
SITE LOCATION 1720-1750 N. Vine St.		DATE(S) DRILLED 2/5/2015	LOGGED BY Eguene Lewis	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8 in	CHECKED BY Steve Koltthoff	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 85		DRILLED BY ABC Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 396	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	345	19		2.3/2.5					<div> <div>Topanga Formation (Tt)</div> <div> Silty SAND 7.5YR 4/4 (brown); moist to wet; mostly fine to medium SAND; few fine to coarse GRAVEL, interbedded conglomerate and silt stone. </div> </div>				
		20		2.3/2.5									
55	340	21	7	2.5/2.5									
		22		1.5/1.5									
60	335								<div> <div>Total depth 60 feet below ground surface.</div> <div>Ground water encountered at approximately 50 ft during drilling</div> <div>Backfilled with soil cuttings and patched with cold patch.</div> </div>				
65	330												
70	325												

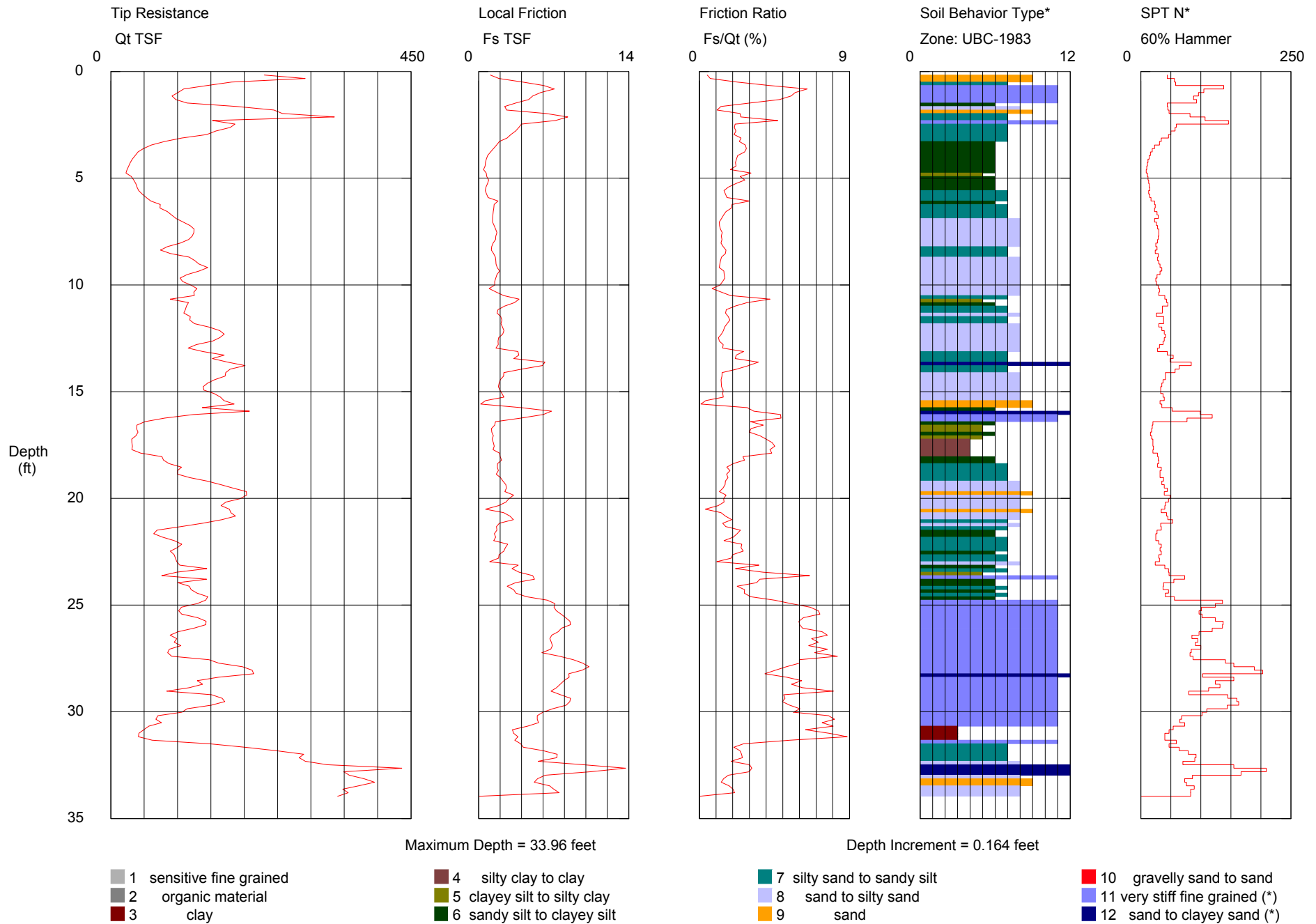
GDC_ROCK_CORE_ENG LA-1191B SOIL CORES B-1 - B-12.GPJ ROCK2.GDT 3/3/15

YUCCA SITE, FAULT ACTIVITY INVESTIGATION 6230 YUCCA STREET, SW CORNER OF YUCCA STREET AND ARGYLE AVENUE HOLLYWOOD AREA, CITY OF LOS ANGELES, CALIFORNIA, CPT and BORING LOGS.

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-01b*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 3:53:44 PM
Location: Yucca
Job Number: LA-1161

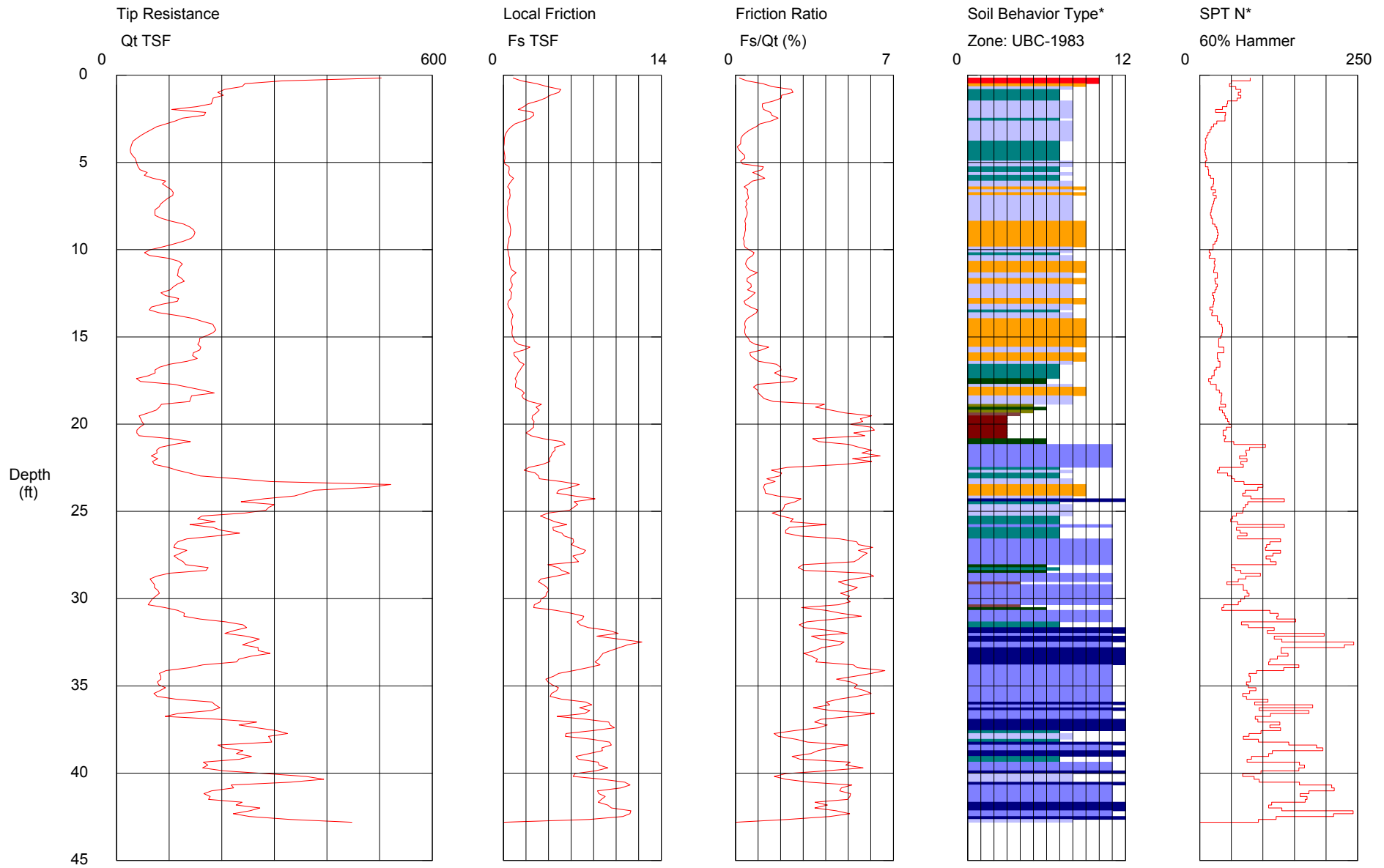


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-02*
Cone Used: DSG1104

CPT Date/Time: 10/21/2013 8:34:23 AM
Location: Yucca
Job Number: LA-1161



Maximum Depth = 42.81 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay

4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt

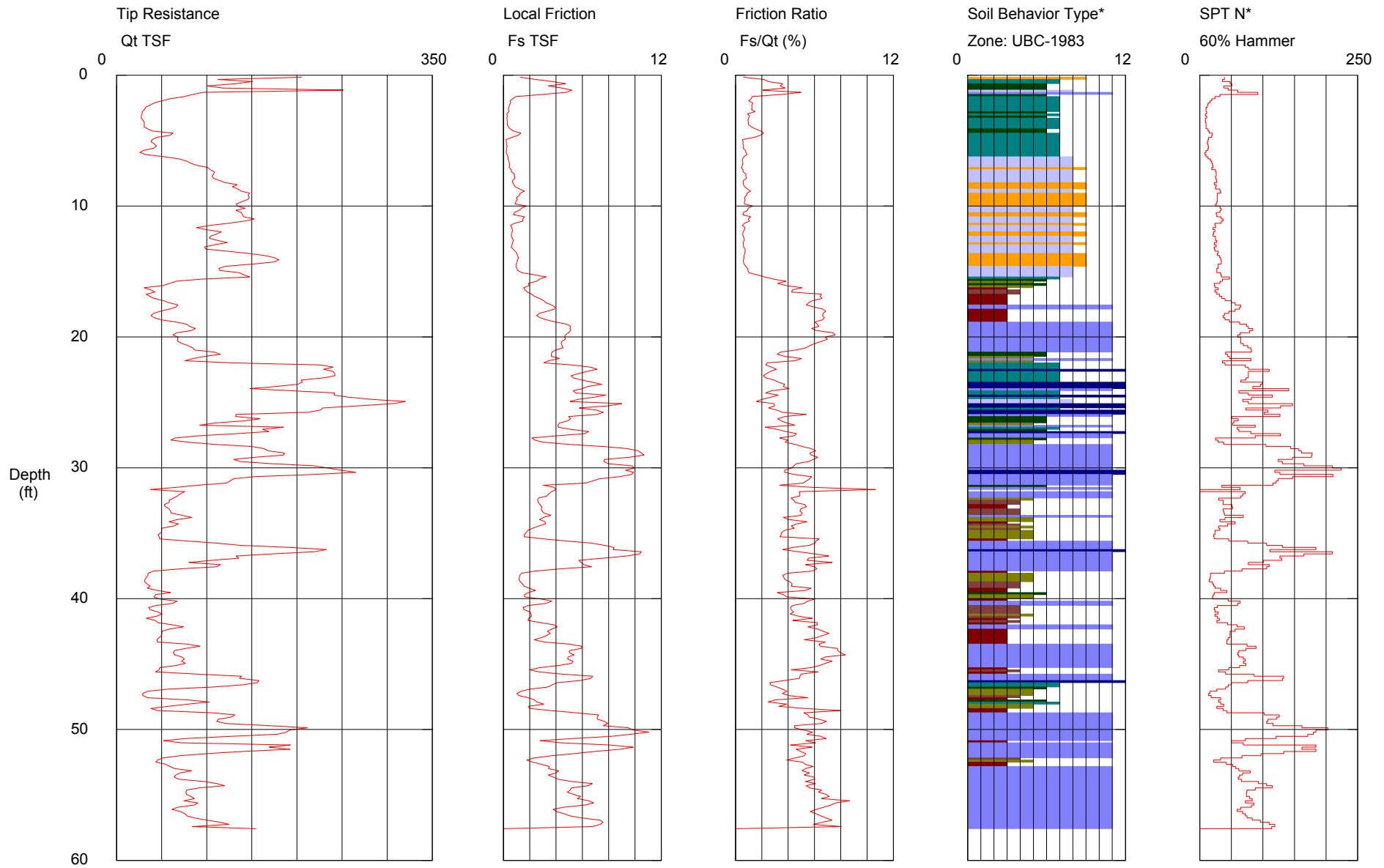
7 silty sand to sandy silt
8 sand to silty sand
9 sand

10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-03a*
Cone Used: DSG1104

CPT Date/Time: 10/21/2013 10:23:37 AM
Location: Yucca
Job Number: LA-1161



Maximum Depth = 57.58 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay

4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt

7 silty sand to sandy silt
8 sand to silty sand
9 sand

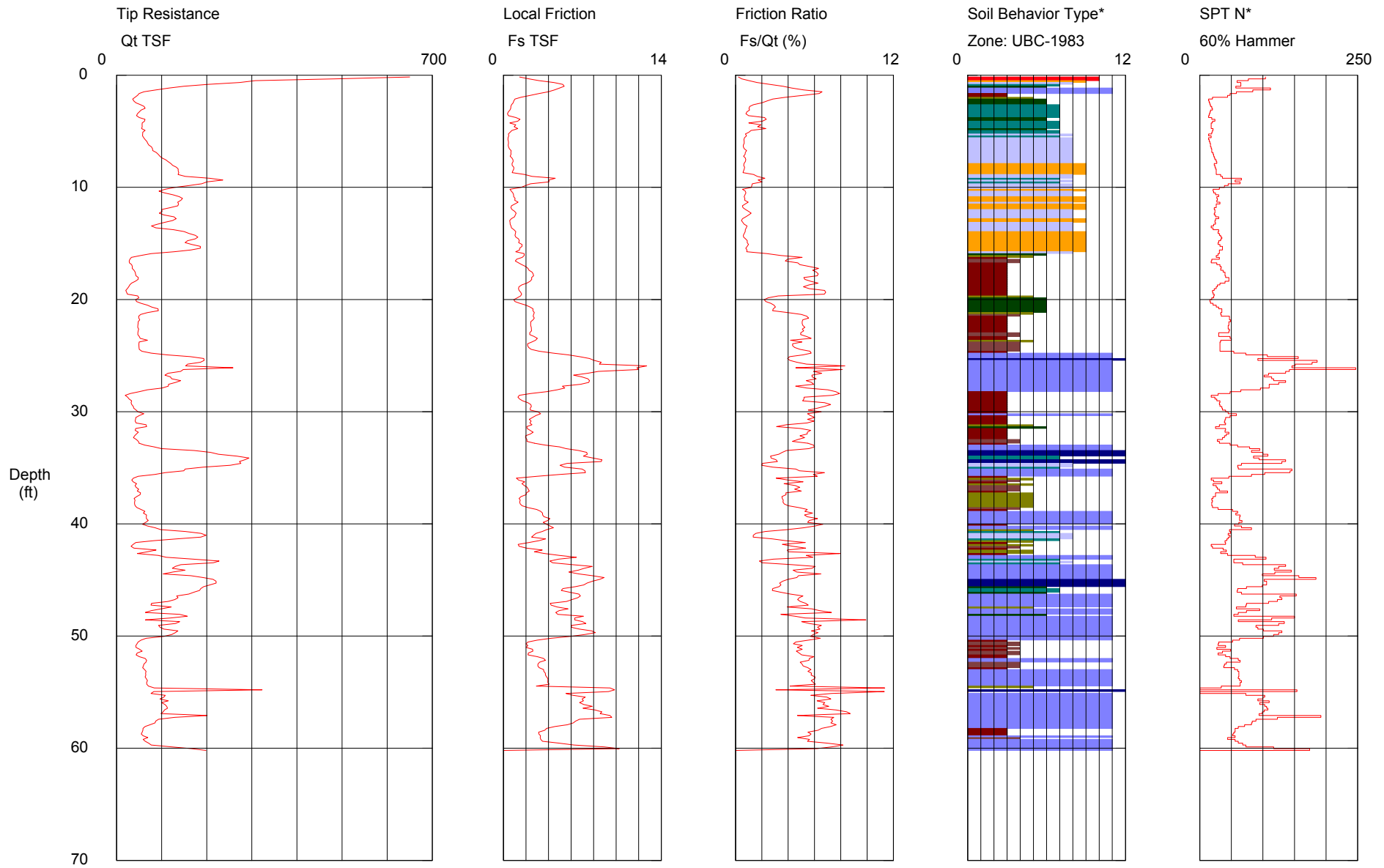
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-04*
Cone Used: DSG1104

CPT Date/Time: 10/21/2013 11:12:33 AM
Location: Yucca
Job Number: LA-1161



Maximum Depth = 60.20 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay

4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt

7 silty sand to sandy silt
8 sand to silty sand
9 sand

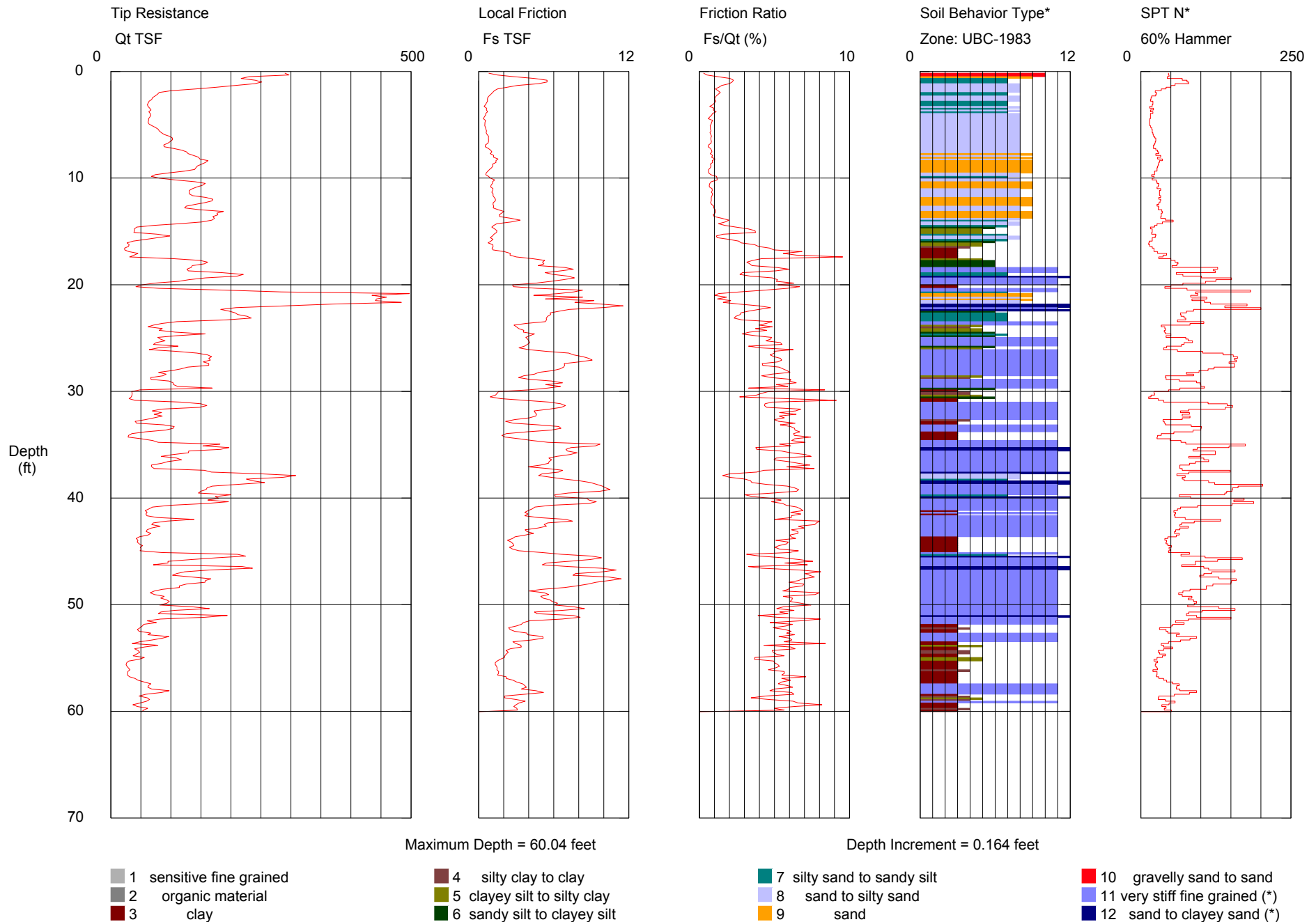
10 gravely sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-05*
Cone Used: DSG1104

CPT Date/Time: 10/21/2013 12:11:51 PM
Location: Yucca
Job Number: LA-1161

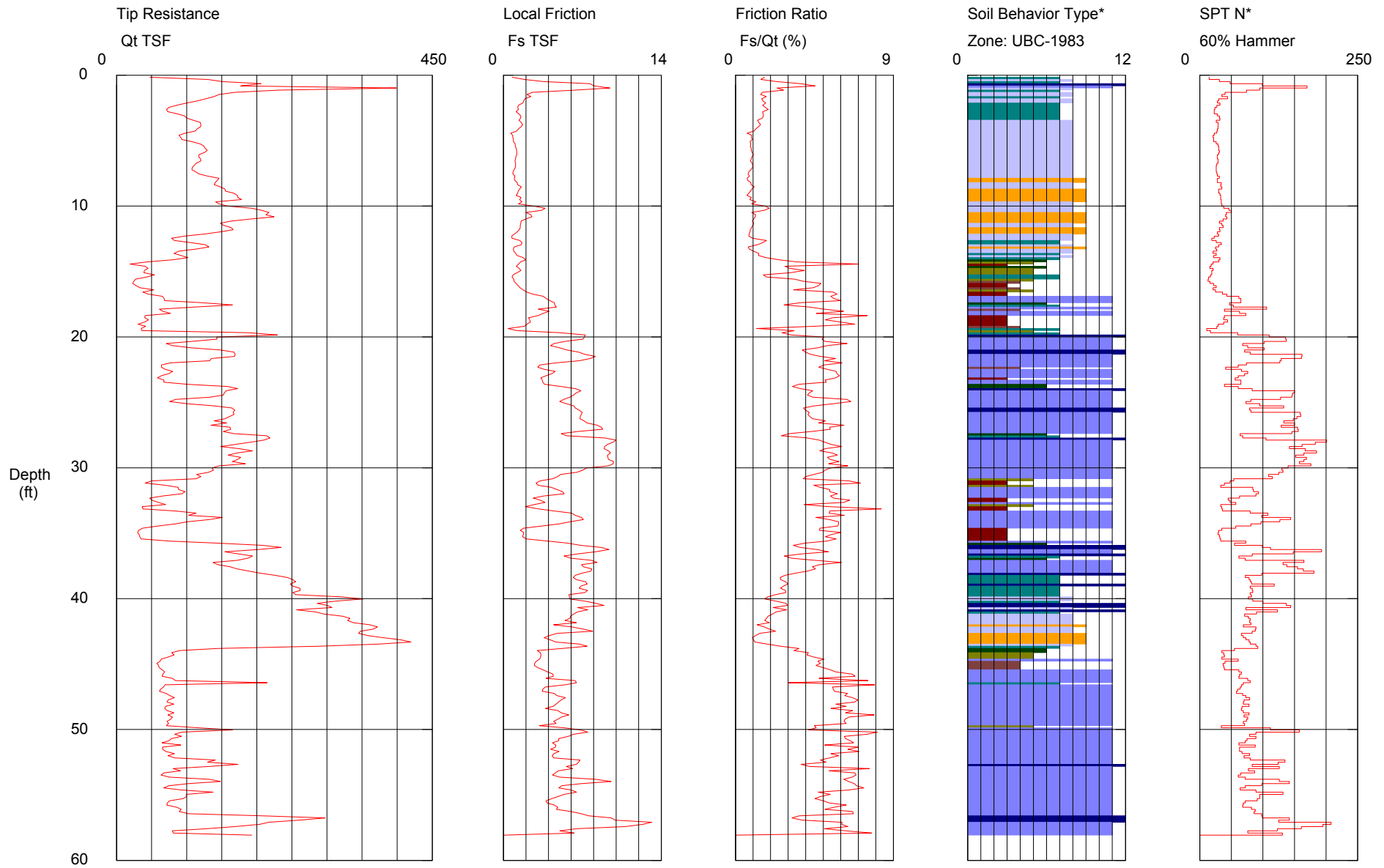


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-06*
Cone Used: DSG1104

CPT Date/Time: 10/21/2013 1:31:39 PM
Location: Yucca
Job Number: LA-1161



Maximum Depth = 58.07 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay

4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt

7 silty sand to sandy silt
8 sand to silty sand
9 sand

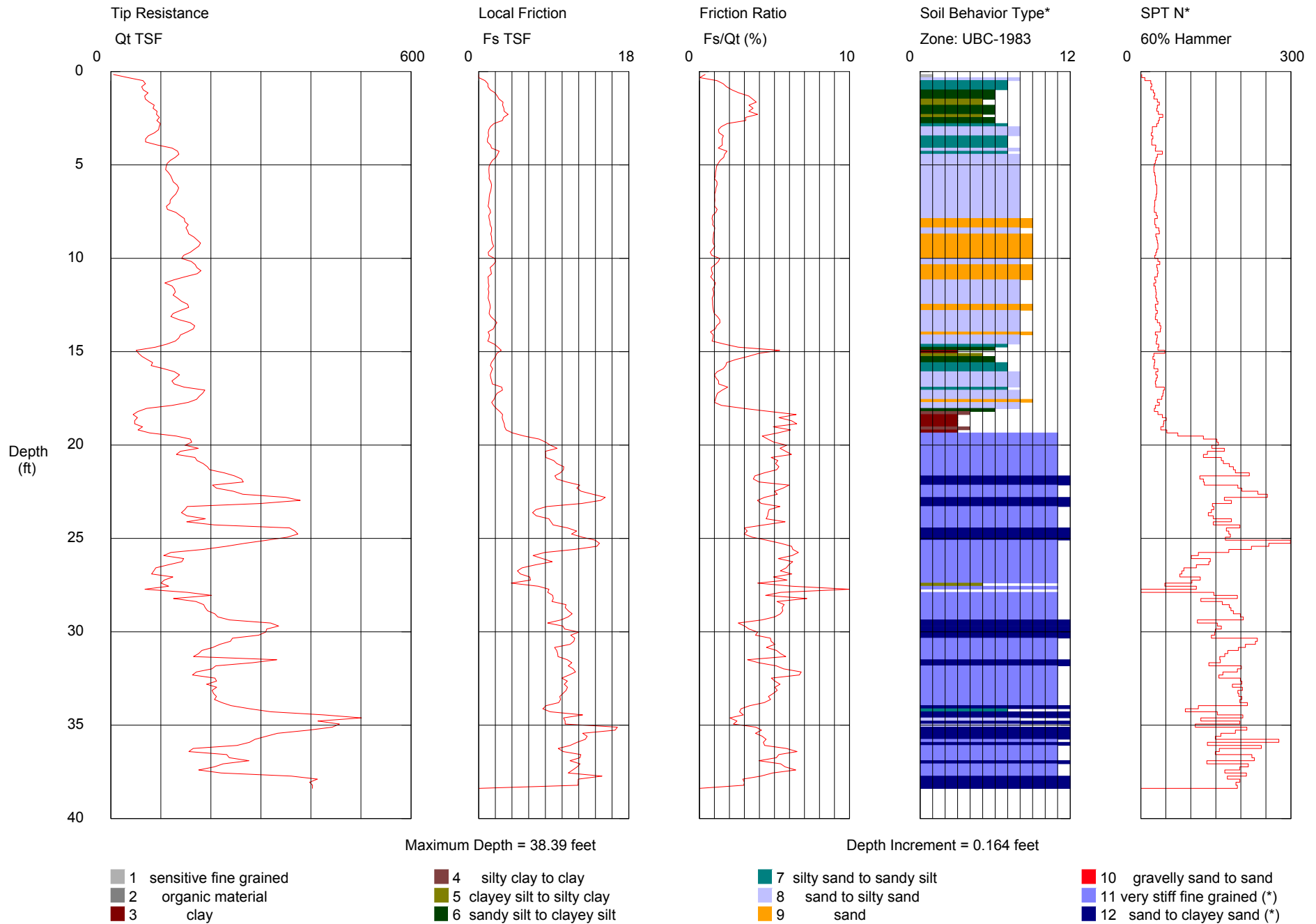
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-07*
Cone Used: DSG1104

CPT Date/Time: 10/21/2013 2:32:23 PM
Location: Yucca
Job Number: LA-1161

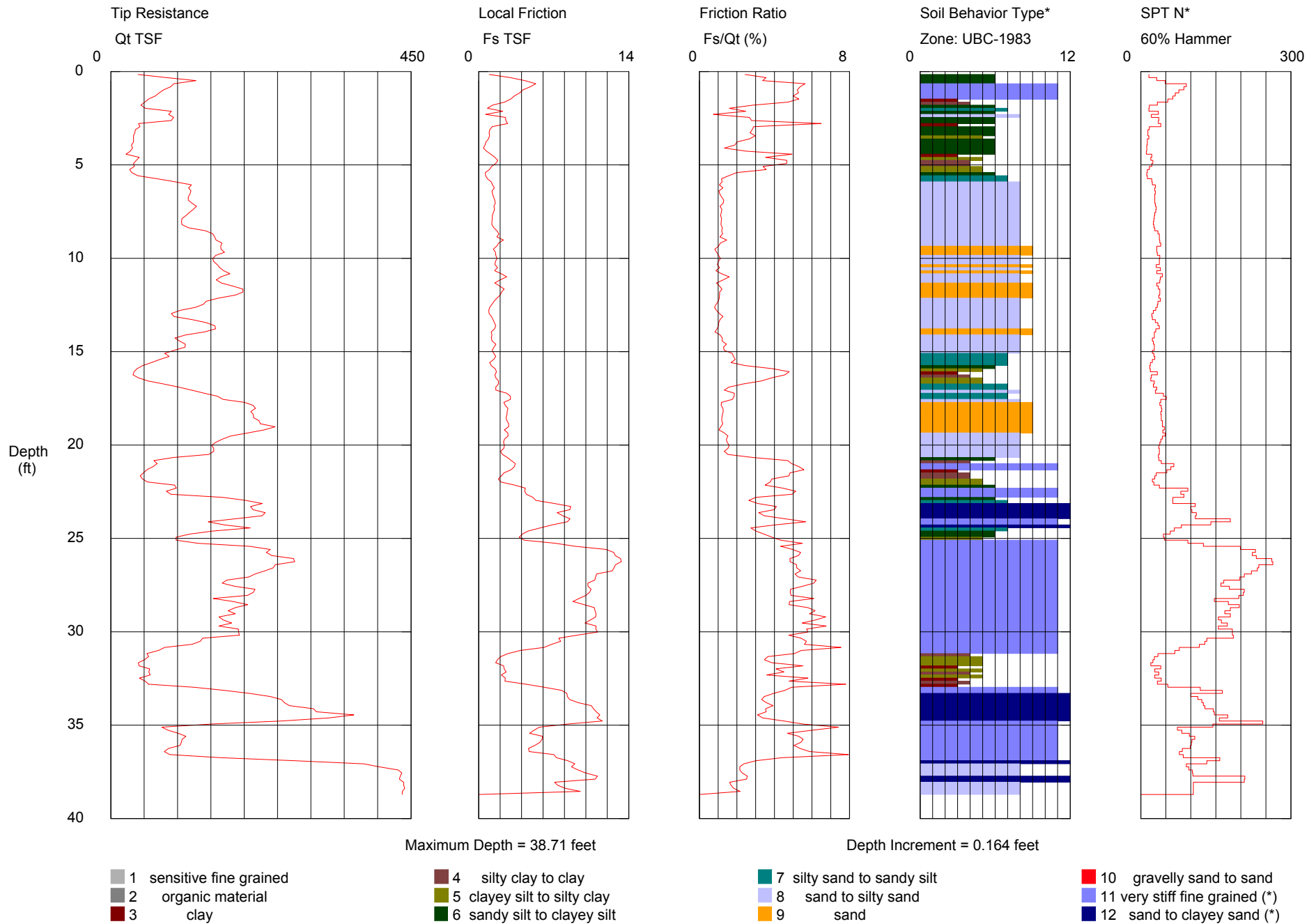


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-08*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 7:23:38 AM
Location: Yucca
Job Number: LA-1161

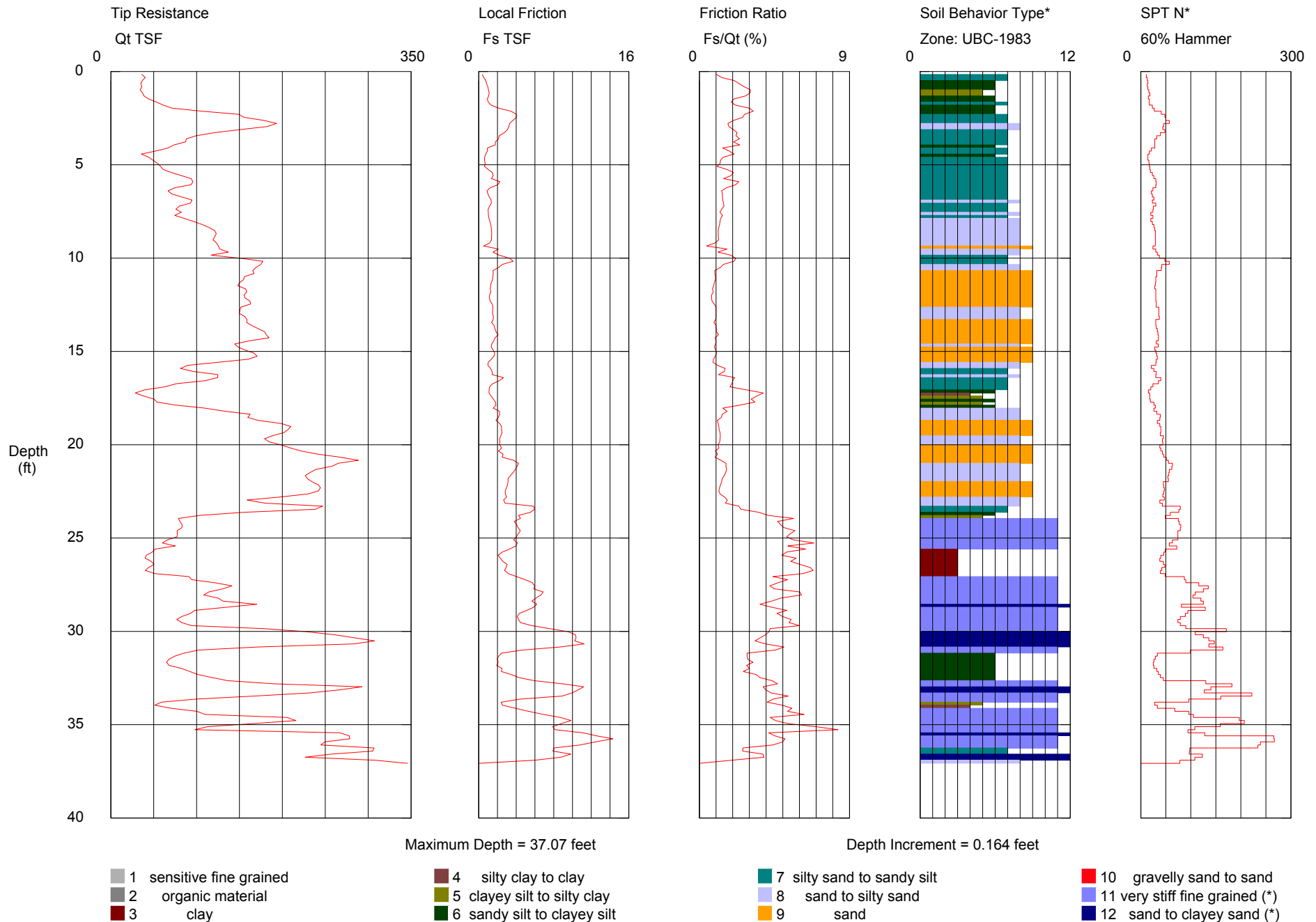


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-09*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 8:25:25 AM
Location: Yucca
Job Number: LA-1161

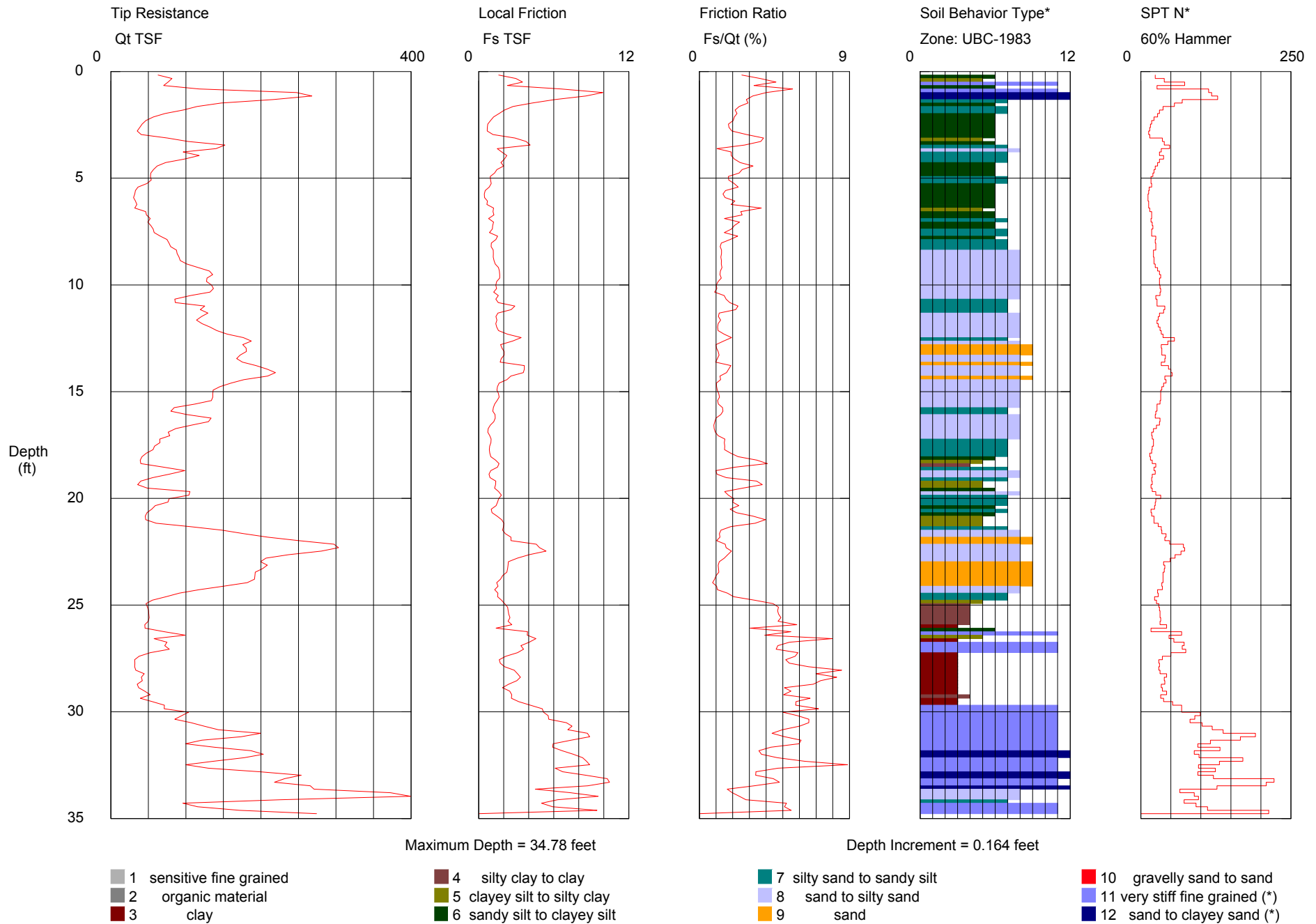


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-10*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 9:00:01 AM
Location: Yucca
Job Number: LA-1161

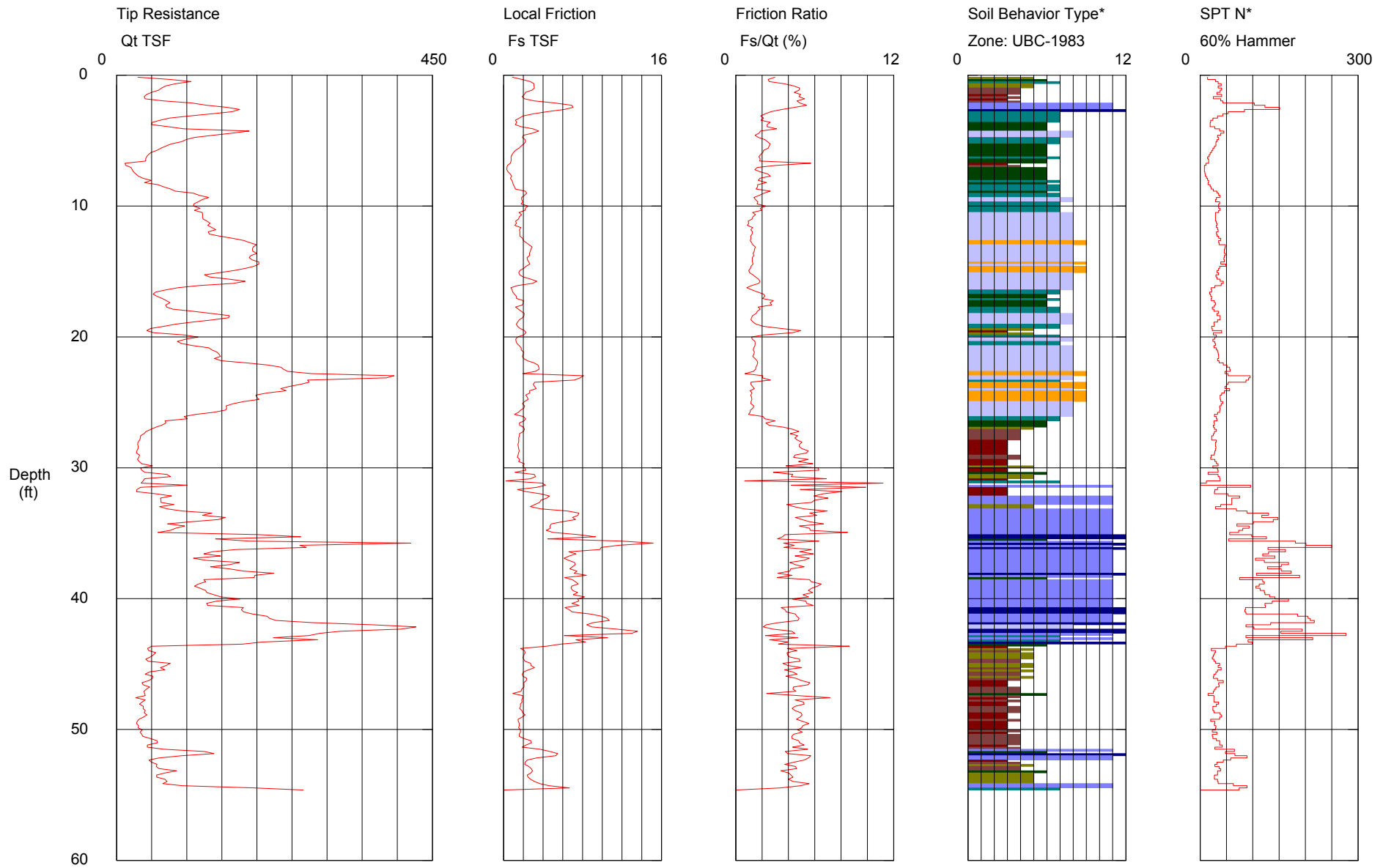


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-11*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 9:34:03 AM
Location: Yucca
Job Number: LA-1161



Maximum Depth = 54.63 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay

4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt

7 silty sand to sandy silt
8 sand to silty sand
9 sand

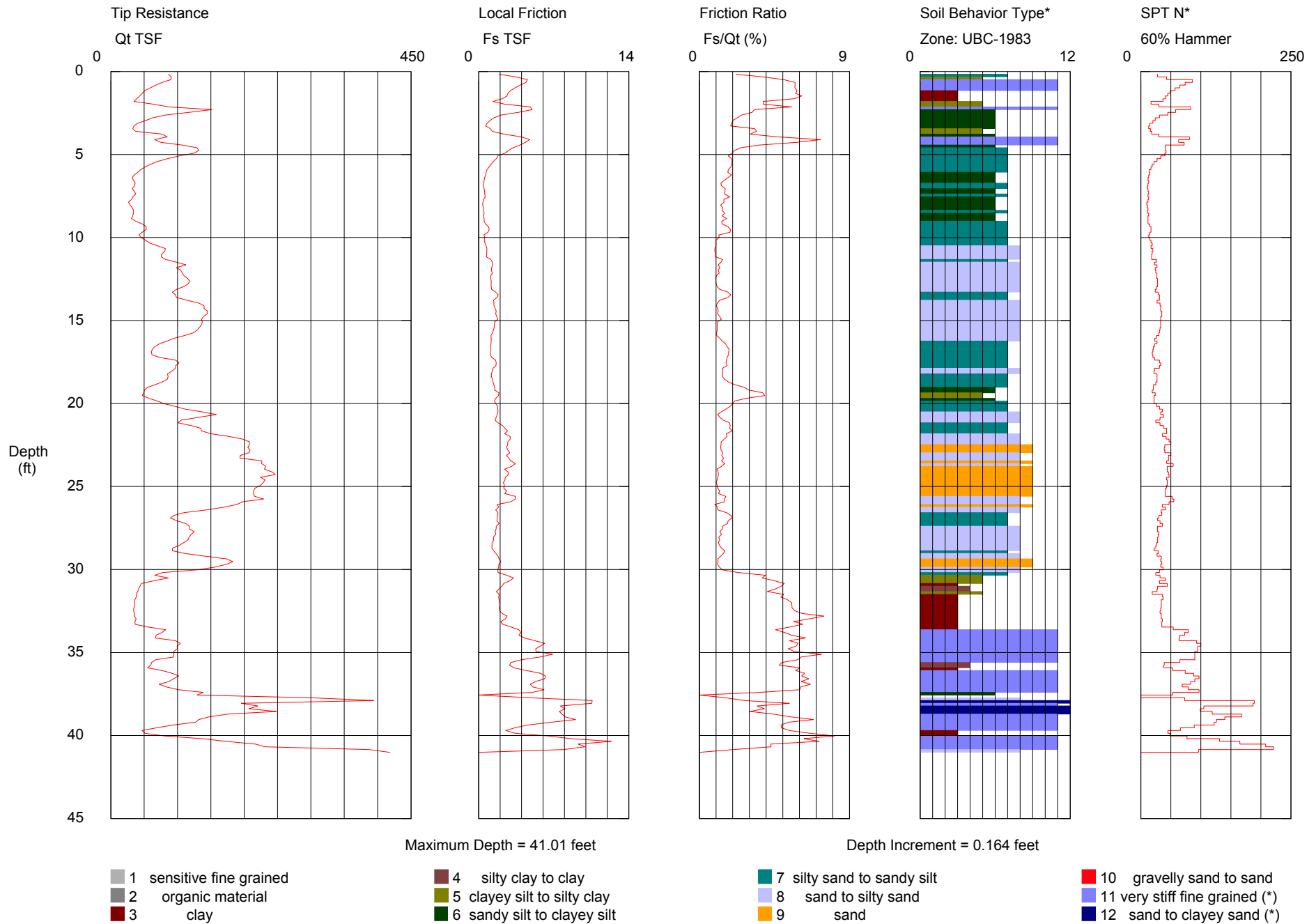
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-12*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 10:16:04 AM
Location: Yucca
Job Number: LA-1161

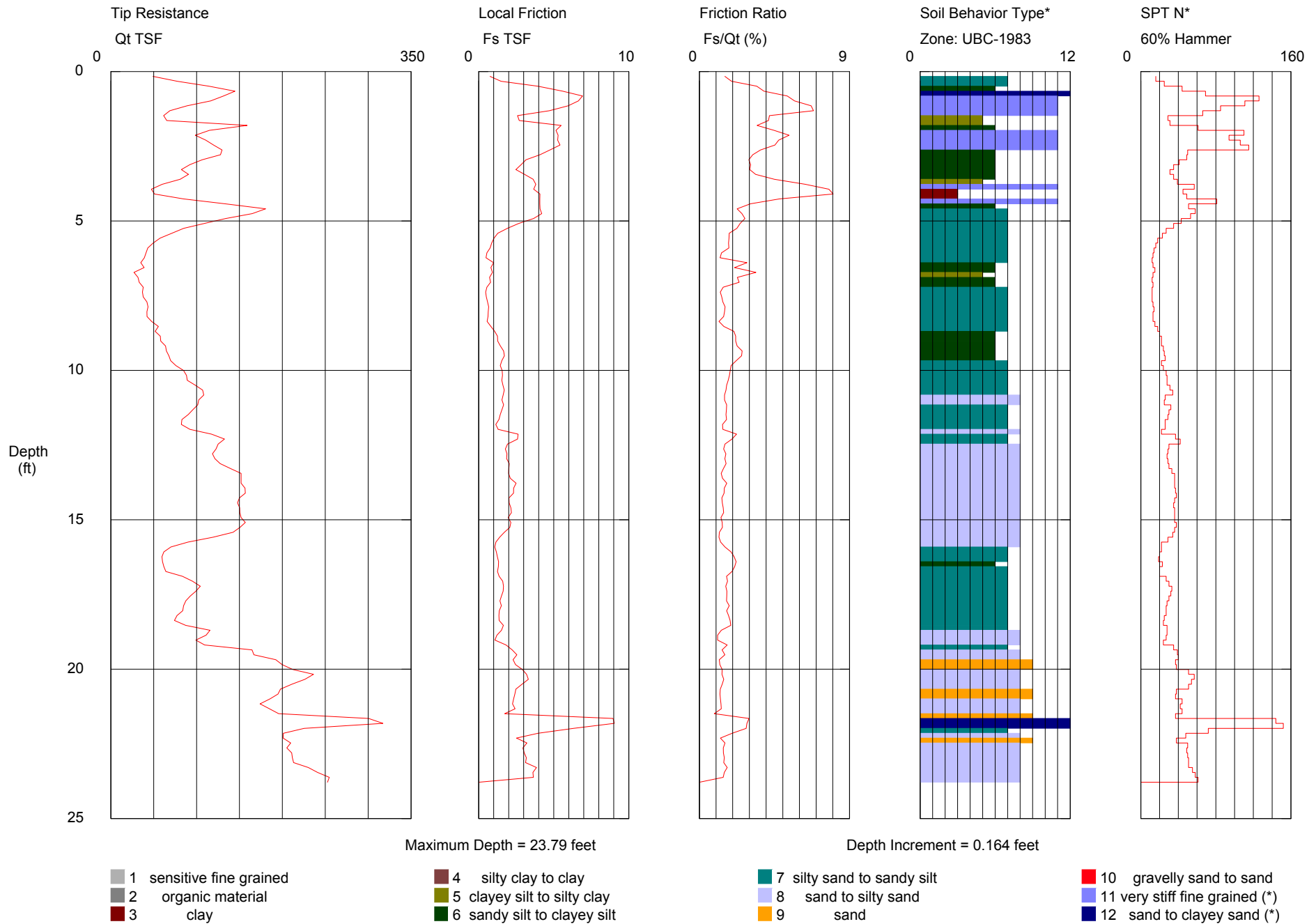


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-13*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 10:50:40 AM
Location: Yucca
Job Number: LA-1161

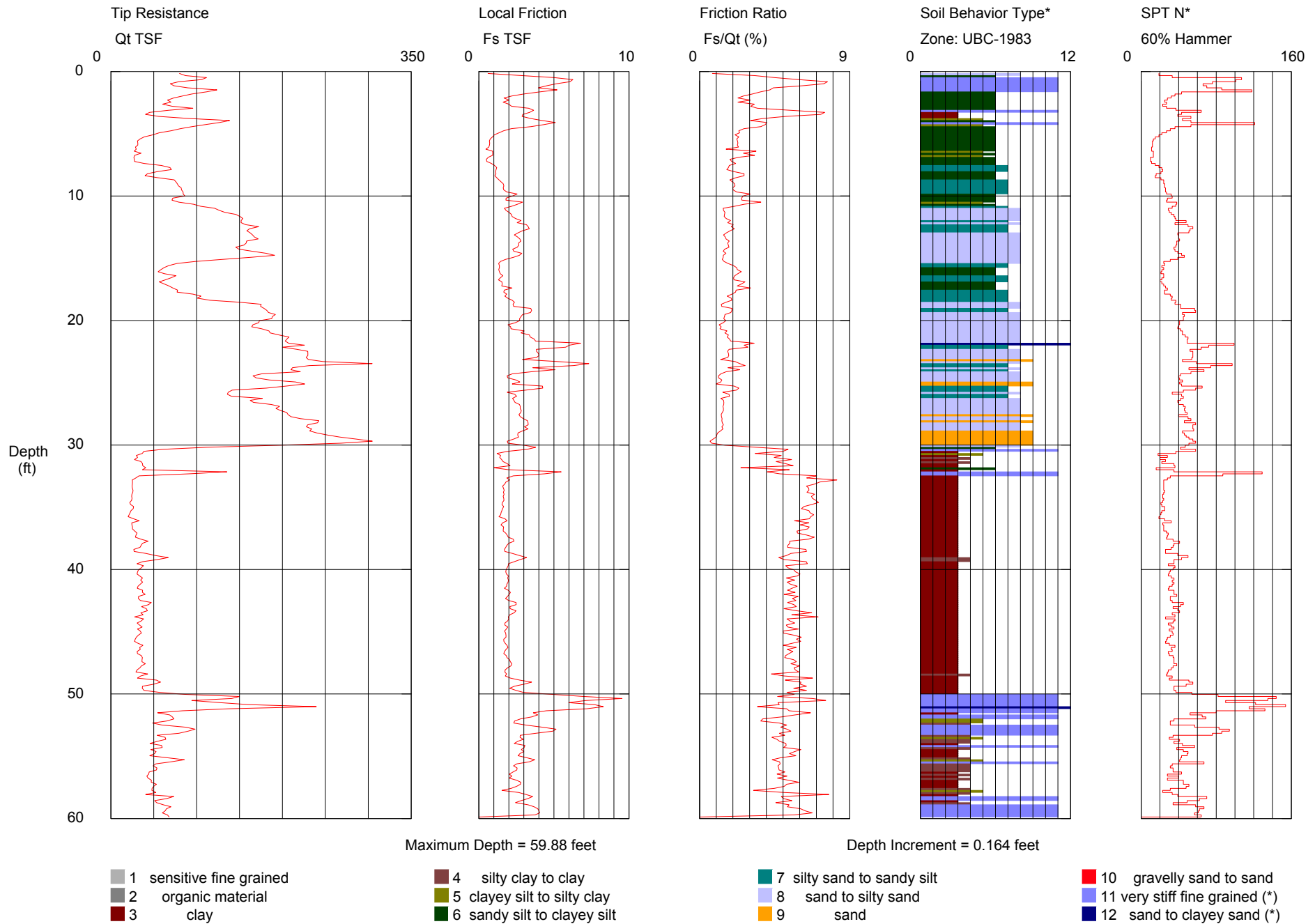


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-13a*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 3:00:14 PM
Location: Yucca
Job Number: LA-1161

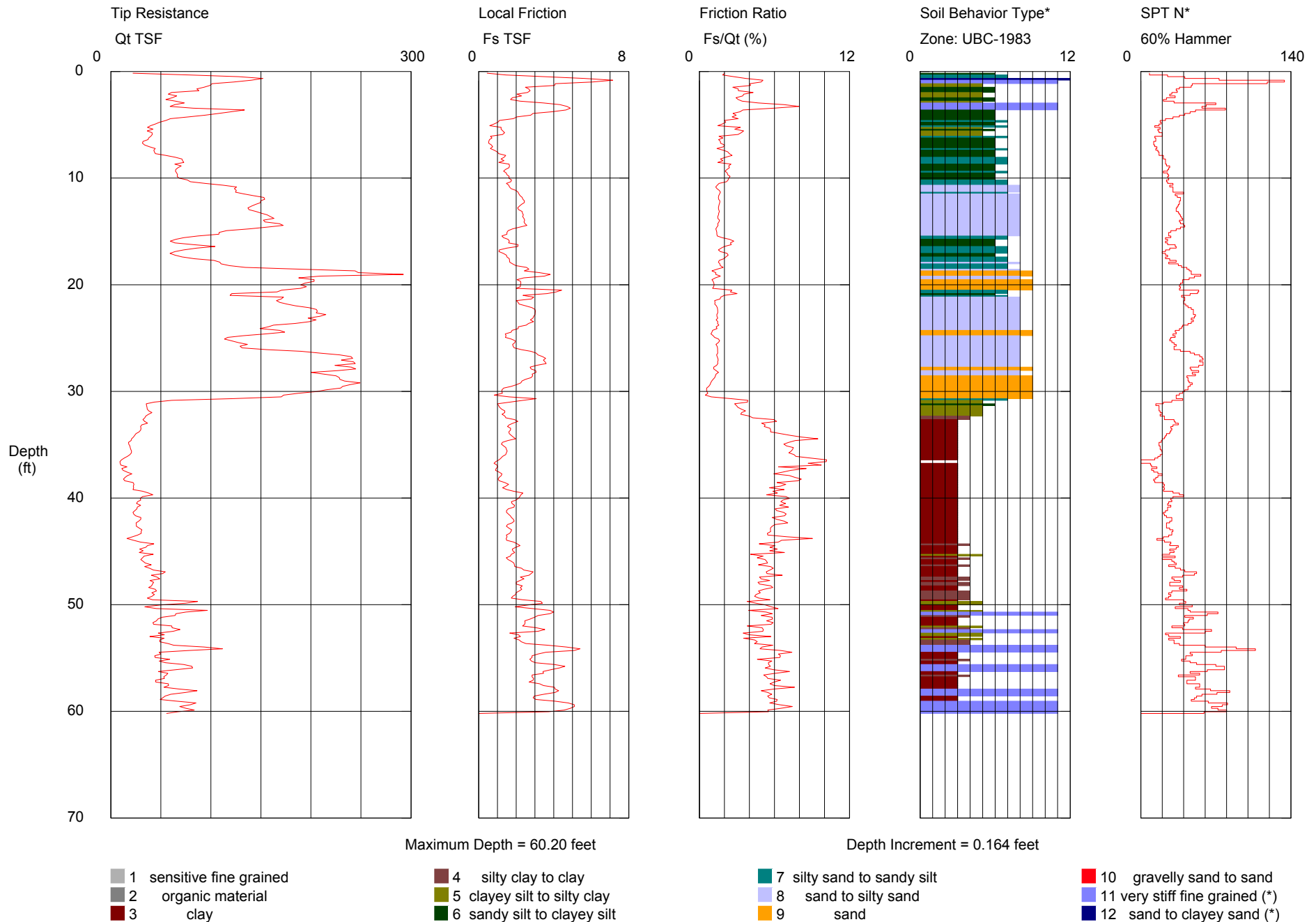


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-14*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 11:18:28 AM
Location: Yucca
Job Number: LA-1161

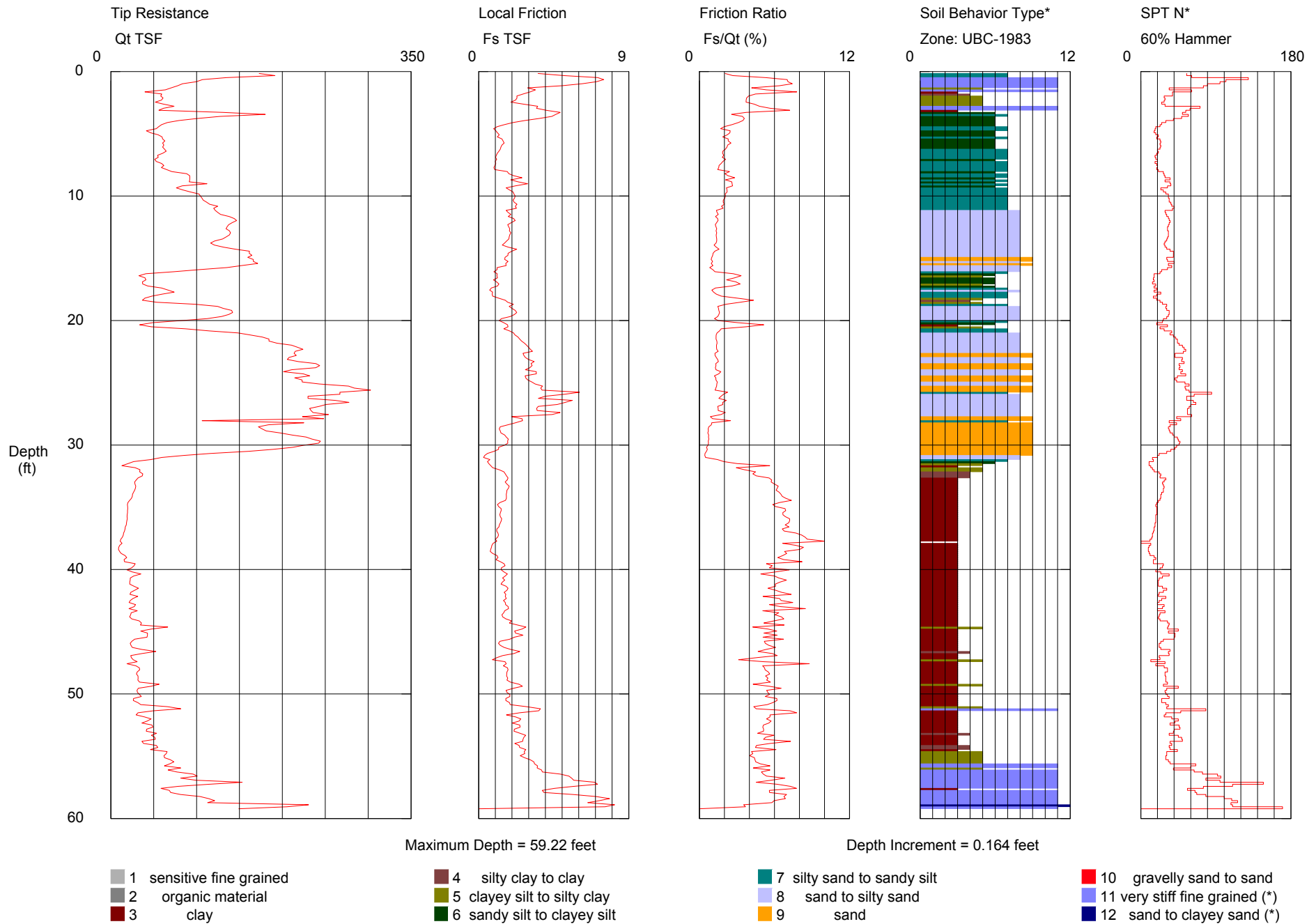


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-15*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 12:36:31 PM
Location: Yucca
Job Number: LA-1161

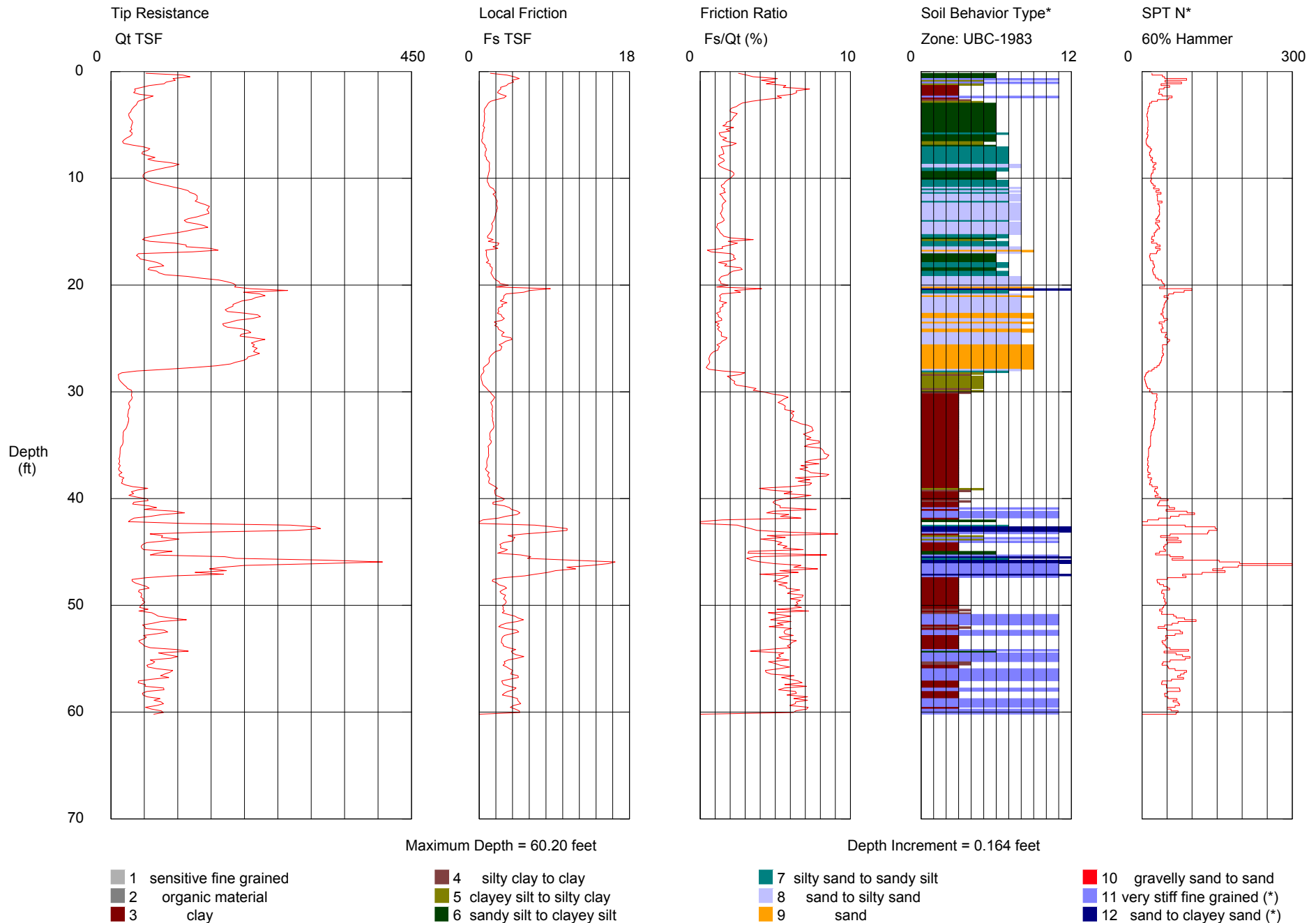


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-16*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 1:23:21 PM
Location: Yucca
Job Number: LA-1161

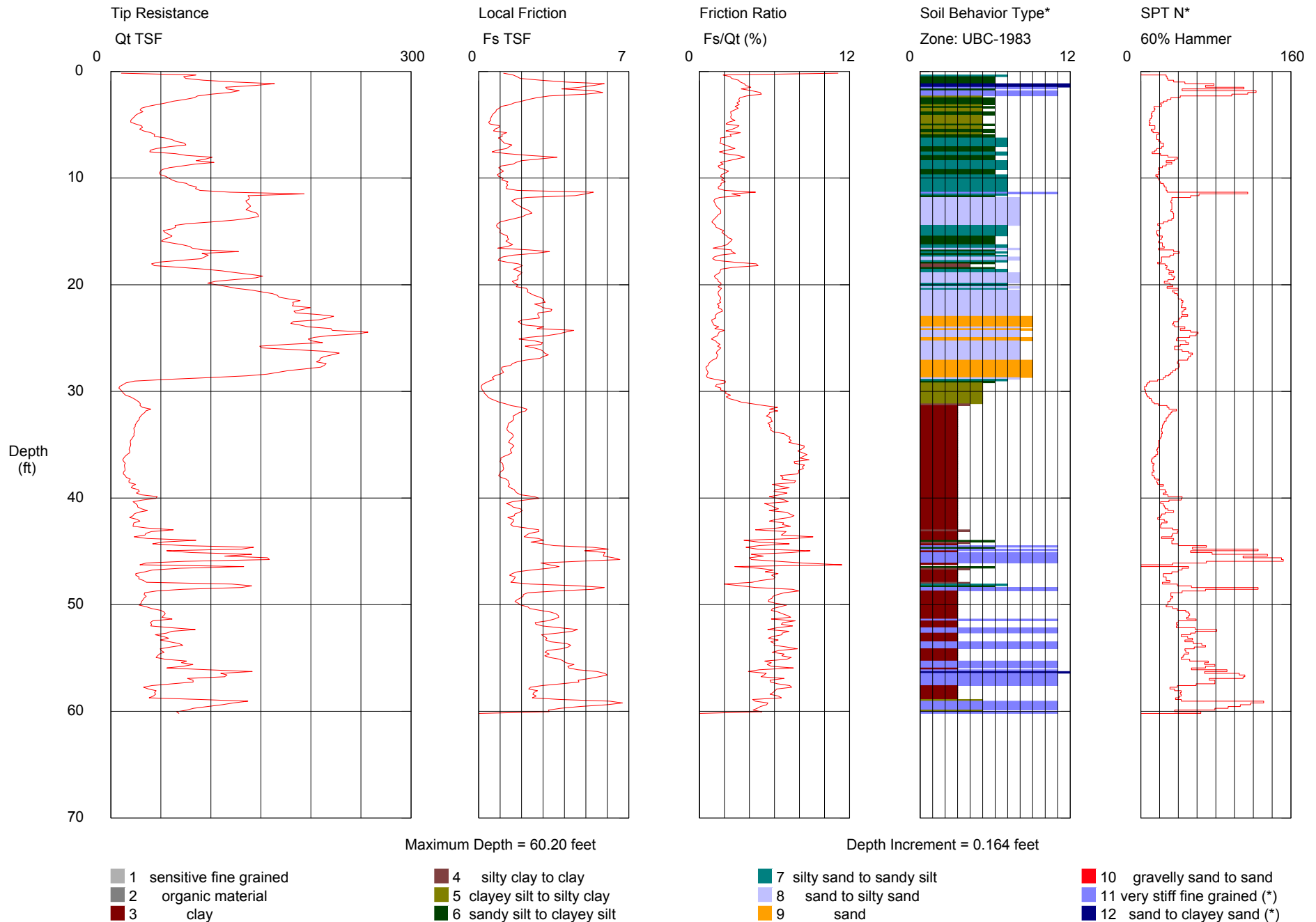


*Soil behavior type and SPT based on data from UBC-1983

Group Delta Consultants

Operator: SA-RA
Sounding: CPT-17*
Cone Used: DSG1104

CPT Date/Time: 10/22/2013 2:11:19 PM
Location: Yucca
Job Number: LA-1161



*Soil behavior type and SPT based on data from UBC-1983



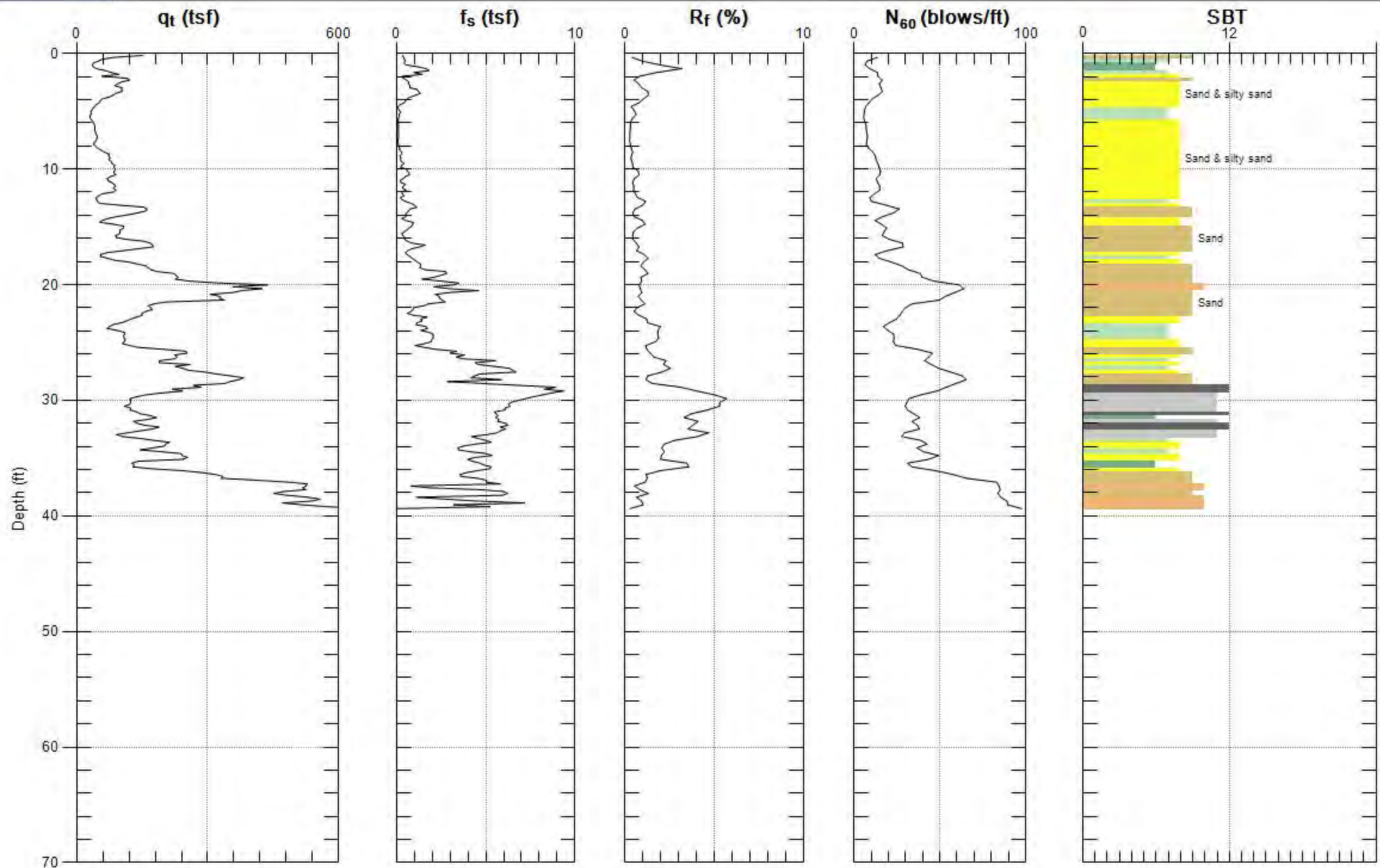
GREGG GROUP DELTA

Site: YUCCA CHAMPION

Sounding: CPT-18 *

Engineer: S.KOLTHOFF

Date: 4/15/2014 07:17



Max. Depth: 39.534 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



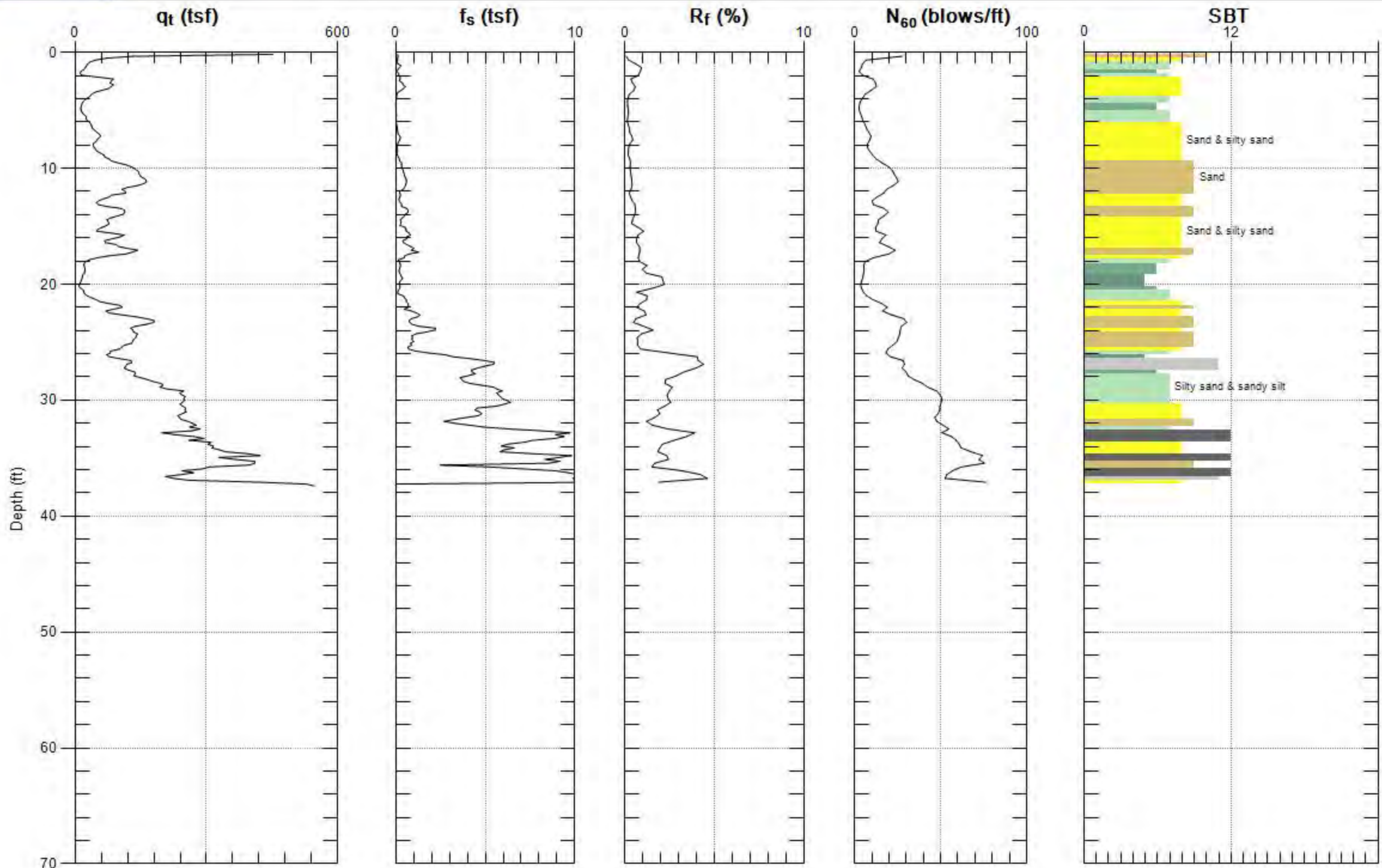
GREGG GROUP DELTA

Site: YUCCA CHAMPION

Sounding: CPT-19 *

Engineer: S.KOLTHOFF

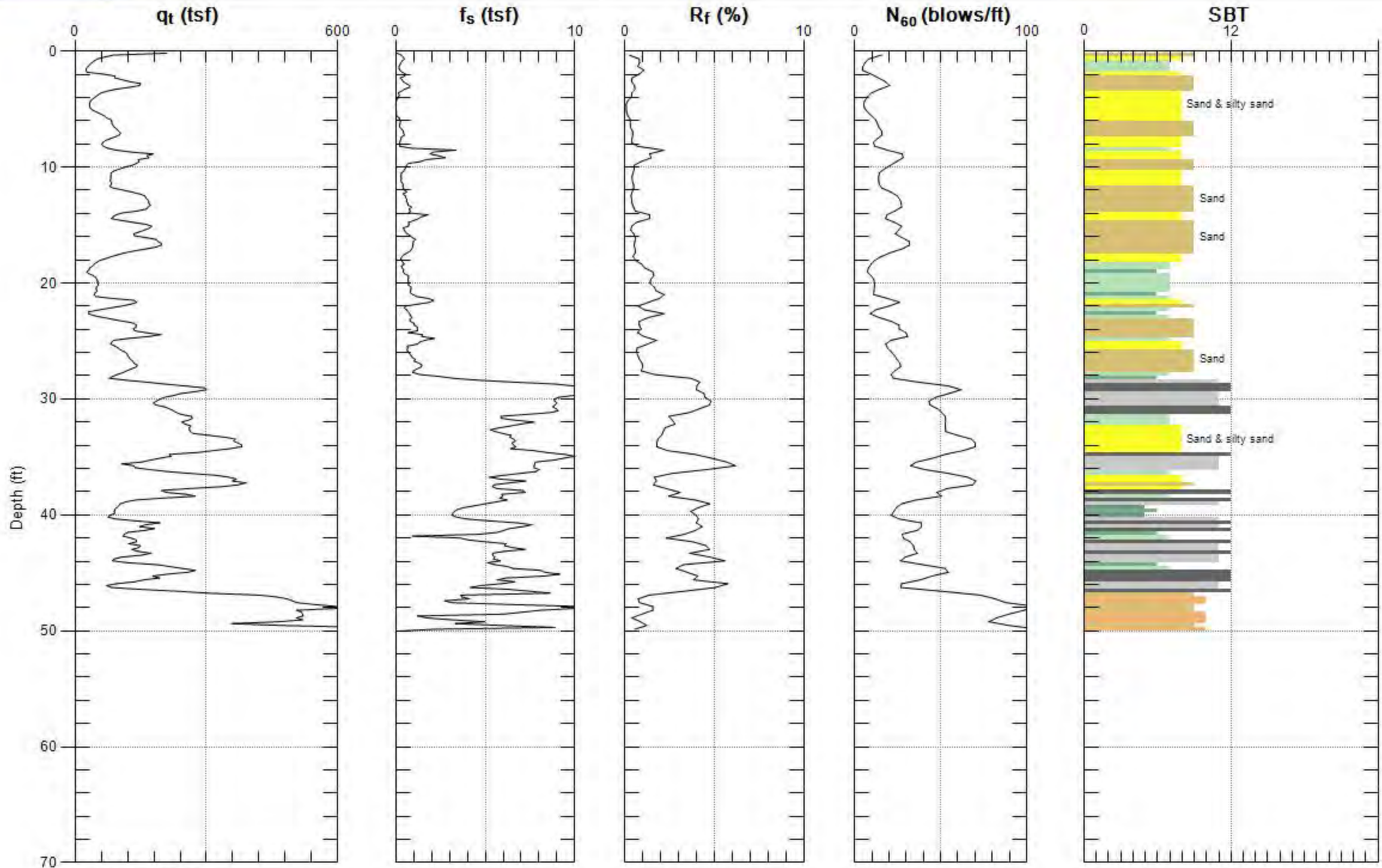
Date: 4/15/2014 07:51



Max. Depth: 37.402 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 50.197 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



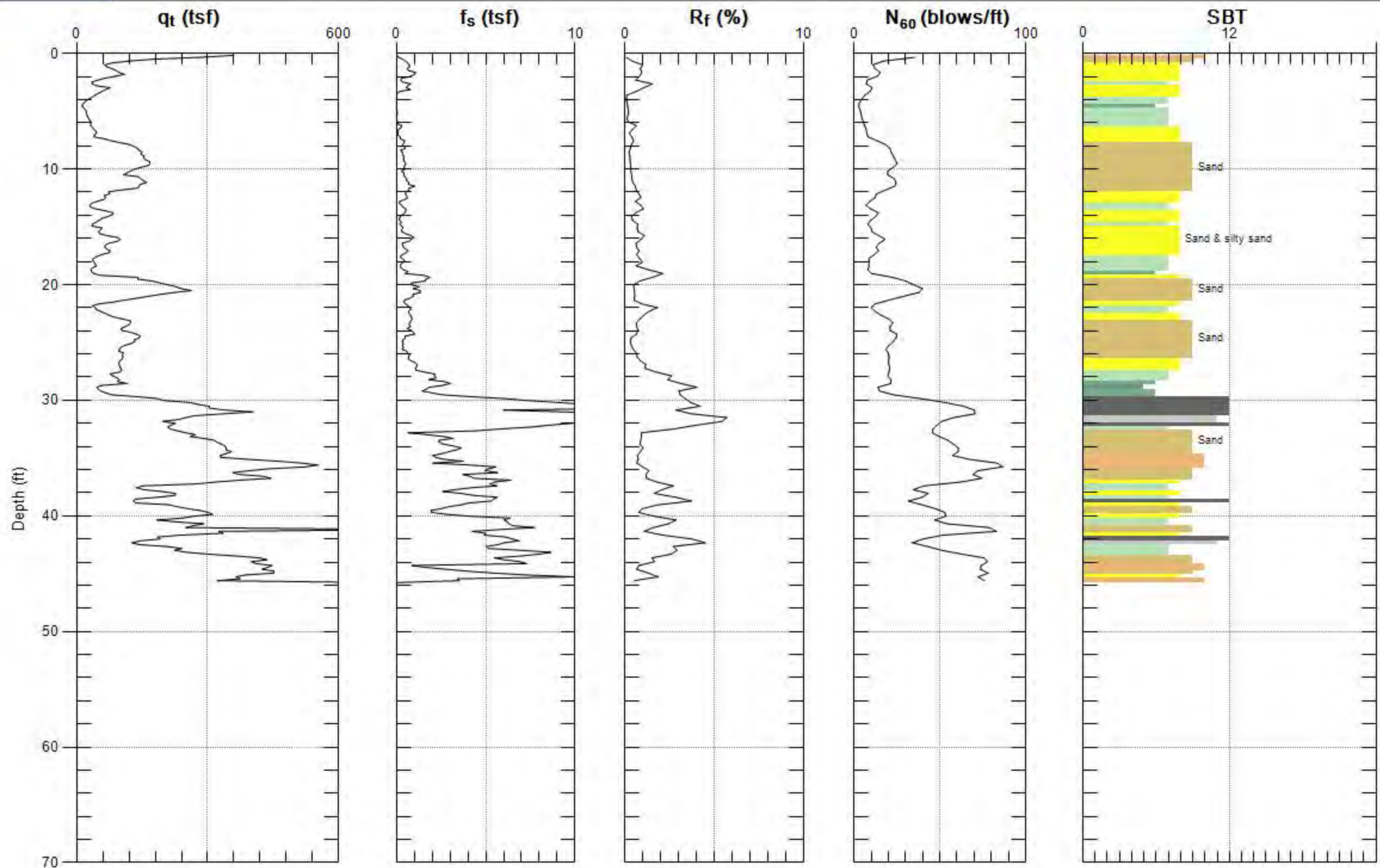
GREGG GROUP DELTA

Site: YUCCA CHAMPION

Engineer: S.KOLTHOFF

Sounding: CPT-21 *

Date: 4/15/2014 09:09




Max. Depth: 45.932 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-1 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/23/13	LOGGED BY SS	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 406	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	405								Asphalt at surface. Hand augered to 5 feet bgs. Artificial Fill (Qaf) Sandy SILT, dark brown, moist, fine to medium sand.				
5	400	1	1	2.1/5					UPPER SAND UNIT (Qs) SAND, Coarse to fine grained, some silt and fine gravel, humid to dry, granitic gravels were found in samples to be highly weathered with phenocrysts weathering to angular sand grains. Volcanic (basalt?) and meta-quartzite gravels found in the deposit were rounded to sub-rounded with slight to no weathering on the surface. Abundant sub-rounded quartz sand grains with frosted outer surface suggesting fluvial in origin, 10YR 5/3 (brown).				
		2											
10	395	3	2	2.5/5					Clayey SAND, some fine gravels, humid, hard to break with fingers or cut with knife.				
		4											
15	390	5	3	3.5/5					MUD FLOW (Qm)				
		6							Clayey SAND, grading down to silty sand, moist to humid, 5YR 4/4 reddish brown.				
20	385	7	4	2.6/5					OLDER ALLUVIUM (Qoal)				
		8							Clayey SAND, some fine gravels, hard to break with fingers and knife. Clayey SAND, some fine gravel with majority volcanic with some meta quartzite, humid to moist, crumbles into chunks between fingers, 3-inch gravel zone at the base (23 feet).				

	GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501	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-32 a

GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-1 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/23/13	LOGGED BY SS	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 406	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
30	380	9	5	4/5					Sandy to Silty CLAY , moist, plastic, 10YR 4/4 (dark yellowish brown), mottled to 10YR 6/1 (light gray to gray).				
	10												
35	375	11	6	3.5/5					Clayey SAND , fine grained sand.				
	12								SAND to Clayey SAND , wet, 10YR 4/6 (strong brown), in contact with silty clay at 34 feet, 7.5 YR 4/6 (strong brown). -Ground water				
40	370	13	7	2.8/5					Clayey SAND , mottled 7.5 YR 4/6 (strong brown) to 2.5 Y 5/4 (light olive brown), sand mostly fine to silt throughout.				
	14												
45	365	15	8	5/5					CLAY to Silty CLAY , moist, hard, fractures into angular blocks, squeezes when pinched between fingers, 5Y 5/2 (olive gray), coarse sand at 43.5 feet for 2-inches and at tip.				
	16												
	360	17	9	2.8/5					SAND to Clayey SAND , wet to saturated, some silt, sand sub-rounded to sub-angular, abundant quartz with trace of mica and heavy minerals, 7.5 YR 5/4 (brown).				
	18												

	GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501	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-32 b

GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-1 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/23/13	LOGGED BY SS	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 406	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	355	19	10	2.6/5					Silty to Sandy CLAY to Clayey SILT 7.5 YR 4/4 (brown).				
	20								Gravel and Sand Conglomerate poorly cemented, angular to subangular clast.				
55	350	21	11	5/5					MODELO FORMATION (Tm) SILTSTONE wet, thinly bedded with sandstone.				
60	345								Total Depth: 60 Feet bgs Groundwater: Encountered at 33 Feet Boring backfilled with tamped cuttings				
65	340												
70	335												

GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-2 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/23/13	LOGGED BY SS	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 407	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	405								Asphalt at surface. Hand augered to 5 feet bgs. Artificial Fill (Qaf) Sandy SILT, dark brown, moist, fine to medium sand				
5		1	1	1.5/5									
	400								UPPER SAND UNIT (Qs)				
		2							SAND, coarse to fine grained, some silt and fine gravel, humid to dry, granitic gravels were found in samples to be highly weathered with phenocrysts weathering to angular sand grains. Volcanic (basalt?) and meta-quartzite gravels found in the deposit were rounded to sub-rounded with slight to no weathering on the surface. Abundant sub-rounded quartz sand grains with frosted outer surface suggesting fluvial in origin. Clayey zones throughout 10YR 4/6 (brown).				
10		3	2	1.25/5									
	395								Clayey SAND, humid, mild soil development, crumbles with fingers, abundant rootlet casts and wormholes, holes coated with clay.				
		4		2/2.5									
15		5	3	2.2/2.5					Gravel CONGLOMERATE with clayey sand matrix 5YR 4/4 (reddish brown) grading down to a clayey sand minus gravel 7.5 YR 5/4 (brown). Abundant rootlets and wormholes, platy fracture in sand perpendicular to core barrel.				
	390								SAND, coarse to fine grained, some silt and fine gravel, humid to dry, granitic gravels were found in samples to be highly weathered with phenocrysts weathering to angular sand grains. Volcanic (basalt?) and meta-quartzite gravels found in the deposit were rounded to sub-rounded with slight to no weathering on the surface. Abundant sub-rounded quartz sand grains mixed in the alluvium with frosted outer surface suggesting fluvial in origin.				
		6		2.2/2.5									
20		7	4	2.8/3					Mild soil development, 10 YR 4/4 (Dark Yellowish Brown), crumbles between fingers, angular contact with sand below.				
	385								MUD FLOW (Qm)				
		8		2.8/3									

<div> <div>  </div> <div> GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501 </div> </div>				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-33 a
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GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-2
SITE LOCATION 6230 Yucca Street, Hollywood, Ca	DATE(S) DRILLED 10/23/13	LOGGED BY SS		SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 407	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
380	9	5	2.2/2.5					Clayey SAND to Silty Clay slight to moderate soil developmemnt, crumbles in to blocky pieces between fingers 7.5 YR 4/6 (Strong Brown), with claystone and siltstone wtih layers of gravel conglomerate and reddish clay infilling the gravel, mottled 5YR 4/4 (Reddish Brown) and 10YR 6/1 (Gray). <u>OLDER ALLUVIUM (Qoal)</u>					
	10		2.5/2.5										
375	11	6	2.4/2.5					Clayey SAND and Gravel mix of sands and gravel with clods of weathered bedrock, clay, and siltstone. -Groundwater					
	12		2.4/2.5										
370	13	7	2.25/2.5					Increase in clay, and weathered bedrock.					
	14		2.15/2.5										
365	15	8	2.5/2.5					Weathered Zone					
	16		2.3/2.5										
360	17	9	2.5/2.5					<u>MODELO FORMATION (Tm)</u> Siltstone and Sandstone wet, thinly interbedded mudstone.					
	18		2.5/2.5										



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-33 b

3/3/15 GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-2 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca	DATE(S) DRILLED 10/23/13	LOGGED BY SS		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 407	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-2 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca	DATE(S) DRILLED 10/23/13	LOGGED BY SS		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 407	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

FIGURE A-33 c

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-3 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/24/13	LOGGED BY SS	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 50
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 409	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
									Asphalt at surface. Hand augered to 5 feet bgs.				
									Artificial Fill (Qaf)				
									Sandy SILT , dark brown, moist, fine to medium sand.				
405													
5		1	1	1.5/2.5									
		2		2/2.5									
400									UPPER SAND UNIT (Qs)				
10		3	2	1.5/2.5					SAND , coarse to fine grained, some silt and fine gravel to cobbles throughout, humid to dry, granitic gravels in samples were highly weathered with phenocrysts weathering to angular sand to fine gravel. Zones of fine clayey sands 10YR 4/6 dark yellowish brown, abundant quartz and mica. Volcanic (basalt?) and meta-quartzite gravels deposits were rounded to sub-rounded with slight to no weathering on the surface. Abundant sub-rounded quartz sand grains with frosted outer surface suggesting fluvial in origin. Clayey zones throughout 10YR 4/4 dark yellowish brown.				
		4		1.5/2.5									
395													
15		5	3	1.1/2.5									
		6		2.2/2.5									
390													
20		7	4	2.4/2.5					-Layer of Clayey SAND, humid, mild soil development, crumbles with fingers, abundant rootlet casts and wormholes, holes coated with clay, approximately 1.5 feet in thickness				
		8		1.5/2.5									
385									Clayey SAND to Silty CLAY matrix mostly gravel conglomerate with reddish clay infilling gravel. 5YR 4/6				

GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-3 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/24/13	LOGGED BY SS	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 50
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 409	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
		9	5	1.1/2.5					(strong brown), mottled to 10YR 6/1 (light gray to gray).				
									MUD FLOW (Qm)				
		10		2.5/2.5					CLAY with Silt mottled 5.5 YR 5/3 to 10 YR 5/4 (Yellowish Brown).				
380													
30		11	6	3.0/3.0					Sandy CLAY , mild soil development, with trace of fine gravel, 7.5 YR 3/2 (dark brown) crumbles between fingers, moist to wet.				
									Ground Water				
									OLDER ALLUVIUM (Qoa)				
		12		2.0/2.0					Conglomerate clayey sand matrix, mostly gravel and cobbles size clasts, abundant meta-quartzite, 7.5 YR 4/4 (Brown to Dark Brown)				
375													
35		13	7	2.0/2.5									
		14		1.75/2.5									
370													
40		15	8	2.0/2.5					Clayey SAND to Silty SAND with fine gravel streaks of clay 7.5 R 3/6 (dark red).				
		16		2.5/2.5									
365									MODELO FORMATION (Tm)				
45		17	9	3.75/5.0					Siltstone and Claystone , thinly bedded, wet. Siltstone 10YR 6/4 (light yellowish brown) and claystone 5Y6/1 (gray),				
360													

GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-3 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/24/13	LOGGED BY SS	SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 50
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 409	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
55	355								Total Depth: 50 Feet bgs Groundwater: Encountered at 29 Feet Boring backfilled with tamped cuttings				
60	350												
65	345												
70	340												
	335												

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GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-4 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca	DATE(S) DRILLED 10/24/13	LOGGED BY SS		SHEET NO. 1 of 2
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 40
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 412	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
									Asphalt at surface. Hand augered to 5 feet bgs. Artificial Fill (Qaf) Sandy SILT , dark brown, moist, fine to medium sand.				
5	410	1	1	1.67/2.5									
	405	2		1.83/2.5									
10		3	2	1.17/2.5					UPPER SAND UNIT (Qs) Silty SAND , dry, brown, some roots and rootlets.				
	400	4		1.17/2.5					Silty to Clayey SAND , some gravel to 1 inch, Clayey zones throughout, fine sand with trace of 1/4 inch gravel in last two feet, 10 YR 4/4 (dark yellowish brown). -Mild soil development, sand with clayey matrix, 10 YR 4/6 (Dark Yellowish Brown), friable between fingers.				
15		5	3	1.33/2.5					Sandy CLAY , coarse to fine grained, some silt and fine gravel to cobbles throughout, humid to dry, granitic gravels, highly weathered to gross angular sand to fine gravel grains. Zones of fine clayey sands 10 YR 4/6 (dark yellowish brown), abundant quartz and mica. Volcanic (basalt?) and meta-quartzite gravels deposits were rounded to sub-rounded with slight to no weathering on the surface. Abundant sub-rounded quartz sand grains with frosted outer surface suggesting fluvial in origin.				
	395	6		1.67/2.5					-Mild soil development, 10 YR 4/6 (Dark Yellowish Brown), approximately 6" thick.				
20		7	4	1.33/2.5					-Mild soil development, 10 YR 4/6 (Dark Yellowish Brown), approximately 6" thick.				
	390	8		1.58/2.5					-Mild soil development, 10 YR 4/6 (Dark Yellowish Brown), approximately 6" thick.				
									-Mild soil development, 10 YR 4/6 (Dark Yellowish Brown), approximately 6" thick.				



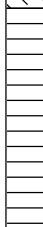


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FIGURE A-35 a

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-4 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca	DATE(S) DRILLED 10/24/13	LOGGED BY SS		SHEET NO. 2 of 2
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 40
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 412	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
385		9	5	1.5/2.5					SAND , moderately well developed soil, when sandy, color ranges from 10 YR 3/3 (dark brown) to 10 YR 3/6 (dark yellow brown), breaks into angular blocks, clay coatings on sand grains. -Ground water <u>MUD FLOW (Qm)</u> Sandy CLAY , fine to medium grained with some clayey sand, 7.5 YR 4/4 (brown).				
		10		1.08/2.5									
380		11	6	1.42/2.5					 <u>MODELO FORMATION (Tm)</u> Siltstone and Claystone , very weathered, residual bedding, some carbonate veins and nodules, mottled 2.5 Y 5/6 (light olive brown) to 5 Y 5/0 (gray), thin bedded, wet.				
		12		1.5/2.5									
375		13	7	2.5/2.5					Total Depth: 40 Feet bgs Groundwater: Encountered at 29 Feet Boring backfilled with tamped cuttings				
		14		2.5/2.5									
370													
365													


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FIGURE A-35 b

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-5
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/25/13	LOGGED BY SS	SHEET NO. 1 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 50
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 411	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
	410								Asphalt at surface. Hand augered to 5 feet bgs. Artificial Fill (Qaf) Sandy SILT, dark brown, moist, fine to medium sand.				
5	405	1	1	1.67/2.5									
		2		2/2.5									
10	400	3	2	1.75/2.5					UPPER SAND UNIT (Qs) Silty SAND, dry, brown, with roots and rootlets.				
		4		1.67/2.5					SAND , Coarse to fine grained, some gravel, humid to dry, gravels scattered throughout from fine grained to 1 1/2 inch consisting mostly of volcanic (basalt?) to decomposing clasts of granite. The granitic clasts were found in samples to be highly weathered with phenocrysts weathering to angular sand grains. Volcanic (basalt?) gravels found in the deposit were rounded to sub-rounded with slight to mild weathering on the surface. Abundant sub-rounded quartz sand grains with frosted outer surface suggesting fluvial in origin.				
15	395	5	3	1.5/2.5									
		6		1.75/2.5					-Mild soil development, friable between fingers, angular contact with sand below, approximately 6" thick. 10 YR 4/4 (Dark Yellowish Brown).				
20	390	7	4	1.75/2.5									
		8		1.83/2.5									

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LOG OF CORE BORING		PROJECT NAME SSV		PROJECT NUMBER LA-1161A		BORING B-5	
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/25/13		LOGGED BY SS		SHEET NO. 2 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 50
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 411		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
	385	9	5	1.92/2.5									
		10		1.75/2.5					-Mild soil development, approximately 6" thick.				
30	380	11	6	2.08/2.5					SAND , wet, fine to coarse grained with some coarse to fine grained gravel with majority being coarse grained, gravel well to sub-rounded, sand mostly quartz, some gravel mostly consisting of volcanic and feldspar, zone well washed, 10YR 4/4 (dark yellowish brown).				
		12		2.5/2.5					-Ground Water				
									MUD FLOW (Qm)				
35	375	13	7	3/3					CLAY with Silt mottled 5.5 YR 5/3 to 10 YR 5/4 (Yellowish Brown).				
									Silty SAND to Sandy Silty CLAY , moderately developed soil, wet, yelds into blocks when pulled apart by hand, base of soil on gravel conglomerate.				
				1.33/2					OLDER ALLUVIUM (Qoal)				
		14							Gravel and Cobble Conglomerate , granitic and volcanic composition, top of conglomerate has a clayey matrix similar to the soil above.				
40	370	15	8	1.33/5					Clayey SAND , wet, trace to some gravel, 10 YR 4/4, (Dark Yellowish Brown).				
									Clayey SAND with GRAVEL , wet, poor core recovery from large cobbles.				
45	365	16		5/5					MODELO FORMATION (Tm)				
									Claystone , well bedded with some siltstone and fine sandstone, trace large cobbles.				

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-5 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca	DATE(S) DRILLED 10/25/13	LOGGED BY SS		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 50
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 411	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-5 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca	DATE(S) DRILLED 10/25/13	LOGGED BY SS		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 50
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 411	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	


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FIGURE A-36 c

LOG OF CORE BORING		PROJECT NAME SSV		PROJECT NUMBER LA-1161A		BORING B-6	
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/25/13		LOGGED BY SS		SHEET NO. 1 of 3	
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0 degrees		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 405		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		


DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
5	400								Asphalt at surface. Hand augered to 5 feet bgs. Artificial Fill (Qaf) Sandy SILT, dark brown, moist, fine to medium sand.				
		1	1	2/2.5									
10	395	2		1.58/2.5					UPPER SAND UNIT (Qs) Silty SAND, dry, brown, with roots and rootlets. SAND, sand grains mostly rounded to well rounded quartz and feldspar, quartz grains frosted indicating fluvial in origin, increase in angular decomposing granitic gravels downward to 20 feet. Abundant silt near top. Volcanic gravel sub rounded, fresh when fractured. 10YR 5/3 (Brown). -Mild soil development, sand with clayey matrix.				
15	390	3	2	1.5/2.5									
20	385	4		1.83/2.5									
	380	5	3	1.42/2.5					-Well soil development, gravel-sand layer, platy fracture. Approx. 40K ybp MUD FLOW (Qm) -Mild soil development, sand with clayey matrix, platy fracture, 10 YR 4/3 (Brown to Dark Brown).				
		6		1.92/2.5					OLDER ALLUVIUM (Qoal) Clayey SAND-Mild soil development, matrix clay with some silt, 7.5 YR 4/4, brown to dark brown, blocky to platy fracture, sand sub rounded to sub angular mix of quartz, dark minerals and mica. Gravel Conglomerate , clay matrix, gravel 1/4- 3/8 inches, rounded to sub rounded, volcanic origin, sands rounded quartz frosted grains with some volcanic sand mixed within.				
		7	4	2.5/2.5									
		8		2.5/2.5									

	GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501	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-37 a

GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-6 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 10/25/13	LOGGED BY SS	SHEET NO. 2 of 3
DRILLING METHOD Hollow Stem Auger		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 405	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
30	375	9	5	2.25/2.5					Cobble Conglomerate , cobbles mostly volcanic in origin.				
		10		2.5/2.5					Clayey SAND , friable with fingers in thin beds, majority well inundated with a blocky fracture, 7.5 YR 4/4 (brown). Mild soil development, sand with silt and clay matrix, blocky fracture, sands rounded, some angular grains, 5 YR 4/3 (reddish brown).				
		11	6	2.5/2.5					Gravel to Cobble Conglomerate clayey to sandy matrix, conglomerate granitic to volcanic. - Ground Water				
		12		2.5/2.5					Sandy Clay to Clayey Sand moist, platy fracture, sub angular meta quartzite gravels though out, mottled 2.5YR 5/4 (light olive brown) to 5YR 4/4 (reddish brown).				
35	370	13	7	2.25/2.5					Gravel to Cobble Conglomerate gravels sub angular to sub rounded volcanic to granitic in origin, granitic gravel decomposing and friable between fingers with little pressure.				
		14		2/2.5					Gravelly SAND with interbedded Clay sands coarse to fine grained with fine grained gravel, both sand and gravel rounded to sub rounded. Sand 7.5YR 4/4 (brown), clay beds mottled 5Y 5/4 (light olive green) to 7.5YR4/4 (brown). -Gravel Bed				
		15	8	2.33/2.5					-Clay Bed				
40	365	16		2.33/2.5					-Sand Bed				
									-Gravel Bed -Clay Bed				
		17	9	2.42/2.5					-Sand Bed				
45	360	18		2.5/2.5									
									Gravel Conglomerate , decomposing granitic gravels overlying bedrock.				
355													

	GROUP GROUP DELTA CONSULTANTS, INC. 370 Amapola Ave. Suite 212 Torrance, California 90501	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-37 b

GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-6 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca	DATE(S) DRILLED 10/25/13	LOGGED BY SS		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 405	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-6 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca	DATE(S) DRILLED 10/25/13	LOGGED BY SS		SHEET NO. 3 of 3
DRILLING METHOD Hollow Stem Auger	DRILL BIT SIZE TYPE 8"		CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 60
DRILL RIG TYPE CME 95	DRILLED BY Gregg In-Situ Drilling		INCLINATION FROM VERTICAL BEARING 0 degrees	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 405	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

FIGURE A-37 c

GREEN SITE, NE CORNER OF YUCCA STREET and ARGYLE
AVENUE, 1800 ARGYLE AVENUE, HOLLYWOOD AREA,
CITY of LOS ANGELES, CALIFORNIA. CPT'S and
BORING USED FOR CROSS SECTION A-A'.



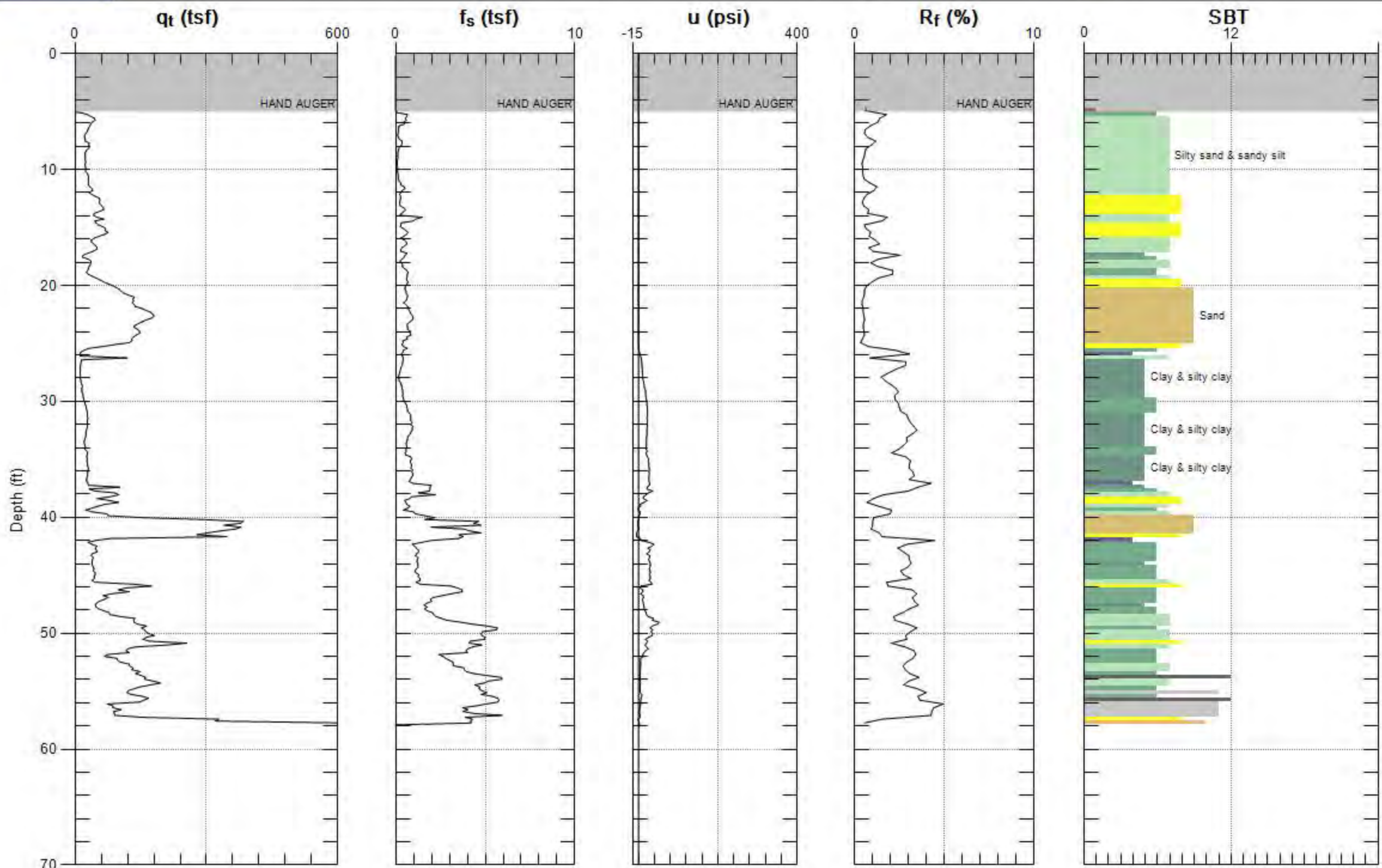
GREGG GROUP DELTA

Site: 1800 ARGYLE AVE.

Sounding: C-18**

Engineer: S.KOLTHOFF

Date: 1/6/2014 10:55



Max. Depth: 58.071 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



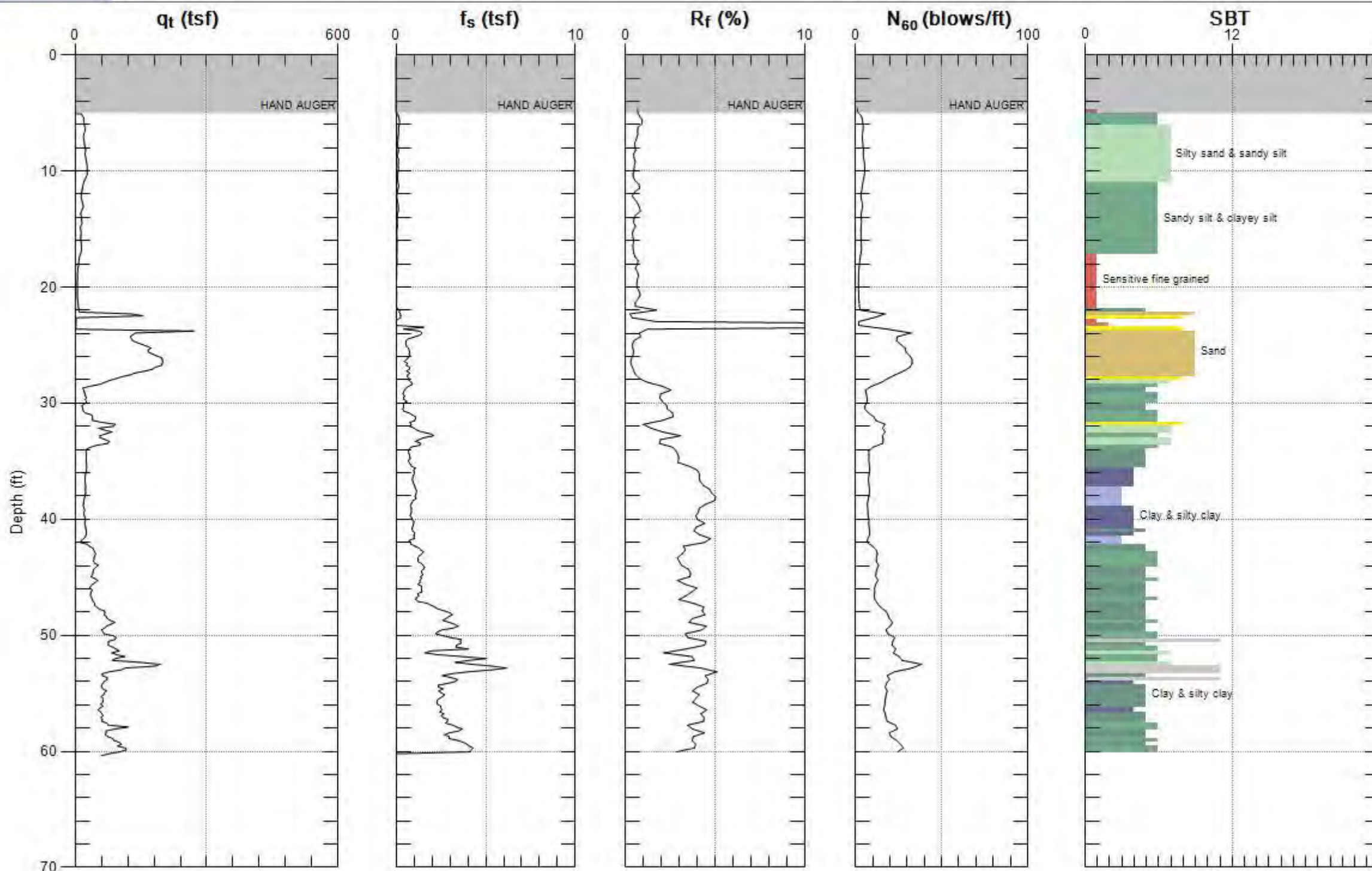
GROUP DELTA

Site: 1800 ARGYLE AVE.

Engineer: S.KOLTHOFF

Sounding: C-19 **

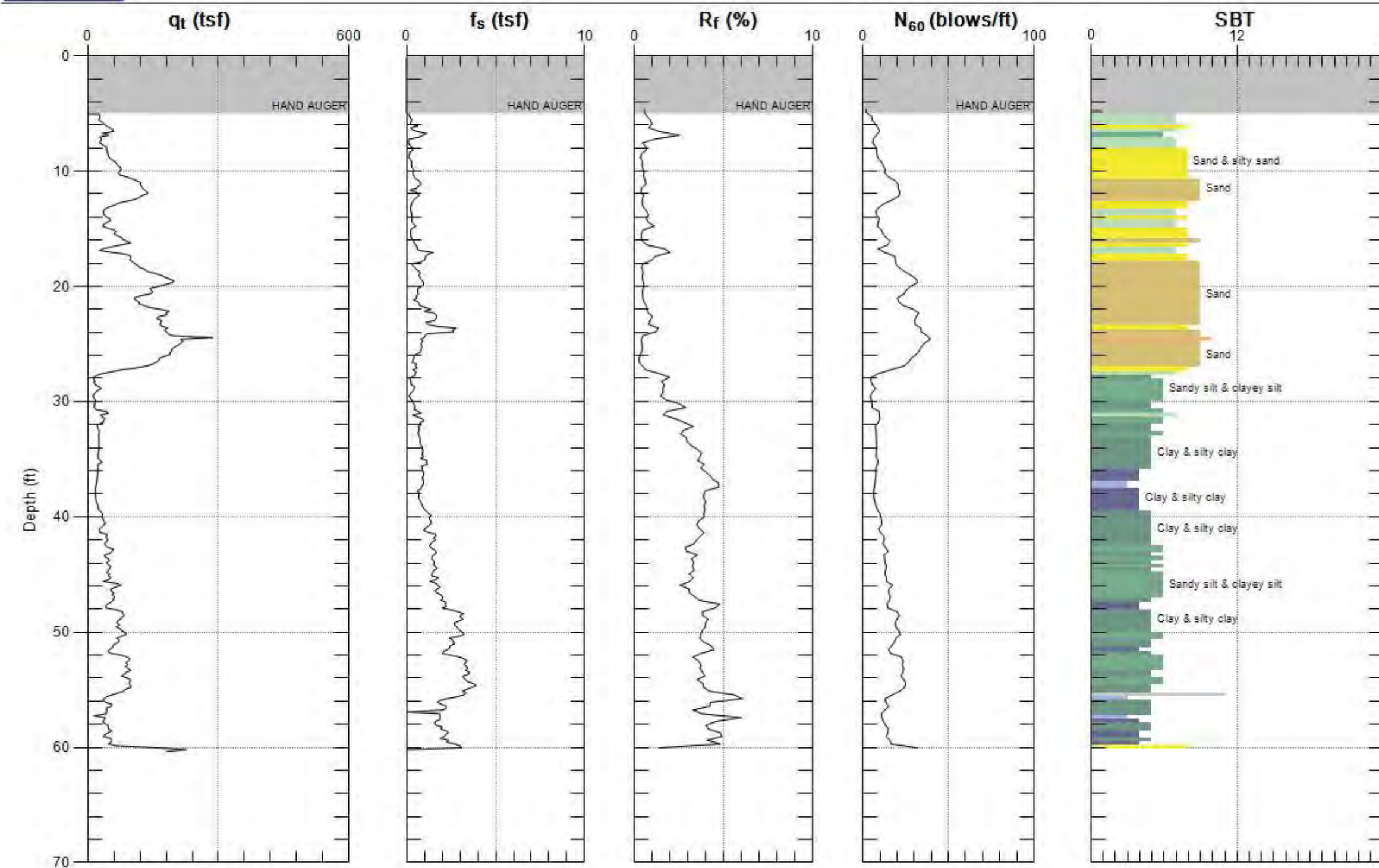
Date: 1/6/2014 12:24



Max. Depth: 60.367 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

LOG OF CORE BORING		PROJECT NAME SSV		PROJECT NUMBER LA-1161A		BORING B-5 <input type="checkbox"/>	
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 1/13/14		LOGGED BY TPO		SHEET NO. 1 of 3	
DRILLING METHOD HSA		DRILL BIT SIZE TYPE 8"			CHECKED BY SK		TOTAL DEPTH DRILLED (feet) 52
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling			INCLINATION FROM VERTICAL BEARING 0		
APPARENT GROUNDWATER DEPTH None encountered					APPROXIMATE SURFACE ELEVATION (feet) 415		
COMMENTS					BOREHOLE BACKFILL Soil Cuttings		

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/NUMBER						
									Approximately 8 inches Asphalt over 15 inches Base Hand augered to 5 feet bgs.				
									Approximately 6 inches Concrete				
									Artificial Fill				
									Sandy SILT , dark brown, moist, fine to medium sand, with rootlets.				
									UPPER SAND UNIT (Qs)				
									Clayey SAND , 7.5 yr 3/4 (Dark Brown), moist, fine to medium sand, trace coarse sand, few fine gravel				
									SAND with Silt , 7.5 yr 5/6 (Strong Brown), moist, fine sand, trace medium and coarse sand, trace fine gravel				
									Clayey SAND , 7.5 yr 3/4 (Dark Brown), moist, fine to medium sand, trace coarse sand, few fine gravel				
									SAND with Silt , moist, fine to medium sand, few fine gravel, 7.5 yr 5/4				
									Clayey SAND , 7.5 yr 3/4 (Dark Brown), moist, fine to medium sand, trace coarse sand, few fine gravel				
									Sand with Silt , 7.5 yr 5/4 (Brown), moist, fine to medium sand, few coarse sand, few fine gravel, trace cobbles				
									-Layer of fine gravel				
									Clayey SAND , 7.5 yr 3/4 (Dark Brown), moist, fine to medium sand, trace coarse sand, trace gravel, trace cobbles				
									SAND with Silt , 7.5 4/6 (Strong Brown), moist, fine to medium sand, few coarse sand, few fine gravel, trace cobbles				
									Clayey SAND Silty SAND , 7.5 yr 4/6 (Strong Brown), fine to medium sand, few coarse sand, trace cobbles				
									Silty SAND , 7.5 yr 4/6 (Strong Brown), moist, fine to medium sand, some coarse sand, few fine gravel				
									MUD FLOW (Qm)				

GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15


LOG OF CORE BORING		PROJECT NAME SSV	PROJECT NUMBER LA-1161A	BORING B-5 <input type="checkbox"/>
SITE LOCATION 6230 Yucca Street, Hollywood, Ca		DATE(S) DRILLED 1/13/14	LOGGED BY TPO	SHEET NO. 2 of 3
DRILLING METHOD HSA		DRILL BIT SIZE TYPE 8"	CHECKED BY SK	TOTAL DEPTH DRILLED (feet) 52
DRILL RIG TYPE CME 95		DRILLED BY Gregg In-Situ Drilling	INCLINATION FROM VERTICAL BEARING 0	
APPARENT GROUNDWATER DEPTH None encountered			APPROXIMATE SURFACE ELEVATION (feet) 415	
COMMENTS			BOREHOLE BACKFILL Soil Cuttings	

DEPTH (ft)	ELEVATION (ft)	ROCK CORE						LITHOLOGY	MATERIAL DESCRIPTION	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER						
30	385	9		30/30					Clayey SAND , 7.5 yr 4/6 (Strong Brown) , moist to wet, fine to medium sand, trace coarse sand, trace fine gravel -7.5 yr 4/4 (Brown) Clayey SAND to Sandy CLAY , 7.5 yr 4/4 (Brown), moist to wet, fine sand, some medium sand, trace coarse sand, traces of peat 2.5 yr 3/1 (Black), slight hydrocarbon odor -Ground Water -10 yr 3/4 (Dark Yellowish Brown)				
		10		28/30									
		11		60/60									
35	380	12		60/60									
40	375	13		60/60					MODELO FORMATION (Tm) Weatherd Sandy SILTSTONE mottled 7.5 yr 4/2 (Brown), 2.5 yr 3/6 (Dark Red), and 10 yr 6/8 (Brownish Yellow), moist				
									Silty SANDSTONE , 7.5 yr 5/8 (Strong Brown)				
45	370	14		60/60					Weathered Sandy SILTSTONE mottled 7.5 yr 4/2 (Brown), 2.5 yr 3/6 (Dark Red), and 10 yr 6/8 (Brownish Yellow) -7.5 yr 2.5/1 (Black) -Sand Lens, 7.5 yr 7/1 (Light Gray), approximately 1" thick, fine sand				
	365												

GDC_ROCK_CORE_ENG LA-1161 BORING LOGS WITH ROCK CORES.GPJ ROCK2.GDT 3/3/15

PRELIMINARY GEOTECHNICAL REPORT PROPOSED HIGH
RISE RESIDENTIAL DEVELOPMENT 6230 YUCCA STREET,
HOLLYWOOD, CALIFORNIA. BORING LOGS (GDC 2006).

LOG OF TEST BORING				PROJECT NAME Proposed Residential Development			PROJECT NUMBER L-718		BORING B-1			
SITE LOCATION 6320 Yucca St. Hollywood, CA						START 10/25/2006		FINISH 10/25/2006		SHEET NO. 1 of 3		
DRILLING COMPANY Jet Drilling				DRILLING METHOD Hollow Stem Auger			LOGGED BY S. Nava		CHECKED BY T. Swantko			
DRILLING EQUIPMENT CME 75				BORING DIA. (in) 6		TOTAL DEPTH (ft) 61		GROUND ELEV (ft) 24.3 / na		DEPTH/ELEV. GROUND WATER (ft)		
SAMPLING METHOD Hammer: 140 lbs., Drop: 30 in.				NOTES								
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	% PASSING #200	ATTERBERG LIMITS LL: PL: PI	POCKET PEN (tsf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
5		B-1									X X X X	2" of Asphalt 2" of Base Possible Fill Silty Sand (SM) dark brown, with some clay, scattered gravel (hand augered to 6')
		S-2		7 10 11							X X X X	Sandy Silt to Silty fine Sand (ML/SM) medium dense to dense, light brown, some roots
10		R-4		14 40 1/2"							X X X X	Silty Sand (SM) with clay, dense, reddish brown
15		S-5		6 35/6"				4.3			X X X X	Silty Clay (CL) hard, reddish brown, shale fragments
20		R-6		10 36 1/2"							X X X X	Reddish brown interbedded Sandy Silt and Clayey Sand medium dense to dense, trace of gravel



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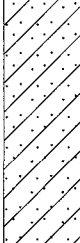

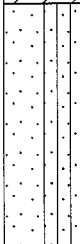



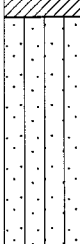

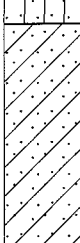
THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE A-2 a

GDC LOG BORING 1A L-718 YUCCA GP J GDC WLOG GDT 10/31/06

LOG OF TEST BORING

PROJECT NAME Proposed Residential Development		PROJECT NUMBER L-718	BORING B-1
SITE LOCATION 6320 Yucca St. Hollywood, CA		START 10/25/2006	FINISH 10/25/2006
DRILLING COMPANY Jet Drilling		LOGGED BY S. Nava	CHECKED BY T. Swantko
DRILLING EQUIPMENT CME 75	BORING DIA. (in) 6	TOTAL DEPTH (ft) 61	DEPTH/ELEV. GROUND WATER (ft) ▼ 24.3 / na

SAMPLING METHOD							NOTES					
Hammer: 140 lbs., Drop: 30 in.												
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	% PASSING #200	ATTERBERG LIMITS LL,PL,PI	POCKET PEN (tsf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
			S-7	12 14 18				3.0				Clayey Sand to Sandy Clay dense, reddish brown, trace of black organics
30			R-8	8 20 1/2"								Silty to Silty fine to medium Sand (SM/SP) wet, medium dense, light reddish brown slightly
35			S-9	7 8 14								Silty Clay (CL) stiff, light reddish brown, with some sand
40			R-10	12 36 1/2"								Slight Silty to Silty fine to coarse Sand (SM) medium dense, reddish brown
45			S-11	33 28 50/3"								Sandy Clay to Clayey Sand (SC/CL) very dense, reddish brown, trace of gravel

GDC LOG BORING 1A L-718 YUCCA.GPJ GDC WLOG.GDT 10/31/06



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FIGURE A-2 b

LOG OF TEST BORING

PROJECT NAME Proposed Residential Development		PROJECT NUMBER L-718	BORING B-1
SITE LOCATION 6320 Yucca St. Hollywood, CA		START 10/25/2006	FINISH 10/25/2006
DRILLING COMPANY Jet Drilling		LOGGED BY S. Nava	CHECKED BY T. Swantko
DRILLING EQUIPMENT CME 75	BORING DIA. (in) 6	TOTAL DEPTH (ft) 61	DEPTH/ELEV. GROUND WATER (ft) ▼ 24.3 / na

SAMPLING METHOD
Hammer: 140 lbs., Drop: 30 in.

NOTES

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	% PASSING #200	ATTERBERG LIMITS LL, PL, PI	POCKET PEN (tsf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
55		⊠	R-12	10 22	64/12"							Sand to Silty fine to coarse Sand dense, reddish brown
		⊠	S-13	21 50/6"	50/6"							Fine to medium Sand (SP) very dense, light brown, some silt
60		⊠	R-14	10 50/6"								Clayey Sand (SC) dense, light brown, with cobbles
65												Bottom of boring B-1 at 61 feet. Groundwater encountered at 24.3 feet. Boring backfilled with soil cuttings and capped with concrete.
70												

GDC LOG BORING 1A L-718 YUCCA.GPJ GDC WLOG.GDT 10/31/06



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FIGURE A-2 c

LOG OF TEST BORING				PROJECT NAME Proposed Residential Development		PROJECT NUMBER L-718		BORING B-2				
SITE LOCATION 6320 Yucca St. Hollywood, CA					START 10/26/2006		FINISH 10/26/2006		SHEET NO. 1 of 3			
DRILLING COMPANY Jet Drilling				DRILLING METHOD Hollow Stem Auger			LOGGED BY S. Nava		CHECKED BY T. Swantko			
DRILLING EQUIPMENT CME 75				BORING DIA. (in) 6		TOTAL DEPTH (ft) 61.5		GROUND ELEV (ft) 44.2 / na		DEPTH/ELEV. GROUND WATER (ft) 44.2 / na		
SAMPLING METHOD Hammer: 140 lbs., Drop: 30 in.				NOTES								
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	% PASSING #200	ATTERBERG LIMITS LL, PL, PI	POCKET PEN (tsf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
5		B-1										2" of Asphalt 2" of Base Silty Sand (SM) brown, some gravel
10		R-2		5 10 1/2"								Silty Sand (SM) brown, some gravel Sandy Silt to Silty Sand (SM/ML) dark brown, scattered gravel, loose
15		S-4		4 10 7								Silty Sand (SM) brown, some gravel Slightly Silty to Silty Sand (SM) medium dense, light brown, trace of gravel
20		R-5		10 24 1/2"								Silty Sand (SM) brown, some gravel Silty fine Sand (SM) medium dense, slightly reddish brown, some clay
25		S-6		8 12 14								Silty Sand (SM) brown, some gravel Slightly Silty fine to medium Sand (SP/SM) medium dense, some coarse sand and gravel
Grades with some thin layers of coarse Sand												

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FIGURE A-3 a

GDC LOG BORING 1A L-718 YUCCA.GPJ GDC WLOG.GDT 10/31/06

LOG OF TEST BORING		PROJECT NAME Proposed Residential Development		PROJECT NUMBER L-718		BORING B-2	
SITE LOCATION 6320 Yucca St. Hollywood, CA				START 10/26/2006		FINISH 10/26/2006	
DRILLING COMPANY Jet Drilling				DRILLING METHOD Hollow Stem Auger		LOGGED BY S. Nava	
DRILLING EQUIPMENT CME 75				BORING DIA. (in) 6		TOTAL DEPTH (ft) 61.5	
SAMPLING METHOD Hammer: 140 lbs., Drop: 30 in.				GROUND ELEV (ft) 44.2 / na		DEPTH/ELEV. GROUND WATER (ft) na	
NOTES							

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	% PASSING #200	ATTERBERG LIMITS LL:PL:PI	POCKET PEN (tsf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
30		⊠	R-7	8 3 1/2"								
35		⊠	S-8	5 7 9						3.5		Clay (CL) very stiff, with some sand
40		⊠	R-9	7 20 1/2"								Silty fine to medium Sand (SM) medium dense, dark brown, some clay
45		⊠	S-10	7 12 12								Silty fine to medium Sand (SM) medium dense, some gravel
		⊠	R-11	7 58 1/2"								

GDC LOG BORING 1A L-718 YUCCA GPJ GDC WLOG.GDT 10/31/06



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FIGURE A-3 b

LOG OF TEST BORING				PROJECT NAME Proposed Residential Development			PROJECT NUMBER L-718		BORING B-2		
SITE LOCATION 6320 Yucca St. Hollywood, CA						START 10/26/2006		FINISH 10/26/2006		SHEET NO. 3 of 3	
DRILLING COMPANY Jet Drilling				DRILLING METHOD Hollow Stem Auger			LOGGED BY S. Nava		CHECKED BY T. Swantko		
DRILLING EQUIPMENT CME 75				BORING DIA. (in) 6		TOTAL DEPTH (ft) 61.5		GROUND ELEV (ft)		DEPTH/ELEV. GROUND WATER (ft) ▼ 44.2 / na	
SAMPLING METHOD Hammer: 140 lbs., Drop: 30 in.				NOTES							

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	% PASSING #200	ATTERBERG LIMITS LL:PL:PI	POCKET PEN (tsf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		X	S-12	12 14 17								Silty to Clayey Sand (SM/SC) dense, slightly reddish brown
55		X	R-13	12 30								Grades with gravel and cobbles
60		X	S-14	12 21 25								
65												Bottom of boring B-2 at 61.5 feet. Groundwater encountered at 44.2 feet. Boring backfilled with soil cuttings and capped with concrete.
70												

GDC LOG BORING 1A L-718 YUCCA.GPJ GDC WLOG.GDT 10/31/06

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FIGURE A-3 c

LANGAN ENGINEERING & ENVIRONMENTAL SERVICES
FAULT INVESTIGATION REPORT FOR THE HOLLYWOOD
DEVELOPMENT, VESTING TENTATIVE TRACT 71837,
HOLLYWOOD, CALIFORNIA. BORING LOGS, 2011.

LANGAN

ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B3**

Sheet **1** of **5**

I:\LANGAN\COMDATA\DATA5700019502\ENGINEERING\DATA\GEOTECHNICAL\GINT\LOGS\700019502 HOLLYWOOD LOGS B1-B4-MODIFIED.GPJ ... 11/20/2012 9:59:01 PM ... Report Log - LANGAN ... Template TEMPLATE.GDT

Project Millennium Hollywood		Plunge (deg) -60	Project No. 700019502	
Location Hollywood, CA		Bearing (deg) 179	Elevation and Datum Approximately 389	
Drilling Company Cascade Drilling, LP		Date Started 7/19/12		Date Finished 7/20/12
Drilling Equipment Sonic Drill Rlg		Completion Length 100 ft		Rock Depth -
Size and Type of Bit -		Number of Samples	Disturbed -	Undisturbed -
Casing Diameter (in) -		Casing Depth (ft) -	Water Level (ft.) First ▽ 56	Completion ▽ 55
Casing Hammer -	Weight (lbs) -	Drop (in) -	Drilling Foreman Jason Klipfel	
Sampler Continuous Core			Inspecting Engineer D.Eberhart, S. Montgomery, & J.Goff	
Sampler Hammer -			Weight (lbs) -	
Drop (in) -				

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Length Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recon. (in)	N-Value (Blows/ft)	
X	389.0		0					##YR ## Soil Color based on Munsell Soil Color Chart
	388.7	Asphalt Pavement Loose, 5YR 3/2, silty fine to medium grained SAND, damp to slightly moist [FILL]	1	1a	CORE	12		
		2						
		3						
		4	1b	CORE	12			
		5						
		6						
		7						
		8						
		9						
		10						
		11	2	CORE	18			
		12						
		13	3	CORE	15			
		14						
		15						
		16						
		17						
		18						
		19						
		20						


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Log of Boring

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Sheet 2 of 5

Project		Plunge (deg)		Project No.					
Millennium Hollywood		-60		700019502					
Location		Bearing (deg)		Elevation and Datum					
Hollywood, CA		179		Approximately 389					
MATERIAL SYMBOL	Elev. (ft)	Sample Description	Length Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist BL6in	N-Value (Blows/ft) 10 20 30 40	
			20						
			21	4	CORE	14			
		Loose, 7.5YR 3/4, silty very fine to fine grained SAND, trace fine subrounded gravel, trace coarse grained sand, some clay, slightly moist (SM)	22						
			23						
	368.2		24	5	CORE	38			
		<u>OLD ALLUVIUM</u>	25						
		Medium dense, 7.5YR 4/4, silty clayey very fine to fine grained SAND, slightly moist to moist (SC)	26						
		Loose to medium dense, 7.5YR 4/6, silty clayey very fine grained SAND, moist (SC)	27						
			28	6	CORE	28			
	364.8		29						
		Medium dense, 7.5YR 4/4, very fine to fine grained poorly graded SAND, trace fine subrounded gravel, trace silt, slightly moist (SP)	30						
			31						
	363.0		32						
		Soft, 7.5YR 4/6, very fine grained sandy SILT, moist (ML)	33						
			34						
	360.9		35	7	CORE	18			
		Medium dense, 7.5YR 4/6, silty very fine to fine grained SAND, moist (SM)	36						
			37						
		Medium dense, 7.5YR 3.5/4, silty very fine to fine grained SAND, trace fine subangular gravel, trace medium and coarse sand, trace clay, slightly moist (SM)	38	8	CORE	24			
			39						
		Loose, 10YR 3/4, silty very fine grained SAND, slightly moist (SM)	40	9	CORE	12			
			41						
		Loose to medium dense, 10YR 3/4, silty very fine to fine grained SAND, moist (SM)	42	10	CORE	17			
			43						
351.8		44	11	CORE	16				
	Medium dense, 7.5YR 3/4, clayey very fine to fine grained SAND, trace silt, slightly moist to moist (SC)								
350.0									

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Project	Millennium Hollywood	Plunge (deg)	-60	Project No.	700019502
Location	Hollywood, CA	Bearing (deg)	179	Elevation and Datum	Approximately 389

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Length Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recon. (in)	Penetr. resist. BL/ft	N-Value (Blows/ft)	
		Loose, 7.5YR 3/4, silty very fine grained SAND, gradational contact, slightly moist (SM)	45						
			46						
			47						
	347.4	Loose, 7.5YR 4/6, very fine grained poorly graded SAND, trace fine to coarse subrounded gravel, gradational contact, damp (SP)	48	12	CORE	14			
			49						
	345.7	Medium dense, 7.5YR 4/6, silty very fine to medium grained SAND, slightly moist (SM)	50						
			51						
	344.4	Medium dense, 7.5YR 4.5/4, very fine to coarse grained well graded SAND, scattered fine subrounded gravel, damp (SW)	52	13	CORE	34			
			53						
	343.1	Loose to medium dense, 7.5YR 3/4, silty very fine grained SAND, slightly moist (SM)	54	14	CORE	21			
	342.7	Medium dense, 10YR 4/6, very fine to medium grained poorly graded SAND, trace fine to coarse subangular gravel, slightly moist (SP)	55						
		Medium dense, 10YR 4/4, very fine to medium grained poorly graded SAND, trace fine subangular gravel, wet (SP)	56						
			57	15	CORE	20			
	339.6	Medium dense, 10YR 3/6, silty very fine to fine grained SAND, trace fine subangular gravel, trace coarse grained sand, moist to wet (SM)	58						
	338.8	Loose, 10YR 5/4, very fine to fine grained poorly graded SAND, trace fine to coarse subangular gravel, damp to slightly moist (SP)	59						
	338.3	Loose, 10YR 4/6, fine to coarse grained well graded SAND, wet (SW)	60	16	CORE	37			
	337.5	Medium dense, 10YR 4/4, silty very fine grained SAND, trace fine subangular gravel, wet (SM)	61						
	336.2	Loose, 10YR 4/6, very fine to medium grained SAND, some coarse grained sand, wet (SP)	62						
		Loose, 10YR 3/4, very fine to medium grained poorly graded SAND, trace fine subangular gravel, wet (SP)	63	17	CORE	30			
	334.9	Medium dense, 10YR 3/6, silty very fine to fine grained SAND, trace coarse grained sand, wet (SM)	64						
	333.6	Soft, 10YR 3/6, very fine to fine grained sandy CLAY, trace coarse grained sand, wet (CL)	65						
			66	18	CORE	36			
	331.8	Medium stiff, 10YR 3.5/5, CLAY, trace coarse grained sand, moist (CL)	67						
	331.0	Loose, 7.5YR 3/4, clayey very fine to fine grained SAND, trace coarse grained sand, wet (SC)	68						
	330.1	Loose, 7.5YR 4/6, fine to coarse grained well graded SAND, wet (SW)	69	19	CORE	36			
	329.9	Stiff, 10YR 4/6, silty CLAY, trace coarse grained sand, slightly moist to moist (CL)	70						

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Project

Millennium Hollywood

Plunge (deg)

-60

Project No.

700019502

Location

Hollywood, CA

Bearing (deg)

179

Elevation and Datum

Approximately 389

MATERIAL SYMBOL

Elev. (ft)

Sample Description

Length Scale

Sample Data

Number

Type

Recov. (in)

Penet. resist. BL/6in

N-Value (Blows/ft)

10

20

30

40

Remarks
(Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Loose, 10YR 3/6, clayey fine to coarse grained SAND, scattered silty lenses, wet (SC)

70

71

326.6

Loose to medium dense, 10YR 3/4, clayey silty very fine grained SAND, trace coarse grained sand, trace fine angular gravel, moist (SM)

72

73

74

324.0

Loose, 10YR 3/6, clayey very fine to coarse well graded SAND, slightly silty, wet (SW)

75

323.2

Medium stiff, 10YR 4/3, silty CLAY, trace fine and medium grained sand, moist (CL)

76

322.3

Medium stiff to stiff, 10YR 3/4, CLAY, trace medium and coarse grained sand, moist (CL)

77

321.5

Medium dense, 10YR 3/4, silty fine to coarse grained SAND, scattered fine subangular to rounded gravel, trace clay, wet (SM)
Loose to medium dense, 10YR 5/8, silty very fine to coarse grained SAND, moist to wet (SM)

78

79

80

81

318.4

Loose, 10YR 4/6, very fine to coarse well graded SAND, scattered fine subrounded gravel, scattered silty lenses, wet (SW)

82

83

84

Loose, 10YR 4/6, very fine to coarse well graded SAND, scattered fine subrounded gravel, scattered silty lenses, wet (SW)

85

314.5

Loose to medium dense, 10YR 5/6, silty very fine to coarse grained SAND, scattered fine subangular gravel, dry to damp (SM)

86

313.7

Loose, 10YR 4/6, fine to coarse grained well graded SAND, moist to wet (SW)

87

312.8

Stiff, 10YR 3/4, silty medium and coarse grained CLAY, slightly moist (CL)

88

89

311.1

Loose, 7.5YR 3/3, fine to coarse grained well graded SAND, trace clay, slightly moist (SW)
Stiff to very stiff, 7.5YR 3/4, CLAY, trace coarse grained sand, moist (CL)

90

91

92

308.5

Medium dense, 10YR 3/4, clayey fine and coarse grained SAND, wet (SC)

93

94

308.7

95

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Sheet **5** of **5**

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Project Millennium Hollywood		Plunge (deg) -60	Project No. 700019502	
Location Hollywood, CA		Bearing (deg) 179	Elevation and Datum Approximately 389	

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Length Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recon. (in)	Penet. resist. BLU/in	N-Value (Blows/ft) 10 20 30 40	
	305.9	Stiff, 10YR 3/6, CLAY, trace very fine grained sand, moist (CL)	95	28	CORE	18			
		96							
	304.1	Loose, 10YR 4/6, fine to coarse grained well graded SAND, wet (SW)	97	29	CORE	28			
		98							
	302.4	Medium dense, 10YR 3/6, silty very fine to fine grained SAND, moist to wet (SM)	99						
		100							
		Boring terminated at 100 feet length Boring backfilled with cement grout Surface patched with black-dyed rapid set concrete	101						
			102						
			103						
			104						
			105						
			106						
			107						
			108						
			109						
			110						
			111						
			112						
			113						
			114						
			115						
			116						
			117						
			118						
			119						
			120						

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Log of Boring

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Sheet 1 of 5

Project Millennium Hollywood		Plunge (deg) -60	Project No. 700019502	
Location Hollywood, CA		Bearing (deg) 178	Elevation and Datum Approximately 393.5	
Drilling Company Cascade Drilling, LP		Date Started 7/20/12		Date Finished 7/21/12
Drilling Equipment Sonic Drill Rig		Completion Length 111 ft		Rock Depth -
Size and Type of Bit		Number of Samples	Disturbed -	Undisturbed -
Casing Diameter (in)	Casing Depth (ft)	Water Level (ft.)	First ▽ 62.5	Completion ▽ 62.5
Casing Hammer	Weight (lbs)	Drop (in)	Drilling Foreman Jason Klipfel	
Sampler Continuous Core			Inspecting Engineer D.Eberhart, S. Montgomery, & J.Goff	
Sampler Hammer	Weight (lbs)	Drop (in)		

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Length Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recon. (in)	Penetr. resist. BL/ft	N-Value (Blows/ft)	
	393.6		0					10 20 30 40	
	393.2	Asphalt Pavement	1	1	CORE	4			##YR ## Soil Color based on Munsell Soil Color Chart
		Loose, 10YR 3/2, silty very fine grained SAND, asphalt and concrete fragments, damp [FILL]							
		Loose, 10YR 3/2, silty fine grained SAND, scattered fine angular gravel, asphalt and concrete fragments, damp to slightly moist [FILL]	2	2	CORE	5			
		Loose, 10YR 3/2, silty fine grained SAND, trace fine subangular gravel, damp [FILL]	3	3	CORE	12			
	389.2	<u>YOUNG ALLUVIUM</u>	4	4	CORE	6			
		Loose, 10YR 3/3, silty very fine to fine grained SAND, trace fine subangular gravel, slightly moist (SM)	5	5	CORE	8			
		Medium dense, 10YR 3/4, silty very fine to fine grained SAND, trace coarse grained sand, moist (SM)	6	6	CORE	12			
		Medium dense, 10YR 3/4, silty very fine to fine grained SAND, trace coarse grained sand, moist (SM)	7	7	CORE	11			
	383.1	Medium dense, 10YR 4/4, clayey fine to coarse grained SAND, trace fine subangular to subrounded gravel, some silt, dry to damp (SC)	8	8	CORE	12			
		Loose, 10YR 4/6, silty fine to coarse grained SAND, trace clay, slightly moist (SM)	9	9	CORE				
	379.6		10	10					
		Medium dense, 10YR 4/4, silty very fine grained SAND, slightly moist (SM)	11						
	376.2		12						

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Project		Plunge (deg)		Project No.					
Millennium Hollywood		-60		700019502					
Location		Bearing (deg)		Elevation and Datum					
Hollywood, CA		178		Approximately 393.5					
MATERIAL SYMBOL	Elev. (ft)	Sample Description	Length Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (ft)	Penetr. resist. Blows	N-Value (Blows/ft)	
		Loose to medium dense, 10YR 4/6, fine to coarse grained poorly graded SAND, slightly moist (SP)	20						
			21	9	CORE	10			
	374.4	Medium dense, 10YR 4/6, silty fine to medium grained SAND, scattered fine subangular gravel, damp to slightly moist (SM)	22						
			23						
			24	10	CORE	10			
		Loose to medium dense, 7.5YR 4/4, silty fine to coarse grained SAND, trace fine angular gravel, moist (SM)	25						
		Medium dense to dense, 7.5YR 4/4, silty fine to coarse grained SAND, trace clay, slightly moist (SM)	26						
	370.1	OLD ALLUVIUM	27	11	CORE	28			
		Medium dense, 7.5YR 3/3, silty fine to coarse grained SAND, slightly moist (SM)	28						
		Medium dense, 7.5YR 4/3, silty fine to medium grained SAND, trace coarse grained sand, slightly moist (SM)	29						
			30	12	CORE	24			
		Medium dense, 7.5YR 4/4, clayey silty fine to coarse grained SAND, slightly moist (SM)	31						
		Medium dense, 7.5YR 4/4, silty fine to coarse grained SAND, trace clay, slightly moist (SM)	32						
			33	13	CORE	26			
	363.6	Medium dense, 7.5YR 3/4, silty very fine to fine grained SAND, slightly moist (SM)	34						
		Loose, 7.5YR 5/6, very fine to coarse grained poorly graded SAND, slightly moist (SP)	35	14	CORE	18			
			36						
	361.5	Loose, 7.5YR 4/6, silty fine to medium grained SAND, trace coarse grained sand, slightly moist (SM)	37						
			38						
			39	15	CORE	20			
	358.4	Loose, 7.5YR 4/6, silty fine to medium grained SAND, slightly moist (SM)	40						
		Loose, 7.5YR 4/4, fine to medium grained poorly graded SAND, trace fine subrounded gravel, slightly moist (SP)	41	16	CORE	18			
	357.1	Medium dense, 7.5YR 4/6, silty very fine to fine grained SAND, slightly moist (SM)	42						
	356.3	Medium dense, 10YR 3/6, clayey fine to medium grained SAND, slightly moist (SC)	43						
		Medium dense to dense, 10YR 3/4, clayey very fine to fine grained SAND, trace fine subrounded gravel, slightly moist	44	17	CORE	21			
			45						

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Log of Boring


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Project		Plunge (deg)		Project No.					
Millennium Hollywood		-60		700019502					
Location		Bearing (deg)		Elevation and Datum					
Hollywood, CA		178		Approximately 393.5					
MATERIAL SYMBOL	Elev. (ft)	Sample Description	Length Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recon. (in)	Penetr. resist. BL/6in	N-Value (Blows/ft) 10 20 30 40	
	354.1	(SC) Medium dense, 10YR 3/6, clayey fine to medium grained SAND, trace silt, slightly moist (SC)	45	17	CORE	21			
	353.2	Medium stiff, 5YR 4/4, silty CLAY, slightly moist (CL) Loose, 7.5YR 4/6, clayey fine to medium grained SAND, trace coarse grained sand, slightly moist (SC)	46						
		Medium dense, 7.5YR 3/4, clayey very fine grained SAND, trace coarse grained sand, slightly moist to moist (SC) Medium dense, 7.5YR 4.5/4, clayey fine grained SAND, slightly moist (SC)	47	18	CORE	24			
			48						
			49						
			50						
	349.3		51	19	CORE	36			
	348.9	Loose, 7.5YR 4/6, silty fine to medium grained SAND, trace fine subangular gravel, trace coarse grained sand, slightly moist (SM)	52						
	348.5	Loose, 10YR 4/6, fine to medium grained poorly graded SAND, scattered fine to coarse subangular gravel, slightly moist (SP)	53						
	347.6	Loose, 10YR 4/6, fine to coarse grained well graded SAND, wet (SW)	54	20	CORE	36			
		Dense, 10YR 3/6, clayey very fine grained SAND, moist (SC)	55						
	345.9	Loose, 10YR 4/6, fine to coarse grained well graded SAND, trace fine subangular gravel, wet (SW)	56						
	345.0	Stiff, 10YR 3/4, CLAY, slightly moist to moist (CL)	57	21	CORE	46			
			58						
	343.3	Medium dense, 10YR 4/6, fine to coarse grained well graded SAND, wet (SW)	59						
	342.0	Stiff, 10YR 4/4, silty CLAY, moist (CL)	60						
			61	22	CORE	60			
	340.7	Medium dense to dense, 10YR 4/4, clayey fine and coarse grained SAND, wet (SC)	62						
			63						
	338.9	Medium dense, 7.5YR 4/6, gravelly fine to coarse grained well graded SAND, fine subrounded gravel, wet (SW)	64						
			65						
			66	23	CORE	52			
	335.5	Medium dense to dense, 7.5YR 4/4, very fine to fine grained poorly graded SAND, trace fine to coarse subrounded gravel, moist (SP)	67						
	334.6	Loose, 7.5YR 5/8, fine to coarse grained well graded gravel, trace fine subangular to subrounded gravel, wet (SW)	68						
		69	24	CORE	58				
332.9		70							

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Project		Plunge (deg)	Project No.									
Millennium Hollywood		-60	700019502									
Location		Bearing (deg)	Elevation and Datum									
Hollywood, CA		178	Approximately 393.5									
MATERIAL SYMBOL	Elev. (ft)	Sample Description	Length Scale	Sample Data						Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)		
				Number	Type	Recon. (in)	Penetr. resist. BL/ft	N-Value (Blows/ft)				
		subangular gravel, slightly moist (GW) Loose to medium dense, 5YR 6/2, sandy well graded GRAVEL, fine to coarse angular to subangular gravel, medium to coarse grained sand, slightly moist (GW)	95	29	CORE	58						
			96									
			97									
	-308.6	Loose to medium dense, 7.5YR 4/4, gravelly silty SAND, fine to coarse angular to subrounded gravel, fine to medium grained sand, slightly moist (SM)	98	30	CORE	58						
			99									
			100									
	-306.0	Loose, 7.5YR 4/3, sandy well graded GRAVEL, fine to coarse angular to subangular gravel, very fine to fine and coarse grained sand, slightly moist (GW)	101	31	CORE	32						
			102									
			103									
	-304.3	Loose, 7.5YR 3/6, fine to medium grained poorly graded SAND, trace coarse grained sand, wet (SP)	104	32	CORE	22						
			105									
			106									
	-300.8	7.5YR 3/3, sandy well graded GRAVEL, fine and coarse grained sand, fine to coarse subangular gravel, trace clay, slightly moist to moist (GW)	107									
			108									
			109									
	-300.0	Loose, 7.5YR 5/6, silty fine to coarse grained SAND, trace fine subangular gravel, wet (SM)	110									
			111									
			112									
	-299.1	Loose, 7.5YR 4/4, clayey sandy well graded GRAVEL, medium to coarse grained sand, fine to coarse subrounded gravel, slightly moist to moist (GW)	113									
			114									
			115									
	-297.4	Boring terminated at 111 feet length Boring backfilled with cement grout Surface patched with black-dyed rapid set concrete	116									
			117									
			118									
			119									
			120									

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APPENDIX B: SOIL STRATIGRAPHIC AGE ASSESSMENTS

ROY J. SHLEMON □ ASSOCIATES, INC.

Geologic and Environmental Consultants

P.O. Box 3066
Newport Beach, CA 92659-0620

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E-mail: rshlemon@jps.net

Quaternary Geology
Economic Geomorphology
Soil Stratigraphy
Geoarchaeology
PG 2867; CPG 1766; CPESC 2167

APPENDIX B

SOIL-STRATIGRAPHIC AGE ASSESSMENTS AND PALEO-ENVIRONMENTAL RECONSTRUCTION, GROUP DELTA CONSULTANTS EAST AND WEST TRENCHES, 6230 YUCCA STREET, HOLLYWOOD AREA, CITY OF LOS ANGELES, CALIFORNIA

INTRODUCTION

This Appendix summarizes soil-stratigraphic field measurements and descriptions for dating relative fault activity (time of last displacement) and for reconstructing local geomorphic evolution over the last □200-300 ka at and near the proposed □Yucca Street□development (Group Delta Consultants, Inc. [GDC], Plate 1, Site 2). The main purpose of the GDC investigation was to determine whether or not the inferred □Argyle Strand□of the Hollywood fault zone affects the proposed site (GDC Plate 1; Hernandez and Treiman, 2014). Accordingly, in addition to onsite and adjacent-site cone penetrometer tests (CPT) and continuous cores, GDC excavated and logged two onsite trenches, informally deemed the □west□and the □east□trenches, respectively (GDC, Plate 1). The two Yucca (Site 2) trenches, excavated and logged under the direction of GDC, complement other site-specific geological and geotechnical analyses (GDC narrative and appendices) to assess possible fault presence and relative activity.

The main purposes of this investigation (Appendix B) were several-fold:

1. To measure and describe a representative soil-stratigraphic section from initial exposures in the west trench;

Appendix B

Page 2

2. To determine the approximate age of the west-trench sediments based mainly on relative soil-profile development of the several paleosols encountered in the trench;
3. To reconstruct the latest Pleistocene-Holocene fluvial environment of deposition as recorded in the west trench exposures; and, from the east trench exposures, to explain the geomorphic evolution of the site and adjacent properties to the east (GDC Plate 1; Champion Site; Site 3) and the northeast (GDC Plate 1; Green Site; Site 4);
4. To assess the validity of two radiocarbon dates for the west trench sediments, particularly focusing on potential sample contamination; and to evaluate the stratigraphic validity of east-trench dates for age of "middle" Argyle Channel deposits;
5. To assist GDC with correlation of trench exposures and adjacent cone penetrometer test (CPT) transects and continuous cores; specifically, those data obtained onsite as well as from on-going investigations to the south (GDC Plate 1; East Millennium Site; Site 1) and to the east (GDC Plate 1, Site 3);
6. To deduce the likely characteristics and relative activity of various Hollywood fault segments inferred to potentially impact the site based on review of the published literature and on exposures in the two, on-site trenches; and
7. To provide an independent "Quality Assurance" critique of the GDC draft report in compliance with current geologic standards-of-practice applicable to fault-activity investigations.

The field work was commissioned by GDC and included various field, office and laboratory meetings with GDC personnel and with reviewers from the California Geological Survey and the City of Los Angeles. These took place from February through July 2014. The west trench field measurements were carried out on 13 February and 29 March; and the east trench documentation took place on 11 June and 7 July, respectively.

GDC personnel and Engineering Geologist Steven Kolthoff logged the trenches and kindly provided field logistical support. I particularly thank Steven Kolthoff and GDC engineers Michael Reader and Thomas Swantko for their much-appreciated courtesy and assistance.

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Two formal soil-stratigraphic sections were measured at the Yucca west trench; on the west wall at station 0-55 (Table 1), and in a basal "trench box" at station 0-35 (Table 2). Representative east-trench sections were documented on the east wall at station 0-60 (Table 3) and on the west wall at station 0-78 (Table 4). Pertinent location and geologic maps, trench logs, and CPT and continuous core data are given in the GDC narrative and hence are referred to, but not replicated in this document.

This Appendix uses traditional pedological (soil science) terminology and field methodology described in Soil Survey Division Staff (1993), in Soil Survey Staff (1999) and in Schaetzl and Anderson (2005). The applicability of soil-stratigraphy to fault-activity assessments for construction of residential and commercial properties, dams, landfills and other large engineered structures is summarized in Shlemon (1985). Numeric dating and "calibration" with relative soil profile development is reviewed in Birkeland (1999), McFadden (1989), and Eppes and others (2002).

Quantifying several key soil (pedogenic) properties by use of the "soil development index" (SDI) may provide an "age of weathering" (Harden, 1982). The index generally works well to determine the age of surface profiles, particularly chronosequences on flights of fluvial terraces. For buried soils, however, such as those at the Yucca site, the "Harden index" may yield incorrect results. Specifically, physical truncation or chemical alteration usually leaves only two or three soil characteristics amenable for quantification; for example, color change (rubification) with depth, expressed by Munsell notation; frequency and relative development of secondary clay films; and decrease in clay content from an argillic (Bt) horizon compared with primary (depositional) clay in the parent material (C horizon). Typically, however, as exposed in the Yucca west trench fluvial deposits, the laterally discontinuous, grossly fining-upward deposits make it almost impossible to confidently calculate the amount of translocated (pedogenic) clay compared with that inherent in the parent material. Moreover, local rubification may be derived from erosion of nearby, previously weathered sediments, a problem particularly affecting age assessments of paleosols identified in subsurface cores. In brief, age quantification of truncated buried soils, based only on a few preserved physical and chemical "signatures," too often results in dates with high uncertainty, even though some practitioners provide numbers to two or more significant figures. The age estimates for the Yucca trench soil-stratigraphy are therefore given in realistic ranges (Tables 1 through 4) to encompass uncertainty inherent in dating partially preserved paleosols.

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WEST TRENCH STRATIGRAPHY

The Argyle Channel

The Yucca west trench, ~130 ft long and locally up to ~35-ft deep, exposed several interbedded and laterally discontinuous, grossly fining-upward sedimentary "packets" laid down in a former stream channel (fan distributary ?) informally named the "Argyle Channel" after its southwest trend down the street of that name and through the site (GDC Fig. 6). The channel thalweg is exposed near the bottom of the west trench (GDC Plate 3 and Appendix D; photographs 1 and 3). The Argyle sediments are mainly bar and channel, capped by a remnant, slightly developed surface soil and replete with four intercalated buried paleosols. Each soil represents an epoch of relative landscape stability and hence a time of weathering (soil formation).

The basal trench unit, incised into and unconformably overlain by the Argyle Channel, is a truncated mudflow (Qm) bearing a remnant soil (dark yellowish brown [10YR 3/6] to dark brown [7.5YR 3/3] silty clay loam [Table 2]). This, in turn, is underlain by matrix-supported angular clasts (debris flows; Qdf) clearly exposed in the east trench (GDC Plate 5) and recognized in CPT transects and in continuous cores (GDC Plates 1 and 4). Topographically, the Argyle Channel no longer exists, its "upstream" source apparently "cut off" by early development in this area. Significantly, however, its sedimentary characteristics and incision into underlying, older clayey deposits indicates relatively abrupt, regional environmental change from deposition of mud- and debris-flows to relatively clean, high-energy fluvial gravels and silts. This major unconformity most likely stems from regional climate and vegetation change, and therefore ostensibly identifies onset of "pluvial" conditions in this area. For conservatism, this is judged to have taken place as recently as ~12-16 ka ago, temporally associated with marine oxygen-isotope stage 2. Accordingly, based on the abrupt change in fluvial environments, the base of the Argyle Channel is at least ~10-12 ka old; an age corroborated by the cumulative age of its several, intercalated buried soils.

Soil-Stratigraphic Measurements and Descriptions

The ~35-ft thick Argyle Channel sediments and paleosols were described from west-trench exposures on the west wall at Station 0~55 (Table 1); and the lower several ft were described from a "box trench" exposure at the base of the trench at Station 0~35 (Table 2).

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Station 0055

The Station 0055 soil-stratigraphic section is ~20-ft thick, measured from the surface to essentially the top of Bench 4 (GDC Plate 3). As documented in Table 1, artificial fill is underlain by about 3-ft of gravelly coarse sand grading upward to a loamy medium sand. The section is sufficiently weathered to have developed ~0.8-ft thick cambic (color) horizons (Bw1 and Bw2). No translocated clay is apparent. Nevertheless, weathering in Mediterranean climate, coarse-grained sediments requires at least an estimated 1 ka of weathering (McFadden, 1989). This surface soil is therefore deemed to be ~very slightly developed.

Another grossly fining-upward packet of sediments occurs between ~3.8 to 7.8 ft (Table 1). A similar, ~very slightly developed~buried soil caps this packet. The upper cambic horizon (2Bw1b) is truncated but, combined with the lower horizon (2Bw2b), similarly represents about ~1-2 ka of weathering.

A second, truncated buried paleosol occurs at a depth of 7.8 ft (Table 1). This soil, however, bears a weak argillic horizon (3Btb) typified by strong brown (7.5YR 4/6) thin clay films that bridge mineral grains and line ped faces. Based on relative development, this ~slightly developed~paleosol is judged to represent ~2-3 ka of weathering.

The top of a third, similarly truncated buried paleosol is identified at 10.4 ft (Table 1). Two weak argillic horizons (4Bt1b and 4Bt2b) are characterized by fine, dark yellowish brown (10YR 4/4) fine clay films that line ped faces and locally bridge root pores. A ~slightly developed~profile suggests that ~2-3 ka of weathering took place before burial by overlying sediments.

A fourth paleosol caps another fining-upward sequence at a depth of 14.5 ft (Table 1). The identified argillic horizon (5tb) is only 0.5-ft thick, probably truncated by deposition of the overlying coarse gravelly sand. Here, too, the horizon probably formed in ~2 ka. These particular deposits locally incise 2-3 ft into the underlying sediments, typical ~cut-and-fill~deposition within the Argyle Channel.

In brief, relative development of the surface and the four buried paleosols suggests a cumulative age of at least ~10-12 ka of weathering, a minimum age for the Argyle Channel deposits. More likely, however, based on thalweg incision into the underlying clay and the dramatic change in the fluvial environment, the

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basal deposits are older, ostensibly initially laid down at least ~12-15 ka ago during onset of marine isotope stage 2.

Station 0-35

In order to assess relative profile development below the base of the Argyle Channel, GDC locally deepened the Yucca trench several ft, providing safe access by means of a "Trench Box" (GDC Appendix D, Photograph 8). As measured and described from Station 0-35, the trench box exposed ~7 to 8-ft of silty clay loam coarsening downward to sandy clay loam, and ultimately to interbedded, mixed coarse sand and granitic gravel lenses at the base (Table 2). The clayey parent material (Qm) is a regional stratigraphic marker, exposed continuously at the base of the Yucca west trench, discontinuously throughout the east trench, and identified in adjacent continuous cores and on CPT transects.

A distinct, though truncated, buried paleosol was identified at the box trench exposure. This soil has two discrete, buried argillic horizons (6Bt1b and 6B2tb; Table 2). The argillic horizons are mainly silty to sandy clay loam, dark brown (7.5YR 3/3) to dark brown (7.5YR 4/4) in color, and replete with few to common fine, dark brown (7.5YR 3/4) clay films that line ped faces, bridge mineral grains and fill old root pores. The trench box exposures show that basal Argyle channel gravels are incised and truncate the underlying paleosol at least about one ft. Nevertheless, sufficient argillic horizon characteristics remain to deem the soil as "moderately developed," thereby representing an additional ~8-15 ka of weathering.

West Trench Radiocarbon Dates

Two "charcoal" samples were collected for potential radiocarbon assay (GDC Appendix C): "Charred material" at ~14-ft (Yucca ~2); and "organic sediments" at ~18-ft (Yucca ~1; GDC Appendix C). The Yucca samples were dated by "standard radiocarbon assay." Such dates may be questionable when sample size is small, where there is potential for modern groundwater contamination, and where samples are taken from high-energy environments and thus potentially reworked from older, "upstream" sediments.

As shown on the trench log (GDC Plate 2), the Yucca sediments are generally very coarse grained and devoid of laterally continuous, relatively impermeable clay beds to "perch" or otherwise prevent modern surface water from penetrating the entire section. Accordingly, the Yucca ~2 sample, dated as ~4300 BP (conventional) has been likely subject to contamination by younger gravitational

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water. It is therefore likely at least 10 or 15 percent too young (Pigati and others, 2007). Similarly, and very highly suspect is the 41,000 BP age for Yucca □ 1, obtained from sediments realistically not more than □12 ka old. Most likely, therefore, this □disseminated organic sediment□ was derived from □upstream□ weathering of older sediments and transported in the high-energy, coarse fluvial sediment at the base of the Argyle Channel. This □too old□ sample age is therefore rejected in favor of more reasonable, and conservative, soil-stratigraphic and paleo-environmental reconstruction.

EAST TRENCH STRATIGRAPHY

GDC excavated the □160-ft long and □30-35-ft deep east that overlapped the west trench and continued south across the Yucca property (Site 2) onto the adjacent Site 1 (GDC Plate 1). The east trench generally encountered four discrete Quaternary stratigraphic units, some bearing buried paleosols amenable to measurement, description and relative age assessments. As described by GDC (stratigraphic section, Fig. 10), the uppermost unit (youngest) pertains to the Argyle Channel, mainly fluvial and locally cross-bedded, medium- to coarse-sand and lenticular gravel beds (Qs). These are underlain by discontinuous mudflows locally capped by slightly to moderately developed buried paleosols (Qm). Underlying the mudflows are extensive debris flows, locally bearing discrete paleosols indicative of periodic (climatically controlled?) landscape stability and soil formation (Qdf). The debris flows are mainly derived from adjacent upstream and sideslope □older alluvium□ (Qoal) that once extended across the entire area. As encountered in onsite and adjacent cores, the Yucca area is underlain by Modelo formation □bedrock□(Tm).

Paleo-Environmental Reconstruction - East Trench Exposures

The east trench exposures supported initial interpretations of core and CPT data about the likely origin and relative age of the mud- and debris flows that underlie the Yucca (Site 2) area. Specifically, as shown on GDC Fig. 7, a veneer of old (likely □300 ka), □high-level□ channel and fan deposits still mantle the eroded surface at Site 3, east of Argyle Street (GDC Plate 1). Based mainly on paleo-environmental interpretation of regional cores and on the east trench exposures, an ancestral drainage apparently incised the area ostensibly □300 ka ago, giving rise to a steep channel wall underlying the present Argyle Street (GDC Plate 1). This channel was then filled by multiple debris flows emanating from upstream as well as from adjacent sideslopes. Debris-flow deposition was apparently episodic, or possibly even periodic, as deduced from preservation of slightly to

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moderately developed buried paleosols observed in the east trench. Many debris flows retain their original "brown to reddish brown" color, a result of previous, deep weathering of the their source sediments, the "high level" fan deposits (GDC Fig. 7).

The debris flows (Qdf) were, in turn, eroded and reworked, giving rise to relatively thin but readily discernible mudflows (Qm) that locally cover the debris flows and underlie the Argyle channel sands (Qs).

Additionally, as shown on the GDC trench log (Plate 5), the east trench exposed a south-verging anticline replete with an apparent slip surface (GDC Plate 5). Last apparent "movement" of this structure involved the debris flows (Qdf), but not the overlying mudflows (Qd) and the Argyle (Qs) deposits, as documented on the GDC logs (Plates 4 and 5).

Soil-Stratigraphic Measurements and Descriptions

Two representative soil sections were measured from the east trench exposures: on the east wall at station 0-60 (Table 3); and on the west wall at station 0-78 (Table 4). The station 0-60 descriptions particularly document the relative profile development of a buried paleosol that caps mudflows (Qm) deposits, which, in turn, unconformably overlie a buried paleosol formed on a local mud- debris flow transitional unit (Qm-Qdf). The station 0-78 soil section provides a detailed measurement and description of a buried paleosol that caps a horizontal, unbroken mudflow (Qm) directly overlying a slip surface (inferred fault) along a south-tilted, debris-flow bedding plane illustrated in GDC Fig. .

East Wall, Station 0-60

As documented in Table 3, the upper ~2.9-ft of section represent the base of the Argyle channel sands (Qs). These deposits are typically dark brown (10YR 4/3) to dark yellowish brown (10YR 4/4) sandy clay loam to fine sand with local, lenticular gravel lenses. Structure is typically massive to weak, fine angular, and thus indicative of the non-consolidation and relatively "youth" of Argyle channel sediments. At the measured section, the Argyle sediments are ~40-50 ft east of, and about halfway above the elevation of the main thalweg (see west trench log). Accordingly, based on stratigraphic position, their age is estimated to be ~4 - 5 k.

Horizons 2b1-2b2 (Table 3) mark a ~2.5-ft thick, remnant buried paleosol that caps underlying mudflow (Qm) deposits. The paleosol is a brown to dark brown (7.5YR 4/4 - 7.5YR 4/6) silt to loamy clay with moderate to strong, fine angular blocky structure. The paleosol is also very hard and sticky and plastic; and

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typified by few fine, yellowish brown (10YR 5/4) clay films that line ped faces and fill root pores. Based on its "moderate" relative development, this remnant soil represents an estimated "20-30 ka of weathering before truncation and burial by Argyle channel (Qs) deposits.

A second, deeper paleosol (horizons 3B1b-3B3b) was also measured and described at station 0-60 (Table 3). This particular paleosol formed across a thin mudflow and is superimposed onto an underlying debris flow. Specifically, the truncated 3B1b horizon is a yellowish brown (10YR 5/6) to strong brown (7.5YR 5/6) sandy clay loam with moderate medium blocky structure. Characteristic are few to common, strong brown (7.5YR 5/6) clay films that line ped faces, bridge mineral grains and line root pores. The underlying parent material (horizons 3C1b through 3c3b) generally grade into debris flows with matrix supported, "0.7-in angular clasts at the base (Table 3). Based on relative profile development, this buried paleosol represents another "25-30 ka of local landscape stability and related weathering.

West Wall, Station 0-78

A very detailed, approximately 1.1-ft thick profile was measured at Station 0-78 on the west wall of the Yucca east trench (Table 4). This section specifically addressed the relative age of a mudflow and capping paleosol that lie horizontal and unbroken over tilted debris flows (Qdf) containing an interbedded slip surface conservatively assumed to be a fault (GDC Plate 6). The upper "0.7 inches of the mudflow bear four discrete, now-buried argillic horizons (2B1b through 2b4b; Table 4) truncated by basal coarse sand and gravel associated with Argyle channel sediments (Qs). The paleosol horizons range in color from dark brown (7.5YR 5/4) to dark reddish brown (5YR 3/4) and formed on fine to coarse medium sandy loam parent material. The diagnostic argillic is the 2b3b (Table 4) with fine subangular blocky structure and few fine brown (7.5YR 5/4) clay films that line ped faces and bridge grains. Any reasonable "upward" projection of the GDC-logged slip surface does not offset the mudflow and its capping buried paleosol (GDC Appendix D [photograph]). Based on relative profile development, the buried paleosol represents at least "30 k of weathering. Its parent material, the horizontal, unbroken mudflow (Qm) is inherently older. Last movement along the underlying slip surface therefore took place prior to at least "30 k ago, and probably well before that time.

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East Trench Radiocarbon Dates

GDC collected eight, west-trench charcoal samples for potential radiocarbon assay, all obtained from Argyle Channel sediments. As documented in Appendix C, the samples are identified as Mill-1 through Mill-7 and Yucca 4; and cumulatively provide standard radiocarbon ages ranging from about 4.1 to 4.4 ka. These values were anticipated based on stratigraphic position and are therefore accepted as reasonable; and they support the estimated age for west-trench exposures at this same stratigraphic level.

CORRELATION OF YUCCA TRENCH SEDIMENTS AND SOILS WITH ADJACENT CONTINUOUS CORES AND CPT SOUNDINGS

The Yucca (Site 2) east and west trenches provided an additional three major benefits to assess potential presence and activity of the inferred Argyle Strand of the Hollywood fault. First, the west trench exposed not only Argyle Channel sediments (Qs), but also underlying, relatively impervious clay (Qm). When initially opened, this clay perched water, essentially at the base of the thalweg. Perched water also was present on clayey channel-bordering mudflows and debris flows into which the Argyle Channel was incised. The several different clay beds are vertically separated ~20 ft, as deduced from on-site geotechnical borings (GDC, 2006). The elevation difference was apparently interpreted (Hernandez and Treiman, 2014) as evidence for a possible "Argyle Strand" of the Hollywood fault system (GDC Plate 1; Fig. 4). Now, however, the trench exposures show that the difference in water-level elevation stems from local Argyle Channel incision into several different, relatively impermeable clayey mud- and debris flows (stratigraphic units Qm and Qdf).

Second, until excavation of the Yucca trenches, several other nearby, Hollywood fault investigations (GDC Fig. 1) did not employ site-specific trenching. Rather, fault-activity assessments were based mainly on correlation of CPT data and locally on extrapolation of often widely spaced cores. In contrast, the 6230 Yucca Street (Site 2) trenches provide geologic "calibration" for correlation with adjacent CPT soundings and continuous cores. This allows for high-confidence "extrapolation" of site stratigraphy north and south of the Yucca trenches (GDC Plates 1, and 2), and thus better assesses whether or not the adjacent sediments are fault displaced.

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Third, the Yucca trenches provide the first complete exposure of post-bedrock (Tm) Quaternary sediments in the Hollywood area. Accordingly, based on geomorphic reconstruction and on numeric (radiocarbon) and relative dating (soil stratigraphy), the Yucca trenches expose an excellent stratigraphy from which to reconstruct local late Quaternary geomorphologic evolution, to determine the characteristics and age of local faults, and to reasonably date the last displacement of those observed at nearby Site 3 immediately east of Argyle Street (GDC Plate 1).

And finally, as particularly observed in the west trench, the Argyle Channel deposits are internally incised, often up to several ft (GDC Fig. 2). This local fluvial incision may well explain "inverted," core-collected radiocarbon dates previously reported at the then, non-trenched Site 1, adjacent to the south (Langan, 2012; GDC Plate 1).

SUMMARY AND CONCLUSIONS

As part of standard-of-practice fault assessments, GDC emplaced and logged two trenches across a proposed development at 6230 Yucca Street (Site 2) in the Hollywood area of Los Angeles. The west trench, about 100-ft long and up to ~35 ft deep, and the east trench, over ~160 ft long and of similar depth, were purposely sited to determine the possible presence and relative activity (time of last surface or near-surface displacement) of the "Argyle Strand" of the Hollywood fault, recently included within a "Fault Hazard Zone" by the California Geological Survey (Hernandez and Treiman, 2014).

The west trench exposed the thalweg and an overlying 30-ft thick sequence of interbedded, grossly fining-upward fluvial sediments within the "Argyle Channel." Soil-stratigraphic measurements and descriptions show that the Argyle Channel sediments are capped by a remnant, very slightly developed surface soil, and by four, underlying buried paleosols, ranging in relative development from very slight to slight. Based on "calibration" with numerically dated soils elsewhere in Mediterranean climates, the cumulative time of weathering for formation of the channel sediments is an estimated ~10-12 ka.

The Argyle Channel incises underlying, relatively impermeable clay that bears a truncated, slightly to moderately developed buried paleosol. This soil, with its distinct translocated clay films, represents another ~8-15 ka of weathering. Additionally, the abrupt unconformity between the base of the channel and the underlying clay, suggest onset of Argyle channel deposition during an epoch of

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regional pluviality, conservatively estimated as 12-16 ka ago (marine isotope stage 2). From a pedogenic standpoint, the cumulative age of the trench-exposed Argyle channel and the underlying clay exceeds 15 ka.

The lower of the two conventional radiocarbon dates from the west trench, Argyle Channel deposits is particularly suspect, owing to likely re-deposition of organic sediment (41,000 bp) resulting in older contamination. Accordingly, more realistic estimates are derived from the cumulative age of the surface and four trench-exposed buried soils and from likely fluvial deposition onset during isotope stage 2.

The east Yucca trench overlapped the west trench to the north and extended onto Site 1 to the south. It exposed multiple debris flows that emanated both from upstream and from sideslope sources. The debris flows are overlain by locally discontinuous mudflows, similar to that observed at the base of the Argyle Channel deposits in the west trench.

A representative soil-stratigraphic section shows that the mudflows bear truncated paleosols with moderate relative profiles development, similar, if not exceeding the soil described in the west trench box cut. The better preserved east-trench buried soils reflect 25-30 ka of weathering.

Another east-trench soil profile was specifically described from an unbroken, horizontal mudflow that overlies an apparent slip surface within the south-dipping limb of a subsurface anticline. The buried soil is similarly moderately developed, again reflecting in this case - at least 30 k of weathering. The soil and its underlying mudflow parent material are undisplaced; therefore, last slip of the presumed fault at this location occurred well before 30 ka ago.

The Yucca trench exposures also explain the origin for an apparent 20-ft vertical offset of piezometric surfaces recorded in adjacent, on-site geotechnical borings. This separation was a main line of evidence for CGS postulation of a possible Argyle Strand fault. However, rather than fault caused, the offset water stems from perching on separate clayey mud- and debris-flows.

The trenches also show that the Argyle Channel sediments typically incise older deposits a few to locally several ft. Thus, without the benefit of trench exposures, charcoal obtained from continuous cores on the adjacent (Site 1) property, the consultants-of-record found that several radiocarbon ages were stratigraphic inverted, thus lowering their confidence to date on-site sediments.

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The Yucca trenches also provide "calibration" to more confidently identify the lithology and grain size and to correlate sediments in adjacent continuous cores and CPT transects. The GDC trench logs and extrapolation to adjacent and logs show that the Argyle Channel overlapping sediments and the underlying clay marker-bed are continuous and unbroken by any fault. Accordingly, if an Argyle Strand of the Hollywood fault truly exists, last surface displacement occurred prior to at least ~30 ka ago.

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TABLE 1

Soil-Stratigraphic Measurements and Descriptions

GDC □ Yucca Street □ Trench, West Wall, Station 0 □ 55; and Basal □ Trench Box; □ Station 0 □ 35

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
0.0 □ 0.8	Af □	Artificial Fill: Un-engineered fill; asphalt and bottle fragments; organic material.
0.8 □ 1.5	A-B	Brown to dark brown (10YR 4/3) to very dark grayish brown (10YR 3/2) when moist loamy medium sand; moderate medium angular blocky structure; slightly hard, slightly firm, non-sticky and non-plastic; few to common fine vertical roots; few to common granitic clasts to 1.5-in dia., gradual wavy boundary.
1.5 □ 1.9	Bw1	Yellowish brown (10YR 5/4) to brown to dark brown (10YR 4/3) when moist silty medium sand; weak fine subangular blocky structure to massive; very hard, very firm, non-sticky and non-plastic; few very fine vertical roots; locally few to common subrounded to angular clasts to 0.5-1.0 in long dia; gradual wavy boundary.
1.9 □ 2.3	Bw2	Yellowish brown (10YR 5/4) to yellowish brown (10YR 5/6) when moist silty fine sand; weak to fine subangular blocky structure; extremely hard to locally very firm; few very fine vertical roots; gradual wavy to abrupt wavy boundary (base of cambic horizon).
2.3 □ 3.8	C1	Brownish yellow (10YR 6/6) to yellowish brown (10YR 5/4) when moist gravelly coarse sand; massive loose, non-sticky and non-plastic; many angular clasts to □3-in long diameter; many subrounded pebbles to □0.8-in dia; abrupt wavy boundary (base of grossly fining-upward channel deposits; laterally discontinuous; unconformity).
3.8 □ 4.6	2Bw1b	Buried Paleosol (very slightly developed): Yellowish brown (10YR 5/6) to dark yellowish brown (10YR 5/4) when moist fine to medium sand; weak subangular blocky structure; hard, friable, non-sticky and non-plastic; few subrounded pebbles to □0.5-in dia., abrupt smooth to abrupt wavy boundary.
4.6 □ 5.2	2Bw2b	Dark yellowish brown (10YR 4/6) dark yellowish brown (10YR 3/6) when moist loamy fine sand; weak to moderate subangular blocky structure; slightly hard, firm, slightly sticky and non-plastic; gradual wavy boundary.

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Table 1 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
5.2 □ 6.0	2C1b	Pale Brown (10YR 6/3) to dark yellowish brown (10YR □) when moist medium to coarse sand; moderate to fine coarse blocky structure; extremely hard, firm to friable; non-sticky and non-plastic; subrounded clasts to 1-in dia.; gradual wavy boundary.
6.0 □ 6.3	2C2b	Yellowish brown (10YR 5/6) to dark yellowish brown (10YR 4/4) when moist coarse loamy sand; massive; loose, friable, non-sticky and non-plastic; few subrounded clasts to 1-in. dia., gradual wavy boundary.
6.3 □ 7.0	2C3b	Brownish yellow (10YR6/6) to dark yellowish brown (10YR 4/4) when moist gravelly coarse sand; structureless (loose), very friable; non-sticky and non-plastic; common to many subangular and angular clasts to 2-in dia., base of grossly fining-upward sequence; abrupt wavy boundary.
7.0 □ 7.8	2C4b	Dark yellowish brown (10YR 4/6) to strong brown (7.5YR 4/6) when moist coarse sand; massive to weak, fine angular blocky structure; soft, friable, non-sticky and non-plastic; very few angular clasts 0.5 to 1.0-in dia., few to common subrounded clasts to 1-in. dia. near base; abrupt wavy boundary (unconformity).
7.8 □ 8.2	3Btb	Buried Paleosol (slightly developed): Yellowish brown (10YR 5/6) to strong brown (7.5YR 4/6) when moist loamy fine sand; moderate medium angular blocky structure; slightly hard to hard, firm non-sticky and slightly plastic; few very fine clay films bridging mineral grains and lining ped faces; abrupt smooth boundary.
8.2 □ 10.4	3Cb	Light yellowish brown (10YR 6/4) to dark yellowish brown (10YR 4/4) when moist coarse sand,; massive structure; loose, very friable, non-sticky and non-plastic; local gravel lenses to 1.5-in thickness; gravel lenses and horizontal stringers of interbedded sand and gravel; laterally discontinuous; poorly sorted; medium energy environment of deposition; abrupt wavy to abrupt irregular boundary (unconformity).
10.4 □ 12.6	4Bt1b	Buried Paleosol (slightly developed): Brownish yellow (10YR 6/6) to dark yellowish brown (10YR 4/6) when moist moderate very fine subangular blocky structure in clayey lenses; friable,

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Table 1 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
		slightly sticky; non-plastic; few very fine dark yellowish brown (10YR 4/4) clay films lining ped faces and bridging mineral grains; locally few to common pebble lenses 0.5 to 1.0 in thick laterally increasing in width; locally discontinuous; local isolated, very angular clasts to 2-in. dia., abrupt wavy boundary
12.6 □ 13.4	4Bt2b	Dark yellowish brown (10YR 4/4) to dark yellowish brown (10YR □) when moist pebbly clay loam; moderate to strong very angular blocky structure; very hard, very firm, slightly sticky and slightly plastic; few very fine dark brown (10YR 3/3) clay films lining ped faces and bridging mineral grains; few to common fine roots and vertical pores; local sand and pebble lenses near base to 2-in. thick; laterally discontinuous; top of grossly fining-upward sequence; gradual to locally abrupt smooth lower boundary.
13.4 □ 14.5	4Bt3b	Dark yellowish brown (10YR 4/4) to dark yellowish brown (10YR 3/4) when moist pebbly loamy sand; weak to moderate angular blocky structure; slightly hard to hard, firm, slightly sticky and plastic; few very fine vertical roots; few very fine clay films lining ped faces and bridging mineral grains; few disseminated detrital charcoal fragments to 0.2-in dia., throughout horizon (see notes), collected near base; few to common pebbly gravel lenses increasing near base; few lenticular subrounded to rounded clasts to 2-in. dia. throughout horizon; abrupt wavy boundary (unconformity).
14.5 □ 15.0	5tb	Buried Paleosol (slightly developed): Yellowish brown (10YR 5/6) to dark yellowish brown (10YR 3/6) when moist pebbly loamy clay; moderate medium angular blocky structure; hard, firm to friable, non-sticky and slightly plastic; few thin lenticular clay lenses; locally few very fine dark yellowish brown (10YR 4/4) clay films lining ped faces and bridging mineral grains; united truncated gradual wavy to abrupt wavy boundary.
15.0 □ 18.4	5C1b	Yellowish brown (10YR 5/8) to dark yellowish brown (10YR 4/6) when moist medium coarse sand; massive structure; very friable, loose; non-sticky and non-plastic; coarsening near base; gradual smooth to locally abrupt boundary.
18.4 □ 18.8	5C2b	Dark yellowish brown (10YR 4/6) to dark yellowish brown (10YR □) silty clay; weak to moderate angular blocky structure; hard very firm, slightly sticky and slightly plastic; laterally extensive marker horizon; thickness variable 2-3 in., continuous unbroken unit below base of locally incised channel

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Table 1 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
		gravels and laminated sand); gradual wavy boundary; base of trench wall measured section approximately 6-ft above trench base at Sta. 0+55.

Notes (*Trench Wall exposures, Sta. 0+55*):

1. Soil profile measurement by RJS and SK, 13 February 2014; GDC Yucca Trench, west wall; Station 0+55.
 2. The surface and four very slightly to slightly developed buried paleosols cap grossly fining-upward sequences; typified by cambic (Bwb) or by cumulic, weak argillic (Btb) horizons. Buried paleosols, in generally coarse-grained parent material, each represent 1-2 k of relative landscape stability soil weathering.
 3. Trench exposes thalweg of SW-trending fluvial channel deposits and interbedded paleosols at 25 ft. Main paleo-channel contains multiple, laterally discontinuous bar and channel sediments; grossly fining upward, and each capped by a truncated buried paleosol.
 4. Present geomorphic setting, stratigraphic position and onset of basal channel-gravel deposition implies formation under a more pluvial climate; conservatively estimated to be during oxygen-isotope stage 2, 12-16 ka ago.
 5. Cumulatively, the surface and the four buried paleosols represent 8-10 ka of weathering.
-

TABLE 2
GDC Yucca Soil Profile Measurement and Description in □Box Trench□
(□4 ft below base of Bench 4, Sta. 0□35)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
25.0 □ 25.5	6Bt1b	<u>Buried Paleosol</u> (truncated; slightly to moderately developed): Dark yellowish brown (10YR 3/6) to dark brown (7.5YR 3/3) when moist silty clay loam; moderate medium angular blocky structure; hard, firm, slightly sticky and slightly plastic; few to common fine dark brown (7.5YR □) clay films lining ped faces; common fine root pores; gradual diffuse boundary.
25.5 □ 27.0	6Bt2b	Brown to dark brown (7.5YR 4/4) sandy clay loam; weak to moderate sub-angular blocky structure; soft, friable, non- sticky and slightly plastic; few very fine clay films decreasing with depth; gradual wavy boundary.
27.0 □ 33.0	6Cb	Sandy loam grading downward to interbedded granitic clast lenses to 0.5-in. dia., increasing at base; base of Trench Box exposure.

Notes (*Box cut at base of trench; sta. 0+35*):

1. Soil measured and described by RJS, 29 March 2014.
2. Basal clay is truncated by overlying, high-energy channel deposits; only remnant buried paleosol is preserved (slightly too moderately developed with argillic [6Bt1b/6Bt2b] horizons).
3. Buried paleosol is estimated to conservatively represent □8-10 ka of weathering. The clay parent material is a regional stratigraphic marker, exposed continuously at the base of GDC □Yucca Box Trench□and identified in adjacent continuous cores.
4. Cumulatively, the □Box Trench□soil and the overlying paleosols within the overlying channel gravels represent □at a minimum □16-20 ka of weathering.

Table 3

Soil-Stratigraphic Measurement and Description,
GDC East Trench, East Wall, Station 0□60

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
0.0 - 0.7	C1	Brown to dark brown (10YR 4/3) to dark yellowish brown (10YR 3/4) when moist gravely sandy clay loam; weak medium subangular blocky structure; extremely hard, extremely firm, locally friable, slightly sticky and slightly plastic; common angular clasts to 2-in dia. near base; abrupt wavy boundary.
0.7 □ 2.0	C2	Dark yellowish brown (10YR 4/4) to dark yellowish brown (10YR 3/4) when moist sandy clay loam; massive structure; very hard and very firm; slightly sticky and slightly plastic; common angular clasts to 2.0 in dia. near base; few detrital charcoal fragments near base; abrupt wavy boundary.
2.0 □ 2.9	C3	Yellowish brown (10YR 5/4) to dark yellowish brown (10YR 3/6) when moist fine gravelly silt loam; massive to weak fine angular blocky structure; extremely hard, extremely firm; slightly sticky and slightly plastic; few to common angular clasts to 0.2 in dia. near base; abrupt smooth boundary (unconformity).
2.9 □ 3.9	2B1b	Buried Paleosol: Brown to dark brown (7.5YR 4/4) to strong brown (7.5YR 4/6) when moist loamy clay; massive to weak fine subangular blocky structure; very hard, very firm, sticky and plastic; few very fine dark brown (7.5YR 3/4) clay films lining ped faces and bridging mineral grains; parent material □ mudflow; upper horizon truncated; abrupt wavy boundary.
3.9 □ 4.8	2B2b	Yellowish brown (10YR 5/6) to dark yellowish brown (10YR 4/6) when moist silty clay; moderate to strong fine angular blocky structure; extremely hard, extremely firm; sticky and very plastic; few very fine rootlets along ped faces; few, very fine yellowish brown (10YR 5/4) clay films along ped faces decreasing near base; parent material □ local mud and debris flow; abrupt wavy boundary.
4.8 □ 5.4	2Cb	Pale brown (10YR 6/3) to brown (10YR 5/3) when moist sandy loamy clay; massive structure; very hard, very firm; slightly sticky and slightly plastic; abrupt wavy boundary (unconformity).
5.4 □ 5.8	3B1b	Buried Paleosol: Yellowish brown (10YR 5/6) to strong brown (7.5YR 5/6) when moist fine sandy clay loam; moderate medium blocky structure; extremely hard, extremely firm, slightly sticky and slightly plastic; very few strong brown (7.5YR 5/8) clay films

Table 3 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
cont:	3B1b	Lining ped faces and bridging mineral grains; parent material □ mudflow bearing a moderately developed buried paleosol; gradual wavy boundary.
5.8 □ 6.3	3B2b	Yellowish brown (10YR 5/6) to strong brown (7.5YR 5/6) medium to coarse angular sand; massive structure; extremely hard; extremely firm; non-sticky and non-plastic; gradual wavy boundary.
6.3 □ 7.1	3B3b	Yellowish brown (10YR 5/6) to strong brown (7.5YR 5/6) when moist medium sandy loam; massive structure; extremely hard; extremely firm; non-sticky and non-plastic; gradual smooth boundary.
7.1 □ 7.6	3C1b	Yellow (10YR 7/6) to brownish yellow (10YR 6/6) when moist fine sandy loamy clay; massive structure; extremely hard; extremely firm; non-sticky and non-plastic; gradual smooth boundary.
7.6 □ 8.2	3C2b	Brownish yellow (10YR 6/8) to brownish yellow (10YR 6/6) when moist medium sandy clay loam; massive structure; extremely hard, extremely firm; non-sticky and non-plastic; abrupt smooth boundary.
8.2 □ 9.2	3C3b	Very pale brown (10YR 7/4) to yellowish brown (10YR 5/6) when moist stratified loamy lay to silt loam; massive structure to fine medium subangular blocky ear base; common mineral staining on ped faces increasing near base; extremely hard, extremely firm; slightly sticky and slightly plastic; common matrix supported angular clasts to 0.7-in dia. (debris flow) near base of measured section; base of third wall (GDC trench log).

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Table 3 (continued)

Notes:

1. Soil measured and described by RJS, assisted by GDC field geologists (see GDC log for location).
2. Upper ~2.9 ft comprises three horizons (C1 through C3) within Qs deposits (~Argyle Channel sands) horizons typified by silty to sandy clay loams; stratified fluvial parent material with angular clasts increasing near base (fining upward sequence), incised into and unconformably overlying GDC-designated Qm (Mud Flow).
3. Upper buried paleosol (horizons 2B1b/2B2b) typically brown to dark brown (7.5YR 4-4/4/6) loamy to silty clay with few fine, fine dark brown (7.5YR 3/4) clay films lining ped faces and bridging mineral grains. Buried soil is ~moderately developed; ~represents minimum ~30 ka of ~weathering. ~Overlying argillic horizons eroded at measured section. Parent material is Qm (Mud Flow).
4. Lower buried paleosol (argillic horizons 3B1b through 3B3b) typically yellowish brown (10YR 5/6) to strong brown (7.5YR 5/6) sandy clay loam with very few to few clay films lining ped faces and bridging mineral grains. Buried soil is ~slightly to moderately developed; ~represents minimum ~20-30 ka of weathering; upper argillic horizons locally truncated. Parent material is Qm locally grading into or unconformably overlying lenticular debris flows with matrix-supported angular clasts identified as Qoal (Older alluvial deposits) on GDC log.

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Table 4**Soil-Stratigraphic Measurement and Description,
GDC East Trench, Bench 2, West Wall, Sta. 0+78**

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
0.00 □ 0.15	2B1b	Brown to dark brown (7.5YR 4/3) to dark brown (7.5YR 3/3) when moist coarse sandy loam; moderate medium subangular blocky structure; hard to very hard, very firm, plastic and slightly sticky; few very fine dark brown (7.5YR 3/3) clay films lining ped faces and bridging mineral grains; gradual wavy boundary.
0.15 □ 0.20	2B2b	Dark brown (7.5YR 3/3) to brown (7.5YR 5/4) when moist medium sandy loam; moderate medium subangular blocky structure; very hard, very firm, sticky and plastic; few very fine dark brown (7.5YR 3/3) clay films bridging mineral grains; gradual wavy to gradual smooth boundary.
0.20 □ 0.40	2B3b	Dark reddish brown (5YR 3/4) to brown (7.5YR 5/4) when moist fine sandy clay loam; massive to weak fine subangular blocky structure; very hard, very firm, slightly sticky and plastic; few very fine brown (7.5YR 5/4) clay films lining ped faces and bridging mineral grains; few very angular clasts to 0.2-in dia., lenticular unit to 3-in thick; gradual wavy boundary.
0.40 □ 0.60	2B4b	Dark brown (7.5YR 3/3) to brown (7.5YR 5/4) when moist coarse sandy clay loam; massive structure; hard, firm, sticky and plastic; few brown to dark brown (7.5YR 4/4) clay films lining ped faces and bridging mineral grains; few very angular pebbles increasing in frequency near base; gradual wavy boundary.
0.60 □ 0.75	2C1b	Dark brown (10YR 3/3) to brown to dark brown (10YR 4/3) when moist sandy clay loam; massive structure; hard, firm to very firm, slightly sticky and plastic; few very angular to common subrounded clasts near base; gradual wavy to abrupt wavy boundary (Unconformity); (Base of Mud Flow, (Qm)).
0.75 □ 1.00	2C2b	□Old Alluvium□ (Qoal) (South Dipping): Dark brown (10YR 3/3) to brown to dark brown (7.5YR 4/3) when moist pebbly clay loam; massive structure; hard, very firm, slightly sticky and plastic; few very angular pebbles to 0.1 in dia., increasing near base; gradual wavy boundary.
1.00 □ 1.10	2C3b	Dark yellowish brown (10YR 3/4) to dark brown (7.5YR 3/4) when moist sandy loamy clay; massive structure; hard to very hard, very firm, slightly sticky and slightly sticky; lenticular angular pebbles to 0.1-in dia. near base; gradual wavy to angular wavy boundary; base of measured section.

Table 4 (continued)

Notes:

1. Soil measured and described by RJS with assistance from GDC staff. Section located immediately north of bedding-plane fault as depicted on GDC log. The top of the ~1.0-ft section is the truncated surface of the GDC-designated Mud Flow (Qm) deposits; and extends downward into relatively coarse-grained, south-dipping sediments pertaining to Old Alluvium (Qoal).
2. The upper ~0.6 ft encompass moderately developed argillic horizons (2B1b through 2B4b) typified by dark reddish brown (5YR 3/4) to brown (7.5YR 3/4) fine sandy clay loam with few to locally common, brown (7.5YR 5/4) clay films lining ped faces and bridging mineral grains.
3. The 2C1b lower boundary ranges from gradual wavy to abrupt wavy, identifying ~deep~ weathering extending into the underlying Qoal deposits. The Qm deposits in this locality are ~0.75-ft thick, but vary laterally as depicted on the GDC logs and pertinent annotated photographs.
4. The remnant buried argillic horizons represent a minimal ~30- to locally 40- ka weathering of the Qm sediments. The argillic horizons (ped faces and clay films) extend downward and across (unbroken) any reasonable projection of the bedding plane fault (see discussion and documentation in the GDC narrative). Last displacement therefore took place prior to at least ~30-40 ka.

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APPENDIX B – W (West Millennium)

SOIL-STRATIGRAPHIC AGE ASSESSMENTS, GROUP DELTA CONSULTANTS CORES B-3A AND B-6A, WEST MILLENNIUM AREA, HOLLYWOOD DISTRICT, CITY OF LOS ANGELES, CALIFORNIA

INTRODUCTION

This Appendix summarizes soil-stratigraphic field measurements and description for dating sediments and soils (pedologic profiles) exposed in two ~40-45-ft continuous cores recovered by Group Delta Consultants (GDC) from the proposed West Millennium development in the Hollywood area of Los Angeles. This Appendix is identified as “B-W” to distinguish it from a previous “Appendix B,” which focused on sediments and soils exposed in trenches at the Yucca and the East Millennium sites, respectively (GDC Plate 1). Two cores, B-3A (Table 1) and B-6A (Table 2) were specifically selected from the several cores that comprise the GDC (Plate 1) northwest-southeast, cross-section O-O’ (GDC Plate 8) across an inferred trace of the “Yucca Street Strand” of the Hollywood fault (Hernandez and Treiman, 2014). Pertinent location and geologic maps, trench logs, cone penetrometer (CPT) and continuous core data are given in the GDC narrative and hence are referred to, but not replicated in this document.

For context, CPT data and interpretations identify an apparent “break in sediment continuity” ~38-ft below ground surface between cores B-3A and B-5A (GDC, Plate 8). Core B-3A is ~8-ft south of the surface projection of the “break,” and Core B-6A is ~20-ft to the north. The particular cores were selected based on their near proximity to the “subsurface break” and on their sediment recovery, in both cases exceeding ~90 percent. The origin of the subsurface “break in sediment continuity” is unknown. It may be the buried south limb of an asymmetrical anticline observed in the East Millennium trench, the back-slope of an ancient sea cliff, or the subsurface expression of faulting. For conservatism, GDC treats it as a fault with a yet-unidentified dip or sense of displacement.

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The investigation was commissioned by GDC and included various field, office and laboratory meetings with GDC personnel and with “Third-Party Reviewers” E. Gath and T. Gonzalez (Earth Consultants International, Santa Ana). The soil-stratigraphic measurements and descriptions were completed in the GDC (Torrance) laboratory in February 2015. Assistance was kindly provided by GDC geologists K. Neill and T. Otis. Likewise appreciated were the observations and comments of consulting geologists S. Kolthoff and M. Mills.

This Appendix uses traditional pedological (soil science) terminology and field methodology described in Soil Survey Division Staff (1993), in Soil Survey Staff (1999) and in Schaetzl and Anderson (2005). The applicability of soil-stratigraphy to fault-activity assessments for construction of residential and commercial properties, dams, landfills and other large engineered structures is summarized in Shlemon (1985). Numeric dating and “calibration” with relative soil profile development is reviewed in Birkeland (1999), McFadden (1989), and Eppes and others (2002).

The presence of multiple buried paleosols, as identified in the cores, indicates that, as elsewhere in California, the Millennium area was subject to episodes of regional sedimentation, ostensibly under “pluvial” climatic and vegetation environments, separated by epochs of relative landscape stability giving rise to weathering and resulting soil formation.

Relative profile development of the several buried paleosols encountered in the B-3A and B-6A cores is based mainly on color changes (Munsell notation) and on presence, thickness and continuity of translocated clay films. Age assessments are given in ranges and, where feasible, associated with the marine isotope stage chronology (GDC, Chart 1; Chappell and Shackleton, 1986; Martinson and others, 1987).

Almost all the core-identified buried paleosols are typified by truncated (eroded) argillic horizons, in some cases up to several inches thick. Locally, however, post-pedogenic erosion likely entirely removed any remnant soil.

In general, the soil parent materials are mixed-lithology, grossly fining-upward fluvial sediments, interspersed with locally derived debris flows grading downslope into mudflows. The remnant buried paleosols are typically internally stratified, and formed on various parent material grain sizes and lithologies. It is therefore impractical to compare illuvial clay percentage with that in an assumed original parent material for quantifying soil age using a typical “soil development

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index” (Harden, 1982). Realistically, therefore, soil (weathering) ages are estimated using “numeric calibration” for similar Mediterranean climates (McFadden, 1989; Eppes and others, 2002).

SOIL-STRATIGRAPHY, CORE B-3A

As documented in Table 1, Core B-3A, south of surface projection of the inferred subsurface fault (GDC Cross Section O-O'), was measured and described to a depth of ~45-ft, several ft below the upward projection of the inferred fault. About 90-95 percent of sample recovery typifies this core; missing are the upper ~5-ft of likely artificial fill.

Cahuenga Fan Paleosols

The Core B-3A parent material ranges from silty clay to sand grading to basal, pebbly coarse sand forming typical grossly fining-upward sedimentary packets. These sediments were episodically laid down by distributaries of the Cahuenga alluvial fan, one of several emanating from “bedrock hills” several hundred ft to the north (GDC Fig. 2).

Several buried paleosols are indentified in this core. These range in relative profile development from “slight,” to “very strong.” The uppermost four paleosols are “slightly developed,” identified at depths of 9.7, 12.5, 15.8, and 18.7 ft, respectively (Table 1; horizons 2Btb, 4tb, 5Btb and 6Btb). The paleosols are typified by “few, very fine dark yellowish brown (10YR 4/3 - 4/4) clay films that line ped faces and bridge mineral grains.” These illuvial clay films are mostly thin and discontinuous, but sufficient to deem these as incipient argillic horizons “Btb.” The four paleosols, and the modern solum, each represent ~1.5 – 2 ka of weathering (epochs of local landscape stability) within the Cahuenga fan sediments. This is slightly more than estimated for a similar number of buried cambic (Bw) horizons documented in trench exposures within the east-adjacent, Argyle fan deposits (Appendix B).

Mudflow (Qm) Paleosols

Core B-3A clearly identifies the base of the Holocene Cahuenga fan by an abrupt unconformity and an underlying moderately developed buried paleosol. The paleosol at ~28.8 ft (Table 1; horizons 9Bt1b, 9Bt2b, and 10Cb) marks the top of several, thin-bedded mudflows. These are regionally extensive stratigraphic

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marker beds similarly exposed in the East Millennium, the Yucca and the Green trenches (GDC Plate 1). The mudflows (GDC Plate 1, "Qm") are typically separated by 1-2 inch erosion contacts (abrupt wavy boundary). An intra-mudflow paleosol at ~33.1 ft (Table 1; horizon 11Btb) is similarly moderately developed, although displaying more frequent and continuous brown to dark brown (7.5YR 4/4) clay films that line ped faces, bridge mineral grains and fill root pores.

The two mudflow paleosols each represent ~35-40 ka of weathering (isotope stage 3); however, the parent material is inherently older, therefore laid down at least ~60 ka (stage 4), or more likely even earlier (GDC Chart 1).

"Old Alluvium" (Qoal) Paleosols

Core B-3A exposed at least six discrete paleosols at the top and within sediments identified as "Old Alluvium" (GDC Plate 1). The paleosols range in relative development from "moderate" to "very strong."

The top of the Old Alluvium is marked by a major unconformity at ~33.3 ft; namely, a truncated, ~1.3-ft thick, very strongly developed buried paleosol (Table 1; horizons 12Bt1b, 12Bt2b, and 12Bt3b). Totally unlike the overlying mudflow and Cahuenga fan deposits, this particular paleosol has common to many (>20 percent) medium yellowish red (5YR 5/6) fine to medium continuous clay films that line ped faces, bridge mineral grains and coat clast faces. Such very strong profile development reflects relative landscape stability and relative weathering for least ~100 ka and more likely ~200 ka.

Three moderately developed paleosols occur at depths of 34.7, 37.3, and 38.6-ft respectively (Table 1). Each caps grossly fining upward sequences; and each identifies at least ~40 ka of weathering (local landscape stability) before burial.

Core B-3A exposed two deeper buried paleosols at ~41.6 and 42.4-ft, respectively (Table 1). Each soil is "strongly developed," with classic common to many dark yellowish brown (7.5YR 4/6) to common reddish brown (5YR 3/3) moderately thick clay films lining ped faces, coating clasts and filling root casts and worm burrows. These soils, too, each represent ~100 ka of weathering.

SOIL-STRATIGRAPHY, CORE B-6A

Core B-6A is north of the inferred subsurface fault depicted on GDC cross-section O-O' (GDC Plate 8). Similar to Core B-3A, several buried paleosols were measured and described to a depth of ~40-ft (Table 2). Here, too, no recovery was obtained from the uppermost ~5-ft of core; ostensibly artificial fill.

Cahuenga Fan Paleosols

Four slightly developed buried paleosols occur with the Core B-6A, stratified Cahuenga-fan sediments. These cap grossly fining-upward sequences at ~8.2, 10.8, 15.0 and 19.0 ft (Table 1). These incipient argillic horizons have few fine brown (10YR 5/3) discontinuous clay films that line ped faces and bridge mineral grains. The base of the Cahuenga-fan deposits occurs at ~23.5 ft, marked by fining-upward sediments and a major unconformity (Table 1).

Mudflow (Qm) Paleosols

The B-6A mudflows occur at ~23.5-ft, are ~4.8-ft thick and are mainly silty clay with common to many brown to dark brown (7.5YR 4/4) continuous clay films lining ped faces, bridging mineral grains and filling root pores (Table 1; horizon 6Btb). Here, too, relative profile development suggests a minimal weathering age of ~40 ka; and the deposits themselves are inherently older. The mudflows (GDC Plate 1; "Qm") unconformably overlie (abrupt wavy boundary) a very strongly developed buried paleosol marking the top of the "Old Alluvium."

"Old Alluvium" (Qoal) Paleosols

Two distinct buried paleosols occur within the B-6A Old Alluvium; the upper, very strongly developed caps the section at 25.2 ft (Table 2; horizons 7Bt1b and 7Bt2b); the lower, moderately to strongly developed is identified at ~36.0 ft (horizons 9btb and 9Cb).

Other paleosols were once likely present, but were eroded as reflected by several intervening fining-upward sections with abrupt wavy lower boundaries (see, for example, the horizon 7Bt2b-8C1b contact). Nevertheless, the two Qoal paleosols are sufficiently developed to each represent about 100-200 ka of weathering for the upper, and ~100 ka for the lower.

SUMMARY AND CONCLUSIONS

CPT data for the northwest-southeast trending O-O' cross section show a "subsurface break" in sediment continuity ~38-ft below ground surface between cores B-3A and B-5A. The age of sediments overlying this GDC inferred fault is reasonably judged by relative development of buried paleosols measured and described from ~40-ft deep, continuous cores B-3A on the south and B-6A on the north.

Both cores encountered several slightly developed paleosols within Cahuenga-fan sediments in the upper ~23 to 28 ft. Relative profile development of these soils suggests that each represents ~1.5 - 2.0 ka of weathering. The entire Cahuenga sequence is thus Holocene in age, comparable to Argyle fan sediments exposed in the nearby Yucca and East Millennium trenches (GDC Plate 1).

A major unconformity marks the base of the Cahuenga deposits. In both cores the unconformity identifies the top of regionally extensive mudflows (Qm). The capping mudflow paleosols are "moderately developed" and thus represent ~40-ka of weathering (relative landscape stability; marine isotope stage 3). The mudflows themselves were therefore deposited earlier, ostensibly at least ~60 ka (stage 4) if not before. The CPT and the paleosol data show that the mudflow deposits continue unbroken over and across any reasonable upward projection of the "subsurface break."

Another major unconformity identifies the base of the mudflow deposits and the top of the Old Alluvium (Qoal). As documented in both cores, the capping paleosol is very strongly developed and reflects ~100 to 200 ka of weathering. Several additional strongly developed buried paleosols occur within the B-3A core; but only one is identified in the B-6A core suggesting subsurface offset or local non-deposition. The top of the B-3A paleosol occurs at ~33.3 ft; and that in B-6A at ~25.2 ft. Given the general south dip, the ~25-ft distance between the cores and the inherent erosion contacts, the ~8-ft difference in elevation is expected. However, in a "worst case scenario," assuming that the subsurface break is truly a fault, then apparent vertical displacement of a few ft might be construed. Regardless, such inferred displacement, does not affect the overlying mudflow deposits and, if existent, took place prior to at least ~60 ka (minimum age for the mudflows).

In sum, the ~45-ft deep Core B-3A, south of the subsurface break, identifies alternating epochs of regional deposition (sedimentation) and weathering (landscape stability and soil formation) most likely exceeding ~500-600 ka in age.

Appendix B-W

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In contrast, the ~40-ft Core B-6A, north of the subsurface break, reflects similar deposition and weathering for the last ~250-300 ka.

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Table 1

Soil-Stratigraphic Measurement and Description
Group Delta Consultants – West Millennium Project
Core B-3A

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
0.0 – 5.8	Af	Artificial Fill (no recovery in core box).
5.8 – 7.2	A1	Dark yellowish brown (10YR 3/6) to very dark brown (10YR 2/2) when moist pebbly fine sandy clay loam; massive to moderate medium subangular blocky structure; hard to very hard, very firm, sticky and very plastic; few to common subrounded pebbles to 0.2-in. dia; decreasing organic matter with depth; truncated original surface horizon; gradual wavy boundary.
7.2 – 7.8	A2-Bt	Brown to dark brown (10YR 3/3) to dark brown (10YR 3/2) when moist sandy loamy clay; massive to moderate medium subangular blocky structure; very hard, very firm, very sticky, plastic; few to common subrounded to subangular pebbles throughout horizon; very few, thin dark brown (10YR 3/3) clay films lining ped faces and bridging mineral grains, discontinuous with depth; abrupt wavy boundary (unconformity).
7.8 – 9.0	C1	Yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/4) when moist coarse sandy loam; single grained to massive structure; soft, very friable, non sticky and non-plastic; gradual wavy boundary.
9.0 – 9.7	C2	Light yellowish brown (10YR 6/4) to brown to dark brown (10YR 4/3) when moist loamy coarse sand; weak to moderate medium subangular blocky structure; slightly hard, friable, non sticky and non-plastic; abrupt wavy boundary (unconformity).
9.7 -10.5	2Btb	Buried Paleosol (slightly developed): Yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/4) when moist silty clay; moderate to strong medium subangular blocky structure; hard, firm, non-sticky plastic; few fine dark yellowish brown (10YR 4/4) discontinuous clay films lining ped faces and bridging mineral grains; horizon characterized by common, thin (0.2-0.2-in) thick silt lenses; gradual wavy boundary.
10.5 – 11.4	2Cb	Light yellowish brown (10YR 6/4) to yellowish brown (10YR 5/4) when moist pebbly sandy loam; granular structure; soft, very friable, non-sticky and non-plastic; abrupt wavy boundary (unconformity).
11.4 – 12.0	3C1b	Yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/4) when moist; silty clay loam; moderate medium angular blocky structure; hard to very hard, very firm, slightly sticky and plastic; gradual wavy boundary.

Table 1 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
12.0 – 12.5	3C2b	Light yellowish brown (10YR 6/4) to dark yellowish brown (10YR 3/4) when moist; loamy coarse sand; granular to weak fine subangular blocky structure; hard to very hard, firm, non-sticky and slightly plastic; abrupt wavy boundary (unconformity).
12.5 – 13.8	4tb	Buried Paleosol (slightly developed): Yellowish brown (10YR 5/6) to dark yellowish brown (10YR 4/4) when moist silty clay; massive to weak fine subangular blocky grading to angular blocky structure; hard, very firm, sticky and slightly plastic; few very fine dark yellowish brown (10YR 4/4) clay films bridging mineral grains; locally bioturbated; abrupt smooth boundary.
13.8 – 14.8	4C1b	Brownish yellow (10YR 6/6) to dark yellowish brown (10YR 4/4) when moist; single-grained to granular structure; sandy loam, loose, very friable, non-sticky and non-plastic; few subrounded to subangular pebbles to 0.3-in dia. at base; abrupt wavy boundary (unconformity).
14.8 – 15.8	4C2b	Yellowish brown (10YR 5/6) to dark yellowish brown (10YR 4/4) when moist; granular structure; pebbly loamy sand; slightly hard, friable, non-sticky and non-plastic; subrounded to rounded pebbles to 0.2-in. dia. throughout horizon increasing toward base; abrupt wavy boundary (unconformity).
15.8 – 17.1	5Btb	Buried Paleosol (slightly developed): Brownish yellow (10YR6/6) to yellowish brown (10YR 5/6) when moist coarse sand; moderate medium angular blocky structure; hard, firm, to very firm, non-sticky and slightly plastic; few very fine yellowish brown (10YR 5/4) clay films lining ped faces and bridging mineral grains in upper part of horizon (truncated) decreasing with depth; few to common very angular granitic clasts (grussified) increasing toward base; abrupt wavy boundary.
17.1 – 18.7	5CB	Very pale brown (10YR 7/3) to yellowish brown (10YR 5/4) when moist coarse sand increasing to very coarse sand with depth; single grained to granular structure near base; loose, very friable, non-sticky and non-plastic; few very angular clasts near base; abrupt wavy boundary (unconformity; base of fining-upward sequence).
18.7 - 19.2	6Btb	Buried Paleosol (slightly developed): Yellowish brown (10YR 5/6) to dark yellowish brown (10YR 4/4) when moist silty clay; moderate medium subangular blocky structure; very hard, very firm, slightly sticky and plastic; few very fine dark yellowish brown (10YR 5/6) clay films lining ped faces; abrupt wavy boundary (unconformity).
19.2 – 19.8	6Cb	Light yellowish brown (10YR 6/4) to dark yellowish brown (10YR 4/4) when moist coarse sandy loam; single grained, loose, friable, non-sticky and slightly plastic; abrupt wavy boundary (unconformity).

Table 1 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
19.8 – 21.6	7C1b	Brownish yellow (10YR 6/6) to brown to dark brown (10YR 4/3) when moist silty clay; moderate to strong medium subangular blocky structure; very hard, very firm, sticky and plastic; abrupt wavy boundary (unconformity).
21.6 – 21.9	7C2b	Light yellowish brown (10YR 6/4) to yellowish brown (10YR 5/4) when moist medium sandy loam; single grained to medium fine subangular blocky structure; loose to slightly hard, friable, non-sticky and non-plastic; (abrupt wavy boundary (unconformity).
21.9 – 22.9	7C3b	Yellowish brown (10YR 5/5) to dark yellowish brown (10YR 5/4) when moist silty clay; moderate to strong medium subangular blocky structure; very hard, very firm, non-sticky and slightly plastic; gradual wavy boundary.
22.9 – 24.5	7C4b	Brownish yellow (10YR 6/6) to dark yellowish brown (10YR 4/6) when moist pebbly loamy coarse sand; moderate to strong medium subangular blocky structure; very hard, very firm, non-sticky and non-plastic; gradual wavy boundary.
24.5 – 25.9	7C5b	Dark yellowish brown (10YR 4/6) to dark yellowish brown (10YR 4/4) when moist loamy medium sand; moderate to strong medium angular blocky structure; very hard, very firm, non-sticky and slightly plastic; gradual wavy boundary.
25.9 – 27.0	7C6b	Yellowish brown (10YR 5/6) to dark yellowish brown (10YR 3/6) when moist pebbly sandy loam; moderate to strong medium subangular blocky structure; very hard, very firm, non-sticky and slightly plastic; very few angular clasts to 0.2-in dia. Increasing near base; abrupt wavy to broken boundary (unconformity).
27.0 – 27.8	8C1b	Yellowish brown (10YR 5/6) to dark yellowish brown (10YR 5/4) when moist loamy coarse sand; single grained, soft, very friable non-sticky and non-plastic; few to common subrounded metamorphic clasts to 0.4-in dia. throughout horizon; abrupt wavy boundary (unconformity).
27.8 – 28.8	8C2b	Light olive brown (2.5Y 5/4) to dark brownish yellow (10YR 5/4) when moist silty clay loam; moderate fine angular blocky grading to thin platy structure near base; slightly hard, friable non-sticky and plastic; few thin (0.2-in) subrounded clasts at base; gradual smooth to gradual wavy boundary (unconformity; perched water; interpreted base of Cahuenga fan deposits).
28.8 - 30.2	9Bt1b	Buried Paleosol (moderately developed): Dark yellowish brown (10YR 4/6) to dark yellowish brown (10YR 4/4) when moist pebbly fine sandy loam; moderate to strong platy structure; very hard, very firm, slightly sticky and slightly plastic; few fine yellowish brown (10YR 5/4) clay films lining ped faces and bridging

Table 1 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
		mineral grains in upper part of horizon grading to common fine yellowish brown (10YR 5/8) in mid horizon; parent materials are cumulic, thin bedded mudflows; gradual smooth to gradual wavy boundary (interpreted top of mudflow, regional stratigraphic marker).
30.2 - 32.0	9Bt2b	Horizon similar to above with common very angular clasts increasing near base; abrupt wavy boundary (intra-mudflow unconformity).
32.0 – 33.1	10Cb	Yellowish brown (10YR 5/6) to brown to dark brown (10YR 4/3) when moist pebbly fine sand clay loam; moderate medium angular blocky structure; hard to very hard, friable, slightly sticky, plastic; few subrounded to locally subangular ~0.2-in clasts near top of horizon; abrupt wavy boundary (unconformity; base of fining-upward section).
33.1 – 33.3	11Btb	Buried Paleosol (moderately developed): Dark yellowish brown (10YR 4/4) to dark brown (10YR 3/3) when moist pebbly silty clay; moderate to strong medium angular blocky structure; very to extremely hard, extremely firm, sticky and plastic; few to common brown to dark brown (7.5YR 4/4) clay films lining ped faces and bridging mineral grains and coating clast faces; very few angular clasts to 0.2-in dia. near base; abrupt smooth to abrupt wavy boundary (major unconformity; base of mudflows (Qm).
33.3 – 33.9	12Bt1b	Buried Paleosol (very strongly developed; cumulic profile): Yellowish red (5YR 4/6) dark reddish brown (5YR 3/4) when moist pebbly coarse sandy clay; strong medium platy structure; extremely hard, extremely firm, sticky and very plastic; common to many fine to medium yellowish red (5YR 5/6) continuous clay films lining ped faces, bridging mineral grains and coating clast faces; clay films distinct throughout horizon; few to common very angular clasts locally stratified; gradual smooth boundary (horizon marks top of Old Alluvium; Qoal).
33.9 – 34.3	12Bt2b	Horizon similar to above with increasing angular clasts scattered throughout; gradual wavy boundary.
34.3 – 34.7	12Bt3b	Reddish brown (5YR 5/4) to reddish brown (5YR 4/3) when moist sandy clay loam; moderate to strong medium platy structure; very hard, very firm, sticky and plastic; common fine to moderately thick reddish brown (5YR 4/3) to dark reddish brown (5YR 3/3) clay films lining ped faces, bridging mineral grains and filling root pores; abrupt smooth boundary (unconformity).
34.7 – 35.6	13Bt1b	Buried Paleosol (moderately developed): Reddish brown (5YR 5/4) to yellowish red (5YR 5/6) when moist pebbly sandy clay loam moderate to strong medium platy structure; very hard, very firm, sticky and plastic; few fine reddish brown

Table 1 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
		(5YR 4/3) clay films lining ped faces and bridging mineral grains; gradual smooth boundary.
35.6 – 36.8	13Bt2b	Brown to dark brown (7.5YR 4/4) to brown to dark brown (7.5YR 4/3) when moist pebbly coarse loamy sand, very strong medium platy structure; extremely hard, extremely firm, slightly sticky and slightly plastic; few fine dark reddish brown (5YR 3/3) clay films bridging mineral grains; common to many grussified granitic clasts to 1.0-in. dia., gradual wavy boundary.
36.8 – 37.3	13Bt3b	Horizon similar to above with increasing frequency of very angular clasts near base; abrupt wavy to irregular broken boundary (unconformity; base of grossly fining-upward section).
37.3 – 38.1	14Bt1b	Buried Paleosol (moderately developed): Light yellowish brown (10YR 6/4) to dark yellowish brown (10YR 4/4) when moist sandy clay loam; moderate to strong medium platy structure; very hard, very firm, slightly sticky and slightly plastic; few fine strong brown (7.5YR 4/6) clay films lining ped faces and bridging mineral grains, decreasing with depth; common very angular clasts to 0.3 in. dia. throughout horizon; gradual smooth boundary.
38.1 – 38.6	14Bt2b	Light yellowish brown (10YR 6/4) to dark yellowing brown (10YR 4/4) when moist granular to weak medium platy structure; very hard, very firm, slightly sticky and plastic; few brown to dark brown (7.5YR 4/4) clay films bridging mineral grains, decreasing near base; common to many ~1.0-in dia. angular clasts increasing near base; abrupt wavy boundary (unconformity).
38.6 – 39.3	15Bt1b	Buried Paleosol (moderately developed): Reddish yellow (7.5YR 6/6) to strong brown (7.5YR 5/6) when moist; pebbly fine sandy clay loam; moderate medium platy structure; extremely hard, extremely firm, sticky and plastic; few to common fine strong brown (7.5YR 4/6) clay films lining ped faces and lining upper clast faces; gradual smooth boundary.
39.3 – 41.6	15Bt2b	Horizon similar to above with few fine strong brown (7.5YR 5/6) clay films bridging mineral grains, decreasing near base; gradual smooth to gradual wavy boundary (unconformity).
41.6 – 42.4	16Btb	Buried Paleosol (strongly developed): Light yellowish brown (10YR 6/4) to dark yellowish brown (10YR 4/6) when moist sandy loamy clay; single grained to fine moderately strong platy structure; extremely hard, extremely firm, slightly sticky and plastic; common to many dark yellowish brown (7.5YR 4/6) clay films lining ped faces and bridging mineral grains; abrupt broken boundary (unconformity).

Table 1 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
42.4 – 44.1	17Bt1b	Buried Paleosol (very strongly developed): Light brown (7.5YR 6/4) to brown (7.5YR 3.3) when moist pebbly coarse sandy clay loam; massive to moderately strong platy structure; extremely hard, extremely firm, sticky and slightly plastic; common reddish brown (5YR 3/3) clay films lining ped faces and filling worm burrows; common subangular to subrounded grussified clasts to ~1.0-in dia. increasing towards base; abrupt wavy boundary (unconformity; parent material locally stratified).
44.1 – 45+	17Bt2b	Dark brown (7y.5YR 3/4) to dark brown (7.5YR 3/3) when moist loamy coarse sand; massive to weak moderate platy structure; extremely hard, extremely firm, very sticky; very plastic; few fine to medium reddish brown (5YR 4/4) clay films lining ped faces and bridging mineral grains; common light yellowish brown (2.5Y 3/3) mottles throughout horizon; deposit is massive clay with locally mottled plates typically ~0.5 to 0.8 in thick; base of measured section.

Notes:

1. Section measured from Core B-3A at GDC (Torrance) by R. J. Shlemon, 20 and 23 February 2015; assisted by T. Otis (GDC). Core locations and cross-sections shown on GDC maps and on cross-section O-O'.
2. Core B-3A = ~90-95 percent recovery; upper 5-ft missing; likely artificial fill.
3. Soil terminology follows NRCS; geologic interpretation indicated in parentheses.
4. Multiple buried paleosols identified ranging from "slightly" to "very strongly developed." Diagnostic horizons predominately argillic (Bt) with field-identified clay films ranging from few fine to many moderately thick lining ped faces, bridging mineral grains and filling root pores. Secondary clay films increase in thickness, depth and continuity with typical Munsell colors ranging from 10YR 4/4 for "slightly developed;" 7.5YR 3/4 for "moderately developed;" to 5YR 3/3 for "strongly to very strongly developed."
5. Likely base of Cahuenga fan deposits ("Argyle fan sediments" at East Millennium trench [see GDC location map]) and top of truncated mudflows ("Qm" of GDC) identified at ~28.8 ft. Mudflow(s) base at ~33.3 ft, typified by thin-bedded deposits with internal, locally truncated, slightly to moderately developed buried paleosols. Estimated minimal soil weathering age is ~35-40 ka (marine isotope stage 3). The deposits are inherently older; at a minimum 60 ka (stage 4); but probably earlier (see GDC regional stratigraphic sections and Chart 1).
6. Major unconformity (top of GDC "old alluvium") at ~33.3 ft where basal mudflows cap a ~3.3-ft thick very strongly developed, cumulic buried paleosol typified by a coarse pebbly sand clay with common to many, reddish brown (5YR 5/6) continuous clay films lining ped faces and bridging mineral grains. The buried

Table 1 (continued)

paleosol represents at least ~100 ka of weathering; and a minimum forming during isotope stage 5; but likely stage 7 (~200 ka).

7. Five other moderately to strongly developed buried paleosols are identified below the base of the capping "old alluvium." Based on relative morphological development, each represents at least ~40 to 100+ ka of weathering. Their respective parent materials are inherently older. From the base of the "old alluvium," to the bottom of the measured section (~45 ft), the five buried paleosols identify multiple epochs of regional debris flow, fluvial and local mudflow deposits, each separated by long periods of relative landscape stability and soil formation.

Table 2

Soil-Stratigraphic Measurement and Description
Group Delta Consultants West Millennium **Core B-6a**

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
0.0 - 5.0	Af	Artificial fill (no core recovery)
5.0 - 6.6	A1	Olive grey (5Y 3/2) to black (5Y2.5/2) when moist pebbly sandy clay loam; massive structure increasing to moderate medium platy near base; hard to very hard, firm, sticky and slightly plastic; few to common subangular clasts to 0.2-in. dia., upper part of horizon truncated by artificial fill and not recovered in core; abrupt wavy boundary.
6.6 - 8.2	A2-C	Yellowish brown (10YR 5/4) to dark yellowish brown (10YR 3/6) when moist coarse sandy loam; single grained; to fine weak angular blocky structure; slightly hard, friable, non-sticky and slightly plastic; abrupt wavy boundary (unconformity; base of grossly fining-upward section).
8.2 – 9.2	2Btb	Buried Paleosol (slightly developed): brown (10YR 5/3) to dark yellowish brown (10YR 4/4) when moist silty clay coarsening downward to fine sandy loam; moderate to strong medium to coarse angular blocky structure; very hard, very firm, sticky and plastic; few dark yellowish brown (10YR 3/4) discontinuous clay films bridging mineral grains; gradual wavy boundary.
9.2 – 9.9	2C1b	Brown (10YR 5/3) to dark yellowish brown (10YR 3/4) when moist fine sandy clay loam; weak medium platy to weak fine angular blocky structure; hard, firm, slightly sticky and non-plastic; gradual wavy boundary.
9.9 – 10.8	2C2b	Yellowish brown (10YR 5/5) to dark yellowish brown (10YR 4/4) when moist coarse loamy sand; weak very fine subangular blocky structure; slightly hard, very friable non-sticky and slightly plastic; (abrupt wavy boundary (unconformity; base of grossly fining-upward section).
10.8 – 12.1	3Bt1b	Buried Paleosol (slightly to moderately developed): Brown to dark brown (10YR 4/3) to dark yellowish brown (10YR 3/4) when moist silty clay loam; moderate medium fine angular blocky grading to fine thin platy structure; hard, friable, slightly sticky and plastic; few fine dark yellowish brown (10YR 4/4) discontinuous clay films lining ped faces, bridging mineral grains and filling root pores; abrupt wavy boundary bridging mineral grains and filling root pores; gradual to abrupt wavy boundary.

Table 2 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
12.1 – 13.0	3Bt2b	Brownish yellow (10YR 6/6) to dark yellowish brown (10YR 4/4) when moist coarse sandy loam; moderate medium angular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine brown (10YR 5/3) clay films bridging mineral grains; few angular clasts to 0.2-in dia. Increasing near base; gradual smooth to wavy boundary.
13.0 – 15.0	3Cb	Brownish yellow (10YR 6/6) to yellowish brown (10YR 5/4) when moist sandy clay loam, coarsening downward; massive to single-grained, soft, very friable, non-sticky and slightly plastic; few subrounded metamorphic and grussified granitic clasts to 0.2-in dia. near base; abrupt wavy boundary (unconformity; base of fining-upward section).
15.0 – 19.0	4Btb	Buried Paleosol (slightly developed): Light yellowish brown (10YR 6/4) to dark yellowish brown (10YR 4/4) when moist loamy sand coarsening near base; fine strong angular blocky structure grading to single-grained near base; very hard, very firm, sticky and plastic; few fine brown (10YR 5/3) clay films bridging mineral grains decreasing with depth; local medium sand lenses to 1-2-in thick throughout horizon (stratified); abrupt wavy boundary (unconformity).
19.0 – 21.5	5Btb	Buried Paleosol (slightly developed): Dark yellowish brown (10YR 3/4) to brown (10YR 5/3) when moist sandy clay; moderate medium platy grading to moderate medium platy structure near base; very hard, very firm, sticky and plastic; few very fine dark yellowish brown (10YR 4/6) clay films bridging mineral grains decreasing with depth; gradual wavy boundary.
21.5 – 23.5	5Cb	Yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/4) when moist loamy medium sand; massive to fine moderate subangular blocky structure; slightly hard, friable, non-sticky and non-plastic; abrupt wavy boundary (major unconformity; base of fining-upward sequence; base of Cahuenga fan deposits).
23.5 – 25.2	6Btb	Buried Paleosol (moderately developed): Yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/4) when moist silty clay; moderate medium subangular blocky structure grading to weak fine platy; few fine brown to dark brown (7.5YR 4/4) clay films lining ped faces and bridging mineral grains; common to many dark brown (7.5YR 4/4) clay films filling worm and root holes extending to base of horizon; abrupt wavy boundary (unconformity; base of GDC mudflow deposits (Qm)).
25.2 – 28.2	7Bt1b	Buried Paleosol (very strongly developed): Dark reddish brown (5YR 3/3) to dark reddish brown (2.5YR 3/3) when moist fine sandy clay coarsening to medium sandy clay near base; massive to moderate fine platy structure

Table 2 (continued)

<u>Depth (ft)</u>	<u>Horizon</u>	<u>Description</u>
		increasing near base; hard to very hard, firm, very sticky very plastic; common to many dark reddish brown and continuous (2.5YR 3/3) clay films lining ped faces and bridging mineral grains; gradual wavy to abrupt boundary (top of GDC old alluvium (Qoal).
28.2 – 33.1	7Bt2b	Yellowish brown (10YR 5/4) to dark yellowish brown (10YR 3/4) when moist medium sandy clay coarsening to pebbly coarse sand near base; massive to weak very fine platy structure; extremely hard, extremely firm, sticky and plastic; common to many brown to dark brown (7.5YR 4/4) clay films lining ped faces and bridging mineral grains; common pale brown (10YR 6/3) “fissure fills” (bioturbation ?) from 29.0 ft to base; few grussified clasts to 2.0-in diameter near base; abrupt wavy boundary (unconformity; base of fining-upward section).
33.1 – 33.0	8C1b	Dark yellowish brown (10YR 6/3) to dark yellowish brown (10YR 3/6) when moist sandy clay loam; granular to weak fine subangular blocky structure; slightly to moderately hard, friable, slightly sticky and slightly plastic; gradual smooth boundary.
33.0 – 36.0	8C2b	Dark yellowish brown (10YR4/6) to dark yellowish brown (10YR 4/4) when moist silty clay; massive to weak fine angular blocky structure, very hard, very firm, sticky and plastic; abrupt wavy boundary (unconformity).
36.0 – 37.8	9Btb	Buried Paleosol (moderately to strongly developed): Brownish yellow (10YR 6/6) to yellowish brown (10YR 5/6) when moist pebbly clay loam; massive to weak fine platy structure, very hard, very firm, sticky and plastic; few very fine brown (7.5YR 5/4) clay films lining ped faces and bridging mineral grains; abrupt smooth to abrupt wavy boundary.
37.8 – 40+	9Cb	Brownish yellow (10YR 6/6) to yellowish brown (10YR 5/6) when moist pebbly coarse silty sand; single grain to massive structure; slightly hard, very friable, non-sticky and non-plastic; common to many very angular clasts to ~2.0-in dia. in lenses ~3-4-in thick near top of horizon; base of measured section.

Notes:

1. Section measured and described from Core B-6A at Group Delta (Torrance), by R. J. Shlemon, 23 February 2015; assisted by T. Otis (GDC).
2. Core B-6A = ~95 percent recovery; upper ~5-ft missing; likely artificial fill.

Table 2 (continued)

3. Soil terminology follows Soil Survey Division Staff, (1993); geologic interpretation indicated in parentheses.
4. Multiple buried paleosols identified ranging from “slightly” to “very strongly developed.” Diagnostic horizons predominately argillic (Bt) with field-identified clay films ranging from few fine to many moderately thick lining ped faces, bridging mineral grains and filling root pores. Secondary clay films increase in thickness, continuity and depth with typical Munsell colors ranging from 10YR 4/4 for “slightly developed;” 7.5YR 3/4 for “moderately developed;” to 5YR 3/3 for “strongly to very strongly developed.”
5. Likely base of Cahuenga fan deposits (“Argyle fan sediments” at East Millennium trench [see GDC location map]) and top of truncated mudflows (“Qm” of GDC) identified at ~23.5 ft. Mudflow(s) base at ~25.2 ft, typified by thin-bedded deposits with internal, locally truncated, slightly to moderately developed buried paleosols. Estimated minimal soil weathering age is ~35-40 ka (marine isotope stage 3). The deposits are inherently older; at a minimum 60 ka (stage 4); but probably earlier (see GDC Chart 1).
6. Major unconformity (top of GDC Old Alluvium) at ~25.2 ft where basal mudflows cap a ~7.9-ft thick, stratified, very strongly developed, cumulic buried paleosol typified by downward coarsening sandy clay loam with common to many (>20 percent), continuous dark reddish brown (2.5YR 5/3) clay films lining ped faces and bridging mineral grains. The buried paleosol represents at least ~100 ka of weathering; and, at a minimum formed during isotope stage 5; but more likely during isotope stage 7 (~200 ka).
7. Several unconformities are identified in the cores, particularly in the Old Alluvium. Local fluvial erosion probably locally exceeded ~1-2 ft, removing probable underlying weathering profiles. Remnants of a strongly developed buried paleosol at ~36 ft identifies at least one additional epoch of regional landscape stability and soil formation within the Old Alluvium. Relative profile development is indicative of another ~100 ka of weathering.
8. Based on relative development of the capping and underlying buried paleosol, Core B-6C records a minimum of ~200 ka of weathering on and within the old alluvium. The parent materials (underlying sediments) are inherently older.

APPENDIX C: BETA ANALYTICAL RADIOCARBON DATING RESULTS



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Tel: 305 667 5167
Fax: 305 663 0964
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Darden Hood
President

Ronald Hatfield
Christopher Patrick
Deputy Directors

February 26, 2014

Mr. Steven H. Kolthoff
Group Decta Consultants
370 Amapola Avenue, Suite 212
Torrance, CA 90501
United States

RE: Radiocarbon Dating Results For Samples 1161A Yucca-1, 1161A Yucca-2

Dear Mr. Kolthoff:

Enclosed are the radiocarbon dating results for two samples recently sent to us. The report sheet contains the Conventional Radiocarbon Age (BP), the method used, material type, and applied pretreatments, any sample specific comments and, where applicable, the two-sigma calendar calibration range. The Conventional Radiocarbon ages have been corrected for total isotopic fractionation effects (natural and laboratory induced).

All results (excluding some inappropriate material types) which fall within the range of available calibration data are calibrated to calendar years (cal BC/AD) and calibrated radiocarbon years (cal BP). Calibration was calculated using the one of the databases associated with the 2013 INTCAL program (cited in the references on the bottom of the calibration graph page provided for each sample.) Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric ^{14}C contents at certain time periods. Looking closely at the calibration graph provided and where the BP sigma limits intercept the calibration curve will help you understand this phenomenon.

Conventional Radiocarbon Ages and sigmas are rounded to the nearest 10 years per the conventions of the 1977 International Radiocarbon Conference. When counting statistics produce sigmas lower than ± 30 years, a conservative ± 30 BP is cited for the result.

All work on these samples was performed in our laboratories in Miami under strict chain of custody and quality control under ISO-17025 accreditation protocols. Sample, modern and blanks were all analyzed in the same chemistry lines by qualified professional technicians using identical reagents and counting parameters within our own particle accelerators. A quality assurance report is posted to your directory for each result.

As always, your inquiries are most welcome. If you have any questions or would like further details regarding the analyses, please do not hesitate to contact us.

The cost of the analysis was charged to the MASTERCARD card provided. Thank you. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,


Digital signature on file

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Steven H. Kolthoff

Report Date: 2/26/2014

Group Decta Consultants

Material Received: 2/19/2014

Sample Data	Measured Radiocarbon Age	¹³ C/ ¹² C Ratio	Conventional Radiocarbon Age(*)
Beta - 373452 SAMPLE : 1161A Yucca-1 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (organic sediment): acid washes 2 SIGMA CALIBRATION : Cal BC 43525 to 41465 (Cal BP 45475 to 43415)	40970 +/- 580 BP	-22.8 o/oo	41010 +/- 580 BP
Beta - 373453 SAMPLE : 1161A Yucca-2 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 3010 to 2975 (Cal BP 4960 to 4925) and Cal BC 2965 to 2950 (Cal BP 4915 to 4900) and Cal BC 2940 to 2890 (Cal BP 4890 to 4840)	4310 +/- 30 BP	-24.2 o/oo	4320 +/- 30 BP

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the ¹⁴C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby ¹⁴C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured ¹³C/¹²C ratios (delta ¹³C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta ¹³C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta ¹³C, the ratio and the Conventional Radiocarbon Age will be followed by "**". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -22.8 o/oo : lab. mult = 1)

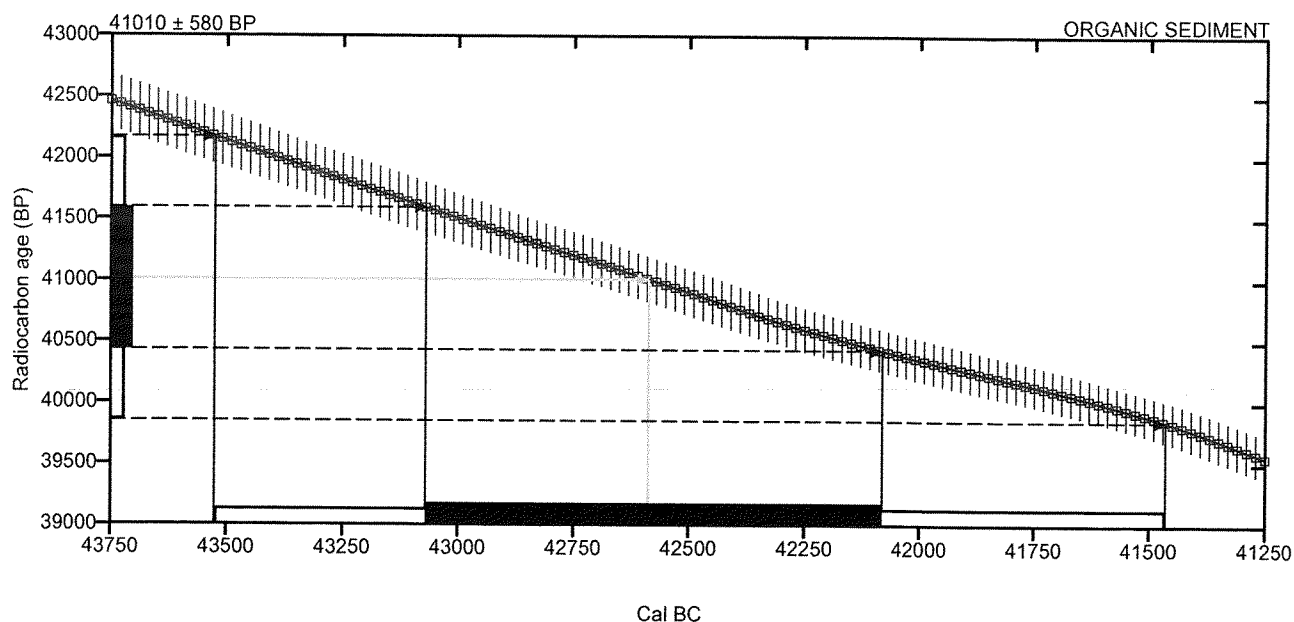
Laboratory number **Beta-373452**

Conventional radiocarbon age **41010 ± 580 BP**

2 Sigma calibrated result Cal BC 43525 to 41465 (Cal BP 45475 to 43415)
95% probability

Intercept of radiocarbon age with calibration curve Cal BC 42585 (Cal BP 44535)

1 Sigma calibrated results Cal BC 43070 to 42085 (Cal BP 45020 to 44035)
68% probability



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887.

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -24.2 o/oo : lab. mult = 1)

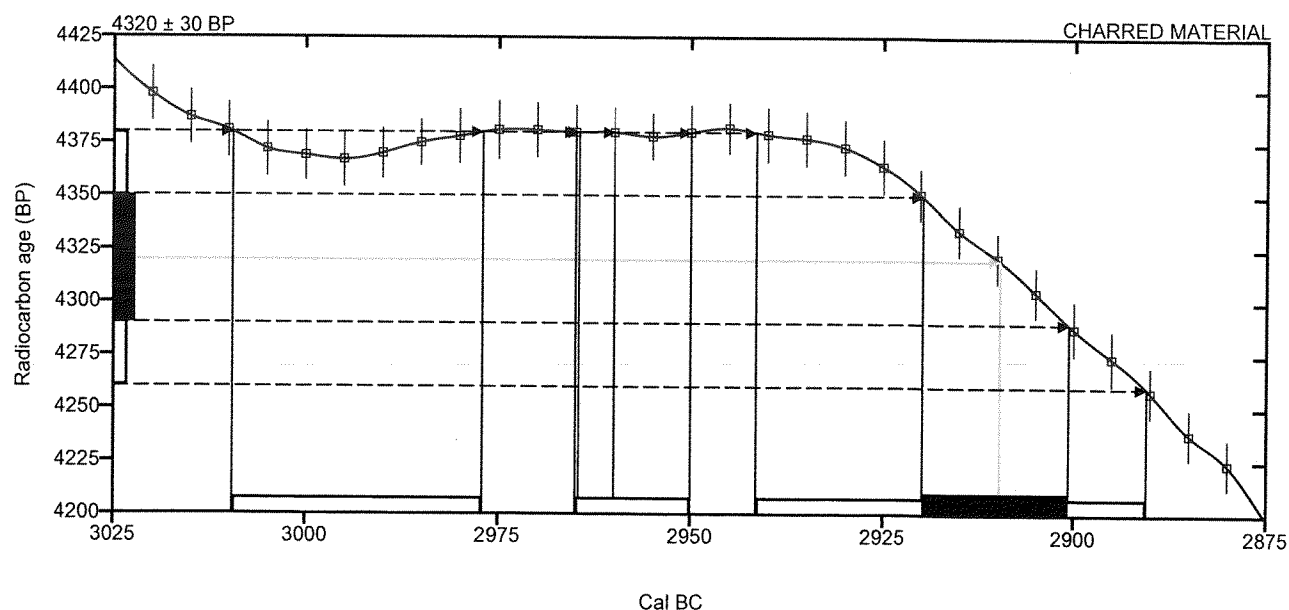
Laboratory number **Beta-373453**

Conventional radiocarbon age 4320 ± 30 BP

2 Sigma calibrated result Cal BC 3010 to 2975 (Cal BP 4960 to 4925)
95% probability Cal BC 2965 to 2950 (Cal BP 4915 to 4900)
 Cal BC 2940 to 2890 (Cal BP 4890 to 4840)

Intercept of radiocarbon age with calibration curve Cal BC 2910 (Cal BP 4860)

1 Sigma calibrated results Cal BC 2920 to 2900 (Cal BP 4870 to 4850)
68% probability



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. *Radiocarbon* 55(4):1869–1887.

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Darden Hood
President

Ronald Hatfield
Christopher Patrick
Deputy Directors

June 25, 2014

Mr. Steven H. Kolthoff
Group Delta Consultants
370 Amapola Avenue
Suite 212
Torrance, CA 90501
United States

RE: Radiocarbon Dating Results For Samples Mill-1, Mill-2, Mill-3, Mill-4, Mill-5, Mill-6, Mill-7, Yucca-4

Dear Mr. Kolthoff:

Enclosed are the radiocarbon dating results for eight samples recently sent to us. As usual, the method of analysis is listed on the report with the results and calibration data is provided where applicable. The Conventional Radiocarbon Ages have all been corrected for total fractionation effects and where applicable, calibration was performed using 2013 calibration databases (cited on the graph pages).

The web directory containing the table of results and PDF download also contains pictures, a cvs spreadsheet download option and a quality assurance report containing expected vs. measured values for 3-5 working standards analyzed simultaneously with your samples.

Reported results are accredited to ISO-17025 standards and all chemistry was performed here in our laboratories and counted in our own accelerators here in Miami. Since Beta is not a teaching laboratory, only graduates trained to strict protocols of the ISO-17025 program participated in the analyses.

As always Conventional Radiocarbon Ages and sigmas are rounded to the nearest 10 years per the conventions of the 1977 International Radiocarbon Conference. When counting statistics produce sigmas lower than +/- 30 years, a conservative +/- 30 BP is cited for the result.

When interpreting the results, please consider any communications you may have had with us regarding the samples. As always, your inquiries are most welcome. If you have any questions or would like further details of the analyses, please do not hesitate to contact us.

Thank you for prepaying the analyses. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,


Digital signature on file

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Steven H. Kolthoff

Report Date: 6/25/2014

Group Delta Consultants

Material Received: 6/19/2014

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 383451 SAMPLE : Mill-1 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 2915 to 2880 (Cal BP 4865 to 4830)	4280 +/- 30 BP	-25.3 o/oo	4280 +/- 30 BP
Beta - 383452 SAMPLE : Mill-2 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 3015 to 2895 (Cal BP 4965 to 4845)	4310 +/- 30 BP	-23.8 o/oo	4330 +/- 30 BP
Beta - 383453 SAMPLE : Mill-3 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 2880 to 2830 (Cal BP 4830 to 4780) and Cal BC 2820 to 2625 (Cal BP 4770 to 4575)	4170 +/- 30 BP	-25.6 o/oo	4160 +/- 30 BP
Beta - 383454 SAMPLE : Mill-4 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 2895 to 2860 (Cal BP 4845 to 4810) and Cal BC 2805 to 2755 (Cal BP 4755 to 4705) and Cal BC 2720 to 2705 (Cal BP 4670 to 4655)	4190 +/- 30 BP	-23.3 o/oo	4220 +/- 30 BP

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "w". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Steven H. Kolthoff

Report Date: 6/25/2014

Sample Data	Measured Radiocarbon Age	¹³ C/ ¹² C Ratio	Conventional Radiocarbon Age(*)
Beta - 383455 SAMPLE : Mill-5 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 3085 to 3065 (Cal BP 5035 to 5015) and Cal BC 3025 to 2905 (Cal BP 4975 to 4855)	4330 +/- 30 BP	-23.2 o/oo	4360 +/- 30 BP
Beta - 383456 SAMPLE : Mill-6 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 3320 to 3235 (Cal BP 5270 to 5185) and Cal BC 3170 to 3160 (Cal BP 5120 to 5110) and Cal BC 3115 to 3005 (Cal BP 5065 to 4955) and Cal BC 2990 to 2930 (Cal BP 4940 to 4880)	4430 +/- 30 BP	-24.7 o/oo	4430 +/- 30 BP
Beta - 383457 SAMPLE : Mill-7 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 3305 to 3300 (Cal BP 5255 to 5250) and Cal BC 3280 to 3275 (Cal BP 5230 to 5225) and Cal BC 3265 to 3240 (Cal BP 5215 to 5190) and Cal BC 3105 to 2925 (Cal BP 5055 to 4875)	4420 +/- 30 BP	-25.0 o/oo	4420 +/- 30 BP
Beta - 383459 SAMPLE : Yucca-4 ANALYSIS : AMS-PRIORITY delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 2890 to 2835 (Cal BP 4840 to 4785) and Cal BC 2815 to 2675 (Cal BP 4765 to 4625)	4170 +/- 30 BP	-24.0 o/oo	4190 +/- 30 BP

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the ¹⁴C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby ¹⁴C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured ¹³C/¹²C ratios (delta ¹³C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta ¹³C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta ¹³C, the ratio and the Conventional Radiocarbon Age will be followed by "w". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -25.3 o/oo : lab. mult = 1)

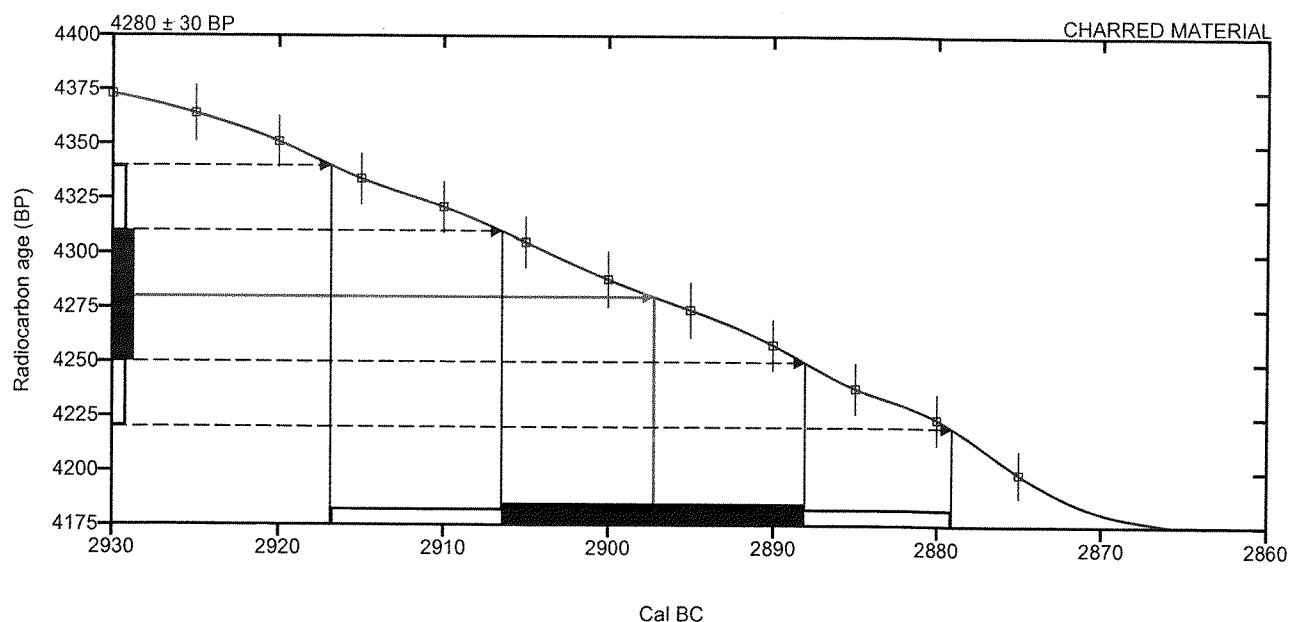
Laboratory number **Beta-383451**

Conventional radiocarbon age **4280 ± 30 BP**

2 Sigma calibrated result **Cal BC 2915 to 2880 (Cal BP 4865 to 4830)**
95% probability

Intercept of radiocarbon age with calibration curve Cal BC 2895 (Cal BP 4845)

1 Sigma calibrated results **Cal BC 2905 to 2890 (Cal BP 4855 to 4840)**
68% probability



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887.

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -23.8 o/oo : lab. mult = 1)

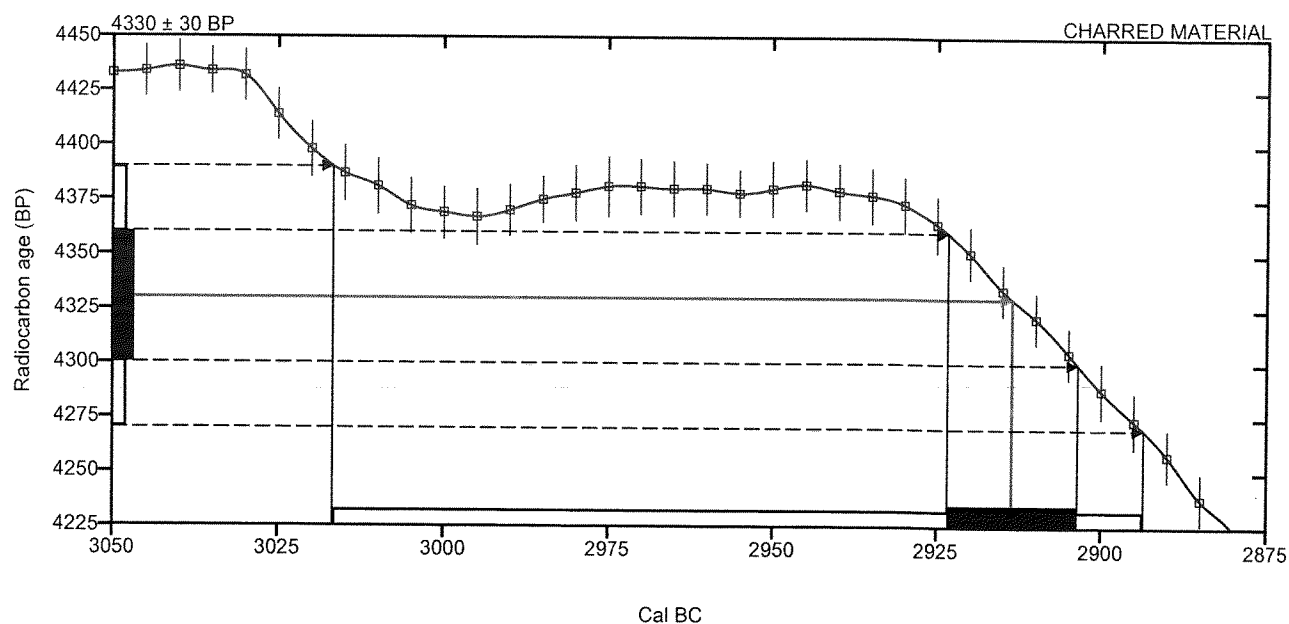
Laboratory number **Beta-383452**

Conventional radiocarbon age **4330 ± 30 BP**

2 Sigma calibrated result **Cal BC 3015 to 2895 (Cal BP 4965 to 4845)**
95% probability

Intercept of radiocarbon age with calibration curve Cal BC 2915 (Cal BP 4865)

1 Sigma calibrated results **Cal BC 2925 to 2905 (Cal BP 4875 to 4855)**
68% probability



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887.

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -25.6 o/oo : lab. mult = 1)

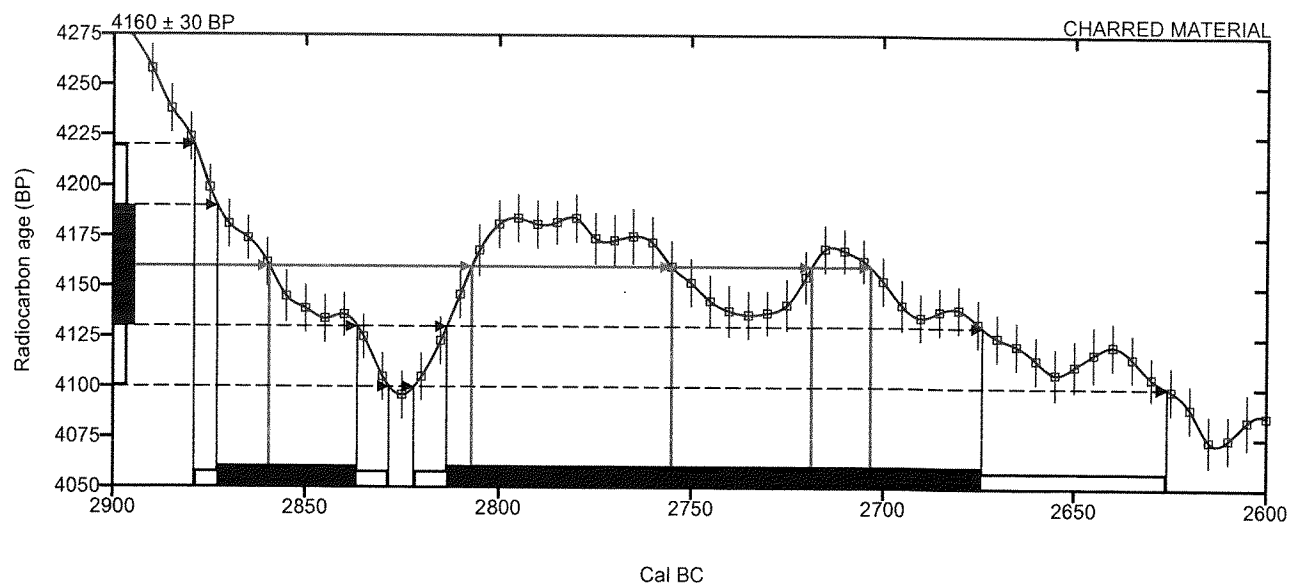
Laboratory number **Beta-383453**

Conventional radiocarbon age **4160 ± 30 BP**

2 Sigma calibrated result **Cal BC 2880 to 2830 (Cal BP 4830 to 4780)**
95% probability **Cal BC 2820 to 2625 (Cal BP 4770 to 4575)**

Intercept of radiocarbon age with calibration
curve Cal BC 2860 (Cal BP 4810)
 Cal BC 2805 (Cal BP 4755)
 Cal BC 2755 (Cal BP 4705)
 Cal BC 2720 (Cal BP 4670)
 Cal BC 2705 (Cal BP 4655)

1 Sigma calibrated results Cal BC 2875 to 2835 (Cal BP 4825 to 4785)
68% probability Cal BC 2815 to 2675 (Cal BP 4765 to 4625)



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887.

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -23.3 o/oo : lab. mult = 1)

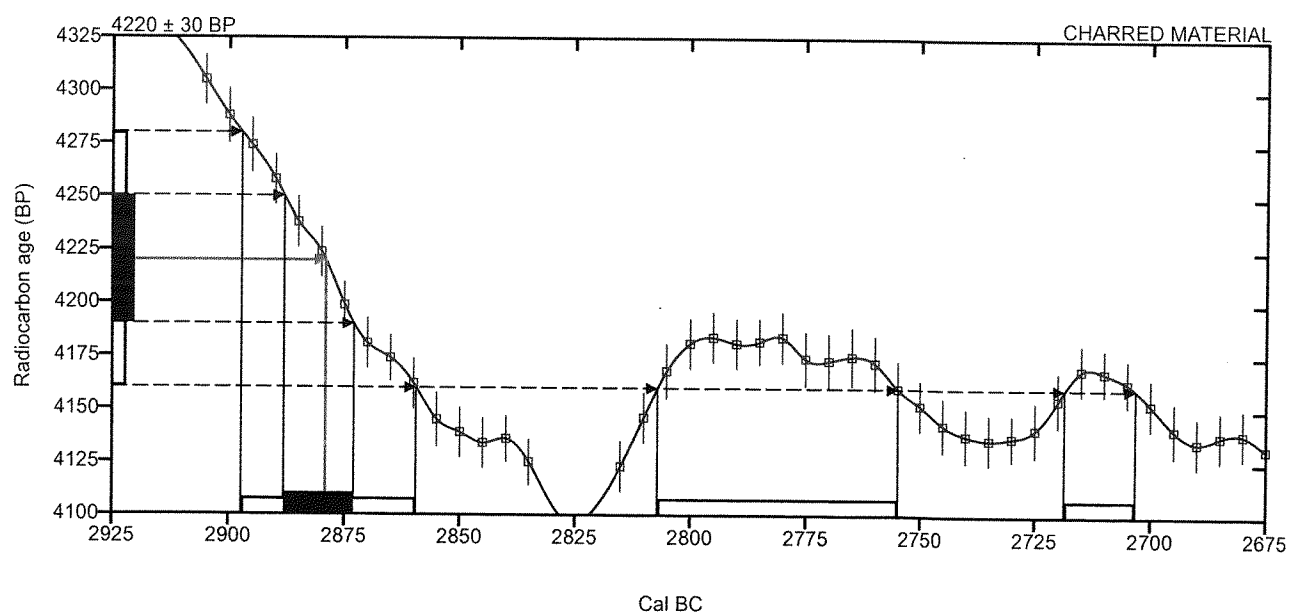
Laboratory number **Beta-383454**

Conventional radiocarbon age **4220 ± 30 BP**

2 Sigma calibrated result **Cal BC 2895 to 2860 (Cal BP 4845 to 4810)**
95% probability **Cal BC 2805 to 2755 (Cal BP 4755 to 4705)**
 Cal BC 2720 to 2705 (Cal BP 4670 to 4655)

Intercept of radiocarbon age with calibration curve Cal BC 2880 (Cal BP 4830)

1 Sigma calibrated results **Cal BC 2890 to 2875 (Cal BP 4840 to 4825)**
68% probability



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887.

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -23.2 o/oo : lab. mult = 1)

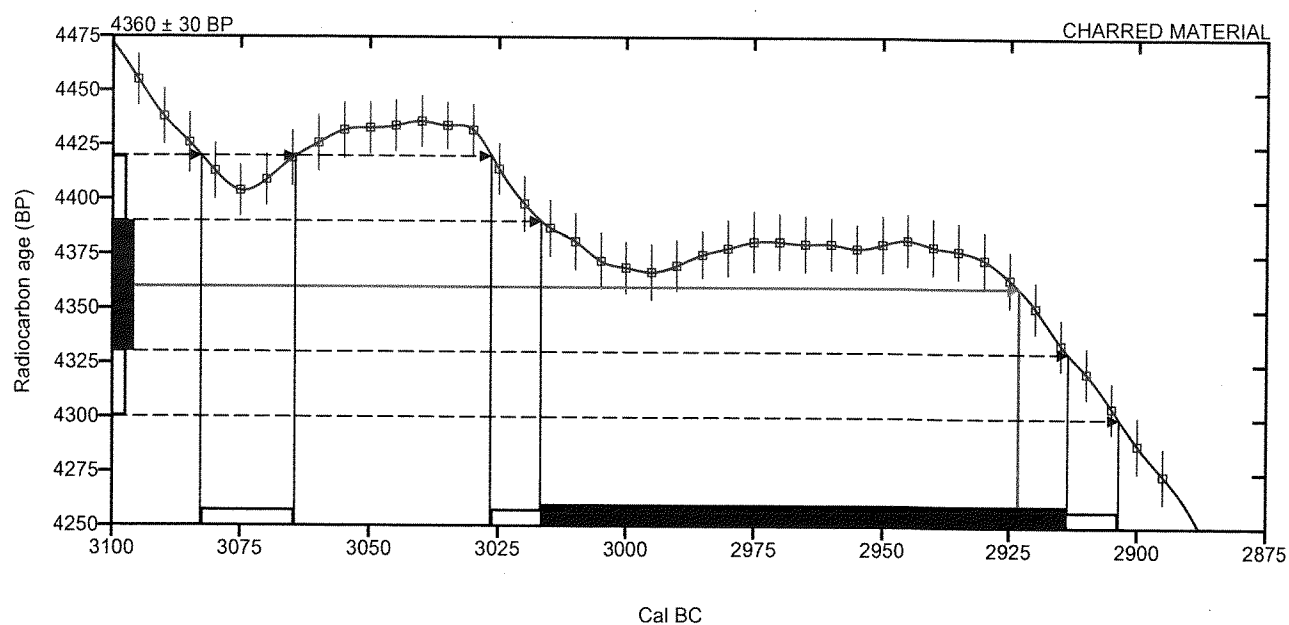
Laboratory number **Beta-383455**

Conventional radiocarbon age **4360 ± 30 BP**

2 Sigma calibrated result **Cal BC 3085 to 3065 (Cal BP 5035 to 5015)**
95% probability **Cal BC 3025 to 2905 (Cal BP 4975 to 4855)**

Intercept of radiocarbon age with calibration curve Cal BC 2925 (Cal BP 4875)

1 Sigma calibrated results **Cal BC 3015 to 2915 (Cal BP 4965 to 4865)**
68% probability



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887.

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -24.7 o/oo : lab. mult = 1)

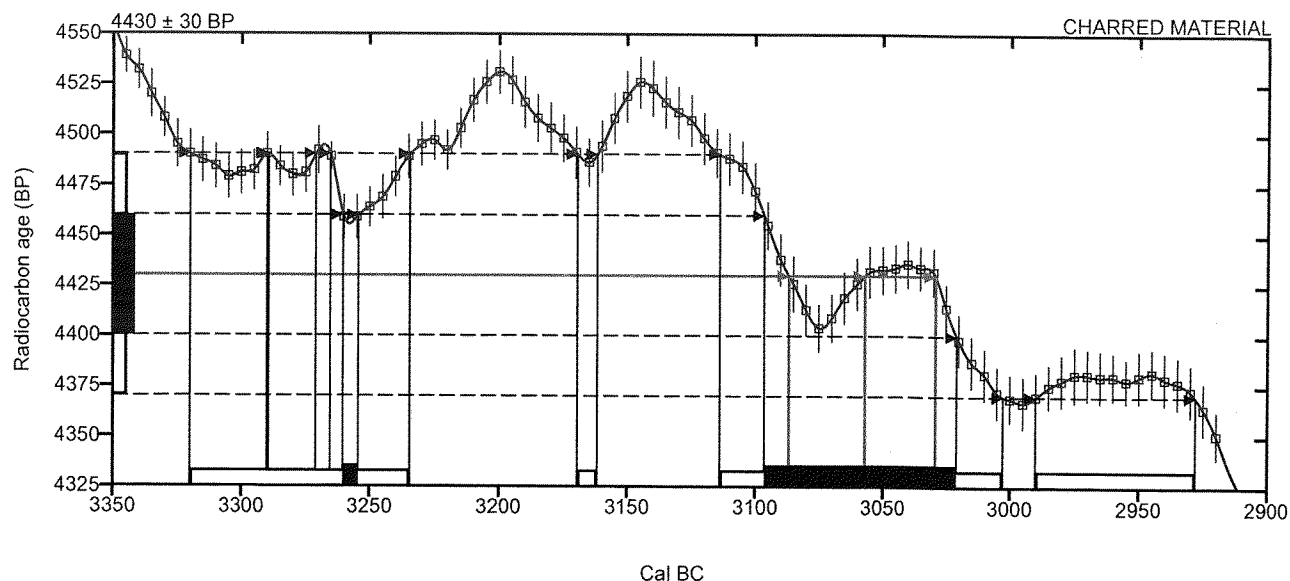
Laboratory number **Beta-383456**

Conventional radiocarbon age **4430 ± 30 BP**

2 Sigma calibrated result **Cal BC 3320 to 3235 (Cal BP 5270 to 5185)**
95% probability **Cal BC 3170 to 3160 (Cal BP 5120 to 5110)**
 Cal BC 3115 to 3005 (Cal BP 5065 to 4955)
 Cal BC 2990 to 2930 (Cal BP 4940 to 4880)

Intercept of radiocarbon age with calibration Cal BC 3085 (Cal BP 5035)
 curve Cal BC 3055 (Cal BP 5005)
 Cal BC 3030 (Cal BP 4980)

1 Sigma calibrated results Cal BC 3260 to 3255 (Cal BP 5210 to 5205)
68% probability Cal BC 3095 to 3020 (Cal BP 5045 to 4970)



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887.

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -25 o/oo : lab. mult = 1)

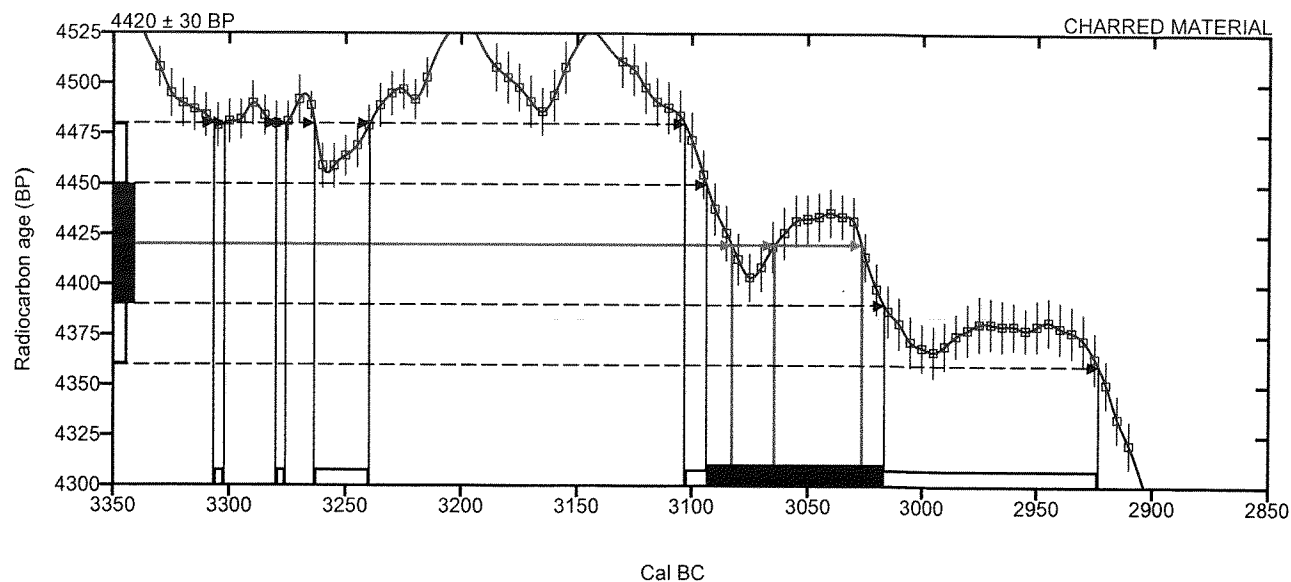
Laboratory number **Beta-383457**

Conventional radiocarbon age **4420 ± 30 BP**

2 Sigma calibrated result **Cal BC 3305 to 3300 (Cal BP 5255 to 5250)**
95% probability **Cal BC 3280 to 3275 (Cal BP 5230 to 5225)**
 Cal BC 3265 to 3240 (Cal BP 5215 to 5190)
 Cal BC 3105 to 2925 (Cal BP 5055 to 4875)

Intercept of radiocarbon age with calibration curve Cal BC 3085 (Cal BP 5035)
 Cal BC 3065 (Cal BP 5015)
 Cal BC 3025 (Cal BP 4975)

1 Sigma calibrated results **Cal BC 3095 to 3015 (Cal BP 5045 to 4965)**
68% probability



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887.

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -24 o/oo : lab. mult = 1)

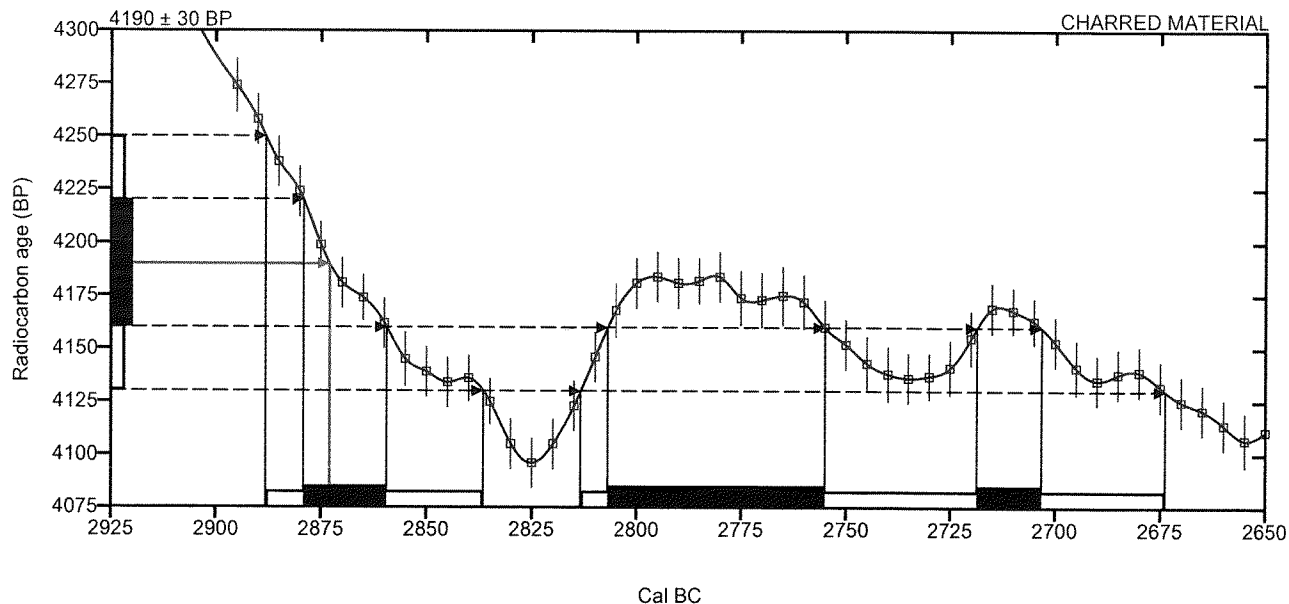
Laboratory number **Beta-383459**

Conventional radiocarbon age **4190 ± 30 BP**

2 Sigma calibrated result **Cal BC 2890 to 2835 (Cal BP 4840 to 4785)**
95% probability **Cal BC 2815 to 2675 (Cal BP 4765 to 4625)**

Intercept of radiocarbon age with calibration curve Cal BC 2875 (Cal BP 4825)

1 Sigma calibrated results Cal BC 2880 to 2860 (Cal BP 4830 to 4810)
68% probability Cal BC 2805 to 2755 (Cal BP 4755 to 4705)
Cal BC 2720 to 2705 (Cal BP 4670 to 4655)



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887.

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74 Court Miami Florida 33155 USA • Tel: (305)-667-5167 • Fax: (305)-663-0964 • Email: beta@radiocarbon.com

APPENDIX D: PHOTOS OF WEST AND EAST TRENCH



Photo 1 & 2:

East Millennium site (Top photograph, Ariel photo of the Millennium trench and the bottom photo is of the south parking lot). Both parking lots encompass the eastern portion of the Millennium development east of Vine Street and North of Hollywood Boulevard. In the top photo you can see the excavation of the East Millennium Site. The bottom photo shows the approximate location of Cross Section N-N'.



Photo 3:

(East Trench Looking North) A view looking north along the Millennium Fault Trench. The grayish sand in the view is the upper sands of the “Argyle Sand” Q_s deposits. On the left side of the photograph below the soil stockpile, a slope failure occurred which was cut back to maintain slope stability for safety.



Photo 4:

(West Trench - East Wall) Looking south at the Holocene upper sand sediments along the eastern side of the west Trench at sta. 0+60. The sands are part of the Argyle Sand (Qs) deposits.



Photo 5:

(East Trench - East Wall) Looking south along the Millennium Property line. Artificial fill (Qaf) on top of Argyle Sand (Qs).



Photo 6:

(East Trench) Breaking Ground. Note the dark layers of historic burnt pits near the surface. This material consisted of incinerated debris likely from the local residence that was buried in shallow pits. Below the burn pits were thick layers of upper sand sediments that thickened to +30 feet thick to the south, on top of mud flow sediments then found unconformable found on top of old alluvium sediments to the east.



Photo 7:

(East Trench looking north). To the left, upper sand sediments are on top of parent mudflow deposits. To the right, artificial fill is on top of older alluvium deposits. At the northern terminus of the trench, artificial fill is on top of upper sand sediments.

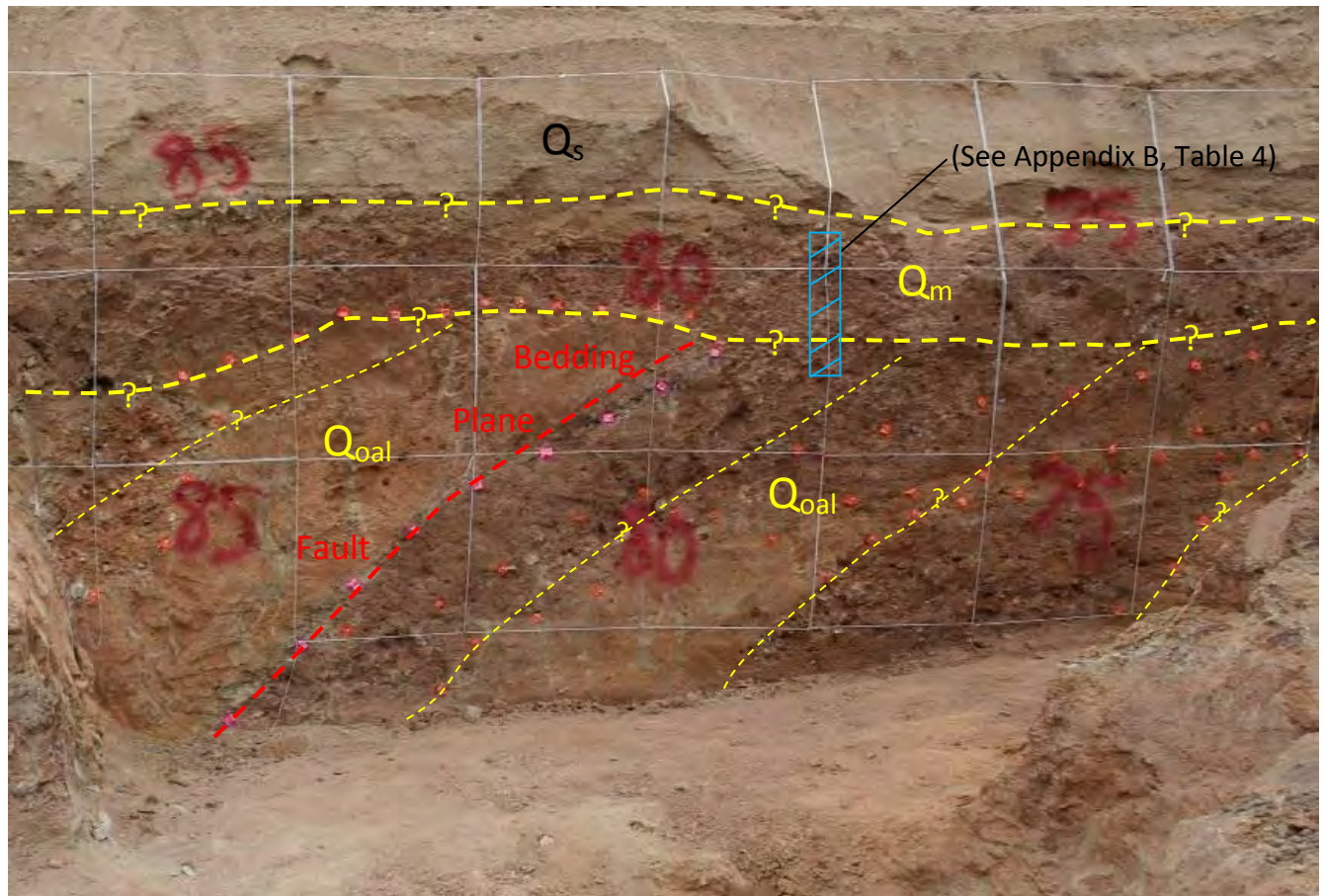


Photo 8:

East trench, west wall close-up showing contact between remnant unbroken mudflow deposits (Q_m) and underlying bedding-plane fault within south-dipping older alluvium (Q_{oal}). Location of representative soil-stratigraphic section indicated by dashed blue column.

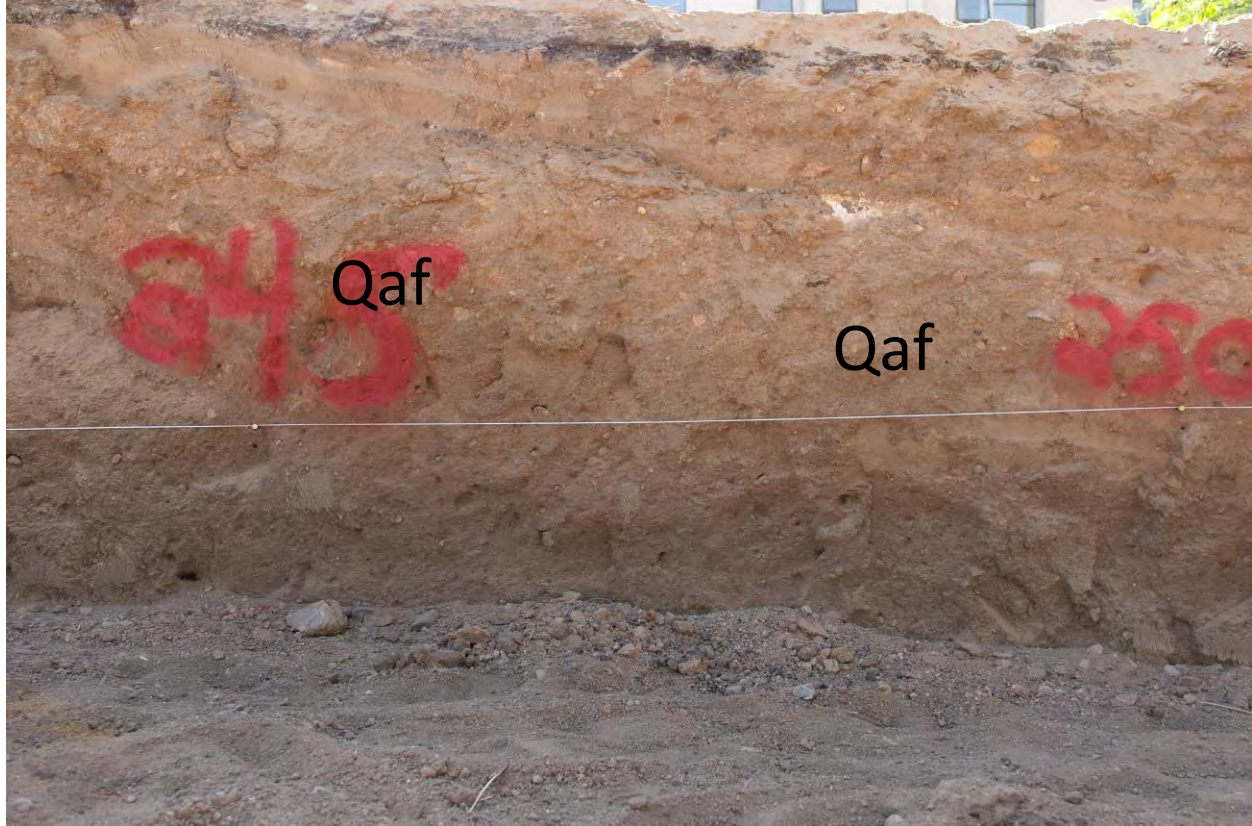


Photo 9:

(East Trench – East Wall) Artificial fill (Qaf) overlies native soils in the Capitol Tower parking area. The fill material consist mostly fine to medium sand, trace fine to coarse gravel.

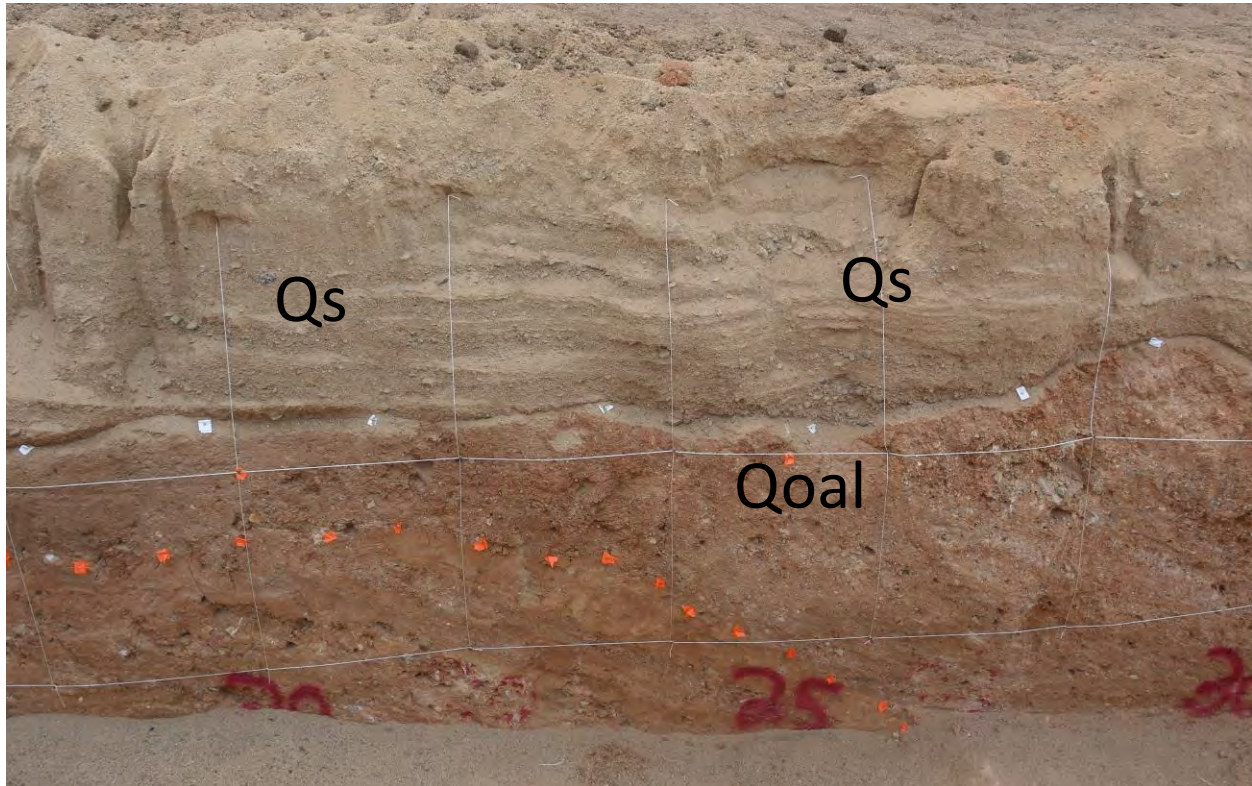


Photo 10:

(East Trench – East Wall) Holocene Argyle Sand deposits (Qs), consist of loose to moderately dense, gradationally bedded and sub-rounded to sub-angular sands with local, weakly cemented gravelly sands.

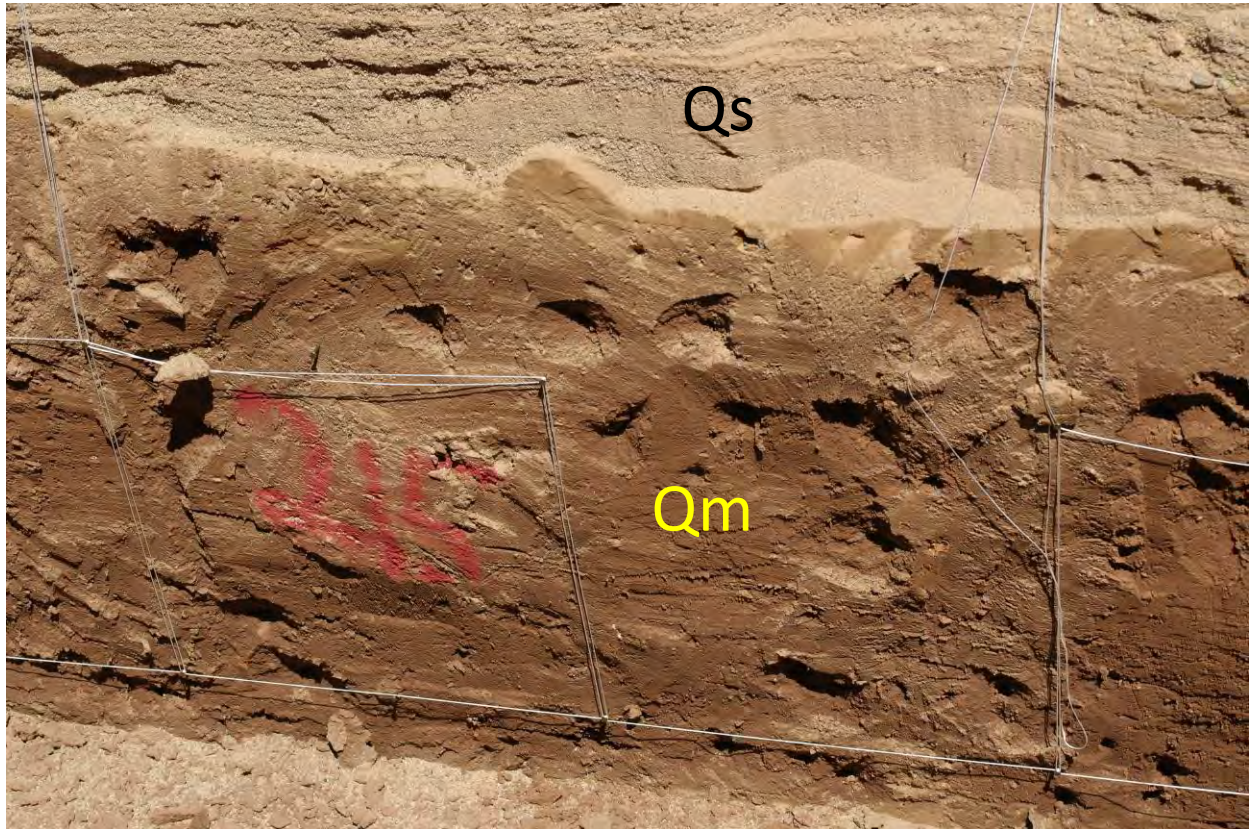


Photo 11:

(East Trench – East Wall) Pleistocene Mud Flow (Qm) Deposits are typically stiff with locally abundant sands, silts and few fine gravels within a clayey supported matrix. General grain-size and stratigraphic position indicate the mudflow deposits initially filled the deeply incised Argyle Channel. Note the erosional contact with the Argyle Sand deposits (Qs).

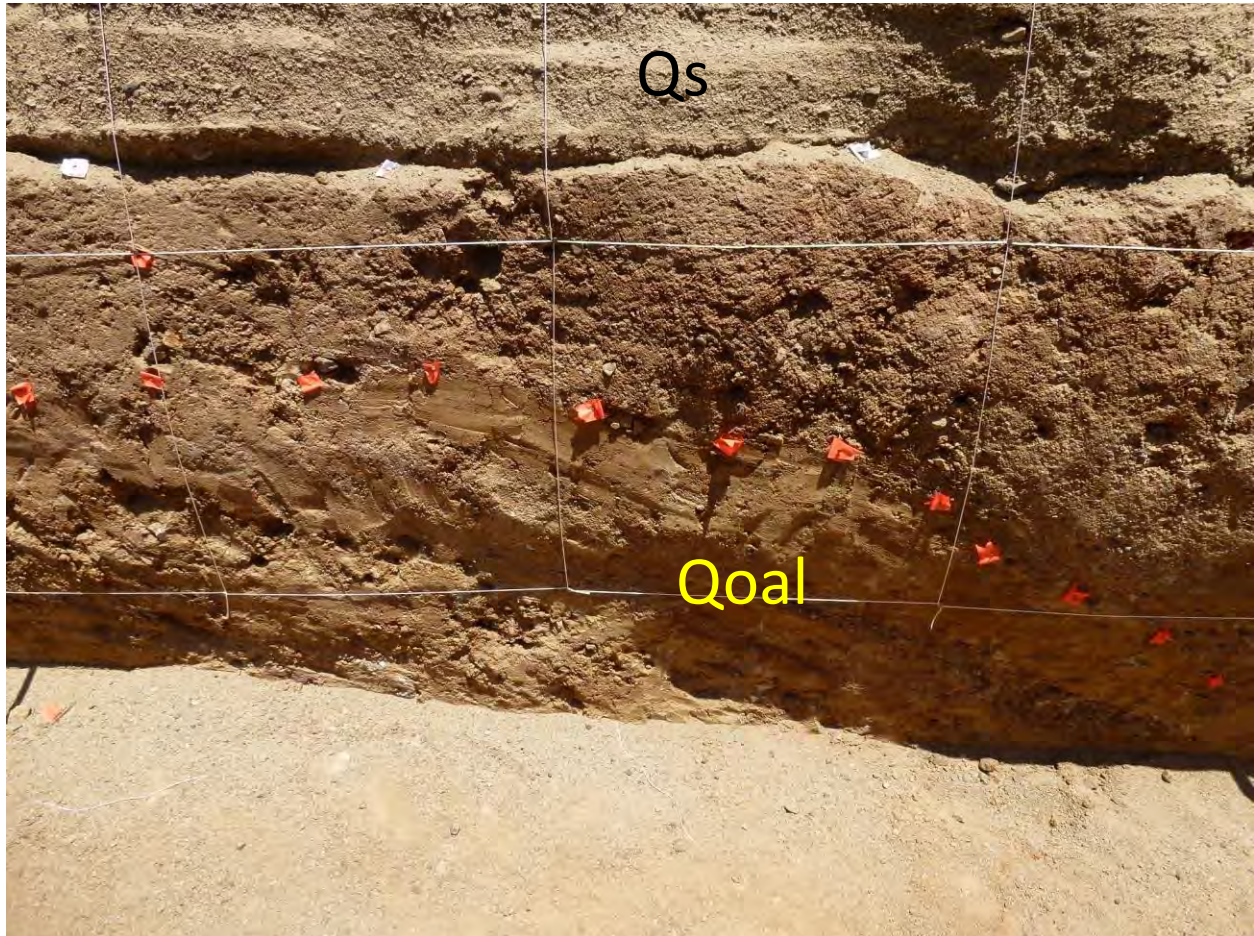


Photo 12:

(East Trench – East Wall) Pleistocene Older Alluvium (Qoal) Deposits are mainly sand and silts, with lenses of gravels and cobbles. The Argyle Sand (Qs) deposits are horizontal and the Older Alluvium (Qoal) dips to the south ($\sim 20^\circ$ - $\sim 49^\circ$), increasing to the south.

West Millennium Site

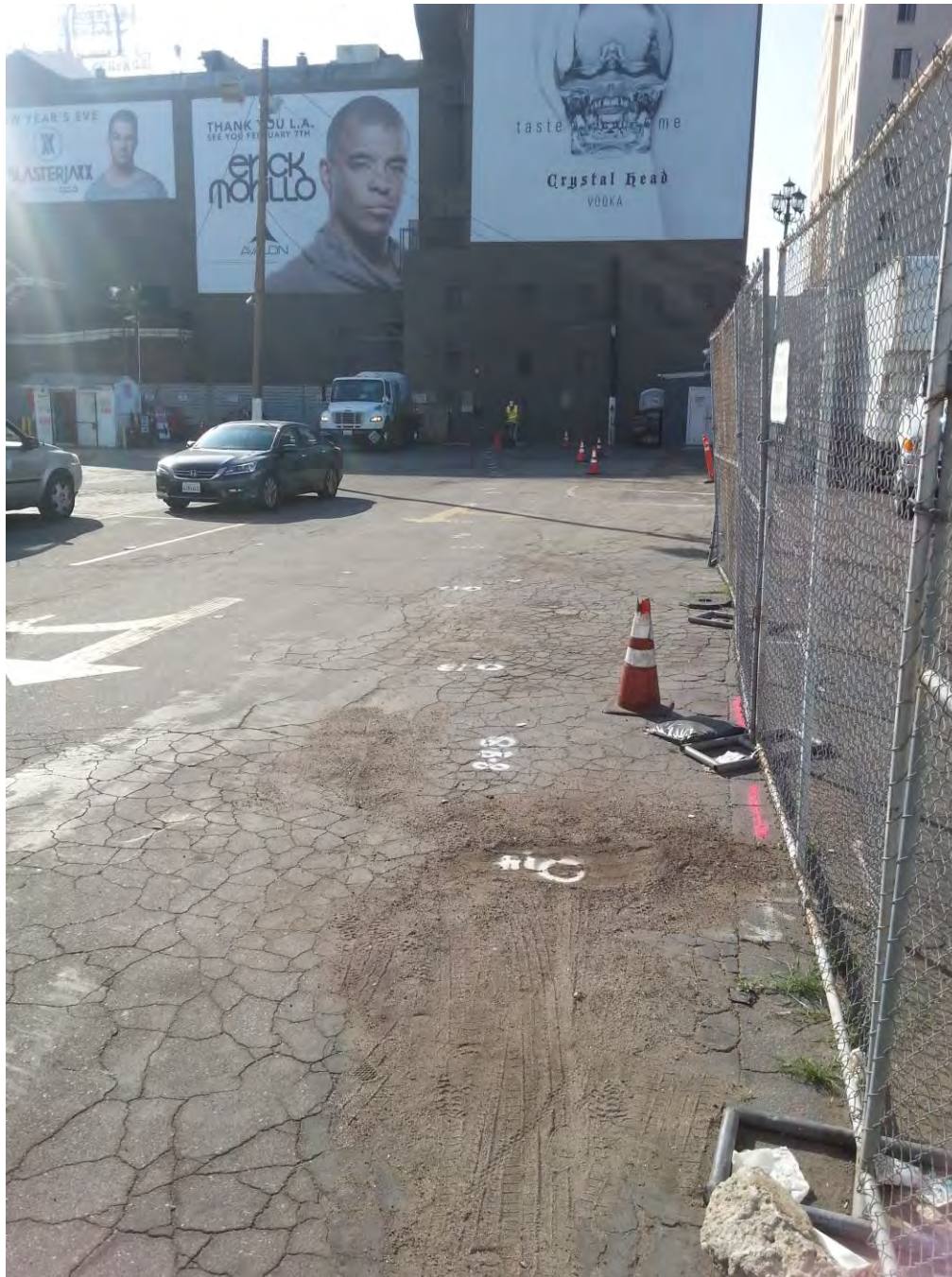


Photo 13:

General picture taken approximately midway along the cone penetration test (CPT) and soil core alignment looking south.

West Millennium Site



Photo 14:

General picture taken at the north end of the CPT and soil core alignment looking south.

APPENDIX E: THIRD-PARTY REVIEW BY ECI

“To Be Supplied Under Separate Cover”

By

Earth Consultants Inc.



GROUP DELTA

Mr. Philip E. Aarons, VP
Millennium Hollywood Development LLC
1680 N. Vine Street
Los Angeles, California 90028

May 17, 2015
GDC Project. LA-1191 A

Subject: Response to Request from City of Los Angeles
Department of Building and Safety Grading Division
East and West Millennium Sites
1733-1741 Argyle Avenue; 6236 and 6334 W. Yucca Street; 1720-1730, 1740,
1745-1760, and 1762-1770 N. Vine Street; 1746, 1748-1754, 1760, and 1764 N.
Ivar Avenue, Hollywood Area, City of Los Angeles, California

Mr. Aarons:

Group Delta Consultants (GDC) is pleased to submit the enclosed letter responding to concerns raised by the City of Los Angeles Building and Safety Grading Division. More specifically, we received an e-mail from Dan Schneidereit of the City of Los Angeles on 3/17/15 stating the following,

"The Department of Building and Safety (LADBS) has completed its initial review of your submittal and the accompanying 3rd party review by ECI and generally agrees with the conclusions of your report. We recognize that your report is based on a large amount of exploration (78 cone penetrometer tests, 35 continuous core borings and a trench up to 25 feet deep and over 250 feet long) as well as the extensive geologic analysis conducted by yourself, Roy and ECI.

In a meeting I had with Jerry Treiman and Janis Hernandez with the California Geological Survey (CGS) on Friday March 13, 2015, I saw that the CGS has created several cross section based on your "raw" CPT transects, where they indicate alternative interpretations to the conclusions in your report. As you know, LADBS is the reviewing agency and has the sole responsibility in the permitting process to make the final decision as to the adequacy of your report. Nevertheless, we want to be as cooperative as possible to interested agencies. To this end, it would be very helpful to our final evaluation if you could provide any additional analysis you have related to some of these alternative interpretations. Specifically, an apparent change of thickness of the "mudflow" unit across the inferred fault was identified on Cross Section M-M'. Another issue includes a possible southern trace, similar to what ECI shows in their report, may be present. The CGS points to a slight warp of the overlying "mudflow" unit and a minor discontinuity in the overlying sand deposits. All of these issues seemingly can be addressed by your current data.

Unfortunately, while CGS showed me their interpreted cross sections and indicated that they had been provided to others through a PRA, they stated that they were not able to provide me with

copies. Therefore, it may assist your reply to this email if you obtain CGS's interpretations so that you can provide specific responses to the cross sections CGS created.

Your response and additional analysis will enable us to wrap up our review."

Additional Analyses Summary

In response to the subject e-mail, GDC performed the following additional analyses:

- GDC Reevaluated the inferred location of the Alquist-Priolo zoned Yucca Street Fault to determine whether or not the fault exists, and to determine if it should be classified as active or inactive.
- GDC conducted additional field surveying work with a manometer and engaged Psomas Associates to field survey the work at or approximately at the CPT and core locations in order to ensure that apparent stratigraphic differences in cross-sections M-M' and N-N' were not the result of inaccurate elevation assessment and plotting.
- GDC and ECI conducted additional detailed core logging along N-N'.
- GDC performed detailed stratigraphic analyses on increased scale printouts of CPTs along the portion of transect N-N in question. Detailed examination of CPT data included tip resistance, skin friction, and engineering soil behavior type represented by the specific color bars on section N-N. Section N-N' was chosen for this analysis because it overlaps with M-M', has CPT data extending south of section M-M, and has very closely spaced cores.

Field Survey

Due to interim re-surfacing of the parking lot between the data collection on M-M' and N-N', the specific original locations of the CPTs and cores could not be found along cross-section M-M'. Therefore, a north-south line was surveyed in the vicinity of the line on the original plot. The stations for cross-section M-M' are surveyed approximately with a lower degree of accuracy. For cross-section N-N', the CPT and core locations were still visible during the additional field survey; hence, these locations have the best accuracy.

Stratigraphic Analysis

As indicated in the GDC Fault Evaluation Report for the East and West Millennium Sites, (GDC, March 6, 2015), the East Millennium Site is mostly covered with a thin veneer of artificial fill with an asphalt surface. Directly below the fill are deposits of Holocene alluvial sand sediments (the Argyle Sand), which deepen within inset channels. The sand deposits are lying unconformably on top of the Late Pleistocene Mud Flow Unit, which was determined to be 80 to 125 ka (GDC, 2015a). In the southern portion of both the East and West Millennium Sites, the Mud Flow Unit (Qm, 80-125ka) lies unconformably on top of the older mudflow deposits determined to be 125->500ka+ (based on updated core interpretations for this letter). The identification of this contact was not indicated in the GDC previously submitted report (GDC, 2015a) for the East Millennium

Site. The older mudflow deposits have many strongly developed paleosols; this results in an estimated age for the older mudflow deposits of 125-500 ka+. Both the older mudflow and older alluvium are Middle Pleistocene in age. In the northern portion of both the East and West Millennium Sites, the Mud Flow Unit (Qm, 80-125ka) lies unconformably on top of the Old Alluvium (200ka+).

At the margins of the old Argyle Canyon, which occupies the eastern portion of the east site, and the western portion of the west site, the Argyle Sand lies unconformably on the Old Alluvium, and the Mudflow unit is mostly absent due to erosion previous to deposition of the Argyle Sand.

Near the surface, the Argyle Sand and the Late Pleistocene Mud Flow Unit are both continuous in the subsurface across the aerial extent of the eastern portion of the East Millennium Site. Bedding in the Argyle Sand has a dip of ~2 degrees to the south to horizontal with a consistent increase in thickness to the south. The Argyle Sand is unconformably overlying the Pleistocene Mud Flow Unit and does not show discontinuities due to faulting.

The Mud Flow Unit is continuous with some thickening to the south and apparent dips of <5 degrees to the south. In the approximate area of C-22 along cross-section M-M', the Mud Flow Unit overlays older alluvium to the north and old mudflow deposits to the south. The contact with the older deposits is slightly irregular, showing that the Younger Pleistocene Mud Flow Unit is slightly ductile. The sedimentary deposits, especially the clayey strata, are only slightly ductile in the subsurface. The dip of <5 degrees, the thickening of the Argyle Sand, the thickening of the Mud Flow Unit, and the lower ductile contact with the older units is indicative of normal alluvial deposition, erosion and overburden loading of the soft sediments with minor to no influence from the neo-tectonics at the site.

Fault Evaluation

The California Geological Survey (CGS) and Earth Consultants International (ECI) analyzed the preliminary CPT data for cross-section M-M' and N-N' in the East Millennium Site. During their assessments, they discovered faulting and deformation of sedimentary beds in the older alluvium and older mudflow deposits. The CGS did not show any inferred or suggested faulting projecting into cross-section N-N'. After GDC evaluated their preliminary analysis, GDC concluded that none of the inferred faults crossed the 80 ka Holocene-Upper Pleistocene contact between the Argyle Sand and the Mud Flow Unit. Therefore, these inferred faults are classified as pre-Holocene or inactive. In one case, between C-21 and C-22 along cross-section M-M', the CGS mapped a small potential fault breaking the contact between the Holocene Argyle Sand and the Mud Flow Unit. When this minor potential fault is projected through the East Trench, +/- 100 feet east of cross-section M-M', the fault cannot be found breaking the 80 ka Upper Pleistocene Mud Flow Unit contact with the Argyle Sand. Hence, the faults shown by the CGS either do not exist or are at a depth that would render them definitely not active as defined by the Alquist-Priolo Act.

In cross-sections M-M' and N-N', in the East Millennium Site, the transition south from older alluvium to older mudflow deposits are shown in the subsurface near C-22. This can be explained by a reverse fault separating the older alluvium to the north from the older mudflow at depth below the Holocene alluvium. The east trench in the East Millennium Site was excavated over this fault's projection. No fault rupture was logged crossing or breaking the 80 ka contact of the Upper Pleistocene Mud Flow Unit with the Holocene Argyle Sand, demonstrating that no active faults were found crossing the East Millennium Site.

The Mud Flow Unit has continuous, non-deformed erosional contact with the upper Argyle Sand, the older alluvium, and the mudflow deposit along cross-section N-N'. However, the base contact with the lower older alluvium and the mudflow deposit was found to be irregular along cross-section M-M', especially in the area of C-29. A ~1.5 foot elevation high was found at C-29 along cross-section M-M' in the Mud flow Unit. The apparent higher elevation at C-29 was revisited by evaluating the CPT data, evaluating the surveying data, and a survey of the site. Both the CPT data and recent survey data indicate that the elevation of CPT 29 was depicted correctly in the previously submitted GDC report (GDC, 2015a). When projecting the Mud Flow Unit's upper and lower contacts from C-28 to C-30 across C-29, there is no evidence of fault offset with the Argyle Sand and/or Mud Flow Unit, or the lower older alluvium and mudflow deposit to the west. Neither the elevation high at C-29 nor the irregular contact was found laterally across cross-section N-N'. Although one inactive fault was found in the East Trench on the 6230 Yucca Site, this inactive fault existed solely within the Old Alluvium and did not offset Argyle Sand. No faults were found breaking the older alluvium or Mud Flow Unit throughout the remaining portion of the trench; hence, no active faults were found in any of the trench exposures.

Conclusion

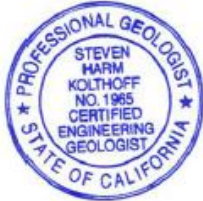
Our detailed examination demonstrates that the older alluvial and older mudflow deposits below the Mud Flow Unit (Qm) are older than 125 ka (and most likely older than 500 ka). Lateral inconsistencies may explain faulting that is older than 80 ka but younger than 125 ka. Our own analysis indicates the potential presence of an inferred inactive fault near CPT-20. This inferred inactive fault was found on other CPT transects O-O' and P-P' on the West Millennium Site. Therefore its interpretation has both vertical and lateral correlation across the explorations of both the East and West Millennium Sites. Given other lateral discontinuities elsewhere in section M-M', it is possible to interpret smaller faults which could be the cause of these lateral discontinuities. However, other depositional or erosional explanations are equally likely. Nonetheless, in all cases, all of the potential interpreted fault locations place the potential inferred faults below the excavated trenches, or below the Mud Flow Unit in the highly detailed and correlated Section N-N'. Therefore, all of these inferred potential faults are demonstrably older than 80 ka, pre-Holocene, and therefore definitely inactive.

This updated detailed analysis confirms the findings in the previously submitted report (GDC, 2015a): the East and West Millennium Sites are characterized by unbroken Holocene sediments and underlying un-faulted Pleistocene Mud Flow Unit deposits that are at least 125 ka. This thereby demonstrates that no active faults were present within the area of our subsurface study on the East and West Millennium Sites or the other areas reviewed within this report.

A summary of the faulting exemplified by the CGS is summarized in Table 1.

GDC appreciates the opportunity to provide geotechnical and geological services for this project. Should you have any questions, please call at 310-320-5100.

Yours Sincerely,
GROUP DELTA CONSULTANTS, INC.



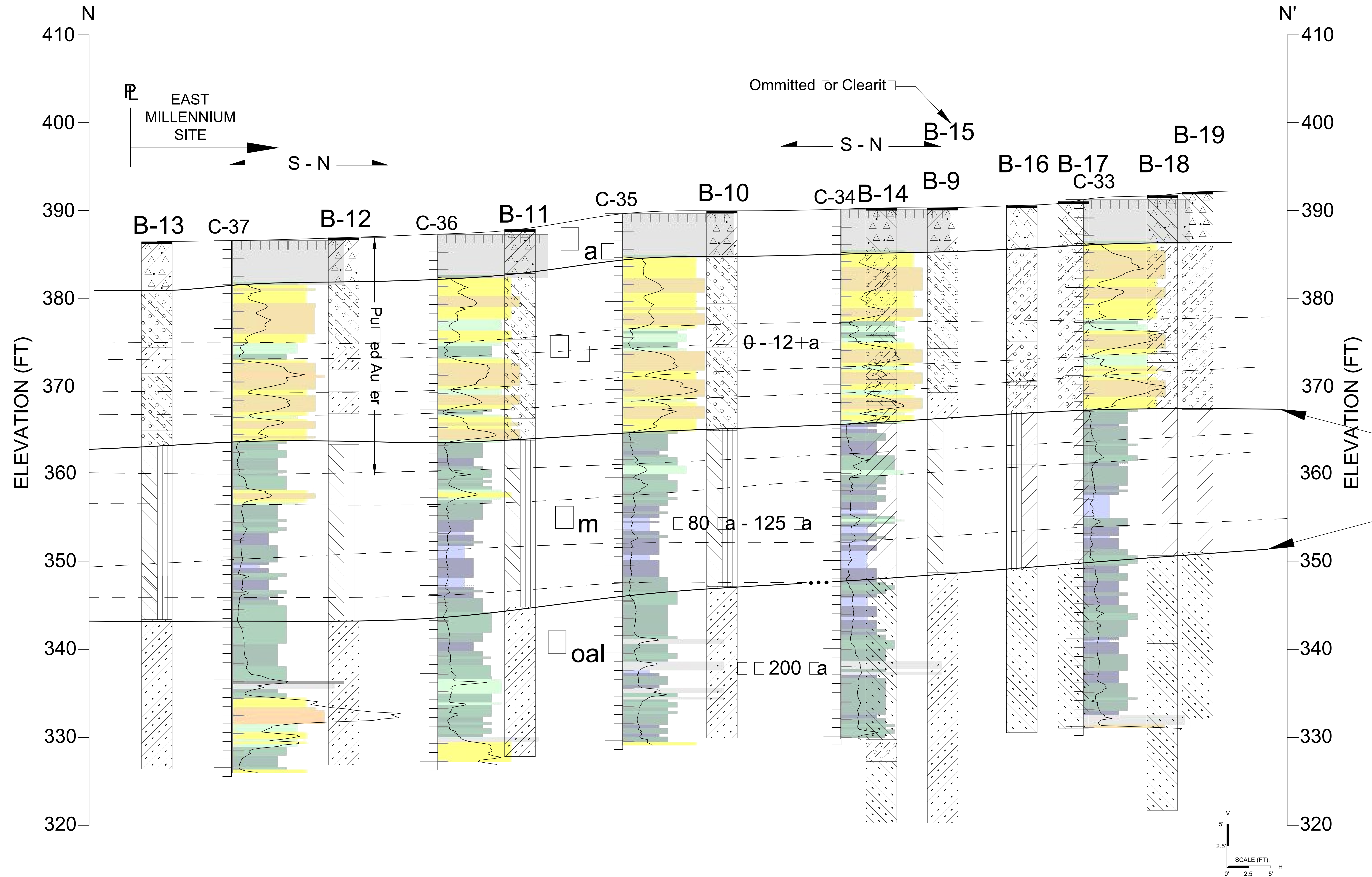
A handwritten signature in black ink, appearing to read "S.H. Kolthoff".

Steven H. Kolthoff, CEG # 1965, exp. 8/31/15
Engineering Geologist Consultant




Michael D. Reader, PE, GE
CEO, Principal Engineer

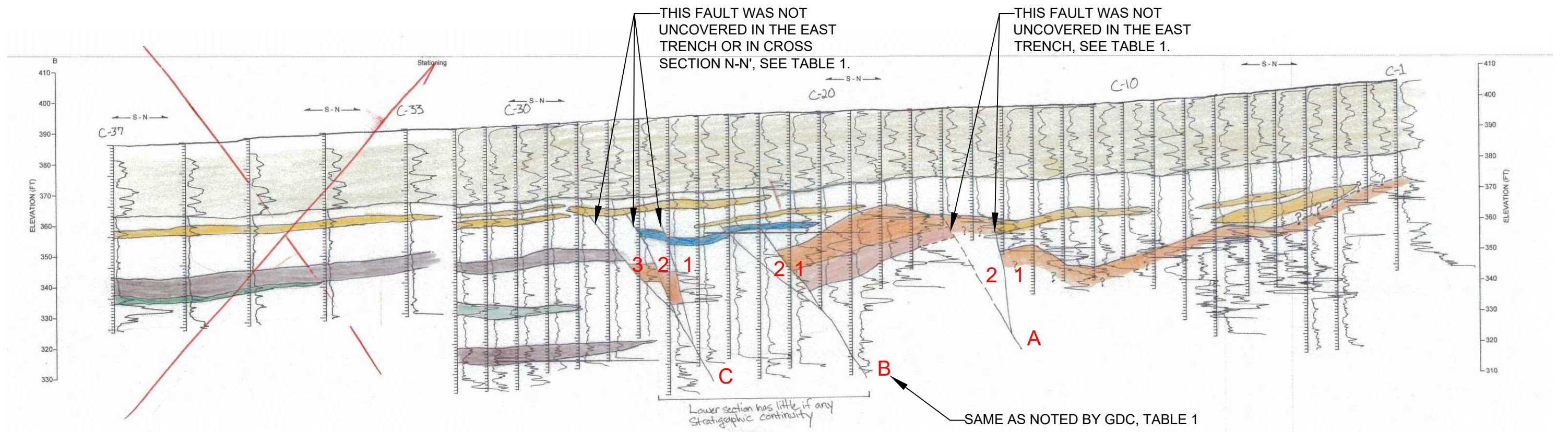
Dist: Addressee (1), LADBS (3)



NOTE:


BORING AND CPT ELEVATIONS SURVEYED
BY PSOMAS ASSOCIATES

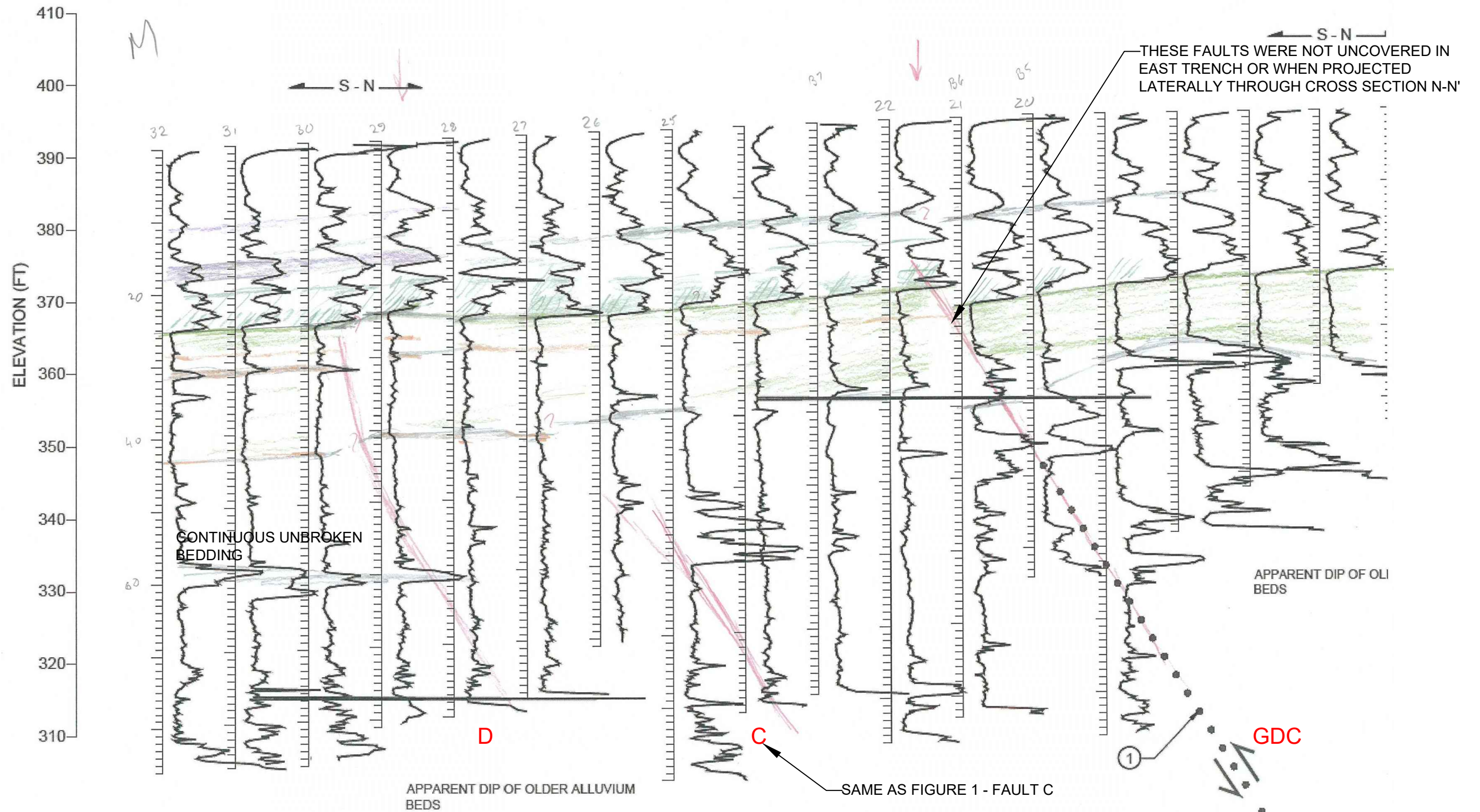
DATE:	9/12/2014	DRAWN BY:	JMT	 GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	CROSS SECTION N-N' (CPT/SOIL CORE)	PROJECT NUMBER:	LA1191A
REVISION:	3/25/2015	APPROVED BY:	SK			SCALE:	AS SHOWN
REVISION:					EAST MILLENNIUM SITE	PLATE NUMBER:	7



NOTES:

- ① CROSS-SECTION REPRODUCED FROM GDC BY CGS WITH HYPOTHETICAL, INFERRED FAULTS. RED LETTERS ADDED BY GDC FOR DISCUSSION REFERENCE.
- ② HAND WRITTEN NOTES BY CGS

DATE: 5/1/2015	DRAWN BY: JMT		GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	SUPPLEMENTAL REPORT	PROJECT NUMBER: LA1191A
REVISION: -	APPROVED BY: SK				SCALE: NONE
REVISION: -				MILLENNIUM SITE	FIGURE NUMBER: 1



NOTE:

- ① CROSS-SECTION REPRODUCED FROM GDC BY CGS WITH HYPOTHETICAL, INFERRED FAULTS. RED LETTERS ADDED BY GDC FOR DISCUSSION REFERENCE.

DATE:	5/1/2015	DRAWN BY:	JMT
REVISION:	-	APPROVED BY:	SK
REVISION:	-		

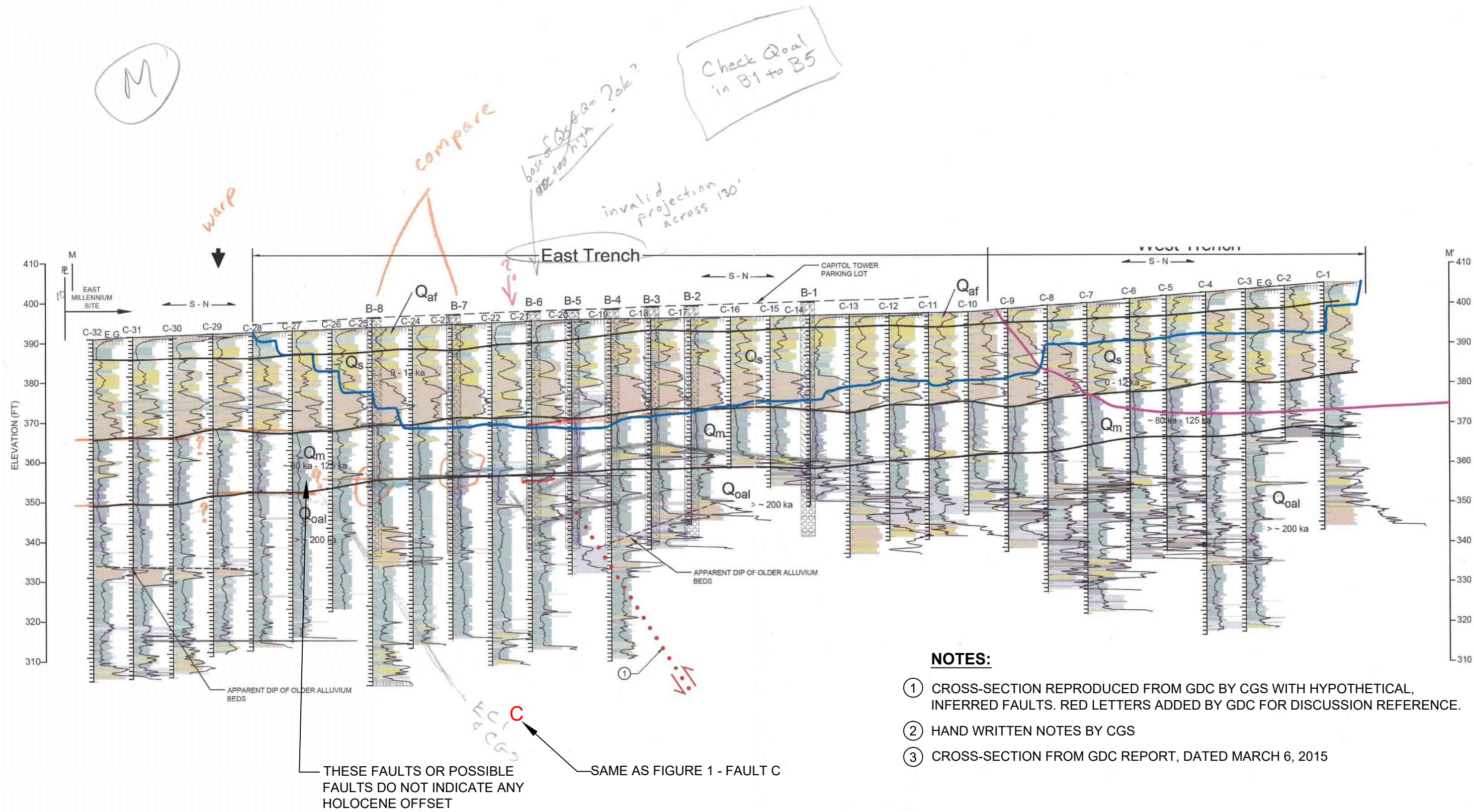


GROUP DELTA
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SUPPLEMENTAL REPORT

MILLENNIUM SITE

PROJECT NUMBER:	LA1191A
SCALE:	NONE
FIGURE NUMBER:	2



DATE:	5/1/2015	DRAWN BY:	JMT
REVISION:	-	APPROVED BY:	SK
REVISION:	-		

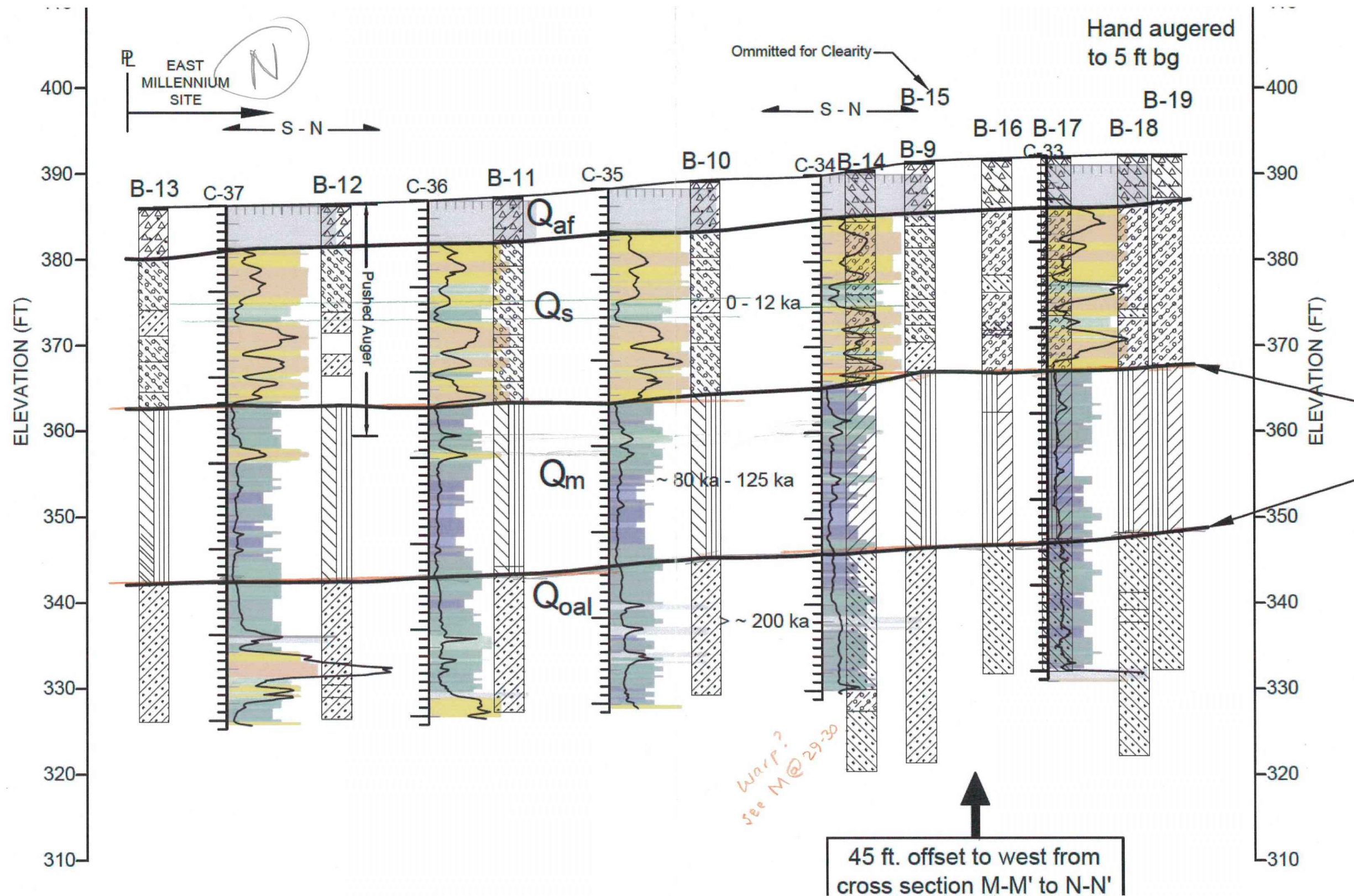


GROUP DELTA
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SUPPLEMENTAL REPORT

MILLENNIUM SITE

PROJECT NUMBER:	LA1191A
SCALE:	NONE
FIGURE NUMBER:	3



NOTE:

- ② HAND WRITTEN NOTES BY CGS

DATE:	5/1/2015	DRAWN BY:	JMT
REVISION:	-	APPROVED BY:	SK
REVISION:	-		

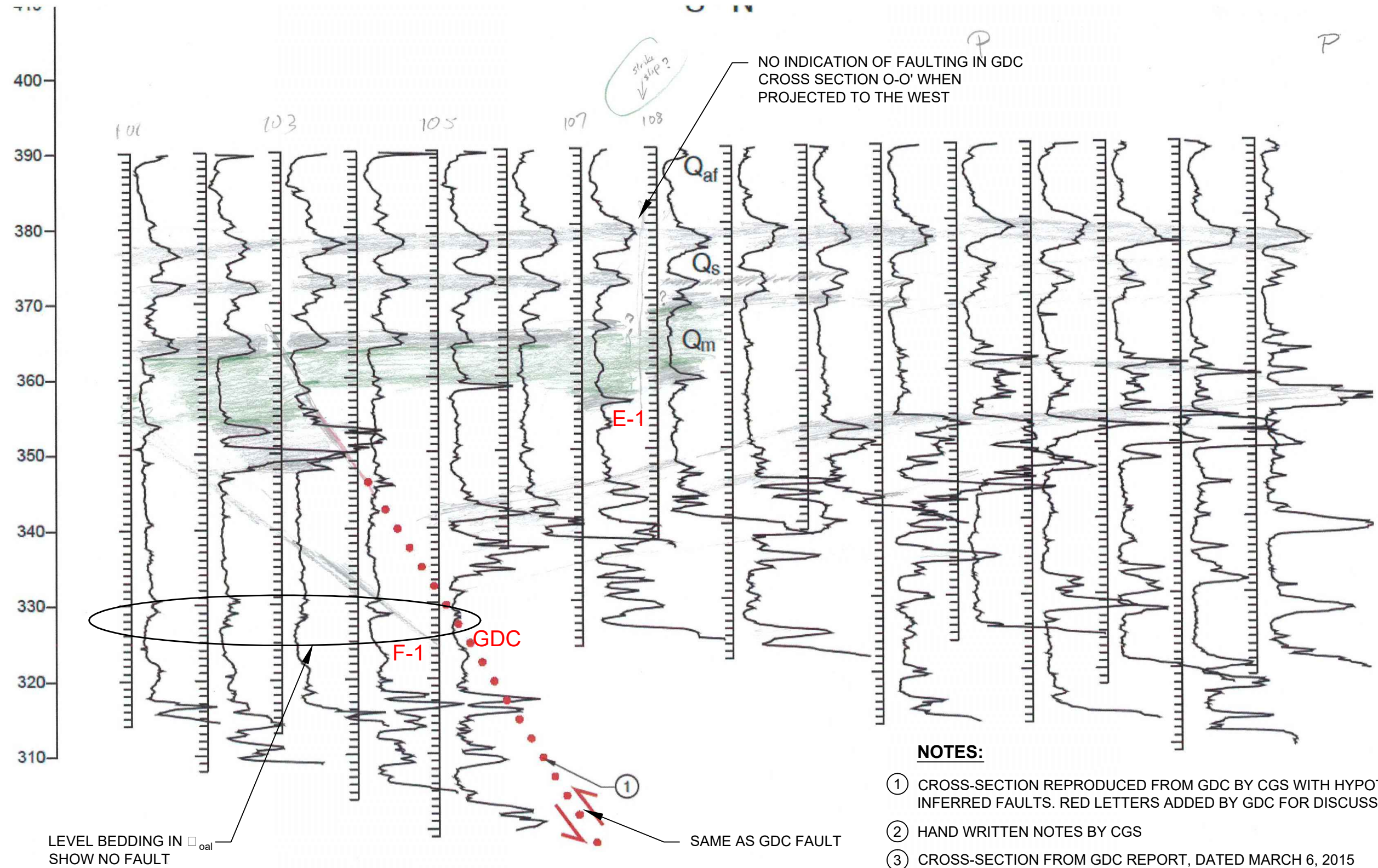


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SUPPLEMENTAL REPORT

MILLENNIUM SITE

PROJECT NUMBER:	LA1191A
SCALE:	NONE
FIGURE NUMBER:	4



DATE:	5/1/2015	DRAWN BY:	JMT
REVISION:	-	APPROVED BY:	SK
REVISION:	-		

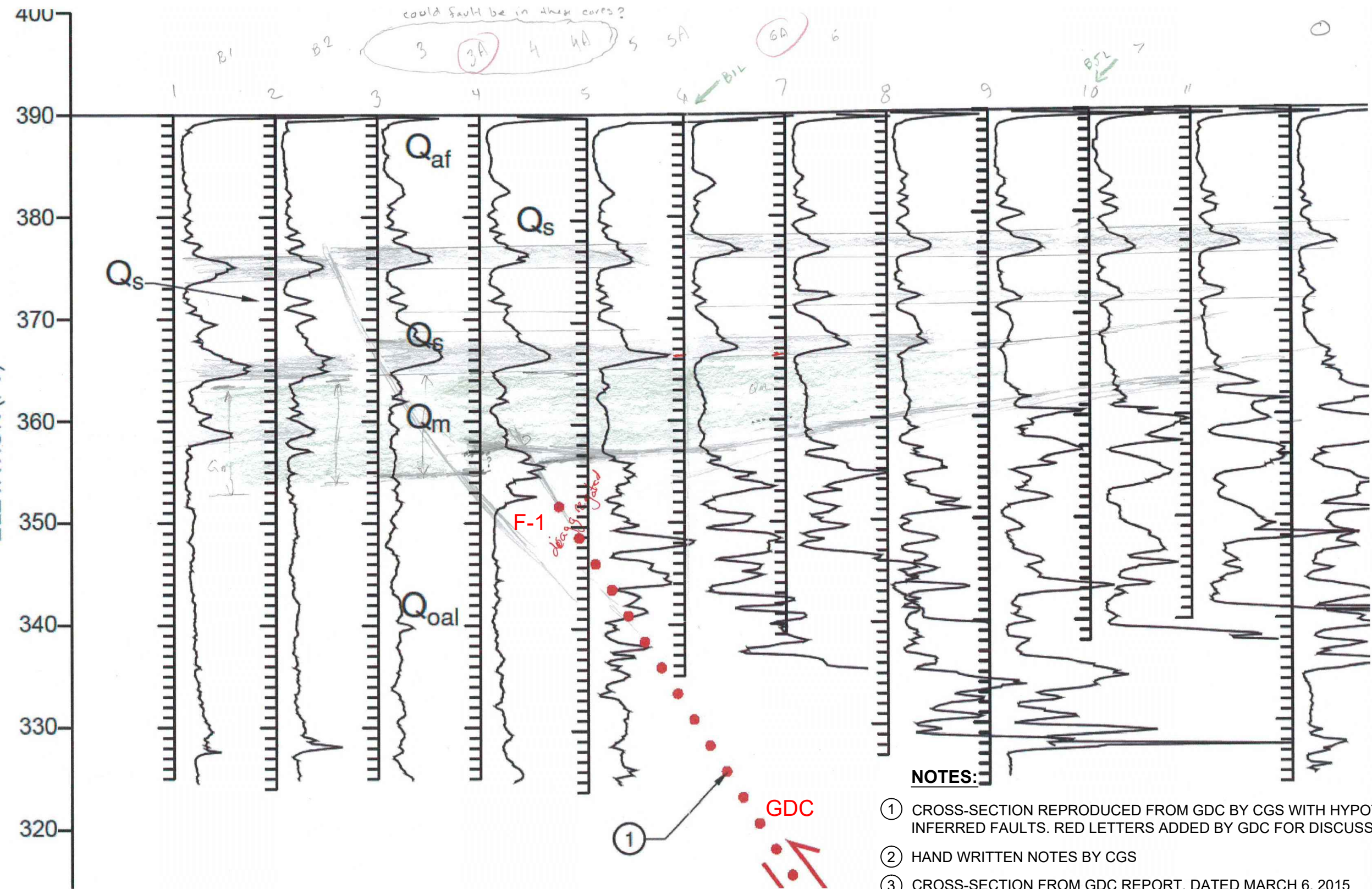


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SUPPLEMENTAL REPORT

MILLENNIUM SITE

PROJECT NUMBER:	LA1191A
SCALE:	NONE
FIGURE NUMBER:	5



NOTES:

- ① CROSS-SECTION REPRODUCED FROM GDC BY CGS WITH HYPOTHETICAL, INFERRED FAULTS. RED LETTERS ADDED BY GDC FOR DISCUSSION REFERENCE.
- ② HAND WRITTEN NOTES BY CGS
- ③ CROSS-SECTION FROM GDC REPORT, DATED MARCH 6, 2015

DATE:	5/1/2015	DRAWN BY:	JMT
REVISION:	-	APPROVED BY:	SK
REVISION:	-		



GROUP DELTA
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Torrance, CA. 90501

SUPPLEMENTAL REPORT

MILLENNIUM SITE

PROJECT NUMBER:	LA1191A
SCALE:	NONE
FIGURE NUMBER:	6

REFERENCES

Group Delta Consultants, Inc., March 6, 2015a, Fault Activity Investigation, East and West Millennium Sites 1733-1741 Argyle Avenue; 6236 and 6334 West Yucca Street; 1720-1730, 1740, 1745-1760, and 1762-1770 N. Vine Street; 1746, 1748-1754, 1760, and 1764 N. Ivar Avenue, Hollywood Area, City of Los Angeles, California.

Group Delta Consultants, Inc., October 24, 2014a, Response to the City of Los Angeles Geology Correction Letter #85579, Fault Activity Investigation, Yucca-Argyle Apartments - Champion Site, SE Corner of Yucca Street and Argyle Avenue, 1756 and 1760 Argyle Avenue, Hollywood District, City of Los Angeles, California.

Group Delta Consultants, Inc., September 3, 2014b, "Fault Activity Investigation," Yucca-Argyle Apartments, 1756 and 1760 Argyle Avenue, Hollywood Area, City of Los Angeles, CA, GDC Project no. LA-1175 A.

Group Delta Consultants, Inc., September 7, 2014c, "Fault Activity Investigation," 1756 to 1760 Argyle Avenue, Hollywood Area, City of Los Angeles, CA, GDC Project no. LA-1183 A.

Group Delta Consultants, Inc., September 7, 2014d, "Fault Activity Investigation," 1800 Argyle Avenue, Hollywood Area, City of Los Angeles, CA, (Supersedes Previous Version 9/3/14) GDC Project no. LA-1175 A.

Table 1: California Geological Survey (CGS) interpretation of GDC Millennium Report (GDC, 2015a) cross-sections M-M', N-N', O-O', and P-P'.

Cross-Section M-M (Raw Data)			
(A) A-1 A-2	Terminates between C-14 and C-15	A steeply northerly dipping fault that extends through the (Qoal) into the lower (Qm) base by ~ 3.25 ft.	This Fault splays into two breaks. The fault trend, when projected across the East Trench on the East Millennium Site to the east, was not found breaking the (Qm) upper contact with (Qs). So, this fault does not exist or is not active. See plates 4A and 4B in GDC, 2015a.
(B) B-1 B-2	Terminates between C-21 and C-24	A steeply northerly dipping fault that extends through the (Qoal) into the lower (Qm) base by ~ 0.75 ft.	This Fault splays into two breaks. The fault trend, when projected across the East Trench on the East Millennium Site to the east, was not found breaking the (Qm) upper contact with (Qs). So, the fault does not exist or is not active. See plates 4A and 4B in GDC, 2015a.
(C) C-1 C-2 C-3	Terminates between C-25 and C-28	A steeply northerly dipping fault that extends through the (Qoal) into the lower (Qm) base by ~ 10 ft.	This Fault splays into three breaks. The fault trend, when projected across the East Trench on the East Millennium Site to the east, was not found breaking the (Qm) upper contact with (Qs). So, the fault does not exist or is not active. See plates 4A and 4B in GDC, 2015a.
Cross-Section M-M' (Submitted in Report, GDC, 2015a)			
GDC	Terminates between C-21 and C-22	The CGS projects the fault mapped by GDC as breaking the (Qm) and possible (Qs) contact.	GDC has this fault terminating in (Qoal) at depth. (GDC, 2015a) When projecting the fault trend west though cross-section N-N', the fault was not found so it either does not exist or is below the (Qm) and not active.
C	Terminates between C-25 and C-26	A steeply northerly dipping fault that extends though the (Qoal) into the lower (Qm) base by an undetermined amount.	This is the same (C) fault that CGS mapped from the raw data without splays or maybe splay C-3. When projecting the fault trend west though cross-section N-N', the fault was not found so it either does not exist or is below the (Qm) and not active.
D	Terminates between C-29 and C-30.	A steeply northerly dipping fault that extends through the (Qoal) and (Qm) into the (Qs).	This questioned zone suggests faulting that may project between C-29 and C-30 due to a 1.5 ft. rise at C-29. Since the rise does not affect the trace at C-28 or C-30, it is considered a stratigraphic anomaly due to erosion. When projecting the fault trend west though cross-section N-N', the fault was not found so it either does not exist or is below the (Qm) and not active.
Cross-Section O-O' (Submitted in Report, GDC, 2015a)			
GDC	Terminates between C-102 and C-103	The CGS projects the fault mapped by GDC (GDC, 2015a) as breaking the	GDC (GDC, 2015a) has this fault terminating in (Qoal) at depth. When projecting the fault trend west though cross-section N-N', the fault was not found so

		(Qm) and possible (Qs) contact.	it either does not exist or is below the (Qm) and not active.
F-1	Terminates off cross-section to the south	Not shown terminating on cross-section but to the south.	This fault may be a splay of the inferred inactive GDC fault. (GDC, 2015a) Therefore, if it exists it is inactive.
Cross-Section P-P' (Submitted in Report, GDC, 2015a)			
GDC	Terminates between C-102 and C-103	The CGS projects the fault mapped by GDC (GDC, 2015a) as breaking the (Qm) and possible (Qs) contact.	GDC has this fault terminating in (Qoal) at depth. (GDC, 2015a) When projecting the fault trend west though cross-section N-N', the fault was not found so it either does not exist or is below the (Qm) and not active.
E-1	Terminates between C-107 and C-108	Vertical Strike-Slip Fault	Placed between two 10 ft. spaced CPT's, this potential strike -slip fault does not show any flower structures, so its existence is unlikely. If it exists, it's inactive.
F-1	Terminates off cross-section to the south	Not shown terminating on cross-section	This fault may be a splay of the inferred inactive GDC fault. (GDC, 2015a) Therefore, if it exists it is inactive.