Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

# SUPPLEMENTAL 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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June 15, 2015
Project No. 402132007

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

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



Dear Mr. Shin:

In accordance with your request, we have performed a supplemental fault rupture hazard evaluation for the Hollywood Courthouse at 5925 Hollywood Boulevard in Los Angeles, California. We previously prepared a fault rupture hazard evaluation report dated February 24, 2015 for the proposed improvements to the existing courthouse. The purpose of this study was to further evaluate the potential for faulting south of the existing building and to provide preliminary design recommendations for a new building. This report presents our findings and conclusions regarding the presence of faulting underlying the area south of the existing building.

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 supplemental fault rupture 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 previously performed a fault rupture hazard and geotechnical evaluation for proposed improvements to the existing courthouse, the results of which were presented in the referenced reports dated February 24 and March 16, 2015. The purpose of this study was to further evaluate the potential for faulting south of the existing building.

Based on our previous work, possible active faulting was discovered near the center of the building (Figure 2). The possible faulting was based on our interpretation of discontinuities in the stratigraphy in the alluvial soils underlying the existing building. The offset deposits were considered to be late Pleistocene to early Holocene in age. The subject property and location of the possible faulting is near the active Hollywood fault zone mapped by the California Geological Survey (2014). In order to confirm the presence and activity of the possible faulting under the building, additional exploration would be involved.



As an alternative to the proposed remodel improvements, we understand that a new building is being considered for the existing parking lot south of the building (away from the suspected zone of faulting). The proposed structure may consist of an approximately 48,000 square feet, two to four-story building with a slab-on-grade foundation. Plans are not available at the time of this report.

For the purpose of this report, we have included data from our previous study to provide an understanding of the subsurface conditions across the property. Depending on the details of the new structure, an update geotechnical evaluation report will be provided at a later date.

## 2. SCOPE OF SERVICES

Our geologic services have included the following:

- Planning and coordination of our activities with AOC and review of our previous work.

- A site reconnaissance to evaluate the current conditions and mark out proposed boring locations.
- Coordination with Underground Service Alert 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.
- Subsurface exploration utilizing a truck-mounted drill and direct push rigs and a cone penetrometer testing rig. Two small-diameter borings were drilled with a truck-mounted drill rig up to a depth of approximately 51½ feet, two 1¼-inch-diameter borings were continuously cored up to a depth of approximately 52 feet and ten cone penetrometer tests (CPTs) were performed up to a depth of approximately 75 feet south of the existing building.
- Review of subsurface data with our Technical Advisor, Dr. Thomas Rockwell, to evaluate the soil stratigraphy, soil age, and potential for 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.

The site of the possible future building is occupied by an asphalt-paved parking lot south of the building and adjacent to Hollywood Boulevard. Adjacent buildings and screen walls are present east and west of the courthouse as well as adjacent to the sidewalk along Hollywood Boulevard. Some landscaping is present in front of the building and within the parking lot near Hollywood Boulevard.

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. 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 this report.

# 5. GEOLOGIC CONDITIONS

## 5.1. 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 gently 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.



## 5.2. 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 including the parking lot south of the existing building. 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.



### 5.3. 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.

### 5.4. Groundwater

Groundwater was not encountered during our evaluation, which included borings and CPT soundings up to approximately 75 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.

# 6. FAULTING

## 6.1. 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.

## 6.2. 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.



### 6.3. 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.

### 6.4. 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.

### 6.4.1. 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).



### 6.4.2. 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).



### 6.4.3. Ninyo & Moore

Ninyo & Moore previously performed a fault rupture hazard evaluation for the portion of the lot underlying the existing building (Ninyo & Moore, 2015a). The evaluation included four continuous cores and 14 CPTs up to a depth of approximately 74.2 feet within the interior of the west side of the building. Our previous subsurface exploration indicated 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 beneath the existing building. 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 in the existing building area if the observed steps in stratigraphy are a result of faulting. 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.



## 7. FIELD EVALUATION

In order to further evaluate the presence of faulting south of the building, we performed a subsurface evaluation utilizing direct-push 1.75-inch-diameter continuous cores and CPTs at a spacing generally of approximately 12 feet along the west side of the property. 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 proposed building.

Our subsurface evaluation was conducted on May 11 and 12, 2015 and consisted of the drilling, logging, and sampling of two small-diameter borings to depths of approximately 51½ feet on the east side of the property, two direct push continuous cores to depths of approximately 52 feet and ten CPTs to depths ranging from approximately 75.1 to 75.8 feet along the west side of the parking lot, south of the building. The direct push continuous cores were located adjacent to a CPT location to aid in evaluating the stratigraphy and relative age of the soils.

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 a previous CPT location inside the building of 402.4 feet

MSL. The locations of each exploratory location were measured with a measuring tape from the south edge of the building. Logs of the exploratory borings and cores are presented in Appendix A. Logs of the CPTs are presented in Appendix B. The approximate locations of the borings and CPTs as well as the previous borings and CPTs are presented on Figure 9. For the purpose of this report, we have numbered the borings, cores and CPTs in a consecutive sequence to our previous borings, cores and CPTs.

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. After the field exploration, core samples and CPT logs were reviewed with Dr. Rockwell (paleoseismologist and professor of geology, SDSU) to evaluate the stratigraphy and age of soils. Direct push core samples were obtained at 4-foot intervals to provide relatively continuous lithology data. The percent recovery of the cores varied from approximately 33 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.

### 7.1. 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.

#### 7.1.1. Fill

Fill soils were encountered in borings B-3 and B-4 and in cores C-5 and C-6 to a depth of approximately 4 feet. The fill soils were generally composed of brown, moist, loose, 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.

### 7.1.2. Holocene age Alluvial Deposits

Holocene (younger) alluvial deposits were encountered in each boring and core location to depths ranging from approximately 39 to 41 feet. The younger alluvial deposits generally consisted of two subunits. In our previous report, we had included a third sub-unit (Subunit 3), which we now interpret to be the upper unit associated with the buried Pleistocene deposits. This change in interpretation is based on better core recovery in this evaluation which has allowed for a better analysis of the subsurface soils. 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 and firm to stiff, sandy clay. Subunit 1 extended to depths of approximately 26 to 28 feet below original grade and exhibits scattered crude stratification.

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 with interbedded clayey sand and sandy clay. Subunit 2 ranged in thickness from approximately 10 to 12 feet.

The age estimated for the younger alluvium was based on our review of samples and prior experience with soil age dating in the Los Angeles region; there were no recognizable soil horizons observed in these upper deposits at the locations explored except for the possible presence of some discontinuous and weakly formed horizons. 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 have been present and not recovered in some cores, 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 the upper 39 to 40 feet of alluvium is Holocene in age, with the possibility that the lowest portions are latest Pleistocene in age.

### 7.1.3. 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, strong brown and 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 profiles 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 the previous cores C-2 and C-3 are presented below. Similar soils were observed in the recent cores C-5 and C-6. The purpose of the composite description is to provide a more representative description of the soil sequence at the site for age purposes.

Subunit 3 in our previous report is now recognized as the buried A horizon associated with the top of the Pleistocene strata, and consists predominantly of massive, dark yellowish brown, moist, medium dense to dense, fine to medium grained, clayey sand and stiff, sandy clay. Unit 3 ranged in thickness from approximately 1 to 2 feet in cores C-5 and C-6.

**Table 2 – Composite Description of Buried Soil Horizons**

| Thickness (ft) | Horizon | Description |
|---|---|---|
| 1.2-1.5 | 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: |
| 3-4 | 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: |
| 0.7-2 | 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 (Bkb horizon); abrupt, smooth boundary to: Note: The 1BCb horizon was not encountered in all cores, as some cores encountered a thicker 1Btb overlying the calcic Bkb horizon. In these cases, the 1Btb horizon is as much as 4 feet thick. |
| 0.5 | 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: |
| >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) which is collectively developed in about 6.5 feet of alluvium 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 similar 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 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.

### 7.2. Site 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 (33 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, as appropriate, to compensate for deviation of the inclination of the CPT probe. Our interpretation of the stratigraphy in the parking lot south of the building is presented on Figure 11, which includes the corrected plot of the CPTs as well as a previous CPT and boring from our previous evaluation.



Based on our review of the core samples and CPT logs, two of the four distinct stratigraphic layers are within the younger Holocene alluvial deposits. The third layer represents the top of the Pleistocene section (Ab and upper part of the clayey Btb horizons) and the fourth layer comprises the lower gravelly sand part of the upper buried soil along with the older lower Pleistocene alluvial deposits and buried soil. The younger layers are generally sloping to the south at approximately 2 to 3 degrees. The younger layers are relatively continuous with distinct contacts with the underlying materials. No discontinuities were observed in the younger layers or at the contact with the Pleistocene age alluvial deposits.

## 8. 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 parking lot along the south side of the property is not within the mapped APEFZ of the Hollywood fault (Figure 8). The purpose of our study was to provide the AOC with an assessment of fault rupture hazard that could potentially impact the construction of a new building along the south side of the property, and to provide supplemental recommendations for the proposed improvements, if appropriate.

The Hollywood fault is an active sinistral-reverse oblique strike slip fault trending N76E. 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.

Geologic evidence indicates that faults typically rupture repeatedly along existing fault planes; therefore, the risk for fault rupture hazard is higher for sites located over the trace of an active fault. Fault rupture may occur in previously unfaulted areas; however, the potential is less. Generally, the risk of fault rupture decreases the farther away a site is from an active fault.



Based on our previous and current evaluations, the younger alluvial soils are up to approximately 39 to 40 feet deep. Our scope included a combination of direct push cores and CPTs at a spacing of approximately 12 feet along the western side of the property in a north-south direction. The traverse of the cores and CPTs were along the same trend as our previous study to allow correlation of the stratigraphy across the property. As a result of the type of exploration, our work was limited to a two-dimensional evaluation of the underlying soil and geologic conditions.

Based on the results of our supplemental fault rupture hazard evaluation, it is our opinion that no active (Holocene age) faults cross the southern portion of the subject property (parking lot) nor are faults recognized at depth on the older Pleistocene deposits beneath the southern portion of the property. Furthermore, it is our opinion that the risk of future fault rupture within the design life of the project is low and building setbacks are not warranted. The bases for our opinions are summarized below.

- Our current subsurface exploration indicates that the parking lot is underlain by gently-sloping stratigraphy with distinct depositional sequences of younger alluvial soils that were repeated in each continuous core and CPT. No offsets were observed in the younger alluvial soils or along the contact with the older alluvial soils with estimated ages of 130,000 years or more.

- No geomorphic evidence such as lineaments, scarps, troughs and depressions was observed in the area of the parking lot or trending through the site from neighboring properties in topographic maps and aerial photographs dating back to 1925.
- The area of the possible future building is not mapped in an Earthquake Fault Zone by the California Geological Survey (California Geological Survey, 2014).
- 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 (Ninyo & Moore, 2015a).
- Our previous subsurface evaluation indicated possible faulting near the center of the existing building. Based on the orientation of the Hollywood fault as observed by others, the possible faulting would not trend toward the parking lot south of the building.

## 9. GEOTECHNICAL EVALUATION



We previously performed a geotechnical evaluation for a proposed 5,000 square foot building addition to the south side of the courthouse, the results of which were presented in our report dated March 6, 2015. As indicated previously, the existing two-story portion of the building on the south side is supported on caissons and the parking garage on the north side is supported on spread footings. In order to preclude the potential differential settlement resulting from a mixed foundation condition between the existing and new foundations, we previously recommended that the previously proposed building addition along the south side of the building be supported on deep foundations.

Our current scope of work included small diameter borings and laboratory testing to evaluate the soil and geologic conditions for the purpose of providing design recommendations for a possible new building in the parking lot. Based on the results of our current subsurface evaluation, laboratory testing, and data analysis, the proposed new building is feasible from a geotechnical standpoint. The recommendations presented in our previous report generally remain applicable for the new building. Depending on the size and type of new building, recommendations for spread footings should be considered. We recommend that an update geotechnical evaluation report be provided based on further details regarding the proposed construction such as building size, location and elevation. Additional borings and laboratory testing as well as supplemental recommendations may be appropriate.

## 10. 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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| Source | Date | Flight | Numbers | Scale |
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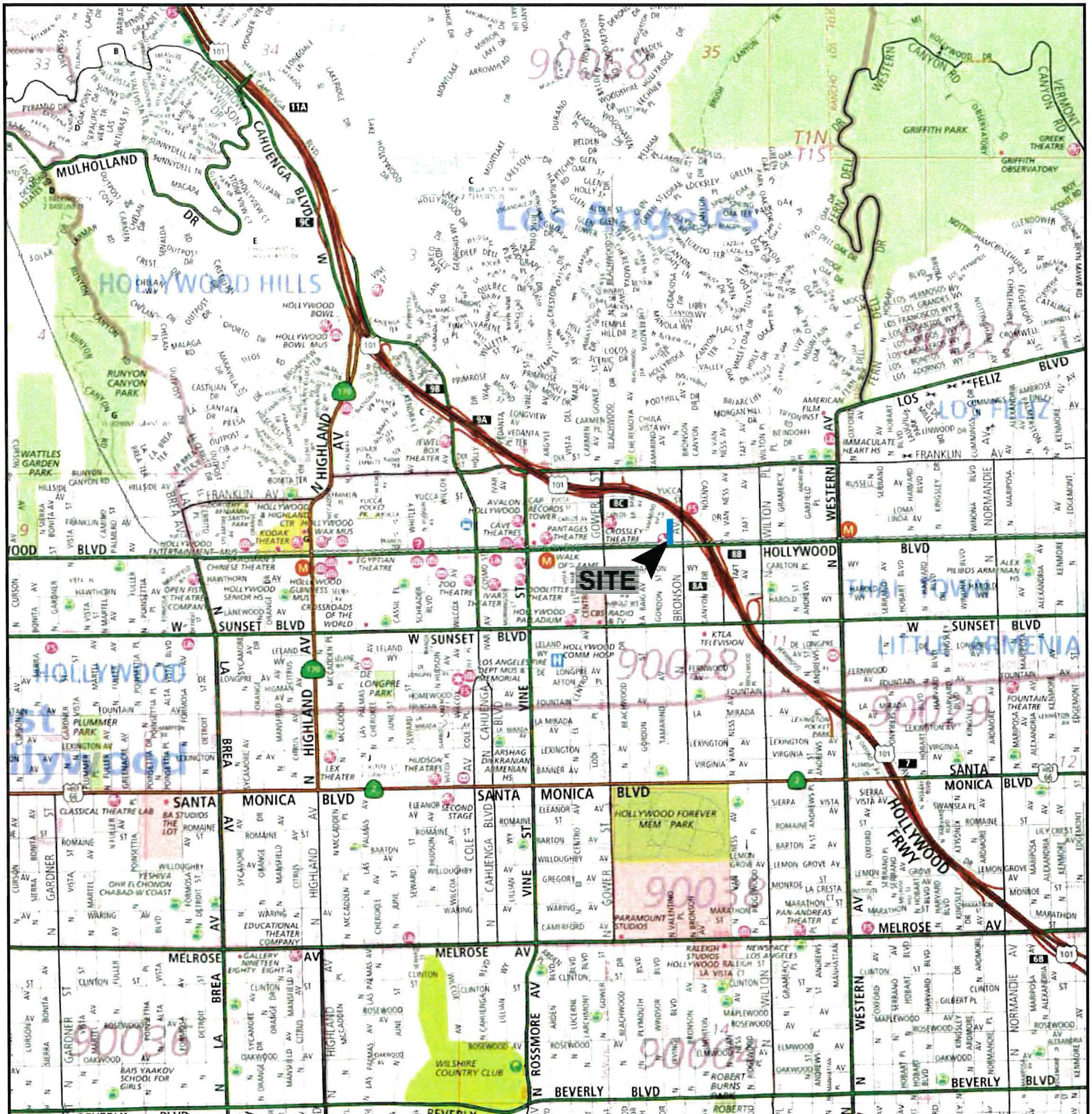
| USDA | 10-27-54 | AXJ-20K | 45 and 46 | 1: 20,000 |




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

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NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Map © Rand McNally, R.L.07-S-129

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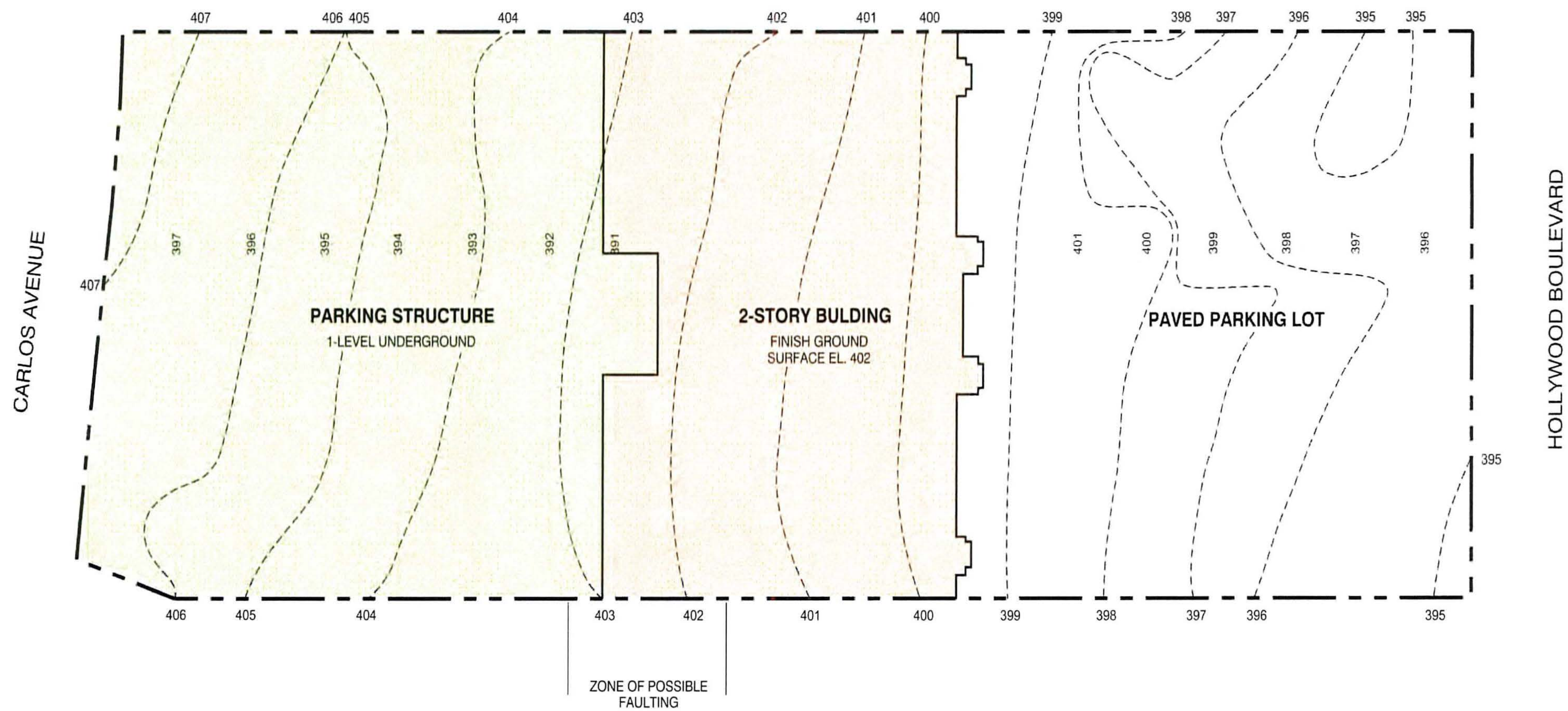


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397 FINISHED SURFACE ELEVATION; IN AREA OF PARKING GARAGE, ELEVATION SHOWN AS LOWER LEVEL

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NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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

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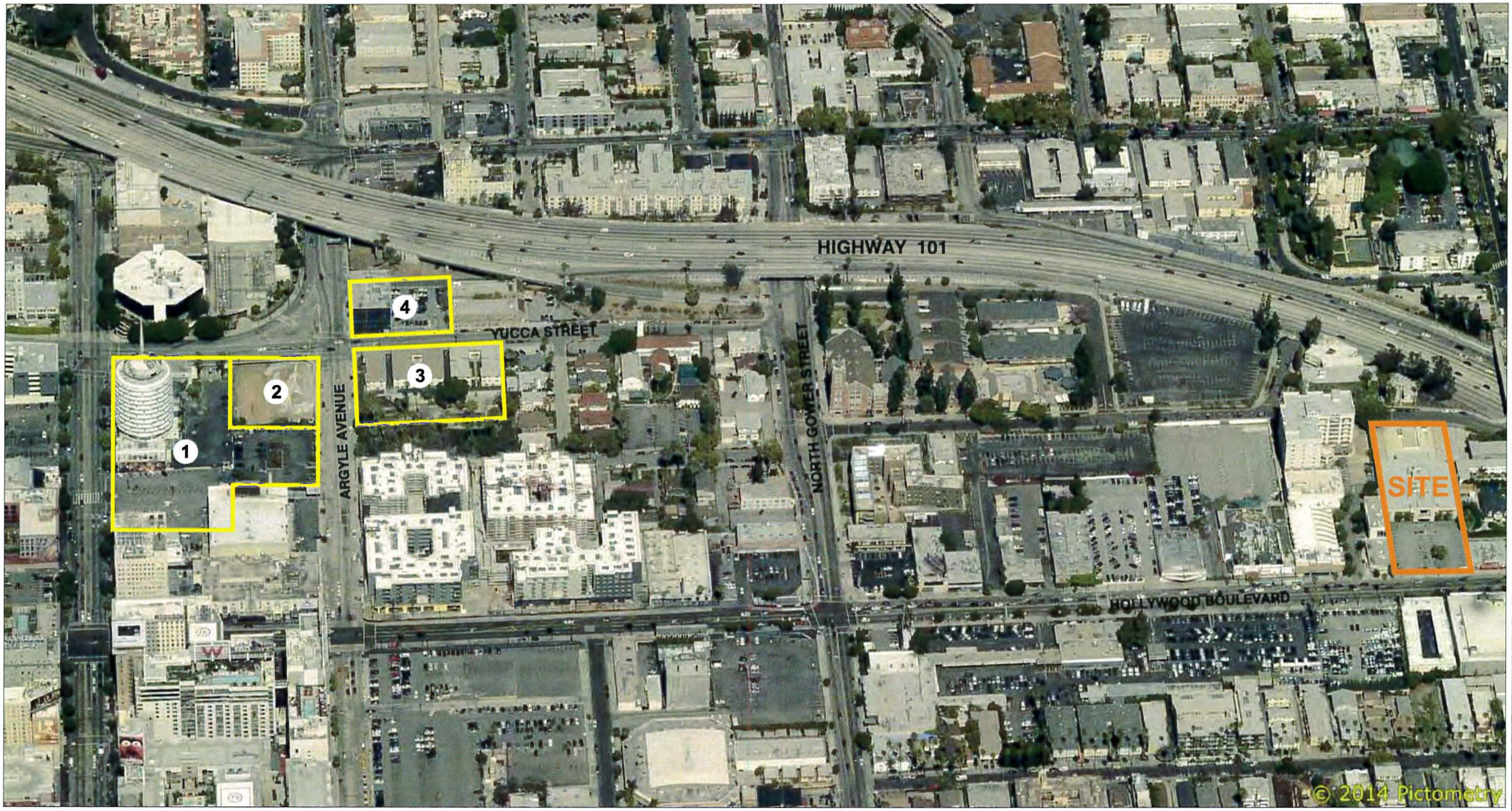


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- ① GROUP DELTA (9/3/2014)
- ② GROUP DELTA (9/3/2014)
- ③ GROUP DELTA (9/7/2014)
- ④ GROUP DELTA (9/3/2014)

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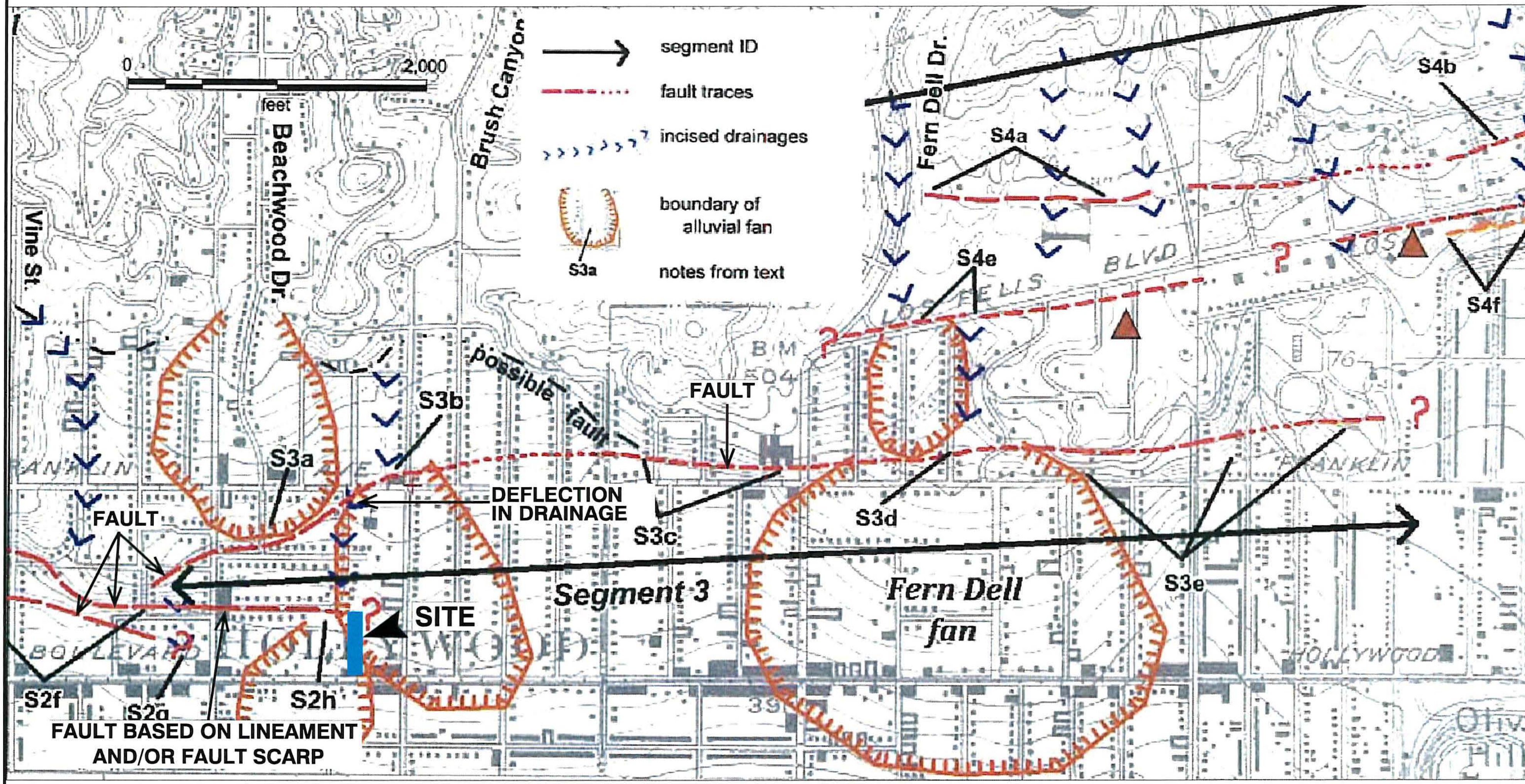


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NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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

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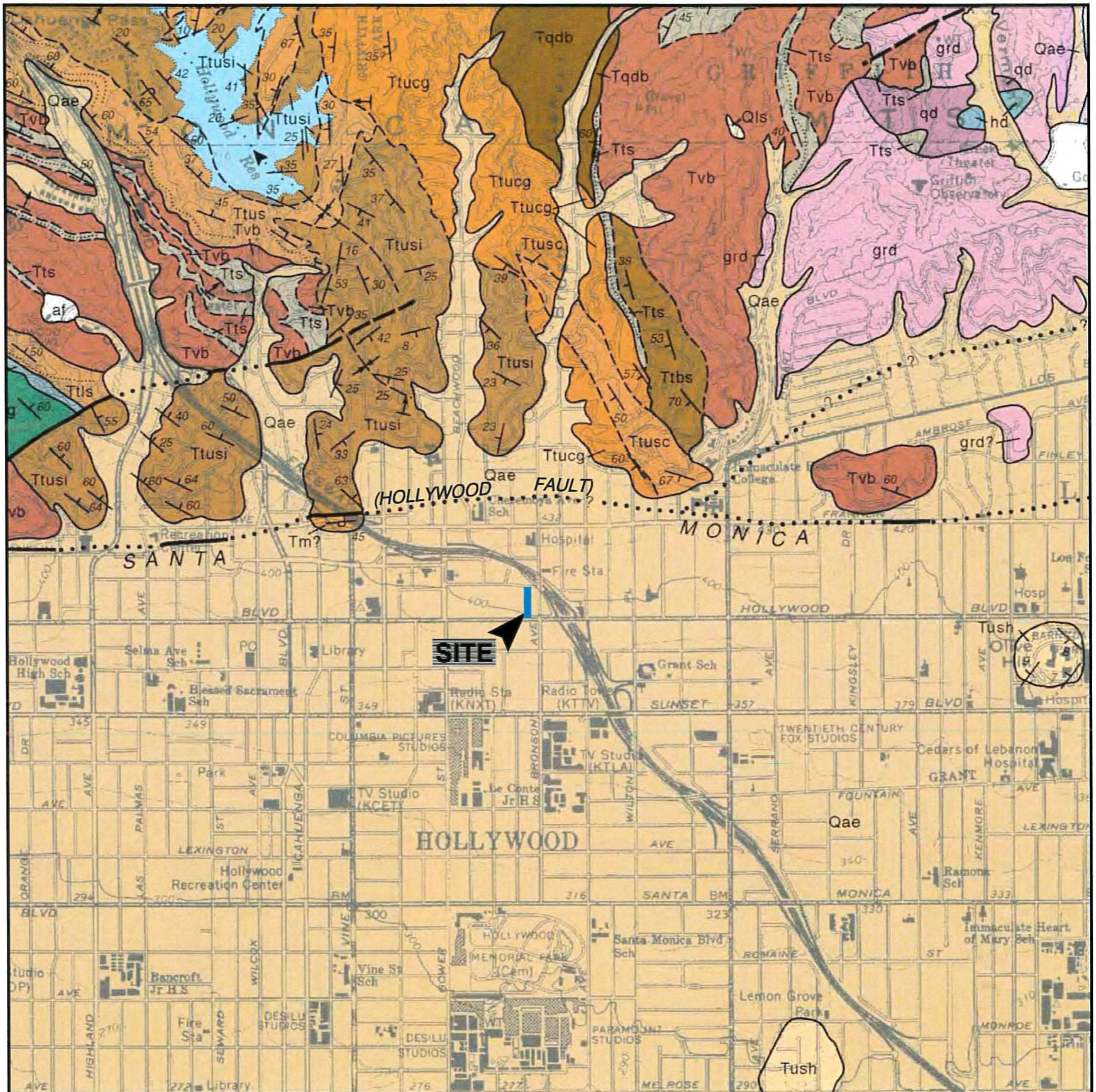


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NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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

| Ninyo & Moore | | REGIONAL GEOLOGY | FIGURE |
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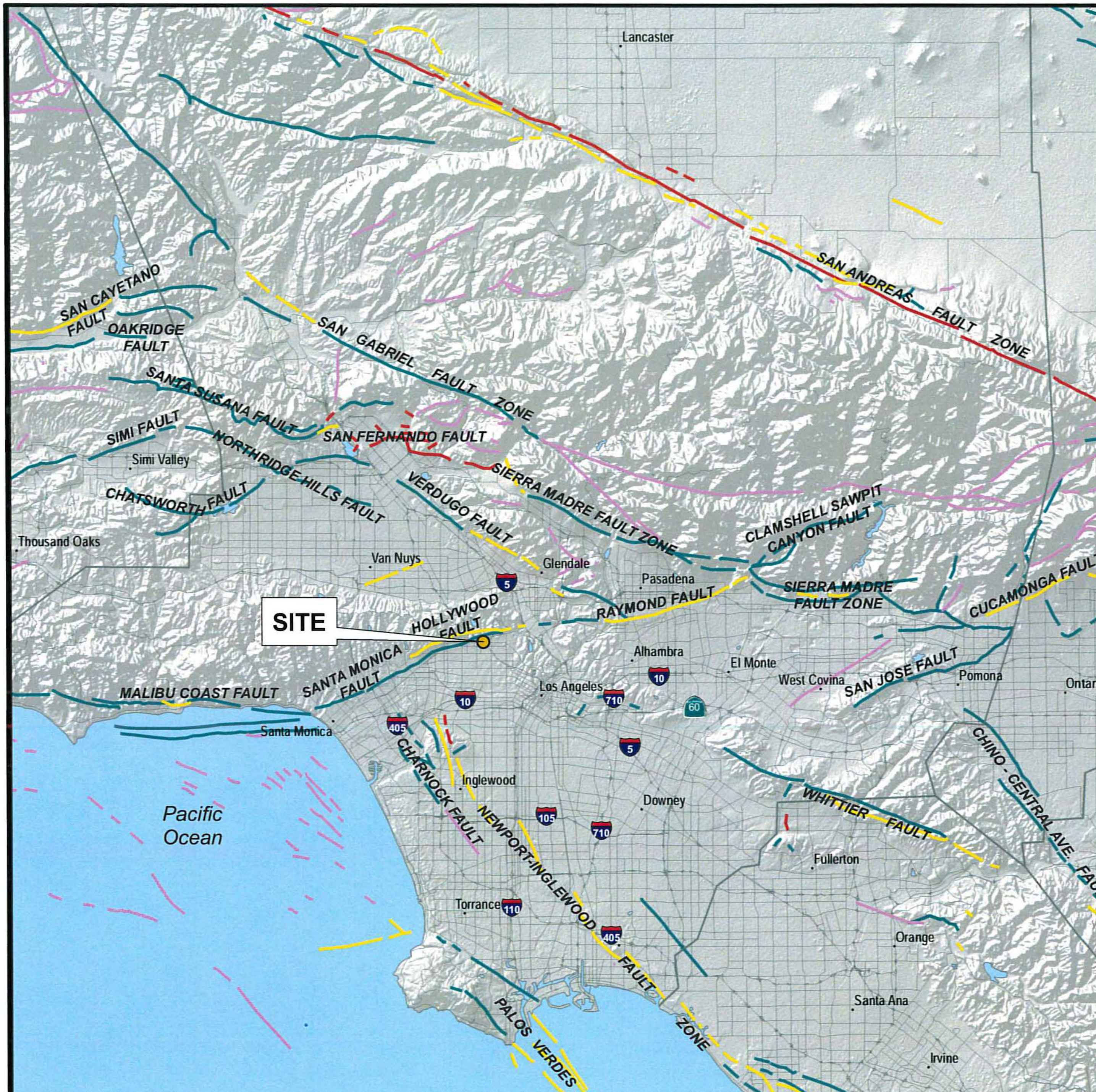


GIS DATA SOURCE: CALIFORNIA GEOLOGICAL SURVEY (CGS); ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE (ESRI)
REFERENCE: JENNINGS, 2010, FAULT ACTIVITY MAP OF CALIFORNIA.

**LEGEND**

**FAULT ACTIVITY:**

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

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NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE

| Ninyo & Moore | | FAULT LOCATIONS | FIGURE |
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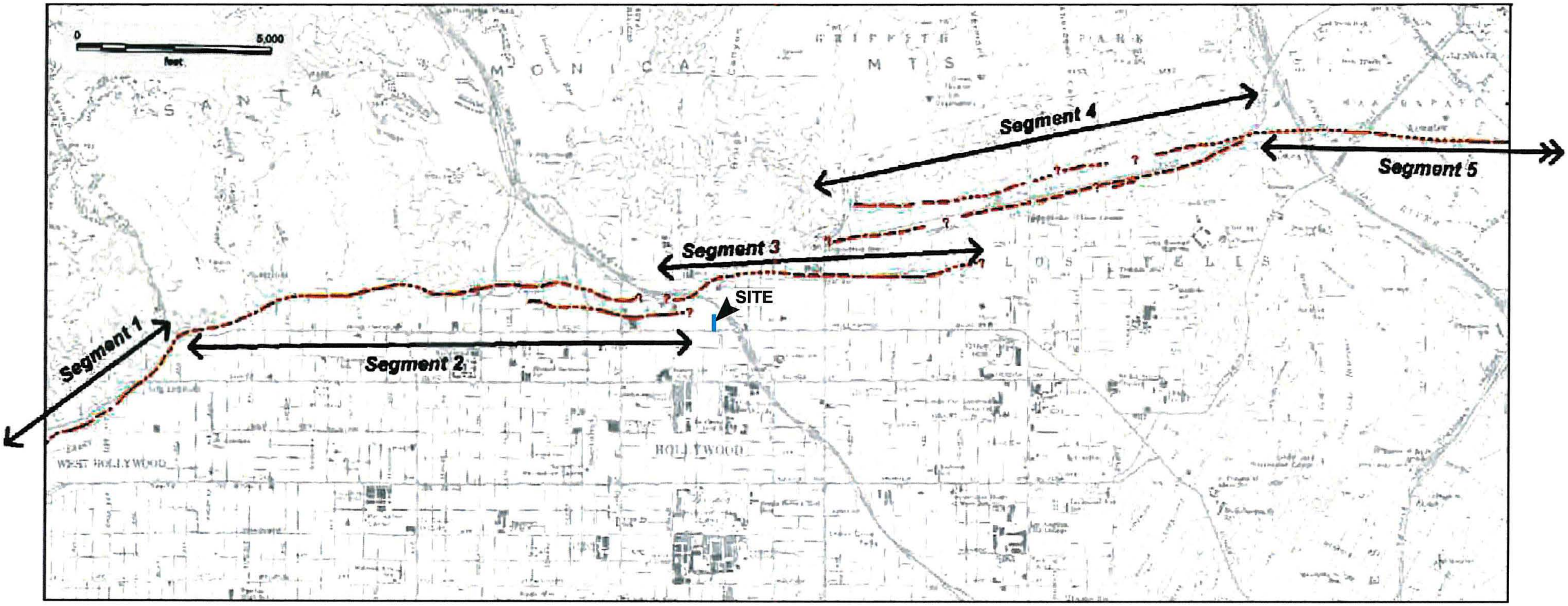


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REFERENCE: CALIFORNIA GEOLOGICAL SURVEY, 2014, FAULT EVALUATION REPORT 253, DATED FEBRUARY 14.

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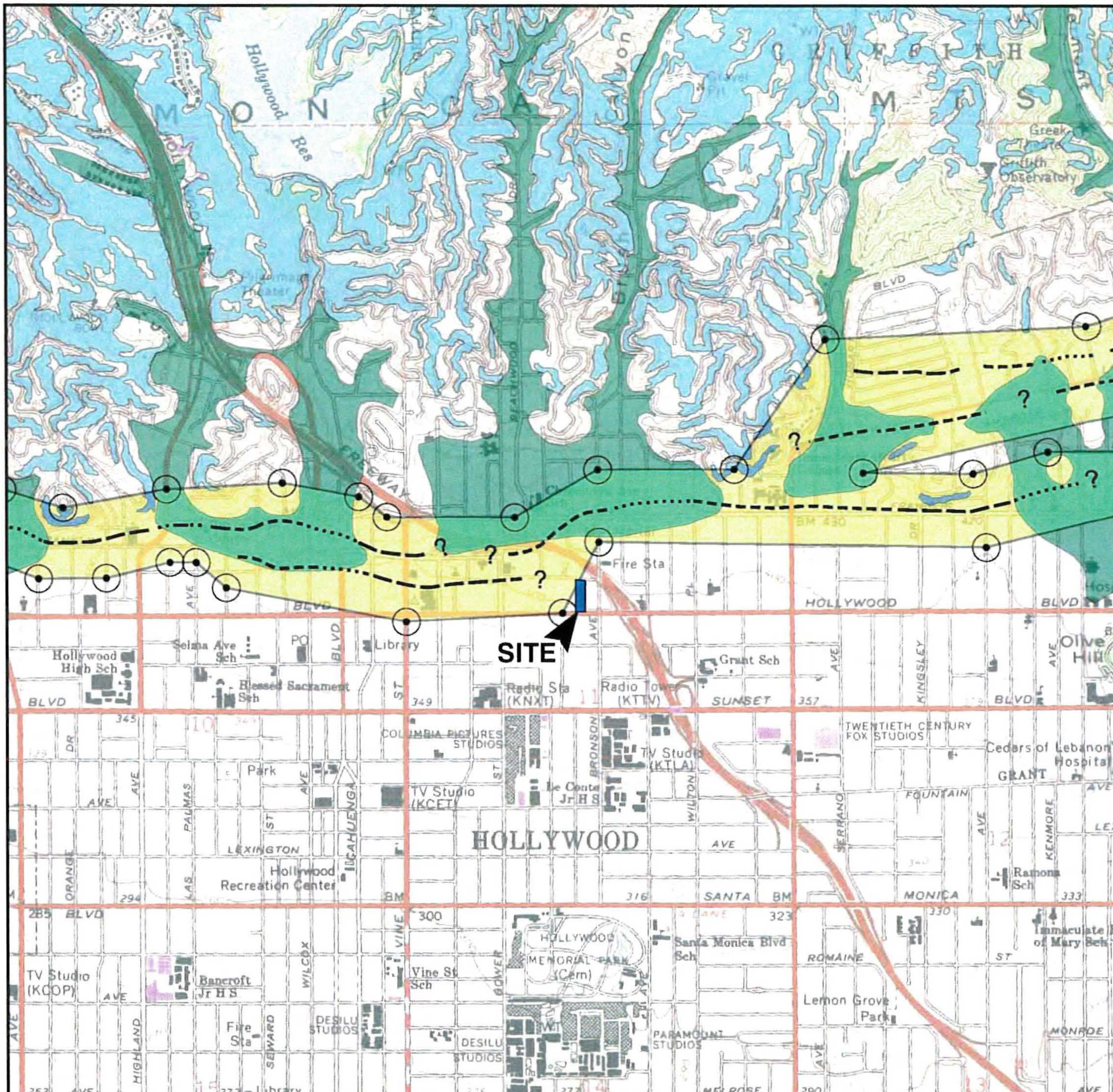


**LEGEND**

**Potentially Active Faults**

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.

N

SCALE IN FEET

0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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| PROJECT NO. | DATE |
|---|---|
| 402132007 | 6/15 |

**EARTHQUAKE FAULT ZONES**

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

FIGURE

**8**

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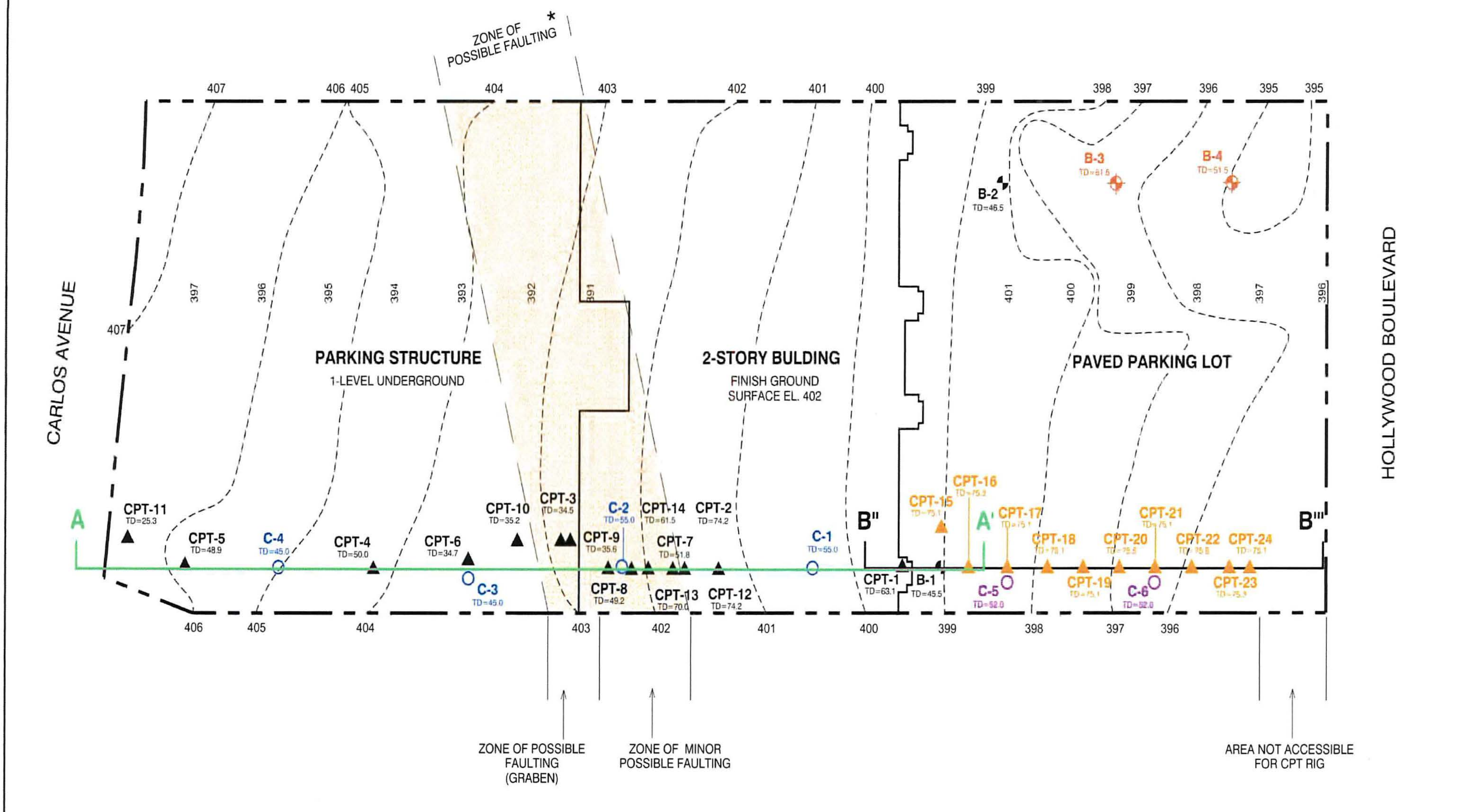


**LEGEND**

| | | | |
|---|---|---|---|
| --- 407 --- | PRE-EXISTING GROUND SURFACE ELEVATION (1984) | CPT-24 | CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET |
| 397 | FINISHED SURFACE ELEVATION; IN AREA OF PARKING GARAGE, ELEVATION SHOWN AS LOWER LEVEL | C-6 TD=52.0 | CORE; TD=TOTAL DEPTH IN FEET |
| C-4 TD=45.0 | CORE; TD=TOTAL DEPTH IN FEET (NINYO & MOORE, FEBRUARY 2015) | A A' | CROSS SECTION; (NINYO & MOORE, 2015a) |
| CPT-14 TD=61.5 | CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET (NINYO & MOORE, FEBRUARY 2015) | A'' A''' | CROSS SECTION |
| B-2 TD=46.5 | BORING; TD=TOTAL DEPTH IN FEET (NINYO & MOORE, MARCH 2015) | * | TREND OF FAULTING BASED ON REVIEW OF GEOLOGIC LITERATURE REGARDING HOLLYWOOD FAULT |
| B-4 TD=51.5 | BORING; TD=TOTAL DEPTH IN FEET | | |

N

SCALE IN FEET

0 30 60

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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

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| PROJECT NO. | DATE |
|---|---|
| 402132007 | 6/15 |

**BORING AND CPT LOCATIONS**

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

FIGURE 9

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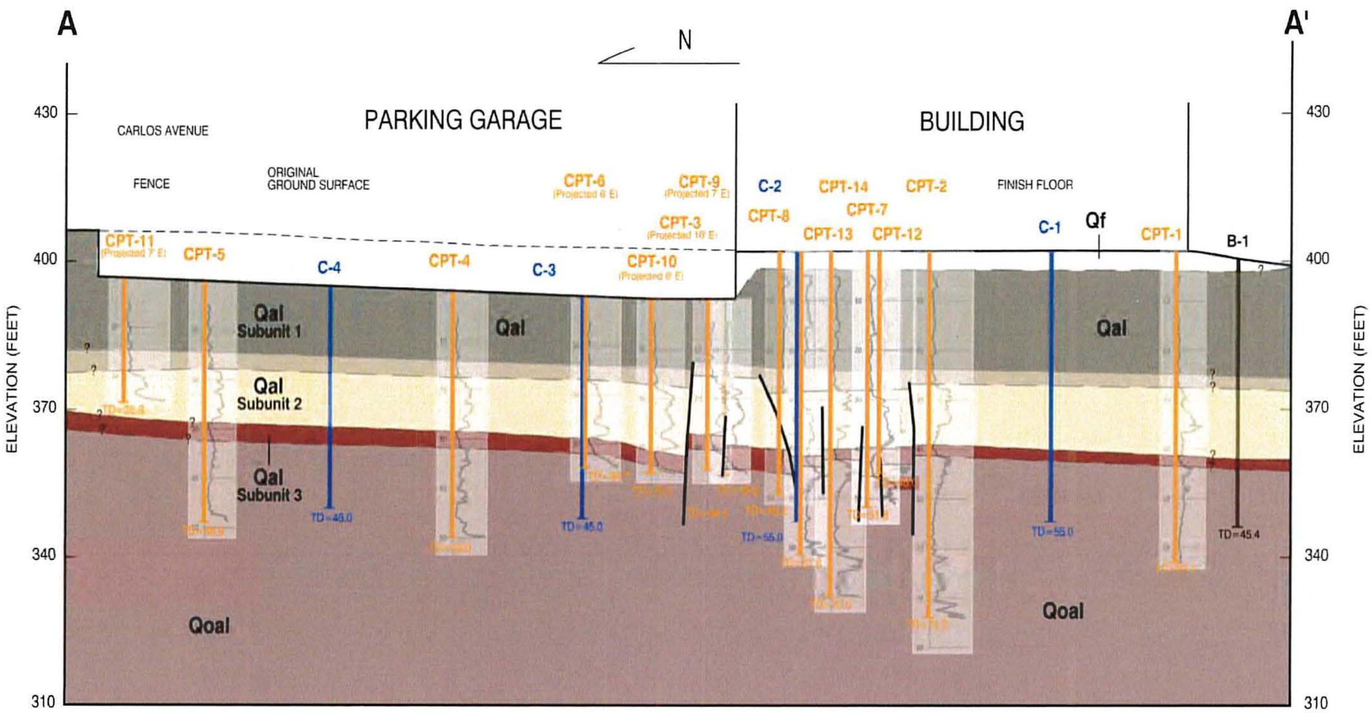



**LEGEND**

| | | | |
|---|---|---|---|
| — — —?— — | GEOLOGIC CONTACT; QUERIED WHERE INFERRED | Qf | FILL |
| C-4 (TD=45.0) | CORE; TD=TOTAL DEPTH IN FEET | Qal Subunit 1 / Qal Subunit 2 / Qal Subunit 3 | ALLUVIUM |
| CPT-6 (TD=28.9) | CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET | Qoal | OLDER ALLUVIUM |
| B-2 (TD=34.7) | BORING; TD=TOTAL DEPTH IN FEET | \ | POSSIBLE FAULT |

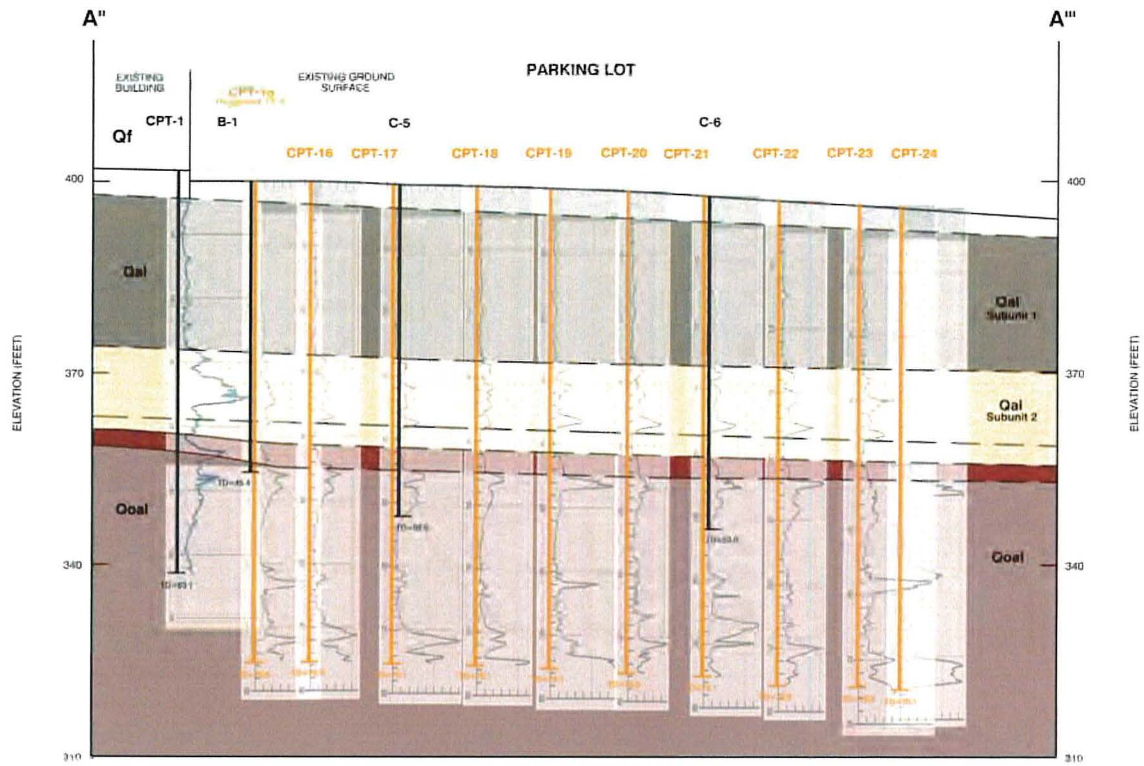
SCALE IN FEET
0 30 60

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

REFERENCE: NINYO & MOORE, 2015, FAULT RUPTURE HAZARD EVALUATION, DATED, FEBRUARY 24.

| Ninyo & Moore | | CROSS SECTION A-A' | FIGURE |
|---|---|---|---|
| PROJECT NO. 402132007 | DATE 6/15 | HOLLYWOOD COURTHOUSE<br>5925 HOLLYWOOD BOULEVARD<br>LOS ANGELES, CALIFORNIA | 10 |

402132006_CS (11X17) TCR.dwg 14:50:05 01/06/2015 GK




**LEGEND**

? GEOLOGIC CONTACT; QUERIED WHERE INFERRED

CPT-1 (TD=63.1) CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET (NINYO & MOORE, 2015a)

CPT-24 CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET

B-1 (TD=45.4) BORING; TD=TOTAL DEPTH IN FEET (NINYO & MOORE, 2015b)

C-6 (TD=52.0) CORE; TD=TOTAL DEPTH IN FEET

Qf FILL

Qal Subunit 1 / Qal Subunit 2 ALLUVIUM

Qoal OLDER ALLUVIUM

SCALE IN FEET

0 30 60

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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| PROJECT NO. | DATE |
|---|---|
| 402132007 | 6/15 |

## CROSS SECTION A''-A'''

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

FIGURE

11

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## 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.

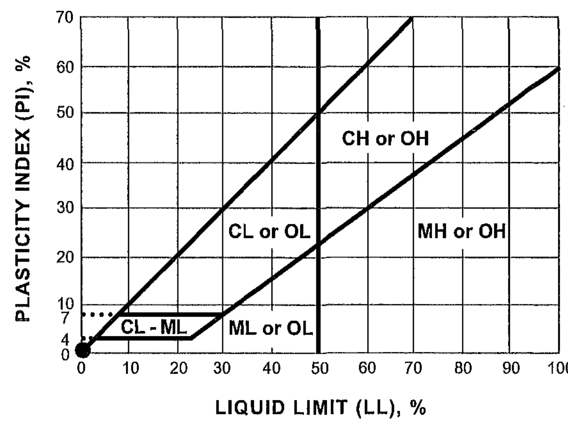
## SOIL CLASSIFICATION CHART PER ASTM D 2488

| 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

| CONSISTENCY | 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 |
|---|---|---|
| | | |

# BORING LOG EXPLANATION SHEET

| DEPTH (feet) | SAMPLES Bulk | SAMPLES Driven | BLOWS/FOOT | MOISTURE (%) | DRY DENSITY (PCF) | SYMBOL | CLASSIFICATION U.S.C.S. | |
|---|---|---|---|---|---|---|---|---|
| 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. |
| 10 | | | | | | | | Seepage.<br>Groundwater encountered during drilling.<br>Groundwater measured after drilling. |
| | | | | | | | SM | MAJOR MATERIAL TYPE (SOIL):<br>Solid line denotes unit change. |
| | | | | | | | CL | Dashed line denotes material change.<br><br>Attitudes: Strike/Dip<br>b: Bedding<br>c: Contact<br>j: Joint<br>f: Fracture<br>F: Fault<br>cs: Clay Seam<br>s: Shear<br>bss: Basal Slide Surface<br>sf: Shear Fracture<br>sz: Shear Zone<br>sbs: Shear Bedding Surface |
| 15 | | | | | | | | |
| 20 | | | | | | | | The total depth line is a solid line that is drawn at the bottom of the boring. |

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| BORING LOG | | |
|---|---|---|
| Explanation of Boring Log Symbols | | |
| PROJECT NO. | DATE<br>Rev. 11/11 | FIGURE |

| DATE DRILLED | 5/11/15 | BORING NO. | B-1 |
|---|---|---|---|
| GROUND ELEVATION | 398' ± (MSL) | SHEET | 1 OF 2 |
| 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 | | | | | | | SM | ASPHALT CONCRETE: Approximately 3 inches thick. |
| | X | | | | | | SM | AGGREGATE BASE: Olive brown, moist, medium dense, silty SAND with gravel; approximately 8 inches thick. |
| | | | | | | | SC | FILL: Brown, moist, loose, silty SAND. |
| | | X | 33 | 11.9 | 117.4 | | | ALLUVIUM: Brown, moist, medium dense, clayey SAND; trace coarse sand. |
| 10 | | X | 10 | | | | | |
| | X | X | 15 | 7.5 | 105.3 | | | |
| 20 | | X | 7 | 10.5 | | | | Yellowish brown; loose. |
| | | X | 25 | | | | | Trace gravel. |
| 30 | | X | 10 | 14.1 | | | | Medium dense. |
| | | X | 34 | 6.6 | 114.0 | | | |
| 40 | | | | | | | | |

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**BORING LOG**

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-1 |

| DEPTH (feet) | SAMPLES Bulk | SAMPLES Driven | BLOWS/FOOT | MOISTURE (%) | DRY DENSITY (PCF) | SYMBOL | CLASSIFICATION U.S.C.S. | DATE DRILLED 5/11/15 BORING NO. B-1 / GROUND ELEVATION 398' ± (MSL) SHEET 2 OF 2 / 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 | | | 12 | 14.1 | | | SC | ALLUVIUM: (Continued)<br>Light yellowish brown, moist, medium dense, clayey SAND. |
| | | | | | | | CL | OLDER ALLUVIUM:<br>Dark reddish brown, moist, very stiff to hard, sandy CLAY; trace gravel and coarse sand. |
| | | | 50/6" | 10.8 | 116.4 | | | Reddish brown and olive brown; hard; mottled; trace caliche stringers. |
| 50 | | | 57 | | | | | |
| | | | | | | | | Total Depth = 51.5 feet.<br>Groundwater was not encountered during drilling.<br>Backfilled with on-site soils on 5/11/15.<br><br>Note:<br>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.<br><br>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. |
| 60 | | | | | | | | |
| 70 | | | | | | | | |
| 80 | | | | | | | | |

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**BORING LOG**

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-2 |

DATE DRILLED 5/11/15 BORING NO. B-2

GROUND ELEVATION 396' ± (MSL) SHEET 1 OF 2

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 | | | | | | | SC | ASPHALT CONCRETE: Approximately 2½ inches thick. AGGREGATE BASE: Olive brown, moist, medium dense, silty SAND with gravel; approximately 4½ inches thick. FILL: Brown, moist, loose, clayey SAND; trace gravel. |
| | | | 7 | | | | SC | ALLUVIUM: Brown, moist, loose, clayey SAND; trace gravel and coarse sand. |
| 10 | | | 16 | 10.1 | 104.4 | | | Medium dense. |
| | | | 6 | | | | | Loose. |
| 20 | | | 13 | 19.9 | 96.0 | | | |
| | | | 6 | | | | CL | Yellowish brown, moist, stiff, sandy CLAY. |
| 30 | | | 21 | 18.8 | 104.3 | | | Very stiff. |
| | | | | | | | SM | Yellowish brown, moist, medium dense, silty SAND. |
| | | | 12 | | | | SC | Yellowish brown, moist, medium dense, clayey SAND. |
| 40 | | | | | | | | |

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**BORING LOG**

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-3 |

| | |
|---|---|
| DATE DRILLED 5/11/15 | BORING NO. B-2 |
| GROUND ELEVATION 396' ± (MSL) | SHEET 2 OF 2 |
| 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 |
|---|---|---|---|---|---|---|---|---|
| 40 | | ■ | 24 | 16.6 | 112.1 | | CL | OLDER ALLUVIUM: Dark reddish brown, moist, very stiff, sandy CLAY; trace coarse sand. |
| | | ▼ | 41 | | | | | Hard. Difficult drilling. |
| 50 | | ■ | 98/10" | | | | | |
| | | | | | | | | Total Depth = 51 feet. Groundwater was not encountered during drilling. Backfilled with bentonite-grout on 5/11/15. |
| | | | | | | | | Note: 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. |
| 60 | | | | | | | | |
| 70 | | | | | | | | |
| 80 | | | | | | | | |

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## BORING LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD, LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-4 |

# DIRECT PUSH CORE LOGS

DATE DRILLED 5/11/15 CORE NO. C-1
GROUND ELEVATION 399.6'± (MSL) SHEET 1 OF 4
METHOD OF DRILLING TRUCK MOUNTED DIRECT PUSH DRILLER MARTINI DRILLING
LOCATION PARKING LOT - 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 |
|---|---|---|---|---|---|---|---|---|
| 399.6 | 0 | | | | SM | ASPHALT CONCRETE<br>Approximately 4 inches thick.<br>AGGREGATE BASE<br>Olive brown, moist, loose, silty SAND with gravel, approximately 5 inches thick | | Hand Auger to 5 feet |
| 398.6 | 1 | | | | | FILL<br>Brown, moist, loose, silty SAND; trace gravel, | | |
| 397.6 | 2 | | | | SM | | | |
| 396.6 | 3 | | | | | | | |
| 395.6 | 4 | | | | SC | ALLUVIUM - SUBUNIT 1<br>Dark yellowish brown, (10YR 3/4), moist, loose, clayey SAND; trace coarse sand. | | |
| 394.6 | 5 | | | | | | | |
| 393.6 | 6 | 1 | 1 | 36 | | | | |
| 392.6 | 7 | | | | | | | |
| 391.6 | 8 | | | | | | | |
| 390.6 | 9 | | | | | | | |
| 389.6 | 10 | 2 | | 35 | | | | |
| 388.6 | 11 | | | | | @ 11.9' Light gray, subrounded to subangular gravel up to 3/4 inch. | | |
| 387.6 | 12 | | | | | | | |
| 386.6 | 13 | 3 | | 42 | | | | |
| 385.6 | 14 | | | | CL | Dark brown, (10YR 3/3), moist, firm, sandy CLAY; trace coarse sand. | | |
| 384.6 | 15 | | | | SC-SM | Dark yellowish brown, (10YR 3/4), moist, loose, clayey to silty SAND; trace coarse sand and fine, subangular gravel. | | |
| 383.6 | 16 | | | | | | | |

Ninyo & Moore

# CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-5 |

| DATE DRILLED 5/11/15 | CORE NO. C-1 |
|---|---|
| GROUND ELEVATION 399.6'± (MSL) | SHEET 2 OF 4 |
| METHOD OF DRILLING TRUCK MOUNTED DIRECT PUSH | DRILLER MARTINI DRILLING |
| LOCATION PARKING LOT - 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 |
|---|---|---|---|---|---|---|---|---|
| 384.6 | 16 | 4 | 1 | 50 | SC-SM | ALLUVIUM - SUBUNIT 1 CONT. Dark yellowish brown (10YR 3/4), moist, loose, clayey to silty SAND; trace coarse sand and fine, subangular gravel. | | |
| 383.6 | 17 | | | | | | | |
| 382.6 | 18 | | | | | | | |
| 381.6 | 19 | | | | | | | |
| 380.6 | 20 | 5 | | 42 | | Dark yellowish brown, (10YR 4/4), trace subrounded gravel. | | |
| 379.6 | 21 | | | | | Graditional Contact | | |
| 378.6 | 22 | | | | CL | Yellowish brown, (10YR 5/6), moist, firm to stiff, sandy CLAY; trace fine to coarse sand. | | |
| 377.6 | 23 | | | | | @ 23'6" 2 inch clayey sand lens. | | |
| 376.6 | 24 | 6 | | 69 | | | | |
| 375.6 | 25 | | | | | | | |
| 374.6 | 26 | | | | | Thin interbeds of clayey SAND. | | |
| 373.6 | 27 | | | | | @ 27'6" 2-inch interbed of dark yellowish brown (10YR 6/4), moist, medium dense, poorly graded SAND. | | |
| 372.6 | 28 | 7 | 2 | 85 | SP | ALLUVIUM - SUBUNIT 2 Dark yellowish brown (10YR 6/4), moist, medium dense, poorly graded SAND; fine to medium grained; scattered lenses with trace clay. | | |
| 371.6 | 29 | | | | | @ 29'9" 3-inch interbed of dark yellowish brown (10YR 4/4), moist, stiff sandy CLAY; shallow angular contact. | | |
| 370.6 | 30 | | | | | @ 30' 1-inch thick lens of poorly graded SAND. @ 30'1" 5-inch thick interbed of dark yellowish brown (10YR 4/4), moist, medium dense, clayey SAND. @ 30'6": Dark yellowish brown (10YR 6/4), moist, stiff, sandy CLAY; gradational to clayey SAND. | | |
| 369.6 | 31 | | | | | @ 31' Yellowish brown (10YR 5/6), moist, medium dense, poorly graded SAND; trace gravel. | | |
| 368.6 | 32 | | | | | | | |

Ninyo & Moore

## CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-6 |

402132007_C1-2.dwg 10:09:18 06/04/2015 GK

DATE DRILLED 5/11/15 CORE NO. C-1
GROUND ELEVATION 399.6'± (MSL) SHEET 3 OF 4
METHOD OF DRILLING TRUCK MOUNTED DIRECT PUSH DRILLER MARTINI DRILLING
LOCATION PARKING LOT - 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 |
|---|---|---|---|---|---|---|---|---|
| 367.6 | 32 | 8 | 2 | 83 | SP | ALLUVIUM - SUBUNIT 2 CONT.<br>Yellowish brown (10YR 5/6), moist, medium dense, poorly graded SAND; trace gravel. | | |
| 366.6 | 33 | | | | | @ 33' to 34' Gradational interbeds of sandy CLAY; and clayey SAND. | | |
| 365.6 | 34 | | | | SC | Yellowish brown (10YR 5/6), moist, medium dense, clayey SAND. | | |
| 364.6 | 35 | | | | | | | |
| 363.6 | 36 | 9 | | 81 | | | | |
| 362.6 | 37 | | | | | @ 37'10" Groundwater carbonation on gravel. | | |
| 361.6 | 38 | | | | SP | Very pale brown (10YR 7/4), moist, medium dense, poorly graded SAND. | | |
| | | | | | SC | ALLUVIUM - SUBUNIT 3<br>Dark yellowish brown (10YR 7/4), moist, medium dense, clayey SAND; trace, coarse sand and fine gravel. | | |
| 360.6 | 39 | | | | | @ 39'8" stringers of dark brown (10YR 3/3), moist, stiff, sandy CLAY. | | |
| 359.6 | 40 | 10 | | 73 | | OLDER ALLUVIUM<br>Very dark brown (7.5YR 3/4), moist, very stiff, sandy CLAY.<br>Paleosol 1; A horizon (approximately 17 1/2 inches in thickness). | | |
| 358.6 | 41 | | | | CL | Strong brown (7.5YR 4/6), trace coarse sand. | | |
| 357.6 | 42 | | | | | | | |
| 356.6 | 43 | | | | | | | |
| 355.6 | 44 | 11 | | 100 | | | | |
| 354.6 | 45 | | | | | Scattered carbonated gravel. | | |
| 353.6 | 46 | | | | SC | Very pale brown (10YR 7/4), moist, dense, clayey SAND; low angular contact; Paleosol 2; A horizon (approximately 5 inches in thickness).<br>Graditional to dark yellowish brown (10YR 3/4), clayey SAND to sandy CLAY. | | |
| 352.6 | 47 | | | | | | | |
| 351.6 | 48 | | | | | | | |

Ninyo & Moore

## CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| DATE DRILLED 5/11/15 | | | | | CORE NO. C-1 | |
| GROUND ELEVATION 399.6'± (MSL) | | | | | SHEET 4 OF 4 | |
| METHOD OF DRILLING TRUCK MOUNTED DIRECT PUSH | | | | | DRILLER MARTINI DRILLING | |
| LOCATION PARKING LOT - 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 |
|---|---|---|---|---|---|---|---|---|
| 367.6 | 48 | 12 | 2 | 100 | SC | OLDER ALLUVIUM CONT.<br>Yellowish brown (10YR 3/4), moist, dense, clayey SAND. | | |
| 366.6 | 49 | | | | CL | Brown (7.5YR 4/4), moist, hard, sandy CLAY; trace coarse sand, trace subangular gravel. | | |
| 349.6 | 50 | | | | | Yellowish brown (10YR 5/6), moist, medium dense, clayey SAND. | | |
| 348.6 | 51 | | | | | | | |
| 347.6 | 52 | | | | | Total Depth = 52.0 feet<br>Groundwater not encountered during drilling<br>Backfilled with bentonite grout on 5/11/15<br><br>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. | | |

Ninyo & Moore

## CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-8 |

402132007_C1-4.dwg 10:09:18 06/04/2015 GK

DATE DRILLED 5/11/15 CORE NO. C-2

GROUND ELEVATION 397.7'± (MSL) SHEET 1 OF 4

METHOD OF DRILLING TRUCK MOUNTED DIRECT PUSH DRILLER MARTINI DRILLING

LOCATION PARKING LOT - 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 |
|---|---|---|---|---|---|---|---|---|
| 397.7 | 0 | | | | | ASPHALT CONCRETE<br>Approximately 3 inches thick. | | |
| | | | | | SM | AGGREGATE BASE<br>Olive brown, moist, medium dense, silty SAND with gravel, approximately 4 inches thick | | Hand Auger to 5 feet |
| 396.7 | 1 | | | | | FILL<br>Brown, moist, loose, silty SAND; trace gravel, | | |
| 395.7 | 2 | | | | SM | | | |
| 394.7 | 3 | | | | | | | |
| 393.7 | 4 | | | | SC | ALLUVIUM - SUBUNIT 1<br>Dark yellowish brown, (10YR 3/4), moist, loose, clayey SAND; trace coarse sand. | | |
| 392.7 | 5 | 1 | 1 | 33 | | | | |
| 391.7 | 6 | | | | | | | |
| 390.7 | 7 | | | | | | | |
| 389.7 | 8 | 2 | | 48 | | | | |
| 388.7 | 9 | | | | | | | |
| 387.7 | 10 | | | | | | | |
| 386.7 | 11 | | | | | | | |
| 385.7 | 12 | 3 | | 50 | | | | |
| 384.7 | 13 | | | | | | | |
| 383.7 | 14 | | | | | | | |
| 382.7 | 15 | | | | SM | Light yellowish brown (10YR 6/4), moist, loose, silty SAND; trace gravel. | | |
| 381.7 | 16 | | | | SC-SM | Dark yellowish brown (10YR 3/4), moist, loose, clayey to silty SAND; trace coarse sand. | | |

Ninyo & Moore

# CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-9 |

DATE DRILLED 5/11/15 CORE NO. C-2

GROUND ELEVATION 397.7'± (MSL) SHEET 2 OF 4

METHOD OF DRILLING TRUCK MOUNTED DIRECT PUSH DRILLER MARTINI DRILLING

LOCATION PARKING LOT - 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 |
|---|---|---|---|---|---|---|---|---|
| 381.7 | 16 | 4 | 1 | 48 | SC-SM | ALLUVIUM - SUBUNIT 1 CONT.<br>Dark, yellowish brown (10YR 3/4), moist, loose, clayey to silty SAND; trace coarse sand. | | |
| 380.7 | 17 | | | | | | | |
| 379.7 | 18 | | | | | | | |
| 378.7 | 19 | | | | | | | |
| 377.7 | 20 | 5 | | 75 | | | | |
| | | | | | CL | Dark yellowish brown, (10YR 3/4), moist, very stiff, sandy CLAY; trace coarse sand. | | |
| 376.7 | 21 | | | | | | | |
| 375.7 | 22 | | | | | | | |
| 374.7 | 23 | | | | | | | |
| 373.7 | 24 | 6 | | 85 | SC | Yellowish brown, (10YR 5/6), moist, medium dense, clayey SAND. | | |
| 372.7 | 25 | | | | | | | |
| | | | | | | Gradational contact | | |
| 371.7 | 26 | | | | SP | ALLUVIUM - SUBUNIT 2<br>Yellowish brown, (10YR 5/6), moist, medium dense, poorly graded SAND. | | |
| 370.7 | 27 | | | | SC | Yellowish brown, (10YR 5/6), moist, medium dense, clayey SAND. | | |
| 369.7 | 28 | 7 | 2 | 83 | SP | Very pale brown, (10YR 7/4), moist, medium dense, poorly graded SAND. | | |
| 368.7 | 29 | | | | CL | Dark yellowish brown, (10YR 4/4), moist, stiff, sandy CLAY. | | |
| 367.7 | 30 | | | | | @ 30'4" gravel. | | |
| 366.7 | 31 | | | | SP | Yellowish brown (10YR 5/6), moist, medium dense, poorly graded SAND. | | |
| 365.7 | 32 | | | | | | | |

DATE DRILLED 5/11/15 CORE NO. C-2

GROUND ELEVATION 397.7'± (MSL) SHEET 3 OF 4

METHOD OF DRILLING TRUCK MOUNTED DIRECT PUSH DRILLER MARTINI DRILLING

LOCATION PARKING LOT - 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 |
|---|---|---|---|---|---|---|---|---|
| 365.7 | 32 | 8 | 2 | 79 | SP | ALLUVIUM - SUBUNIT 2 CONT.<br>Yellowish brown (10YR 5/6), moist, medium dense, poorly graded SAND. | | |
| 364.7 | 33 | | | | | @33'6" gravel. | | |
| 363.7 | 34 | | | | SC | Yellowish brown, (10YR 5/6), moist, medium dense, clayey SAND and sandy CLAY; interbedded; trace gravel. | | |
| 362.7 | 35 | | | | | | | |
| 361.7 | 36 | 9 | | 79 | SP | Very pale brown, (10YR 7/4), moist, medium dense, poorly graded SAND. | | |
| 360.7 | 37 | | | | | Horizontal contact | | |
| 359.7 | 38 | | | | SC | ALLUVIUM - SUBUNIT 3<br>Dark yellowish brown, (10YR 3/4), moist, dense, clayey SAND; trace coarse sand and fine gravel. | | |
| 358.7 | 39 | | | | CL | OLDER ALLUVIUM<br>Very dark brown, (7.5YR 3/4), moist, very stiff, sandy CLAY.<br>Paleosol 1; A horizon (approximately 14 inches in thickness). | | |
| 357.7 | 40 | 10 | | 100 | | | | |
| 356.7 | 41 | | | | | Strong brown, (7.5YR 4/6), trace, coarse sand and fine gravel. | | |
| 355.7 | 42 | | | | | | | |
| 354.7 | 43 | | | | | | | |
| 353.7 | 44 | 11 | | 100 | | @44'9" Groundwater carbonation on coarse, subangular gravel. | | |
| 352.7 | 45 | | | | | @45'8" carbonated gravel<br>Brown, (7.5YR 4/4), hard.<br>Paleosol 2; A horizon (approximately 5 inches in thickness). | | |
| 351.7 | 46 | | | | | | | |
| 350.7 | 47 | | | | | | | |
| 349.7 | 48 | | | | | | | |

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## CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-11 |

| | | | | | | |
|---|---|---|---|---|---|---|
| DATE DRILLED 5/11/15 | | | CORE NO. C-2 | | | |
| GROUND ELEVATION 397.7'± (MSL) | | | SHEET 4 OF 4 | | | |
| METHOD OF DRILLING TRUCK MOUNTED DIRECT PUSH | | | DRILLER MARTINI DRILLING | | | |
| LOCATION PARKING LOT - 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 |
|---|---|---|---|---|---|---|---|---|
| 349.7 | 48 | 12 | 2 | 100 | CL | OLDER ALLUVIUM CONT.<br>Brown (10YR 4/4), moist, hard, sandy CLAY; trace coarse sand and subangular gravel. | | |
| 348.7 | 49 | | | | | | | |
| 347.7 | 50 | | | | | | | |
| 346.7 | 51 | | | | | | | |
| 345.7 | 52 | | | | | Total Depth = 52.0 feet<br>Groundwater not encountered during drilling<br>Backfilled with bentonite grout on 5/11/15<br>Note 3<br><br>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. | | |

Ninyo & Moore

## CORE LOG

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

| PROJECT NO. | DATE | FIGURE |
|---|---|---|
| 402132007 | 6/15 | A-12 |

402132007_C2-4.dwg 10:03:18 06/04/2015 GK

# APPENDIX B

# CONE PENETROMETER TESTING

# (GREGG DRILLING)

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

May 13, 2015

Ninyo & Moore
Attn: Jim Barton

Subject: CPT Site Investigation
Hollywood Courthouse
Los Angeles, California
GREGG Project Number: 14-812SH – part 3

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-01 | 5/12/15 | 75 | - | - | 75.1 |
| CPT-02 | 5/11/15 | 75 | - | - | 75.3 |
| CPT-03 | 5/11/15 | 75 | - | - | 75.1 |
| CPT-04 | 5/11/15 | 75 | - | - | 75.1 |
| CPT-05 | 5/11/15 | 75 | - | - | 75.1 |
| CPT-06 | 5/11/15 | 75 | - | - | 75.5 |
| CPT-07 | 5/11/15 | 75 | - | - | 75.1 |
| CPT-08 | 5/12/15 | 75 | - | - | 75.8 |
| CPT-09 | 5/12/15 | 75 | - | - | 75.3 |
| CPT-10 | 5/12/15 | 75 | - | - | 75.1 |

# 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.

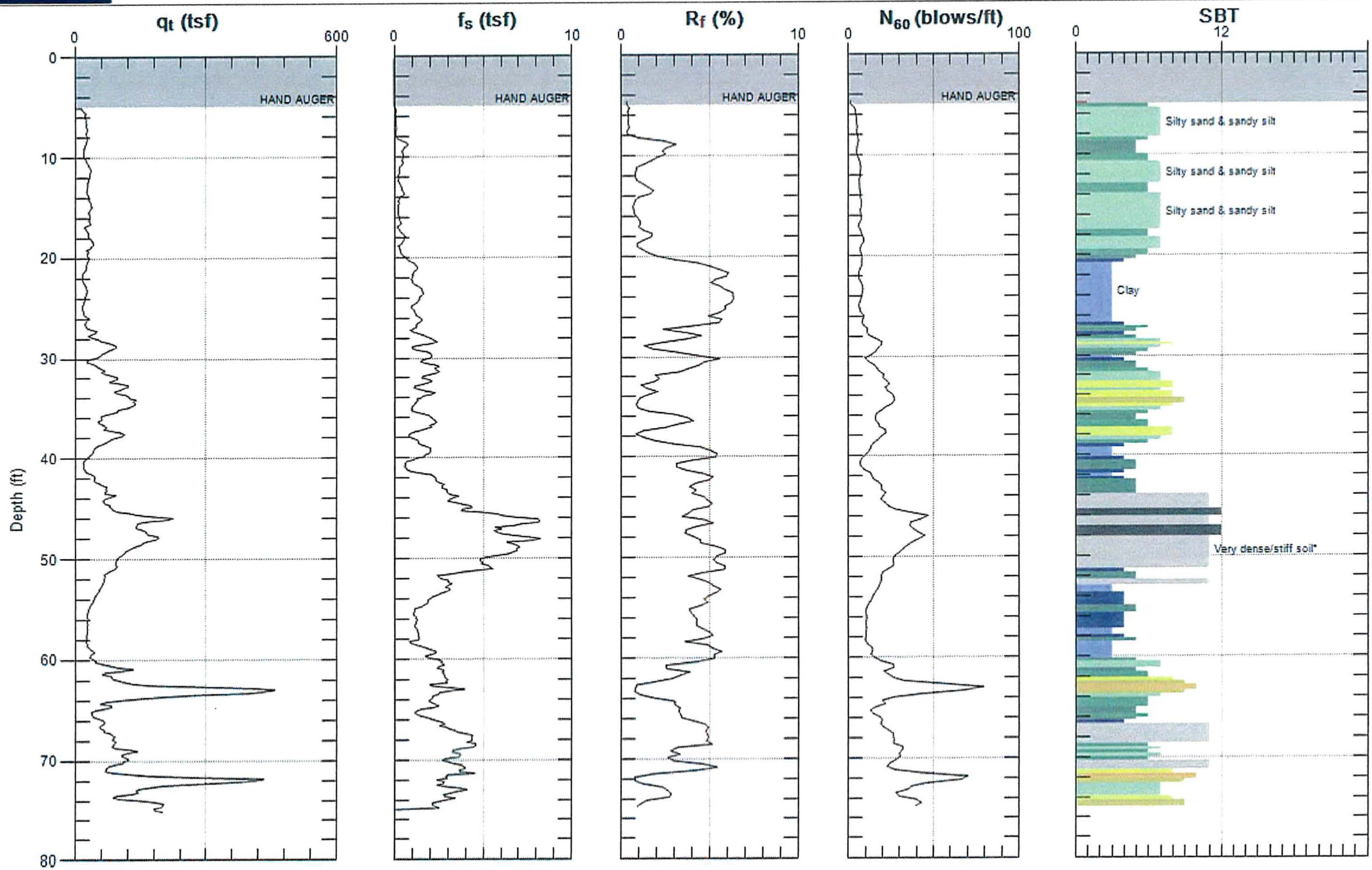
Copies of ASTM Standards are available through www.astm.org

GREGG

# NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-15

Engineer: J.BARTON
Date: 5/12/2015 07:46




Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

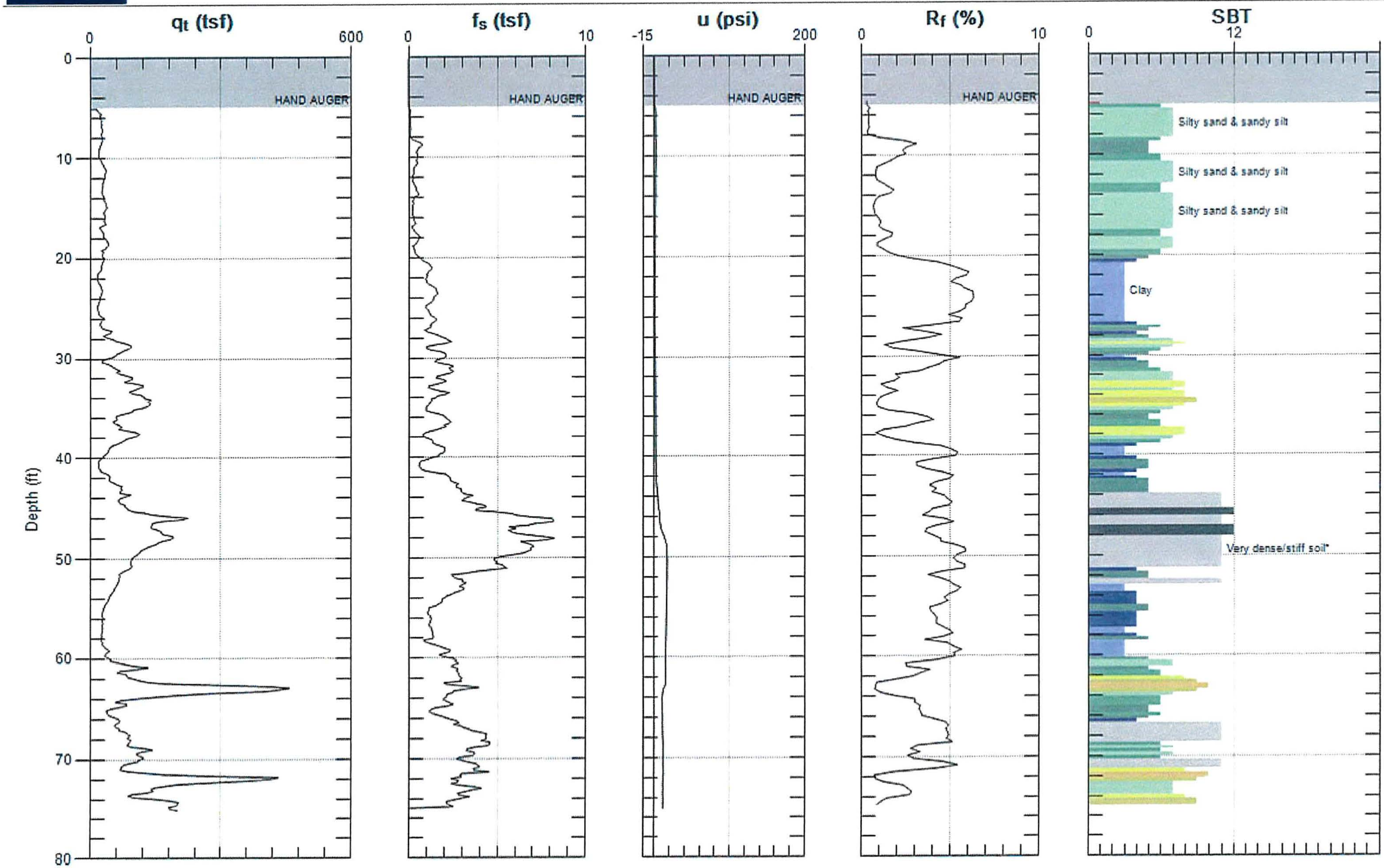
SBT: Soil Behavior Type (Robertson 1990)

GREGG

# NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-15

Engineer: J.BARTON
Date: 5/12/2015 07:46



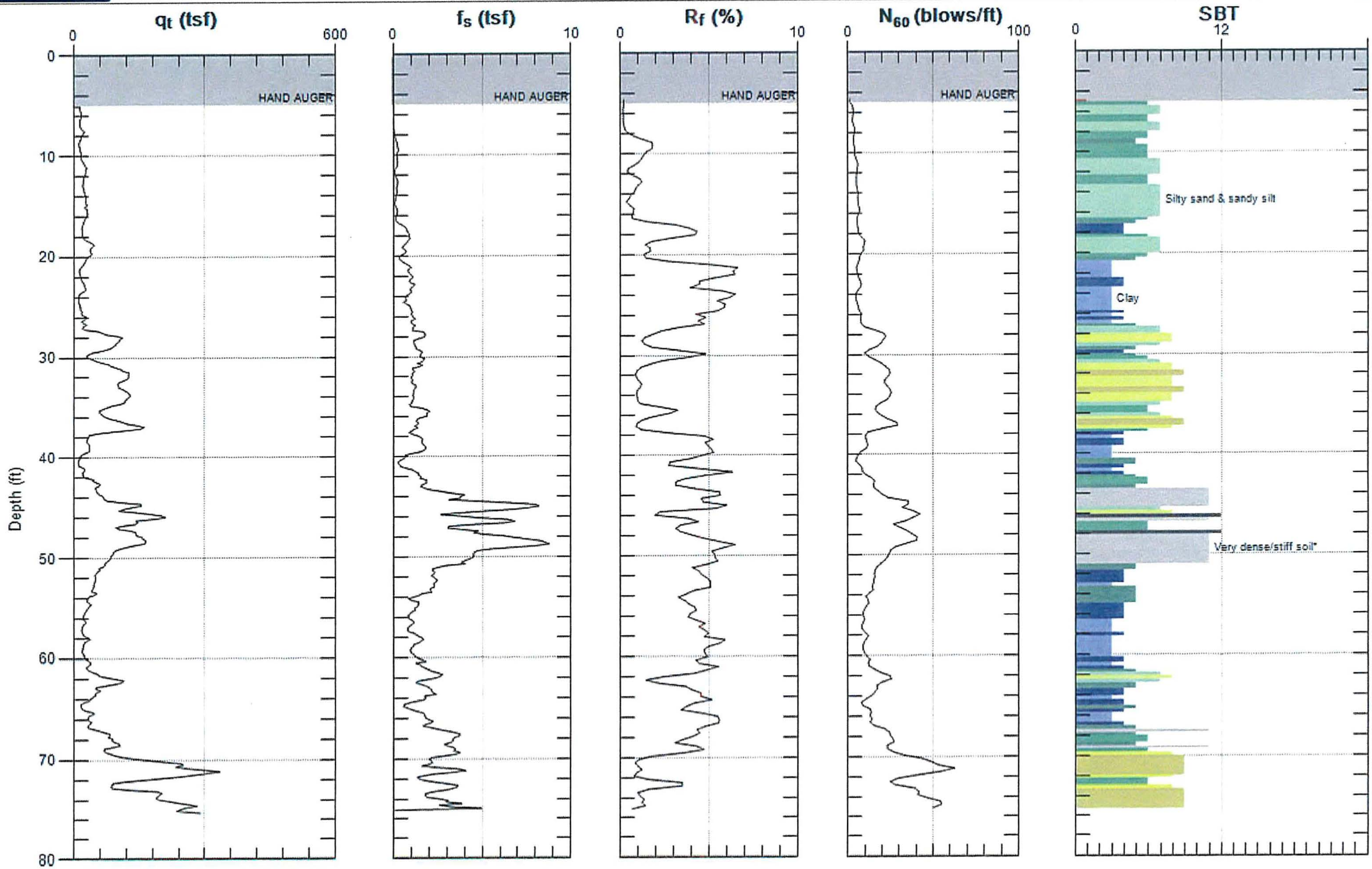

Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

# NINYO & MOORE

Site: HOLLYWOOD COURT | Engineer: J.BARTON
Sounding: CPT-16 | Date: 5/11/2015 01:54

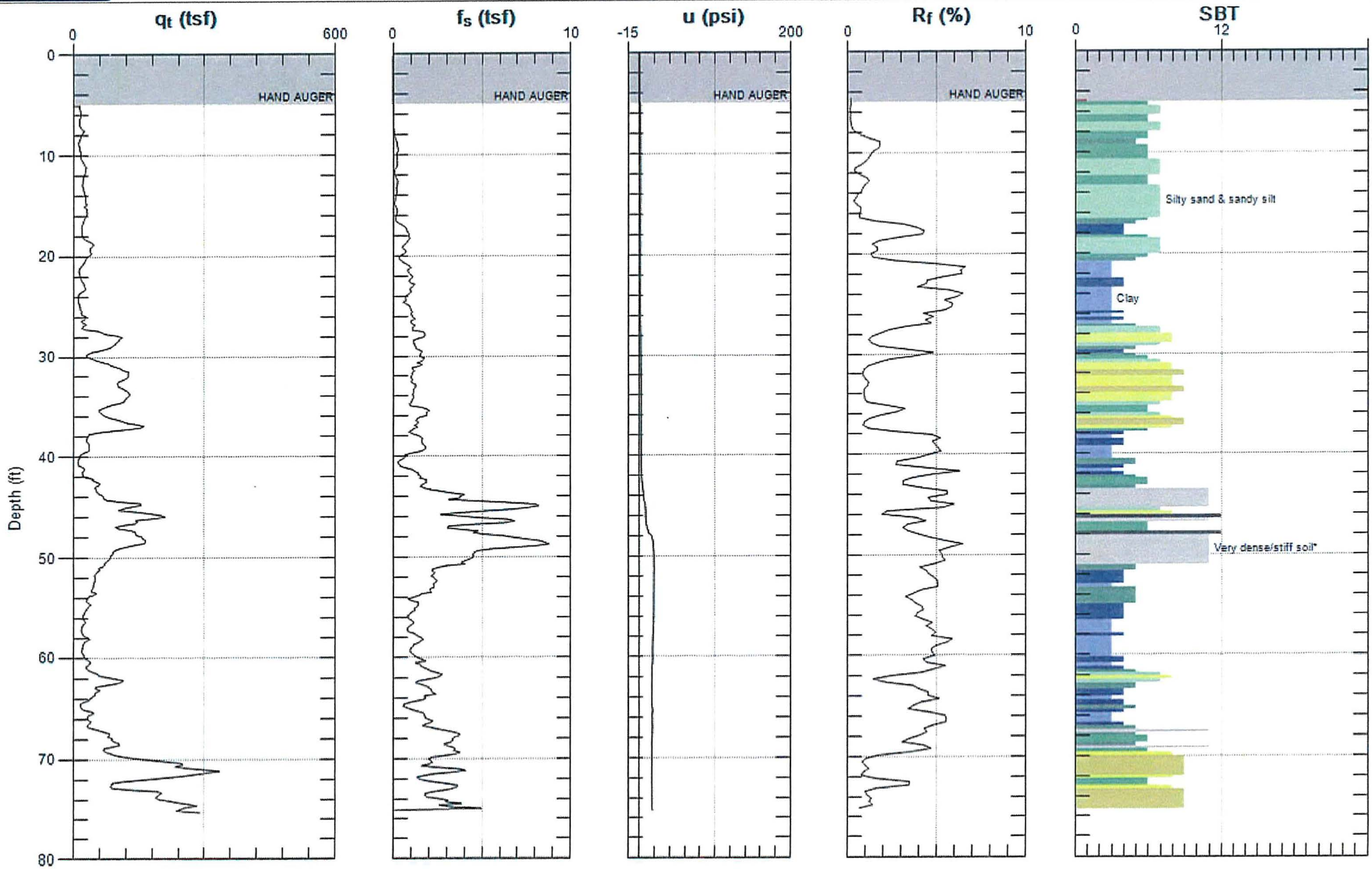



Max. Depth: 75.295 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **NINYO & MOORE**

Site: HOLLYWOOD COURT | Engineer: J.BARTON
Sounding: CPT-16 | Date: 5/11/2015 01:54




Max. Depth: 75.295 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

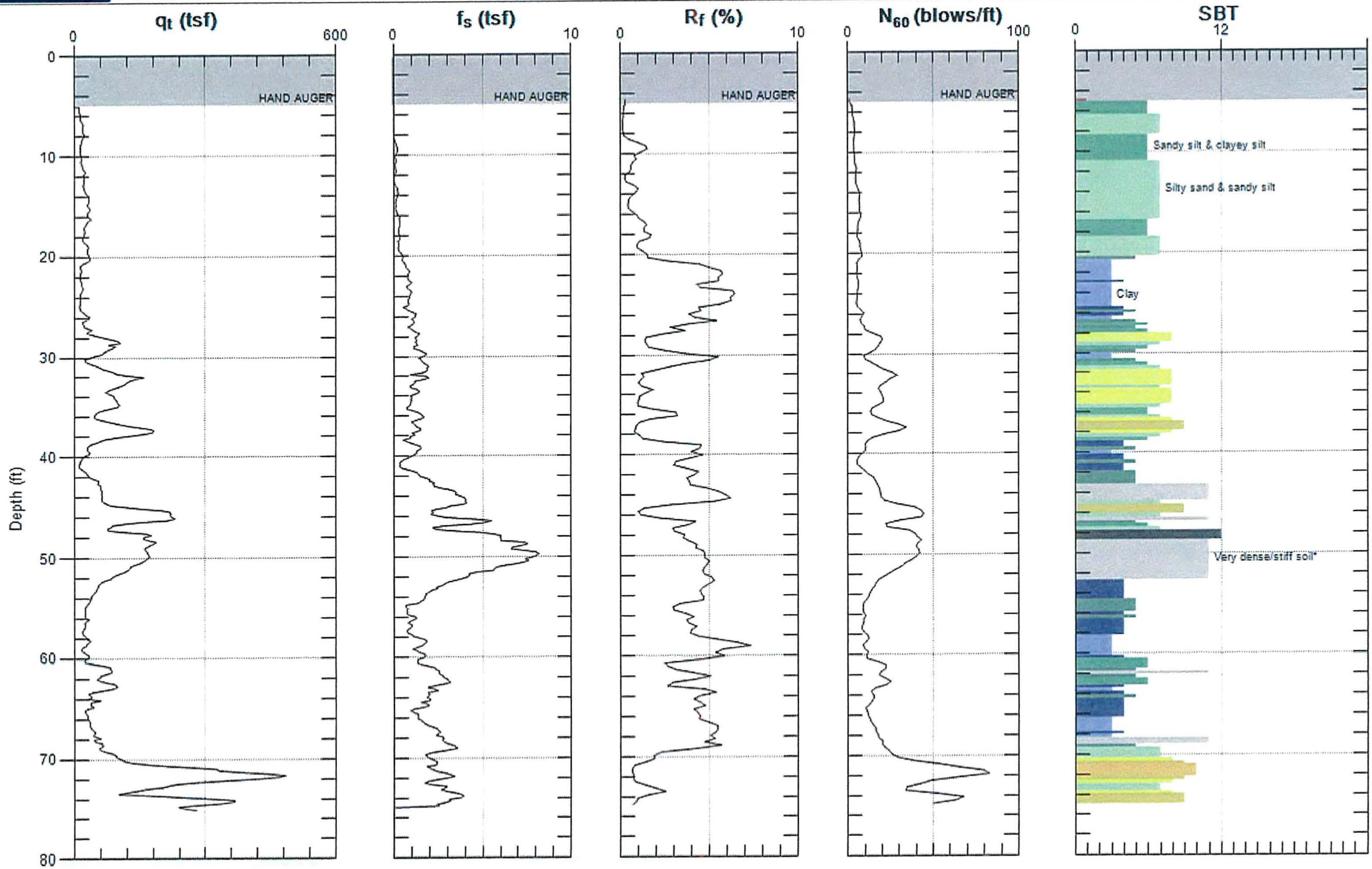
# NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-17

Engineer: J.BARTON

Date: 5/11/2015 01:01




Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

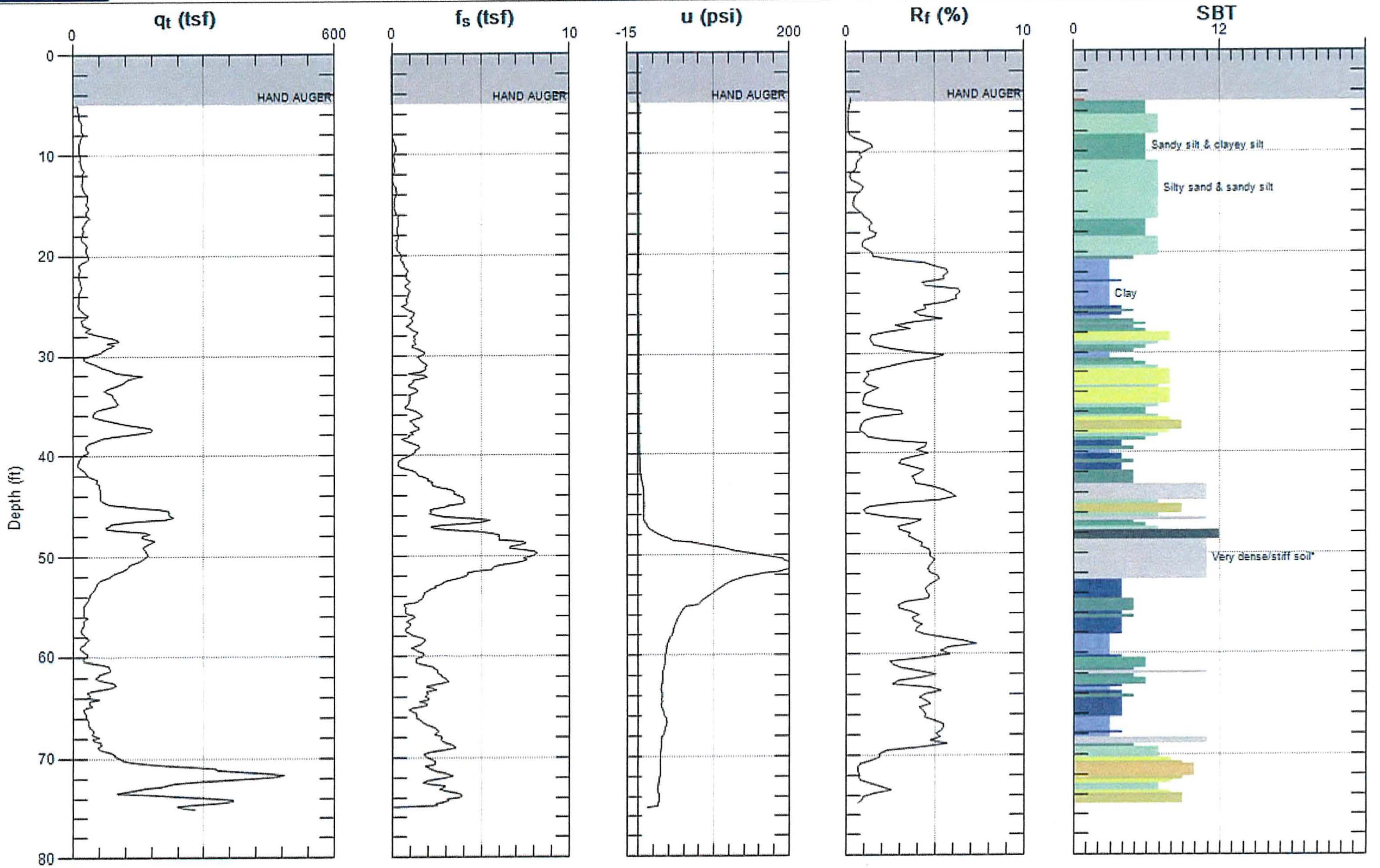
NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-17

Engineer: J.BARTON

Date: 5/11/2015 01:01




Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

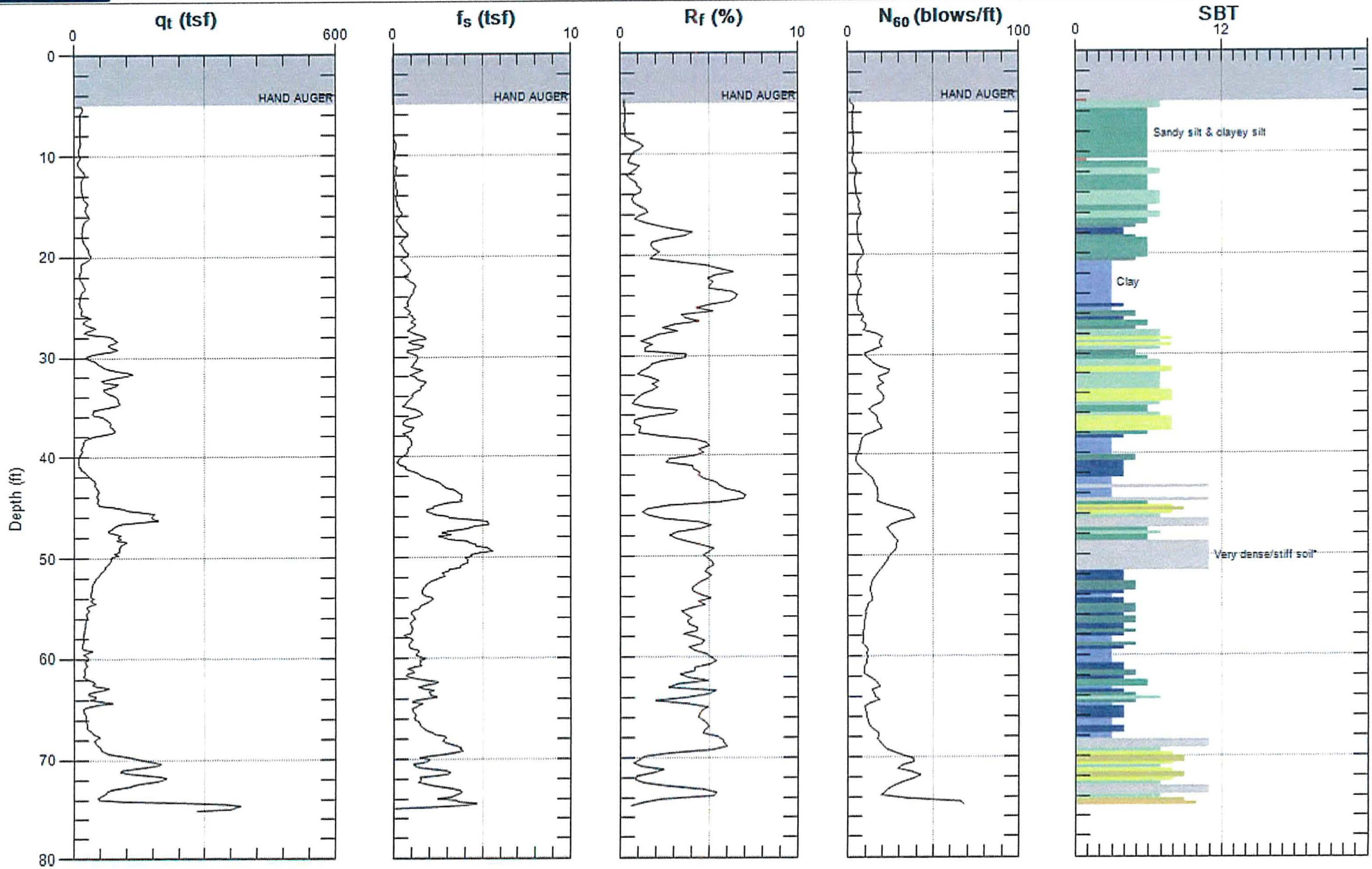
SBT: Soil Behavior Type (Robertson 1990)

GREGG

# NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-18

Engineer: J.BARTON
Date: 5/11/2015 12:02



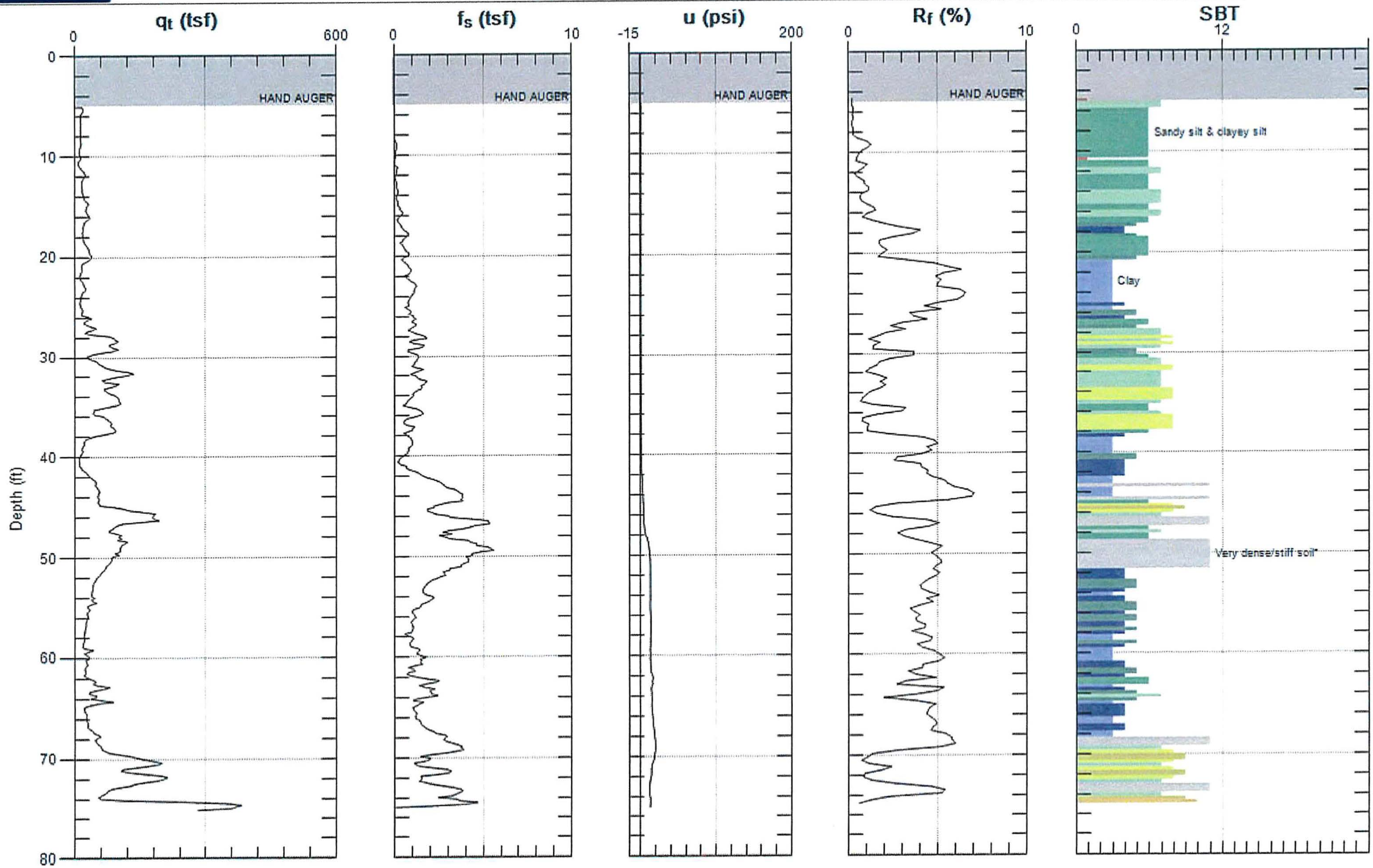

Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

# NINYO & MOORE

Site: HOLLYWOOD COURT
Engineer: J.BARTON
Sounding: CPT-18
Date: 5/11/2015 12:02




Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

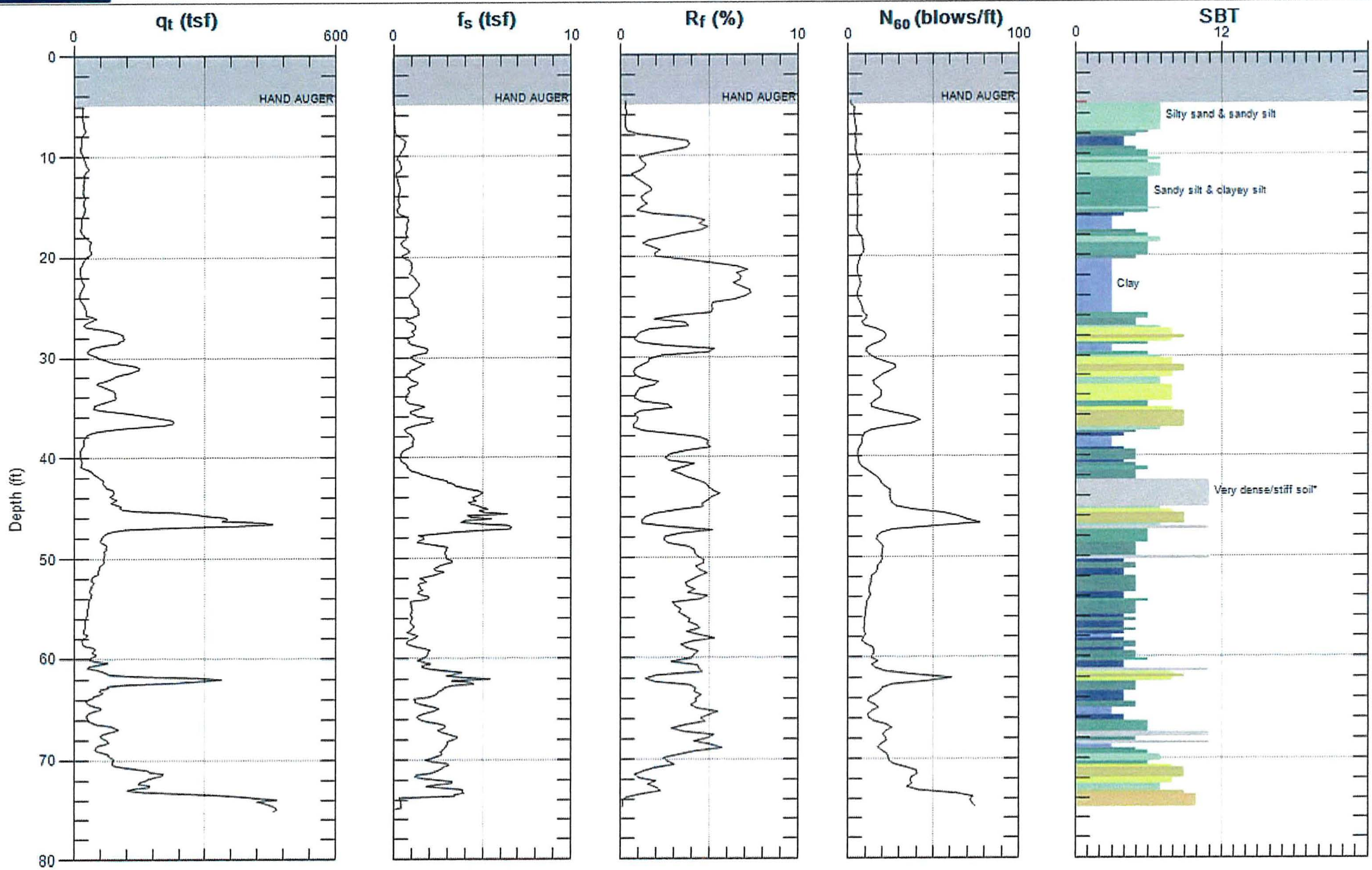
**NINYO & MOORE**

Site: HOLLYWOOD COURT

Sounding: CPT-19

Engineer: J.BARTON

Date: 5/11/2015 10:39




Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

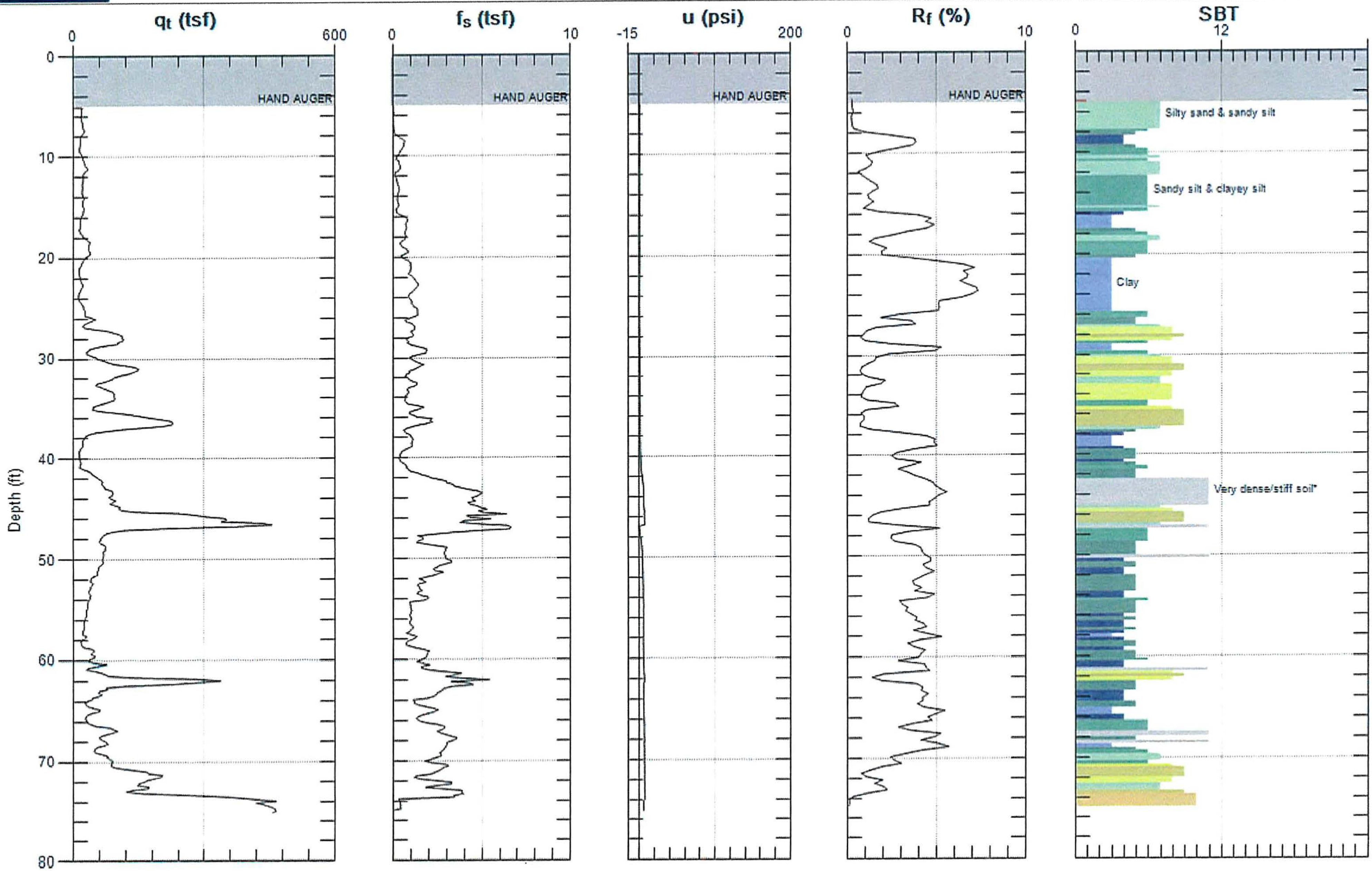
SBT: Soil Behavior Type (Robertson 1990)

GREGG

# NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-19

Engineer: J.BARTON
Date: 5/11/2015 10:39




Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

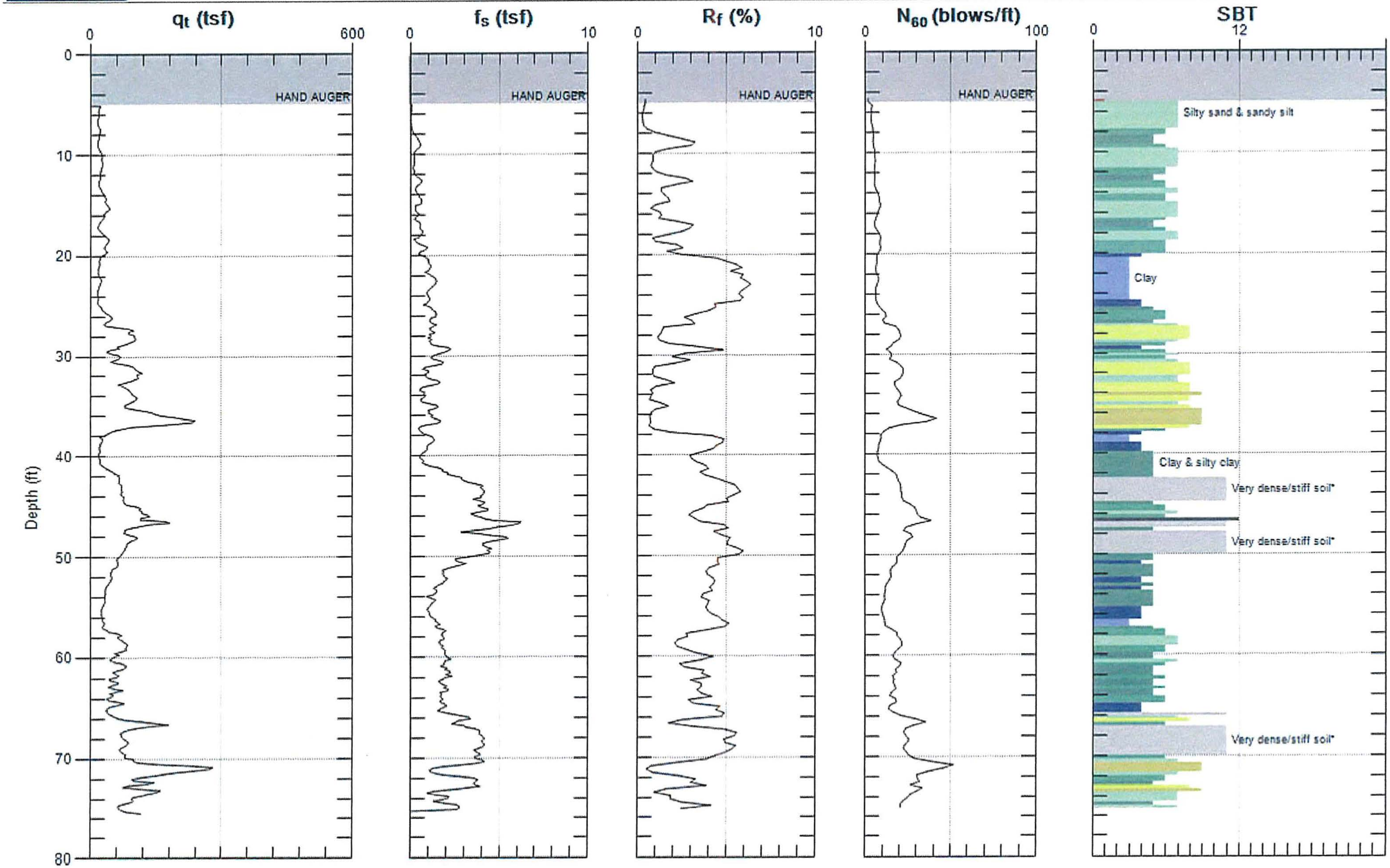
SBT: Soil Behavior Type (Robertson 1990)

GREGG

# NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-20

Engineer: J.BARTON
Date: 5/11/2015 09:37




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

SBT: Soil Behavior Type (Robertson 1990)

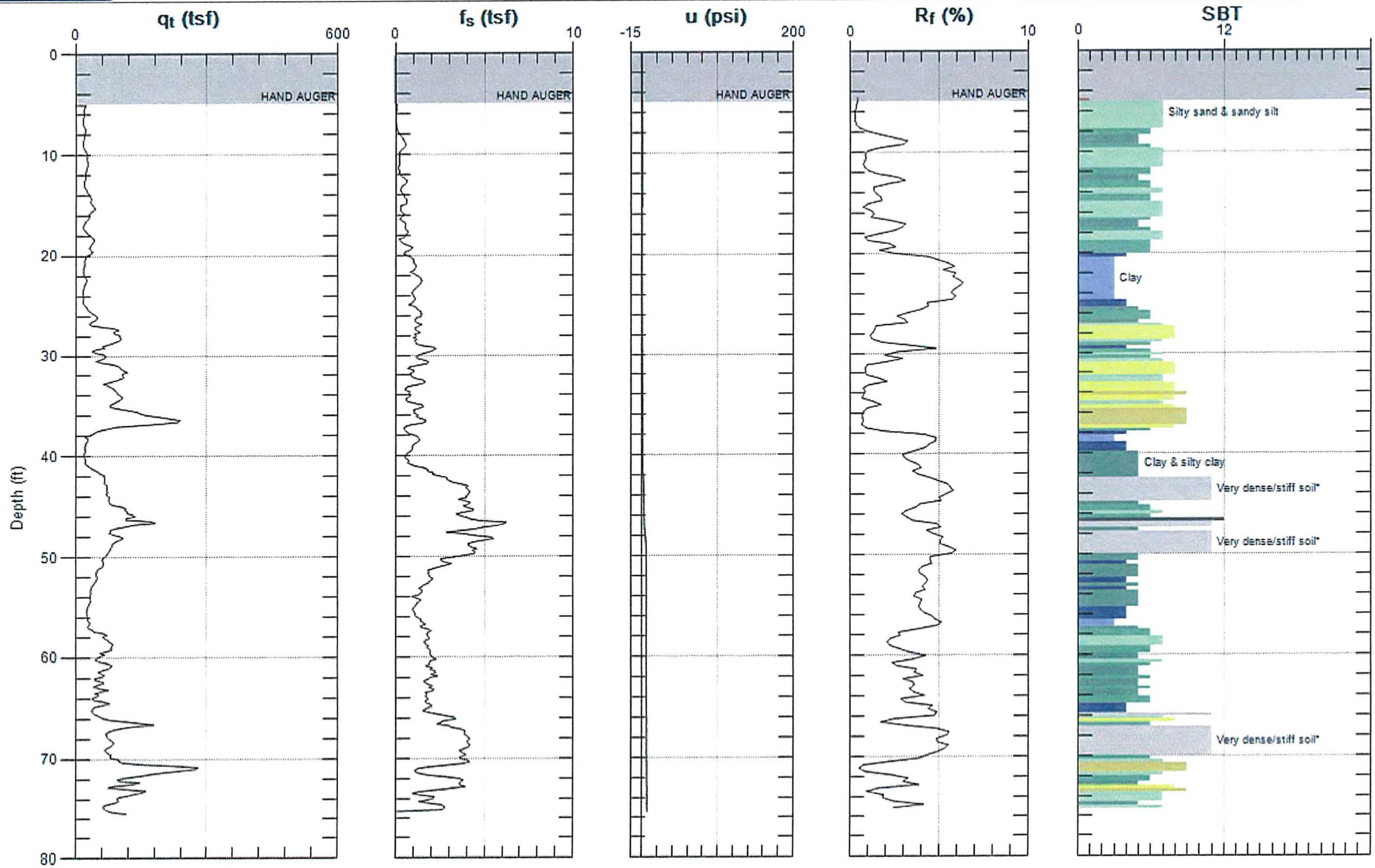
**GREGG** NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-20

Engineer: J.BARTON

Date: 5/11/2015 09:37




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

SBT: Soil Behavior Type (Robertson 1990)

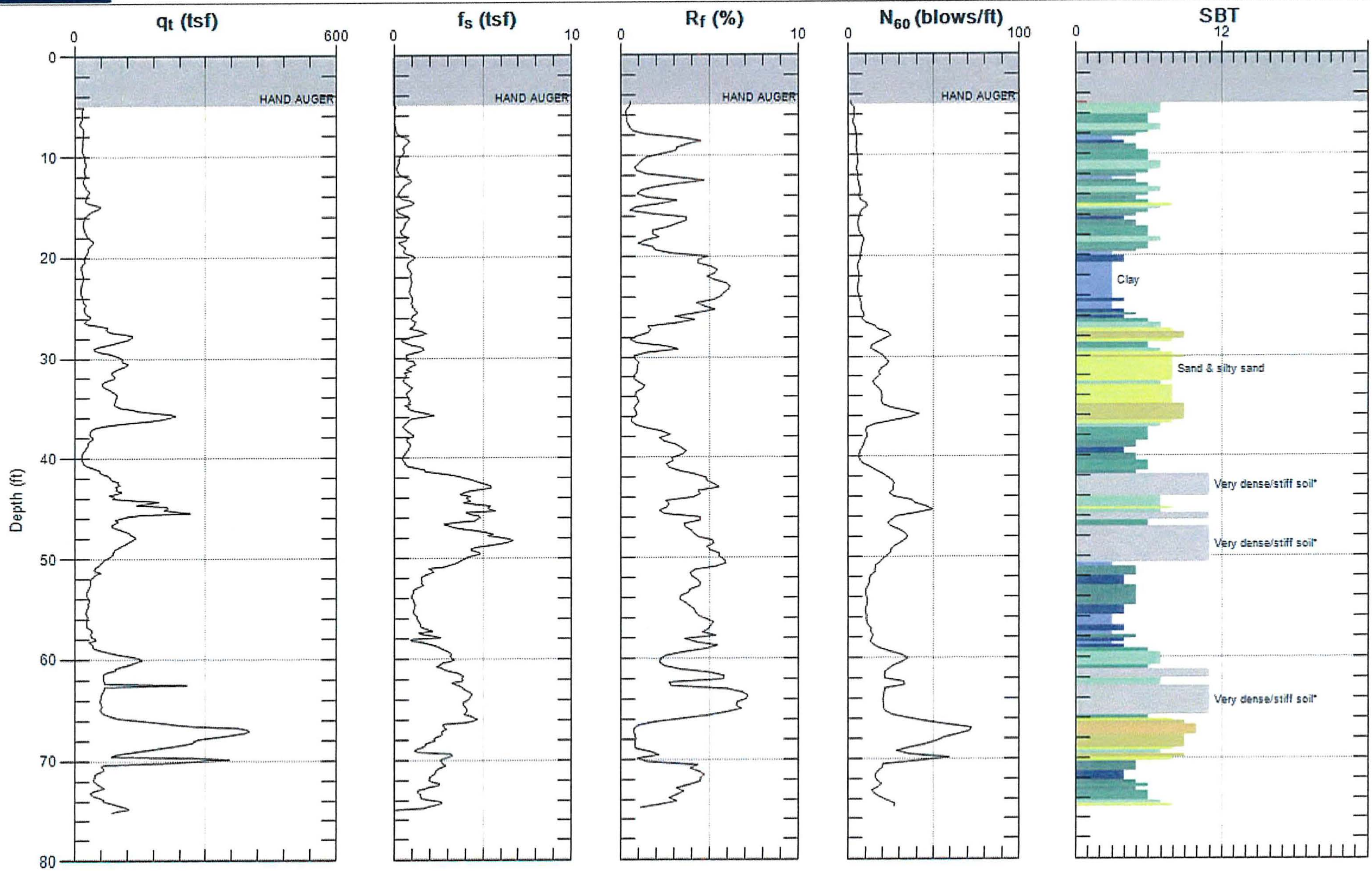
GREGG NINYO & MOORE

Site: HOLLYWOOD COURT

Sounding: CPT-21

Engineer: J.BARTON

Date: 5/11/2015 07:38




Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

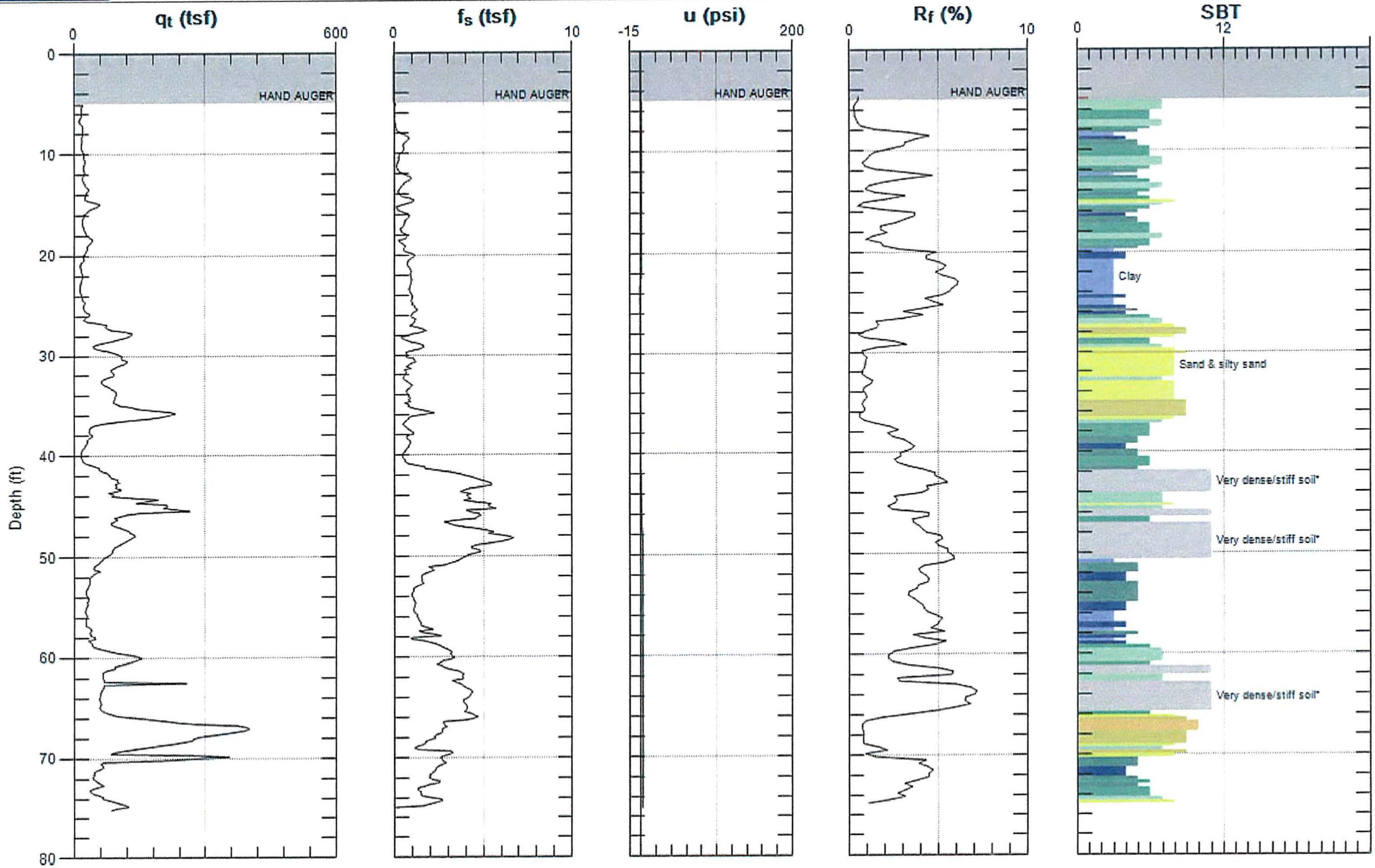
SBT: Soil Behavior Type (Robertson 1990)

GREGG

## NINYO & MOORE

**Site: HOLLYWOOD COURT**
**Sounding: CPT-21**

**Engineer: J.BARTON**
**Date: 5/11/2015 07:38**



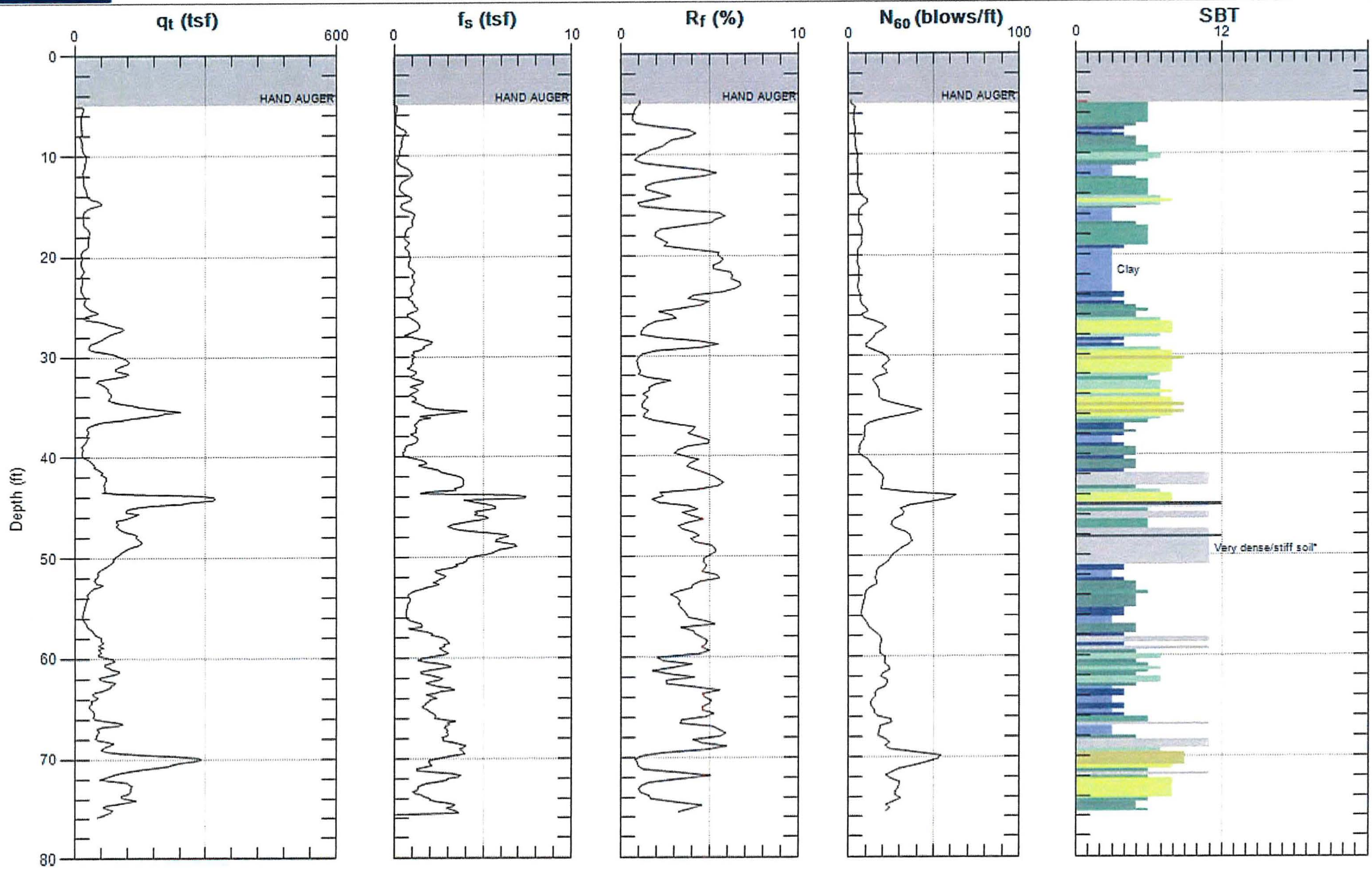

Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-22

Engineer: J.BARTON
Date: 5/12/2015 11:03




Max. Depth: 75.787 (ft)
Avg. Interval: 0.328 (ft)

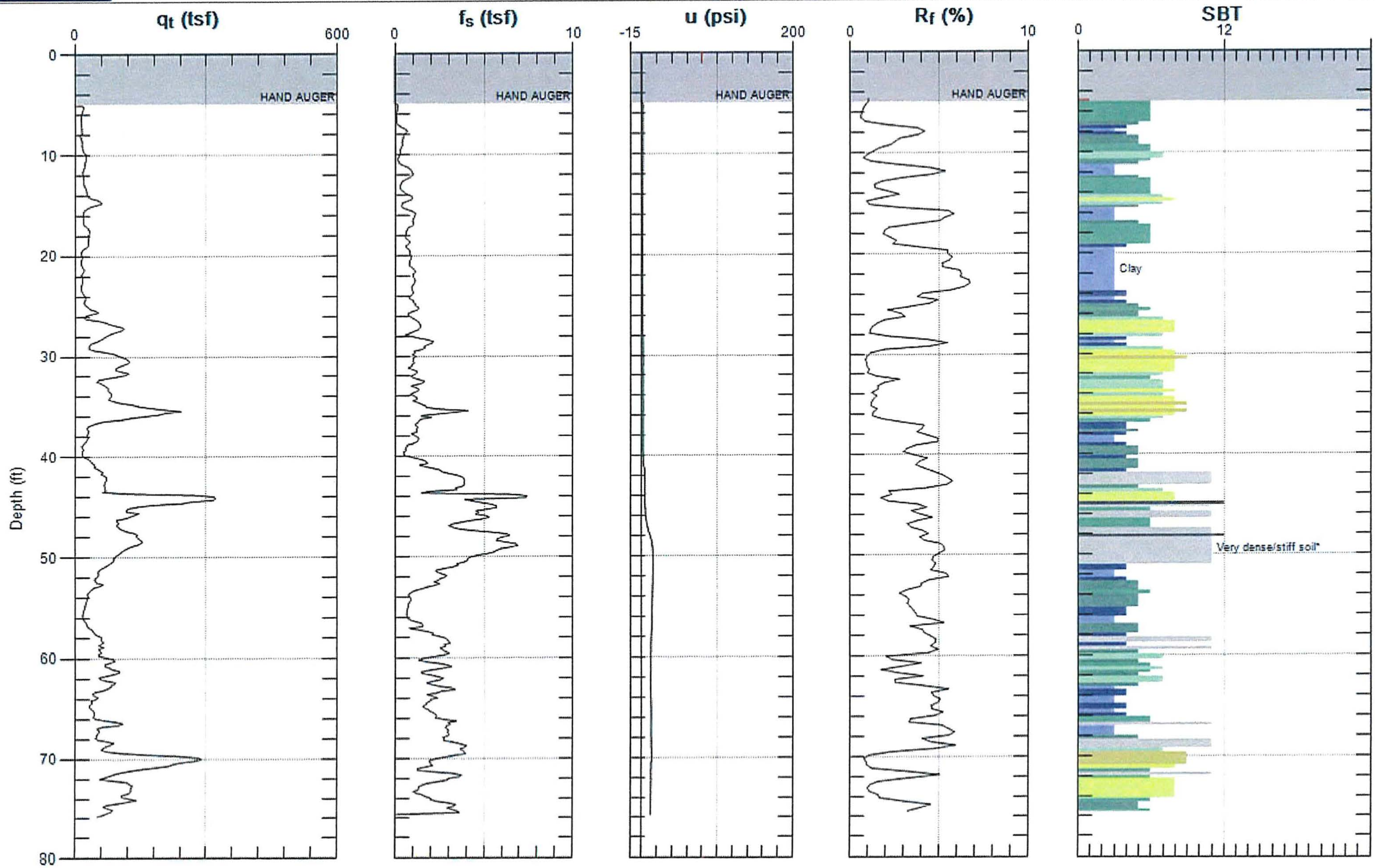
SBT: Soil Behavior Type (Robertson 1990)

GREGG

# NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-22

Engineer: J.BARTON
Date: 5/12/2015 11:03

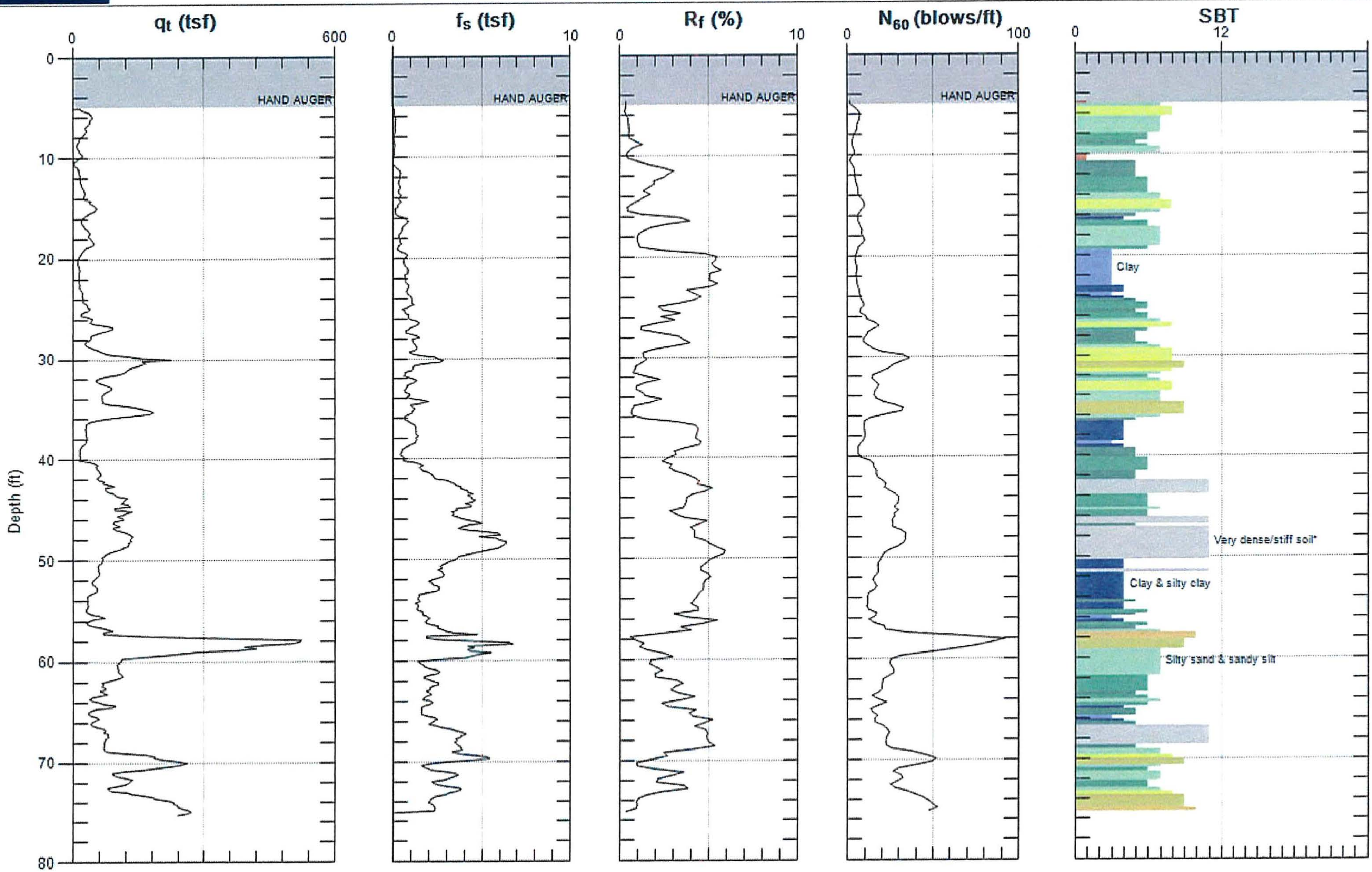



Max. Depth: 75.787 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **NINYO & MOORE**

Site: HOLLYWOOD COURT | Engineer: J.BARTON
Sounding: CPT-23 | Date: 5/12/2015 10:04



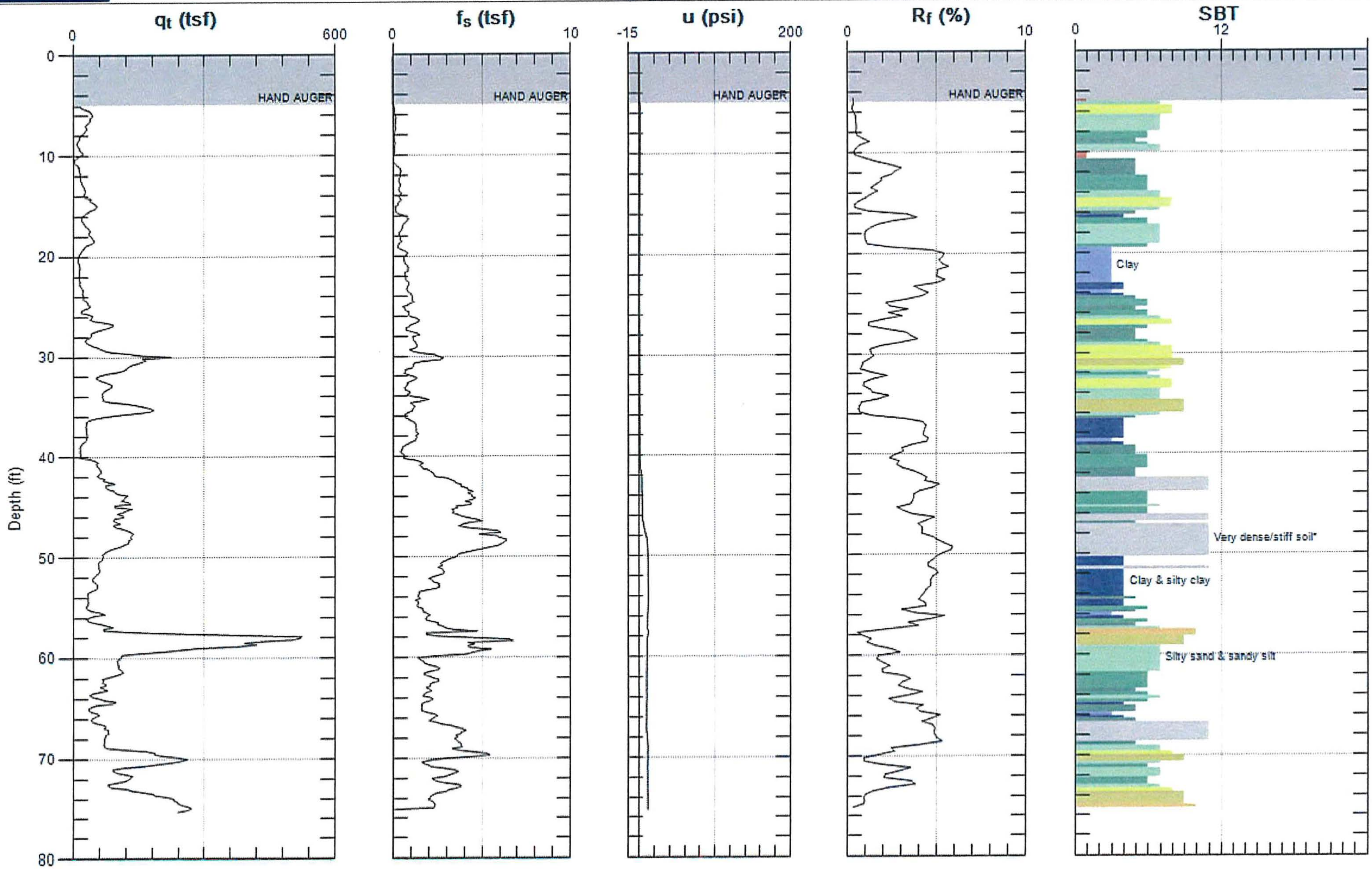

Max. Depth: 75.295 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

# NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-23
Engineer: J.BARTON
Date: 5/12/2015 10:04



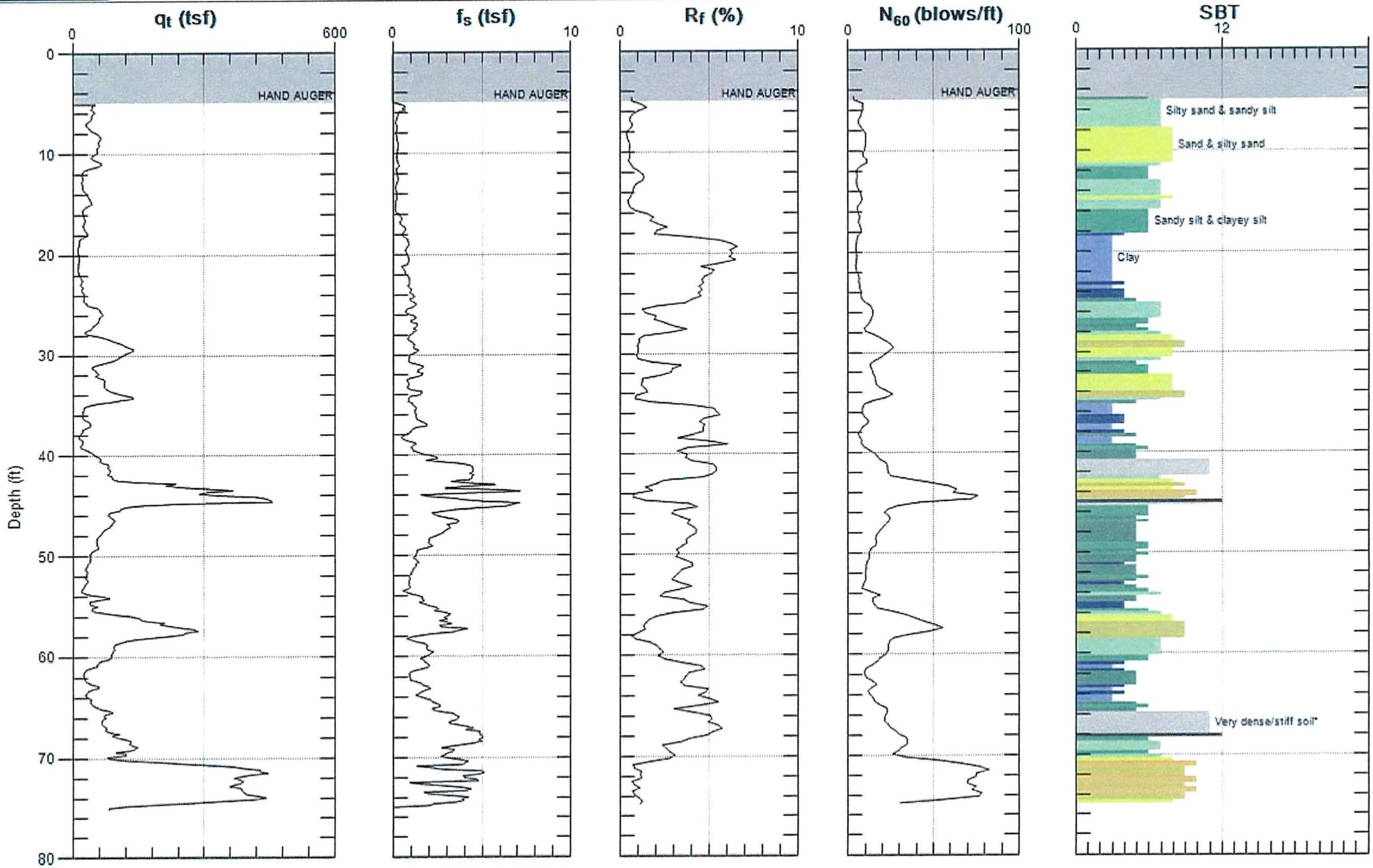

Max. Depth: 75.295 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

# NINYO & MOORE

**Site: HOLLYWOOD COURT**
**Sounding: CPT-24**
**Engineer: J.BARTON**
**Date: 5/12/2015 08:53**

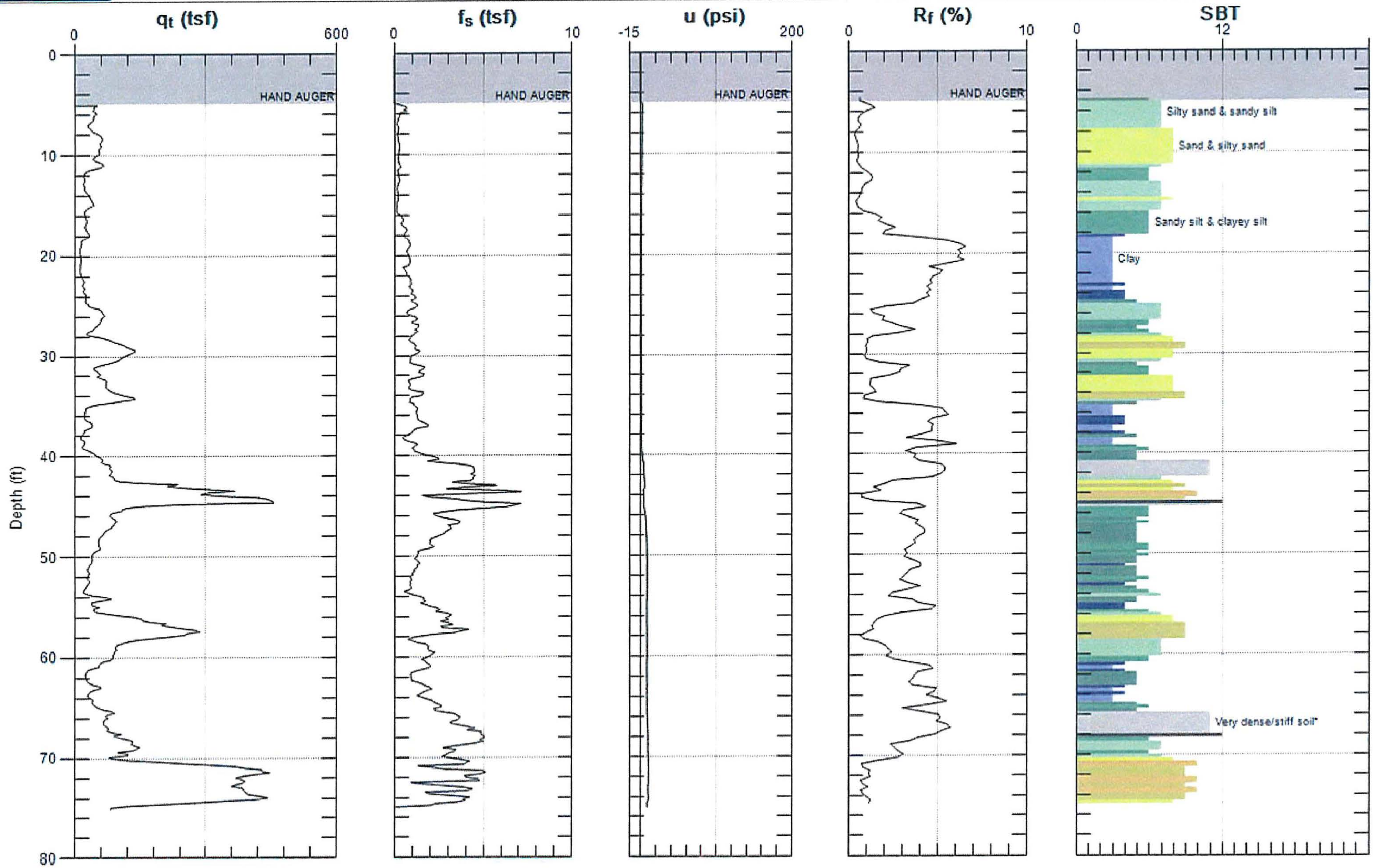



Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

**GREGG** NINYO & MOORE

Site: HOLLYWOOD COURT
Sounding: CPT-24
Engineer: J.BARTON
Date: 5/12/2015 08:53




Max. Depth: 75.131 (ft)
Avg. Interval: 0.328 (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**

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



**Consolidation Tests**

Consolidation tests were performed on selected relatively undisturbed soil samples in general accordance with ASTM D 2435. The samples were inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the tests are summarized on Figures C-3 and C-4.

**Proctor Density Tests**

The maximum dry density and optimum moisture content of a selected representative soil sample were evaluated using the Modified Proctor method in general accordance with ASTM D 1557. The results of the test is summarized on Figure C-5.

**Direct Shear Tests**

Direct shear tests were performed on a remolded 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-6.

**Soil Corrosivity Tests**

Soil pH, and resistivity tests were performed on representative samples of the on-site 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-7.

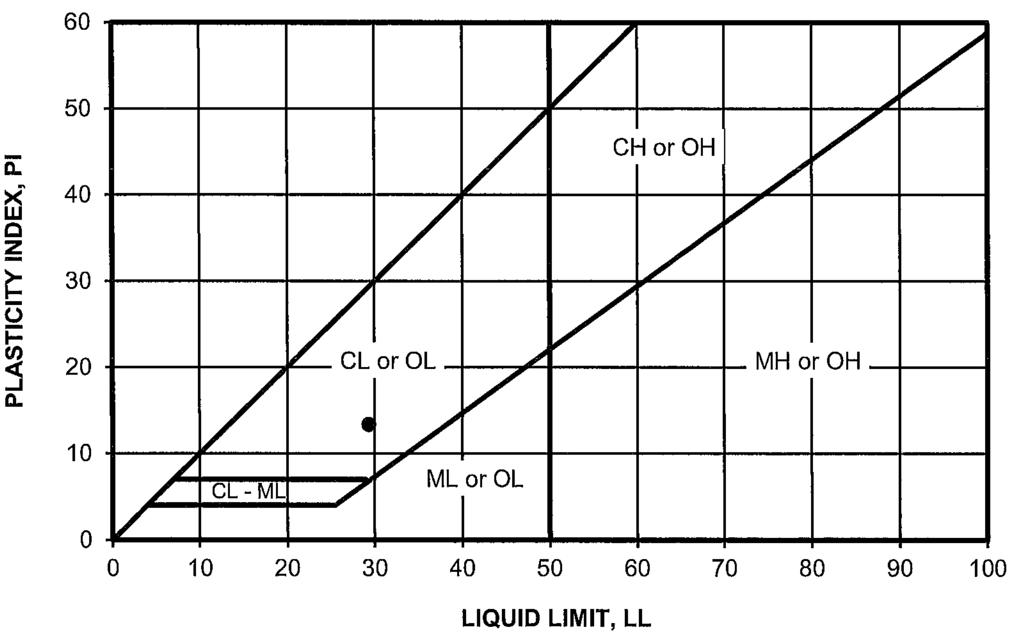
| SAMPLE LOCATION | SAMPLE DEPTH (FT) | DESCRIPTION | PERCENT PASSING NO. 4 | PERCENT PASSING NO. 200 | USCS (TOTAL SAMPLE) |
|---|---|---|---|---|---|
| B-1 | 5.0-6.5 | CLAYEY SAND | 95 | 36 | SC |
| B-1 | 41.0-41.5 | SANDY CLAY | 97 | 60 | CL |
| B-2 | 1.0-5.0 | CLAYEY SAND | 94 | 34 | SC |

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140

| Ninyo & Moore | | NO. 200 SIEVE ANALYSIS | FIGURE |
|---|---|---|---|
| PROJECT NO. | DATE | HOLLYWOOD COURTHOUSE<br>5925 HOLLYWOOD BOULEVARD<br>LOS ANGELES, CALIFORNIA | C-1 |
| 402132007 | 6/15 | | |

402132007 Figure C-01_200 WASH B-1--B-2

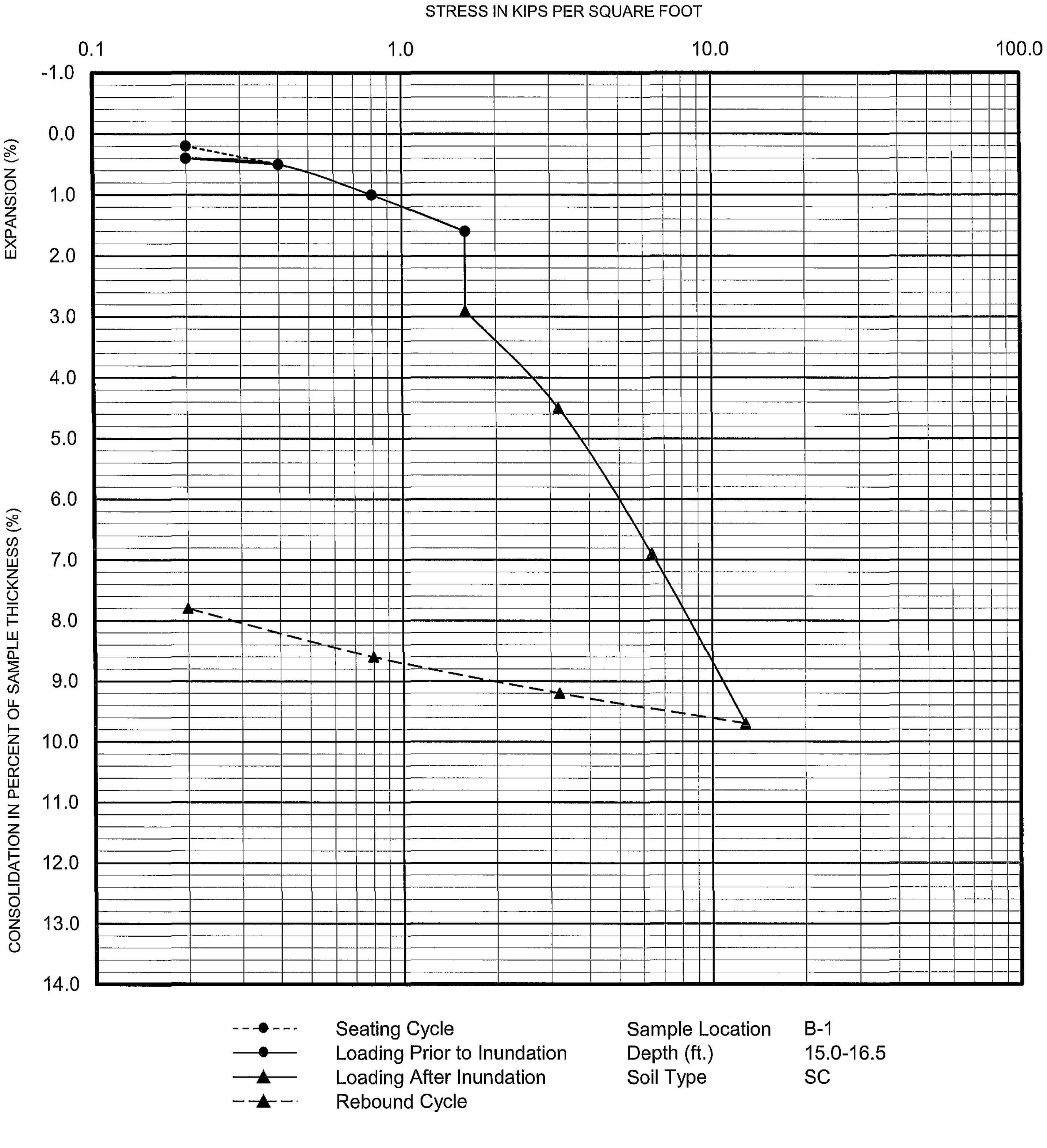
| SYMBOL | LOCATION | DEPTH (FT) | LIQUID LIMIT, LL | PLASTIC LIMIT, PL | PLASTICITY INDEX, PI | USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve) | USCS (Entire Sample) |
|---|---|---|---|---|---|---|---|
| ● | B-2 | 25.0-26.5 | 29 | 16 | 13 | CL | CL |




PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

| Ninyo & Moore | ATTERBERG LIMITS TEST RESULTS | FIGURE |
|---|---|---|
| PROJECT NO. 402132007 / DATE 6/15 | HOLLYWOOD COURTHOUSE<br>5925 HOLLYWOOD BOULEVARD<br>LOS ANGELES, CALIFORNIA | C-2 |

402132007 Figure C-02_ATTERBERG B-2 25.0-26.5

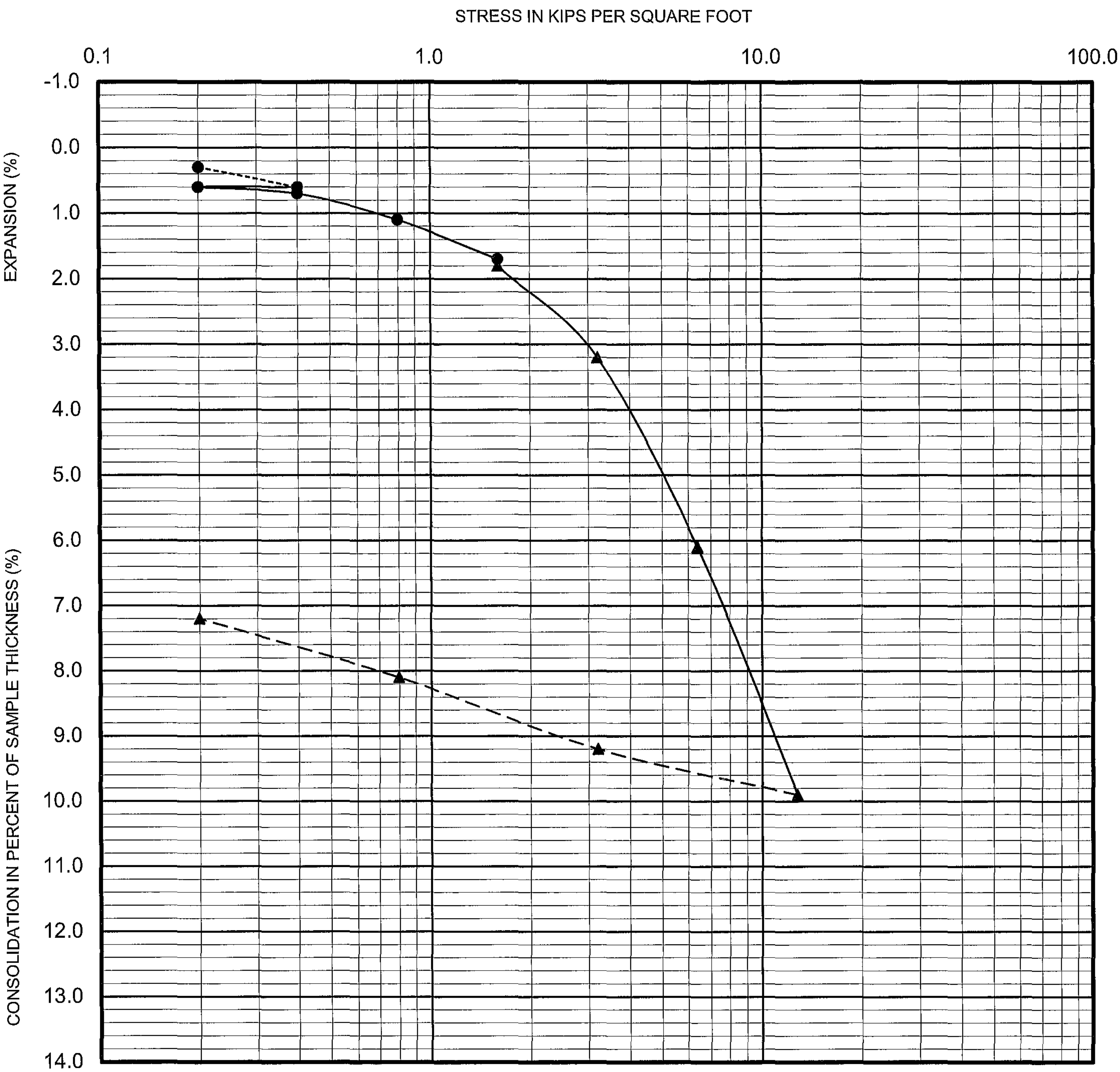



| | |
|---|---|
| Sample Location | B-1 |
| Depth (ft.) | 15.0-16.5 |
| Soil Type | SC |

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

| Ninyo & Moore | | CONSOLIDATION TEST RESULTS | FIGURE |
|---|---|---|---|
| PROJECT NO. | DATE | HOLLYWOOD COURTHOUSE<br>5925 HOLLYWOOD BOULEVARD<br>LOS ANGELES, CALIFORNIA | C-3 |
| 402132007 | 6/15 | | |

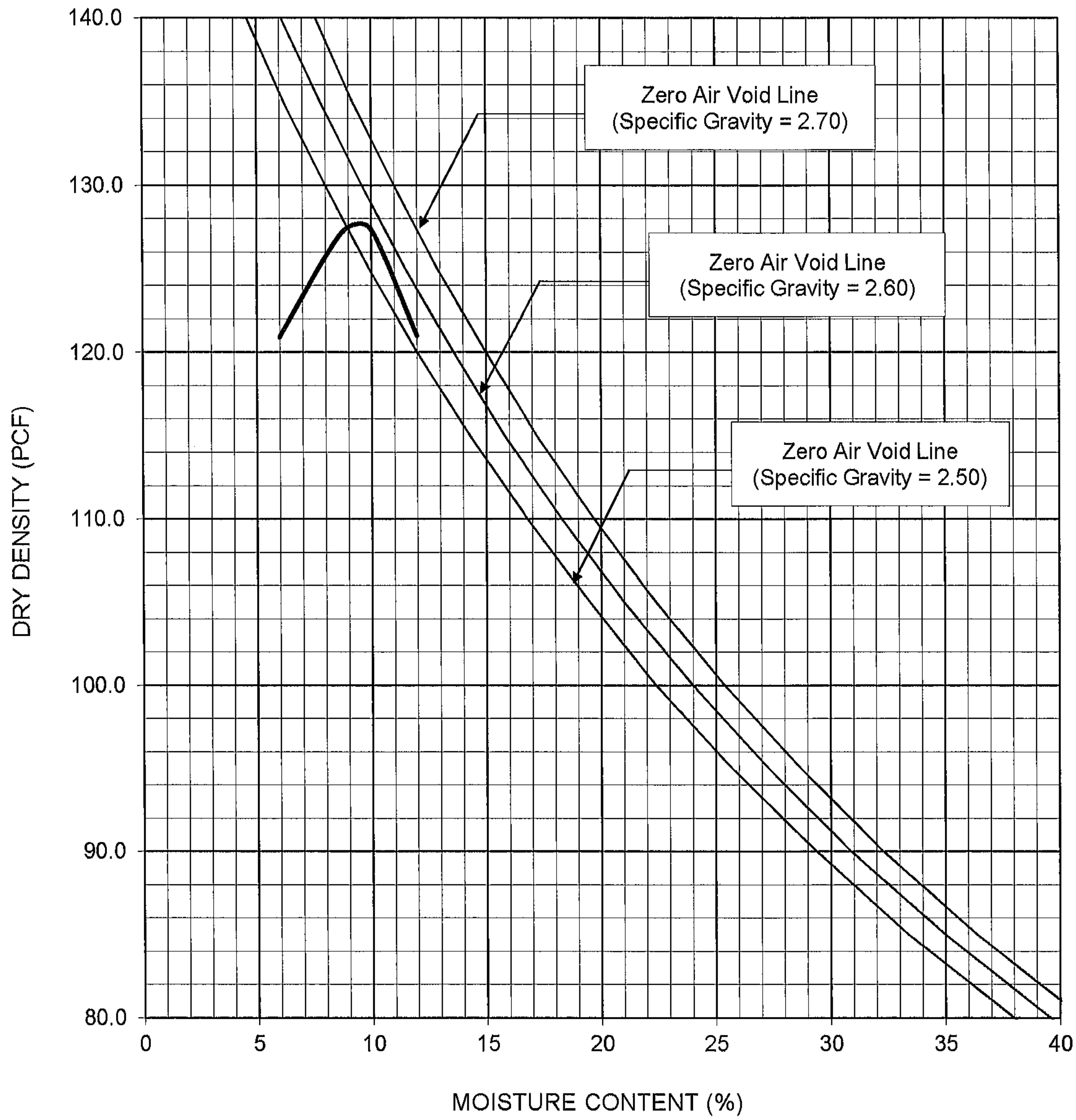
402132007 Figure C-03_CONSOLIDATION B-1-----15.0-16.5




| | Sample Location | B-2 |
|---|---|---|
| Seating Cycle | Depth (ft.) | 20.0-21.5 |
| Loading Prior to Inundation | Soil Type | SC |
| Loading After Inundation | | |
| Rebound Cycle | | |

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

| Ninyo & Moore | | CONSOLIDATION TEST RESULTS | FIGURE |
|---|---|---|---|
| PROJECT NO. | DATE | HOLLYWOOD COURTHOUSE<br>5925 HOLLYWOOD BOULEVARD<br>LOS ANGELES, CALIFORNIA | C-4 |
| 402132007 | 6/15 | | |

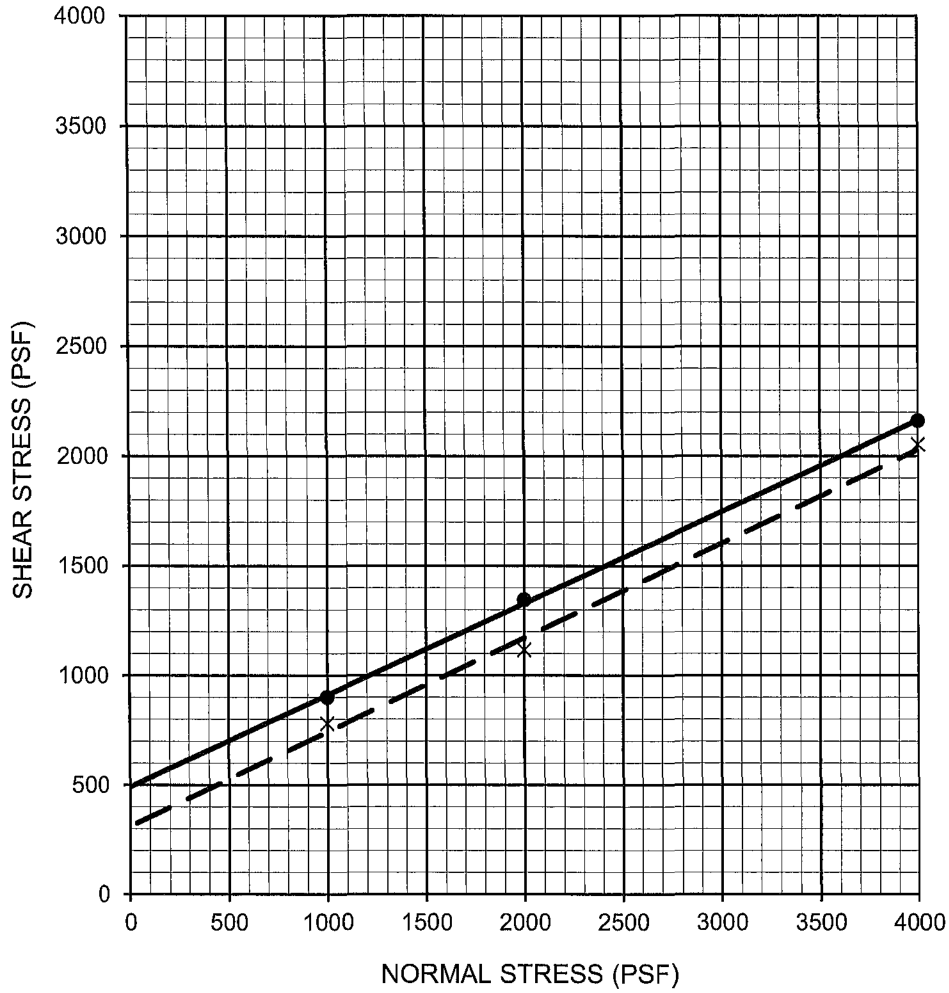



| Sample Location | Depth (ft) | Soil Description | Maximum Dry Density (pcf) | Optimum Moisture Content (%) |
|---|---|---|---|---|
| B-2 | 1.0-5.0 | BROWN CLAYEY SAND | 127.5 | 9.0 |
| Dry Density and Moisture Content Values Corrected for Oversize (ASTM D 4718-87) | | | | |

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

| Ninyo & Moore | | PROCTOR DENSITY TEST RESULTS | FIGURE |
|---|---|---|---|
| PROJECT NO. | DATE | HOLLYWOOD COURTHOUSE<br>5925 HOLLYWOOD BOULEVARD<br>LOS ANGELES, CALIFORNIA | C-5 |
| 402132007 | 6/15 | | |

402132007 Figure C-05_MAXDENSITY1




| Description | Symbol | Sample Location | Depth (ft) | Shear Strength | Cohesion, c (psf) | Friction Angle, ϕ (degrees) | Soil Type |
|---|---|---|---|---|---|---|---|
| CLAYEY SAND | —●— | B-2 | 1.0-5.0 | Peak | 492 | 23 | SC |
| CLAYEY SAND | - - x - - | B-2 | 1.0-5.0 | Ultimate | 312 | 23 | SC |

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

| | | | |
|---|---|---|---|
| Ninyo & Moore | | DIRECT SHEAR TEST RESULTS | FIGURE |
| PROJECT NO. | DATE | HOLLYWOOD COURTHOUSE<br>5925 HOLLYWOOD BOULEVARD<br>LOS ANGELES, CALIFORNIA | C-6 |
| 402132007 | 6/15 | | |

402132007 Figure C-06_DIRECT SHEAR - REMOLDED B-2---1.0-5.0

| SAMPLE LOCATION | SAMPLE DEPTH (FT) | pH [1] | RESISTIVITY [1] (Ohm-cm) | SULFATE CONTENT [2] | | CHLORIDE CONTENT [3] (ppm) |
|---|---|---|---|---|---|---|
| | | | | (ppm) | (%) | |
| B-1 | 15.0-20.0 | 7.6 | 1,100 | 120 | 0.012 | 45 |
| B-2 | 1.0-5.0 | 7.7 | 2,745 | 20 | 0.002 | 30 |

[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

Ninyo & Moore

## CORROSIVITY TEST RESULTS

| PROJECT NO. | DATE |
|---|---|
| 402132007 | 6/15 |

HOLLYWOOD COURTHOUSE
5925 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA

FIGURE
C-7