FAULT RUPTURE HAZARD EVALUATION
HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PREPARED FOR:

Judicial Branch Capital Program Office
Design and Construction Unit
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Judicial Branch Capital Program Office
Design and Construction Unit
2255 North Ontario Street, Suite 220
Burbank, California 91504

Subject: Fault Rupture Hazard Evaluation
Hollywood Courthouse
5925 Hollywood Boulevard
Los Angeles, California

Dear Ms. Freiwald:

In accordance with your request, we have performed a fault rupture hazard evaluation at the existing Hollywood Courthouse located at 5925 Hollywood Boulevard in Los Angeles, California. The site is located adjacent to a State of California Earthquake Fault Zone (formerly Alquist-Priolo Special Studies Zone). The purpose of our study was to locate and evaluate potential faulting crossing the site and provide preliminary design recommendations for improvements to the building. This report presents our findings and conclusions regarding the presence of faulting underlying the Hollywood Courthouse.

Ninyo & Moore appreciates the opportunity to be of service on this project.

Respectfully submitted,
NINYO & MOORE

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1. INTRODUCTION

In accordance with your request, we have performed a fault hazard and geotechnical evaluation for the Administrative Office of Courts (AOC), Hollywood Courthouse located at 5925 Hollywood Boulevard in Los Angeles, California (Figure 1). We understand that AOC intends to remodel the building with a possible building addition to the front of the building. No plans are available at this time. The purpose of our study was to evaluate the potential for active faulting that may cross the site, and provide preliminary design recommendations for improvements to the building.

The California Geologic Survey (CGS) has mapped the active Hollywood fault west and north of the property. Although no active fault trace is mapped directly under the building, the building is situated in close proximity to an earthquake fault zone as depicted on a recently issued map by CGS released on November 6, 2014. Furthermore, the site lies on trend with the inferred end of active faulting to the west, and possibly within a zone of transfer of active faulting to the north of the site. The boundaries of the fault hazard zone may include active faults that constitute a potential hazard to structures from surface faulting or fault creep and which require investigations. Several investigations have been conducted to evaluate the presence and activity of the Hollywood fault in the general vicinity of the site, and active faults have been mapped several blocks to the west of the site that trend towards the site.

The Alquist-Priolo Earthquake Fault Zoning Act (A-P Act), effective January 1, 1994, prohibits the location of most structures for human occupancy across the traces of active faults, so as to mitigate the hazard of fault rupture. The A-P Act is not retroactive with respect to existing structures. The California Public Resources Code of the A-P Act indicates that a site may be exempt from state agencies prohibiting the location of structures for human occupancy across the trace of active faults, if an alteration or addition to the structure does not exceed 50 percent of the value of the structure (California Geological Survey, 2007). Although the existing courthouse may not be subject to the provisions of the A-P Act, the AOC requested that a fault hazard evaluation study be performed due to the proximity of the site to the Hollywood fault.

2. SCOPE OF SERVICES

Our geological services have included the following:

- Planning and coordination of our activities with AOC, including meetings to discuss our general approach and anticipated field activities.
- Research and review of readily available published geologic literature, fault study reports, as well as the existing building plans for the courthouse. In addition, we reviewed existing geotechnical reports prepared for the subject site and adjacent sites.
- A site reconnaissance to evaluate the current conditions and mark out proposed boring locations.
- Coordination with Underground Service Alert (USA) to locate underground utilities prior to site excavations. In addition, a utility locator surveyed the locations of proposed exploration for potential conflicts with underground utilities.
- Performed a subsurface evaluation utilizing a truck-mounted drill rig and limited access direct push and cone penetrometer testing rigs. Two small-diameter borings were drilled with a truck-mounted drill rig in front of the building up to a depth of approximately 46½ feet. Four 1¼-inch-diameter borings were continuously cored up to a depth of approximately 55 feet and fourteen cone penetrometer tests (CPTs) were performed up to a depth of approximately 74 feet inside the building.
- Review of subsurface data with our Technical Advisor, Dr. Thomas Rockwell, to evaluate the soil stratigraphy, soil age, and recency of faulting.
- Laboratory testing including moisture density, percentage of particles finer than No. 200 sieve, Atterberg limits, Proctor density, shear strength and corrosivity.
- Geologic and geotechnical analysis of the field and laboratory data.
- Preparation of this report including our findings and conclusions regarding potential fault rupture hazards.

3. SITE DESCRIPTION

The Hollywood Courthouse is situated on a rectangular property between Carlos Avenue and Hollywood Boulevard (Figure 1). The site latitude and longitude are approximately 34.1023 degrees north and 118.3187 degrees west, respectively (Google, 2014). Topographically, the property generally slopes to the south from an elevation of approximately 407 feet above Mean

Sea Level (MSL) adjacent to Carlos Avenue to approximately 395 feet MSL adjacent to Hollywood Boulevard. Surface drainage is currently diverted to storm drain systems.

The property is occupied by a two-story concrete and wood-frame building partially over one-level of underground parking. The finish floor elevation of the building is approximately 402.4 feet MSL (K. Kenshi Nishimoto & Associates, 1984). The parking portion of the structure extends from the northern end of the building to Carlos Avenue with a parking level near the street grade over a lower level that slopes toward the building from a finish surface elevation of approximately 397 feet MSL to approximately 391 feet MSL (Figure 2). The east and west sides of the building and parking garage are situated along the property lines. An asphalt-paved parking lot is present in front of the building along Hollywood Boulevard. Adjacent buildings and screen walls are present east and west of the courthouse. Some landscaping is present in front of the building.

Neighboring properties include residential housing and offices of the Salvation Army to the west and residential properties to the east and north. Commercial properties border Hollywood Boulevard.

4. PROPOSED CONSTRUCTION

Based on our review of an adaptive use study by a team of consultants for the AOC, we understand that the existing courthouse will be remodeled to accommodate the Superior Court's mental health calendars. The existing courthouse was designed for three court departments with an option to add a fourth hearing room in an area currently occupied by office space (AC Martin, 2014). The proposed Mental Health Court will require additional space and separations as well as more and larger holding cells. Accordingly, an additional building area will be added to accommodate the new program. The design strategy includes reconfiguration of interior spaces and addition of approximately 4,941 square feet near the front of the building and a new vehicular sally port at the rear of the building (AC Martin, 2014). Some structural retrofitting will be appropriate to reinforce existing walls and beams. The structure and building systems will be designed to update the building to meet the current codes. New parking and landscaping will be provided in the front of the building.

5. BACKGROUND

The property was previously used as a parking lot until the time the current building was constructed around 1984 (Historical Aerial Photos, 2015). According to a preliminary soils investigation report prepared by T.K. Engineering Corporation (1984) for the design of the building, the site was vacant at that time. The surface conditions reportedly consisted of broken asphalt concrete pavements and weeds. Based on review of older photographs and topographic maps, no significant structures or grading operations were evident at the site dating back to 1926. Highway 101, north of the site, was constructed sometime between 1952 and 1954. Grading was evident near the north end of the site in connection with the highway grading as well as the future extension of Carlos Avenue to Bronson Avenue (Figure 1). Historically, the neighboring properties were primarily residential with some commercial development along Hollywood Boulevard.

The preliminary soils investigation by T.K. Engineering (1984a), included eight borings up to a depth of approximately 31 feet. Recommendations for deep foundations and remedial earthwork were provided. The investigation did not include a fault hazard evaluation. At that time, the consultant concluded that, based on available geotechnical literature, no active faults were known to be present at the site.

Grading for the project included cuts up to approximately 10 feet along the northern portion of the site and minor cuts and fills along the southern portion of the site (Figure 2). Some remedial earthwork was performed, which included removing and recompacting the near surface soils to a depth of approximately 4 feet (T.K. Engineering, 1984b).

Based on our review of foundation plans prepared by K. Kenshi Nishimoto & Associates (KNA), dated October 9, 1984, the building is supported on 30-inch-diameter piers with grade beams. The parking garage is supported on spread footings. The piers along the southern portion of the building reportedly were designed to extend to depths of approximately 35 feet with an allowable bearing capacity of 123 kips. The spread footings for the garage portion of the building complex were designed for 10-foot-square footings at a depth of approximately 2 feet with allowable bearing capacity of 2,000 pounds per square foot (KNA, 1984).

Based on our research of geotechnical literature at the Los Angeles Department of Building and Safety (LADBS), a geotechnical evaluation was performed by Law/Crandall, Inc. (LCI) for a development west of the site, the results of which were presented in a report dated April 21, 1993. The proposed development was part of a three-phase construction project within the existing Salvation Army facility. The phases included a three-story new youth center, an eight story residential building with grade level parking, and a two-story gymnasium building with a basement and a pool. The geotechnical evaluation included nine borings up to a depth of approximately 50 feet. No detailed fault hazard evaluation was performed. Based on the geologic findings of the geotechnical evaluation, LCI reported that no faults are known to exist at the site (LCI, 1993).

Several fault hazard evaluations have been recently performed by Group Delta approximately 0.4 miles west of the site (Figure 3). Based on the data by Group Delta and additional research, the California Geological Survey (CGS) updated the fault map of the Hollywood Quadrangle. A discussion of the findings by Group Delta and others are presented in Sections 7.4.1 and 7.4.2 of the report.

6. GEOLOGIC CONDITIONS

6.1. Regional Setting

The project site is located along the southern edge of the Hollywood Hills, the eastern extension of the Santa Monica Mountains within the Transverse Ranges, an east-west trending system of mountains that developed in response to north-south compression that began 2.5 to 5 million years ago (Dolan et al., 1997). The mountains exhibit an asymmetric anticlinal structure, which has been interpreted as a fault propagation fold above a gentle north-dipping blind thrust fault (Dolan et al., 1997). A series of faults define the southern boundary of the Transverse Ranges including the Hollywood fault. The fault juxtaposes

Cretaceous-age basement rock, consisting of quartz diorite and predominantly Miocene volcanic and sedimentary rocks of the Santa Monica Mountains, against Quaternary and Tertiary sedimentary rocks to the south. The Hollywood fault is also the northern boundary of the Hollywood basin, an asymmetric basin structure that is bound on the south by the North Salt Lake fault (CGS, FER 253, 2014a). The base of the mountains in the area of the site, also known as Hollywood Hills, is incised by several drainage tributaries resulting in the deposition of Late Pleistocene to Holocene-aged alluvial fan deposits along the southern flank of the range.

6.2. Geomorphology

A review of topographic maps and aerial photographs dated 1926, 1928, 1931, 1948, 1952, 1954, 1964, 1972, 1977, 1980, 1989, and 1994 was performed to evaluate the geomorphic expression of landforms within and adjacent to the subject property. Features such as lineaments and abrupt changes in topography and/or vegetation were evaluated with regards to their potential of being related to faulting.

The east-west trending uplifted Hollywood Hills dominate the regional geomorphology of the site and vicinity. Older topographic maps (United States Geological Survey [USGS], 1948) show sharp breaks in the topography at the base of the hills north and west of the site indicating the locations of possible fault scarps. Prior to development, the ground surface across the site was relatively flat, sloping gently to the south. No lineaments or indications of fault related features were observed at the site. A vegetation lineament and/or possible fault scarp was reported by others near the north end of the site along Carlos Avenue (CGS, FER 253, 2014a). In addition, a deflection of a north-south drainage tributary was also reported farther north of the site, as shown on Figure 4 and observed in a 1928 photograph.

Based on our review of photographs dated 1948 and 1952, it appears that around 1952, some grading was being performed for the future extension of San Carlos Avenue and the new highway (US 101). Based on our review of a 1948 topographic map, no clear indication of a fault scarp is evident at the north end of the site.

6.3. Site Geology

The geology of the site is characterized by gently sloping alluvial fan deposits of Holocene age to late Pleistocene age (Figure 5). The alluvial fan deposits are underlain by Tertiary age formational siltstones of the Modelo Formation. The alluvial deposits are expected to be more than 70 feet thick under the site. A detailed description of the alluvial deposits encountered during our field exploration is presented in Section 9; Field Evaluation.

6.4. Groundwater

Groundwater was not encountered during our evaluation, which included borings and CPT soundings up to approximately 74 feet in depth. In addition, groundwater was not encountered in the previous subsurface exploration on site by TK Engineering, which included borings drilled up to depths of approximately 31 feet. Based on review of the State of California Seismic Hazard Evaluation (1998), the historical high groundwater level mapped at the site is 80 feet or more below the ground surface. Data presented by the County of Los Angeles Department of Regional Planning's Safety Element (1990) indicate that perched groundwater and/or the groundwater level may be approximately 30 or more feet below the ground surface. It should be noted that fluctuations in the level of groundwater at the subject site will occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, and other factors which may not have been evident at the time of our evaluation.

7. FAULTING

7.1. Regional Fault Setting

The site is located in a seismically active area, as is the majority of southern California. Figure 6 shows the approximate site location relative to major faults in the region. The major structural boundary between the Pacific and North American tectonic plates traverses southeast to northwest through California, with the Pacific Plate moving to the northwest relative to the North American plate. Most of this movement occurs along the northwest trending San Andreas fault zone; movement is also accommodated by east-west trending, reverse, oblique-slip and left lateral strike slip faults within southern California, including the Hollywood-Santa Monica fault system. Table 1 lists selected principal known active faults that may affect the site. The maximum moment magnitude (M_{max}) and approximate fault-to-site distances were calculated using the USGS web-based program (USGS, 2008).

Table 1 – Principal Active Faults

Fault	Approximate Fault to Site Distance in miles[1] (km)	Maximum Moment Magnitude[1] (Mmax)
Santa Monica-Hollywood	0.31 (0.50)	7.4
Hollywood	0.53 (0.86)	6.7
Elysian Park	1.4 (2.3)	6.7
Puente Hills	4.9 (7.9)	7.0
Raymond	5.6 (9.0)	6.8
Newport-Inglewood	5.8 (9.3)	7.2
Verdugo	6.1 (9.8)	6.9
Sierra Madre	10.5 (16.9)	7.2
Malibu Coast	12.9 (20.8)	6.7
Northridge	14.7 (23.7)	6.9

Notes:
[1] USGS, 2008.

7.2. Alquist-Priolo Earthquake Fault Zoning Act

As presented in the California Division of Mines and Geology, Special Publication 42, the 1972 Alquist-Priolo Earthquake Fault Zoning Act requires the State Geologist to delineate "Earthquake Fault Zones" (EFZs) along known active faults in California. The law also requires building setbacks to be established from the trace of an active fault. EFZs must meet the requirements of being "sufficiently active" (evidence of movement within the last approximate 11,000 years) and "well-defined" (detectable by a trained geologist). It is known that faults often rupture along a complex zone that may include the movement of multiple splays/strands rather than of a single strand. The EFZs are intended to be sufficiently wide enough on both sides of a known active fault to include these known or unknown splays/strands of the fault. The purpose of the act was to prohibit the location of most structures for human occupancy across the traces of active faults, thus mitigating the hazard of fault rupture.

7.3. Historic Earthquakes

In historic times, no large earthquakes have occurred within the Los Angeles Basin that have been attributed to the Hollywood fault. Some of the more significant events within 100 kilometers of the site are listed below.

- In December 1812, a magnitude 7.3 earthquake occurred along the San Andreas fault between Pallet Creek and Wrightwood, approximately 42 miles northeast of the site, and may have extended to San Bernardino. The northern part of this section of fault ruptured again in 1857, with rupture from Parkfield southeast to about the I-15.

- On March 10, 1933, a magnitude 6.4 earthquake, "the Long Beach Earthquake," occurred offshore of Newport Beach along the Newport Inglewood fault (approximately 33 miles south of the site) (Hauksson and Gross, 1991). Over 200 aftershocks, generally magnitude 4.0 or less, followed the main event. The earthquake resulted in approximately 115 deaths and 40 million dollars of damage (USGS, 1993). This event resulted in the passing of the Field and Riley Acts of the California State Code for the design and construction of school structures and buildings larger than two-family dwellings, respectively.

- A magnitude 6.6 earthquake occurred on February 6, 1971 in San Fernando (approximately 22 miles northeast of the site) resulting in over 505 million dollars in losses and many changes in the building codes.

- On October 1, 1987, a magnitude 6 earthquake occurred in the Whittier Narrows area (approximately 14 miles southeast of the site) resulting in 358 million dollars in losses.

- On January 17, 1994, a magnitude 6.7 earthquake occurred in Northridge (approximately 15 miles northwest of the site) with 57 dead, more than 9,000 injured and about 40 billion dollars in property damage.

7.4. Hollywood Fault

The Hollywood fault extends approximately 9 miles (14 km) through Beverly Hills, West Hollywood and Hollywood to the Los Angeles River. The fault is truncated on the west by the north-northwest trending West Beverly Hills Lineament, which includes a left-step of approximately ¾ miles (1.2 km) between the Santa Monica fault and the Hollywood fault (Dolan et al., 2000). In the Los Angeles River floodplain, the fault is defined by a steep gravity gradient and steep drop in groundwater levels as the fault trends eastward toward the Raymond Fault (CGS, 2014a). The Hollywood fault contains five segments (Figure 7). The subject site is in an area near overlapping Segments 2 and 3, where there is a left (releasing) step-over between Segments 2 and 3 resulting in a pull-apart or sag between the two segments.

The Hollywood fault is an active sinistral-reverse oblique strike slip fault with an average attitude of N76°E and dips ranging from 25 to 90 degrees to the north. A slip rate of 1 to 5 millimeters per year has been assigned to this fault (USGS, 2014b). Based on previous work by others, the Hollywood fault could produce an earthquake with a magnitude on the order of 6.7, or larger if it ruptures with the Santa Monica and/or Raymond faults. Geologic data suggests that the last movement along the fault was approximately 7,000 years ago (Dolan, et al., 2000). A probable minimum oblique-slip rate has been assumed at approximately 0.35 millimeters per year for the Hollywood fault, which yields a recurrence interval of approximately 4,000 years (Dolan, et al., 1997) if the fault ruptures on its own. No historical movement (less than 200 years) has been recorded on this fault.

The Santa Monica-Hollywood fault zone is a significant fault system that has long been recognized along the base of the Santa Monica Mountains. Due to dense urbanization, however, the location and activity of the fault system has been uncertain and subject to debate. Until recently, there was insufficient data for the CGS to classify the Hollywood fault as an active EFZ. Based on recent studies, the Hollywood fault has been mapped by the State of California (2014) as an EFZ (Figure 8). A brief description of the recent fault studies is presented below.

7.4.1. Group Delta

Exploration of possible faulting at four potential building sites near the intersection of Argyle Avenue and Yucca Street was performed by Group Delta during the period of 2013 to 2014. Based on available data from the LADBS, the exploration consisted of several fault trenches up to approximately 35 feet in depth and cone penetrometer testing and continuous cores up to a depth of approximately 60 feet to evaluate for the presence and activity of faults. The reports by Group Delta (referenced) indicated various soil units within Holocene age alluvium overlying older (Pleistocene age) alluvial deposits and/or Tertiary age sedimentary deposits with some faulting within the older alluvium. Based on the detailed logging of the trenches and soil-age assessments, the upper Holocene age alluvial deposits extending to depths of approximately 27 to 30 feet were reportedly unbroken (Group Delta, 2014a). The age of the unbroken sediments were considered to be 12,000 to 15,000 years old. Group Delta concluded that faulting at these sites was considered to be older than 12,000 years old. Data presented by others farther west of these sites indicated the age of the younger alluvium of approximately 20,000 years old at depths ranging from approximately 21 feet to 38 feet below the ground surface (Dolan and others, 1997 and 2000).

7.4.2. California Geological Survey FER 253

The Hollywood fault was previously evaluated for Holocene age active faulting as part of a 1977 study (Smith, 1978). At that time, the study concluded that there was insufficient evidence of Holocene faulting to recommend fault traces for zoning. Based on subsequent geologic and geotechnical studies, as well as paleoseismic and geomorphic studies by Dolan et al. (1997), Dolan et al. (2000), and other research, CGS re-evaluated evidence of Holocene displacement along traces of the Hollywood fault. Accordingly, CGS prepared Fault Evaluation Report 253, dated February 14, 2014. The purpose of the report was to assess the location and activity of fault strands along the Hollywood fault within the Hollywood 7½ minute quadrangle. At that time, the faults determined to be sufficiently active (Holocene) and well-defined were zoned by the State Geologist as directed by the A-P Act of 1972 (Hart and Bryant, 2007). Prior to the report, CGS issued a preliminary fault map for public comment on January 8, 2014 showing the recommended Alquist-Priolo Earthquake Fault Zone (APEFZ) for the Hollywood quadrangle. Although the subject site was partially located within the zone, no traces of an active fault were mapped across the site at that time.

On November 5, 2014, a supplement was prepared to FER 253. The purpose of the supplement was to review and address the public comments as well as to review additional reports issued to CGS after the preparation of FER 253. The additional reports included the work Group Delta performed in the area west of the site. Based on the additional review, CGS revised the APEFZ map for the Hollywood quadrangle. The edge of the mapped zone clips a very small edge of the northwest side of the site (Figure 8).

8. FIELD EVALUATION

Due to the existing structure, we were unable to perform a conventional fault hazard evaluation with a trench to expose the subsurface conditions. Accordingly, we performed exploration utilizing continuous sampling of small diameter borings, direct push 1.75-inch-diameter continuous cores and cone penetrometer testing (CPTs) at a variable spacing ranging from approximately 3 feet to approximately 30 feet. The purpose of our subsurface evaluation was to: 1) evaluate the stratigraphy across the site for the possible presence of faulting, and 2) evaluate the subsurface soil and geologic conditions for the future renovation of the building.

Our subsurface evaluation was conducted initially on November 5, 7 and 18, 2014 and consisted of the drilling, logging, and sampling of two small-diameter borings to depths of approximately 45½ and 46½ feet south of the building, four direct push continuous cores to depths ranging from 45 and 55 feet and six CPTs to depths ranging from approximately 34.7 to 74.2 feet inside the building.

In general, the exploratory locations were approximately 30 feet apart. During the initial exploration, anomalies in the subsurface conditions were observed near the center of the building. Accordingly, additional exploration was performed on January 21, 22 and 23, 2015, which consisted of eight CPTs to depths ranging from approximately 25.3 to 74.2 feet. The spacing of CPTs near the center of the building ranged from approximately 3 feet to approximately 13 feet apart. CPT-6 and CPT-14 were performed adjacent to Cores C-3 and C-2, respectively.

Prior to the subsurface exploration, the exploratory locations were surveyed for potential utility conflicts. In addition, elevations at each exploratory location were checked with a manometer relative to an assumed elevation at CPT-1 of 402.4 feet MSL. A hand level with a staff rod was also used to check the elevation change between core C-2 (first floor) and CPT-3 (south end of the garage). The locations of each exploratory location inside the building were measured with a measuring tape from the south edge of the building. Logs of the exploratory borings are presented in Appendix A. Logs of the CPTs are presented in Appendix B. The approximate locations of the borings and CPTs are presented on Figure 9.

Laboratory testing was performed to evaluate in-place moisture and density, percent of materials finer than the No. 200 sieve, Atterberg limits, Proctor density, direct shear strength, and soil corrosivity. Our laboratory test results are presented on the boring logs in Appendix A and in Appendix C.

The cores were logged by our certified engineering geologists. During our field evaluation, Dr. Rockwell (paleoseismologist and professor of Geology, SDSU) was on site to observe the site conditions and evaluate the soil samples from boring B-1. After the field exploration, core samples and CPT logs were reviewed with Dr. Rockwell to evaluate the stratigraphy and age of soils. Direct push core samples were obtained at 5-foot intervals to provide relative continuous lithology data. The percent recovery of the cores varied from approximately 37 to 100 percent. The CPTs provided a continuous profile of tip resistance and sleeve friction, which are correlated to general soil types. The CPT profiles were used to correlate the soil units underlying the site.

8.1. Geologic Units

The materials encountered during the subsurface exploration generally consisted of three geologic units; Fill soil, Holocene age alluvium and Pleistocene age alluvium. Brief descriptions of the units are presented below.

8.1.1. Fill

Fill soils were encountered in borings B-1 and B-2 and in cores C-1 and C-2 to a depth of approximately 4 feet. The fill soils were generally composed of brown, moist, loose to medium dense, silty sand with scattered minor construction debris including brick fragments. The fill soils were generated during the prior grading and development of the property. Based on the material type and a compaction report by T.K. Engineering, dated December 3, 1984, the source of the fill soils were from on-site remedial excavations. According to the report, up to approximately 6 feet of fill is present at the site. The fill soils were reportedly compacted to 90 percent relative compaction.

8.1.2. Holocene age Alluvial Deposits

Holocene (younger) alluvial deposits were encountered in each boring and core location to depths ranging from approximately 39½ to 41 feet in the building area and approximately 30 to 31 feet in the lower level parking garage area. The younger alluvial deposits generally consisted of three subunits. Brief descriptions of the subunits are presented below.

Subunit 1: Subunit 1 consists predominantly of thinly to crudely bedded, dark yellowish brown, moist, loose to medium dense, clayey and silty, fine- to coarse-grained sand. Subunit 1 extended to depths of approximately 26 feet below original grade.

Subunit 2: Subunit 2 consists predominantly of massive yellowish to dark yellowish brown, moist, loose to medium dense, medium to coarse grained, poorly graded sand with silt and gravel. Subunit 2 ranged in thickness from approximately 8 to 11 feet.

Subunit 3: Subunit 3 consists predominantly of thinly to crudely bedded, dark yellowish brown, moist, medium dense, fine to medium grained, clayey to silty sand and stiff sandy clay. Unit 3 ranged in thickness from approximately 3 to 7 feet.

The age of the younger alluvium was based on our review of samples and experience; there were no recognizable soil horizons observed in these upper deposits at the locations explored. In addition, carbon material or other datable material was not present in the younger alluvial sediments encountered. It is possible that weakly expressed soil horizons may be present and not recovered, as core recovery was not 100 percent. Nevertheless, the absence of significant soil development along with reported thick Holocene alluvium west of the site (Dolan et al., 2000 and Group Delta, 2014) strongly suggests that this upper 41 feet of alluvium is Holocene in age, with the possibility that the lowest portions are latest Pleistocene in age.

8.1.3. Pleistocene Age Alluvial Deposits

Pleistocene (older) alluvial deposits were encountered underlying the younger alluvium at each boring and core location to the depths explored. The older alluvium encountered on site was generally comprised of dark yellowish to dark brown, moist, very stiff to hard sandy clay with interbeds of clayey and silty sand to the depths explored.

The unconsolidated (Holocene age) alluvial deposits cap two buried soil horizons that represent substantial periods of non-deposition and surface exposure. Both soil profiles have similar characteristics, indicating that they may represent similar amounts of time in terms of surface exposure. These soil profiles were described and evaluated to estimate the age of the materials. Portions of the buried soil horizons, however, had been eroded or degraded. Accordingly, the following composite soil description of the soils generally encountered in cores C-2 and C-3 are presented below. The purpose of the composite description is to provide a more representative description of the soil sequence at the site for age purposes.

Table 2 – Composite Description of Buried Soil Horizons

Thickness (ft)	Horizon	Description
0.98	1Ab	Dark brown to brown (7.5YR 4/3m, 7.5-10YR4/4d) color; clay loam texture; massive breaking to moderate, coarse subangular blocky structure; extremely hard dry consistence (compacted), very plastic and very sticky wet consistence; no clay films observed; clear, smooth boundary to:
3.01	1Btb	Strong brown (7.5YR 4/6m, 5/5d) color; sandy clay loam texture; massive breaking to moderate, coarse subangular blocky structure; extremely hard dry consistence, very plastic and very sticky wet consistence; many moderately thick to thick clay films in pores; common moderately thick clay films on ped faces, common thin clay films as bridges between grains; gradual to clear, smooth boundary to:

Table 2 – Composite Description of Buried Soil Horizons

Thickness (ft)	Horizon	Description
2.85	1BCb	Dark yellowish brown (10YR 4/4m, 6/4d) color; sandy loam texture; massive breaking to weak, coarse subangular blocky structure; slightly hard dry consistence, slightly plastic and slightly sticky wet consistence; few to common thin clay films in pores and very few thin clay films on ped faces; stage II $CaCO_3$ as pore linings and clast coatings with few nodules (<1 cm) in lower part of horizon; abrupt, smooth boundary to:
0.71	2Ab	Brown to dark brown (10YR 4/3m, 6/3d) color; sandy loam texture; extremely hard dry consistence, slightly sticky and slightly plastic wet consistence; no clay films; many random, tubular pores; clear to abrupt, smooth boundary to:
6.5+	2Btb	Dark brown to brown (7.5YR 4/4m, 7.5-10YR 5/6d) color; sandy clay loam texture; massive breaking to strong, coarse subangular blocky to angular blocky structure; extremely hard dry consistence, very sticky and very plastic wet consistence; continuous, thick clay films in pores, common to many thin to moderately thick clay films on ped faces; boundary not observed:

The upper buried soil (unit 1 in Table 2) is characterized by a reddened A (relic topsoil) and Bt (argillic) horizons, with the average mixed moist color in the argillic horizon reaching 7.5YR 4/6. The color, along with the sandy clay loam texture and abundance and thickness of clay films, indicates that this is a well-developed soil that classifies as a Palexeralf. Similarly developed soils in southern California have been dated to the late Pleistocene and are typically on the order of 100,000 years in age, or older. This soil is nearly identical in description to soils developed on fluvial terraces in Orange County that correlate to the 120,000 year-old MIS 5e marine terrace (Rockwell, unpublished data), and weaker soils in Los Angeles basin have been dated to about 55,000 years in age (McFadden and Weldon, 1985).

A particular characteristic of the upper buried soil suggests a slightly older age for the actual deposition of the alluvium. The lower part of the profile exhibits secondary calcium carbonate accumulation that typically only occurs in arid to semi-arid regions with low rainfall. Secondary carbonate has been noted in some Holocene Los Angeles basin soils at some distance from the coast, but all post 100,000 year-old soils in coastal southern California are typically devoid of secondary carbonate. This is believed to be because the late Pleistocene climate of southern California was colder and wetter than the present climate (Huesser, 1978 and many other studies by the same author), with conifer forests growing throughout the coastal region until early Holocene time. The implication is that secondary calcium carbonate could not have formed in well-drained soils in late Pleistocene time in Los Angeles basin, consistent with all known observations. The last time that secondary carbonate may have formed in the Los Angeles basin is during the last interglacial, between 130,000 and about 115,000 years ago, during which time, the climate in southern California may have been warmer and dryer than at present. The observation of secondary carbonate in the upper buried soil therefore implies that this soil experienced the warm, dry conditions of the last interglacial period. Consequently, the age of the older alluvium is best interpreted as pre-dating the last interglacial and was probably deposited during the waning phases of MIS 6. Thus, we estimate the age of the upper buried alluvium to be in the range of 130,000 to 160,000 years old.

The lower buried soil exhibits similar characteristics to the upper buried soil, although the color is slightly less red (7.5YR 4/4m). The texture and clay film abundance are similar to the upper buried soil, as are the structure and consistence characteristics. As a rough estimate of age, we consider the lower buried soil to have been exposed for a similar length of time as the upper buried soil, suggesting an age as old as 300,000 years for deposition of the lowest deposits exposed in the cores.

8.2. Soil Stratigraphy

In order to evaluate the stratigraphy of the alluvial sediments on site, we utilized borings, direct push cores and cone penetrometer tests. Specific soil layers were evaluated for continuity between exploratory locations. Due to the variable recovery percentages (37 to 100 percent) in the cores, the CPTs were more valuable in providing a relatively clear connectivity between exploratory locations. The CPT profiles indicated four distinct stratigraphic layers that were repeated in each CPT. The stratigraphic layers were correlated with the materials encountered in the cores at or near the respective depths in the CPTs. In addition, we evaluated the vertical inclination of the CPTs and corrected the plots to compensate for deviation of the inclination of the CPT probe. Our interpretation of the stratigraphy is presented on Figure 10, which includes the corrected plot of the CPTs.

Based on review of core samples and CPT logs, three of the four distinct stratigraphic layers are within the younger Holocene alluvial deposits and the fourth layer comprises the older Pleistocene alluvial deposits. The younger layers are generally sloping to the south at approximately 3 degrees. In the area between CPT 2 and CPT 10, several offsets (discontinuities) between layers were observed within the lower portion of Subunit 1 and Subunits 2 and 3 of the younger alluvium. Apparent displacement between CPT 10 and CPT 14 suggest a graben type structure within the lower portion of the units with the older alluvium stepping down to the north in the area between CPT 10 and CPT 3. The displacement between layers within the graben includes vertical offsets up to approximately 3 feet. Horizontal displacements could not be measured. Smaller displacements of less than one foot were observed to the south of the graben. The offsets in the stratigraphy are interpreted as the result of possible faulting (Figure 10). Based on the subsurface exploration, distinct layers within the older alluvium were not evident that would allow interpretation of possible fault displacement at greater depths. A possible fault with a dip of approximately 70 degrees was also encountered in core C-2 at a depth of approximately 50.7 feet. The possible fault juxtaposes sandy clay against clayey sand. In addition, some high angle contacts between soil types were also observed within the soil horizon of the older alluvium in core C-2.

9. FINDINGS AND CONCLUSIONS

The property is situated near the southern edge of the Hollywood fault zone, where the fault has been mapped with a left-step over to the north of the site. The northwest corner of the property clips the edge of the mapped APEFZ of the Hollywood fault (Figure 7). The purpose of our study was to provide the AOC with an assessment of fault rupture hazard that could potentially impact the remodeling of the existing building, and to provide geotechnical parameters for the proposed improvements, if appropriate.

The Hollywood fault is an active sinistral-reverse oblique strike slip fault. Based on previous work by others, the Hollywood fault could produce an earthquake with a magnitude on the order of 6.6, or larger if it fails with the Santa Monica and/or Raymond faults. Geologic data suggests that the last movement along the fault was approximately 7,000 years ago (Dolan, et al., 2000). A probable minimum oblique-slip rate has been estimated at approximately 0.35 millimeters per year for the Hollywood fault, which yields a recurrence interval of approximately 4,000 years (Dolan, et al., 1997) if the fault ruptures on its own. No historical movement (less than 200 years) has been recorded on this fault.

The property is occupied by a two-story concrete and wood-frame building partially over one-level of underground parking. Due to the presence of the building complex that occupies the full width of the property, conventional trenching to evaluate faulting was not feasible. Accordingly, our scope included a combination of borings, direct push cores and CPTs at a spacing generally ranging from approximately three feet to approximately 30 feet along the western portion of the building in a north-south direction. As a result of the type of exploration, our work was limited to a two-dimensional evaluation of the underlying soil and geologic conditions.

The results of our subsurface exploration indicate that the site is underlain by gently sloping, unconsolidated, interbedded younger (Holocene age) alluvium up to a depth of approximately 41 feet that overlies older (Pleistocene age) alluvial soils to the depths explored. There were no recognizable soil horizons or datable material observed in the upper alluvial soils at the locations explored. The absence of significant soil development and a previously reported thick Holocene alluvial cover west of the site (Dolan et al., 2000 and Group Delta, 2014) suggests that the upper alluvium is Holocene in age, with the possibility that the lower portions of this upper alluvium are latest Pleistocene in age. Two distinct buried soil profiles were observed in the older alluvial soils with estimated ages of 130,000 years or more.

Our subsurface exploration indicates that the site is underlain by generally gently-sloping stratigraphy with distinct depositional sequences that were repeated in each continuous core and CPT. However, the soil stratigraphy near the Holocene-Pleistocene contact included several discontinuities that suggest the possible presence of faulting. A graben type structure with vertical offsets in the soil layers of up to approximately 3 feet is present near the center of the building complex between the 2-story building and the parking garage (Figures 9 and 10). Minor vertical offsets in the soil layers were also observed south of the graben structure. Due to the limited nature of our evaluation, we were unable to evaluate for the possibility of horizontal displacements along these possible faults.

Based on our evaluation, there may be a potential for surface rupture to occur at the site if the observed steps in stratigraphy are a result of faulting. Additional work would be involved to confirm this interpretation. Existing published data indicate that the Hollywood fault occurs as a series of short segments with step-over zones between the ends of individual segments. The subject site is located near the eastern end of Segment 2 of the fault, where the displacement along the fault is not considered to be as significant compared to displacement in the middle part of a segment, as is present to the west and north of the site. The data suggest that faulting, if present at the site, was probably associated with events near the late Pleistocene to early Holocene period. In light of the location of the site with respect to the segmented portions of the Hollywood fault and the recurrence interval of a significant earthquake event along the Hollywood fault of more than 4,000 years, the short-term (life of the building) risk of surface rupture is relatively low.

The future magnitude of displacement along the possible faults at the site is unknown. Based on the subsurface observations, up to approximately 3 feet of apparent vertical displacement has occurred after deposition of the upper Pleistocene unit (upper buried soil). The amount of vertical displacement observed could have occurred during a single event or multiple events in the past 130,000 years, although multiple events is more probable. Further, if the Hollywood fault is more strike-slip, the amount of horizontal motion could exceed the vertical motion. Our scope of work performed to data did not include a detailed evaluation to estimate the future magnitude of displacement. Evaluation of the potential magnitude of displacement would involve modeling of the geologic/tectonic structure and would also involve multiple assumptions due to the limited data available.

10. RECOMMENDATIONS

In order to confirm the presence and activity of the apparent faulting at the subject site, we recommend that the subsurface conditions in the area near the center of the western edge of the building be further evaluated. The purpose of the subsurface evaluation would be to expose the area of possible faulting to confirm the presence and activity of the possible faulting at the site.

The subsurface evaluation would initially include a relatively significant shored excavation in the garage area of the structure. Due to the limited ceiling height of the garage, the excavation would be done manually to depths of approximately 15 to 30 feet depth. In the event faulting was not observed, additional exploration inside the building would consist of drilling several large diameter borings up to a depth of approximately 45 feet utilizing a limited access drill rig. In order to perform subsurface exploration inside the building, significant demolition will be involved to provide access for the equipment. A detailed proposal can be provided upon request.

11. LIMITATIONS

The field evaluation, laboratory testing, and geologic analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by geologic consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified, and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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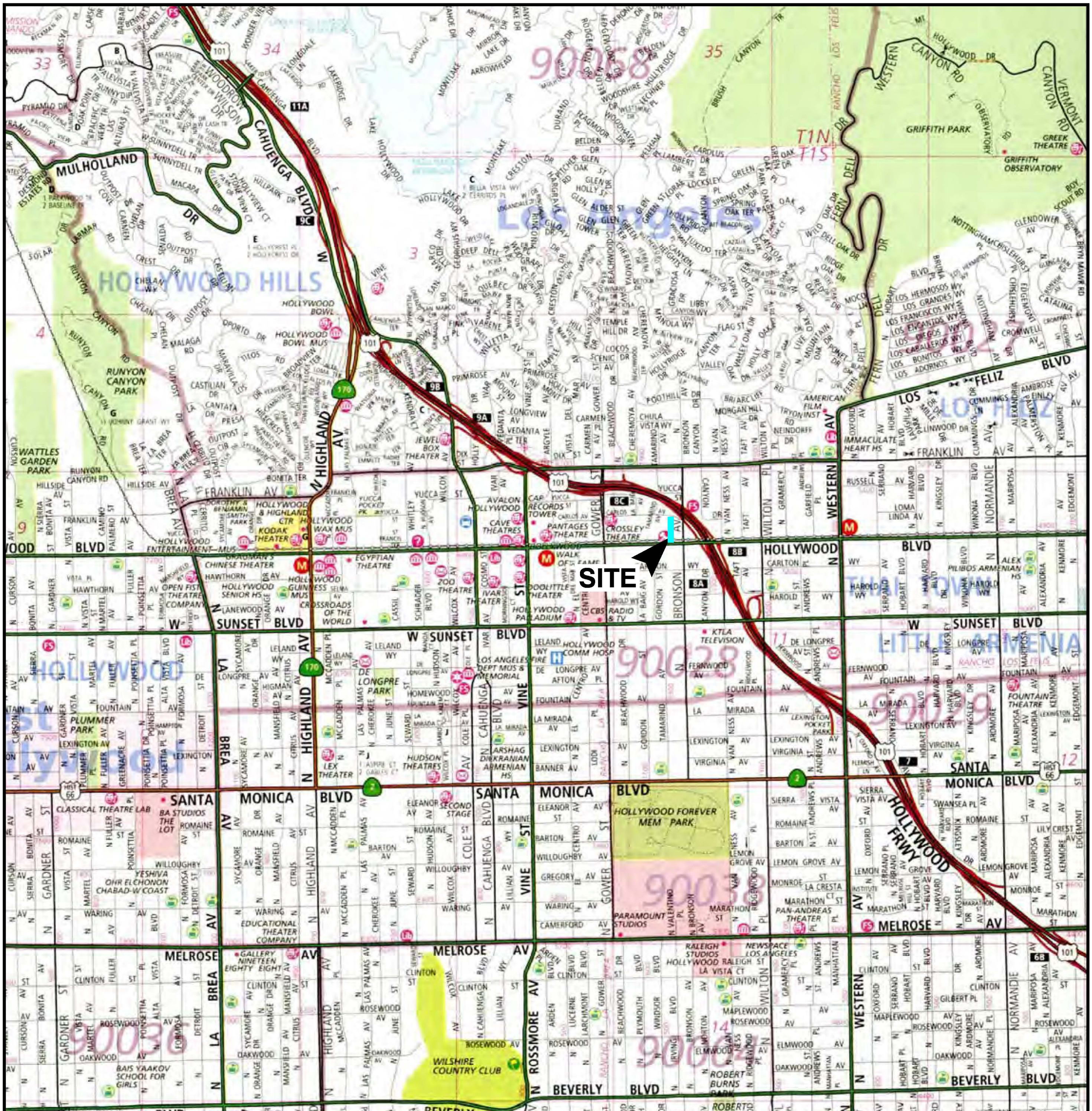
AERIAL PHOTOGRAPHS

Source	**Date**	**Flight**	**Numbers**	**Scale**
Fairchild	1928	C-300	K-116 and 117	1: 1,700
USDA	10-27-54	AXJ-20K	45 and 46	1: 20,000



REFERENCE: 52ND EDITION, THOMAS GUIDE FOR LOS ANGELES/ORANGE COUNTIES, STREET GUIDE AND DIRECTORY.

N

SCALE IN FEET

0 2,400 4,800

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore

PROJECT NO.	DATE
402132006	2/15

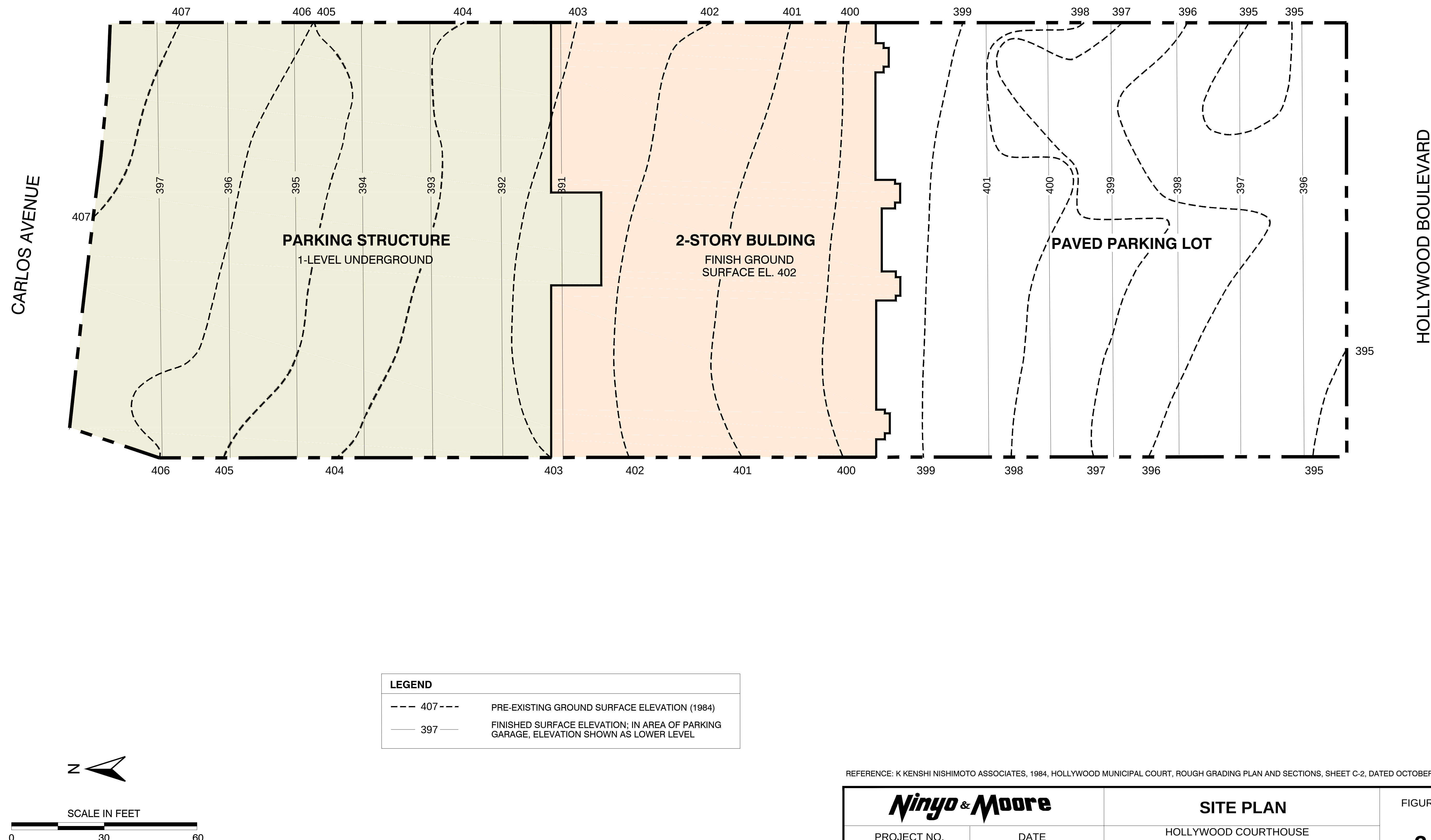
SITE LOCATION

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

FIGURE

1

402132006_SL.dwg 14:27:02 01/02/2015 GK (5925 HOLLYWOOD)



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

- - - 407 - - -	PRE-EXISTING GROUND SURFACE ELEVATION (1984)
—— 397 ——	FINISHED SURFACE ELEVATION; IN AREA OF PARKING GARAGE, ELEVATION SHOWN AS LOWER LEVEL

REFERENCE: K KENSHI NISHIMOTO ASSOCIATES, 1984, HOLLYWOOD MUNICIPAL COURT, ROUGH GRADING PLAN AND SECTIONS, SHEET C-2, DATED OCTOBER 9.

Ninyo & Moore		SITE PLAN	FIGURE
PROJECT NO.	DATE	HOLLYWOOD COURTHOUSE 5925 HOLLYWOOD BOULEVARD LOS ANGELES, CALIFORNIA	2
402132006	2/15		

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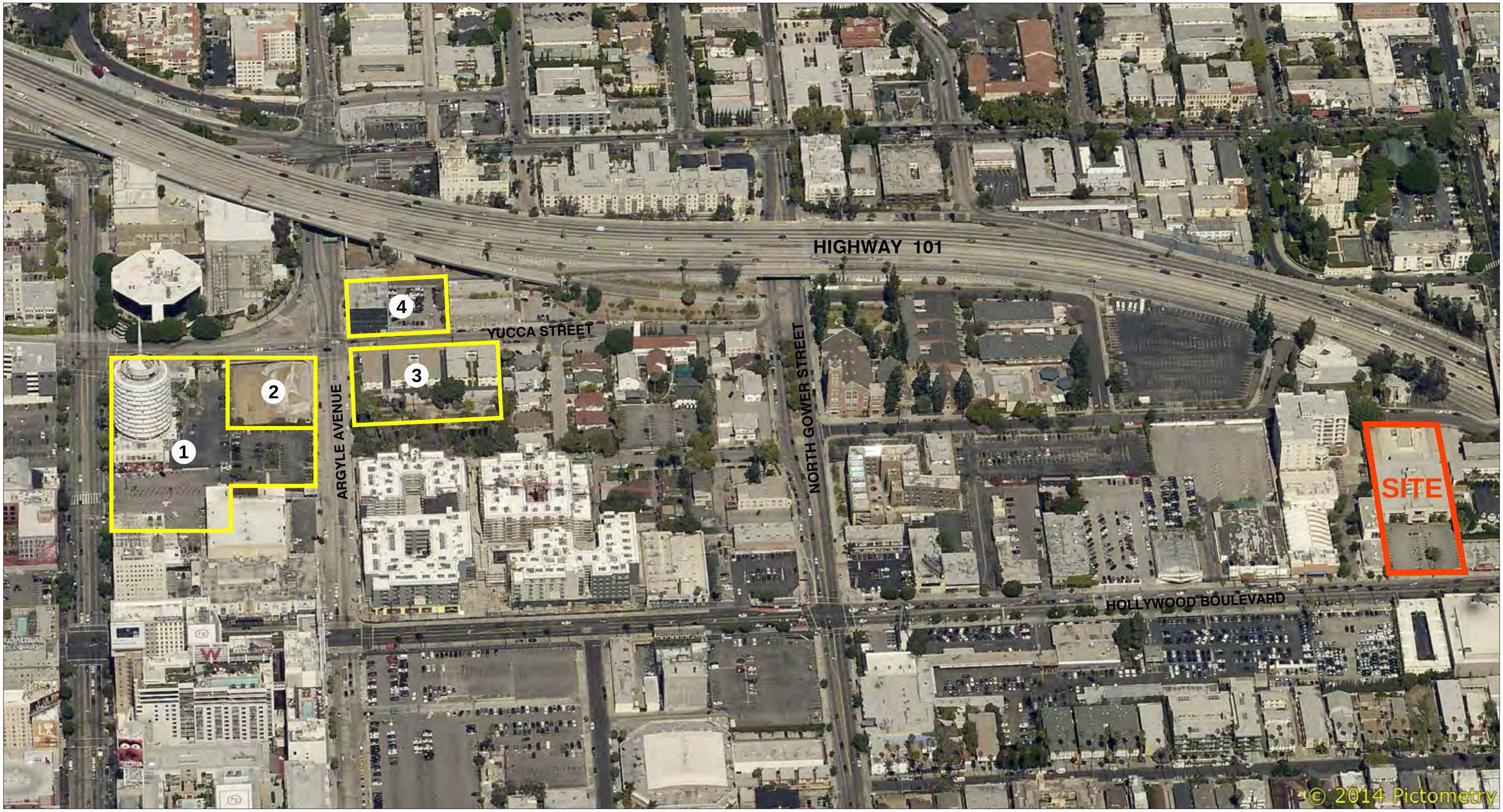

REFERENCE: PICTOMETRY.COM

LEGEND

PROPERTY WHERE FAULT STUDIES PERFORMED

1 GROUP DELTA (9/3/2014)

2 GROUP DELTA (9/3/2014)

3 GROUP DELTA (9/7/2014)

4 GROUP DELTA (9/3/2014)

N

NOT TO SCALE

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore

PROJECT NO.	DATE
402132006	2/15

FAULT STUDIES

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

FIGURE

3

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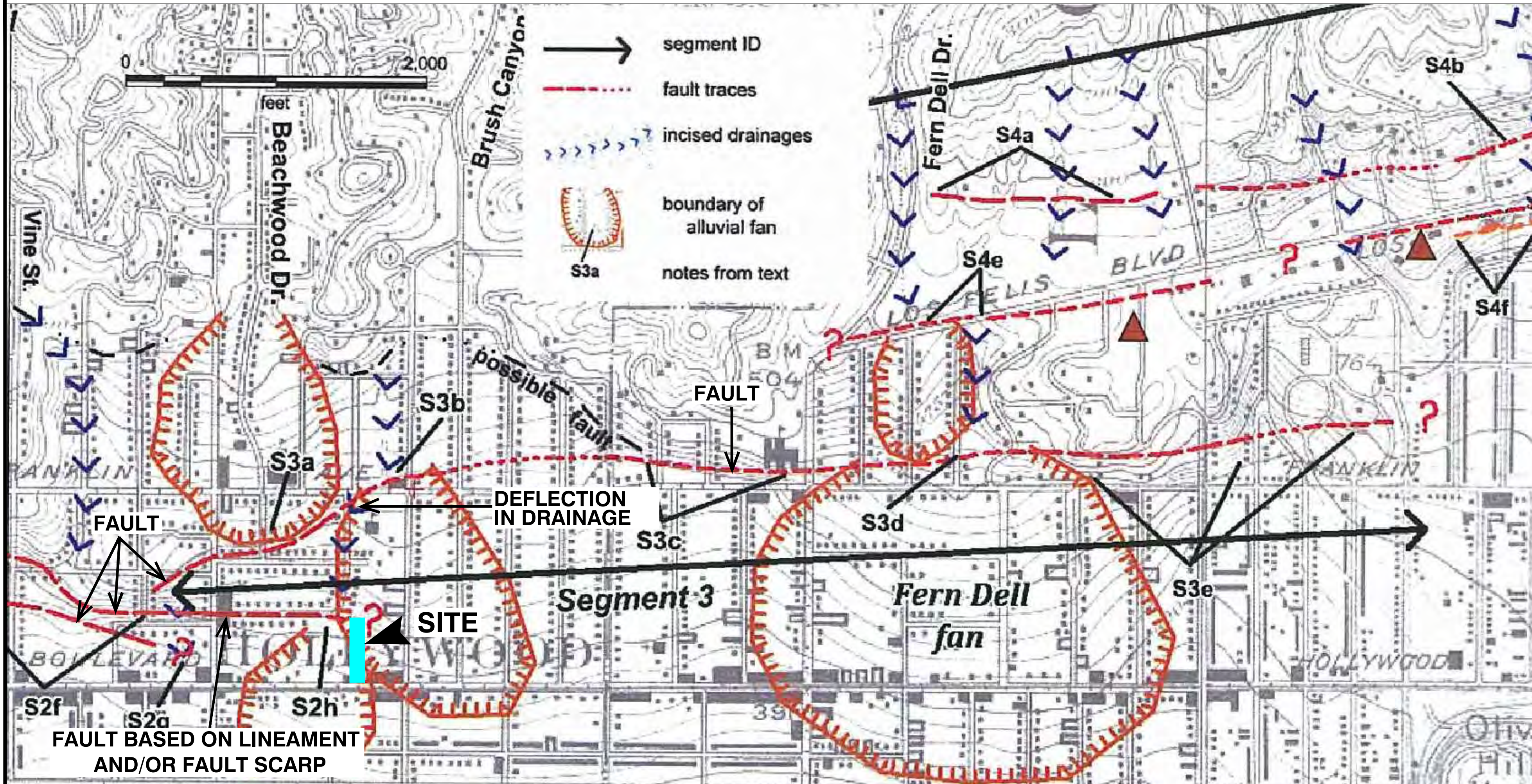

SCALE IN FEET

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NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

REFERENCE: CALIFORNIA GEOLOGICAL SURVEY FAULT EVALUATION REPORT 253, DATED FEBRUARY 14, 2014.

Ninyo & Moore

PROJECT NO.	DATE	
402132006	2/15	

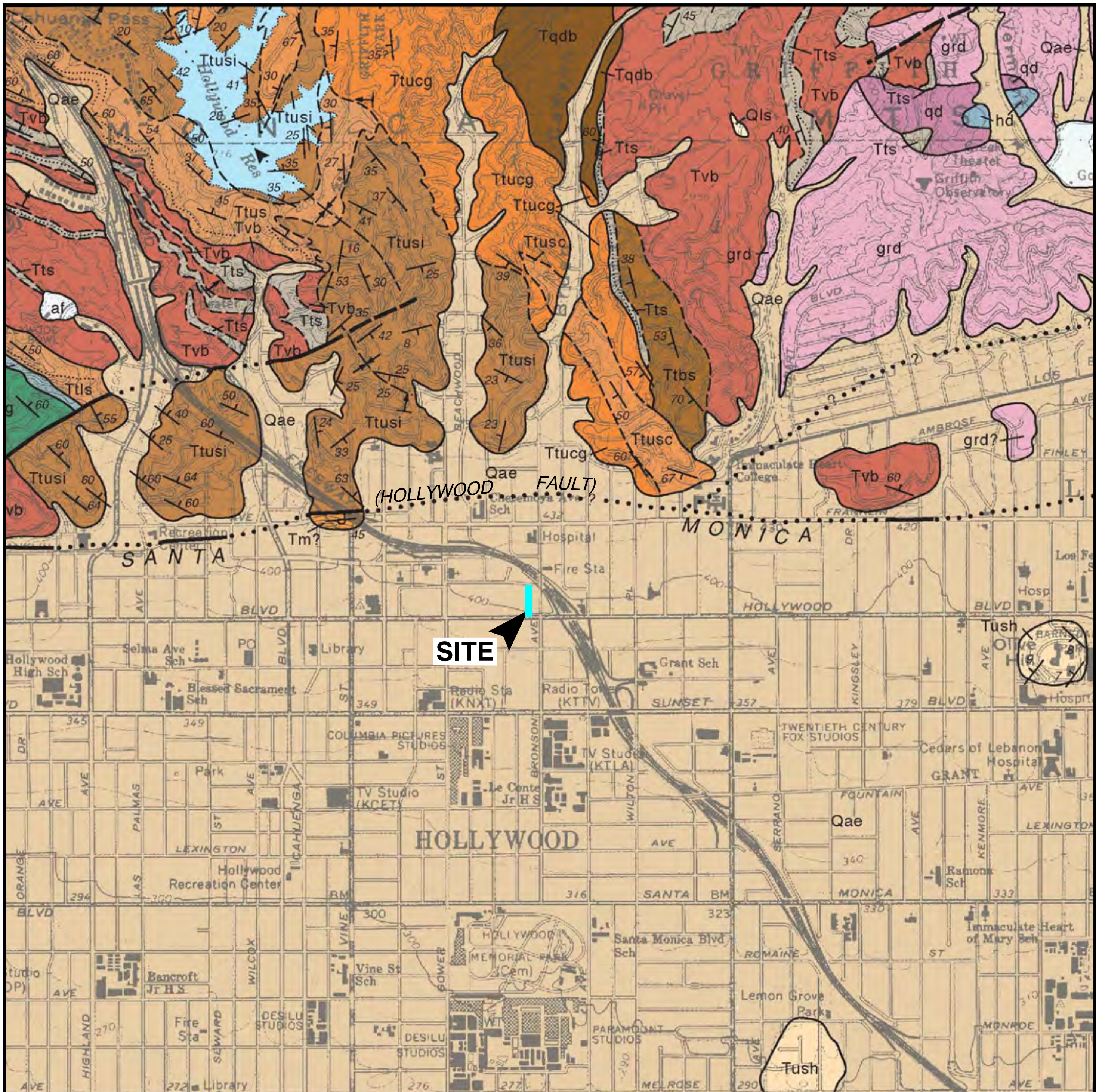
GEOMORPHIC FEATURES

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

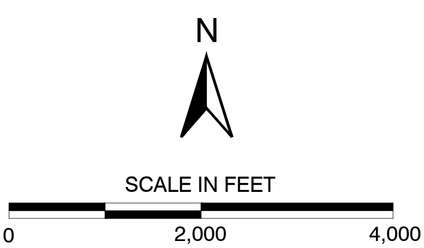
FIGURE

4

402132006_GF.dwg 08:30:05 01/05/2015 GK



REFERENCE: DIBBLEE, T.W., JR., 1991, GEOLOGIC MAP OF THE HOLLYWOOD AND SOUTH 1/2 BURBANK QUADRANGLES, LOS ANGELES COUNTY, CALIFORNIA: DIBBLEE FOUNDATION, DF-30.



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

- Qae — ALLUVIUM
- Ttusi — TERTIARY SEDIMENTARY DEPOSITS
- Tvb — VOLCANIC ROCKS
- grd — GRANODIORITE
- GEOLOGIC CONTACT
- 63 — BEDDING ATTITUDE
- FAULT; DOTTED WHERE CONCEALED

Ninyo & Moore

PROJECT NO.	DATE
402132006	2/15

REGIONAL GEOLOGY

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

FIGURE **5**

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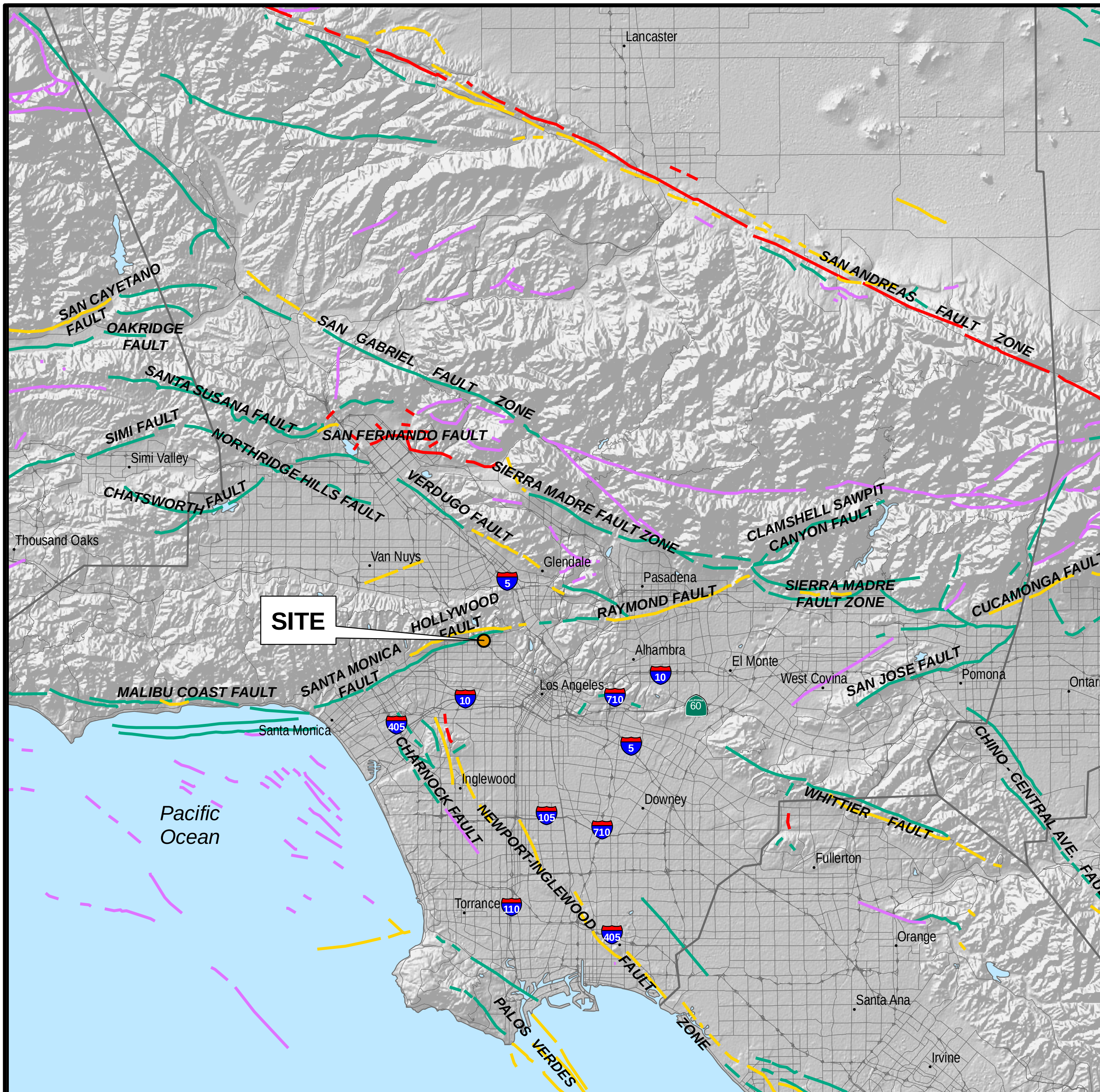


GIS DATA SOURCE: CALIFORNIA GEOLOGICAL SURVEY (CGS); ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE (ESRI)
REFERENCE: JENNINGS, 2010, FAULT ACTIVITY MAP OF CALIFORNIA.

LEGEND

FAULT ACTIVITY:

- HISTORICALLY ACTIVE
- HOLOCENE ACTIVE
- LATE QUATERNARY
- QUATERNARY
- COUNTY BOUNDARIES

N

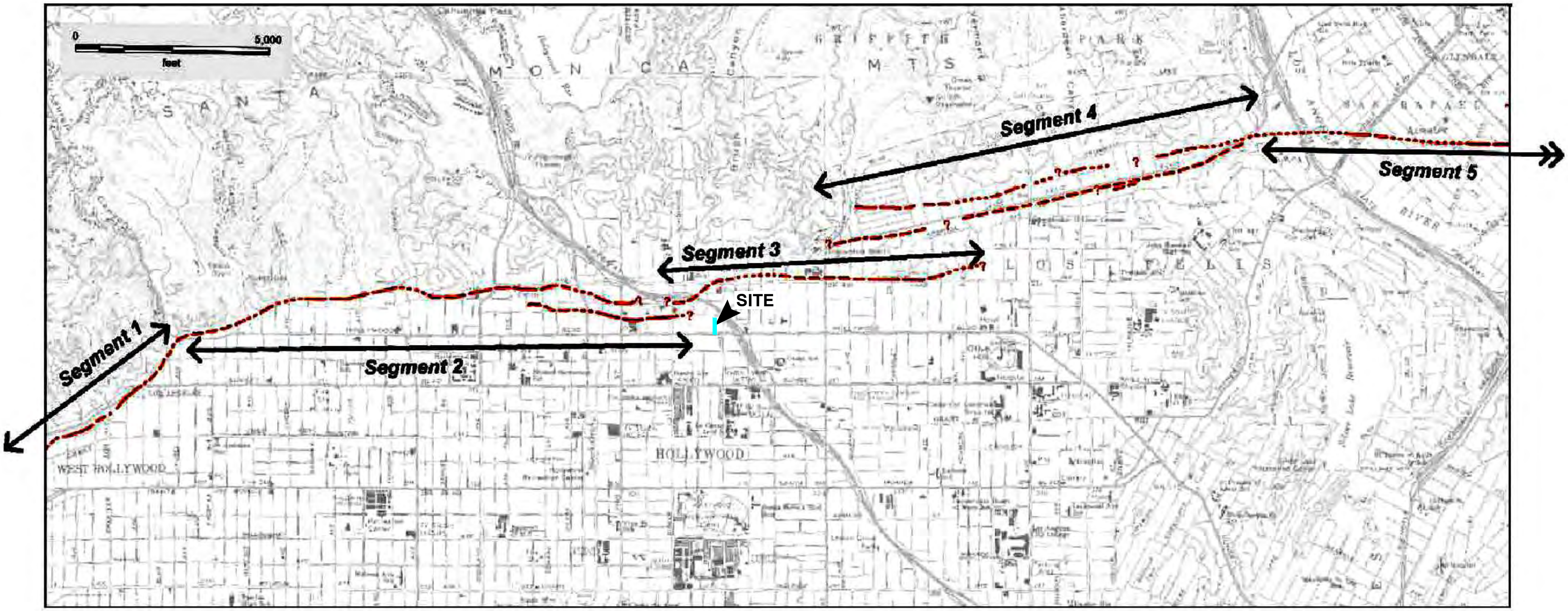
10 0 10

Miles

NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE

Ninyo & Moore		FAULT LOCATIONS	FIGURE
PROJECT NO.	DATE	HOLLYWOOD COURTHOUSE 5925 HOLLYWOOD BOULEVARD LOS ANGELES, CALIFORNIA	6
402132006	2/15		

402132006_FL........GK



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SCALE IN FEET

0 4,000 8,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

REFERENCE: CALIFORNIA GEOLOGICAL SURVEY, 2014, FAULT EVALUATION REPORT 253, DATED FEBRUARY 14.

Ninyo & Moore		FAULT SEGMENTS	FIGURE
PROJECT NO.	DATE	HOLLYWOOD COURTHOUSE 5925 HOLLYWOOD BOULEVARD LOS ANGELES, CALIFORNIA	7
402132006	2/15		

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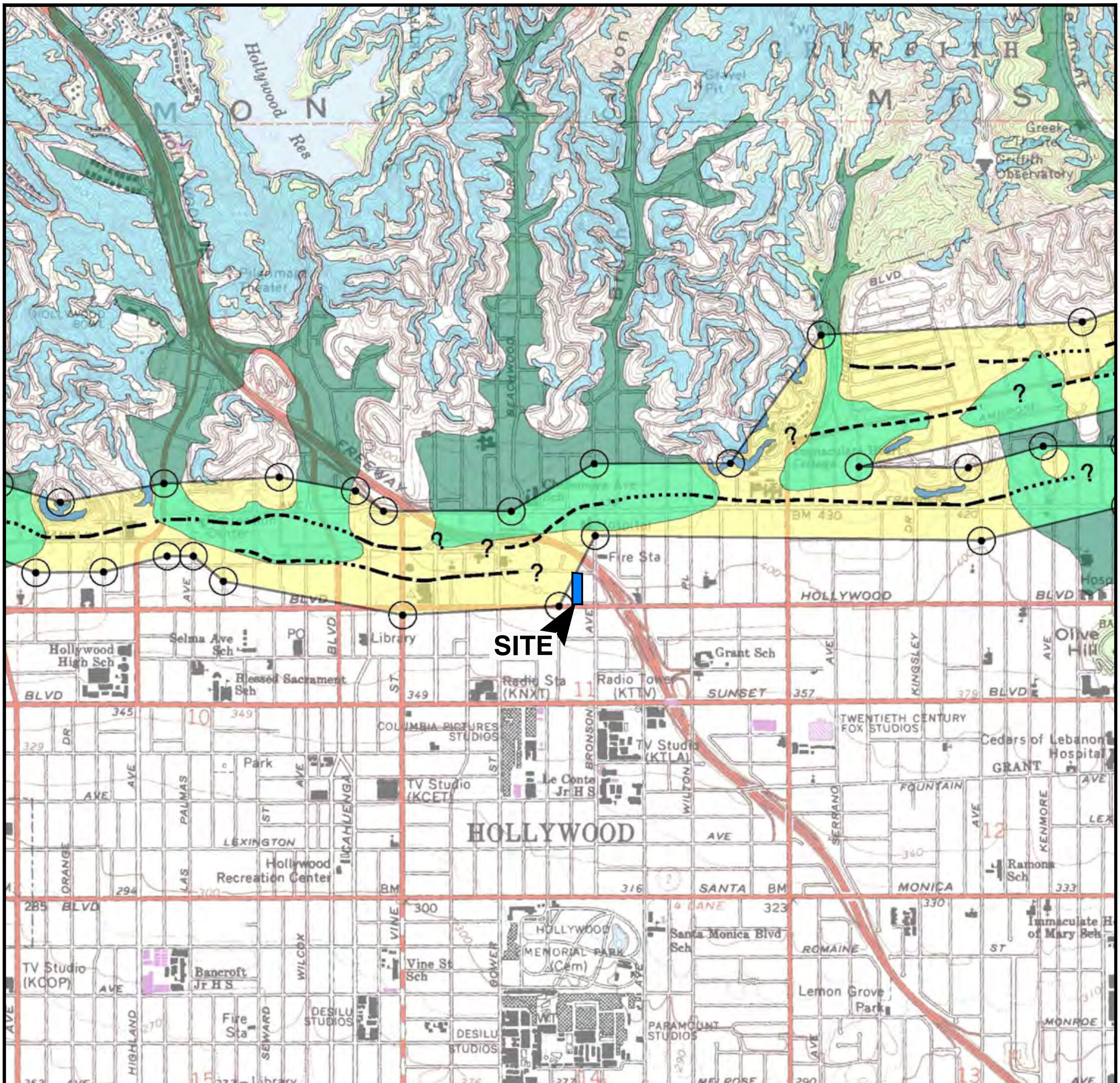
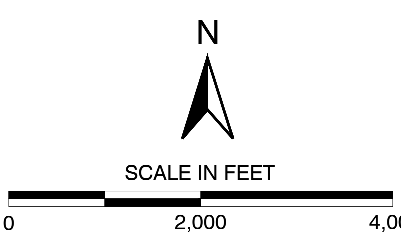


REFERENCE: EARTHQUAKE FAULT ZONES HOLLYWOOD QUADRANGLE, NOVEMBER 5, 2014.



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

Potentially Active Faults

1906 C

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

Special Studies Zone Boundaries

These are delineated as straight-line segments that connect encircled turning points so as to define special studies zone segments.

Seaward projection of zone boundary.

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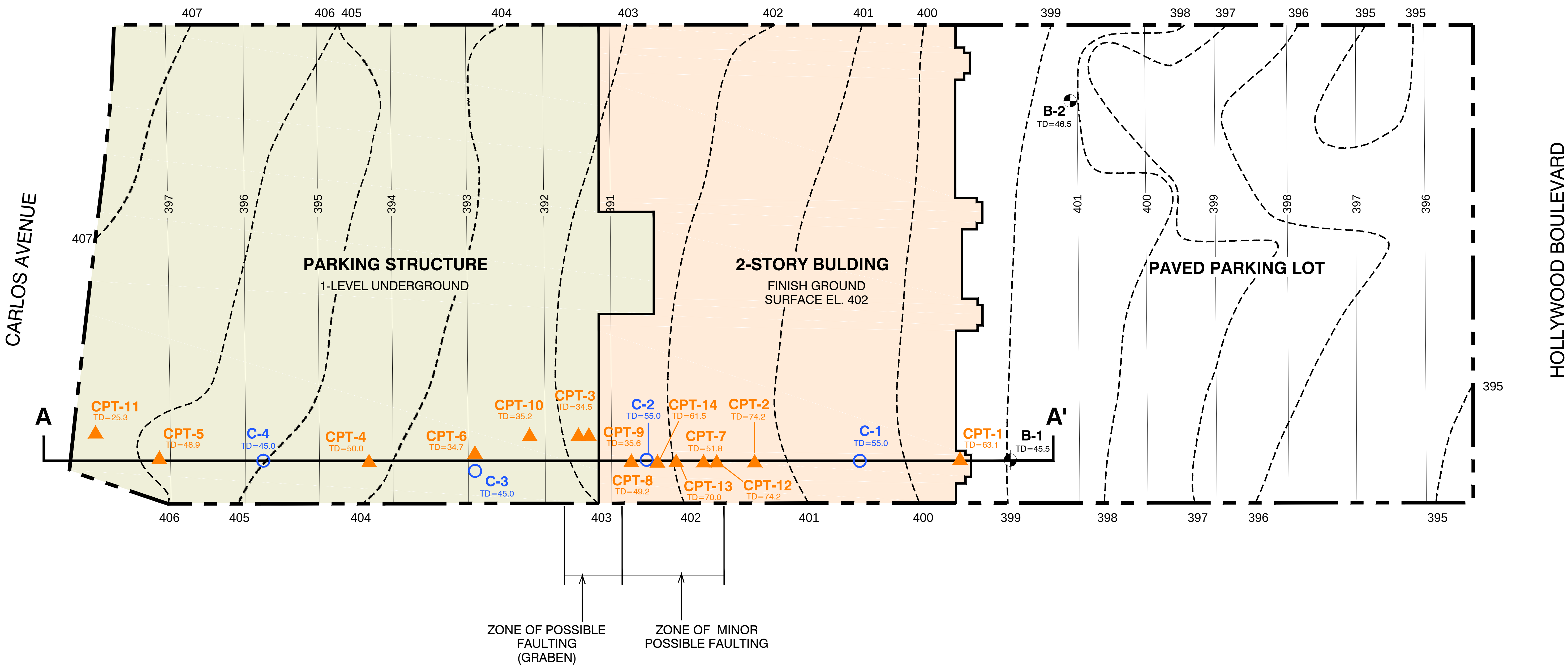
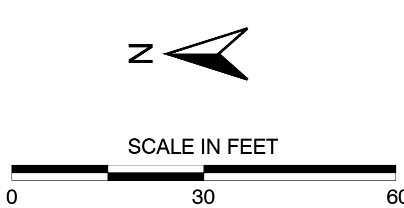
Ninyo & Moore	EARTHQUAKE FAULT ZONES	FIGURE
PROJECT NO. / DATE	HOLLYWOOD COURTHOUSE 5925 HOLLYWOOD BOULEVARD LOS ANGELES, CALIFORNIA	8
402132006 / 2/15		



LEGEND

--- 407 ---	PRE-EXISTING GROUND SURFACE ELEVATION (1984)	B-2 TD=46.5	BORING; TD=TOTAL DEPTH IN FEET
— 397 —	FINISHED SURFACE ELEVATION; IN AREA OF PARKING GARAGE, ELEVATION SHOWN AS LOWER LEVEL	A A'	CROSS SECTION
C-4 TD=45.0	CORE; TD=TOTAL DEPTH IN FEET		
CPT-6 TD=48.9	CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET		



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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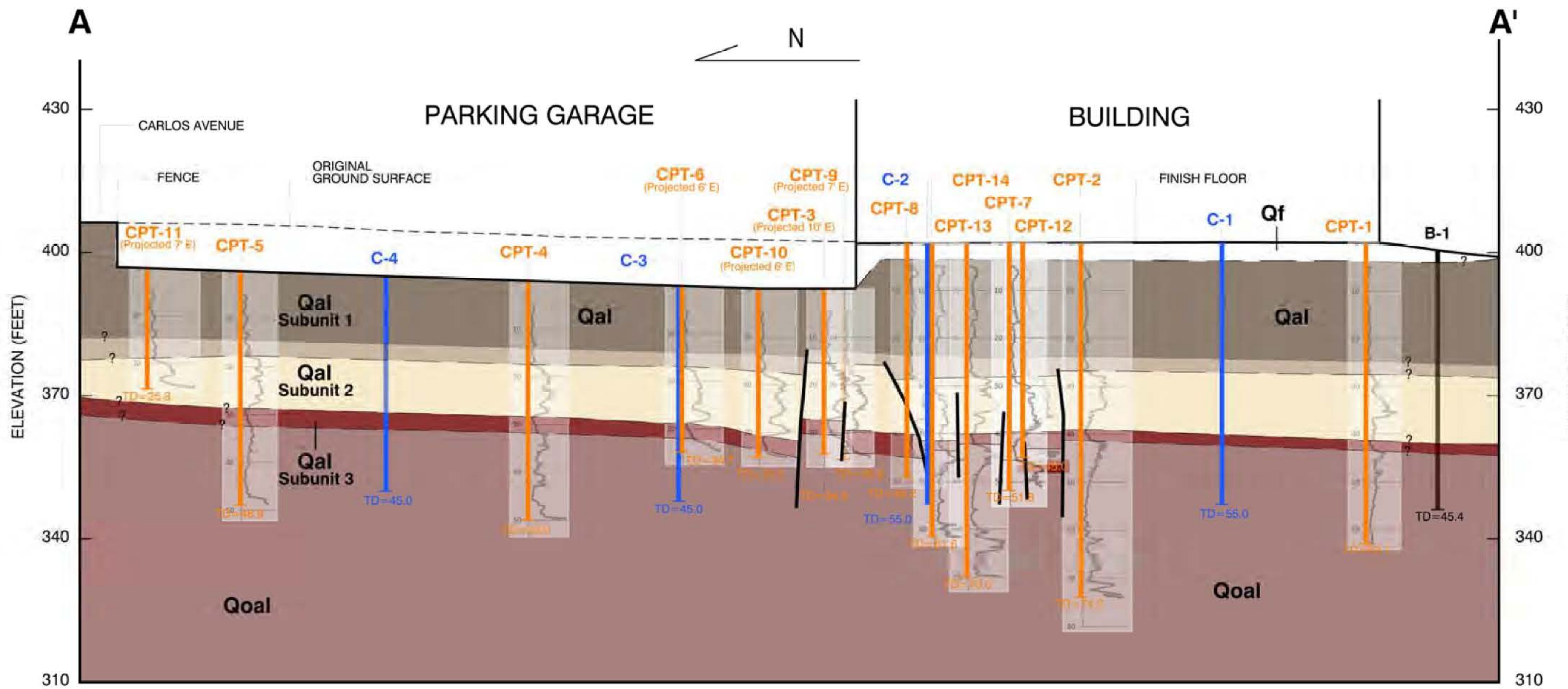
REFERENCE: K KENSHI NISHIMOTO ASSOCIATES, 1984, HOLLYWOOD MUNICIPAL COURT, ROUGH GRADING PLAN AND SECTIONS, SHEET C-2, DATED OCTOBER 9.

Ninyo & Moore	BORING AND CPT LOCATIONS	FIGURE
PROJECT NO. 402132006 / DATE 2/15	HOLLYWOOD COURTHOUSE 5925 HOLLYWOOD BOULEVARD LOS ANGELES, CALIFORNIA	9



LEGEND

— — —?— — GEOLOGIC CONTACT; QUERIED WHERE INFERRED

C-4 — CORE; TD=TOTAL DEPTH IN FEET (TD=45.0)

CPT-6 — CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET (TD=34.7)

B-2 — BORING; TD=TOTAL DEPTH IN FEET (TD=34.7)

Qf — FILL

Qal Subunit 1, Qal Subunit 2, Qal Subunit 3 — ALLUVIUM

Qoal — OLDER ALLUVIUM

\ — POSSIBLE FAULT

SCALE IN FEET

0 30 60

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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CROSS SECTION A-A'

PROJECT NO.	DATE
402132006	2/15

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

FIGURE **10**

402132006_CS (11X17) KCR.dwg 14:58:06 01/06/2015 GK

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples
Disturbed soil samples were obtained in the field using the following methods.

Bulk Samples
Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Spoon
Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test spoon sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1 $^{3}/_{8}$ inches. The spoon was driven into the ground 12 to 18 inches with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586-99. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the spoon, bagged, sealed, and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples
Relatively undisturbed soil samples were obtained in the field using the following method.

The Modified Split-Barrel Drive Sampler
The sampler, with an external diameter of 3 inches, was lined with 1-inch-long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer or the kelly bar of the drill rig in general accordance with ASTM D 3550-01. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer or bar, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

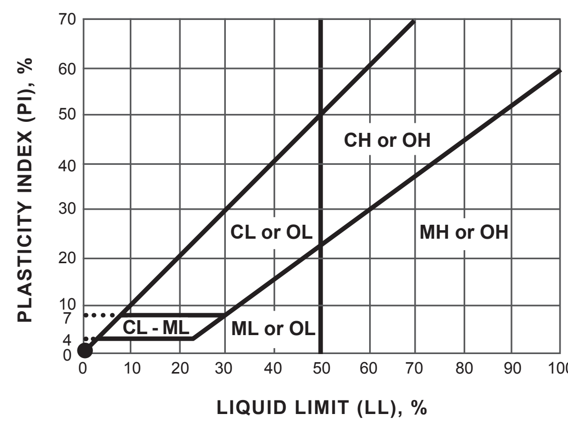
SOIL CLASSIFICATION CHART PER ASTM D 2488

PRIMARY DIVISIONS			SECONDARY DIVISIONS: GROUP SYMBOL	SECONDARY DIVISIONS: GROUP NAME
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	**GRAVEL** more than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVEL less than 5% fines	GW	well-graded GRAVEL
			GP	poorly graded GRAVEL
		GRAVEL with DUAL CLASSIFICATIONS 5% to 12% fines	GW-GM	well-graded GRAVEL with silt
			GP-GM	poorly graded GRAVEL with silt
			GW-GC	well-graded GRAVEL with clay
			GP-GC	poorly graded GRAVEL with clay
		GRAVEL with FINES more than 12% fines	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND 50% or more of coarse fraction passes No. 4 sieve	CLEAN SAND less than 5% fines	SW	well-graded SAND
			SP	poorly graded SAND
		SAND with DUAL CLASSIFICATIONS 5% to 12% fines	SW-SM	well-graded SAND with silt
			SP-SM	poorly graded SAND with silt
			SW-SC	well-graded SAND with clay
			SP-SC	poorly graded SAND with clay
		SAND with FINES more than 12% fines	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 sieve	**SILT and CLAY** liquid limit less than 50%	INORGANIC	CL	lean CLAY
			ML	SILT
			CL-ML	silty CLAY
		ORGANIC	OL (PI > 4)	organic CLAY
			OL (PI < 4)	organic SILT
	SILT and CLAY liquid limit 50% or more	INORGANIC	CH	fat CLAY
			MH	elastic SILT
		ORGANIC	OH (plots on or above "A"-line)	organic CLAY
			OH (plots below "A"-line)	organic SILT
	Highly Organic Soils		PT	Peat

GRAIN SIZE

DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders		> 12"	> 12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	Fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	Coarse	#10 - #4	0.079 - 0.19"	Rock-salt-sized to pea-sized
	Medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized
Fines		Passing #200	< 0.0029"	Flour-sized and smaller

PLASTICITY CHART



APPARENT DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPOOLING CABLE OR CATHEAD: SPT (blows/foot)	SPOOLING CABLE OR CATHEAD: MODIFIED SPLIT BARREL (blows/foot)	AUTOMATIC TRIP HAMMER: SPT (blows/foot)	AUTOMATIC TRIP HAMMER: MODIFIED SPLIT BARREL (blows/foot)
Very Loose	≤ 4	≤ 8	≤ 3	≤ 5
Loose	5 - 10	9 - 21	4 - 7	6 - 14
Medium Dense	11 - 30	22 - 63	8 - 20	15 - 42
Dense	31 - 50	64 - 105	21 - 33	43 - 70
Very Dense	> 50	> 105	> 33	> 70

CONSISTENCY - FINE-GRAINED SOIL

CONSIS-TENCY	SPOOLING CABLE OR CATHEAD: SPT (blows/foot)	SPOOLING CABLE OR CATHEAD: MODIFIED SPLIT BARREL (blows/foot)	AUTOMATIC TRIP HAMMER: SPT (blows/foot)	AUTOMATIC TRIP HAMMER: MODIFIED SPLIT BARREL (blows/foot)
Very Soft	< 2	< 3	< 1	< 2
Soft	2 - 4	3 - 5	1 - 3	2 - 3
Firm	5 - 8	6 - 10	4 - 5	4 - 6
Stiff	9 - 15	11 - 20	6 - 10	7 - 13
Very Stiff	16 - 30	21 - 39	11 - 20	14 - 26
Hard	> 30	> 39	> 20	> 26

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USCS METHOD OF SOIL CLASSIFICATION

Explanation of USCS Method of Soil Classification

PROJECT NO.	DATE	FIGURE

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	BORING LOG EXPLANATION SHEET
0								Bulk sample.
								Modified split-barrel drive sampler.
								No recovery with modified split-barrel drive sampler.
								Sample retained by others.
								Standard Penetration Test (SPT).
5								No recovery with a SPT.
			XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
								No recovery with Shelby tube sampler.
								Continuous Push Sample.
								Seepage.
10								Groundwater encountered during drilling.
								Groundwater measured after drilling.
							SM	MAJOR MATERIAL TYPE (SOIL): Solid line denotes unit change.
							CL	Dashed line denotes material change. Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Shear Bedding Surface
15								
								The total depth line is a solid line that is drawn at the bottom of the boring.
20								

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BORING LOG

Explanation of Boring Log Symbols

PROJECT NO.	DATE	FIGURE
	Rev. 11/11	

DATE DRILLED	11/5/14
BORING NO.	B-1
GROUND ELEVATION	400'± (MSL)
SHEET	1 OF 3
METHOD OF DRILLING	8" Hollow-Stem Auger (Martini Drilling)
DRIVE WEIGHT	140 lbs. (Auto. Trip Hammer)
DROP	30"
SAMPLED BY	ZH
LOGGED BY	ZH
REVIEWED BY	JJB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								ASPHALT CONCRETE: Approximately 4 inches thick.
							GP	AGGREGATE BASE: Grayish brown, dry to moist, medium dense, sandy GRAVEL; approximately 5 inches thick.
	X						SM	FILL: Brown, moist, loose to medium dense, silty SAND; few gravel; trace brick debris up to 3 inches thick.
							SM	ALLUVIUM - SUBUNIT 1: Dark yellowish brown (10YR 4/4), moist, loose, silty SAND; trace gravel.
5		X	5	8.5				
		X	2					Very pale brown (10YR 7/4); very loose, trace coarse sand.
		X	3				SC	Brown (10YR 4/3), moist, very loose, clayey SAND.
10		X	2					Trace gravel.
		X	2	12.2				
		X	5					Dark brown (10YR 3/3), loose.
15		X	4				SM	Yellowish brown (10YR 5/4), moist, very loose, silty SAND. Scattered thin layers of gravel.
		X	4					Gradational contact.
							SC	Yellowish brown (10YR 5/4), moist, very loose, clayey SAND.
		X	2					
		X	7					Loose.
20								

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BORING LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-1

DATE DRILLED	11/5/14	BORING NO.	B-1
GROUND ELEVATION	400'± (MSL)	SHEET	2 OF 3
METHOD OF DRILLING	8" Hollow-Stem Auger (Martini Drilling)		
DRIVE WEIGHT	140 lbs. (Auto. Trip Hammer)	DROP	30"
SAMPLED BY	ZH	LOGGED BY	ZH
REVIEWED BY	JJB		

DEPTH (feet)	SAMPLES Bulk / Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20		3	17.9			CL	ALLUVIUM: (Continued) Yellowish brown (10YR 5/4), moist, soft, sandy CLAY.
		7					Stiff.
		2				ML	Brown (10YR 5/3), moist, very loose to soft, sandy to clayey SILT.
25		7				SC	Brown (10YR 5/3), moist, loose, clayey SAND.
		7					Trace fine gravel and coarse sand; parallel bedding contacts, finer-grained.
		18				SM	ALLUVIUM - SUBUNIT 2: Dark yellowish brown (10YR 4/4), moist, medium dense, silty SAND.
		10				SP	Yellowish brown (10YR 5/4), moist, medium dense, poorly graded SAND.
30		15	8.4			SC	Dark yellowish brown (10YR 3/4), moist medium dense, clayey SAND; trace gravel.
		10				SM	Brown (7.5YR 5/4), moist, medium dense, silty SAND. Clayey SAND; relatively flat thin bed.
		12					Trace gravel.
35		11				SC	Brown (7.5YR 5/4), moist, medium dense, clayey SAND.
						SP-SM	Brown (7.5YR 5/4), moist, medium dense, poorly graded SAND with silt.
		18				SM	Brown (7.5YR 5/4), moist, medium dense, silty SAND.
						SP-SM	Brown (7.5YR 5/4), moist, moist, medium dense, poorly graded SAND with silt; trace gravel.
		7				SC	ALLUVIUM - SUBUNIT 3: Brown (7.5YR 5/4), moist, loose, clayey SAND. Thin sand bed.
40							

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BORING LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-2

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 11/5/14 BORING NO. B-1 GROUND ELEVATION 400'± (MSL) SHEET 3 OF 3 METHOD OF DRILLING 8" Hollow-Stem Auger (Martini Drilling) DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30" SAMPLED BY ZH LOGGED BY ZH REVIEWED BY JJB **DESCRIPTION/INTERPRETATION**
40							SC	ALLUVIUM: (Continued) Brown (7.5YR 5/4), moist, loose, clayey SAND.
			8				SP	Brown (7.5YR 5/4), moist, medium dense, poorly graded SAND with gravel.
							SC	OLDER ALLUVIUM: Brown (7.5YR 4/3), moist, medium dense, clayey SAND.
			13				CL	Strong brown (7.5YR 4/6), moist, stiff, sandy CLAY; mottled; trace gravel.
			26	14.1			SC	Strong brown (7.5YR 4/6), moist, very dense, clayey SAND; mottled.
45			32					Dark yellowish brown (10YR 4/4), trace coarse sand.
								Total Depth = 45½ feet. Groundwater was not encountered during drilling. Backfilled with on-site soil on 11/5/14. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
55								
60								

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BORING LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-3

DATE DRILLED 11/5/14	BORING NO. B-2	
GROUND ELEVATION 400'± (MSL)	SHEET 1 OF 3	
METHOD OF DRILLING 8" Hollow-Stem Auger (Martini Drilling)		
DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer)	DROP 30"	
SAMPLED BY ZH	LOGGED BY ZH	REVIEWED BY JJB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								ASPHALT CONCRETE: Approximately 3½ inches thick.
							GW	AGGREGATE BASE: Grayish brown, dry to moist, medium dense, sandy GRAVEL; approximately 4 inches thick.
	X						SM	FILL: Brown, moist, loose to medium dense, silty SAND; trace gravel.
5							SM	ALLUVIUM - SUBUNIT 1: Dark yellowish brown (10YR 4/4), moist, loose, silty SAND.
10		X	9	11.2			CL	Dark brown (10YR 3/3), moist, stiff, sandy CLAY with scattered lenses of clayey SAND.
15								
20								

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BORING LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-4

DATE DRILLED 11/5/14 BORING NO. B-2

GROUND ELEVATION 400'± (MSL) SHEET 2 OF 3

METHOD OF DRILLING 8" Hollow-Stem Auger (Martini Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY JJB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20		■	5	9.9			SC	ALLUVIUM - SUBUNIT 1: (Continued) Yellowish brown (10YR 5/4), moist, loose, clayey SAND.
25								
							SM	ALLUVIUM - SUBUNIT 2: Yellowish brown (10YR 5/4), moist, medium dense, silty SAND.
30		■	10	7.0				
35		■	14					Yellowish brown (10YR 5/6); trace clay and gravel.
		■	14					
		■	17				SC	ALLUVIUM - SUBUNIT 3: Yellowish brown (10YR 5/6), moist, medium dense, clayey SAND.
							SP-SM	Yellowish brown (10YR 5/6), moist, medium dense, poorly graded SAND with silt.
40		■					SC	OLDER ALLUVIUM:

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BORING LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-5

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 11/5/14 BORING NO. B-2 GROUND ELEVATION 400'± (MSL) SHEET 3 OF 3 METHOD OF DRILLING 8" Hollow-Stem Auger (Martini Drilling) DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30" SAMPLED BY ZH LOGGED BY ZH REVIEWED BY JJB DESCRIPTION/INTERPRETATION
40			13				SC	OLDER ALLUVIUM: (Continued) Brown (7.5YR 4/3), moist, medium dense, clayey SAND.
			38	14.4			CL	Strong brown (7.5YR 4/6), moist, hard, sandy CLAY.
45			69					
								Total Depth = 46½ feet. Groundwater was not encountered during drilling. Backfilled with on-site soil on 11/5/14. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
55								
60								

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BORING LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-6

DIRECT PUSH CORE LOGS

DATE DRILLED 11/7/14 | CORE NO. C-1
GROUND ELEVATION 402.4'± (MSL) | SHEET 1 OF 4
METHOD OF DRILLING LIMITED ACCESS DIRECT PUSH | DRILLER VIRONEX
LOCATION HALLWAY - WEST SIDE
SAMPLED BY ZH | LOGGED BY ZH | REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
402.4	0					PORTLAND CEMENT CONCRETE Approximately 4 inches thick with 1 inch light yellow, moist, loose, SAND.		
401.4	1				SM	FILL @ 0.4' Brown, (10YR 4/3), moist, loose to medium dense silty SAND trace gravel.		Hand auger to 5.25'
400.4	2							
399.4	3							
398.4	4				SC-SM	ALLUVIUM - SUBUNIT 1 Dark yellowish brown, (10YR 4/4), moist, loose, clayey to silty SAND.		
397.4	5	1	1	37			746	
396.4	6							
395.4	7							
394.4	8					@ 8.6' Dark yellowish brown, (10YR 4/6) .		
393.4	9					@ 9.2' Dark brown, (10YR 3/3); occasional gravel.	748	
392.4	10	2		50			751	
391.4	11							
390.4	12					@ 12.25' Dark yellowish brown, (10YR 4/4), few coarse sand; occasional gravel.		
389.4	13							
388.4	14						752	
387.4	15	3		58			755	
386.4	16							

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-7

DATE DRILLED 11/7/14	CORE NO. C-1
GROUND ELEVATION 402.4'± (MSL)	SHEET 2 OF 4
METHOD OF DRILLING LIMITED ACCESS DIRECT PUSH	DRILLER VIRONEX
LOCATION HALLWAY - WEST SIDE	
SAMPLED BY ZH LOGGED BY ZH	REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE: Run No.	CORE: Box No.	CORE: Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
386.4	16	3	1		SC-SM	ALLUVIUM - SUBUNIT 1 CONT. Dark yellowish brown, (10YR 4/4), moist, loose, clayey to silty SAND; thinly bedded, flat lying.		
385.4	17							
384.4	18					Sandy clay (approximately 1-inch thick). @ 18.8' trace angular gravel, coarse sand.		
383.4	19							
382.4	20	4		68			757 801	
381.4	21							
380.4	22					Gradational contact		
					CL	Yellowish brown, (10YR 5/6), moist, firm, sandy CLAY; scattered fine to coarse grained sand; thinly bedded to massive.		
379.4	23							
378.4	24					@ 24.6' trace rootlets.		
377.4	25	5		100			802 809	
376.4	26					@ 27' Subrounded gravel at contact.		
375.4	27				CL-SC	Yellowish brown, (10YR 5/6), moist, firm, sandy clay to medium dense, clayey and silty SAND.		
374.4	28							
373.4	29							
					SP	ALLUVIUM - SUBUNIT 2 @ 29.25' Dark yellowish brown, (10YR 6/4), loose to medium dense, fine to coarse grained poorly graded SAND; no distinct bedding.	811	
372.4	30	6	2	68			817	
371.4	31							
370.4	32							

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-8

DATE DRILLED 11/7/14 CORE NO. C-1

GROUND ELEVATION 402.4'± (MSL) SHEET 3 OF 4

METHOD OF DRILLING LIMITED ACCESS DIRECT PUSH DRILLER VIRONEX

LOCATION HALLWAY - WEST SIDE

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
370.4	32	6	2	68	SP	ALLUVIUM - SUBUNIT 2 CONT. Yellowish brown, (10YR 5/6), moist, loose to medium dense, fine to coarse grained poorly graded SAND; Contact with clayey sand (2-inches thick) approximately 60 degrees @ 32 feet. @ 32.6' and 33.1' clayey sand beds approximately one to two inches thick; flat lying.		
369.4	33							
368.4	34						819	
367.4	35	7		93		@ 35.3' - 35.8' Dark brown, (10YR 3/3), clayey SAND. @ 35.8' Very pale brown, (10YR 7/4), trace subangular to subrounded gravel.	829	
366.4	36					@ 36.7' Groundwater carbonation on gravel. Relatively horizontal contact.		
365.4	37				SC	ALLUVIUM - SUBUNIT 3 Dark yellowish brown, (10YR 4/6), moist, medium dense, clayey SAND. Massive to crudely bedded.		
364.4	38					@ 38.5' Gradational contact.		
					CL	Dark yellowish brown, (10YR 4/6), moist, stiff, sandy CLAY.		
363.4	39					@ 39' 1-inch thick clayey sand bed.	832	
362.4	40	8		100		Scattered gravel near contact.	845	Slightly harder coring
361.4	41				CL	OLDER ALLUVIUM Very dark brown, (7.5YR 3/4), moist, stiff, sandy CLAY; trace subrounded gravel; Paleosol 1; A horizon (approximately 12 inches in thickness).		
360.4	42					@ 42' Strong brown, 7.5YR 4/16.		
359.4	43							
358.4	44					@ 44.2' 1/2-inch thick subangular gravel dipping approximately 45 degrees. @ 44.25' Mottled yellowish brown, (10YR 5/4) and dark yellowish brown, (10YR 4/4); trace gravel.	848	
357.4	45	9		100		@ 45' Dark yellowish brown, (10YR 3/4), trace subrounded gravel. @ 45.7' Dark yellowish brown, (10YR 4/4); clayey sand bed.	913	
356.4	46					@ 46' Gradational between sandy clay and clayey sand.		
355.4	47				CL-SC	Brown, 10YR 4/3, moist, stiff, sandy CLAY; to medium dense clayey SAND; Paleosol 2. Burn surface. reddish yellow, (5YR 6/8). @ 47.75' brown, (7.5YR 4/4), and very stiff, trace coarse sand; some subrounded gravel.		
354.4	48							

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-9

DATE DRILLED 11/7/14	CORE NO. C-1
GROUND ELEVATION 402.4'± (MSL)	SHEET 4 OF 4
METHOD OF DRILLING LIMITED ACCESS DIRECT PUSH	DRILLER VIRONEX
LOCATION HALLWAY - WEST SIDE	
SAMPLED BY ZH LOGGED BY ZH	REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
354.4	48	9	2	100	CL-SC	OLDER ALLUVIUM CONT. Brown (7.5YR 4/4), moist, hard, sandy CLAY to dense clayey SAND.		
353.4	49							Hard to core
							917	
352.4	50	10		100		@ 50.4' gravel Strong brown, (7.5YR 4/6).	933	
351.4	51							
350.4	52							
349.4	53							
348.4	54							Very difficult to core
							940	
347.4	55					Total Depth = 55.0 feet Groundwater not encountered during coring Backfilled with bentonite grout on 11/7/14		

402132006_C4.dwg 10:09:18 11/18/2014 GK (CORE 4/4)

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-10

DATE DRILLED 11/7/14 | CORE NO. C-2
GROUND ELEVATION 402.4'± (MSL) | SHEET 1 OF 4
METHOD OF DRILLING LIMITED ACCESS DIRECT PUSH | DRILLER VIRONEX
LOCATION HALLWAY - WEST SIDE
SAMPLED BY ZH | LOGGED BY ZH | REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
402.4	0					PORTLAND CEMENT CONCRETE Approximately 4 inches thick with 1 inch light yellow, moist, loose, SAND.		
					SM	FILL @ 0.4' Brown, (10YR 4/3), moist, loose to medium dense, silty SAND; trace gravel.		
401.4	1							Hand auger to 5 feet
400.4	2							
399.4	3							
398.4	4				SC-SM	ALLUVIUM - SUBUNIT 1 @ 4' Dark yellowish brown, (10YR 4/4), moist, loose, clayey to silty SAND. Relatively flat, thinly bedded to fine laminations.		
397.4	5	1	3	42			1017	
396.4	6							
395.4	7					@ 7.6' Yellowish brown, (10YR 5/4); trace subrounded gravel.		
394.4	8					@ 8.5' Dark brown, (10YR 3/3).		
393.4	9					@ 9.3' Grades to dark yellowish brown, (10YR 4/6).	1018	
392.4	10	2		47			1021	
391.4	11							
390.4	12							
389.4	13					@ 13'-13.25' few subrounded gravel		
388.4	14					@ 14.25' - 14.6' Brown, (10YR 3/4); moist, loose, poorly graded SAND with silt @ 14.6' highly oxidized, subrounded gravel.	1024	
387.4	15	3		68			1028	
386.4	16							

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-11

DATE DRILLED 11/7/14	CORE NO. C-2
GROUND ELEVATION 402.4'± (MSL)	SHEET 2 OF 4
METHOD OF DRILLING LIMITED ACCESS DIRECT PUSH	DRILLER VIRONEX
LOCATION HALLWAY - WEST SIDE	
SAMPLED BY ZH LOGGED BY ZH	REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
386.4	16	3	3	68	SC-SM	ALLUVIUM - SUBUNIT 1 CONT. Brown, 10YR 3/4, moist, loose to medium dense, clayey to silty SAND.		
						@ 16.8' trace subrounded gravel.		
385.4	17					@ 16.9' Dark yellowish brown, (10YR 4/4).		
384.4	18							
						@ 18.5' highly oxidized, subrounded gravel.		
383.4	19							
							1030	
382.4	20	4		83			1034	
381.4	21							
						@ 21.75' few angular gravel.		
380.4	22							
						@ 22.5' - 22.75' Dark yellowish brown, (10YR 4/4), moist, loose, poorly graded SAND.		
379.4	23				CL	Yellowish brown, (10YR 5/4), moist, firm, sandy CLAY. Scattered fine to coarse sand.		
378.4	24							
						@ 24.2'-24.3' Dark yellowish brown, (10YR 3/3), loose to medium dense, clayey sand.		
							1036	
377.4	25	5		90			1041	
376.4	26				CL-SC+SM	Dark, yellowish brown, (10YR 3/3), moist, firm, sandy CLAY to medium dense, clayey and silty SAND.		
375.4	27							
374.4	28							
373.4	29				SP	ALLUVIUM - SUBUNIT 2 Pale brown, (10YR 6/3), moist, loose to medium dense, fine to coarse gravel, poorly graded SAND.		
						@ 29.5' Increasing coarse grained sand and trace subangular gravel.		
							1044	
372.4	30	6	4	73			1051	
371.4	31							
						@ 31.1'-31.5' Dark grayish brown, (10YR 4/2), silty SAND		
						@ 31.5' Yellowish brown, (10YR 5/4), fine to coarse grained sand.		
370.4	32							

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-12

DATE DRILLED 11/7/14 CORE NO. C-2

GROUND ELEVATION 402.4'± (MSL) SHEET 3 OF 4

METHOD OF DRILLING LIMITED ACCESS DIRECT PUSH DRILLER VIRONEX

LOCATION HALLWAY - WEST SIDE

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
370.4	32	6	4	73	SP	ALLUVIUM - SUBUNIT 2 CONT. Yellowish brown, (10YR 5/4), moist medium dense, fine to coarse grained poorly graded SAND.		
369.4	33					@ 32.25' trace subangular gravel. @ 32.8' trace subrounded gravel.		
368.4	34							
367.4	35	7		100	SC-SM	ALLUVIUM - SUBUNIT 3 Dark yellowish brown, (10YR 3/4), moist medium dense, clayey to silty SAND.	1055 / 1002	
366.4	36							
365.4	37				CL	@ 37.5 Dark yellowish brown, (10YR 3/4), moist, stiff, sandy CLAY.		
364.4	38					@ 38.8' Dark brown, (10YR 3/3).		
363.4	39					1-inch thick coarse grained sand at contact.		
					CL	OLDER ALLUVIUM Brown, (7.5YR 4/3), moist, very stiff, sandy CLAY, interbedded with clayey and silty SAND; Paleosol 1; A horizon; approximately 6 inches thick.		
362.4	40	8		100		@ 40' Strong brown, (7.5YR 4/6).	1104 / 1116	Hard to core
361.4	41					@ 40.4' Mottled dark grayish brown, (7.5YR 3/4) and brown, (7.5YR 4/4).		
360.4	42					@ 42.4' few subrounded gravel up to 1 inch		
359.4	43				SC	Contact dipping approximately 60° Dark yellowish brown, (10YR 4/4), moist, medium dense clayey SAND;		
358.4	44					@ 44.25' trace gravel		
357.4	45	9		100		@ 45' coarse gravel @ 45.3'-46.1 Dark grayish brown, (10YR 4/2), paleo gravel.	1119 / 1133	
356.4	46				CL	Brown, (7.5YR 4/4), moist, very stiff, sandy CLAY; vertical dark grayish brown seams; trace subangular gravel; Paleosol 2.		
355.4	47							
354.4	48							

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-13

DATE DRILLED 11/7/14		CORE NO. C-2
GROUND ELEVATION 402.4'± (MSL)		SHEET 4 OF 4
METHOD OF DRILLING LIMITED ACCESS DIRECT PUSH		DRILLER VIRONEX
LOCATION HALLWAY - WEST SIDE		
SAMPLED BY ZH	LOGGED BY ZH	REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	CORE U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
354.4	48	9	4	100	CL	OLDER ALLUVIUM CONT. Brown, (10YR 4/3), moist, very stiff, sandy CLAY.		
353.4	49					@ 49.3' Brown, (7.5YR 4/4).	1141	Very difficult to core
352.4	50	10		100		@ 50.7' possible fault dipping approximately 70°.	1150	
351.4	51					@ 51' Subrounded gravel, dark brown, 7.5YR 3/4, trace gravel and coarse sand.		
350.4	52							
349.4	53							
348.4	54						1156	
347.4	55					Total Depth = 55.0 feet Groundwater not encountered during coring Backfilled with bentonite grout on 11/7/14		

402132006_C8.dwg 10:09:18 11/18/2014 GK (CORE 2/4)

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-14

DATE DRILLED 11/7/14 CORE NO. C-3

GROUND ELEVATION 393.8'± (MSL) SHEET 1 OF 3

METHOD OF DRILLING DIRECT PUSH DRILLER VIRONEX

LOCATION HOLLYWOOD COURTHOUSE PARKING GARAGE

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE: Run No.	CORE: Box No.	CORE: Recovery, %	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
393.8	0					PORTLAND CEMENT CONCRETE Approximately 4 inches thick.		
					SM	ALLUVIUM - SUBUNIT 1 @ 0.3' Dark yellowish brown, (10YR 4/4), moist, loose, silty SAND; fine grained.		
393.8	1							
391.8	2							Hand auger to 5 feet
390.8	3							
389.8	4				SC	Dark yellowish brown, (10YR 4/4), moist, loose, clayey fine to coarse grained SAND		
388.8	5	1	5	77			1124	
387.8	6							
386.8	7							
385.8	8							
384.8	9						1125	
383.8	10	2		84			1130	
						@ 10.8' Yellowish brown, (10YR 5/6), moist.		
382.8	11							
381.8	12					@ 12.75' Dark yellowish brown, (10YR 4/4), trace gravel		
380.8	13					@ 13.2' - 13.7' clayey to silty SAND. @ 13.5' trace caliche stringers.		
379.8	14				CL	Dark yellowish brown, (10YR 3/3), moist, stiff sandy CLAY.	1132	
378.8	15	3		100		Gravel @ 15'. @15.5'-17.0' sandy clay and clayey SAND.	1140	
	16							

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-15

DATE DRILLED 11/7/14 CORE NO. C-3

GROUND ELEVATION 393.8'± (MSL) SHEET 2 OF 3

METHOD OF DRILLING DIRECT PUSH DRILLER VIRONEX

LOCATION HOLLYWOOD COURTHOUSE PARKING GARAGE

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
377.8	16	3	5	100	CL	ALLUVIUM - SUBUNIT 1 CONT. Olive brown, (10YR 4/4), moist, stiff, sandy CLAY. @ 16.6' Yellowish brown, (10YR 5/6). @ 16.75' Dark yellowish brown, (10YR 3/4), moist, stiff, silty CLAY		
376.8	17							
375.8	18				SP+ SC-SM	ALLUVIUM - SUBUNIT 2 @ 18.2' Light yellowish brown, (10YR 6/4), moist, loose to medium dense, poorly graded SAND with thinly interbedded clayey to silty SAND. @ 18.75' trace gravel.		
374.8	19							
373.8	20	4		63			1142 1150	
372.8	21					@ 21.7' Dark yellowish brown, (10YR 4/4); trace gravel.		
371.8	22					@ 22.7' trace subangular gravel.		
370.8	23							
369.8	24					@ 24' trace gravel.		
368.8	25	5		45	SC	ALLUVIUM - SUBUNIT 3 Strong brown, (7.5YR 4/6), moist, medium dense, clayey SAND .	1153 1212	
367.8	26							
366.8	27					@ 25' trace fine gravel.		
365.8	28				CL	Strong brown, (7.5YR 4/6), moist, stiff, sandy CLAY with interbedded sandy SILT. @ 29.1' few subrounded gravel.		
364.8	29				SP-SM	Dark yellowish brown, (10YR 4/6), moist, medium dense, poorly graded SAND with silt.		
363.8	30	6	6	100			1215 1239	
362.8	31				CL	OLDER ALLUVIUM Dark brown (7.5YR 4/3), moist, stiff, sandy CLAY; trace subangular gravel; Paleosol 1; A Horizon.		
	32							

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-16

DATE DRILLED 11/7/14 CORE NO. C-3

GROUND ELEVATION 393.8'± (MSL) SHEET 3 OF 3

METHOD OF DRILLING DIRECT PUSH DRILLER VIRONEX

LOCATION HOLLYWOOD COURTHOUSE PARKING GARAGE

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
361.8	32	6	6	100	CL	OLDER ALLUVIUM CONT. @ Strong brown, (7.5YR 4/6), moist, stiff, sandy CLAY.		Harder to core
360.8	33					@ 33.3' grades to dark reddish brown, (5YR 3/4).		
359.8	34							
358.8	35	7		82		@ 35' Base of Paleosol 1. Secondary calcium carbonate deposits on subangular gravel to 36 feet.	1243 1257	
357.8	36				SC	Brown (7.5YR 4/4), moist, medium dense, clayey SAND (poorly sorted colluvium); trace gravel. @ 36.3' some subangular gravel.		
356.8	37					Contact dipping approximately 60°		
355.8	38				SC-CL	Grayish brown, (10YR 5/2), moist, medium dense to dense clayey SAND (Paleosol 2). @ 38.5' grades to mottled dark grayish brown, (10YR 5/2), and reddish brown, very stiff, sandy CLAY (5YR 4/4).		
354.8	39							
353.8	40	8		100		@ 40.4' Contact, between yellowish brown (7.5YR 4/4), clayey SAND and sandy CLAY dipping approximately 70°, little gravel.	1300 1318	
352.8	41					@ 40.9' Contact between silty gravel and dark brown, (7.5YR 3/2), sandy CLAY dipping approximately 55°.		
351.8	42					@ 42.1' trace gravel. @ 42.4' grades to mottled dark brown, (7.5YR 4/3), and dark grayish brown, (10YR 4/2).		
350.8	43							
349.8	44					@ 44' grades to dark brown, (7.5YR 3/4). Scattered subrounded gravel.		Very difficult to core
348.8	45					Total Depth = 45.0 feet Groundwater not encountered during coring Backfilled with bentonite grout on 11/7/14	1325	
347.8	46							
346.8	47							
	48							

Ninyo & Moore

CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-17

DATE DRILLED 11/6/14 CORE NO. C-4

GROUND ELEVATION 395.9'± (MSL) SHEET 1 OF 3

METHOD OF DRILLING DIRECT PUSH DRILLER VIRONEX

LOCATION HOLLYWOOD COURTHOUSE PARKING GARAGE

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
395.9	0					PORTLAND CEMENT CONCRETE Approximately 5 inches thick .		
					SM	ALLUVIUM - SUBUNIT 1		
394.9	1					@ 0.4' Dark yellowish brown, (10YR 4/4), moist, loose, silty SAND; fine grained.		Hand auger to 5.3'
393.9	2							
392.9	3							
391.9	4				SC	Dark yellowish brown, (10YR 4/4), moist, loose, clayey SAND.		
390.9	5	1	7	67				
389.9	6							
						@ 6.8' dark, yellowish brown, (10YR 4/4).		
388.9	7					@ 7.3' trace subangular gravel.		
387.9	8							
386.9	9							
385.9	10	2		80			850 900	
						Gradational contact.		
384.9	11				CL-SC	Dark yellowish brown, (10YR 4/4), moist, fine to stiff, sandy CLAY to loose to medium dense, fine to medium SAND.		
						@ 11.3' Dark yellowish brown, (10YR 4/4).		
383.9	12					@ 12.4' Brown, (10YR 4/3); trace, coarse sand.		
382.9	13					@ 13.25' trace, subangular gravel. @ 13.3' Dark yellowish brown, (10YR 4/4). @ 13.9 - 14.3' silty SAND		
381.9	14				SC	Dark yellowish brown, (10YR 4/4), moist, medium dense, clayey SAND.		
380.9	15	3		87			906 908	
	16							

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CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-18

CORE				
DATE DRILLED 11/6/14	CORE NO. C-4			
GROUND ELEVATION 395.9'± (MSL)	SHEET 2 OF 3			
METHOD OF DRILLING DIRECT PUSH	DRILLER VIRONEX			
LOCATION HOLLYWOOD COURTHOUSE PARKING GARAGE				
SAMPLED BY ZH	LOGGED BY ZH	REVIEWED BY JJB		

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery,%	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
369.9	16	3		87	SC	ALLUVIUM - SUBUNIT 1 CONT. Dark, yellowish brown, (10YR 4/4), moist, medium dense, clayey SAND.		
368.9	17					@ 17' trace coarse sand.		
367.9	18					@ 17.8' dark, yellowish brown, (10YR 4/6), moist, medium dense SAND @ 18.5'-18.7' dark, yellowish brown, (10YR 4/4), sandy CLAY.		
376.9	19				SM	ALLUVIUM - SUBUNIT 2 Brownish yellow, (10YR 6/6), moist, medium dense, silty SAND with scattered thin beds of poorly graded sand with SILT.	909	
375.9	20	4		83			911	
374.9	21					@ 21' trace subangular gravel. @ 21.6' - 21.8' subangular gravel lens.		
373.9	22					@ 22.1' - 22.6' Coarse subangular gravel layer with calcium carbonate deposits.		
372.9	23					@ 22.9' Dark yellowish brown, (10YR 4/4). @ 23.1'-23.3' Brownish yellow, (10YR 6/6), moist, medium dense, sandy SILT. @ 23.9' trace subangular gravel.		
371.9	24					@ 24.25' grades to brownish yellow, (10YR 6/6). Gradational silty to clayey SAND.	930	
370.9	25	5		40			937	
369.9	26				SC	ALLUVIUM - SUBUNIT 3 Dark yellow brown, (10YR 3/6), moist, medium dense, clayey SAND.		
368.9	27							
367.9	28					@ 28' trace subangular gravel with calcium carbonate deposits. @ 28.2'-28.5' Brownish yellow, (10YR 6/6), silty SAND. @ 28.5' - 28.75' subangular gravel layer.		
366.9	29				CL	Dark brown, (7.5YR 3/4), moist, very stiff, sandy CLAY.	941	
365.9	30	6	8	90	CL	OLDER ALLUVIUM Dark brown, (7.5YR 4/3), moist, very stiff, sandy CLAY; Paleosol 1; A Horizon.	953	
364.9	31							
	32							

DATE DRILLED	11/6/14	CORE NO.	C-4
GROUND ELEVATION	395.9'± (MSL)	SHEET 3 OF 3	
METHOD OF DRILLING	DIRECT PUSH	DRILLER	VIRONEX
LOCATION	HOLLYWOOD COURTHOUSE PARKING GARAGE		
SAMPLED BY	ZH	LOGGED BY ZH	REVIEWED BY JJB

Elevation, feet	Depth, feet	CORE Run No.	CORE Box No.	CORE Recovery, %	U.S.C.S. Classification	DESCRIPTION/INTERPRETATION	DRILL TIME	FIELD NOTES AND LAB TESTS
363.9	32	6	8	90	CL	OLDER ALLUVIUM Dark brown, (7.5YR 3/3), moist, very stiff, sandy CLAY; some subangular gravel with calcium carbonate deposits.		@ 33' harder to core; sleeve stuck in core rod; core disturbed; caving to 33 feet; push to 37 feet
362.9	33					@ 32.75'-33.3' Brown, (7.5YR 4/4), silty SAND with gravel.		
					CL-SC	Brown, (7.5YR 4/4), very stiff, sandy CLAY to medium dense, clayey SAND; trace gravel; Paleosol 2.		
361.9	34							
360.9	35						957	
		7		100		@ 35.1' grades to reddish brown, (5YR 4/4).	1008	
359.9	36							
358.9	37						1011	
							1030	
357.9	38	8		31				
356.9	39					@ 39.2' Dark brown, (7.5YR 3/3) Brown (7.5YR 4/4), mottled.		
355.9	40						1035	Difficult to core
							1048	
354.9	41					@ 41.7' Brown, (7.5YR 4/4), vertical black, GLEY 1 2.5/N stringers.		
353.9	42	9		57				
352.9	43							
351.9	44							
350.9	45						1056	
						Total Depth = 45.0 feet Groundwater not encountered during coring Backfilled with bentonite grout on 11/6/14		
349.9	46							
348.9	47							
	48							

Ninyo & Moore

CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	A-20

402132006_C13.dwg 10:09:18 11/18/2014 GK (CORE 4/2)

APPENDIX B

CONE PENETROMETER TESTING

(GREGG DRILLING)

GREGG

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

November 20, 2014

Ninyo & Moore
Attn: Jim Barton

Subject: CPT Site Investigation
Hollywood Courthouse
Los Angeles, California
GREGG Project Number: 14-812SH

Dear Mr. Barton:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☐
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☐
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG Drilling & Testing, Inc.

Peter Robertson
Technical Director, Gregg Drilling & Testing, Inc.

2726 Walnut Ave. • Signal Hill, California 90755 • (562) 427-6899 • FAX (562) 427-3314
www.greggdrilling.com

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
CPT-01	11/18/14	63	-	-	-
CPT-02	11/18/14	74	-	-	-
CPT-03	11/18/14	35	-	-	-
CPT-04	11/19/14	50	-	-	-
CPT-05	11/19/14	49	-	-	-
CPT-06	11/19/14	35	-	-	-

Bibliography

Lunne, T., Robertson, P.K. and Powell, J.J.M., "Cone Penetration Testing in Geotechnical Practice" E & FN Spon. ISBN 0 419 23750, 1997

Roberston, P.K., "Soil Classification using the Cone Penetration Test", Canadian Geotechnical Journal, Vol. 27, 1990 pp. 151-158.

Mayne, P.W., "NHI (2002) Manual on Subsurface Investigations: Geotechnical Site Characterization", available through www.ce.gatech.edu/~geosys/Faculty/Mayne/papers/index.html, Section 5.3, pp. 107-112.

Robertson, P.K., R.G. Campanella, D. Gillespie and A. Rice, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8, 1986 pp. 791-803.

Robertson, P.K., Sully, J., Woeller, D.J., Lunne, T., Powell, J.J.M., and Gillespie, D.J., "Guidelines for Estimating Consolidation Parameters in Soils from Piezocone Tests", Canadian Geotechnical Journal, Vol. 29, No. 4, August 1992, pp. 539-550.

Robertson, P.K., T. Lunne and J.J.M. Powell, "Geo-Environmental Application of Penetration Testing", Geotechnical Site Characterization, Robertson & Mayne (editors), 1998 Balkema, Rotterdam, ISBN 90 5410 939 4 pp 35-47.

Campanella, R.G. and I. Weemees, "Development and Use of An Electrical Resistivity Cone for Groundwater Contamination Studies", Canadian Geotechnical Journal, Vol. 27 No. 5, 1990 pp. 557-567.

DeGroot, D.J. and A.J. Lutenegger, "Reliability of Soil Gas Sampling and Characterization Techniques", International Site Characterization Conference - Atlanta, 1998.

Woeller, D.J., P.K. Robertson, T.J. Boyd and Dave Thomas, "Detection of Polyaromatic Hydrocarbon Contaminants Using the UVIF-CPT", 53rd Canadian Geotechnical Conference Montreal, QC October pp. 733-739, 2000.

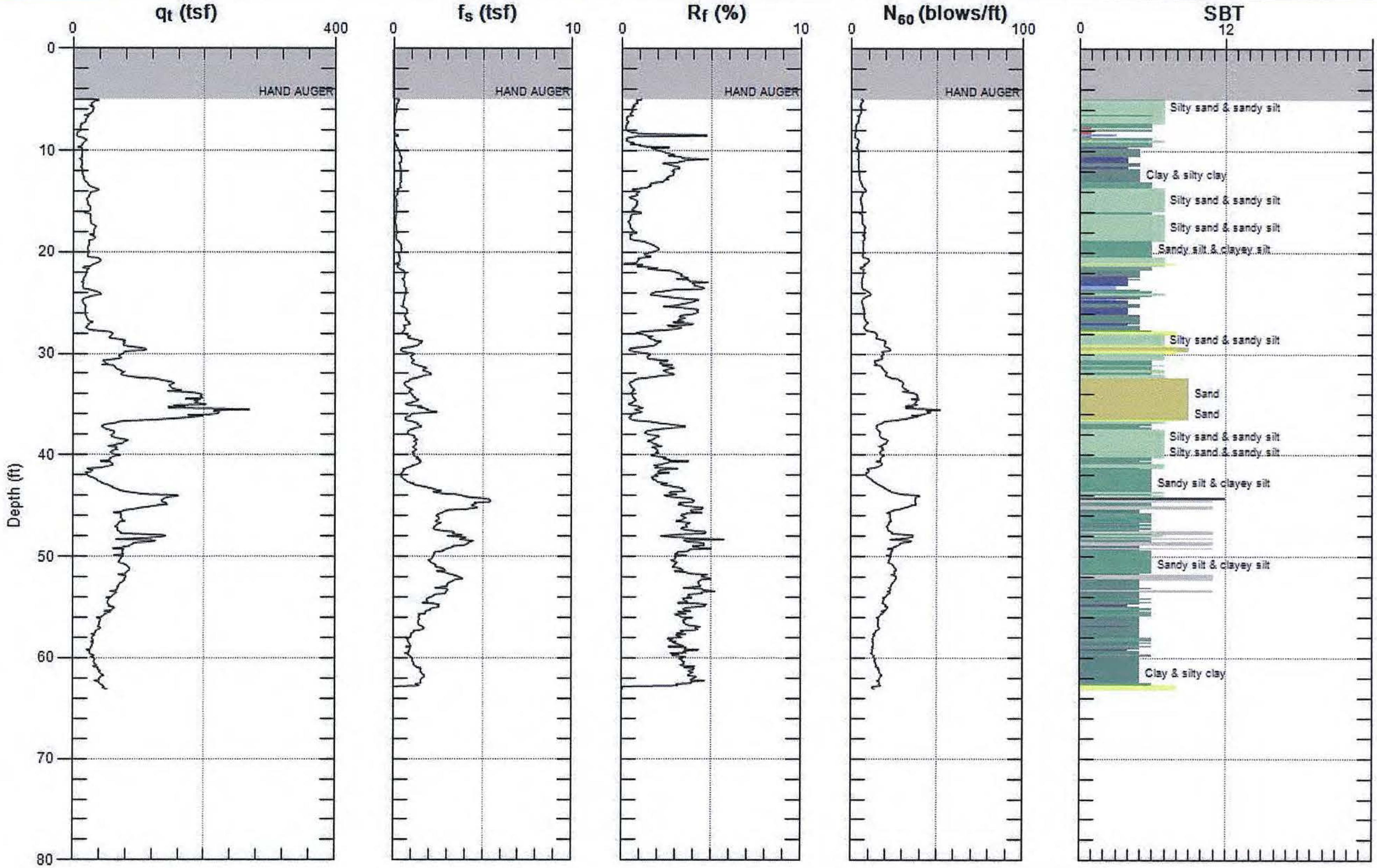
Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

GREGG **NINYO & MOORE**

Site: HOLLYWOOD COURT | Engineer: J.BARTON

Sounding: CPT-01 | Date: 11/18/2014 08:57



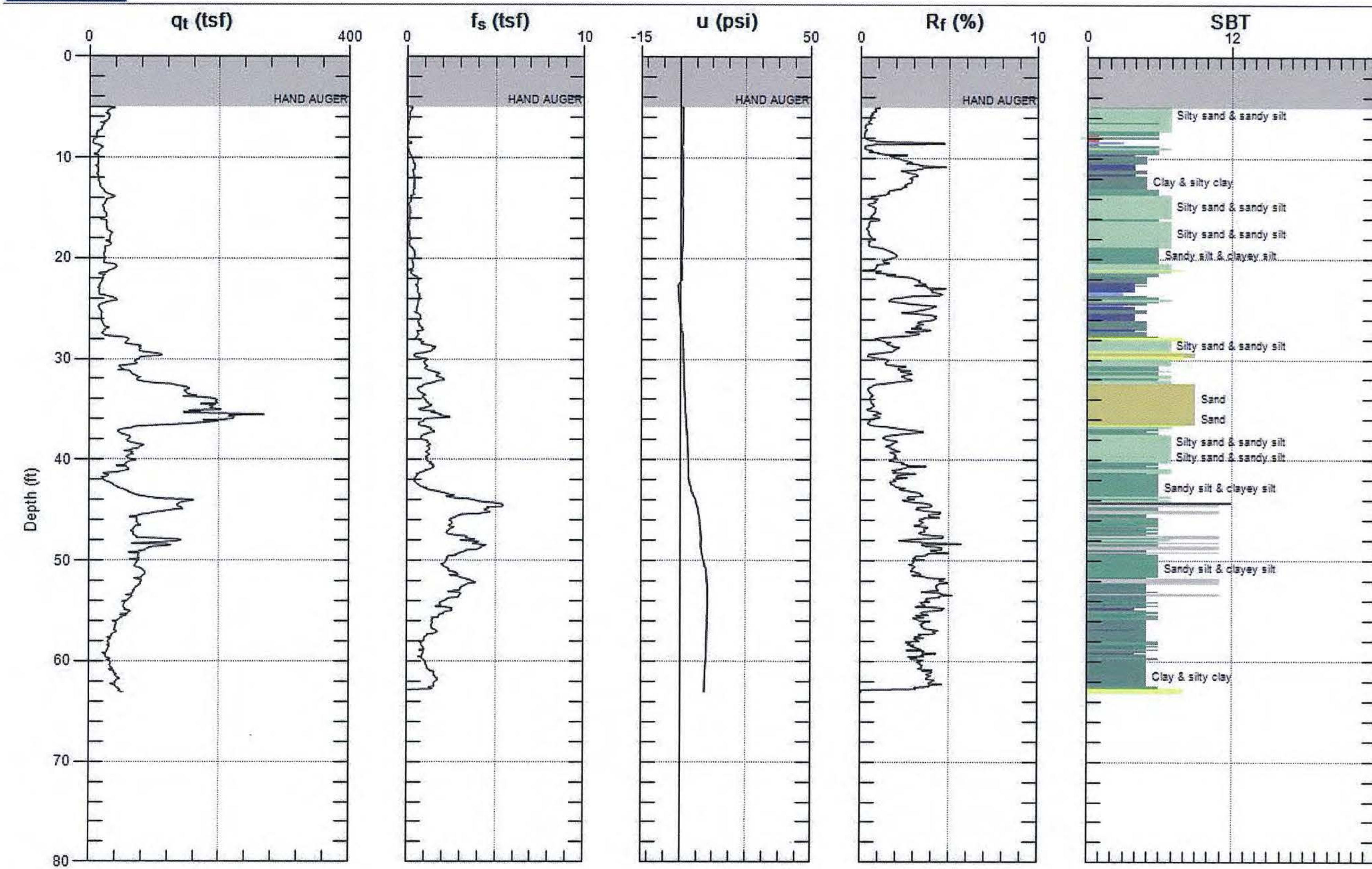
Max. Depth: 63.074 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT | **Engineer: J.BARTON**
Sounding: CPT-01 | **Date: 11/18/2014 08:57**



Max. Depth: 63.074 (ft)
Avg. Interval: 0.164 (ft)

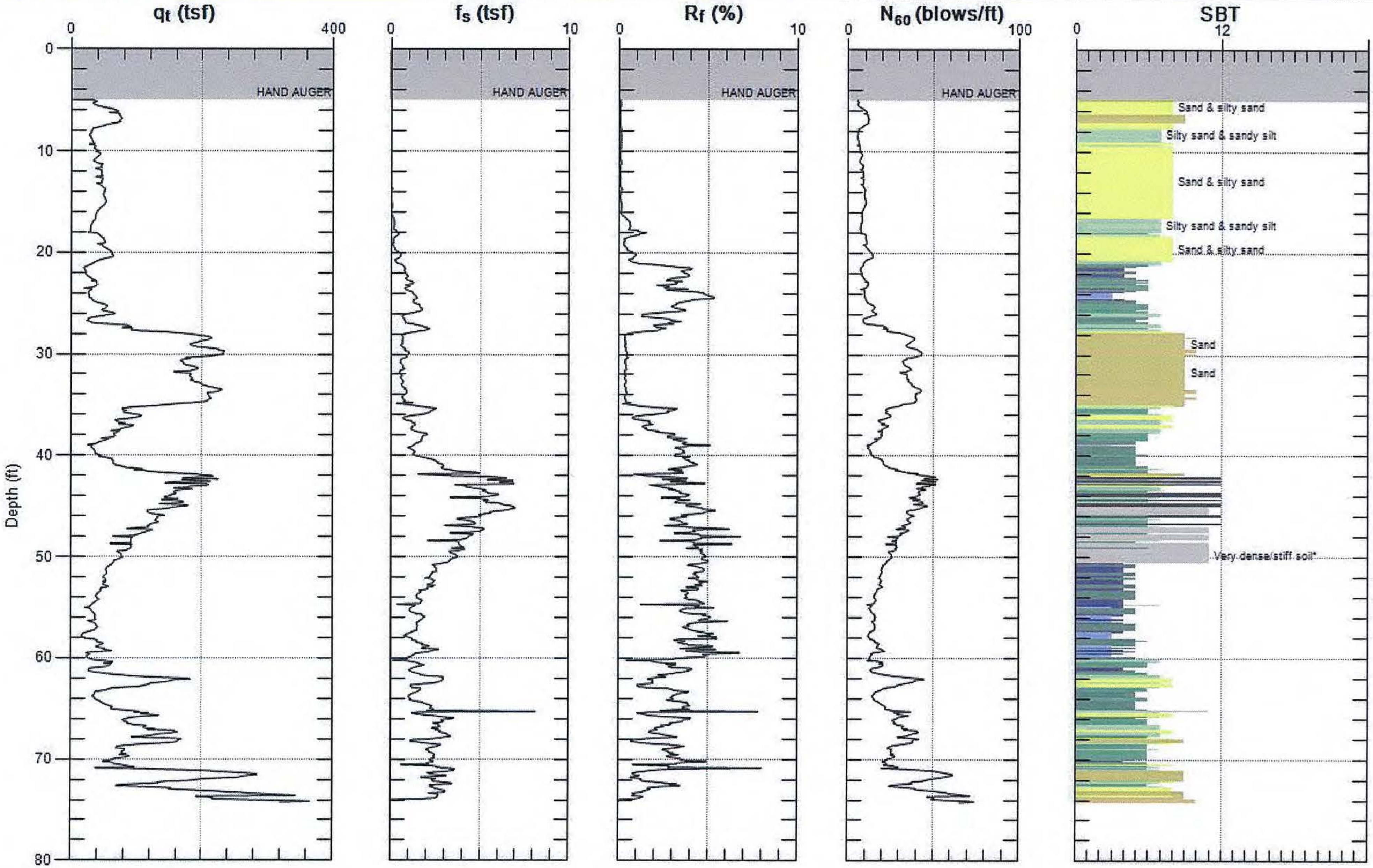
SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-02

Engineer: J.BARTON
Date: 11/18/2014 10:34



Max. Depth: 74.229 (ft)
Avg. Interval: 0.164 (ft)

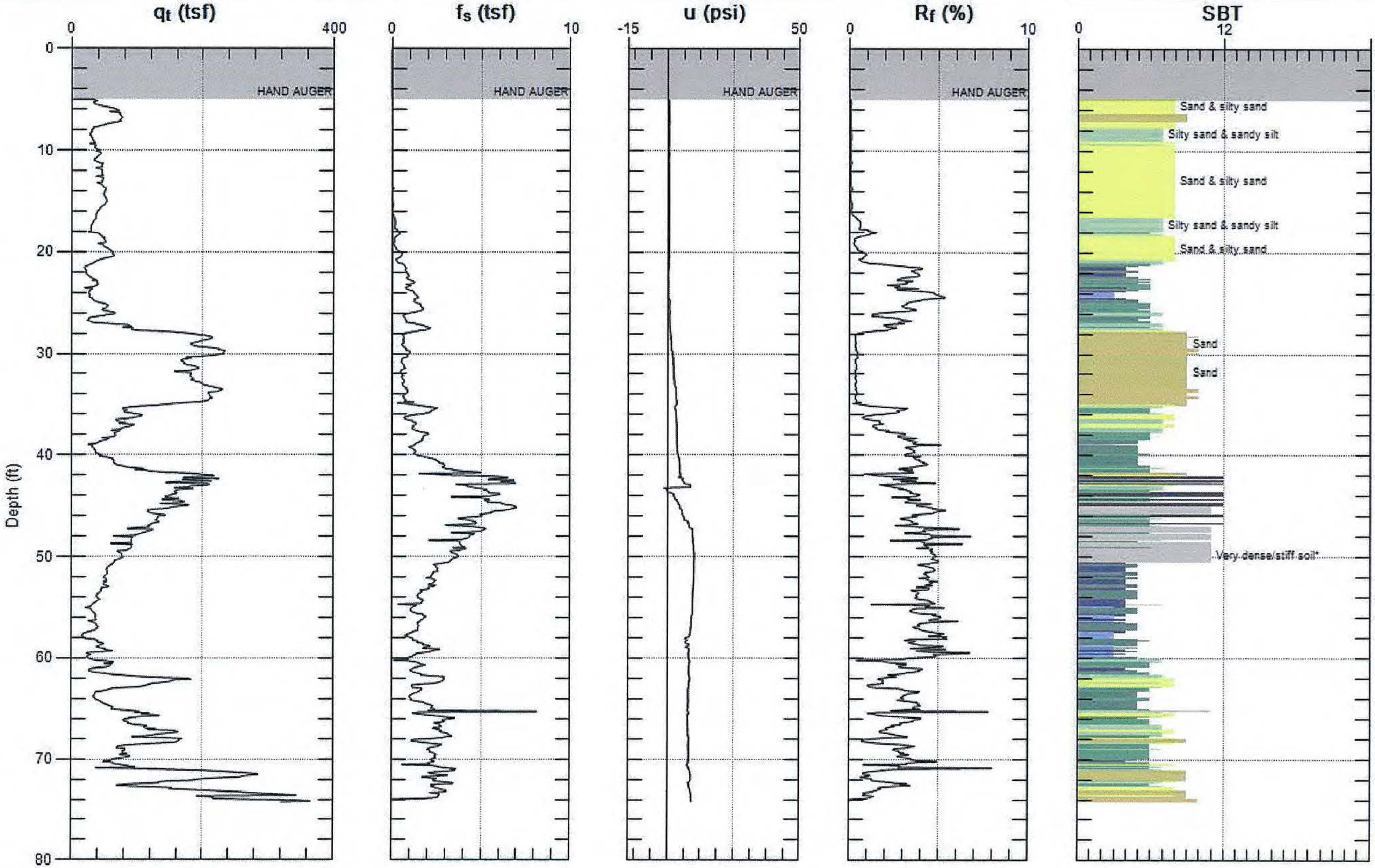
SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-02

Engineer: J.BARTON
Date: 11/18/2014 10:34



Max. Depth: 74.229 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

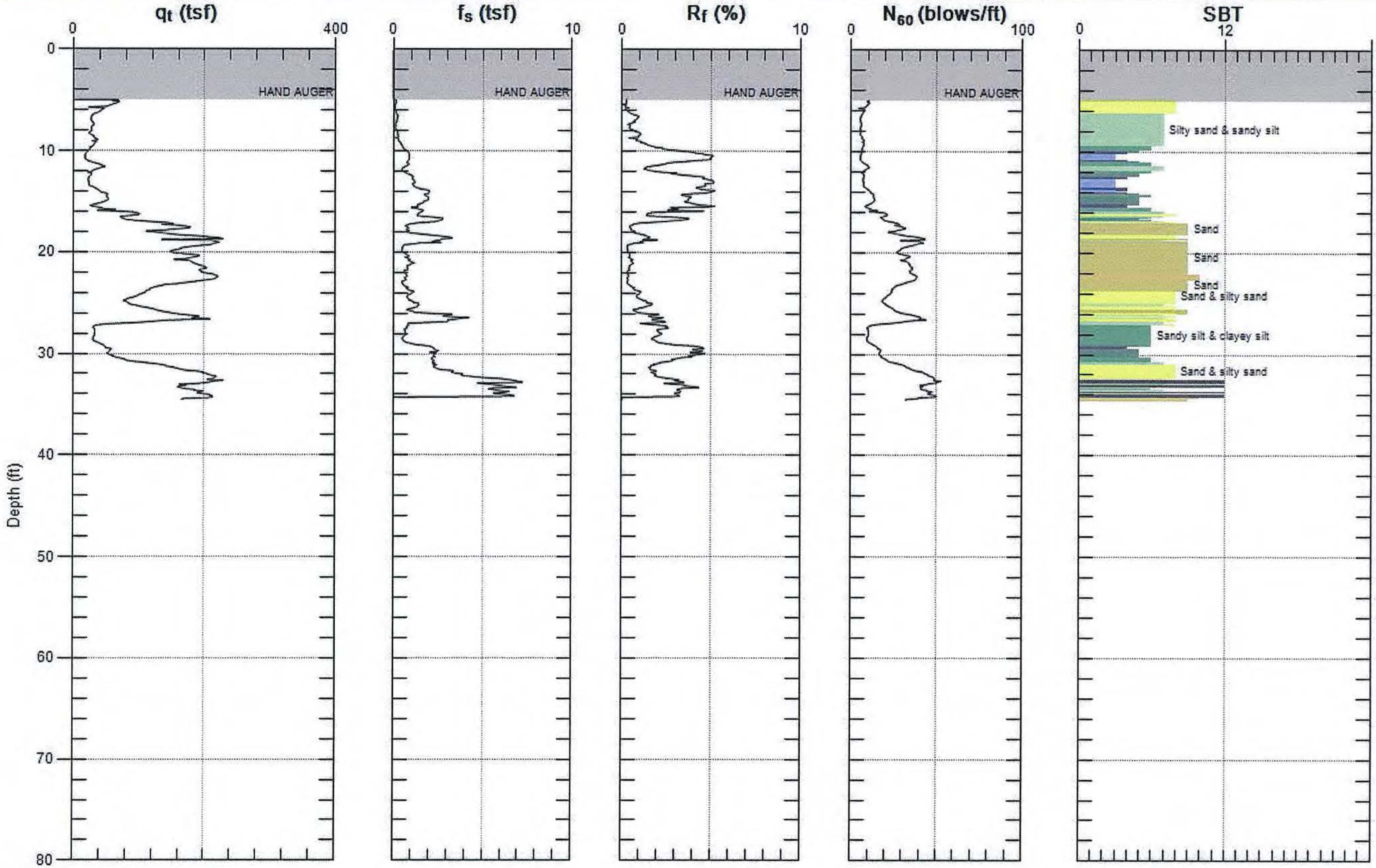
NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-03

Engineer: J.BARTON

Date: 11/18/2014 01:03

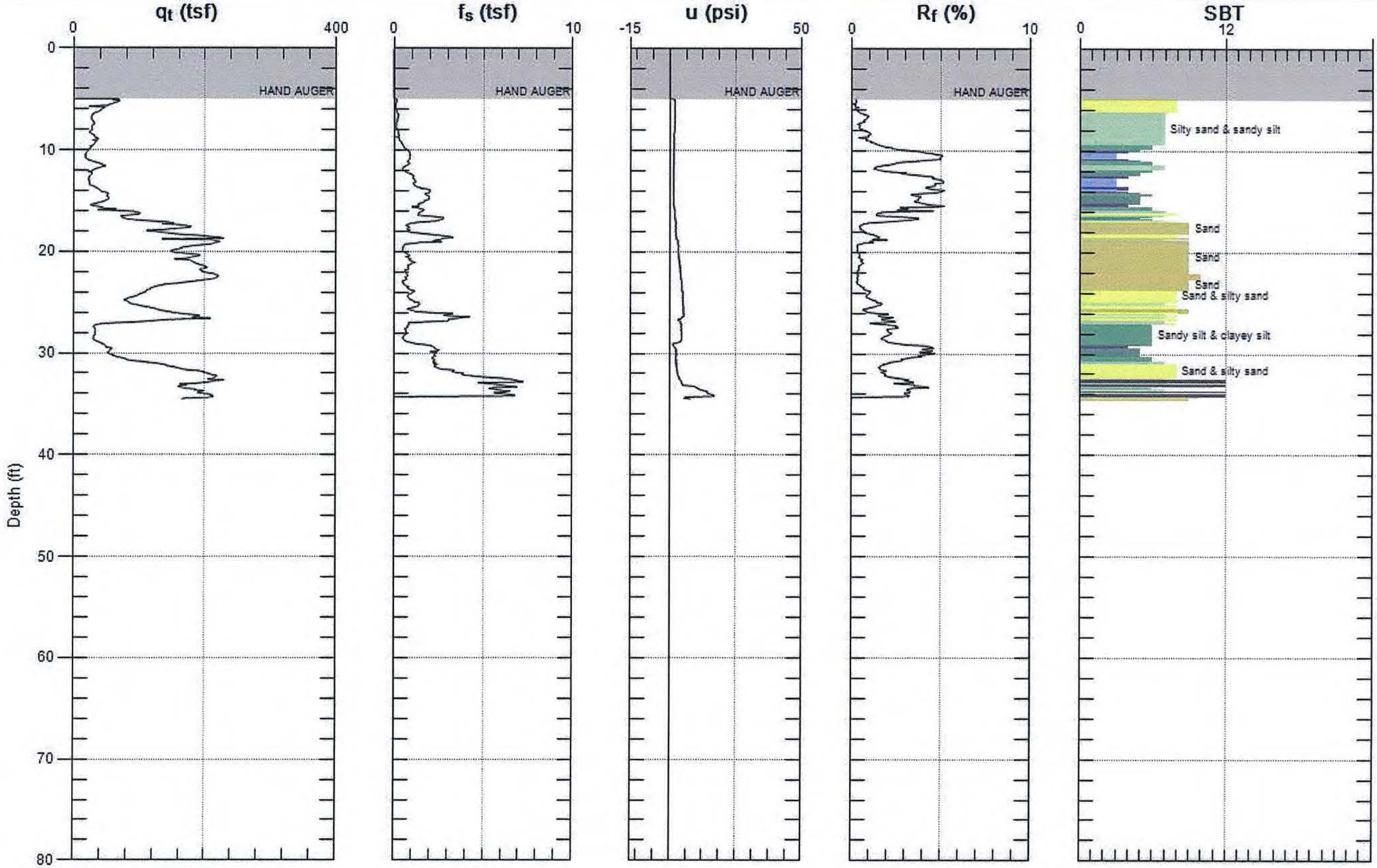


Max. Depth: 34.531 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **NINYO & MOORE**

Site: HOLLYWOOD COURT
Sounding: CPT-03
Engineer: J.BARTON
Date: 11/18/2014 01:03



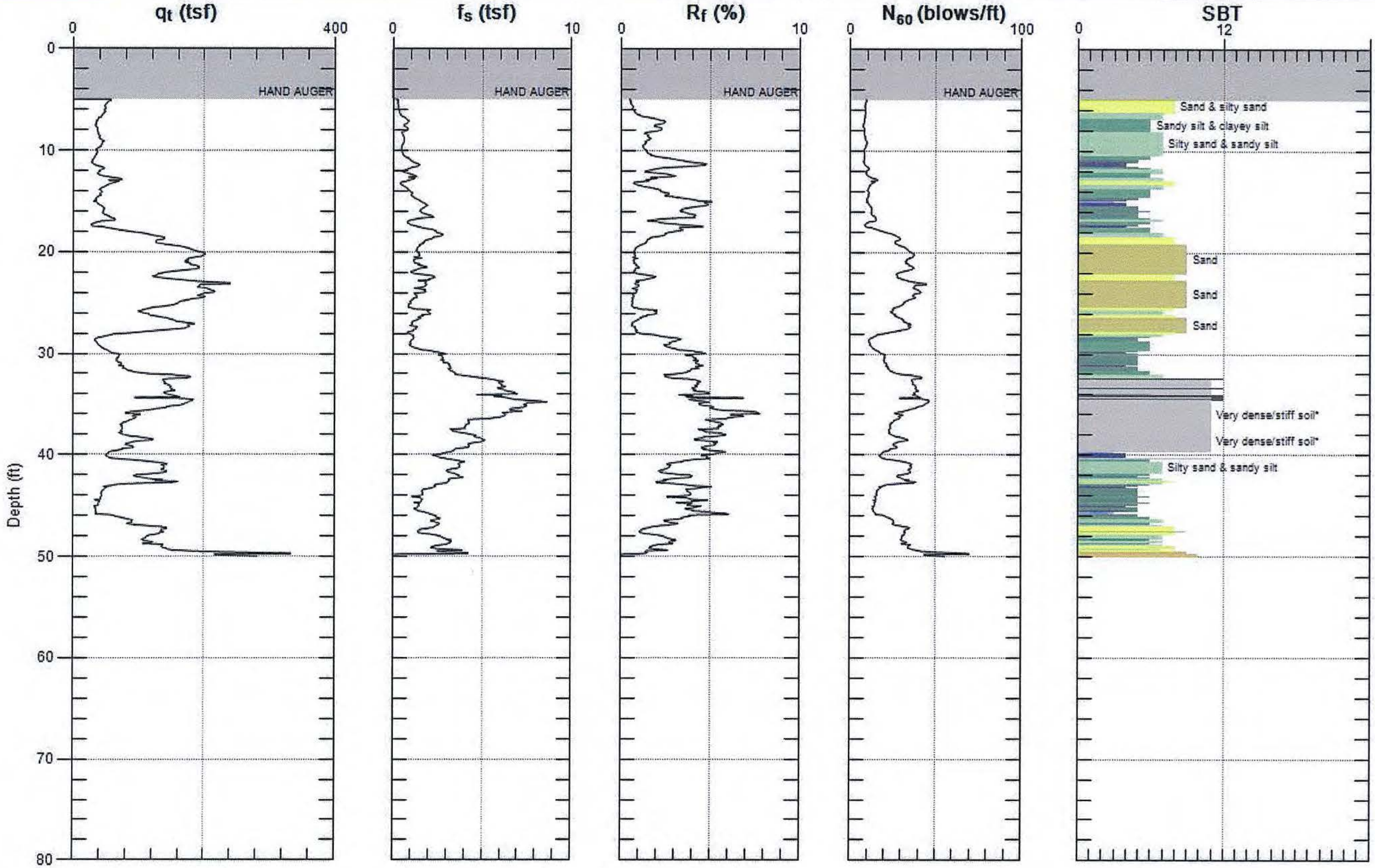
Max. Depth: 34.531 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-04

Engineer: J.BARTON
Date: 11/19/2014 07:30



Max. Depth: 50.033 (ft)
Avg. Interval: 0.164 (ft)

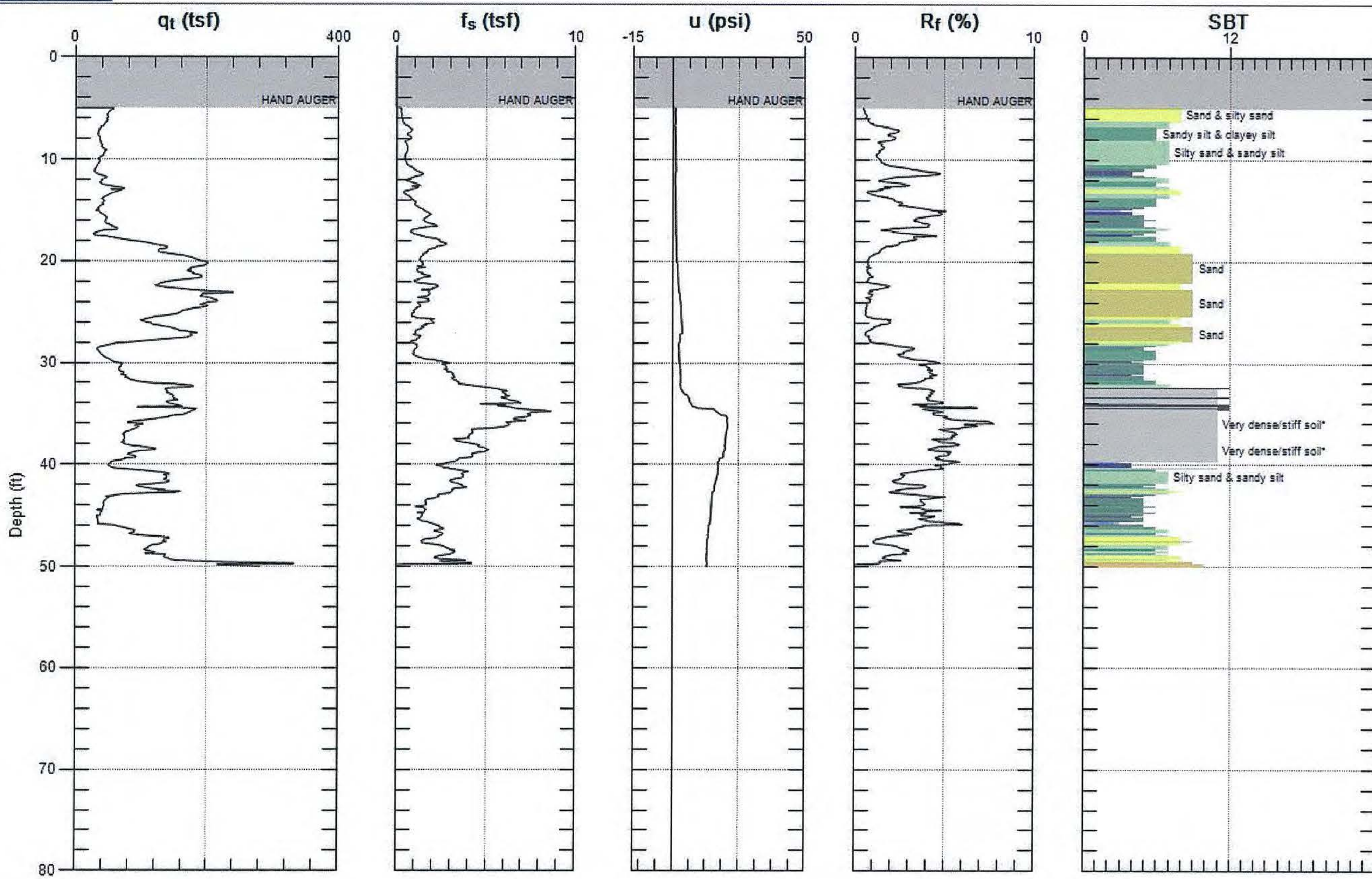
SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT **Engineer: J.BARTON**

Sounding: CPT-04 **Date: 11/19/2014 07:30**

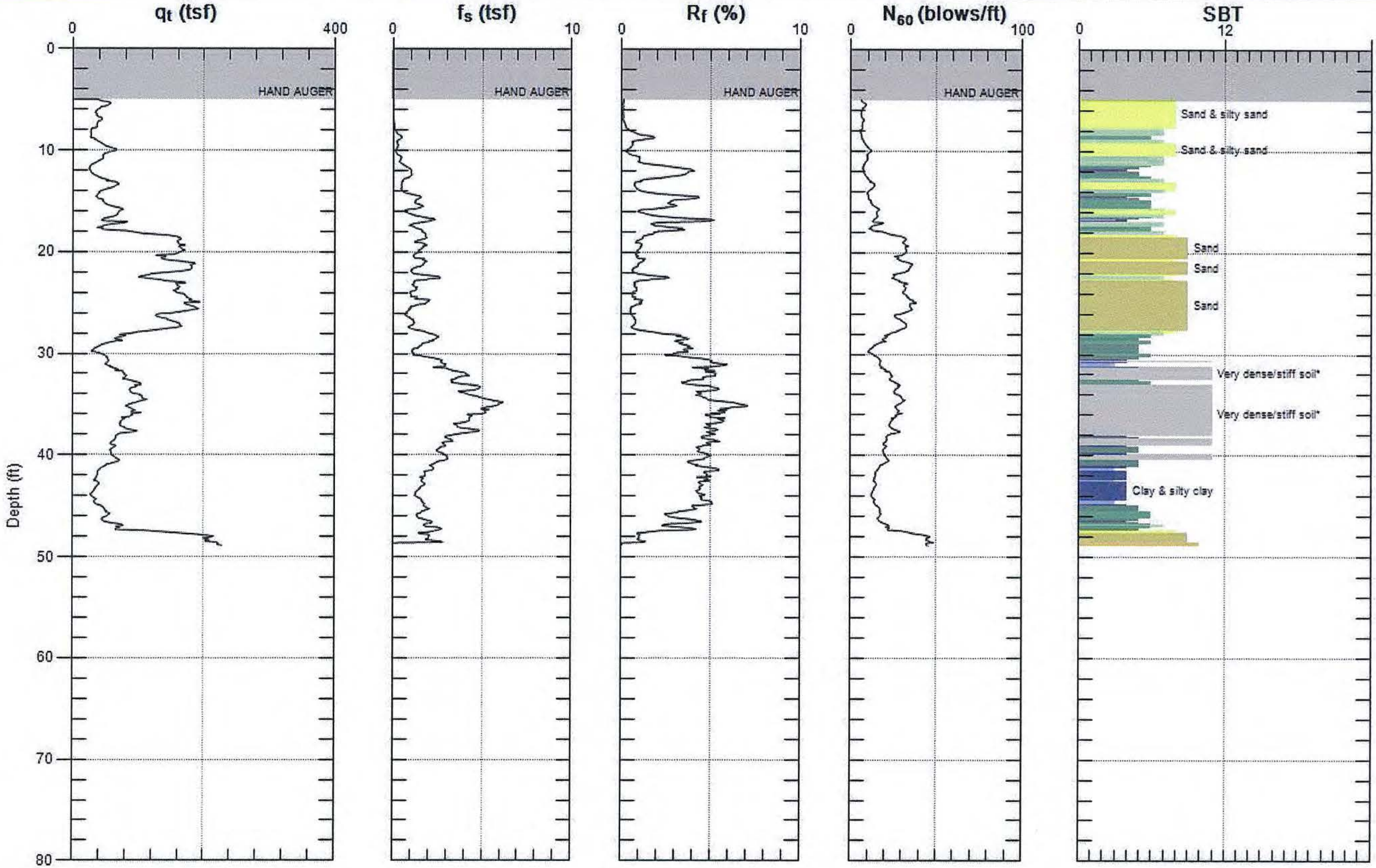


Max. Depth: 50.033 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **NINYO & MOORE**

Site: HOLLYWOOD COURT
Sounding: CPT-05
Engineer: J.BARTON
Date: 11/19/2014 08:52



Max. Depth: 48.885 (ft)
Avg. Interval: 0.164 (ft)

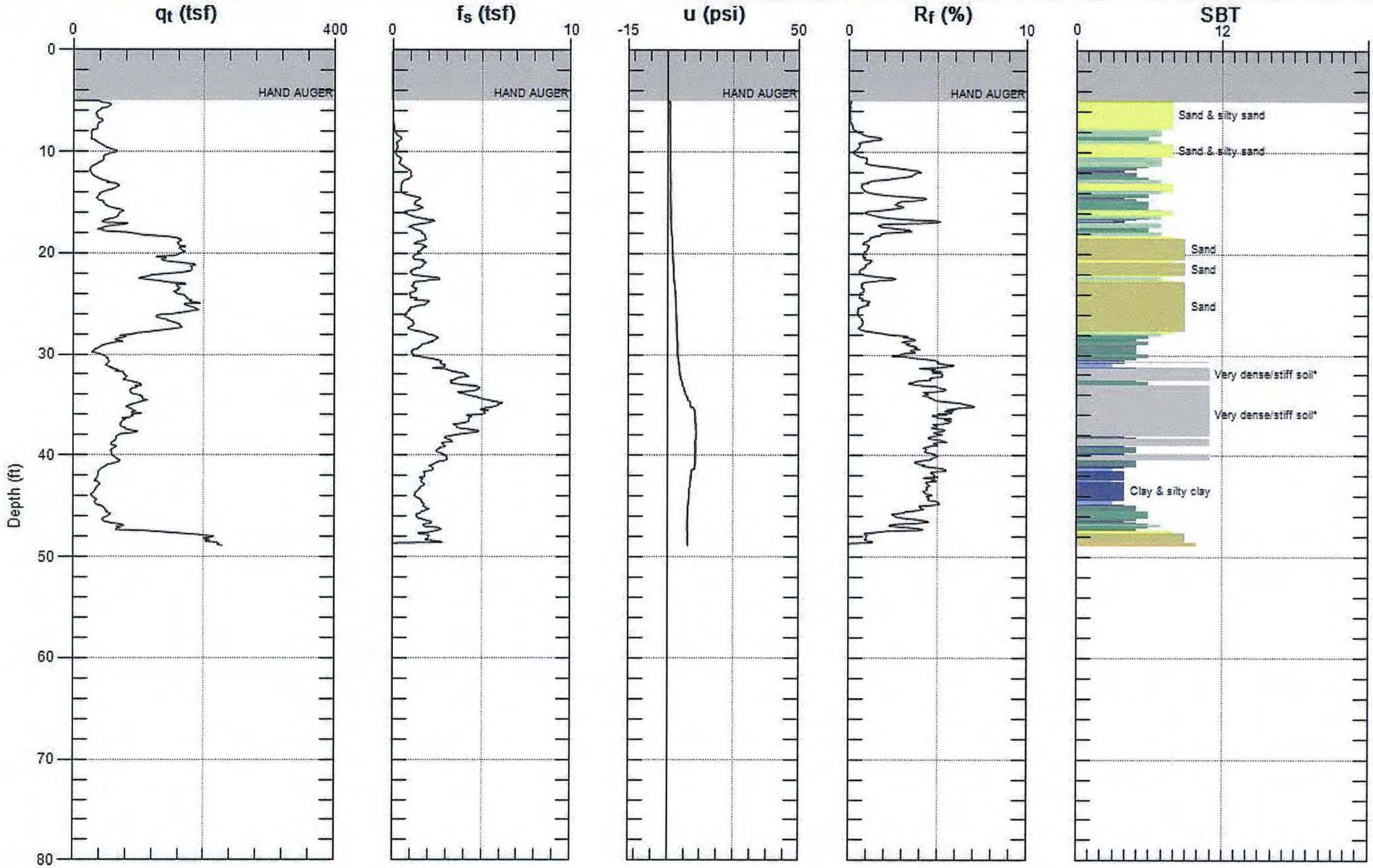
SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-05

Engineer: J.BARTON
Date: 11/19/2014 08:52



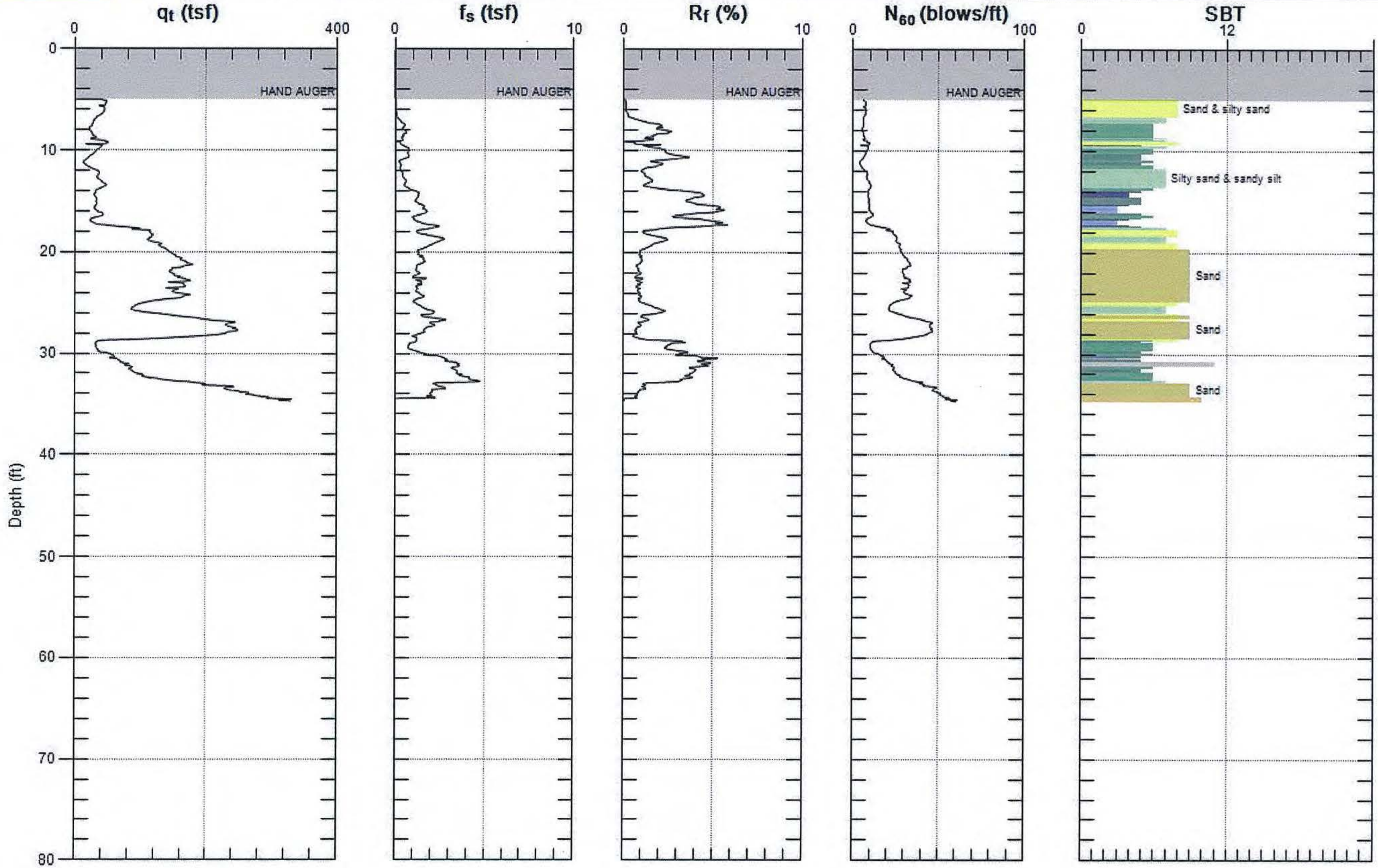
Max. Depth: 48.885 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-06
Engineer: J.BARTON
Date: 11/19/2014 10:31



Max. Depth: 34.695 (ft)
Avg. Interval: 0.164 (ft)

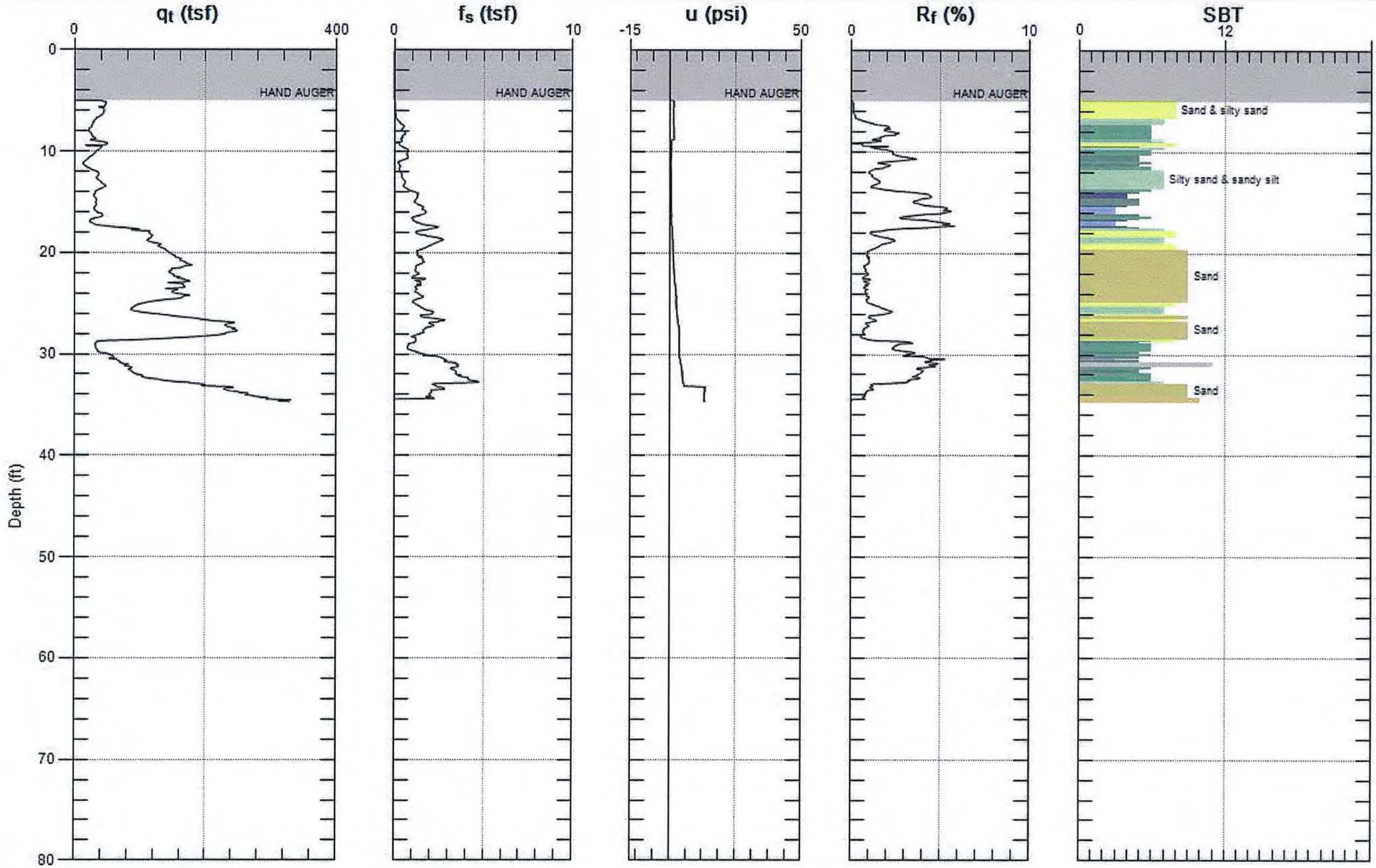
SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-06

Engineer: J.BARTON
Date: 11/19/2014 10:31



Max. Depth: 34.695 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

January 26, 2015

Ninyo & Moore
Attn: Jim Barton

Subject: CPT Site Investigation
Hollywood Courthouse
Los Angeles, California
GREGG Project Number: 14-812SH – part 2

Dear Mr. Barton:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☐
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☐
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG Drilling & Testing, Inc.

Peter Robertson
Technical Director, Gregg Drilling & Testing, Inc.

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
CPT-07	1/21/15	51	-	-	-
CPT-08	1/21/15	49	-	-	-
CPT-09	1/22/15	35	-	-	-
CPT-10	1/22/15	35	-	-	-
CPT-11	1/22/15	25	-	-	-
CPT-12	1/23/15	70	-	-	-
CPT-13	1/22/15	45	-	-	-
CPT-14	1/23/15	61	-	-	-

Bibliography

Lunne, T., Robertson, P.K. and Powell, J.J.M., "Cone Penetration Testing in Geotechnical Practice" E & FN Spon. ISBN 0 419 23750, 1997

Roberston, P.K., "Soil Classification using the Cone Penetration Test", Canadian Geotechnical Journal, Vol. 27, 1990 pp. 151-158.

Mayne, P.W., "NHI (2002) Manual on Subsurface Investigations: Geotechnical Site Characterization", available through www.ce.gatech.edu/~geosys/Faculty/Mayne/papers/index.html, Section 5.3, pp. 107-112.

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Robertson, P.K., Sully, J., Woeller, D.J., Lunne, T., Powell, J.J.M., and Gillespie, D.J., "Guidelines for Estimating Consolidation Parameters in Soils from Piezocone Tests", Canadian Geotechnical Journal, Vol. 29, No. 4, August 1992, pp. 539-550.

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Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

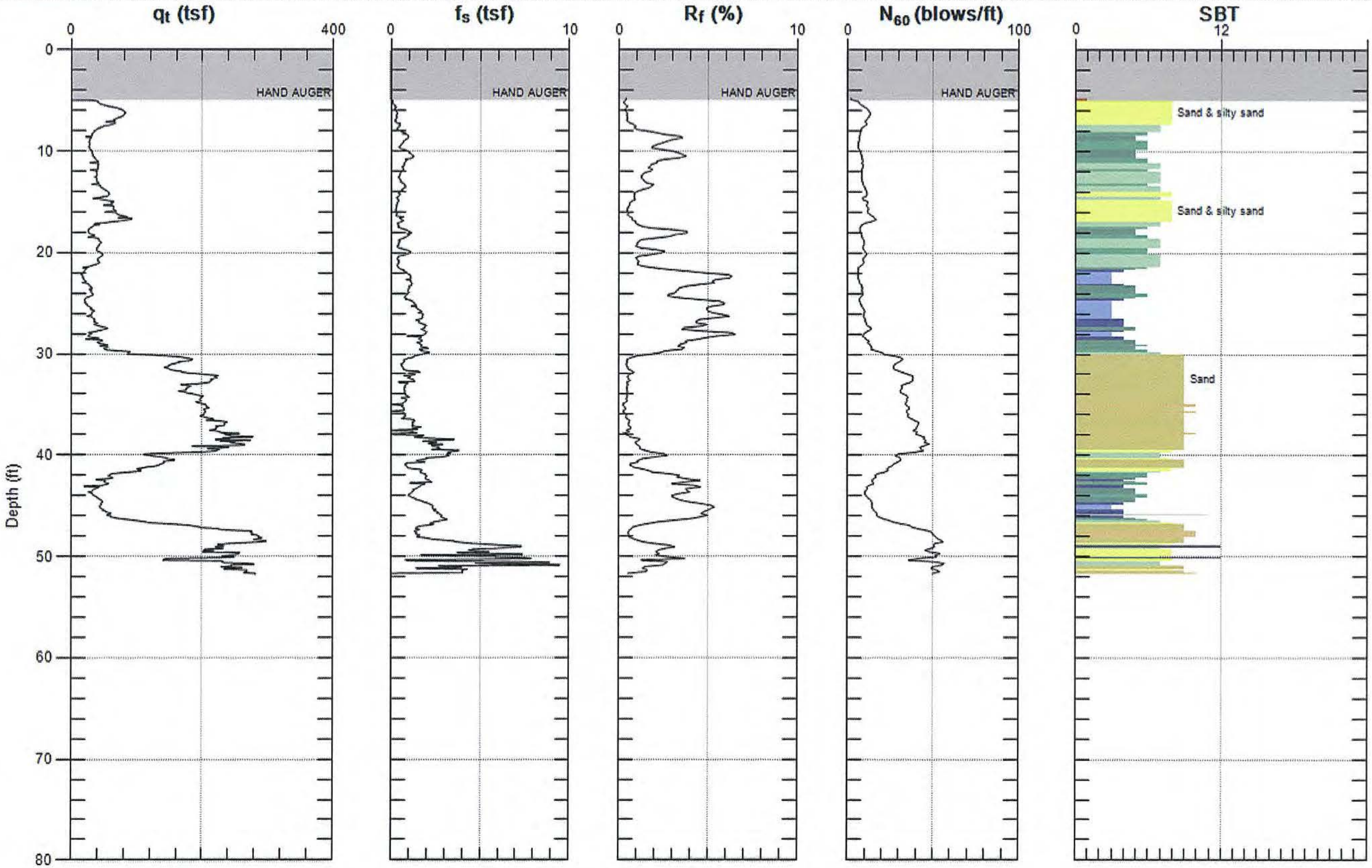
Copies of ASTM Standards are available through www.astm.org

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-7

Engineer: J.BARTON
Date: 1/21/2015 07:05

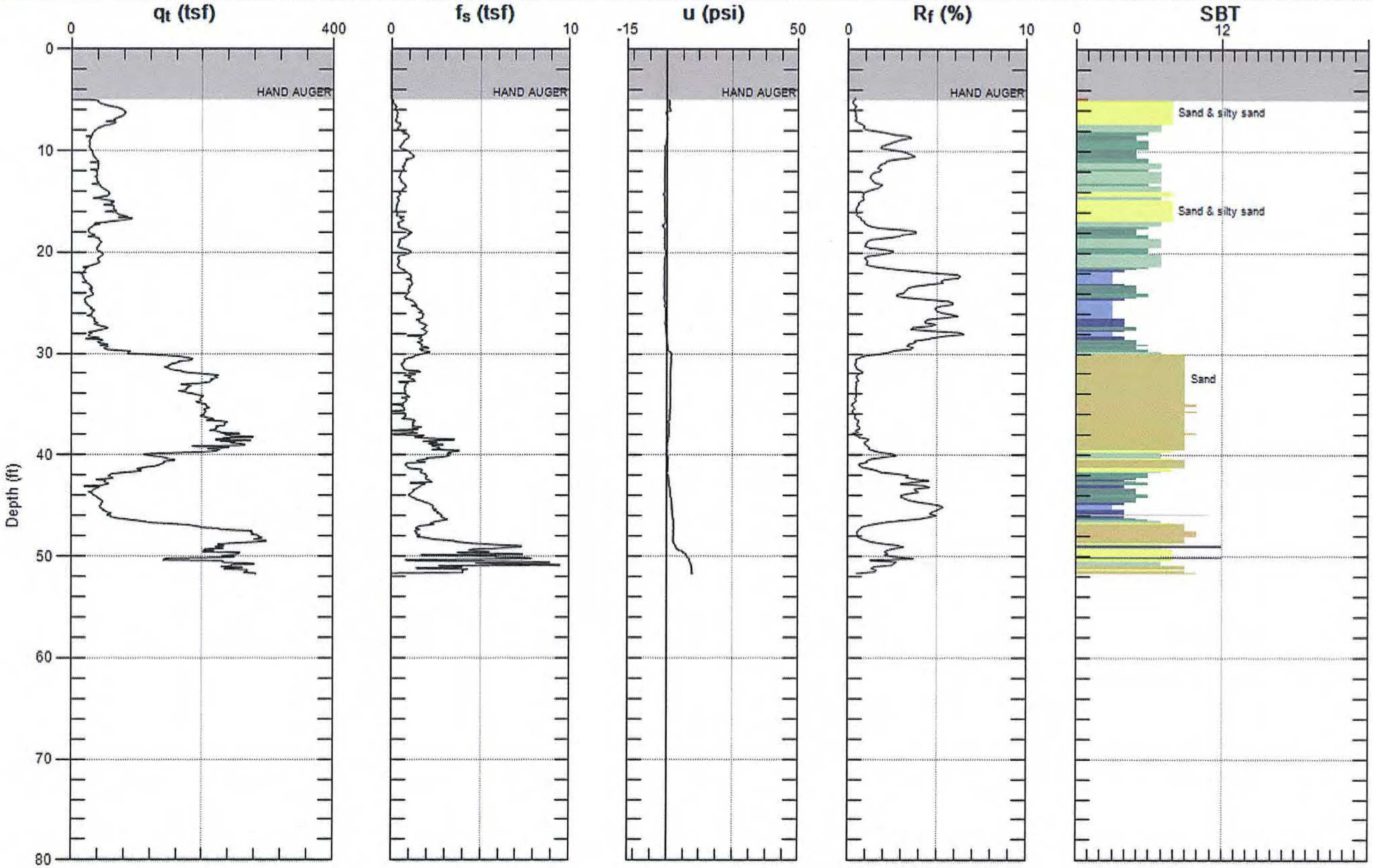


Max. Depth: 51.755 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **NINYO & MOORE**

Site: HOLLYWOOD COURT | Engineer: J.BARTON
Sounding: CPT-7 | Date: 1/21/2015 07:05



Max. Depth: 51.755 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

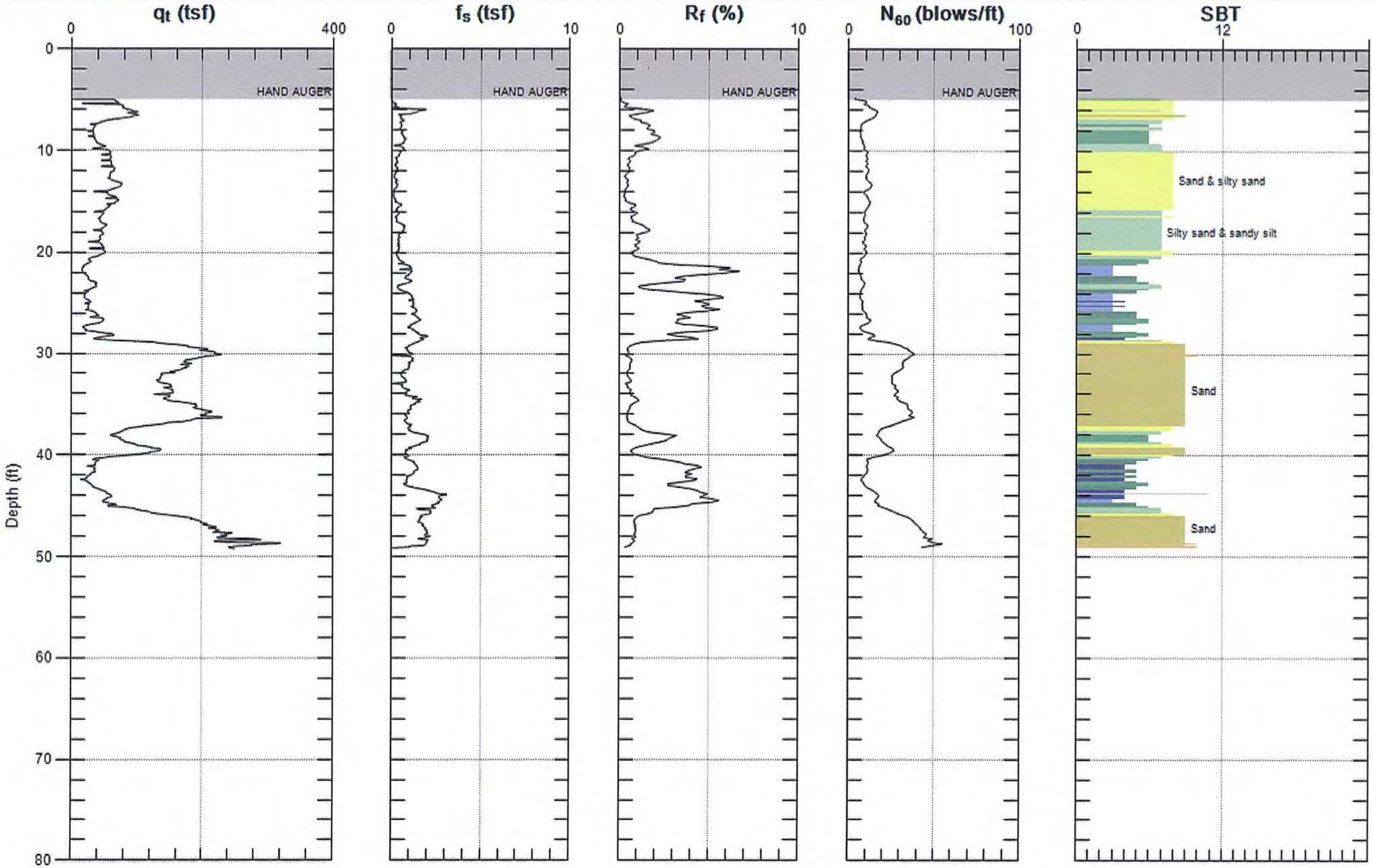
NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-8

Engineer: J.BARTON

Date: 1/21/2015 09:01



Max. Depth: 49.213 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

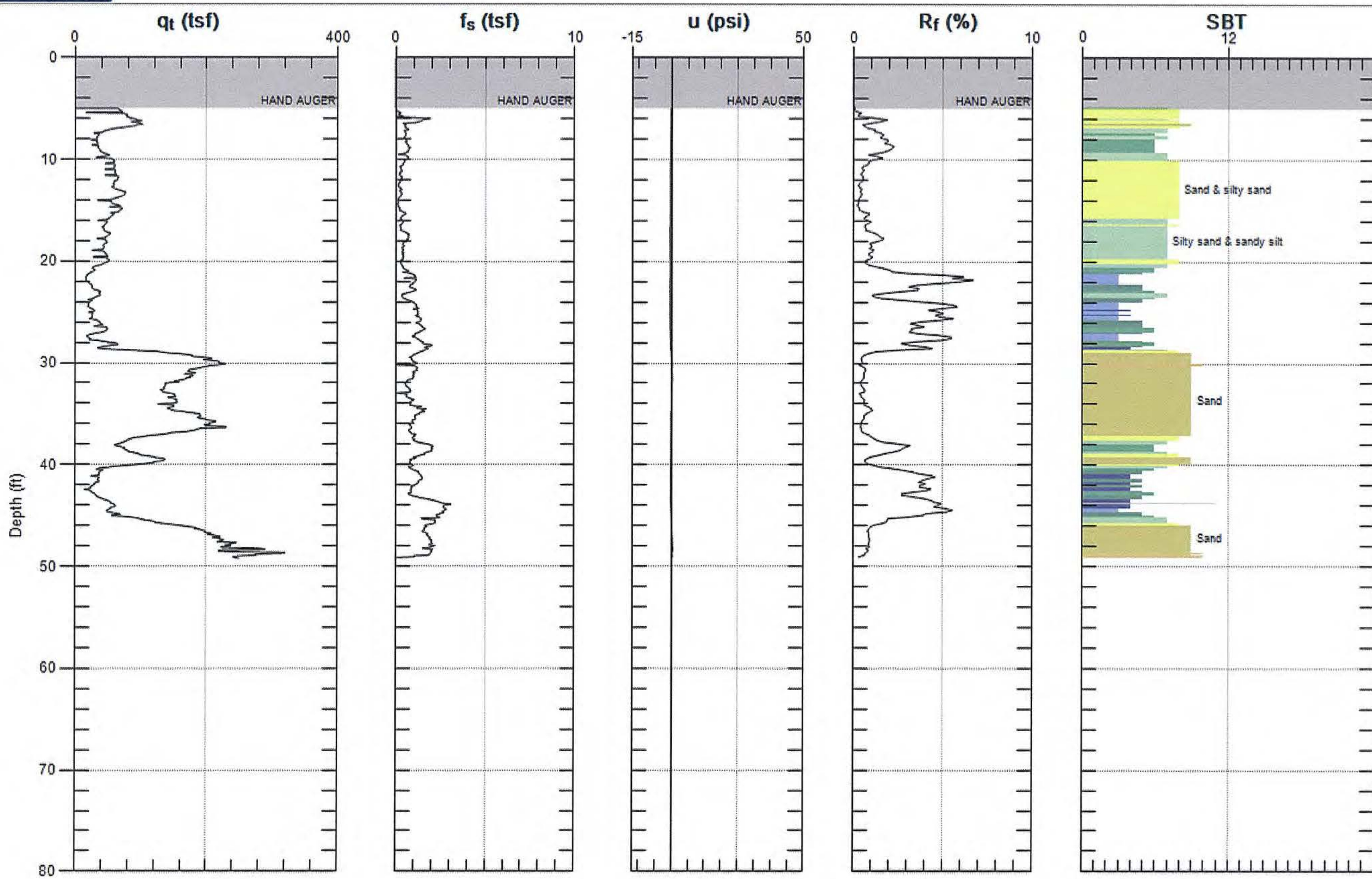
NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-8

Engineer: J.BARTON

Date: 1/21/2015 09:01

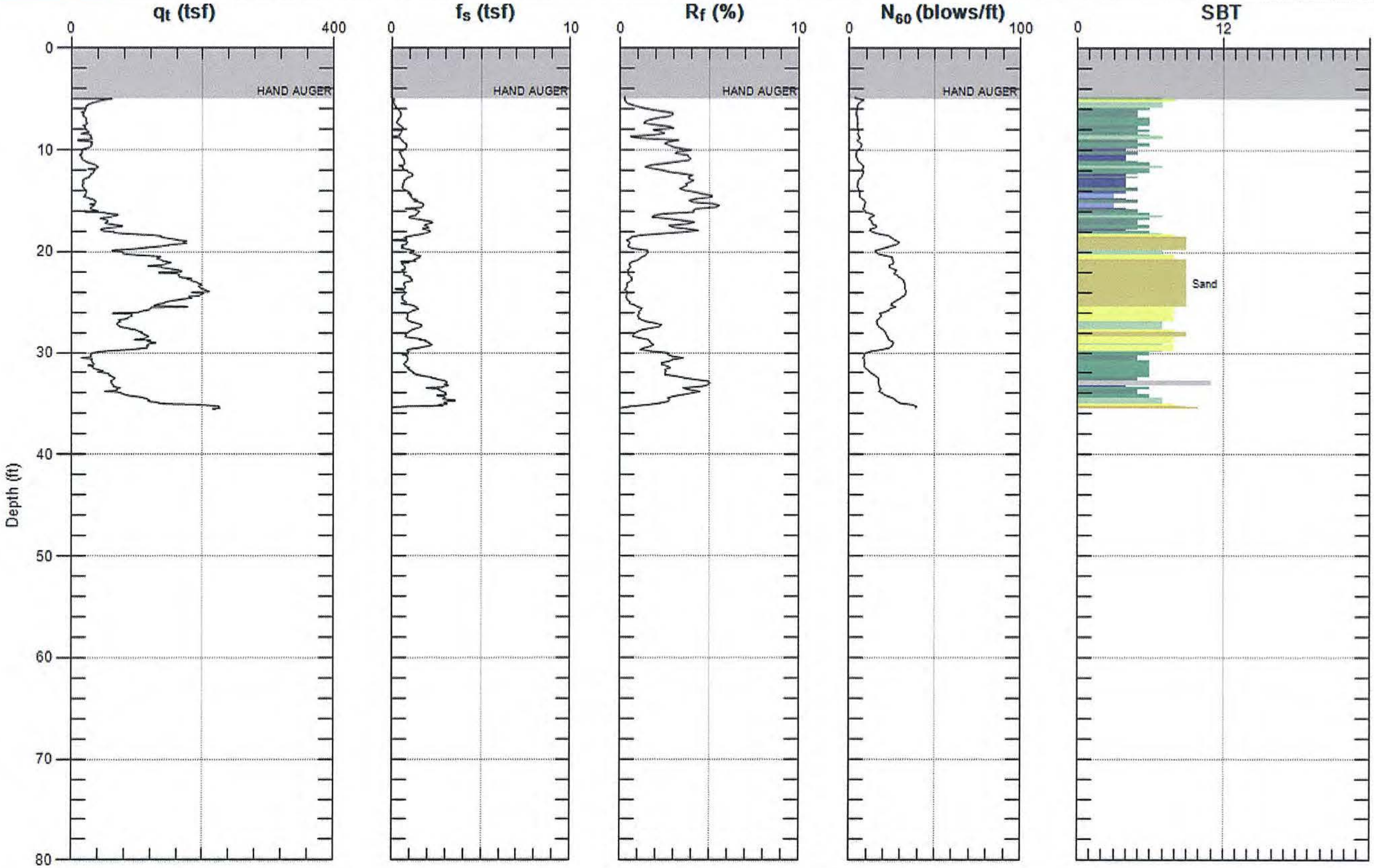


Max. Depth: 49.213 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **NINYO & MOORE**

Site: HOLLYWOOD COURT
Sounding: CPT-9
Engineer: J.BARTON
Date: 1/22/2015 10:38



Max. Depth: 35.597 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

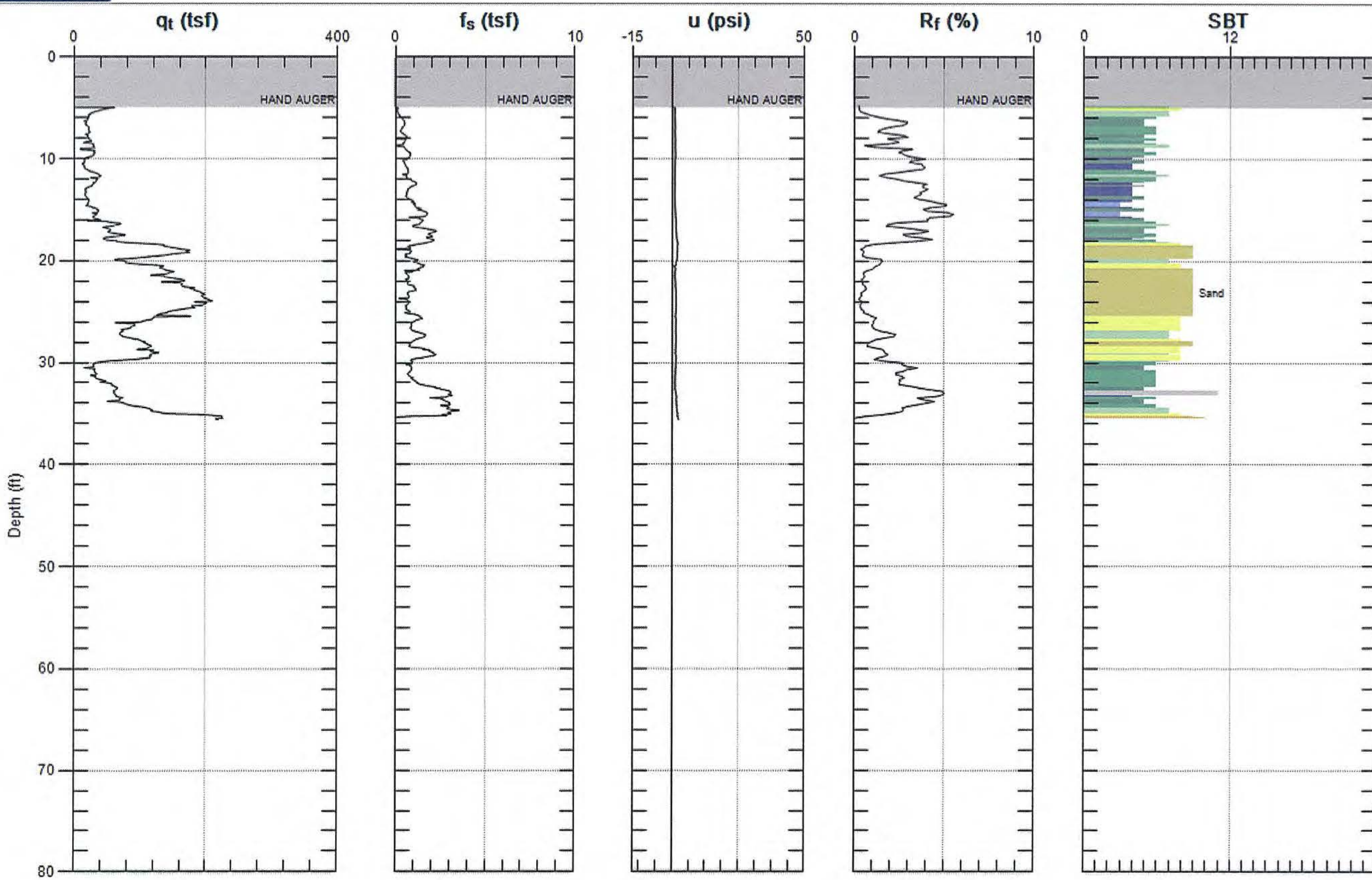
NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-9

Engineer: J.BARTON

Date: 1/22/2015 10:38



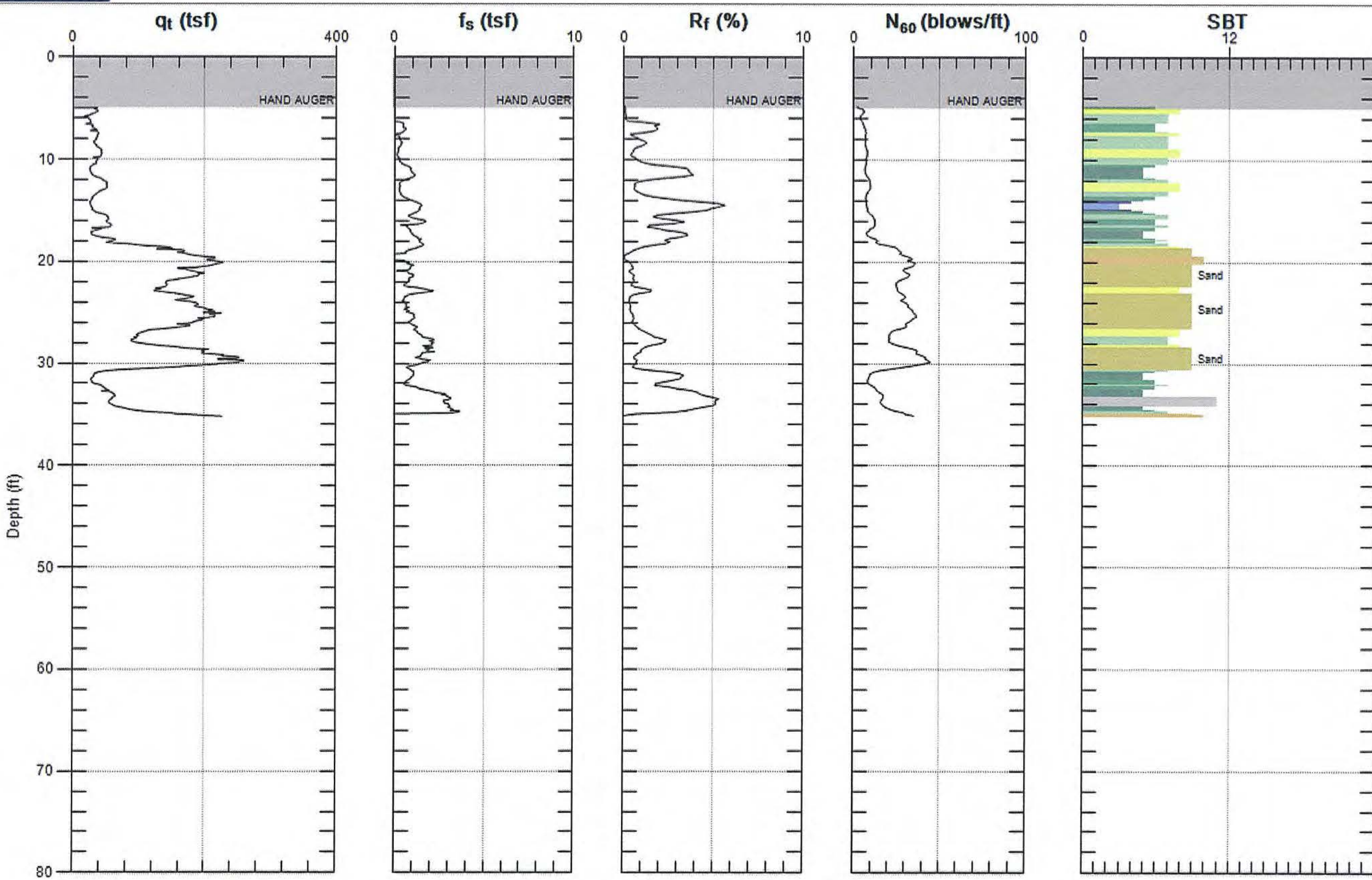
Max. Depth: 35.597 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-10
Engineer: J.BARTON
Date: 1/22/2015 11:20



Max. Depth: 35.187 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

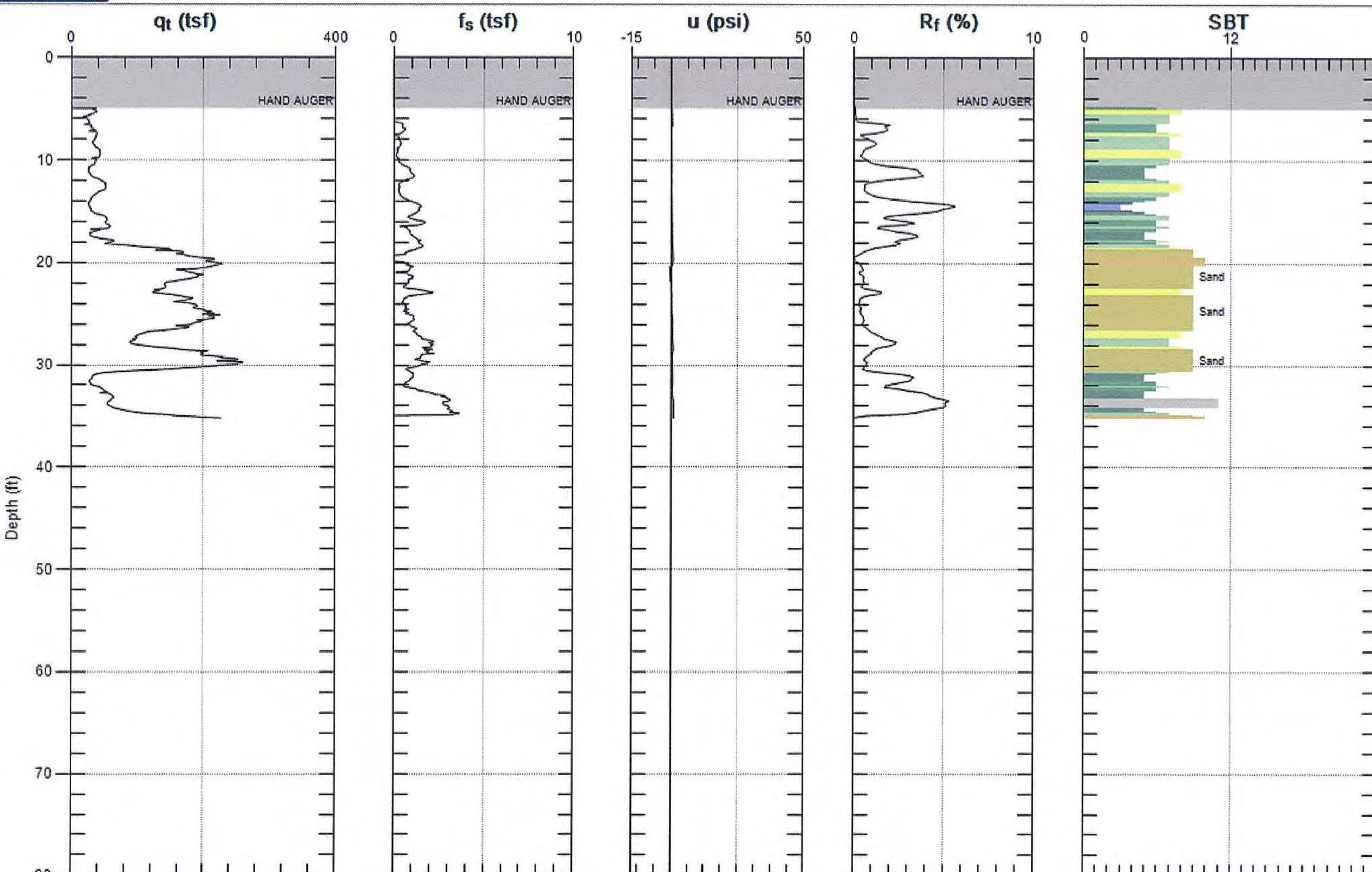
NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-10

Engineer: J.BARTON

Date: 1/22/2015 11:20



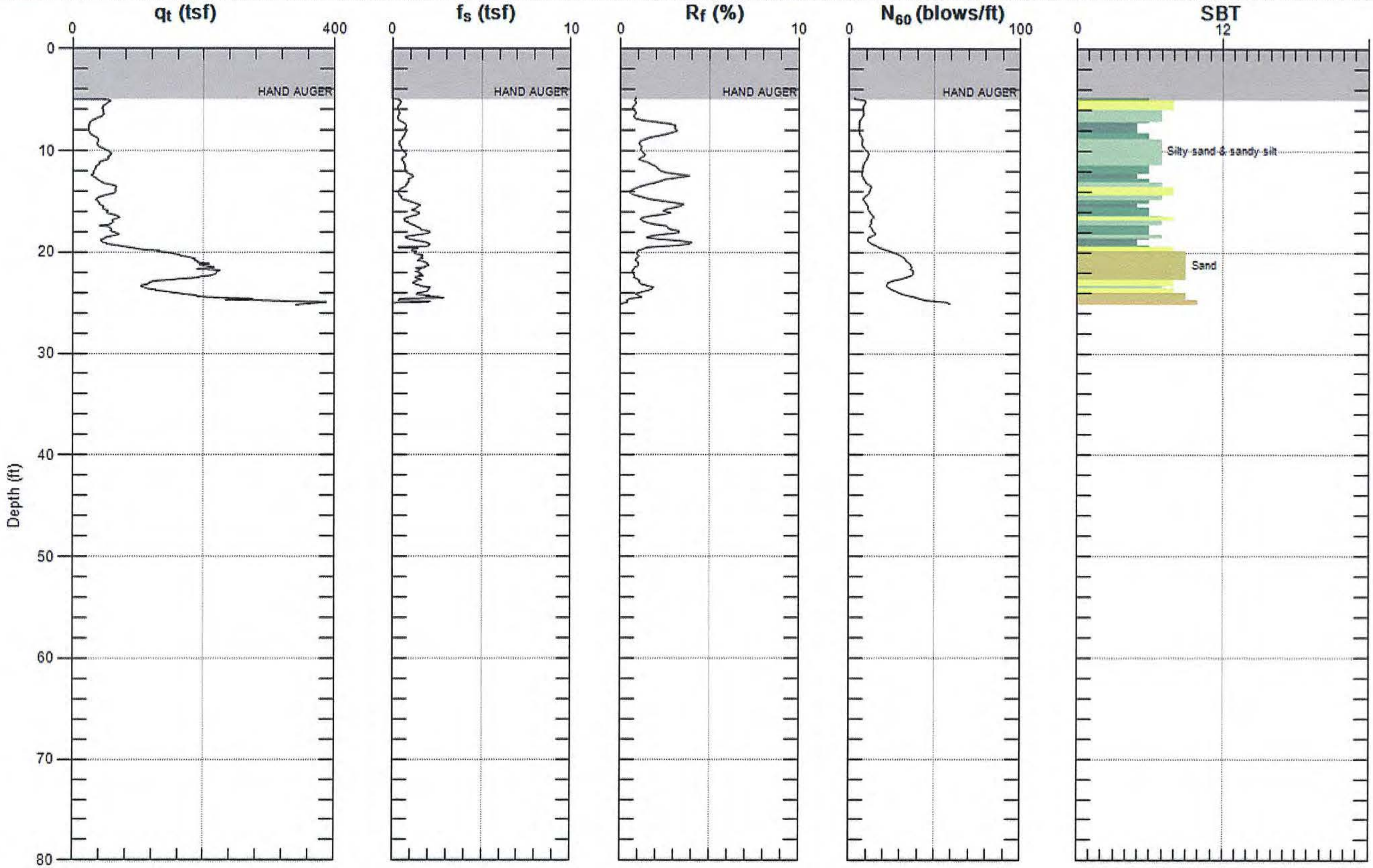
Max. Depth: 35.187 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-11

Engineer: J.BARTON
Date: 1/22/2015 01:11



Max. Depth: 25.262 (ft)
Avg. Interval: 0.164 (ft)

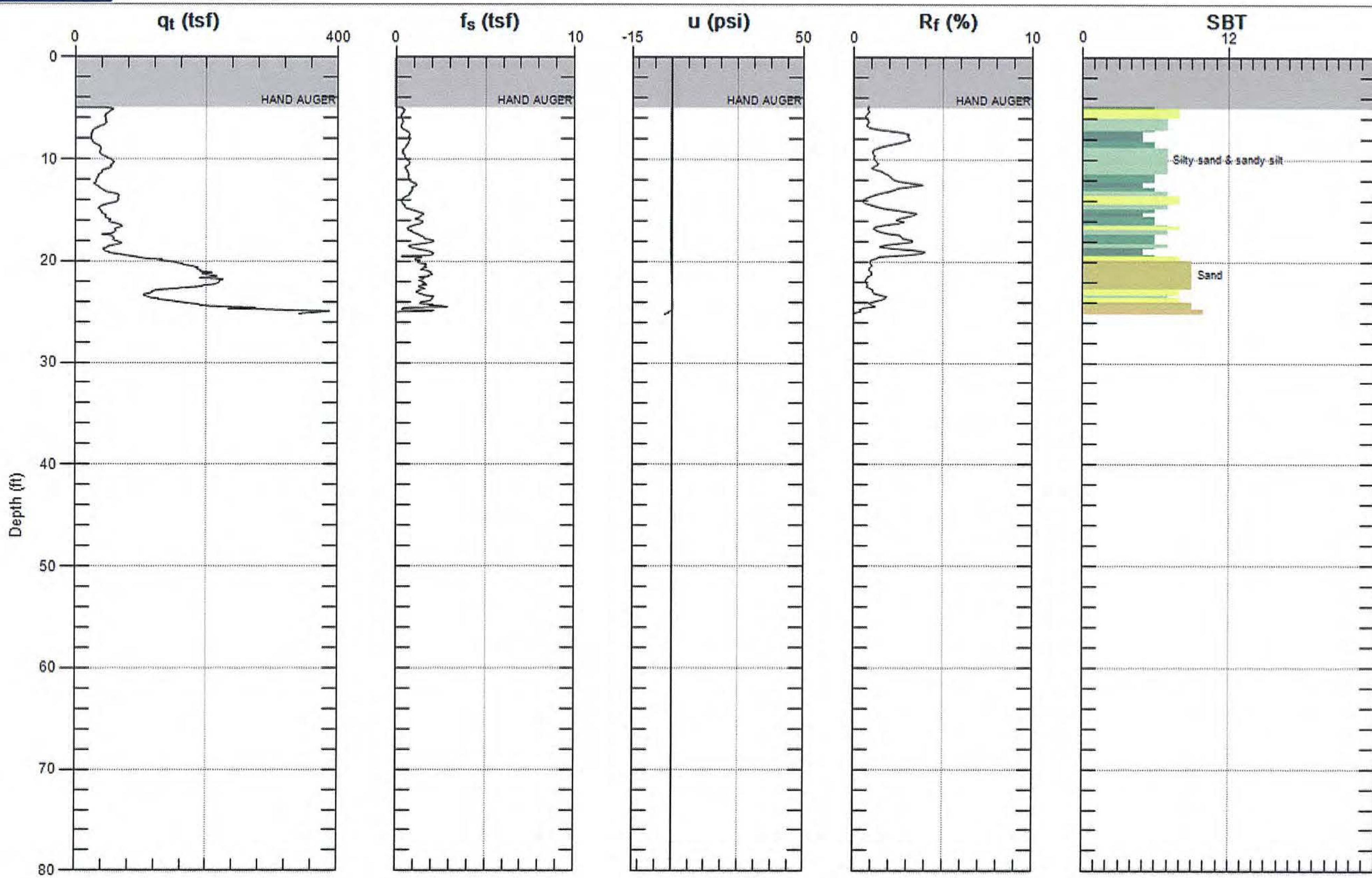
SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT **Engineer: J.BARTON**

Sounding: CPT-11 **Date: 1/22/2015 01:11**



Max. Depth: 25.262 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

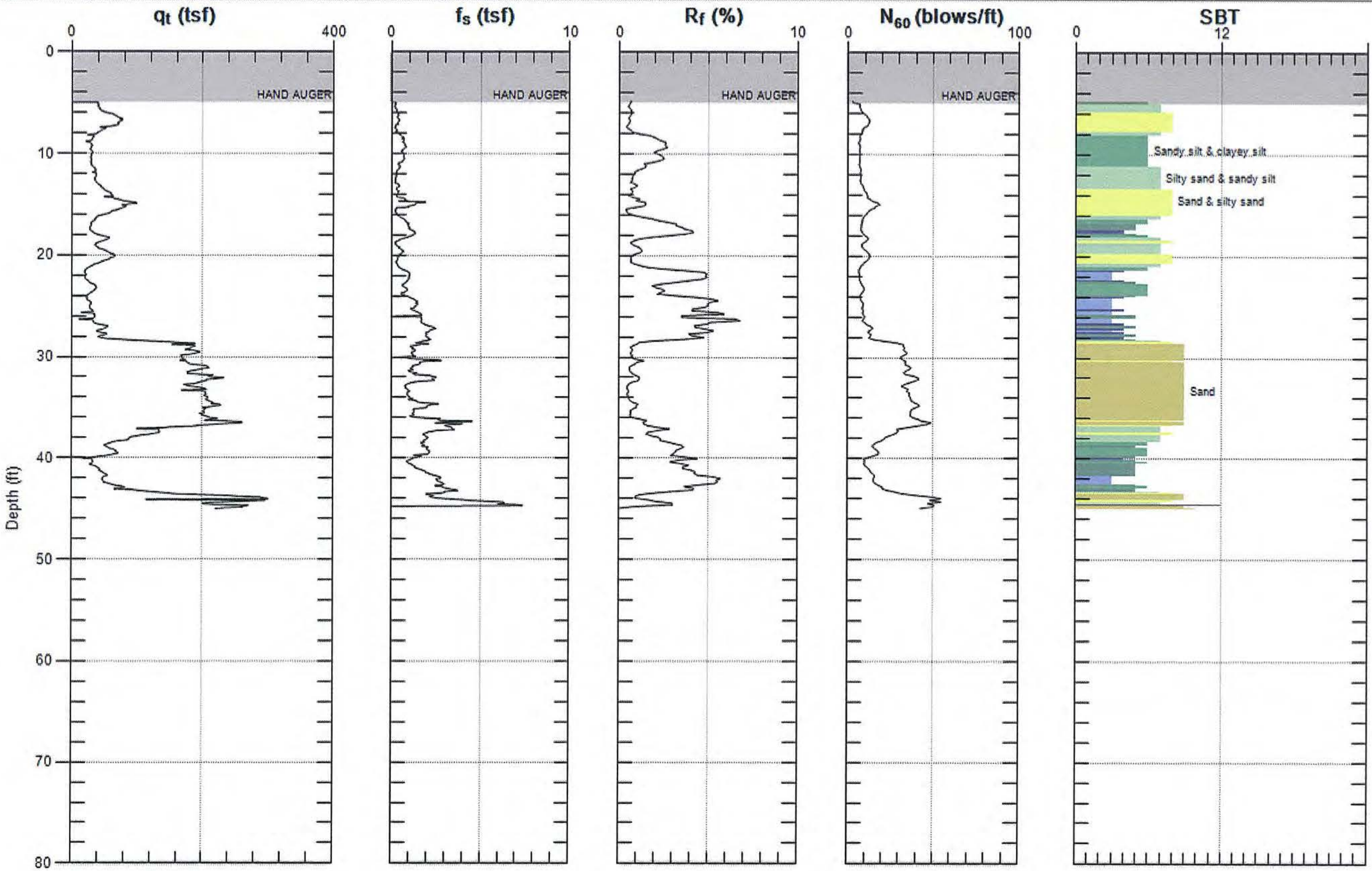
NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-12

Engineer: J.BARTON

Date: 1/23/2015 10:58



Max. Depth: 45.030 (ft)

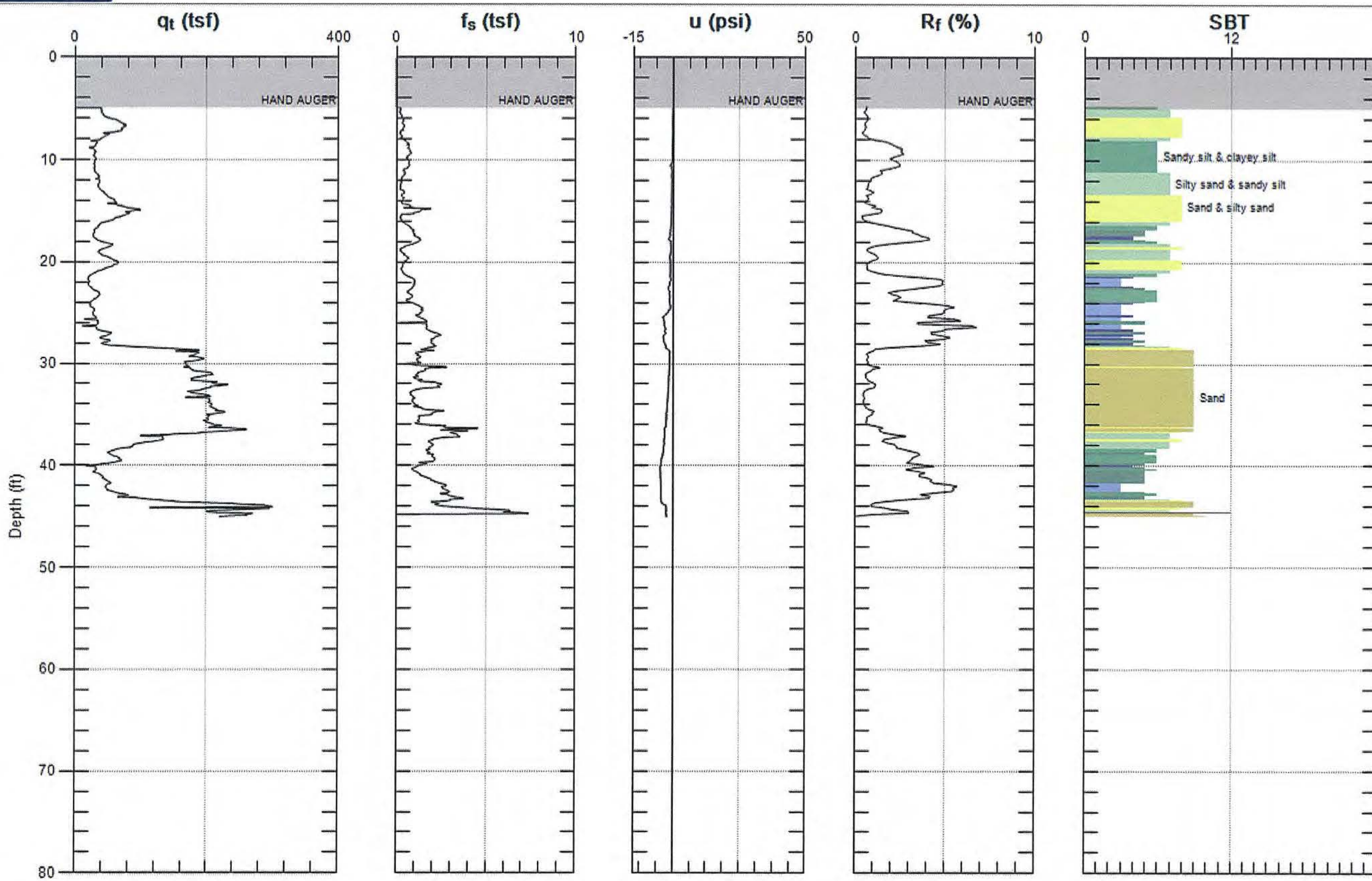
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT | **Engineer: J.BARTON**
Sounding: CPT-12 | **Date: 1/23/2015 10:58**



Max. Depth: 45.030 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

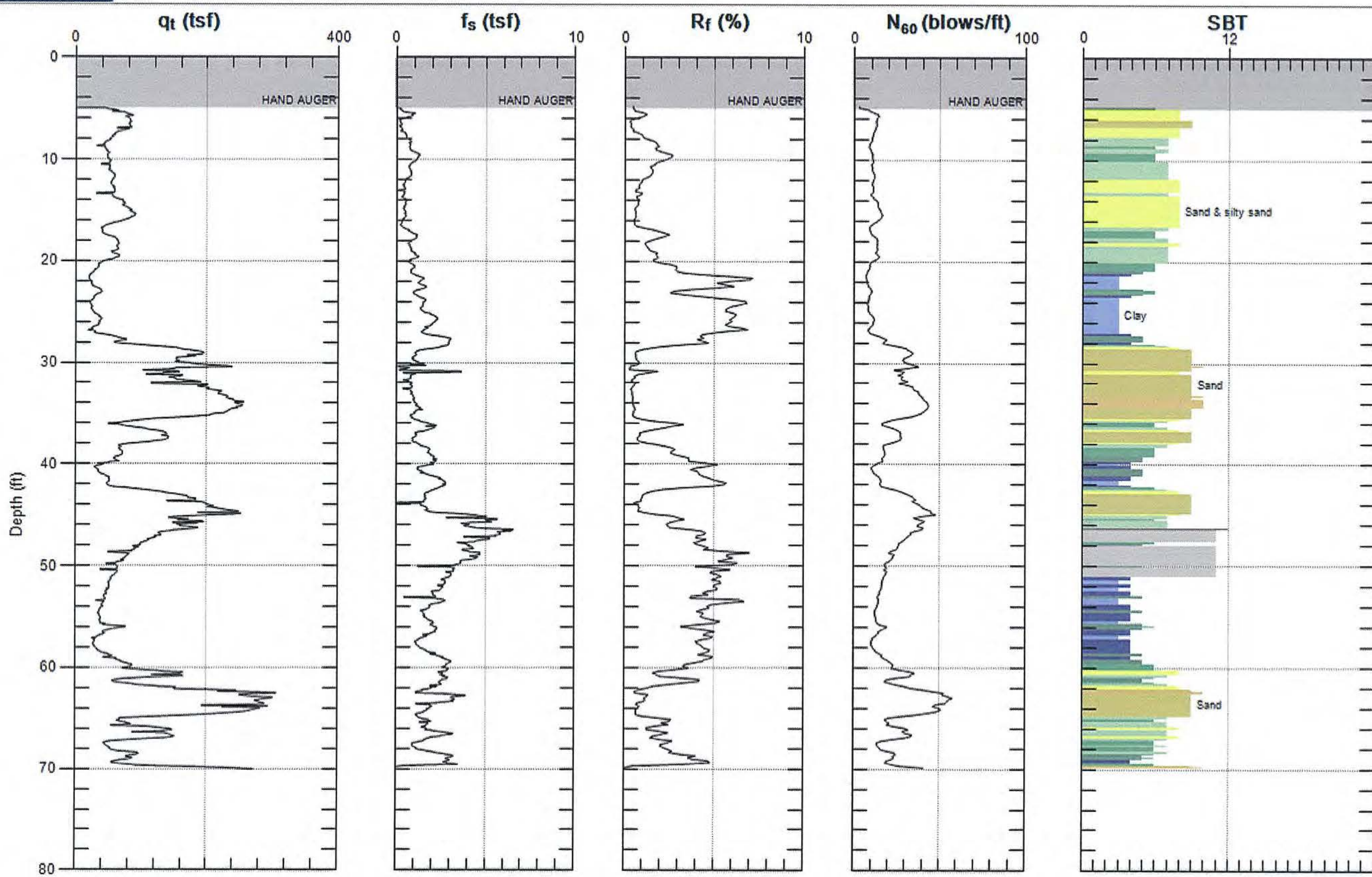
NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-13

Engineer: J.BARTON

Date: 1/22/2015 03:58



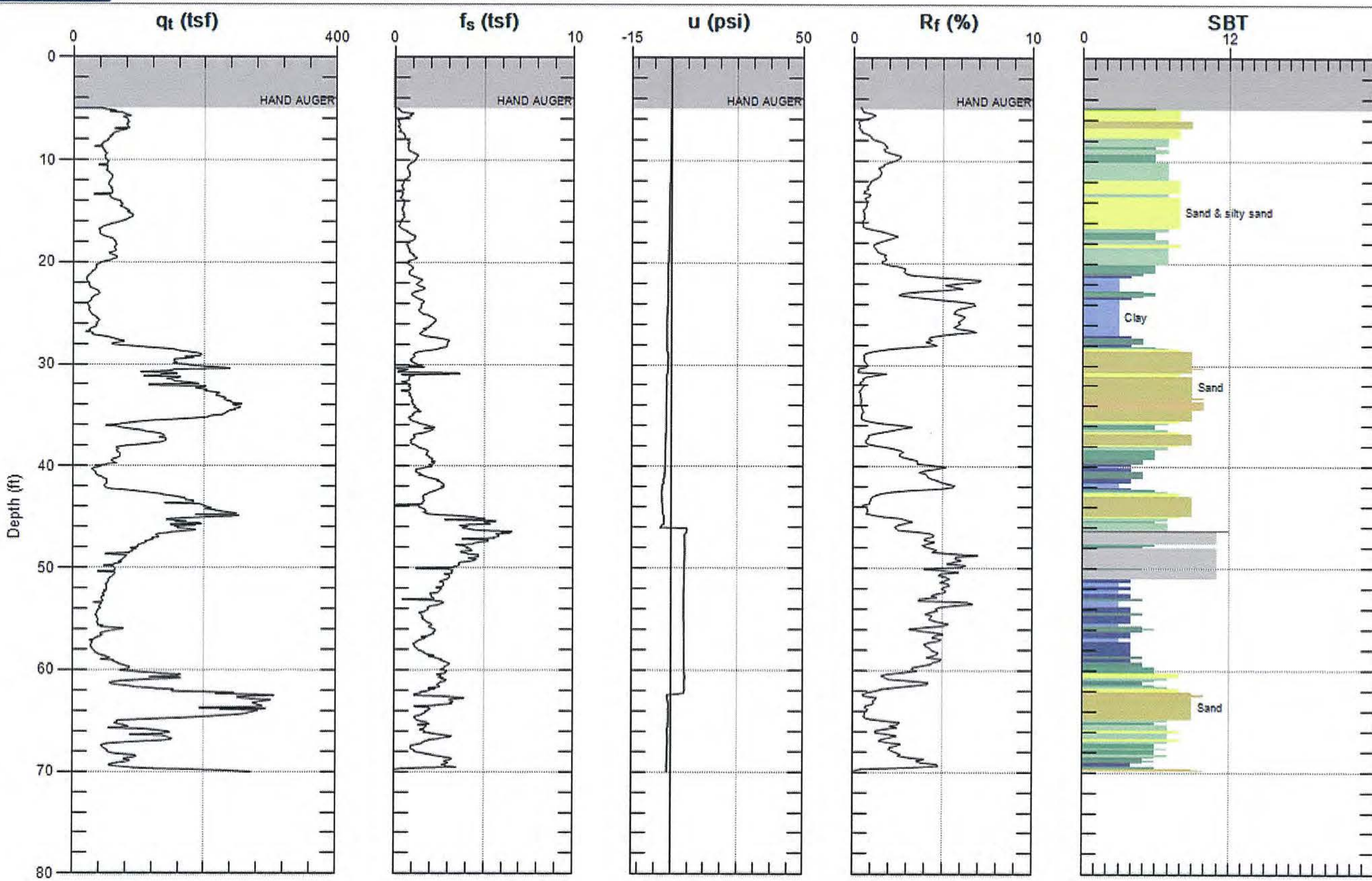
Max. Depth: 70.046 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-13
Engineer: J.BARTON
Date: 1/22/2015 03:58



Max. Depth: 70.046 (ft)
Avg. Interval: 0.164 (ft)

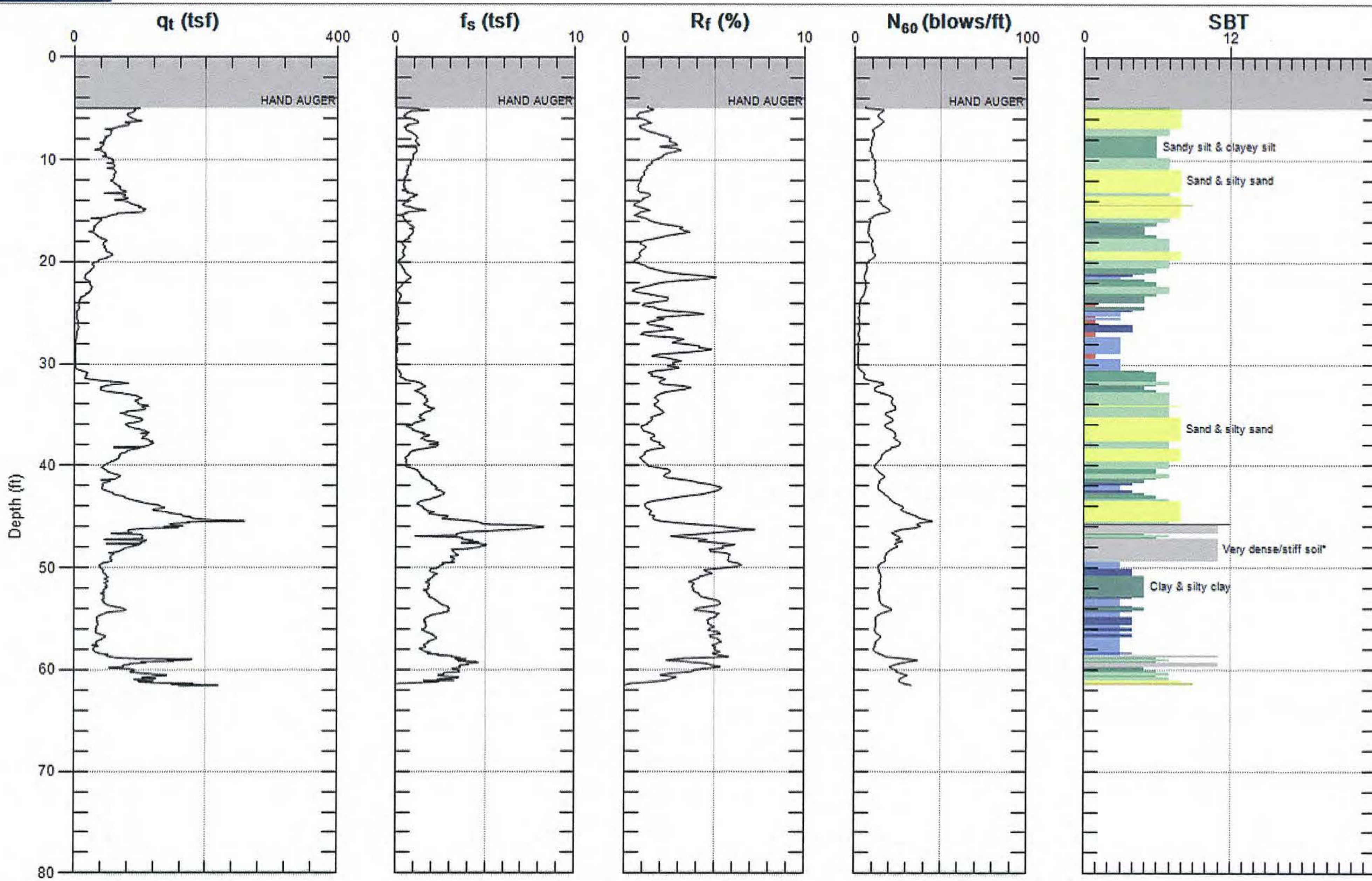
SBT: Soil Behavior Type (Robertson 1990)

GREGG

NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-14

Engineer: J.BARTON
Date: 1/23/2015 08:31



Max. Depth: 61.598 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

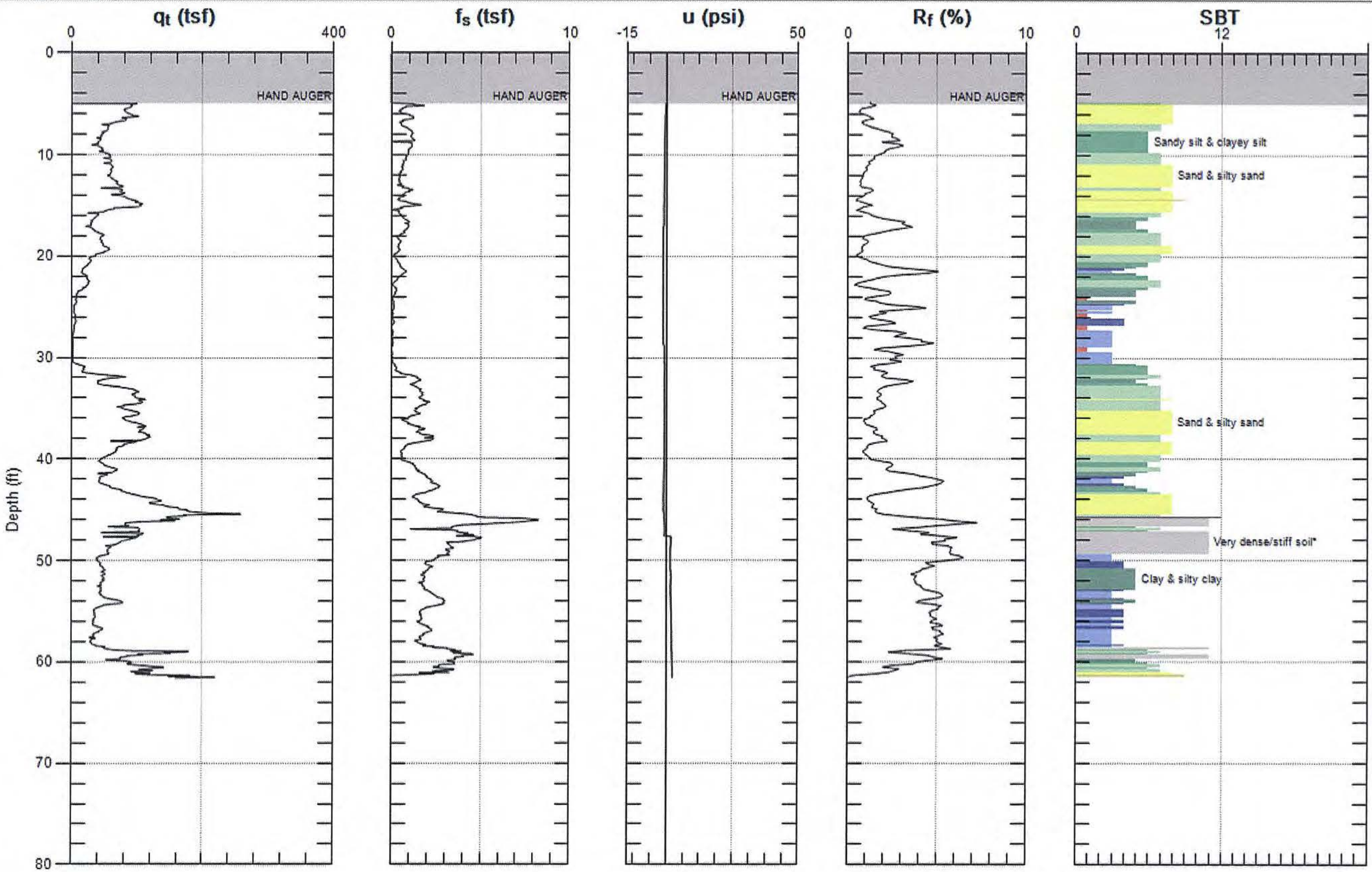
NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-14

Engineer: J.BARTON

Date: 1/23/2015 08:31



Max. Depth: 61.598 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

APPENDIX C

LABORATORY TESTING

In-Place Moisture and Density Tests

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory excavations were evaluated in general accordance with ASTM D 2937. The test results are presented on the logs of the exploratory excavations in Appendix A.

200 Wash

An evaluation of the percentage of particles finer than the No. 200 sieve in selected soil samples was performed in general accordance with ASTM D 1140. The results of the tests are presented on Figures C-1.

Atterberg Limits

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the USCS. The test results and classifications are shown on Figure C-2.

Proctor Density Tests

The maximum dry density and optimum moisture content of selected representative soil samples were evaluated using the Modified Proctor method in general accordance with ASTM D 1557. The results of these tests are summarized on Figure C-3.

Direct Shear Tests

Direct shear tests were performed on a remolded and undisturbed samples in general accordance with ASTM D 3080 to evaluate the shear strength characteristics of selected materials. The samples were inundated during shearing to represent adverse field conditions. The results are shown on Figure C-4 and C-5.

Soil Corrosivity Tests

Soil pH, and resistivity tests were performed on representative samples of the near surface soils in general accordance with CT 643. The soluble sulfate and chloride content of selected samples were evaluated in general accordance with CT 417 and CT 422, respectively. The test results are presented on Figure C-6.

SAMPLE LOCATION	SAMPLE DEPTH (FT)	DESCRIPTION	PERCENT PASSING NO. 4	PERCENT PASSING NO. 200	USCS (TOTAL SAMPLE)
B-1	5.0-6.5	SILTY SAND	94	30	SM
B-1	11.0-12.5	CLAYEY SAND	97	34	SC
B-1	20.0-21.5	SANDY CLAY	100	54	CL
B-1	30.5-31.0	CLAYEY SAND	98	28	SC
B-1	42.5-44.0	CLAYEY SAND	97	37	SC
B-2	10.0-11.5	SANDY CLAY	99	55	CL
B-2	20.0-21.5	CLAYEY SAND	99	45	SC
B-2	30.0-31.5	SILTY SAND	90	35	SM
B-2	38.0-39.0	CLAYEY SAND	98	27	SC
B-2	41.0-42.5	SANDY CLAY	98	53	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140

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NO. 200 SIEVE ANALYSIS

FIGURE

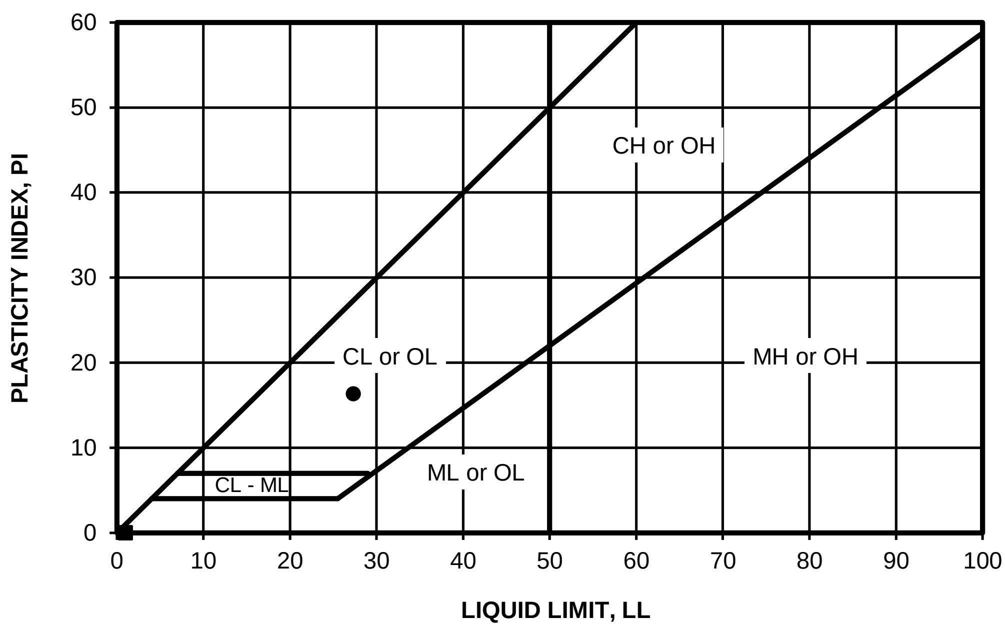
C-1

PROJECT NO.	DATE
402132006	2/15

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

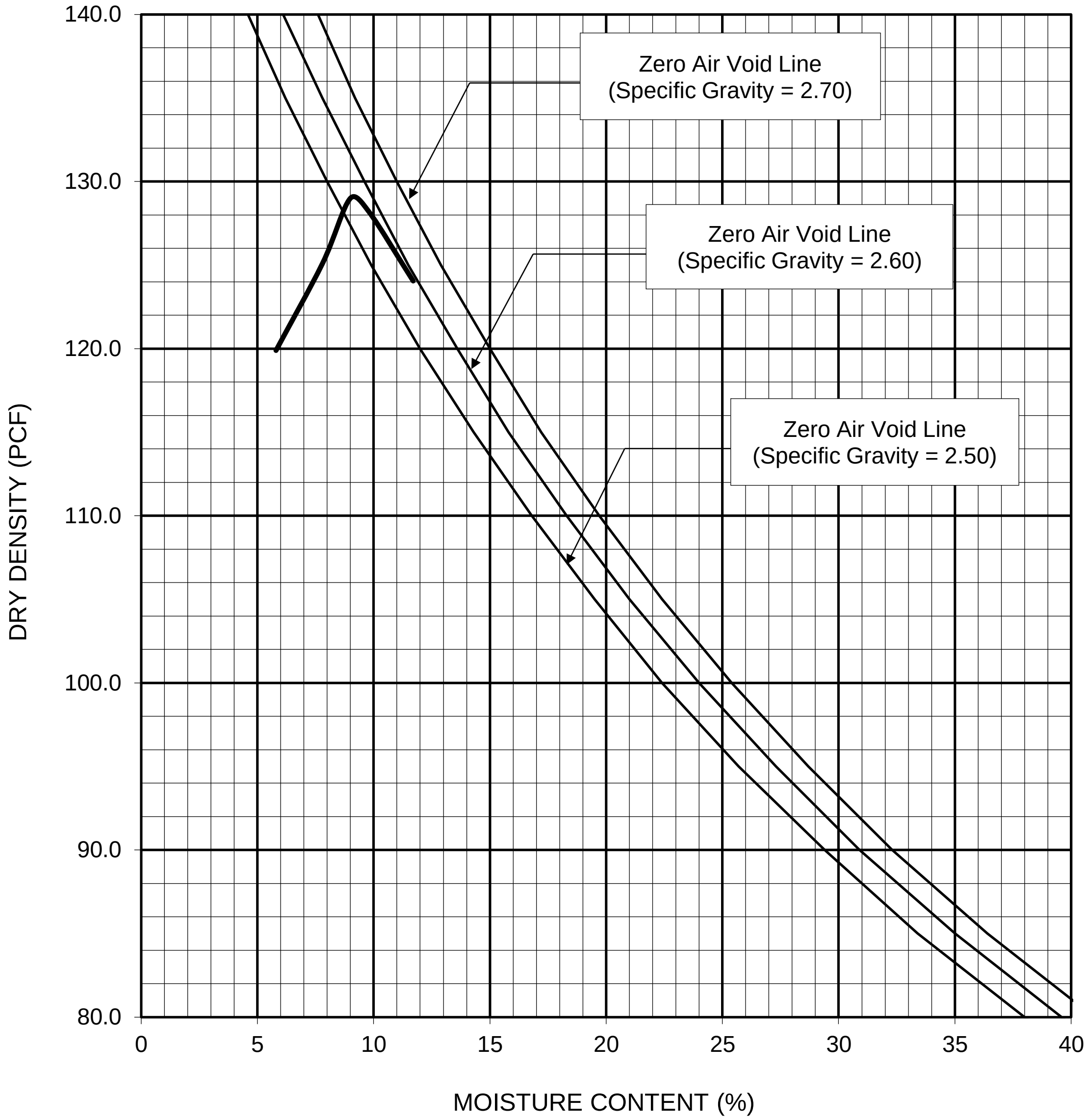
SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
●	B-1	42.5-44.0	27	11	16	CL	SC

NP - INDICATES NON-PLASTIC



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Ninyo & Moore	ATTERBERG LIMITS TEST RESULTS	FIGURE
PROJECT NO. 402132006 / DATE 2/15	HOLLYWOOD COURTHOUSE 5925 HOLLYWOOD BOULEVARD LOS ANGELES, CALIFORNIA	C-2



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
CPT-1	0.0-5.0	CLAYEY SAND	129.0	9.0
Dry Density and Moisture Content Values Corrected for Oversize (ASTM D 4718-87)				

PERFORMED IN GENERAL ACCORDANCE WITH ☑ ASTM D 1557 ☐ ASTM D 698 METHOD ☐ A ☑ B ☐ C

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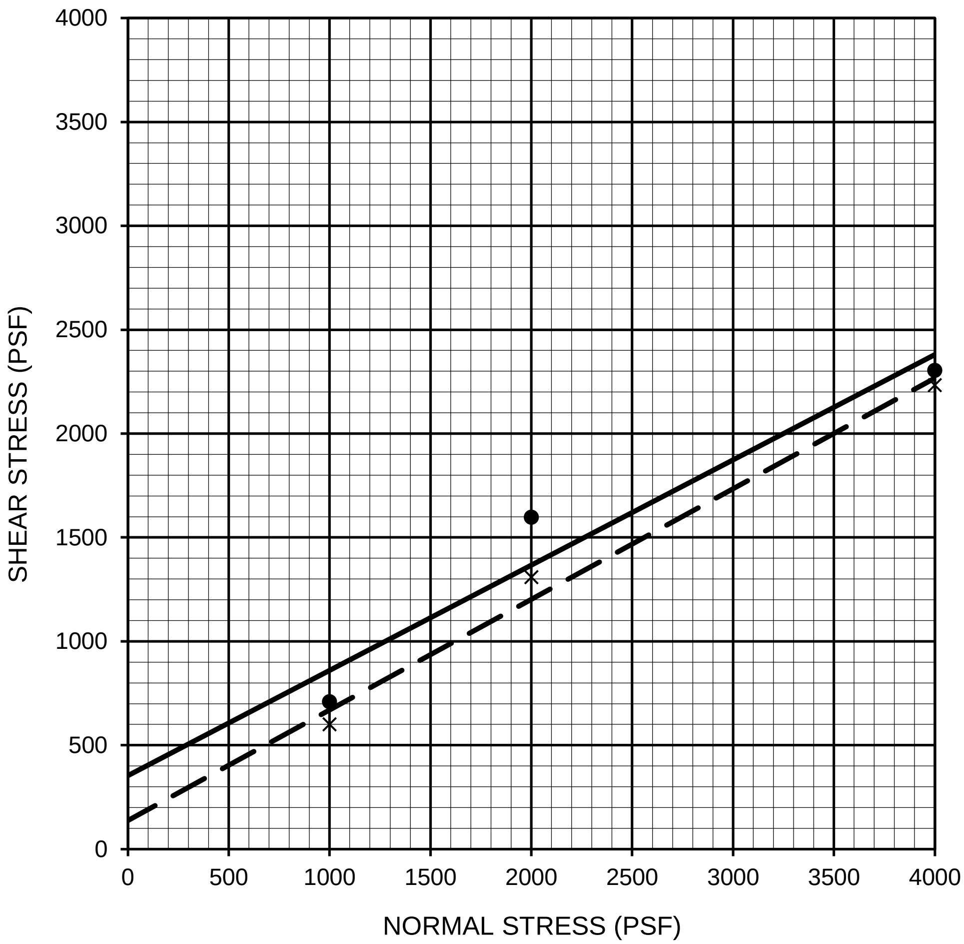
PROCTOR DENSITY TEST RESULTS

PROJECT NO.	DATE	HOLLYWOOD COURTHOUSE 5925 HOLLYWOOD BOULEVARD LOS ANGELES, CALIFORNIA	FIGURE
402132006	2/15		C-3



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
CLAYEY SAND	——●——	CPT-1	0-5	Peak	354	27	SC
CLAYEY SAND	- - x - -	CPT-1	0-5	Ultimate	138	28	SC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080 ON A SAMPLE REMOLDED TO 90% RELATIVE COMPACTION

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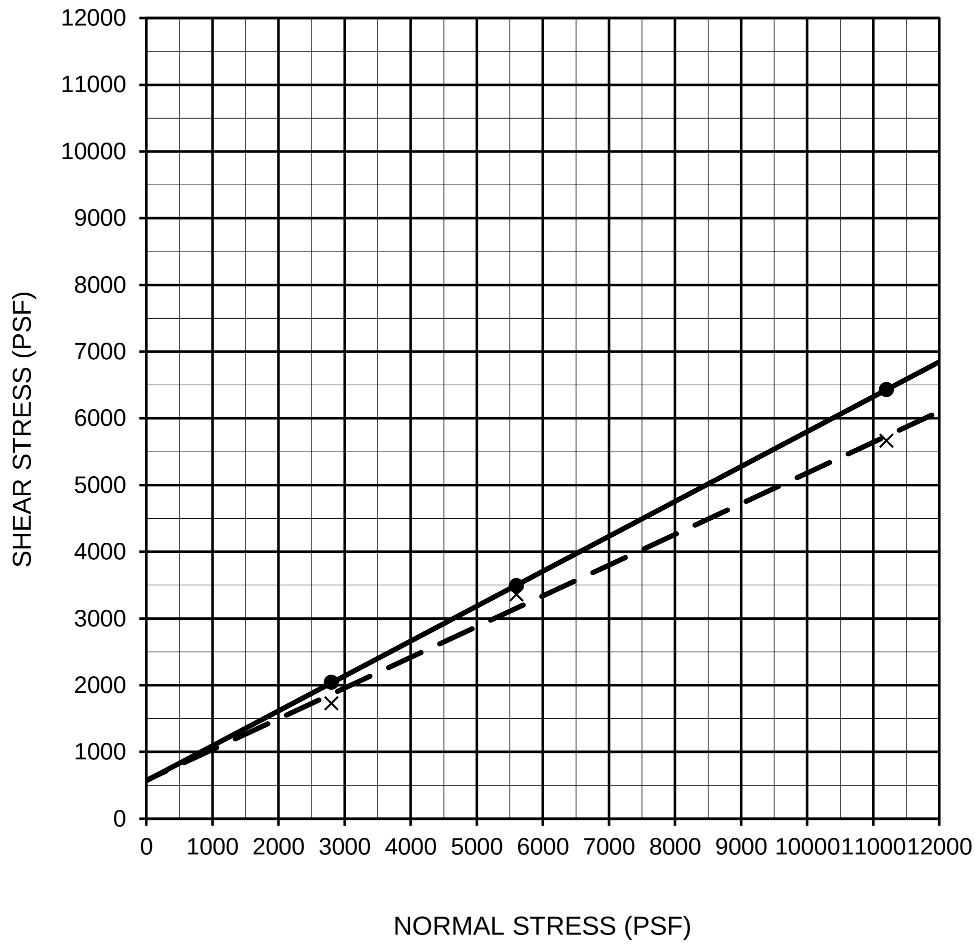
DIRECT SHEAR TEST RESULTS

PROJECT NO.	DATE		FIGURE
402132006	2/15	HOLLYWOOD COURTHOUSE 5925 HOLLYWOOD BOULEVARD LOS ANGELES, CALIFORNIA	C-4

402132006 C-4 DIRECT SHEAR B-1 2.0- 3.0



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
SANDY CLAY	—●—	B-2	45.5-46.0	Peak	570	28	CL
SANDY CLAY	- - x - -	B-2	45.5-46.0	Ultimate	576	25	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

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DIRECT SHEAR TEST RESULTS

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE	FIGURE
402132006	2/15	C-5

SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH [1]	RESISTIVITY [1] (Ohm-cm)	SULFATE CONTENT [2] (ppm)	SULFATE CONTENT [2] (%)	CHLORIDE CONTENT [3] (ppm)
B-1	2.0-3.0	8.1	1,550	180	0.018	15

[1] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643
[2] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417
[3] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

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CORROSIVITY TEST RESULTS

FIGURE

PROJECT NO.	DATE
402132006	2/15

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

C-6