October 15, 2019
BOARD OF COUNTY COMMISSIONERS
ORANGE COUNTY, FLORIDA
RFP Y20-902-JS/ADDENDUM #1
CONTINUING CONSULTING SERVICES FOR GEOTECHNICAL ENGINEERING, TESTING AND INSPECTION FOR THE ORANGE COUNTY CONVENTION CENTER NORTH/SOUTH BUILDING IMPROVEMENTS

Opening Date: October 29, 2019

This addendum is intended to be incorporated into the bid documents of the project referenced above. The following items are clarifications, corrections, additions, deletions and/or revisions to and shall take precedence over the original documents. Underlining indicates additions, deletions are indicated by ~~strikethrough.~~

A. The following are clarifications/questions/responses:

Clarifications: Section 8. MINORITY/WOMEN OWNED BUSINESS ENTERPRISE:

a. Proposers must address how they intend to comply with the Orange County M/WBE Ordinance, No. 94-02 and amended by Ordinance No. 2009-21. The goal of certified minority/women business enterprise is 27% of the contract value for this project. The Ordinance also addresses minority/women group employment levels setting goals to encourage each Proposer to maintain ~~24% minority~~ 18% minority and 6% women employee workforce levels in specific categories.

~~d. The County has established a credit program whereby Proposers are awarded credits to be applied toward meeting the M/WBE goals on certain County projects. Emphasis will be placed on credits for non-County utilization and first-time M/WBE utilization.~~

~~Proposers are encouraged to contact the Business Development Division for information on acquiring and applying the credits.~~

Question 1: Are stadiums and sports arenas considered commercial/industrial building space?

Response 1: Yes, as long as they meet the Similar Projects criteria.

Question 2: Will you kindly consider eliminating the lot size criteria?

Response 2: Replace Section 26. Similar Projects with

~~**"Similar Projects" for the proposed Project Manager and Project Engineer for purpose of this Request for Proposals has been defined as projects for which services have been successfully completed within the past ten (10) years, at least 5 acres in size and 50,000 square feet of commercial/industrial building space, within the contiguous United States, Alaska and Hawaii, of the submittal date of this RFP.**~~

"Similar Projects" for the proposed Project Manager and Project Engineer for purpose of this Request for Proposals has been defined as projects for which services have been successfully completed within the past ten (10) years, at least ~~5~~ 2 acres in size and 50,000 square feet of building space with commercial/industrial structural design criteria, within the contiguous United States, Alaska and Hawaii, of the submittal date of this RFP.

Question 3: Can a "campus" of buildings (such as a building with an associated parking deck, an office complex or an apartment complex with several multi-story buildings) qualify as a similar project if the buildings total more than 50,000 square feet.

Response 3: Yes, a multipurpose complex that belongs to a given academic or non-academic institution that includes meeting spaces, libraries, lecture halls, theaters, food service facilities and / or dining halls provided that it meets all other 'Similar Project" requirements.

Question 4: Will you kindly consider removing the limitation for similar projects to commercial or industrial space?

Response 4: See Response 2 above.

Question 5: On the Contract for Y20-902-JS page 5 it states:

C. The estimated construction cost for any project under this contract shall not exceed $2,000,000. Each Task Authorization shall specifically indicate the project's estimated construction cost. Task Authorizations issued for study activities may not exceed $200,000.

This contract is $605M budget hard and soft cost. We are not sure this paragraph is correct. Please clarify.

Response 5: The section below is not applicable to this project.

(Draft Contract page 5)

III
DESIGN WITHIN FUNDING LIMITATIONS

~~c. The estimated construction cost for any project under this contract shall not exceed $2,000,000. Each Task Authorization shall specifically indicate the project's estimated construction cost. Task Authorizations issued for study activities may not exceed $200,000.~~

Question 6: Was there a recent Geotechnical Report performed on the North/South Building?

Response 6: See attachment as part of this Addendum.

B. ATTACHMENTS:

1. **Geotechnical Report**

C. All other term and conditions of the RFP remain the same.

D. The Proposer shall acknowledge receipt of this addendum by completing the applicable section in the solicitation or by completion of the acknowledgement information on the addendum. Either form of acknowledgement must be completed and returned not later than the date and time for receipt of the proposal.

Receipt acknowledged by:

_____ _____
Authorized Signature **Date Signed**

_____
Title

_____
Name of Firm

UNIVERSAL ENGINEERING SCIENCES

GEOTECHNICAL EXPLORATION – 60% REPORT

OCCC NORTH-SOUTH BUILDING IMPROVEMENTS (Y15-905)
9400 UNIVERSAL BOULEVARD
ORANGE COUNTY, FLORIDA

UES PROJECT NO. 0130.1800259.0000
UES REPORT NO. 1647316

PREPARED FOR:

Orange County Convention Center
P.O. Box 691509
Orlando, Florida 32819

PREPARED BY:

Universal Engineering Sciences
3532 Maggie Boulevard
Orlando, Florida 32811
(407) 423-0504

April 29, 2019

UNIVERSAL
ENGINEERING SCIENCES
Consultants In: Geotechnical Engineering • Environmental Sciences
Geophysical Services • Construction Materials Testing • Threshold Inspection
Building Inspection • Plan Review • Building Code Administration

LOCATIONS:
- Atlanta, GA
- Daytona Beach
- Fort Myers
- Fort Pierce
- Gainesville
- Jacksonville
- Miami
- Ocala
- Orlando (Headquarters)
- Palm Coast
- Panama City
- Pensacola
- Rockledge
- Sarasota
- St. Petersburg
- Tampa
- Tifton, GA
- West Palm Beach

April 29, 2019

Orange County Convention Center
P.O. Box 691509
Orlando, Florida 32819

Attention: Mr. Johnny Rosario
Assistant Project Manager | Capital Planning
Johnny.Rosario@OCCC.net

Reference: **Geotechnical Exploration – 60% Report Submittal**
OCCC North-South Building Improvements (Y15-905)
9400 Universal Boulevard
Orange County, Florida
UES Project No. 0130.1800259.0000
UES Report No. 1647316

Dear Mr. Rosario:

Universal Engineering Sciences, Inc. (UES) has completed the geotechnical exploration at the above referenced site in Orange County, Florida. The scope of our exploration was planned in conjunction with and authorized by you under Purchase Order No. C15905040. This exploration was performed in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made.

The following report presents the results of our field exploration with a geotechnical engineering interpretation of those results with respect to the project characteristics as provided to us. We have included soil and groundwater conditions at our boring locations and geotechnical recommendations for foundation design and site preparation.

We appreciate the opportunity to have worked with you on this project and look forward to a continued association. Please do not hesitate to contact us if you should have any questions, or if we may further assist you as your plans proceed.

Respectfully Submitted,
UNIVERSAL ENGINEERING SCIENCES, INC.
Certificate of Authorization No. 549

Ricardo C. Kiriakidis L., PhD., P.E.
Geotechnical Department Manager

ANDREW S. WILDEROTTER LICENSE NO. 65727 STATE OF FLORIDA PROFESSIONAL ENGINEER

Andrew S. Wilderotter, P.E.
Geotechnical Project Manager
Date: 4/29/19
Florida Registration No. 65727

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

1.0 PROJECT DESCRIPTION

We understand that the proposed project will include the expansion of the existing North-South building at the Orange County Convention Center in Orange County, Florida. We were provided with a conceptual site plan showing the proposed improvements. The site plan indicated the following improvements:

- Multi-Purpose Venue – Column free space covering 200,000 square feet
- Convention Way Grand Concourse – An 80,000 square foot ballroom, 60,000 square feet of meeting rooms and an entrance plaza.

UES has previously performed a preliminary geotechnical exploration at this site (UES Report No. 1592864 dated August 21, 2018). The results of this previous exploration are included in this comprehensive report.

Please note that this a 60% completion report. During our previous meeting (February 2019) we discussed the findings of our exploration and it was decided that additional borings would be required to defined the subsurface condition in the vicinity of soil boring B-09 and CPT-08. Furthermore, we anticipate that once the design team begins designing the improvements there may be additional areas that will require testing. As instructed, a final 100% completion report will be issued once the addition field data and design details are obtained.

Should any of the above information or assumptions made by UES be inconsistent with the planned development and construction, we request that you contact us immediately to allow us the opportunity to review the new information in conjunction with our report and revise or modify our engineering recommendations accordingly, as needed.

No site or project facilities/improvements, other than those described herein, should be designed using the soil information presented in this report. Moreover, UES will not be responsible for the performance of any site improvement so designed and constructed.

2.0 PURPOSE

The purposes of this exploration were:

- to explore and evaluate the subsurface conditions at the site with special attention to potential problems that may impact the proposed development,

- to provide our estimates of the seasonal high groundwater level at the boring locations and

- to provide geotechnical engineering recommendations for foundation design and site preparation

This report presents an evaluation of site conditions on the basis of geotechnical procedures for site characterization. The recovered samples were not examined, either visually or analytically, for chemical composition or environmental hazards. We would be glad to provide you with a proposal for these services at your request.

Our exploration was not designed to specifically address the potential for surface expression of deep geological conditions, such as sinkhole development related to karst activity. We would be pleased to conduct an exploration to evaluate the probable effect of the regional geology upon the proposed construction, if you so desire.

3.0 SITE DESCRIPTION

The subject site is located within Section 1, Township 24 South, Range 28 East and Section 6, Township 24 South, Range 29 East in Orange County, Florida. More specifically, the site is located on the east side of Convention Way between International Drive and Universal Boulevard. At the time of drilling, the subject site was occupied by the conventional center building and parking areas.

3.1 SOIL SURVEY

There are five (5) native soil types mapped within the project boundary according to the USDA NRCS Soil Survey of Orange County. A brief summary of the mapped surficial soil type(s) is presented in Table I.

TABLE I
SUMMARY OF PUBLISHED SOIL DATA

Soil Symbol	Soil Type	Hydrologic Group	Drainage Characteristics	Depth of Published Seasonal High GWT (feet)
3	Basinger fine sand, depressional	A/D	Very poorly drained	0+
37	St. Johns fine sand	B/D	Poorly drained	0 to 1
42	Sanibel muck	A/D	Very poorly drained	0+
44	Smyrna fine sand	A/D	Poorly drained	½ to 1½
45	Smyrna Urban land complex	A/D	Poorly drained	½ to 1½

Please note that the SCS soil survey data is based on pre-developmental conditions. The native subsurface conditions depicted on the soil survey may have been altered due to development within the project vicinity at the subject site and are not necessarily representative of the current subsurface conditions encountered during our exploration.

3.2 TOPOGRAPHY

Site specific topographic information was not provided by the client for our review at the time of this report preparation. According to information obtained from the United States Geologic Survey (USGS) “Lake Jessamine, Florida” quadrangle map, the native ground surface elevation across the site area is approximately +95 to +100 feet National Geodetic Vertical Datum (NGVD). The site is generally located ¾ mile west of the Big Sand Lake Chain. Normal high

levels in the chain of lakes vary between +93 to +95 feet NGVD. A copy of a portion of the USGS Map is included in Appendix A.

4.0 SCOPE OF SERVICES

The services conducted by UES during our geotechnical explorations were as follows:

- Drilled fifteen (15) Standard Penetration Test (SPT) borings to depths of 50 to 145 feet below land surface (bls).
- Performed eight (8) Cone Penetrometer Test (CPT) soundings to depths of approximately 70 to 100 feet bls.
- Secured samples of representative soils encountered in the soil borings for review, laboratory analysis and classification by a Geotechnical Engineer.
- Measured the existing site groundwater levels and provide an estimate of the seasonal high groundwater level at the boring locations.
- Conducted laboratory testing on selected soil samples obtained in the field to determine their engineering properties.
- Assessed the existing soil conditions with respect to the proposed construction.
- Prepared a report which documents the results of our exploration and analysis with geotechnical engineering recommendations.

5.0 FIELD EXPLORATION

The SPT soil borings and CPT soundings were performed with truck and ATV mounted drilling rigs. Horizontal and vertical survey control was not provided for the test locations prior to our field exploration program. UES located the test borings by using the provided site plan, measuring from existing on-site landmarks shown on an aerial photograph, and by using handheld GPS devices. The indicated test locations should be considered accurate to the degree of the methodologies used. The approximate test locations are shown in Appendix B.

5.1 SPT BORINGS

The fifteen (15) SPT borings, designated B-01 through B-15 on the attached Figure B-1, were performed in general accordance with the procedures of ASTM D 1586 “Standard Method for Penetration Test and Split-Barrel Sampling of Soils”. The SPT sampling was performed continuously to 10 feet to detect variations in the near surface soil profile and on approximate 5 feet centers thereafter.

5.2 CPT SOUNDINGS

The Cone Penetrometer Test (CPT) Soundings, designated CPT-01 through CPT-08 in Appendix B, were performed in general accordance with the procedures of ASTM D-5778. The CPT essentially consists of continuously pushing a cylindrical rod with conical tip followed by a friction sleeve through the soil at a constant rate. For a standard cone the conical tip has a surface area of 10 square centimeters (1.55 square inches) and a friction sleeve surface area of

150 square centimeters (23.25 square inches). A typical friction cone test directly measures end bearing resistance on the tip and skin friction resistance on the sleeve.

6.0 LABORATORY TESTING

The soil samples recovered from the SPT borings were returned to our laboratory and visually classified in general accordance with ASTM D 2487 "Standard Classification of Soils for Engineering Purposes" (Unified Soil Classification System). We selected representative soil samples from the borings for laboratory testing to aid in classifying the soils and to help to evaluate the general engineering characteristics of the site soils. The results of these tests are shown on the boring logs in Appendix B. A summary of the tests performed is shown in Table II.

TABLE II
LABORATORY METHODOLOGIES

Test Performed	Number Performed	Reference
Grain Size Analysis (#200 wash only)	62	ASTM D 1140 "Amount of Material in Soils Finer than the No. 200 (75 - µm) sieve"
Moisture Content	62	ASTM D 2216 "Laboratory Determination of Water (Moisture) Content of Soil by Mass"
Atterberg Limits	7	ASTM D 4318 "Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils"
Consolidation Test	1	ASTM D 2435 "Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading"

7.0 SUBSURFACE CONDITIONS

7.1 GENERALIZED SOIL PROFILE

The results of our field explorations and laboratory analysis, together with pertinent information obtained from the SPT borings and CPT soundings, such as soil profiles, penetration resistance, and groundwater levels are shown on the boring logs included in Appendix B. The Key to Boring Logs, Soil Classification Chart is also included in Appendix B. The soil profiles were prepared from field logs after the recovered soil samples were examined by a Geotechnical Engineer. The stratification lines shown on the boring logs represent the approximate boundaries between soil types, and may not depict exact subsurface soil conditions. The actual soil boundaries may be more transitional than depicted. A generalized profile of the soils encountered at our boring locations is presented in Table III. For detailed soil profiles, please refer to the attached boring logs in Appendix B.

TABLE III
GENERALIZED SOIL PROFILE

Typical Depth (feet, bls)		Soil Description	Range of SPT "N" Values (blows/ft)	Average Tip Resistance "Qt" (tsf)
From	To			
Surface	30	Very loose to very dense fine SAND [SP, SP-SM] and silty fine SAND [SM]	2 to 72	100
30	75	Very loose to loose silty/clayey SAND [SM, SC, SC-SM] and very soft to firm CLAY [CH, CL]	W.O.H. to 9	25
75	145*	Medium dense to very dense silty/clayey SAND [SM, SC, SC-SM] with varying quantities of shell and limestone fragments	11 to 50/1"	125

* denotes maximum termination depth of the borings
W.O.H. denotes penetration with only weight of drive hammer
50/1" denotes 50 blows for only 1 inch of penetration (practical refusal)

7.2 NOTABLE FINDINGS

A couple notable findings encountered within the generalized soil profile were the very soft zone between 20 and 25 feet at CPT-08 and the very deep pile bearing stratum at B-09.

- A very soft zone was encountered at CPT-08 between the depths of approximately 20 and 25 feet. The tip resistance within this zone encroached 0 tsf with negative friction. This zone was not encountered at any of the other CPT soundings or SPT boring locations. We believe that this is likely an anomalous reading due to digital or equipment malfunction and does not represent a significant soft/organic layer. **However, additional CPTs are recommended adjacent to this location in order to verify the relative consistency within this zone** (at no additional charge to OCCC).

- Based on the soil profiles encountered at our test locations, the typical dense pile bearing stratum was encountered at depths of roughly 75 to 105 feet below grade (average of about 90 feet). However, at SPT boring B-09, the adequate pile bearing stratum was not encountered until a depth of about 130 feet. This boring was performed along the northern exterior wall of the multi-purpose venue building. Alternate pile bearing depths are included in this report for the northern wall (Section 9.3.1). **We recommend additional SPT borings be performed around the vicinity of B-09 to delineate the area which will need deeper piling.**

8.0 GROUNDWATER CONDITIONS

8.1 EXISTING GROUNDWATER LEVEL

We measured the water levels in the SPT boreholes during drilling operations. The groundwater levels at the boring locations were measured at approximately 6 to 9 feet bls at the time our explorations. The encountered groundwater level at each of the boring locations is shown on the attached boring logs in Appendix B. Fluctuations in groundwater levels should be anticipated throughout the year, primarily due to seasonal variations in rainfall, surface runoff, and other factors that may vary from the time the borings were conducted.

8.2 SEASONAL HIGH GROUNDWATER LEVEL

Based on historical data, the rainy season in Central Florida is between June and October of the year. In order to estimate the seasonal high water level at the boring locations, many factors are examined, including the following:

- Measured groundwater level
- Drainage characteristics of existing soil types
- Current & historical rainfall data
- Natural relief points (such as lakes, rivers, wetlands, etc.)
- Man-made drainage systems (ditches, canals, retention basins, etc.)
- On-site types of vegetation
- Review of available data (soil surveys, USGS maps, etc.)
- Redoximorphic features (mottling, stripping, etc.)

Based on the results of our field explorations and the factors listed above, we estimate that the seasonal high groundwater level at boring locations may form roughly 4 to 7 feet bls. The estimated seasonal high groundwater level at each boring are shown on the boring logs in Appendix B.

It should be noted that the estimated seasonal high water levels do not provide any assurance that groundwater levels will not exceed these estimated levels during any given year in the future. Should the impediments to surface water drainage be present, or should rainfall intensity and duration, or total rainfall quantities, exceed the normally anticipated rainfall quantities, groundwater levels might exceed our seasonal high estimates. Further, it should be understood that changes in the surface hydrology and subsurface drainage from on-site and/or off-site improvements could have significant effects on the normal and seasonal high groundwater levels.

9.0 FOUNDATION DESIGN RECOMMENDATIONS

The following recommendations are made based upon a review of the attached soil test data, our understanding of the proposed construction, and experience with similar projects and subsurface conditions. The applicability of geotechnical recommendations is very dependent upon project characteristics such as improvement locations, and grade alterations. UES must review the final site and grading plans to validate all recommendations rendered herein.

Additionally, if subsurface conditions are encountered during construction, including previous deep foundation systems, deep utility lines, etc., which were not encountered in the borings, report those conditions immediately to us for observation and recommendations.

9.1 STRUCTURAL AND GRADING INFORMATION

At the time of our exploration, detailed structural loading information was not available. Based on our work with similar projects, we have assumed the following loading conditions for each of the structures.

Structure		Assumed Structural Loadings		
		Walls (kips/ft)	Columns (kips)	Floor Slab (psf)
Multi-Purpose Venue		75	2,000	400
Convention Way Grand Concourse	Ballroom	50	1,500	250
	Meeting Rooms	15	200	200

We have assumed that minimal grade changes (±3 feet) will be required to reach final grades.

Prior to finalizing any design, the structural/grading information outlined above should be confirmed by a structural/civil engineer. This is crucial to our evaluation and estimates of settlements. If any of this information is incorrect or if you anticipate any changes, please inform UES immediately so that we may review and modify our recommendations as appropriate.

9.2 FOUNDATION ANALYSIS

9.2.1 Multi-Purpose Venue and Ballroom

Based on the results of the SPT borings and CPT soundings performed within the proposed building footprints, the heavily loaded column and wall footings for the multi-purpose venue and the ballroom structure would be subject to settlements on the order of 2 to 4+ inches due to compression of the loose/soft zone encountered within the upper 90 feet at this site. Based on the large structural loadings, the use of an auger cast piling system would likely be the most feasible foundation option for these structures. Recommendations for auger cast piling are presented in Section 9.3.

9.2.2 Convention Way Grand Concourse Meeting Rooms

Based on the results of our exploration, it is our opinion that the meeting room portion of the Convention Way Grand Concourse structure can be supported on properly designed and constructed shallow foundation systems using conventional, surficial compaction techniques (based on the loadings in Section 9.1). If the structural loadings for the meeting room structures are greater than the assumed loadings, ground improvement techniques (vibro-replacement “stone columns”, rigid inclusions, etc.) may be necessary to limit settlements to tolerable levels.

Provided that the site preparation recommendations outlined in this report are followed, the parameters presented in Section 9.4 may be used for shallow foundation design using conventional compaction techniques.

9.3 AUGER CAST PILE FOUNDATIONS

Auger cast-in-place piles are constructed by drilling into the soil with a crane operated hollow core auger which is pulled up in short lifts while cement grout is pumped under pressure through the auger.

9.3.1 Estimated Capacity

For the multi-purpose venue and ballroom foundations, we anticipate the use of auger cast piles for support of the structures. Due to varying soil conditions across the site, we have divided the estimated pile embedment depths into three areas.

Along the northern exterior wall of the multi-purpose venue structure (SPT Boring B-09), the adequate pile bearing stratum was not encountered until a depth of about 135 feet. Therefore, deeper piles are necessary within this area to provide adequate pile capacities. **We recommend additional SPT borings be performed around the vicinity of B-09 to delineate the area which will need deeper piling.**

Based on the borings performed to date, we recommend that the piles be installed at least 100 feet below existing grade to develop the required allowable capacities along the eastern, western and southern walls of the multi-purpose venue (MPV). For the northern wall, the piles be will need to be installed at least 140 feet below existing grade to develop the required allowable capacities. For the ballroom, pile embedment depths will need to be at least 100 feet below existing grade. Table IV presents estimated allowable compressional and uplift capacities for 14, 16 and 18-inch diameter auger-cast piles for the multi-purpose venue and ballroom structures.

TABLE iV
ESTIMATED PILE CAPACITIES

Structure	Minimum Embedment Depth (feet, bls)	Minimum Pile Length (feet)	Pile Diameter (inches)	Estimated Allowable Capacity (kips)	
				Compression	Uplift
East, West and South Walls of MPV	110	105	14	220	90
North Wall of MPV	140	135	16	260	105
Ballroom	100	95	18	300	120

Please note the pile capacities presented in Table IV are based on existing ground surface conditions at the time of our explorations. Therefore, any changed in final grades must be presented to UES prior to construction in order to assess or adjust the pile capacities. The allowable capacities are based on a minimum factor of safety FS of 2.0.

9.3.2 Quality Control

Auger cast piles are highly dependent on quality of workmanship. For this reason, we strongly recommend that UES review the pile installation plans prepared by the structural engineer and that all pile installations be monitored by a UES representative, or other qualified geotechnical engineering firm. This is necessary in order to determine if piles are being installed properly by the contractor, provide an accurate record of the installation, and provide an opportunity to correct anomalous or unforeseen conditions during the pile placement work. The grout used to form the piles should be sampled and tested for strength on a regular basis.

For auger cast piles, we recommend that at least three (3) non-production piles be tested in accordance with the procedures of ASTM D 1143 to confirm the design pile depth and capacity. We recommend ground survey be completed prior to any earthwork operation and/or pile testing. The geotechnical engineer and structural engineer should review the results of the load test prior to final order of specific piles or lengths. The review is to assess whether installation techniques must be modified, pile lengths changed, etc.

The test pile should be installed with the same men, methods, and equipment that the production piles will be placed. The crane must be powerful enough to pull the full length auger out of the ground without any auger rotation.

Specific requirements for design and installation of auger cast piles are detailed in the Florida Building Code. These requirements cover group strength, installation methods, and reinforcement cover. All steel reinforcing cages for the cast in place piles should have spacers and centering guides to ensure that the reinforcement is properly positioned as designed for the pile.

The piling contractor should be made aware that hard drilling conditions will likely occur within the dense/hard bearing stratum encountered below about 90 feet below current grade.

9.3.3 Pile Spacing

Piles have lower capacities in groups. Spacing them at least 3 pile diameters apart, center to center, can significantly minimize the group effect. The reduction for group effect depends upon the number of piles in a group and their respective positions. Installing piles at a spacing of less than 3 pile diameters is not recommended for this project.

9.4 SHALLOW FOUNDATION DESIGN

9.4.1 Bearing Pressure

Provided our suggested site preparation procedures are followed, we recommend designing shallow footing foundations for a **maximum allowable net soil bearing pressure of 3,000 pounds per square foot (psf)**. The allowable net bearing pressure is that pressure that may be transmitted to the soil in excess of the minimum surrounding overburden pressure. The allowable bearing pressure should include dead load plus sustained live load. The foundations should be designed for the most unfavorable effects due to the combinations of loads specified in the FLBC.

9.4.2 Foundation Size

The minimum width recommended for an isolated column footing is 24 inches. For continuous wall or slab on grade foundations, the minimum footing width should comply with the current FLBC, but under no circumstances should be less than 12 inches. Even though the maximum allowable soil bearing pressure may not be achieved, these width recommendations should control the size of the foundations.

9.4.3 Bearing Depth

The base of all footings should be at least 12 inches below finished grade elevation in accordance with the FLBC. We recommend stormwater and surface water be diverted away from the building exterior, both during and after construction, to reduce the possibility of erosion beneath the exterior footings.

9.4.4 Bearing Material

The bearing level soils should exhibit a density of at least 95 percent of the maximum dry density as determined by ASTM D 1557 (Modified Proctor) to a depth of at least **2 feet below foundation level** as described in this report. In addition to compaction, the bearing soils must exhibit stability and be free of "pumping" conditions.

9.4.5 Settlement Estimates

Post-construction settlement of the structures will be influenced by several interrelated factors, such as (1) subsurface stratification and strength/compressibility characteristics of the bearing soils to a depth of approximately twice the width of the footing; (2) footing size, bearing level, applied loads, and resulting bearing pressures beneath the foundation; (3) site preparation and earthwork construction techniques used by the contractor, and (4) external factors, including but not limited to vibration from off-site sources and groundwater fluctuations beyond those normally anticipated for the naturally-occurring site and soil conditions which are present.

Our settlement estimates for the structures are based upon adherence to our recommended site preparation procedures presented in this report. Any deviation from these recommendations could result in an increase in the estimated post-construction settlement of the structures. Furthermore, should building loads change from those assumed by us, greater settlements may be expected.

Due to the sandy nature of the surficial soils following the compaction operations, we expect the majority of settlement to be elastic in nature and occur relatively quickly, on application of the loads, during and immediately following construction. Using the recommended maximum allowable bearing pressure, the assumed maximum structural loads, and the field and laboratory test data which we have correlated into the strength and compressibility characteristics of the subsurface soils, **we estimate the total post-construction settlement of the proposed structures to be on the order of 1 inch or less.**

Differential settlement results from differences in applied bearing pressures and the variations in the compressibility characteristics of the subsurface soils. Assuming our site preparation recommendations are followed, **we anticipate differential post-construction settlement of less than ½ inch.**

9.4.6 Floor Slabs

Conventional floor slabs may be supported upon the compacted fill and should be structurally isolated from other foundation elements or adequately reinforced to prevent distress due to differential movements. For the slab design, we recommend using a subgrade modulus (k) of 150 pounds per cubic inch, which can be achieved by compacting the subgrade soils as recommended in this report. We recommend using a sheet vapor barrier (in accordance with

Florida Building Code requirements) beneath the building slab-on-grade to help control moisture migration through the slab.

9.4.7 Site Preparation for Shallow Foundations

We recommend normal, good practice site preparation procedures for the new construction areas. These procedures include: stripping/clearing of the site to remove existing improvements, vegetation, roots, organic topsoils, debris, etc. Following stripping, the exposed subgrade soils should be proof-rolled, and all subgrade and subsequent fill/backfill soils should be properly densified. A more detailed description of this work is presented in this section.

1. Prior to construction, existing underground utility lines and other below grade structures within the construction area should be located. Provisions should be made to relocate interfering utilities to appropriate locations. It should be noted that if underground improvements are not properly removed or plugged, they may serve as conduits for subsurface erosion which may lead to excessive settlement of overlying structures.

2. Strip the proposed construction limits of existing improvements, vegetation, topsoil, roots, organic soils, debris and other deleterious materials within and 5 feet beyond the perimeter of the new construction areas. Expect clearing and grubbing to depths of 6 to 12 inches. Deeper stripping may be necessary within the developed areas to remove pavements, utilities, etc. We strongly recommend that the stripped/excavated surfaces be observed and probed by representatives of UES, or other qualified geotechnical firm.

3. Proof-roll the exposed subsurface soils to locate any soft areas of unsuitable soils, and to increase the density of the shallow loose fine sand soils. If deemed necessary, in areas that continue to "yield", remove any deleterious materials and replace with a clean, compacted sand backfill.

4. Place fill as necessary. All fill should consist of clean sand with less than 12 percent soil fines and be free of organics, debris and other deleterious materials. Fill soils containing between 5 and 12 percent fines may require strict moisture control. Place fill in maximum 12-inch loose, uniform lifts and compact each lift at least 95 percent of the Modified Proctor maximum dry density.

5. Within the at-grade (or below grade) foundation areas, subgrade compaction of at least 95 percent of the Modified Proctor should be achieved to a depth of at least 2 feet below bottom of foundation/slab levels.

6. Test the subgrade and each lift of fill for compaction at a frequency of not less than one test per 2,500 square feet in the building areas, with a minimum of 4 tests.

7. Prior to the placement of reinforcing steel and concrete, verify compaction within the footing trenches to a depth of 2 feet. We recommend testing every column footing and at least one test every 100 feet of wall footing, with a minimum of 4 tests per building. Re-compaction of the foundation excavation bearing level soils, if loosened by the excavation process, can typically be achieved by making several passes with a walk-behind vibratory sled or jumping jack.

Stability of the compacted soils is essential and independent of compaction and density control. If the near surface soils or the structural fill experience "pumping" conditions, terminate all earthwork activities in that area. Pumping conditions occur when there is too much water present in the soil-water matrix. Earthwork activities are actually attempting to compact the water and not the soil. The disturbed soils should be dried in place by scarification and aeration prior to any additional earthwork activities.

Vibrations produced during vibratory compaction operations at the site may be significantly noticeable within 100 feet and may cause distress to adjacent structures if not properly regulated. Provisions should be made to monitor these vibrations so that any necessary modifications in the compaction operations can be made in the field before potential damages occur. UES can provide vibration monitoring services to help document and evaluate the effects of the surface compaction operation on existing structures. It is recommended that large vibratory rollers remain a minimum of 50 feet from existing structures. Within this zone, the use of a static roller or small hand guided plate compactors is recommended.

10.0 DEWATERING AND EXCAVATION CONSIDERATIONS

Based on the groundwater level conditions encountered, some dewatering may be required for the successful construction of this project. Where excavations will extend only a few feet below the groundwater table, a sump pump may be sufficient to control the groundwater table. Deeper excavations may require well points and/or sock drains to control the groundwater table. Regardless of the method(s) used, we recommend drawing down the water level at least 2 feet below the bottom of the excavation. The actual method(s) of dewatering should be determined by the contractor. The design and discharge of the dewatering system must be performed in accordance with applicable regulatory criteria (i.e. water management district, etc.) and compliance with such criteria is the sole responsibility of the contractor.

Excavations should be sloped as necessary to prevent slope failure and to allow backfilling. As a minimum, temporary excavations below 4-foot depth should be sloped in accordance with OSHA regulations. Where lateral confinement will not permit slopes to be laid back, the excavation should be shored in accordance with OSHA requirements. During excavation, excavated material should not be stockpiled at the top of the slope within a horizontal distance equal to the excavation depth. Provisions for maintaining workman safety within excavations is the sole responsibility of the contractor.

11.0 CONSTRUCTION RELATED SERVICES

We recommend the owner retain UES, or other qualified geotechnical firm, to provide inspection services during the site preparation procedures for confirmation of the adequacy of the earthwork operations. Field tests and observations include verification of foundation and pavement subgrades by monitoring earthwork operations and performing quality assurance tests of the placement of compacted structural fill courses.

The geotechnical engineering design does not end with the advertisement of the construction documents. The design is an on-going process throughout construction. Because of our familiarity with the site conditions and the intent of the engineering design, we are most qualified to address site problems or construction changes, which may arise during construction, in a timely and cost-effective manner.

12.0 LIMITATIONS

This report has been prepared for the exclusive use of ***Orange County Convention Center*** and other designated members of their design/construction team associated with the proposed construction for the specific project discussed in this report. No other site or project facilities should be designed using the soil information contained in this report. As such, UES will not be responsible for the performance of any other site improvement designed using the data in this report.

The recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated on the Boring Location Plan and from other information as referenced. This report does not reflect any variations which may occur between the boring locations. The nature and extent of such variations may not become evident until the course of construction. If variations become evident, it will then be necessary for a re-evaluation of the recommendations of this report after performing on-site observations during the construction period and noting the characteristics of the variations.

All users of this report are cautioned that there was no requirement for UES to attempt to locate any man-made buried objects or identify any other potentially hazardous conditions that may exist at the site during the course of this exploration. Therefore, no attempt was made by UES to locate or identify such concerns. UES cannot be responsible for any buried man-made objects or environmental hazards which may be subsequently encountered during construction that are not discussed within the text of this report. We can provide this service if requested.

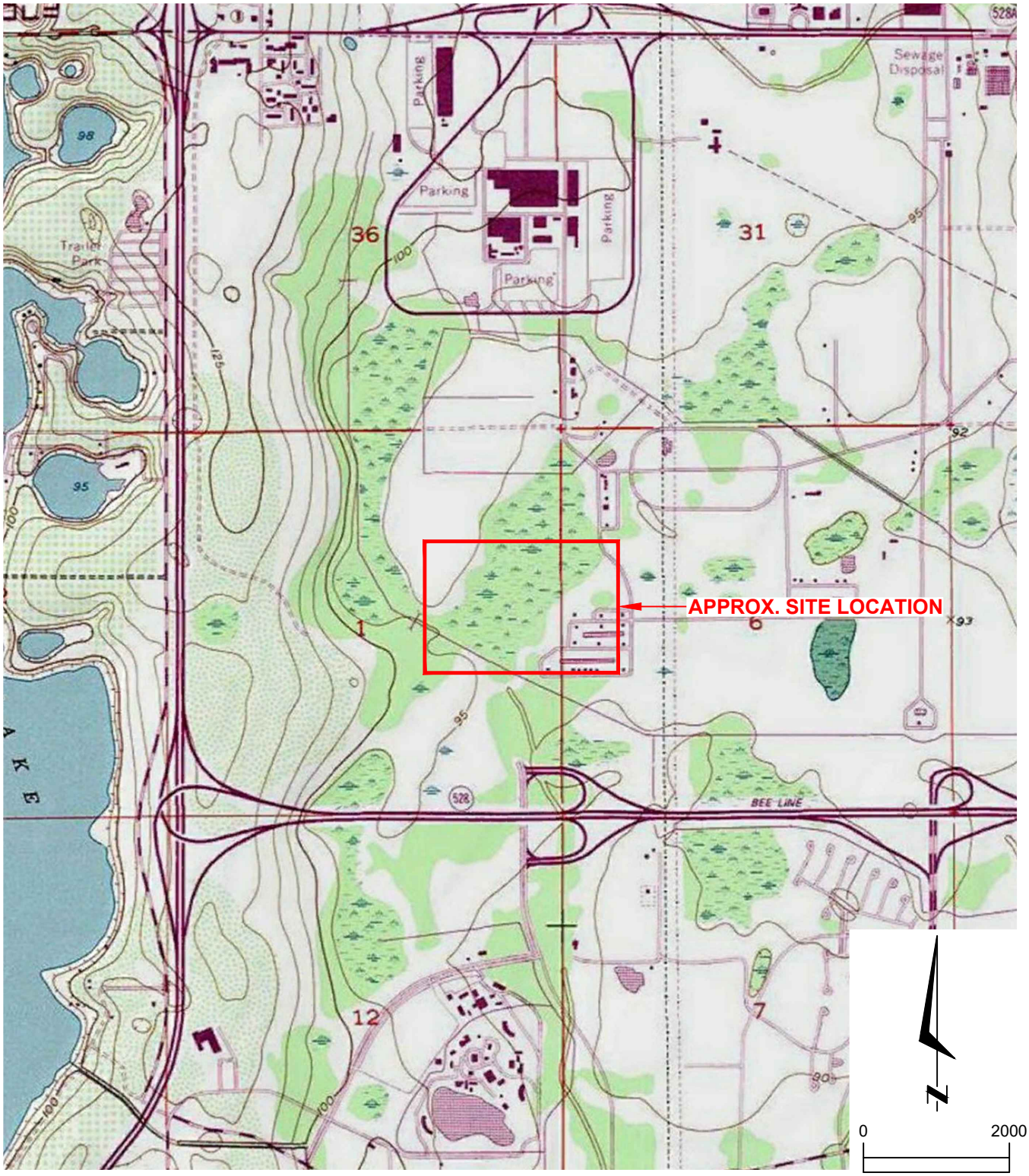
During the early stages of most construction projects, geotechnical issues not addressed in this report may arise. Because of the natural limitations inherent in working with the subsurface, it is not possible for a geotechnical engineer to predict and address all possible problems. A Geotechnical Business Council (GBC) publication, "Important Information About Your Geotechnical Engineering Report" appears in Appendix C, and will help explain the nature of geotechnical issues.

Further, we present documents in Appendix C: Constraints and Restrictions, to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.

*** * * * * * * * ***

APPENDIX A

UNIVERSAL
ENGINEERING SCIENCES



SOURCE: USGS QUADRANGLE MAP OF "LAKE JESSAMINE, FLORIDA".

UNIVERSAL ENGINEERING SCIENCES

FINAL GEOTECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
9400 UNIVERSAL BOULEVARD
ORLANDO, ORANGE COUNTY, FLORIDA

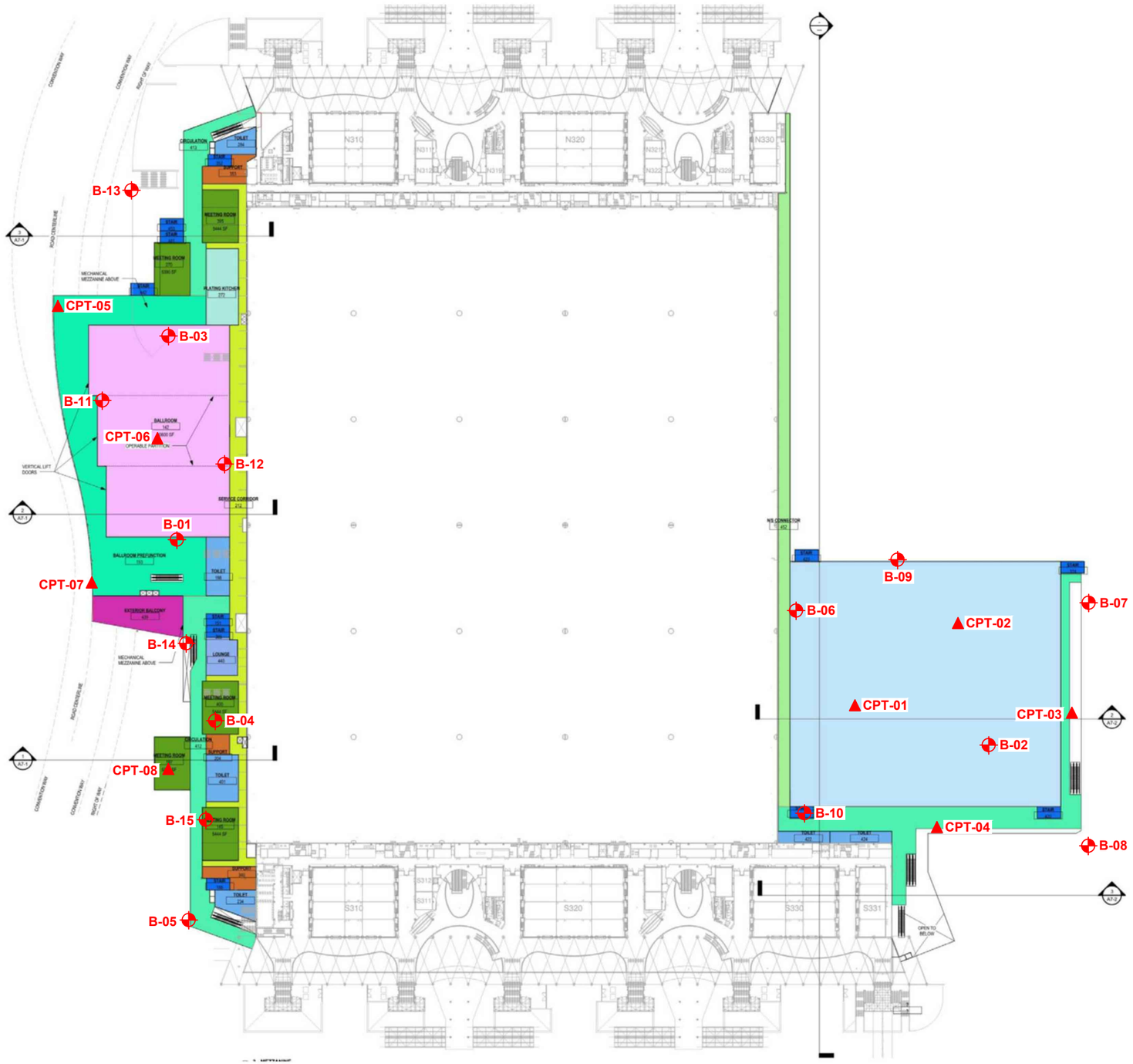
U.S.G.S. SITE LOCATION MAP

DRAWN BY:	R.K.S.	**DATE:**	7 - 17 - 18	**CHECKED BY:**	A.S.W.	**DATE:**	4 - 25 - 19
SCALE:	AS SHOWN	**PROJECT NO:**	0130.1800259.0000	**REPORT NO:**	1647316	**PAGE NO:**	A-1

18-0390-01

APPENDIX B

UNIVERSAL
ENGINEERING SCIENCES



0 200

SCALE (FT.)

LEGEND

- APPROX. STANDARD PENETRATION TEST BORING LOCATION (SPT)
- APPROX. CONE PENETROMETER TEST LOCATION (CPT)

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	R.K.S.	1/17/19
Checked by		
Revised by		
Checked by		
Approved by	ANDREW S. WILDEROTTER, P.E. FLORIDA P.E. #65727	

ENGINEER OF RECORD:
Universal Engineering Sciences
3532 Maggie Boulevard
Orlando, Florida 32811
Phone: (407) 423-0504
Cert. of Authorization #549

ORANGE COUNTY CONVENTION CENTER

UES REPORT NO.	COUNTY	UES PROJECT NO.
1647316	ORANGE	0130.1800259.0000

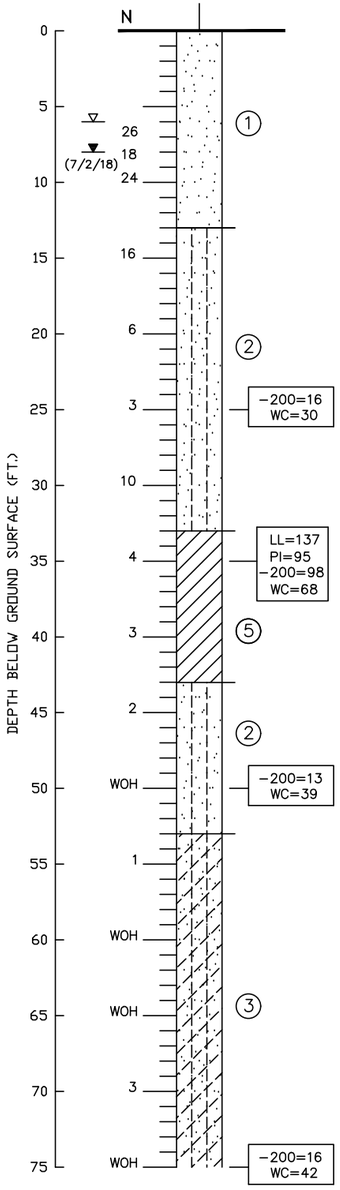
SHEET TITLE: SOIL BORING LOCATION PLAN FOR BUILDING IMPROVEMENTS

PROJECT NAME: FINAL GEOTECHNICAL EXPLORATION
OCCC NORTH/SOUTH BUILDING IMPROVEMENTS
ORANGE COUNTY, FLORIDA

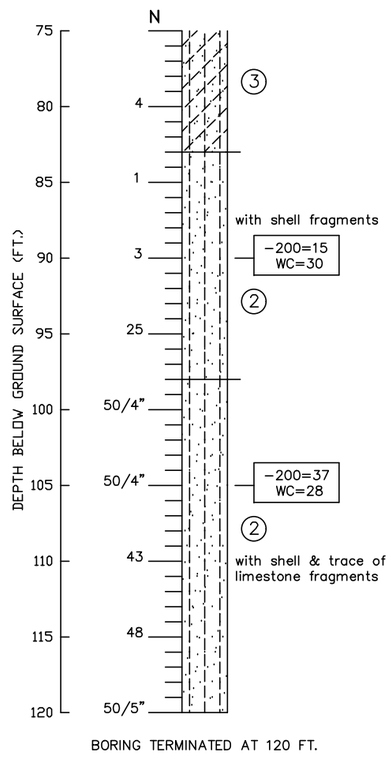
SHEET NO. B-1.1

19-0031-01

B-01

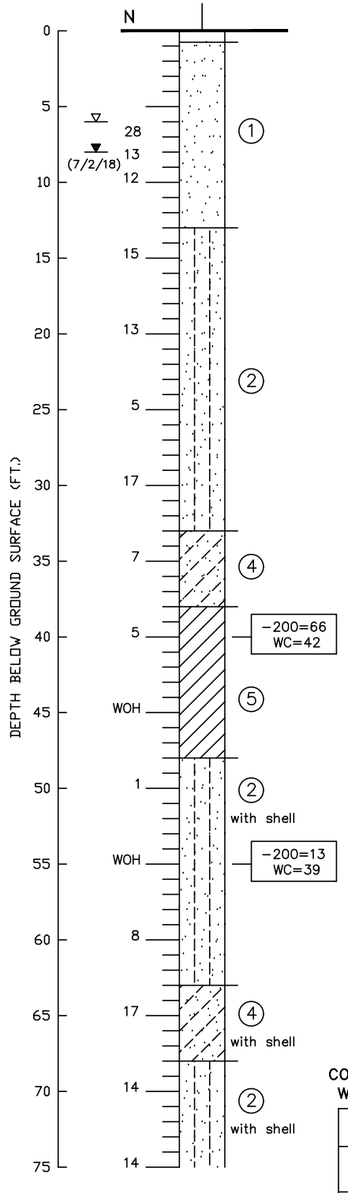


B-01 (CONT.)

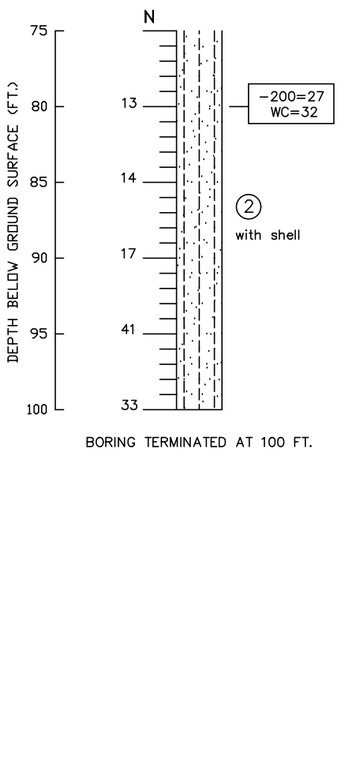


BORING TERMINATED AT 120 FT.

B-02

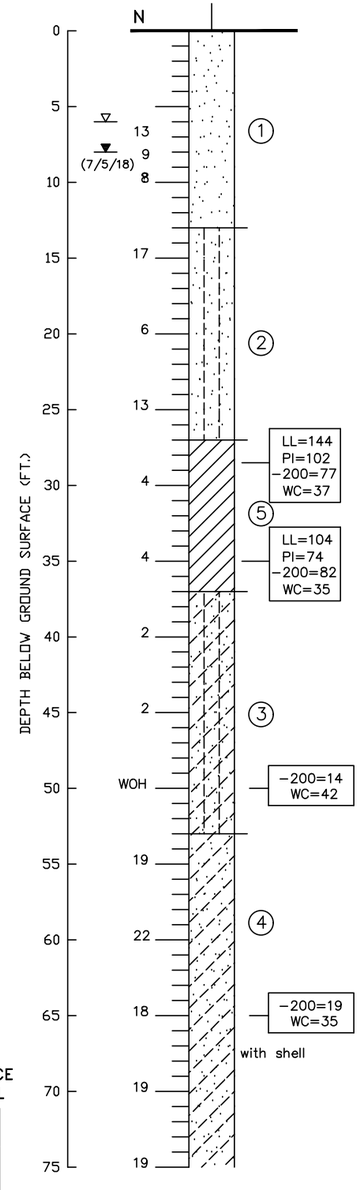


B-02 (CONT.)

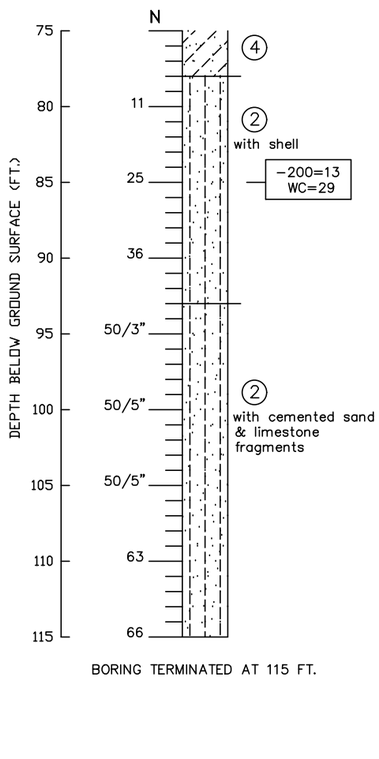


BORING TERMINATED AT 100 FT.

B-03



B-03 (CONT.)



BORING TERMINATED AT 115 FT.

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR MATERIALS (SILTS, SANDS & GRAVELS)		COHESIVE SOILS (CLAYS)	
CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)	CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)
VERY LOOSE	0-4	VERY SOFT	0-2
LOOSE	5-10	SOFT	3-4
MEDIUM DENSE	11-30	FIRM	5-8
DENSE	31-50	STIFF	9-16
VERY DENSE	50+	VERY STIFF	17-30
		HARD	30+

SOILS LEGEND

1. FINE SAND [SP, SP-SM]
2. SILTY FINE SAND [SM]
3. SILTY/CLAYEY FINE SAND [SC-SM]
4. CLAYEY FINE SAND [SC]
5. SANDY CLAY TO CLAY [CL, CH]

NOTE: ALL BORINGS HAND AUGERED FROM GROUND SURFACE TO 5.5 FT.

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	R.K.S.	1/17/19
Checked by		
Revised by		
Checked by		
Approved by	ANDREW S. WILDEROTTER, P.E. FLORIDA P.E. #65727	

ENGINEER OF RECORD:
Universal Engineering Sciences
3532 Maggie Boulevard
Orlando, Florida 32811
Phone: (407) 423-0504
Cert. of Authorization #549

ORANGE COUNTY CONVENTION CENTER

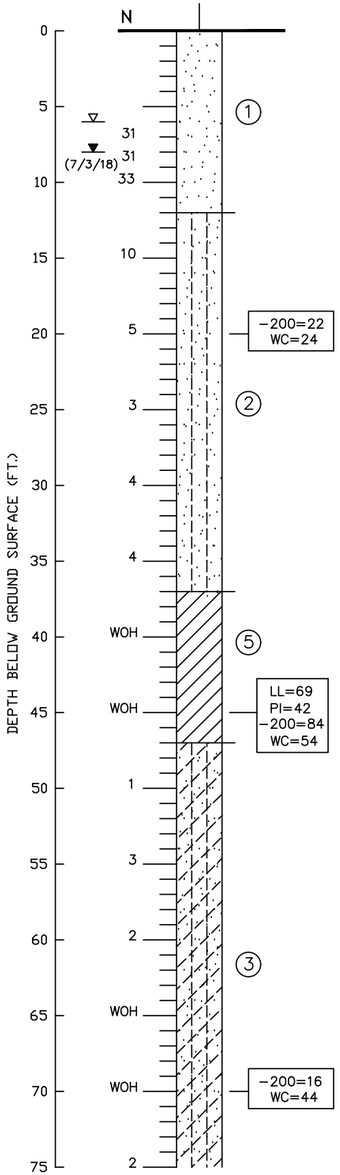
ROAD NO.	COUNTY	UES PROJECT NO.
	ORANGE	0130.1800259.0000

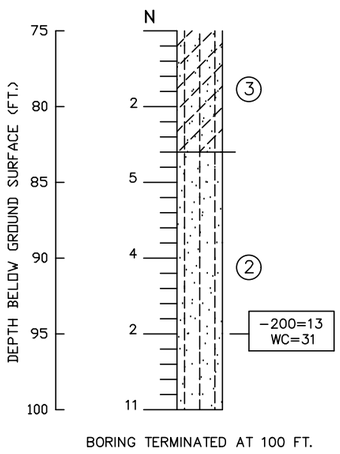
SHEET TITLE: SPT BORINGS FOR BUILDING IMPROVEMENTS

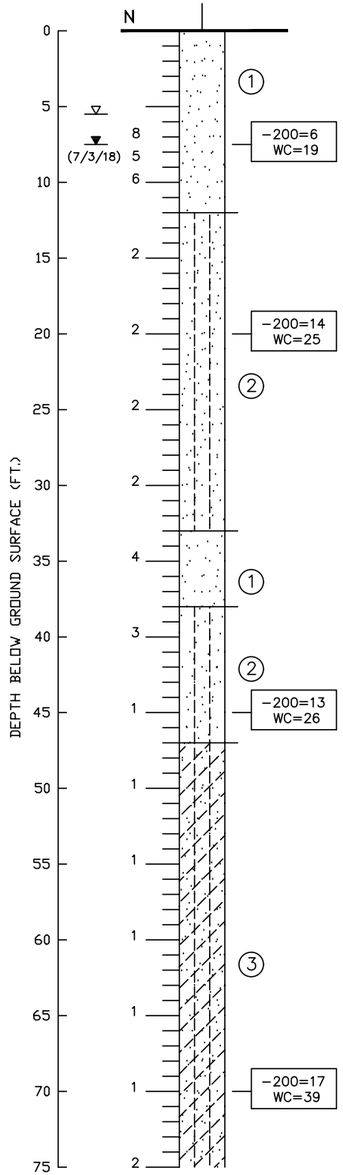
PROJECT NAME: FINAL GEOTECHNICAL EXPLORATION
OCCC NORTH/SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

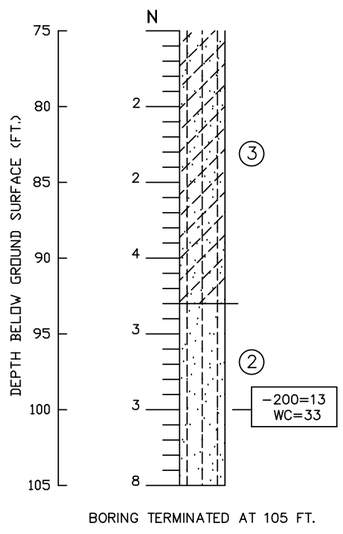
SHEET NO. B-1.2

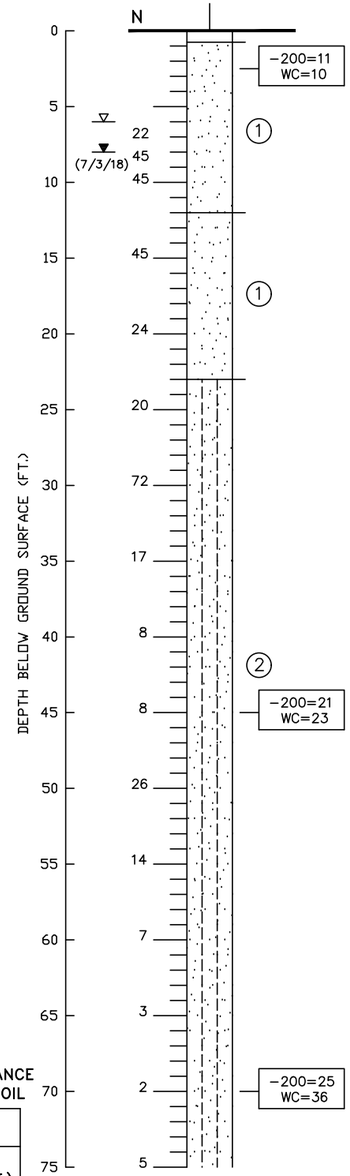
19-0031-01

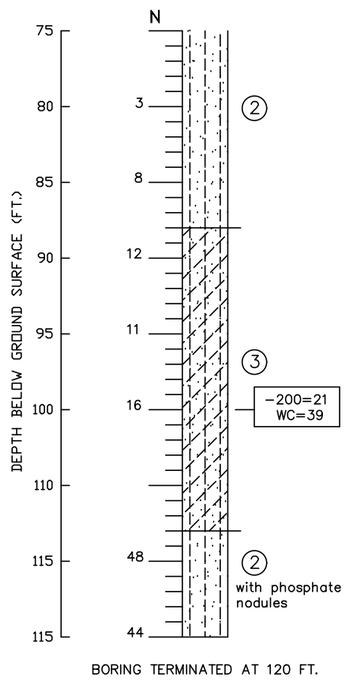












CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR MATERIALS (SILTS, SANDS & GRAVELS)		COHESIVE SOILS (CLAYS)	
CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)	CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)
VERY LOOSE	0–4	VERY SOFT	0–2
LOOSE	5–10	SOFT	3–4
MEDIUM DENSE	11–30	FIRM	5–8
DENSE	31–50	STIFF	9–16
VERY DENSE	50+	VERY STIFF	17–30
		HARD	30+

SOILS LEGEND

1. FINE SAND [SP, SP–SM]
2. SILTY FINE SAND [SM]
3. SILTY/CLAYEY FINE SAND [SC–SM]
4. CLAYEY FINE SAND [SC]
5. SANDY CLAY TO CLAY [CL, CH]

NOTE: ALL BORINGS HAND AUGERED FROM GROUND SURFACE TO 5.5 FT.

19-0031-01

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	R.K.S.	1/17/19
Checked by		
Revised by		
Checked by		
Approved by	ANDREW S. WILDEROTTER, P.E. FLORIDA P.E. #65727	

ENGINEER OF RECORD:
Universal Engineering Sciences
3532 Maggie Boulevard
Orlando, Florida 32811
Phone: (407) 423-0504
Cert. of Authorization #549

ORANGE COUNTY CONVENTION CENTER

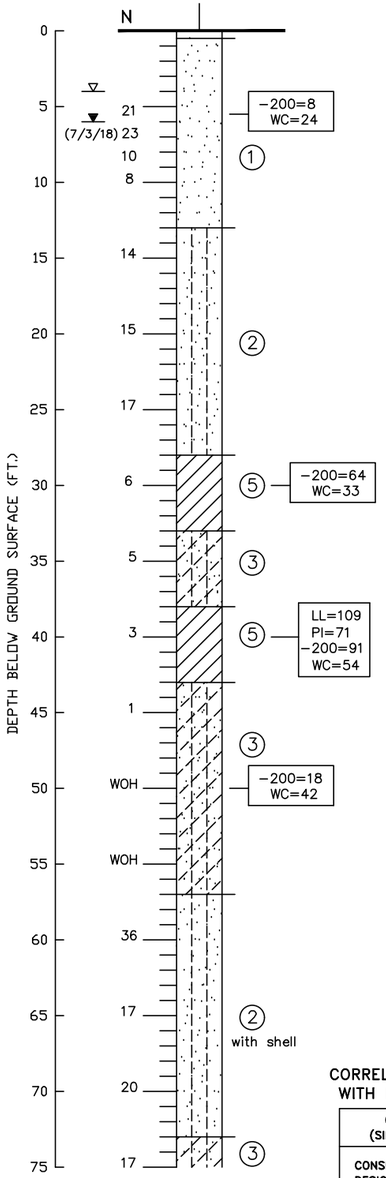
ROAD NO.	COUNTY	UES PROJECT NO.
	ORANGE	0130.1800259.0000

SHEET TITLE: SPT BORINGS FOR BUILDING IMPROVEMENTS

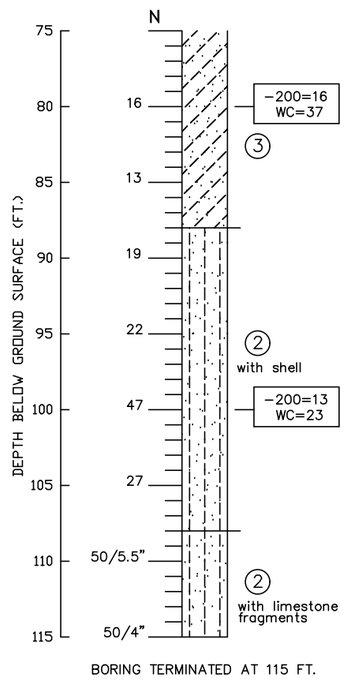
PROJECT NAME: FINAL GEOTECHNICAL EXPLORATION
OCCC NORTH/SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

SHEET NO. B-1.3

B-07

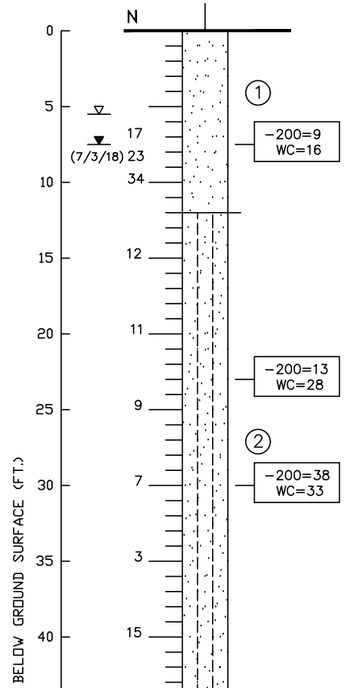


B-07 (CONT.)

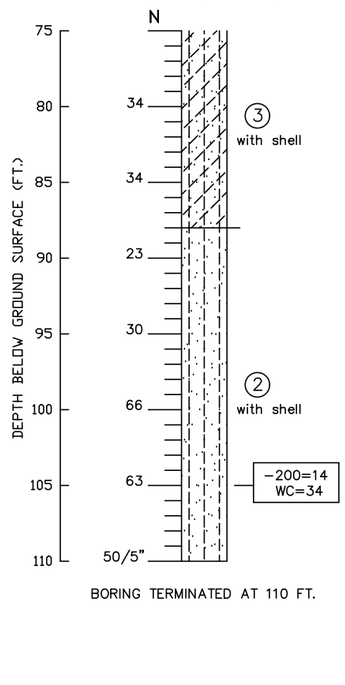


BORING TERMINATED AT 115 FT.

B-08

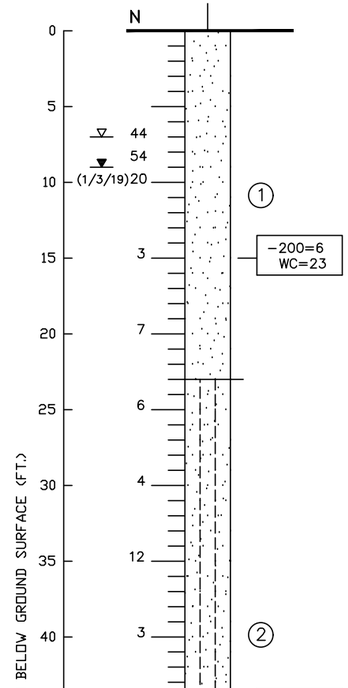


B-08 (CONT.)

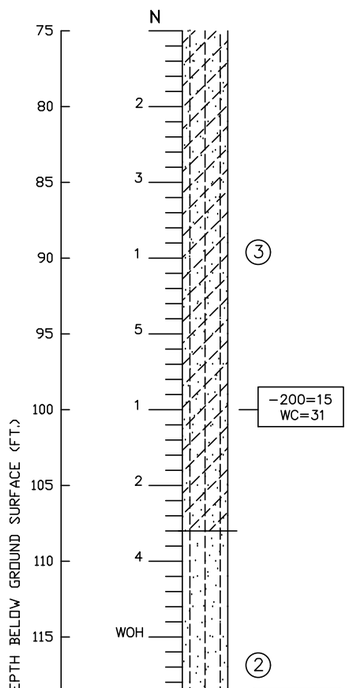


BORING TERMINATED AT 110 FT.

B-09



B-09 (CONT.)



BORING TERMINATED AT 145 FT.

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR MATERIALS (SILTS, SANDS & GRAVELS)		COHESIVE SOILS (CLAYS)	
CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)	CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)
VERY LOOSE	0-4	VERY SOFT	0-2
LOOSE	5-10	SOFT	3-4
MEDIUM DENSE	11-30	FIRM	5-8
DENSE	31-50	STIFF	9-16
VERY DENSE	50+	VERY STIFF	17-30
		HARD	30+

SOILS LEGEND

1. FINE SAND [SP, SP-SM]
2. SILTY FINE SAND [SM]
3. SILTY/CLAYEY FINE SAND [SC-SM]
4. CLAYEY FINE SAND [SC]
5. SANDY CLAY TO CLAY [CL, CH]

NOTE: ALL BORINGS HAND AUGERED FROM GROUND SURFACE TO 5.5 FT. EXCEPT FOR BORING B-7 WHICH WAS HAND AUGERED TO 4 FT.

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	R.K.S.	1/17/19
Checked by		
Revised by		
Checked by		
Approved by	ANDREW S. WILDEROTTER, P.E. FLORIDA P.E. #65727	

ENGINEER OF RECORD:
Universal Engineering Sciences
3532 Maggie Boulevard
Orlando, Florida 32811
Phone: (407) 423-0504
Cert. of Authorization #549

ORANGE COUNTY CONVENTION CENTER

ROAD NO.	COUNTY	UES PROJECT NO.
	ORANGE	0130.1800259.0000

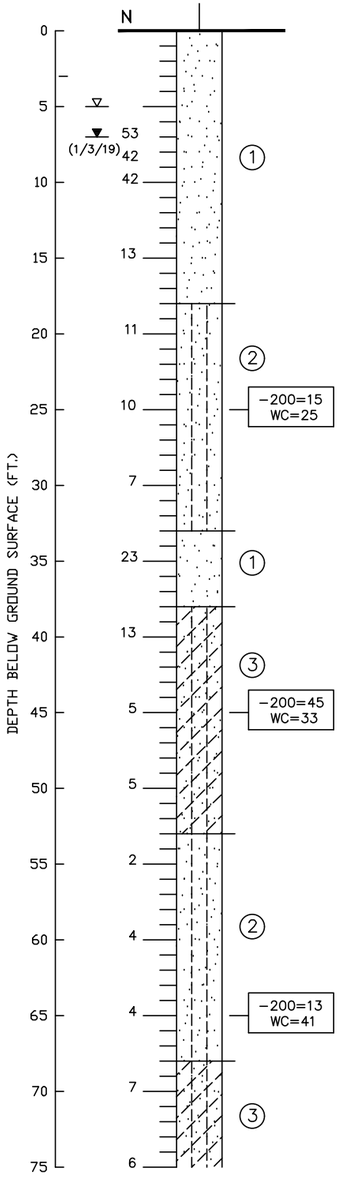
SHEET TITLE: SPT BORINGS FOR BUILDING IMPROVEMENTS

PROJECT NAME: FINAL GEOTECHNICAL EXPLORATION
OCCC NORTH/SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

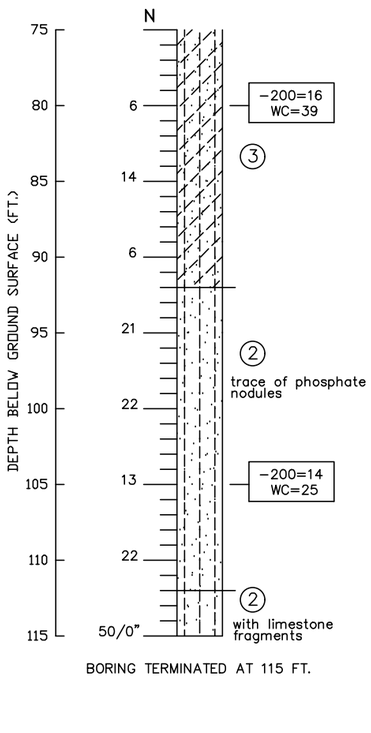
SHEET NO. B-1.4

19-0031-01

B-10

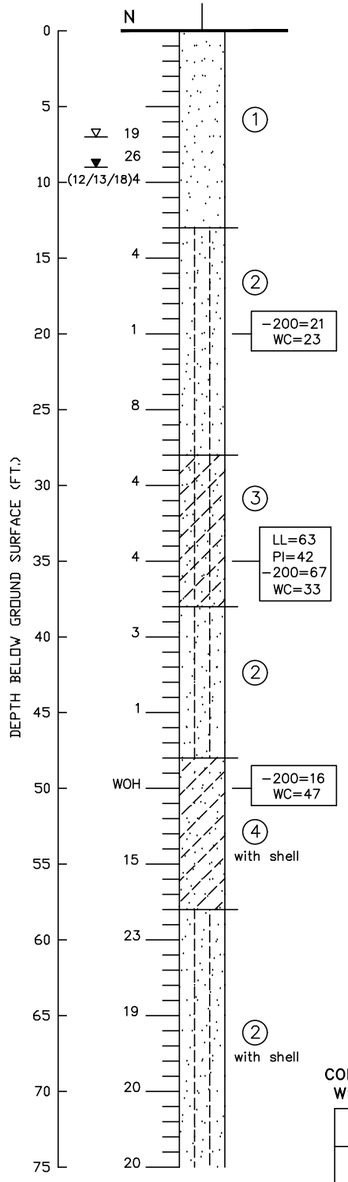


B-10 (CONT.)

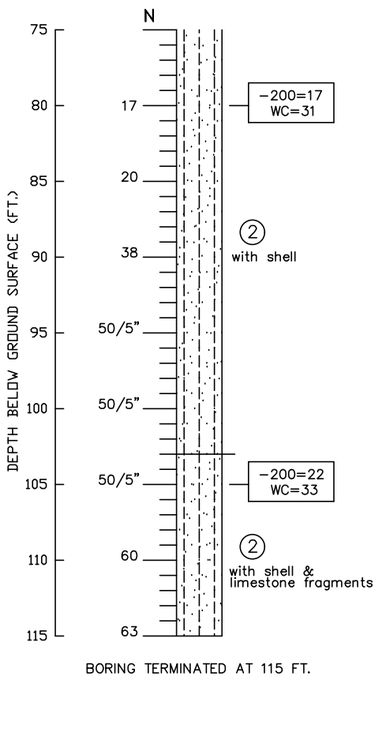


BORING TERMINATED AT 115 FT.

B-11

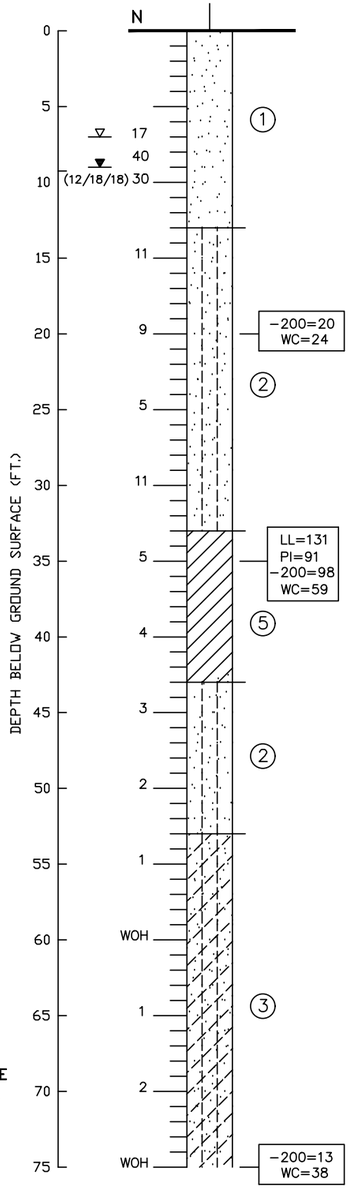


B-11 (CONT.)

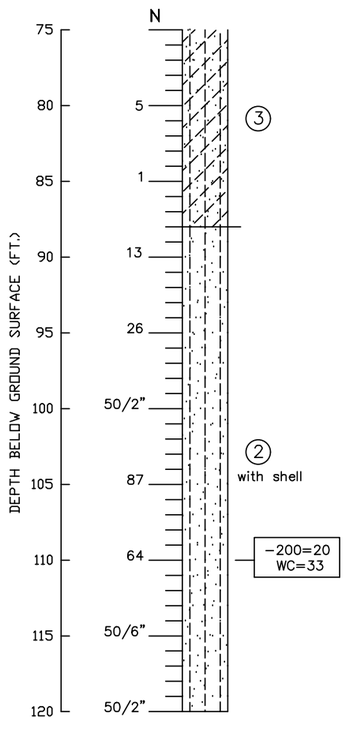


BORING TERMINATED AT 115 FT.

B-12



B-12 (CONT.)



BORING TERMINATED AT 120 FT.

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR MATERIALS (SILTS, SANDS & GRAVELS)		COHESIVE SOILS (CLAYS)	
CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)	CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)
VERY LOOSE	0–4	VERY SOFT	0–2
LOOSE	5–10	SOFT	3–4
MEDIUM DENSE	11–30	FIRM	5–8
DENSE	31–50	STIFF	9–16
VERY DENSE	50+	VERY STIFF	17–30
		HARD	30+

SOILS LEGEND

1. FINE SAND [SP, SP–SM]
2. SILTY FINE SAND [SM]
3. SILTY/CLAYEY FINE SAND [SC–SM]
4. CLAYEY FINE SAND [SC]
5. SANDY CLAY TO CLAY [CL, CH]

NOTE: ALL BORINGS HAND AUGERED FROM GROUND SURFACE TO 5.5 FT.

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	R.K.S.	1/17/19
Checked by		
Revised by		
Checked by		
Approved by	ANDREW S. WILDEROTTER, P.E. FLORIDA P.E. #65727	

ENGINEER OF RECORD:
Universal Engineering Sciences
3532 Maggie Boulevard
Orlando, Florida 32811
Phone: (407) 423-0504
Cert. of Authorization #549

ORANGE COUNTY CONVENTION CENTER

ROAD NO.	COUNTY	UES PROJECT NO.
	ORANGE	0130.1800259.0000

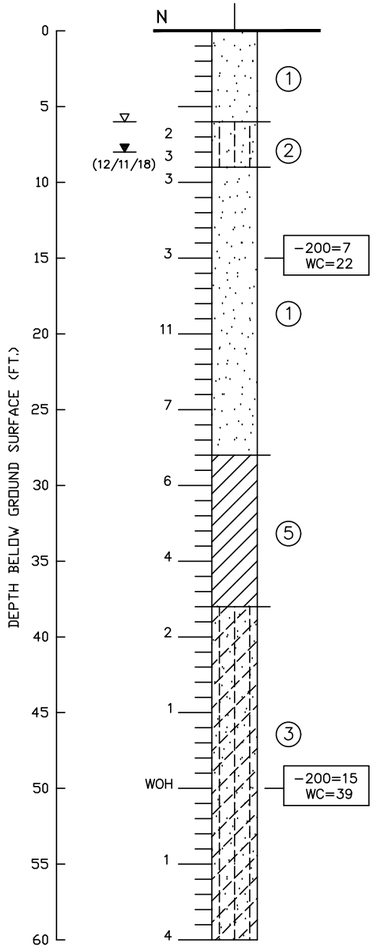
SHEET TITLE: SPT BORINGS FOR BUILDING IMPROVEMENTS

PROJECT NAME: FINAL GEOTECHNICAL EXPLORATION
OCCC NORTH/SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

SHEET NO. B-1.5

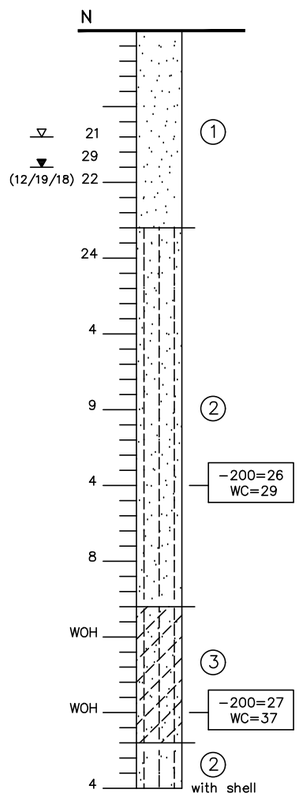
19-0031-01

B-13



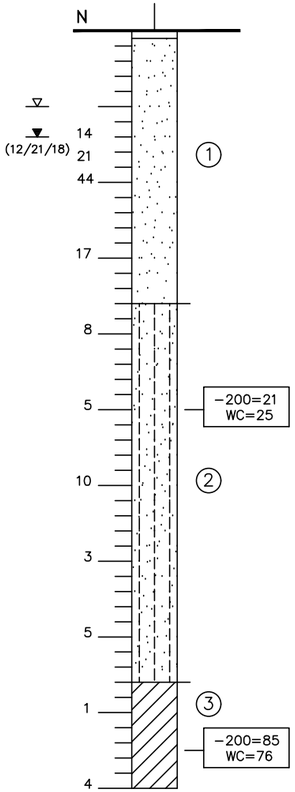
BORING TERMINATED AT 60 FT.

B-14



BORING TERMINATED AT 50 FT.

B-15



BORING TERMINATED AT 50 FT.

SOILS LEGEND

① FINE SAND [SP, SP-SM]

② SILTY FINE SAND [SM]

③ SILTY/CLAYEY FINE SAND [SC-SM]

④ CLAYEY FINE SAND [SC]

⑤ SANDY CLAY TO CLAY [CL, CH]

NOTE: ALL BORINGS HAND AUGERED FROM GROUND SURFACE TO 5.5 FT.

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR MATERIALS (SILTS, SANDS & GRAVELS)		COHESIVE SOILS (CLAYS)	
CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)	CONSISTENCY DESIGNATION	SPT N (BLOWS/FT.)
VERY LOOSE	0-4	VERY SOFT	0-2
LOOSE	5-10	SOFT	3-4
MEDIUM DENSE	11-30	FIRM	5-8
DENSE	31-50	STIFF	9-16
VERY DENSE	50+	VERY STIFF	17-30
		HARD	30+

19-0031-01

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	R.K.S.	1/17/19
Checked by		
Revised by		
Checked by		
Approved by	ANDREW S. WILDEROTTER, P.E. FLORIDA P.E. #65727	

ENGINEER OF RECORD:
Universal Engineering Sciences
3532 Maggie Boulevard
Orlando, Florida 32811
Phone: (407) 423-0504
Cert. of Authorization #549

ORANGE COUNTY CONVENTION CENTER

ROAD NO.	COUNTY	UES PROJECT NO.
	ORANGE	0130.1800259.0000

SHEET TITLE: SPT BORINGS FOR BUILDING IMPROVEMENTS

PROJECT NAME: FINAL GEOTECHNICAL EXPLORATION
OCCC NORTH/SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

SHEET NO. B-1.6

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.1

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-01** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER

LOCATION: SEE BORING LOCATION PLAN

REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED, HAND AUGERED TO 5.5 FT.

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 8
DATE OF READING: 7/2/18
EST. SHGWT (ft): 6

DATE STARTED: 7/2/18
DATE FINISHED: 12/17/18
DRILLED BY: ORL - JB/DM/AI
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Brown fine SAND with silt [SP-SM]						
5		10-12-14	26	▽		-- medium dense, dark gray brown						
		10-8-10	18	▼		-- dark gray						
10		7-11-13	24									
15		5-7-9	16			Medium dense brown silty fine SAND [SM]						
20		3-3-3	6			-- very dense -- loose, light brown						
25		1-1-2	3			-- very loose, very light gray	16	30				
30		3-4-6	10			-- loose, very light gray brown						
35		1-1-3	4			Soft gray green CLAY [CH]	98	68	137	95		
40		0-1-2	3			-- gray brown						
45		1-1-1	2			Very loose gray silty fine SAND [SM]						
50		0-0-0	WOH			-- dark gray green	13	39				
55		0-0-1	1			Very loose dark gray green silty clayey fine SAND [SC-SM]						
60		0-0-0	WOH			-- dark green						
65		0-0-0	WOH									
70		0-1-2	3									
75		0-0-0	WOH				16	42				

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.2

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-01**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80	X	2-1-3	4									
85	X	0-0-1	1			Very loose dark green silty fine SAND with shell [SM]						
90	X	1-1-2	3				15	30				
95	X	10-11-14	25			-- medium dense						
100	X	50/4"	50/4"			Very dense greyish green silty fine SAND with shell and trace of limestone fragments [SM]						
105	X	21-38-50/4"	88/10"				37	28				
110	X	12-19-24	43			-- dense						
115	X	8-18-30	48									
120	X	50/5"	50/5"			BORING TERMINATED AT 120.0 FT.						
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.2

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-02** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER

LOCATION: SEE BORING LOCATION PLAN

REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED, HAND AUGERED TO 5.5 FT.

G.S. ELEVATION (ft):	N.S.	DATE STARTED:	7/2/18
WATER TABLE (ft):	8	DATE FINISHED:	7/2/18
DATE OF READING:	7/2/18	DRILLED BY:	ORL - JB/DM/AI
EST. SHGWT (ft):	6	TYPE OF SAMPLING:	ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						1" ASPHALT, 7" LIMEROCK BASE						
						Gray brown fine SAND with silt [SP-SM]						
5						-- gray						
		17-14-14	28	▽		-- medium dense, red brown						
		4-7-6	13	▼		-- light red brown						
10		3-5-7	12									
						Medium dense gray silty fine SAND [SM]						
15		6-7-8	15									
		6-6-7	13									
20												
		2-2-3	5			-- loose						
25												
		5-9-8	17			-- medium dense, gray						
30												
						Loose gray clayey fine SAND [SC]						
35		3-4-3	7									
						Firm dark gray green sandy CLAY [CL]						
40		0-3-2	5				66	42				
		0-0-0	WOH			-- very soft						
45												
						Very loose dark gray green silty fine SAND with clay [SM]						
50		0-0-1	1									
		0-0-0	WOH				13	39				
55												
		1-3-5	8			-- loose, gray, with shell						
60												
		6-8-9	17			Medium dense green clayey fine SAND with shell [SC]						
65												
		6-6-8	14			Medium dense green silty fine SAND with shell [SM]						
70												
		5-7-7	14									
75												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.3

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-02**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80	X	6-6-7	13				27	32				
85	X	5-6-8	14									
90	X	10-7-10	17									
95	X	10-16-25	41			-- dense						
100	X	16-16-17	33			BORING TERMINATED AT 100.0 FT.						
105												
110												
115												
120												
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.3

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-03** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED, HAND AUGERED TO 5.5 FT.

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 8
DATE OF READING: 7/5/18
EST. SHGWT (ft): 6

DATE STARTED: 7/5/18
DATE FINISHED: 12/12/18
DRILLED BY: ORL - JB/DM
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Brown fine SAND with silt [SP-SM]						
5		3-3-10	13	▽		-- medium dense						
		4-4-5	9	▼		-- loose, very dark brown						
10		3-4-4	8			-- light brown						
15		7-8-9	17			Medium dense light gray silty fine SAND [SM]						
20		4-4-2	6			-- loose, gray brown						
25		4-5-8	13			-- medium dense, very light gray						
30		2-1-3	4			Soft green CLAY with sand [CH]	77	37	144	102		
35		1-2-2	4				82	35	104	74		
40		2-1-1	2			Very loose grey green silty-clayey fine SAND [SC-SM]						
45		1-1-1	2									
50		0-0-0	WOH				14	42				
55		4-8-11	19			Medium dense dark grey green clayey fine SAND with shell [SC]						
60		6-8-14	22									
65		5-7-11	18				19	35				
70		6-7-12	19									
75		7-9-10	19									

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.4

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-03**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80		6-4-7	11			Medium dense grey green silty fine SAND with shell [SM]						
85		6-11-14	25				13	29				
90		11-18-18	36			-- dense						
95		18-50/3"	50/3"			Very dense light green grey silty fine SAND with cemented sand and limestone fragments [SM]						
100		50/5"	50/5"									
105		21-50/5"	50/5"									
110		15-23-40	63									
115		12-22-44	66									
						BORING TERMINATED AT 115.0 FT.						
120												
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.4

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-04** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED, HAND AUGERED TO 5.5 FT.

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 8
DATE OF READING: 7/3/18
EST. SHGWT (ft): 6

DATE STARTED: 7/3/18
DATE FINISHED: 12/19/18
DRILLED BY: ORL - JB/DM
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Brown fine SAND with silt [SP-SM]						
5		10-13-18	31	▽		-- dense, mixed, light orange brown						
		9-13-18	31	▼		-- very dark red brown						
10		14-18-15	33									
						Loose light tan brown silty fine SAND [SM]						
15		5-5-5	10									
20		3-3-2	5				22	24				
25		2-1-2	3			-- very loose, light gray						
30		3-2-2	4									
35		2-2-2	4									
						Very soft grey CLAY with sand [CH]						
40		0-0-0	WOH									
45		0-0-0	WOH				84	54	69	42		
						Very loose grey silty clayey fine SAND [SC-SM]						
50		1-0-1	1									
55		2-1-2	3			-- grey green						
60		1-1-1	2									
65		0-0-0	WOH									
70		0-0-0	WOH				16	44				
75		0-0-2	2									

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.5

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-04**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80		1-1-1	2									
85		1-2-3	5			Loose dark grey green silty fine SAND [SM]						
90		1-2-2	4			-- very loose						
95		1-1-1	2				13	31				
100		4-4-7	11			-- medium dense						
						BORING TERMINATED AT 100.0 FT.						
105												
110												
115												
120												
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.5

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-05** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED, HAND AUGERED TO 5.5 FT.

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 7.5
DATE OF READING: 7/3/18
EST. SHGWT (ft): 5.5

DATE STARTED: 7/3/18
DATE FINISHED: 12/27/18
DRILLED BY: ORL - JB/DM
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Dark gray brown fine SAND with silt [SP-SM]						
						-- tan						
5		7-5-3	8	▽		-- loose, tan orange	6	19				
		2-3-2	5	▼								
10		3-3-3	6									
						Very loose orange tan silty fine SAND [SM]						
15		2-1-1	2									
		1-1-1	2			-- gray brown	14	25				
20												
		1-1-1	2			-- light gray brown						
25												
		1-1-1	2			-- light gray						
30												
		1-1-3	4			Very loose light gray fine SAND with silt [SP-SM]						
35												
		2-1-2	3			Very loose grey silty fine SAND [SM]						
40												
		0-0-1	1				13	26				
45												
		0-1-0	1			Very loose dark grey green silty clayey fine SAND [SC-SM]						
50												
		0-0-1	1									
55												
		1-1-0	1									
60												
		0-1-0	1									
65												
		1-0-1	1				17	39				
70												
		1-1-1	2									
75												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.6

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-05**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80	X	0-0-2	2									
85	X	1-0-2	2									
90	X	1-1-3	4									
95	X	0-1-2	3			Very loose grey green silty fine SAND [SM]						
100	X	1-1-2	3				13	33				
105	X	3-3-5	8			-- loose						
						BORING TERMINATED AT 105.0 FT.						
110												
115												
120												
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.6

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-06** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED, HAND AUGERED TO 5.5 FT.

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 8
DATE OF READING: 7/3/18
EST. SHGWT (ft): 6

DATE STARTED: 7/3/18
DATE FINISHED: 1/2/19
DRILLED BY: ORL - DW/AI
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						2.5" ASPHALT, 6" LIMEROCK BASE						
						Brown fine SAND with silt [SP-SM]	11	10				
						-- light brown						
5				▽								
		6-8-14	22			-- medium dense, brown						
		24-18-27	45	▼		-- dense						
		14-22-23	45									
10												
						Dense brown fine SAND with silt [SP-SM]						
		12-19-26	45									
15												
		11-11-13	24			-- medium dense, dark gray brown						
20												
		8-10-10	20			Medium dense dark gray brown silty fine SAND [SM]						
25												
		16-40-32	72			-- very dense, dark red brown						
30												
		8-8-9	17			-- medium dense, light brown						
35												
		6-4-4	8			-- loose						
40												
		3-4-4	8				21	23				
45												
		6-9-17	26			-- medium dense						
50												
		4-7-7	14									
55												
		3-4-3	7			-- loose						
60												
		2-1-2	3			-- very loose, dark grey brown						
65												
		1-1-1	2				25	36				
70												
		1-2-3	5			-- loose						
75												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.7

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-06**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80	X	1-2-1	3			-- very loose						
85	X	2-2-2	4									
90	X	3-4-4	8			Loose dark grey green silty clayey fine SAND [SC-SM]						
95	X	5-6-6	12			-- medium dense						
100	X	5-5-6	11				21	39				
105	X	6-8-8	16									
110												
115	X	16-23-25	48			Dense dark grey green silty fine SAND with phosphate nodules [SM]						
120	X	17-21-23	44			BORING TERMINATED AT 120.0 FT.						
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.7

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-07** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER

LOCATION: SEE BORING LOCATION PLAN

REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED, HAND AUGERED TO 4 FT.

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 6
DATE OF READING: 7/3/18
EST. SHGWT (ft): 4

DATE STARTED: 7/3/18
DATE FINISHED: 12/28/18
DRILLED BY: ORL - DW/AI
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						2.5" ASPHALT, 5" LIMEROCK BASE						
						Dark red brown fine SAND with silt [SP-SM]						
5		11-10-11	21	▽		-- medium dense, red brown	8	24				
		11-11-12	23	▼								
		5-4-6	10			-- loose, brown						
10		4-4-4	8			-- dark red brown						
15		7-6-8	14			Medium dense light brown silty fine SAND with clay [SM]						
20		6-7-8	15									
25		8-8-9	17									
30		2-2-4	6			Firm blueish green sandy CLAY [CL]	64	33				
35		2-2-3	5			Loose grey silty clayey fine SAND [SC-SM]						
40		0-1-2	3			Soft blueish green CLAY [CH]	91	54	109	71		
45		1-0-1	1			Very loose grey green silty clayey fine SAND [SC-SM]						
50		0-0-0	WOH				18	42				
55		1-0-0	WOH									
60		8-14-22	36			Dense grey green silty fine SAND with shell [SM]						
65		5-8-9	17			-- medium dense						
70		6-8-12	20									
75		5-7-10	17			Medium dense dark grey green silty clayey fine SAND [SC-SM]						

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.8

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-07**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80	X	5-6-10	16				16	37				
85	X	5-5-8	13									
90	X	5-10-9	19			Medium dense grey green silty fine SAND with shell [SM]						
95	X	6-8-14	22									
100	X	14-20-27	47			-- dense	13	23				
105	X	14-15-12	27			-- medium dense						
110	X	2-16-50/5"	66/11"			Very dense grey green silty fine SAND with cemented sand and trace of limestone fragments [SM]						
115	X	50/4"	50/4"			BORING TERMINATED AT 115.0 FT.						
120												
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.8

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-08** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED, HAND AUGERED TO 5.5 FT.

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 7.5
DATE OF READING: 7/3/18
EST. SHGWT (ft): 5.5

DATE STARTED: 7/3/18
DATE FINISHED: 12/28/18
DRILLED BY: ORL - DW/AI
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Dark brown fine SAND with silt [SP-SM]						
						-- dark red brown						
5				▽								
		9-8-9	17	▼		-- medium dense, very dark red brown						
		5-8-15	23			-- light gray brown	9	16				
10		14-15-19	34			-- dense, very dark brown						
						Medium dense light gray brown silty fine SAND [SM]						
15		5-6-6	12									
		5-6-5	11									
20												
		6-5-4	9			-- loose	13	28				
25												
		4-3-4	7				38	33				
30												
		1-2-1	3			-- very loose						
35												
		4-6-9	15			-- medium dense						
40												
		3-4-4	8			-- loose, dark grey green						
45												
						Very loose dark grey green clayey fine SAND [SC]						
50		3-2-2	4				37	53				
55		7-4-3	7			-- loose						
60		1-1-1	2			-- very loose						
65		7-15-9	26			Medium dense grey green silty clayey fine SAND with shell [SC-SM]						
70		12-13-16	29									
75		7-8-12	20				15	41				

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.9

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-08**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80	☒	5-14-20	34			-- dense						
85	☒	13-12-11	23			-- medium dense						
90	☒	9-14-16	30			Medium dense dark grey green silty fine SAND with shell [SM]						
95	☒	16-16-14	30									
100	☒	28-37-29	66			-- very dense						
105	☒	22-29-34	63				14	34				
110	☒	50/5"	50/5"			BORING TERMINATED AT 110.0 FT.						
115												
120												
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.9

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-09** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 9
DATE OF READING: 1/2/2019
EST. SHGWT (ft): 7

DATE STARTED: 1/2/19
DATE FINISHED: 1/3/19
DRILLED BY: ORL - JB/DM/DK
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Brown fine SAND with silt [SP-SM]						
5		6-12-32	44	▽		-- dense, dark grey brown						
		21-25-29	54			-- very dense, dark red brown, with some rock						
10		8-9-11	20	▼		-- medium dense						
15		2-2-1	3			-- very loose, tan grey	6	23				
20		3-4-3	7			-- loose, red brown						
25		3-2-4	6			Loose grey silty fine SAND [SM]						
30		2-2-2	4			-- very loose, grey tan						
35		3-5-7	12			-- medium dense, tan grey						
40		1-2-1	3			-- very loose, light tan grey						
45		1-1-1	2				20	32				
50		1-1-1	2									
55		1-0-2	2			-- light grey green						
60		1-0-0	WOH			Very loose grey silty clayey fine SAND [SC-SM]						
65		0-0-0	WOH			-- dark grey green	14	35				
70		2-1-0	1									
75		1-0-0	1									

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.10

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-09**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80		0-1-1	2									
85		0-1-2	3									
90		1-0-1	1									
95		1-2-3	5			-- loose, grey light green						
100		1-0-1	1			-- very loose, dark grey green	15	31				
105		1-1-1	2									
110		2-2-2	4			Very loose dark grey green silty fine SAND [SM]						
115		0-0-0	WOH									
120		0-0-0	WOH			-- grey	13	24				
125		0-2-2	4									
130		0-0-4	4									
135		21-23-8	31			Dense dark grey geen silty fine SAND with limestone [SM]						
140		50/2.5"	50/2.5"			-- very dense						
145		50/1"	50/1"			BORING TERMINATED AT 145.0 FEET						
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.10

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-10** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 7
DATE OF READING: 1/3/2019
EST. SHGWT (ft): 5

DATE STARTED: 1/3/19
DATE FINISHED: 1/3/19
DRILLED BY: ORL - DW/AI
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Dark red brown fine SAND with silt [SP-SM]						
5				▽		-- brown						
		17-21-32	53	▼		-- very dense						
		22-21-21	42			-- dense						
10		11-17-25	42									
15		4-6-7	13			-- medium dense						
20		5-5-6	11			Medium dense light grey brown silty fine SAND [SM]						
25		6-6-4	10			-- loose	15	25				
30		4-3-4	7									
35		10-12-11	23			Medium dense grey brown fine SAND with silt [SP-SM]						
40		4-5-8	13			Medium dense grey green silty clayey fine SAND [SC-SM]						
45		2-2-3	5			-- loose	45	33				
50		2-2-3	5									
55		1-1-1	2			Very loose grey green silty fine SAND [SM]						
60		1-2-2	4									
65		2-2-2	4				13	41				
70		3-3-4	7			Loose grey green silty clayey fine SAND [SC-SM]						
75		3-3-3	6									

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.11

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-10**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80	☒	2-3-3	6				16	39				
85	☒	4-6-8	14			-- medium dense						
90	☒	1-3-3	6			-- loose						
95	☒	6-10-11	21			Medium dense grey green silty fine SAND with phosphate nodules [SM]						
100	☒	5-8-14	22			-- grey brown	14	25				
105	☒	9-8-5	13									
110	☒	6-10-12	22									
115	☒	50/0"	50/0"			Very dense grey geen silty fine SAND with limestone fragments [SM]						
						BORING TERMINATED AT 115.0 FEET						
120												
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.11

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-11** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 9
DATE OF READING: 12/12/2018
EST. SHGWT (ft): 7

DATE STARTED: 12/12/18
DATE FINISHED: 12/13/18
DRILLED BY: ORL - JB/DW/DM
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Brown fine SAND with silt [SP-SM]						
5						-- dark brown, with roots						
		5-8-11	19	▽		-- medium dense						
		12-14-12	26									
		3-2-2	4	▼		-- very loose, brown						
10												
15		3-2-2	4			Very loose light grey brown silty fine SAND [SM]						
20		2-0-1	1				21	23				
25		3-4-4	8			-- loose						
30		2-2-2	4			Soft dark grey green sandy CLAY [CH]						
35		1-2-2	4			-- grey green	67	33	63	42		
40		2-2-1	3			Very loose grey green silty fine SAND [SM]						
45		0-1-0	1			-- grey						
50		0-0-0	WOH			Very loose grey clayey fine SAND with shell [SC]	16	47				
55		4-6-9	15			-- medium dense, green						
60		6-8-15	23			Medium dense green silty fine SAND [SM]						
65		6-7-12	19			-- dark green						
70		5-8-12	20									
75		6-7-13	20									

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.12

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-11**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80	☒	4-7-10	17			-- green	17	31				
85	☒	6-7-13	20									
90	☒	12-17-20	37			-- dense						
95	☒	50/5"	50/5"			-- very dense, dark green						
100	☒	50/5"	50/5"									
105	☒	19-45-50/5"	50/5"			Very dense dark grey green silty fine SAND with limestone fragments [SM]	22	33				
110	☒	15-23-37	60									
115	☒	12-23-42	63			BORING TERMINATED AT 115.0 FEET						
120												
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.12

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-12** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 9
DATE OF READING: 12/17/2018
EST. SHGWT (ft): 7

DATE STARTED: 12/17/18
DATE FINISHED: 12/18/18
DRILLED BY: ORL - JB/DM/DK/AI
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Dark brown fine SAND with silt & rock [SP-SM]						
5		3-7-10	17	▽		-- medium dense, dark grey brown						
		7-19-21	40			-- dense, brown						
10		18-16-14	30	▼		-- medium dense						
15		3-6-5	11			Medium dense tan silty fine SAND [SM]						
20		4-5-4	9			-- loose, light grey tan	20	24				
25		3-3-2	5									
30		5-4-7	11			-- medium dense, grey						
35		1-2-3	5			Firm grey green CLAY [CH]	98	59	131	91		
40		1-2-2	4			-- soft						
45		1-1-2	3			Very loose grey silty fine SAND [SM]						
50		0-1-1	2			-- grey brown						
55		0-1-0	1			Very loose grey brown silty clayey fine SAND [SC-SM]						
60		0-0-0	WOH			-- grey green brown						
65		1-0-1	1			-- green grey						
70		0-1-1	2									
75		0-0-0	WOH				13	38				

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.13

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-12**
SECTION: TOWNSHIP: RANGE:

SHEET: **2 of 2**

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
80	X	1-2-3	5			-- loose						
85	X	0-0-1	1			-- very loose						
90	X	0-3-10	13			Medium dense grey green silty fine SAND with shell [SM]						
95	X	8-15-11	26									
100	X	11-25-50/2"	50/2"			-- very dense						
105	X	24-41-46	87									
110	X	12-23-41	64				20	33				
115	X	13-50/6"	50/6"									
120	X	50/2"	50/2"			BORING TERMINATED AT 120.0 FEET						
125												
130												
135												
140												
145												
150												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.13

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-13** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 8
DATE OF READING: 12/11/2018
EST. SHGWT (ft): 6

DATE STARTED: 12/11/18
DATE FINISHED: 12/11/18
DRILLED BY: ORL - JB/DW/DM
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Brown fine SAND with silt [SP-SM]						
5				▽		-- very loose, grey brown						
		1-1-1	2	▼		Very loose grey brown silty fine SAND [SM]						
		2-1-2	3									
10		2-1-2	3			Very loose very dark grey brown fine SAND with silt [PS-SM]						
15		1-1-2	3				7	22				
20		4-5-6	11			-- medium dense						
25		4-3-4	7			-- loose						
30		2-3-3	6			Firm very light grey green CLAY [CH]						
35		1-2-2	4			-- soft						
40		1-1-1	2			Very loose grey green silty clayey fine SAND [SC-SM]						
45		0-0-1	1									
50		WOH	0			-- brown	15	39				
55		0-0-1	1			-- dark grey green						
60		2-2-2	4			BORING TERMINATED AT 60.0 FEET						
65												
70												
75												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.14

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-14** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 9
DATE OF READING: 12/19/2018
EST. SHGWT (ft): 7

DATE STARTED: 12/19/18
DATE FINISHED: 12/19/18
DRILLED BY: ORL - JB/AI/DK
TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						Dark grey brown fine SAND with silt [SP-SM]						
5		4-9-12	21	▽		-- medium dense, mix brown						
		10-10-19	29									
10		10-10-12	22	▼		-- brown						
15		7-13-11	24			Medium dense light brown silty fine SAND [SM]						
20		3-2-2	4			-- very loose						
25		3-4-5	9			-- loose						
30		2-2-2	4			-- very loose	26	29				
35		2-3-5	8			-- loose, light grey tan						
40		1-0-0	WOH			Very loose green silty clayey fine SAND [SC-SM]						
45		0-0-0	WOH			-- with shell	27	37				
50		1-2-2	4			Very loose green silty fine SAND with shell [SM]						
55						BORING TERMINATED AT 50.0 FEET						
60												
65												
70												
75												

W-10262.GPJ

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0130.1800259.0000
REPORT NO.:	
PAGE:	B-2.15

PROJECT: GOETECHNICAL EXPLORATION
OCCC NORTH / SOUTH BUILDING IMPROVEMENTS
ORLANDO, ORANGE COUNTY, FLORIDA

BORING I.D.: **B-15** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: ORANGE COUNTY CONVENTION CENTER
LOCATION: SEE BORING LOCATION PLAN
REMARKS: SHGWT = SEASONAL HIGH GROUNDWATER TABLE, N.S. = NOT SURVEYED

G.S. ELEVATION (ft): N.S.
WATER TABLE (ft): 7
DATE OF READING: 12/21/2018
EST. SHGWT (ft): 5

DATE STARTED: 12/21/18
DATE FINISHED: 12/21/18
DRILLED BY: ORL - DW/AI
TYPE OF SAMPLING: ASTM D 1586

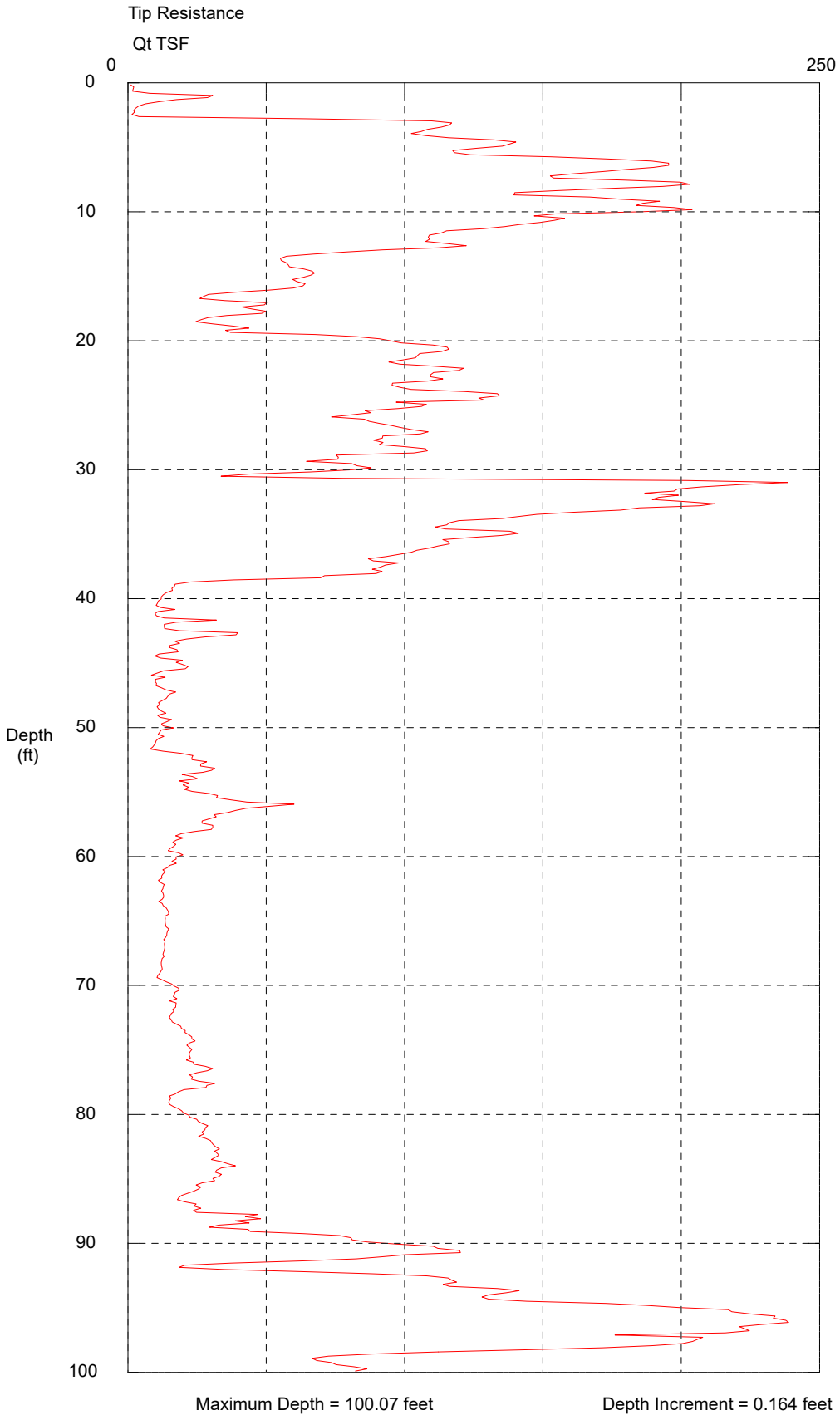
DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N BLOWS / FT	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG. CONT. (%)
0						4" LIMEROCK BASE						
						Grey brown fine SAND with silt [SP-SM]						
5				▽								
		7-8-6	14	▼		-- medium dense						
		5-8-13	21									
		20-21-23	44			-- dense, dark brown						
10												
15		6-7-10	17			-- medium dense, brown						
20		4-4-4	8			Loose light brown silty fine SAND [SM]						
		2-2-3	5			-- light grey brown	21	25				
25												
30		7-5-5	10									
35		3-1-2	3			-- very loose						
40		2-1-4	5			-- loose, grey green						
45		1-0-1	1			Very soft grey green CLAY with sand [CL]						
							85	76				
50		2-2-2	4			-- soft						
						BORING TERMINATED AT 50.0 FEET						
55												
60												
65												
70												
75												

W-10262.GPJ

OCCC North-South Building

Operator: Kyle R.
Sounding: CPT-1
Cone Used: DDG1345
GPS Data: NO GPS

CPT Date/Time: 1/5/2019 1:37:20 PM
Location: Orange County
Job Number: 0130.1800259.0000



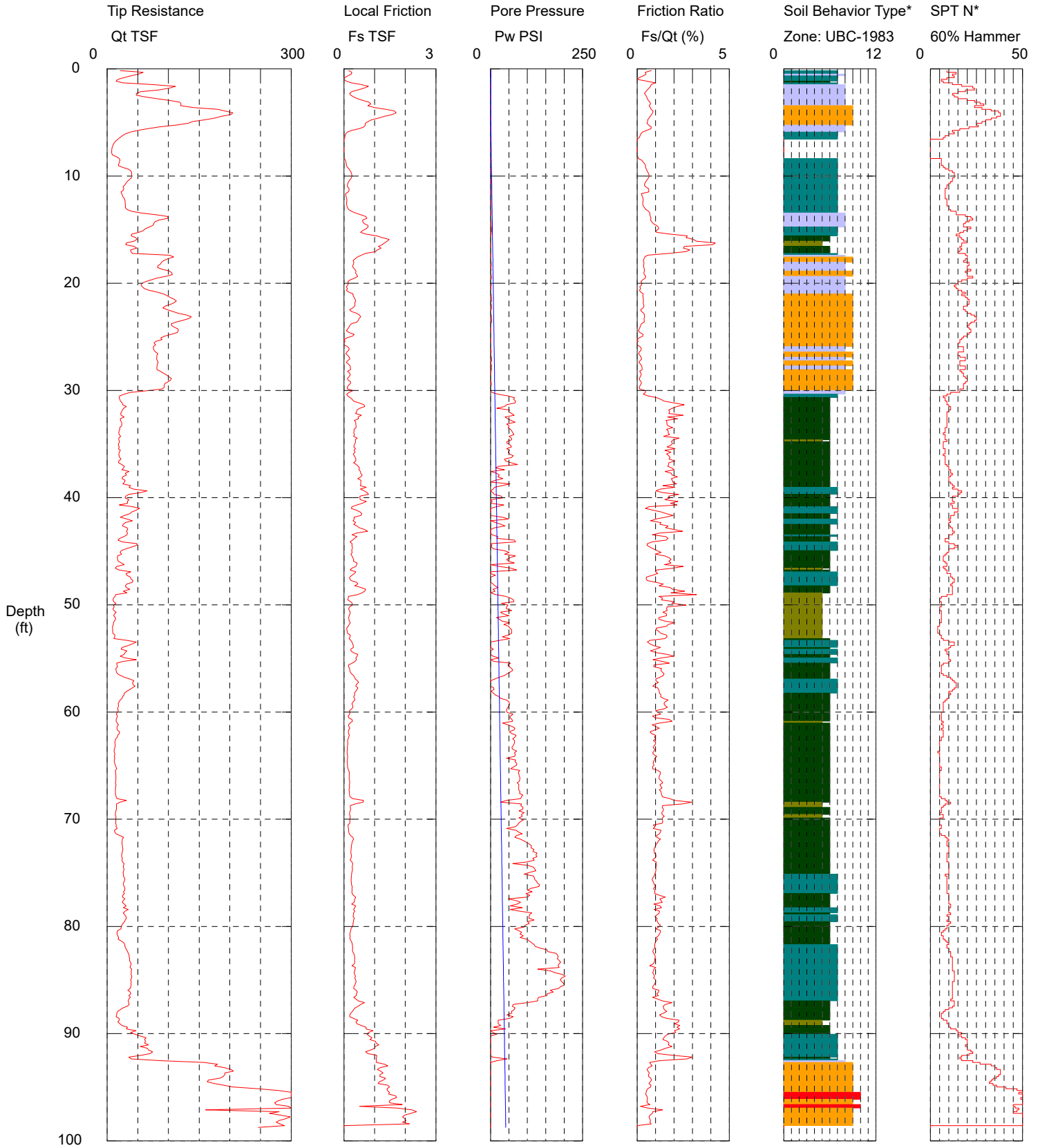
Maximum Depth = 100.07 feet

Depth Increment = 0.164 feet

OCCC North-South Building

Operator: Kyle R.
Sounding: CPT-2
Cone Used: DDG1345
GPS Data: NO GPS

CPT Date/Time: 1/5/2019 11:05:31 AM
Location: Orange County
Job Number: 0130.1800259.0000



Maximum Depth = 98.75 feet

Depth Increment = 0.164 feet

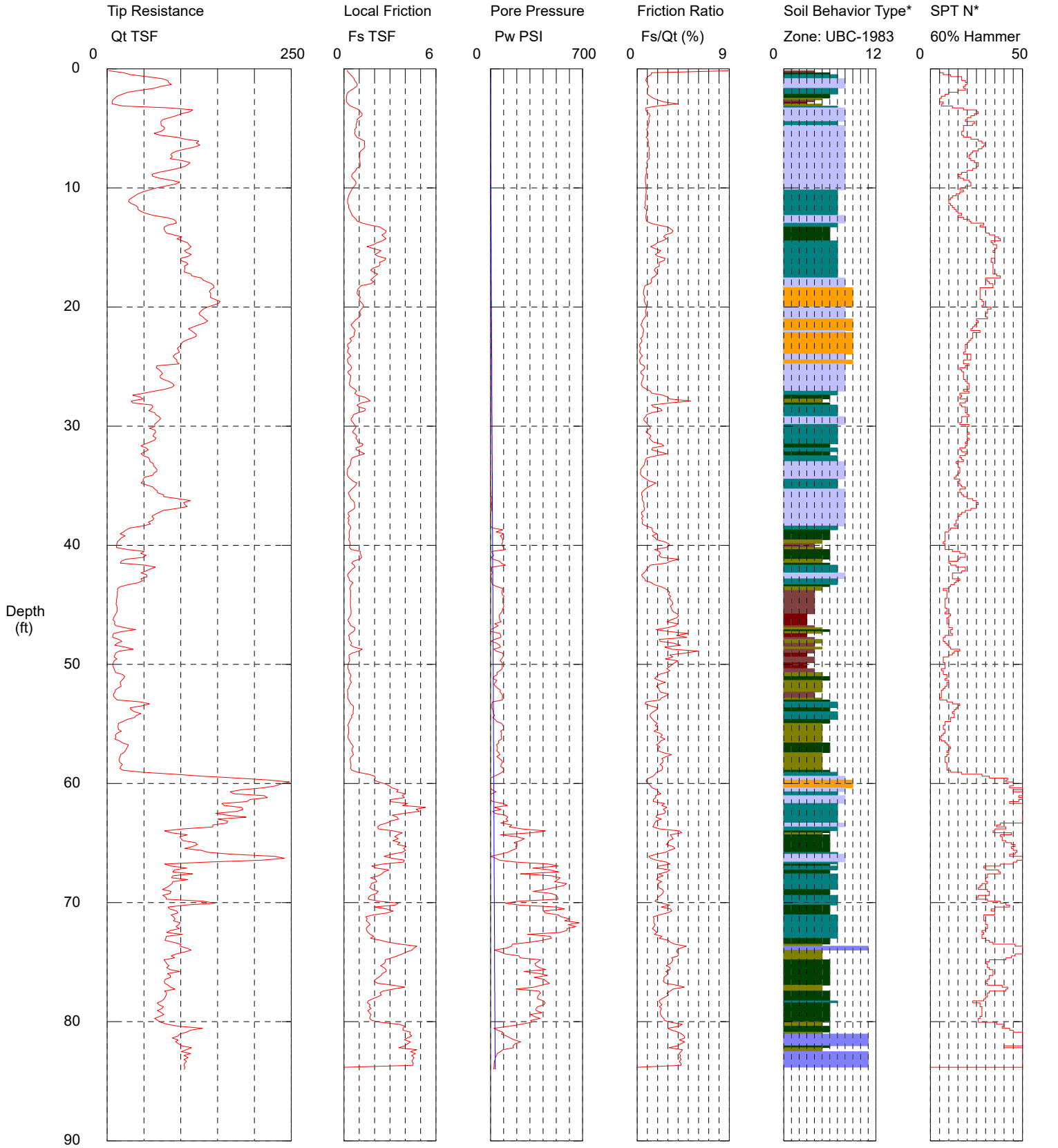
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

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

OCCC North-South Building

Operator: Kyle Reeves
Sounding: CPT-3
Cone Used: DDG1345
GPS Data: NO GPS

CPT Date/Time: 1/5/2019 9:14:28 AM
Location: Orange County
Job Number: 0130.1800259.0000



Maximum Depth = 83.99 feet

Depth Increment = 0.164 feet

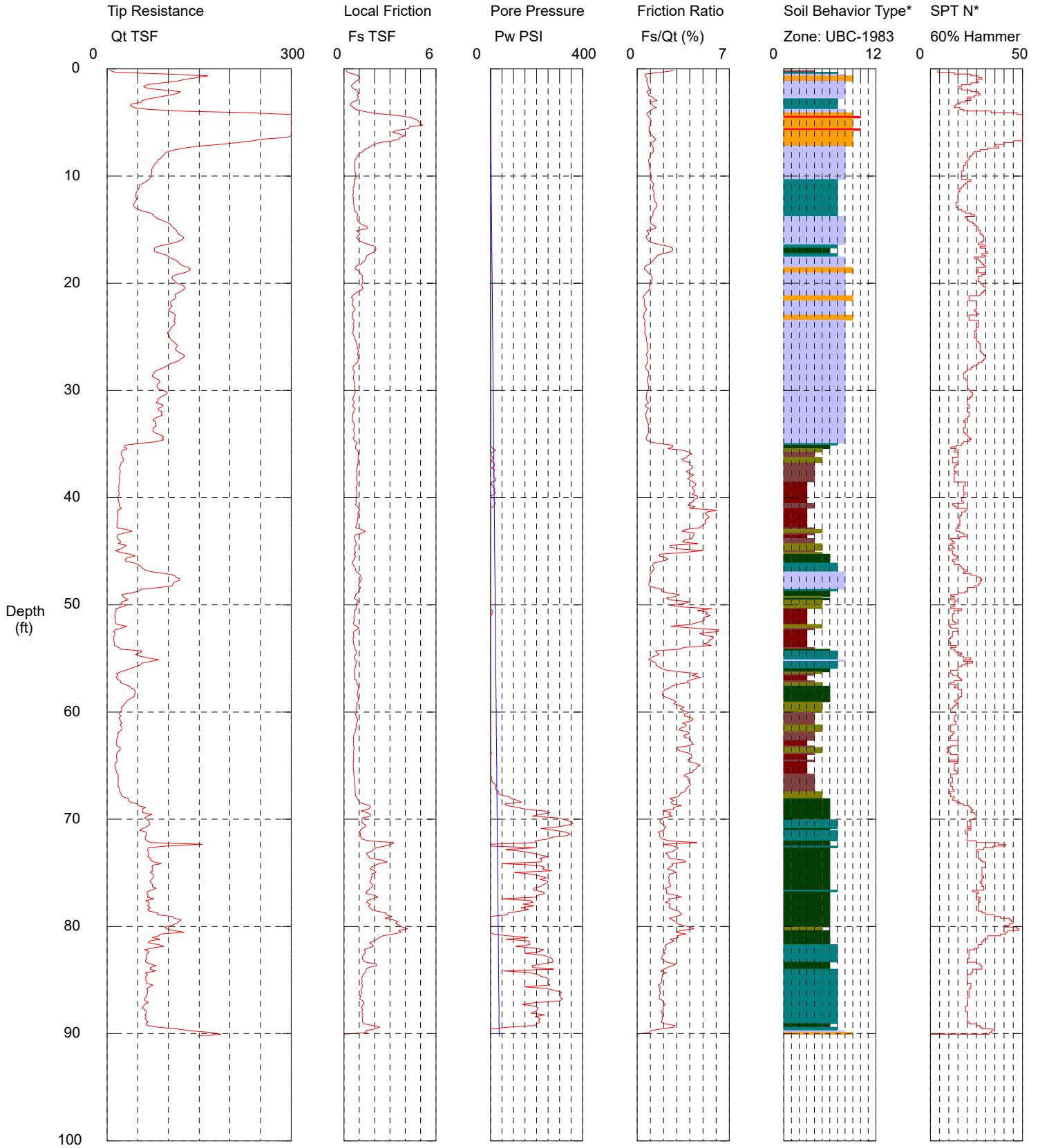
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

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

OCCC North-South Building

Operator: Kyle R.
Sounding: CPT-4
Cone Used: DDG1345
GPS Data: NO GPS

CPT Date/Time: 1/5/2019 3:43:34 PM
Location: Orange County
Job Number: 0130.1800259.0000



Maximum Depth = 90.22 feet

Depth Increment = 0.164 feet

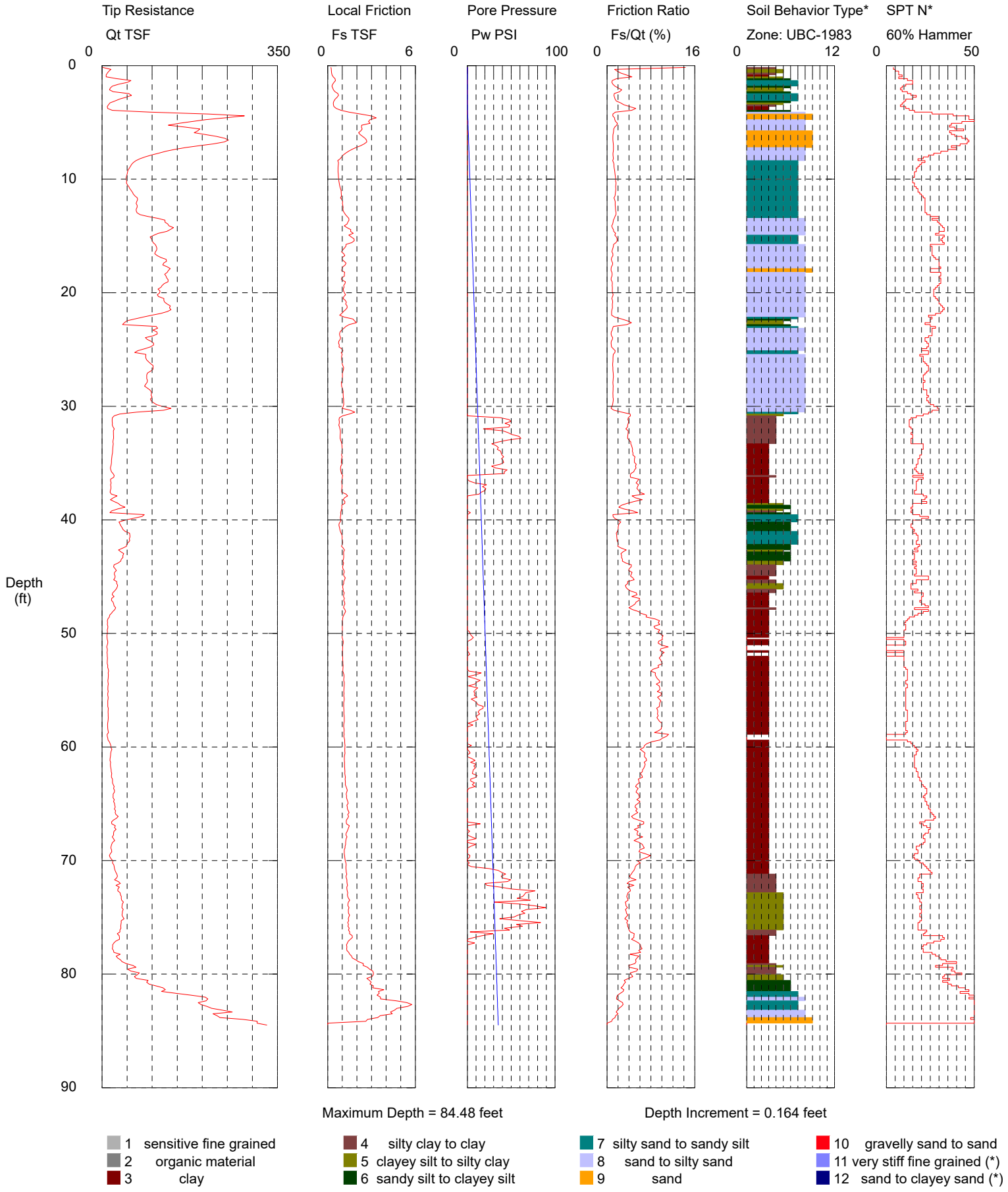
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

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

OCCC North-South Building

Operator: Kyle R.
Sounding: CPT-5
Cone Used: DDG1345
GPS Data: NO GPS

CPT Date/Time: 1/8/2019 3:17:17 PM
Location: Orange County
Job Number: 0130.1800259.0000



Maximum Depth = 84.48 feet

Depth Increment = 0.164 feet

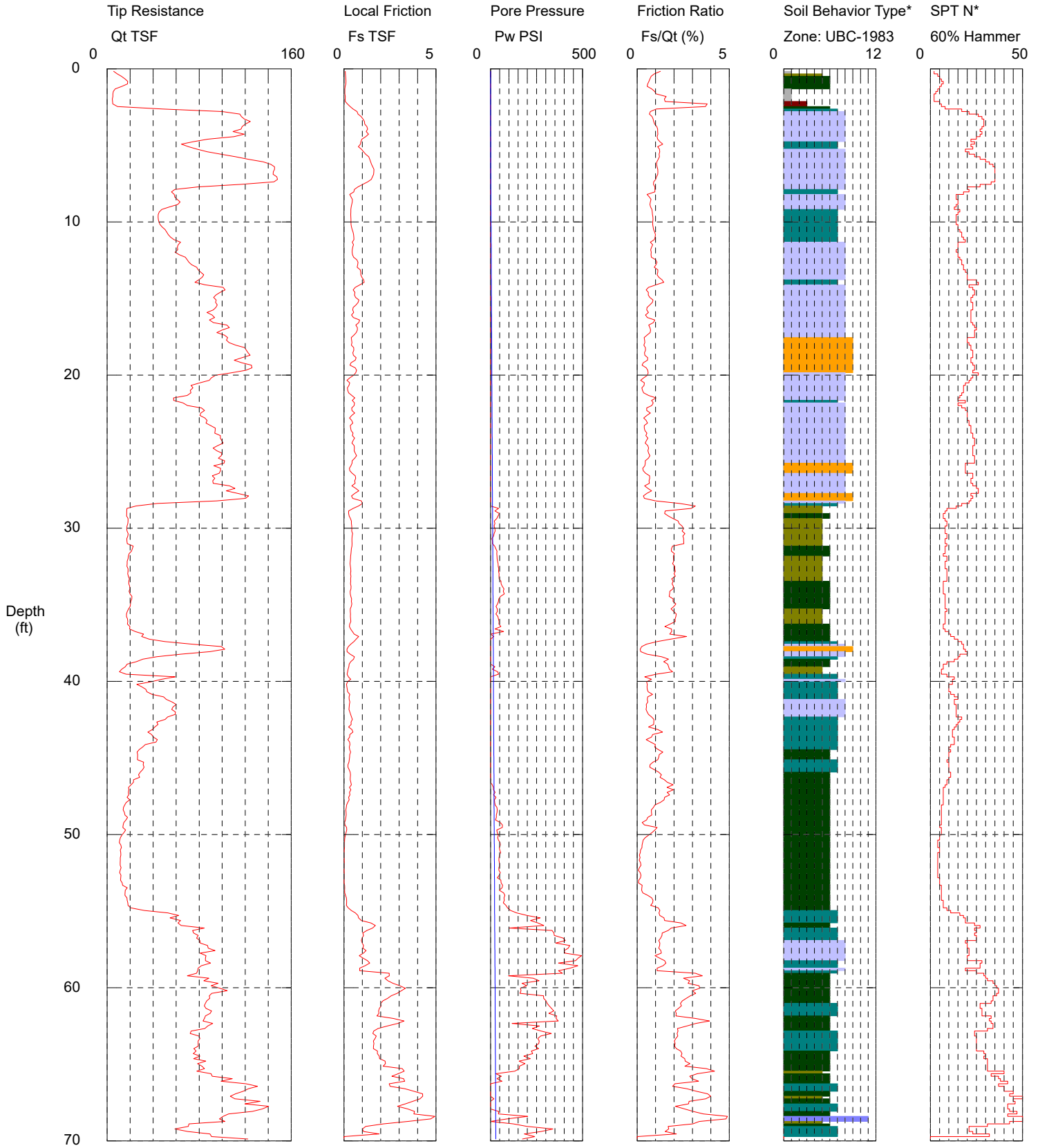
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

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

OCCC North-South Building

Operator: Kyle R.
Sounding: CPT-6
Cone Used: DDG1345
GPS Data: NO GPS

CPT Date/Time: 1/8/2019 1:21:20 PM
Location: Orange County
Job Number: 0130.1800259.0000



Maximum Depth = 69.88 feet

Depth Increment = 0.164 feet

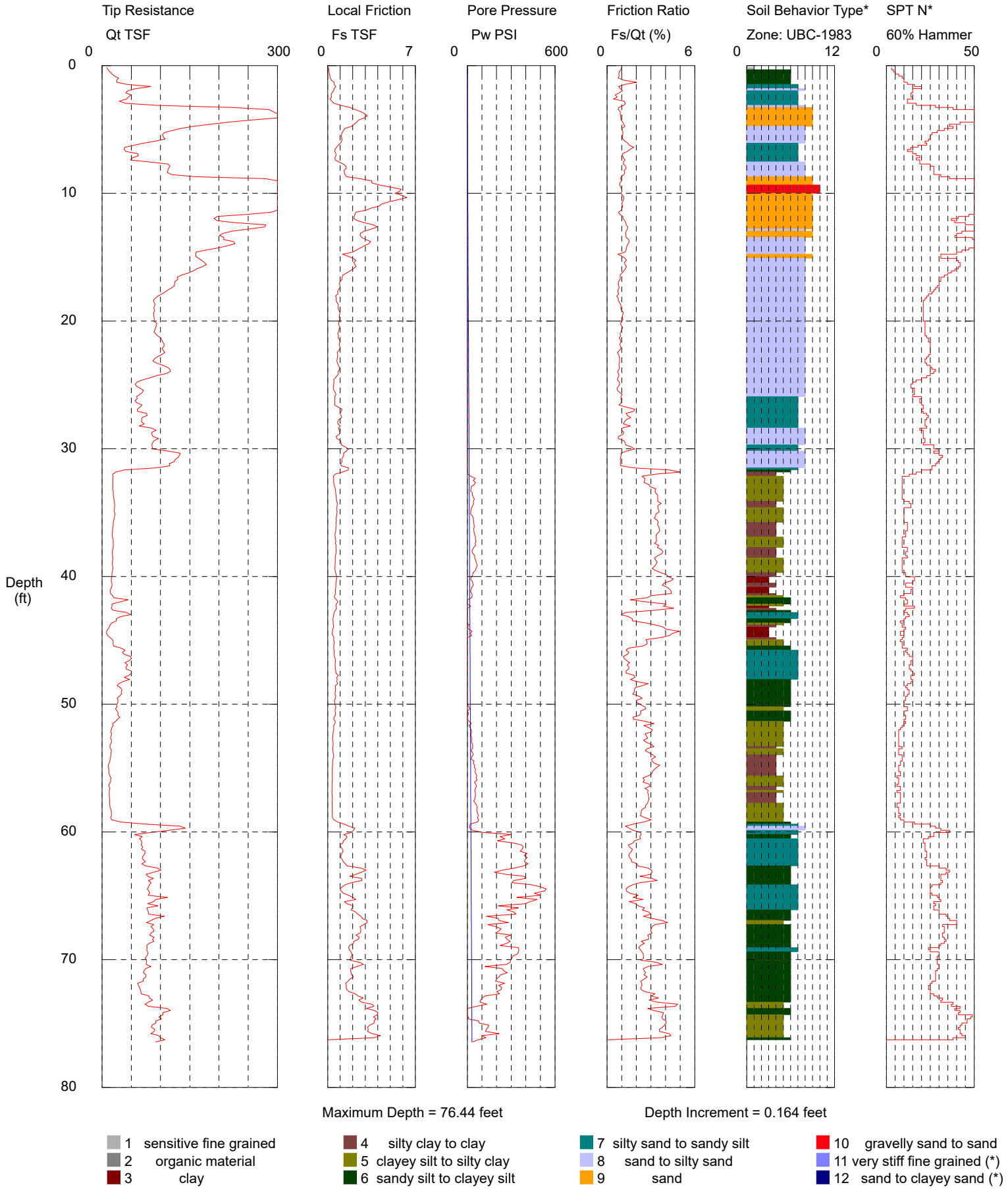
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

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

OCCC North-South Building

Operator: Kyle R.
Sounding: CPT-7
Cone Used: DDG1345
GPS Data: NO GPS

CPT Date/Time: 1/8/2019 10:44:20 AM
Location: Orange County
Job Number: 0130.1800259.0000



Maximum Depth = 76.44 feet

Depth Increment = 0.164 feet

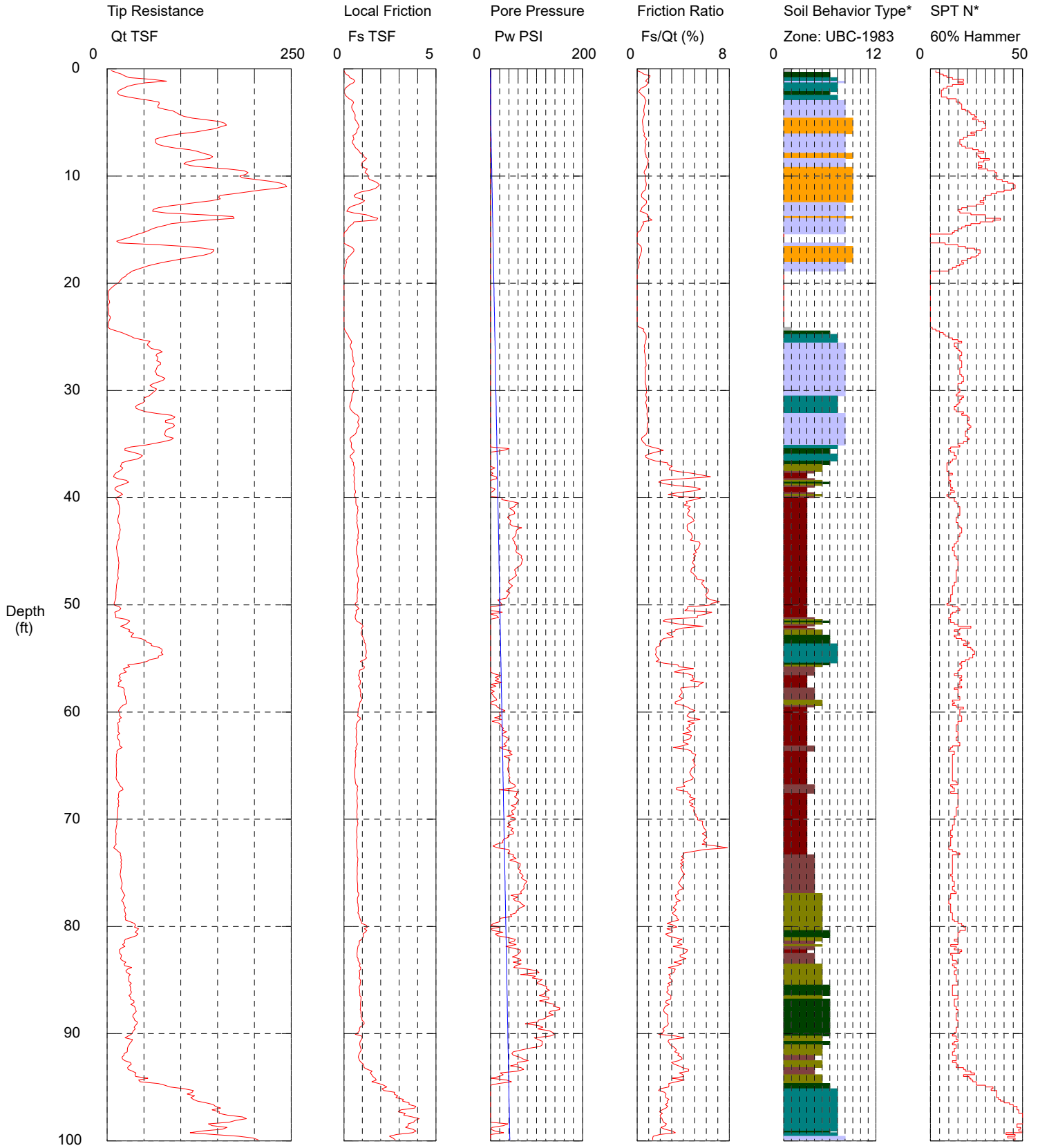
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

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

OCCC North-South Building

Operator: Kyle R.
Sounding: CPT-8
Cone Used: DDG1345
GPS Data: NO GPS

CPT Date/Time: 1/8/2019 9:00:48 AM
Location: Orange County
Job Number: 0130.1800259.0000



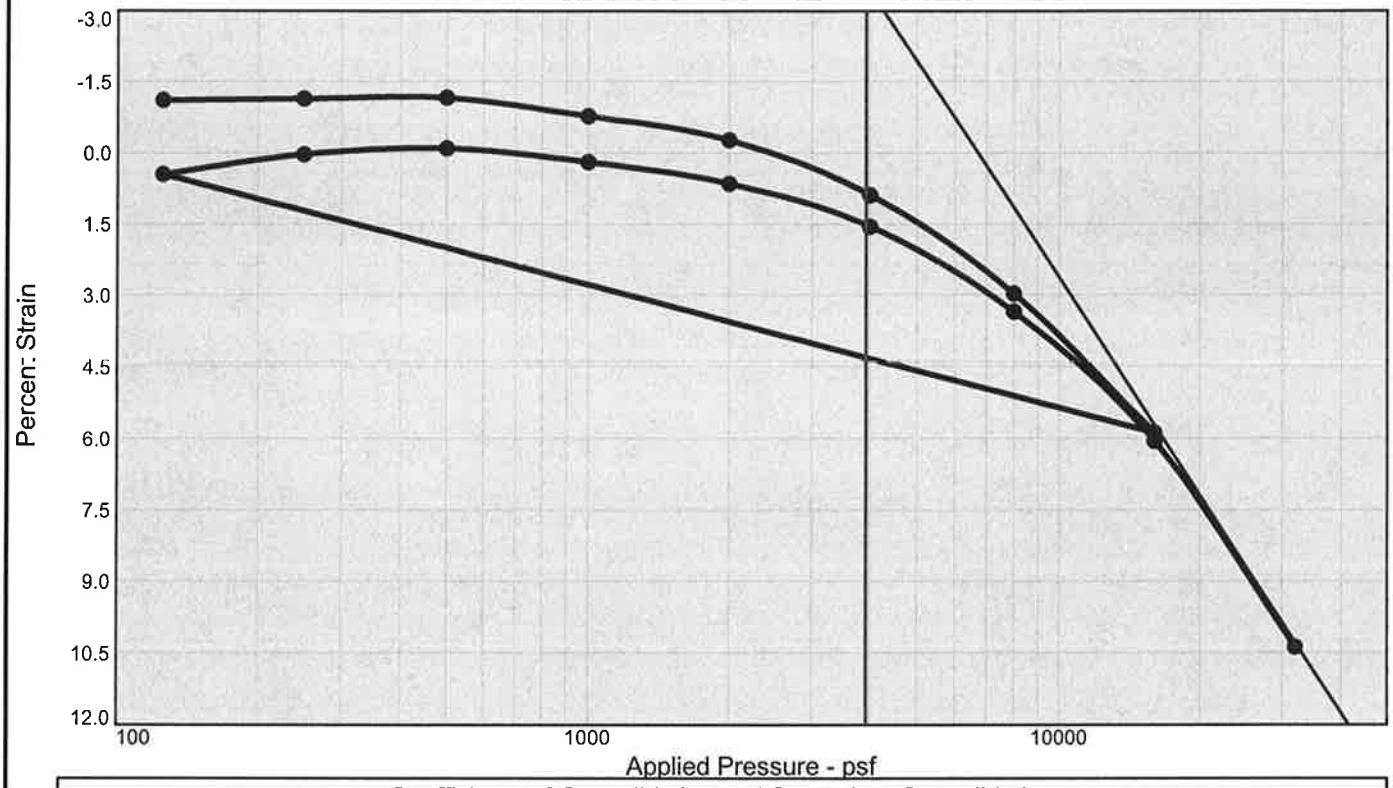
Maximum Depth = 100.23 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

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

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation

No.	Load (psf)	C_v (ft.2/day)	C_α	No.	Load (psf)	C_v (ft.2/day)	C_α	No.	Load (psf)	C_v (ft.2/day)	C_α
1	125	4.422		9	125	5.866					
3	500	0.839		12	1000	0.084					
4	1000	0.061		13	2000	0.619					
5	2000	1.492		14	4000	1.502					
6	4000	6.643		15	8000	0.834					
7	8000	1.014		17	32000	15.547					
8	16000	15.727									

MATERIAL DESCRIPTION	USCS	AASHTO
Gray Clay	CH	A-7

LL	PI	Sp. Gr.	Overburden (psf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (psf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
131	91	2.75	4300	78.2		38.4 %	41.1 %	78.4 %	100.0 %	1.348	1.105	8813	0.36

Preparation Process:	D2435 Method	C_r	Swell Press. (psf)	%
Condition of Test:		0.15		

Project No. **Client:**

Project:

Location: B-12 **Depth:** 41 **Sample Number:** 1

Universal Engineering Sciences

Orlando, Florida

Remarks:

Checked By: AW

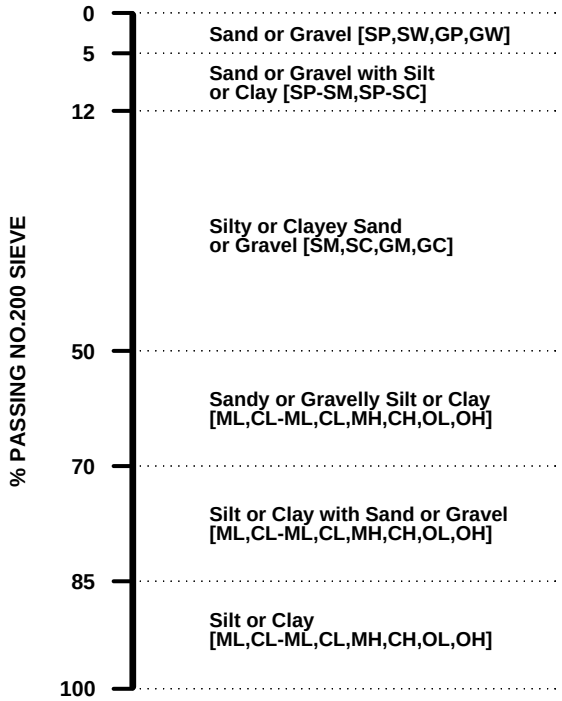
Title:

Figure

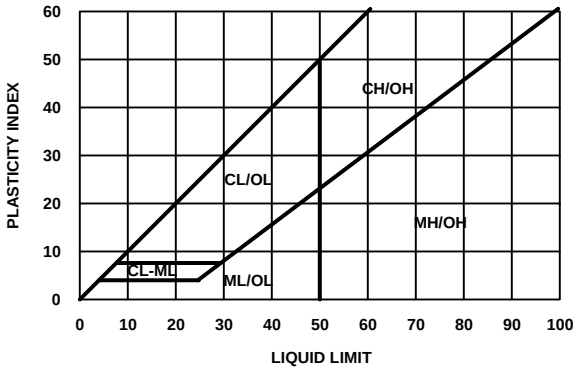
Tested By: RC

KEY TO BORING LOGS

SOIL CLASSIFICATION CHART*



UNIVERSAL ENGINEERING SCIENCES, INC.



PLASTICITY CHART

GROUP NAME AND SYMBOL

COARSE GRAINED SOILS

- POORLY-GRADED SANDS [SP]
- POORLY-GRADED SANDS WITH SILT [SP-SM]
- POORLY-GRADED SANDS WITH CLAY [SP-SC]
- SILTY SANDS [SM]
- CLAYEY SANDS [SC]
- SILTY CLAYEY SANDS [SC-SM]
- WELL-GRADED GRAVELS [GW]
- POORLY-GRADED GRAVELS [GP]
- POORLY-GRADED GRAVELS WITH SILT [GP-GM]
- POORLY-GRADED GRAVELS WITH CLAY [GP-GC]
- SILTY GRAVELS [GM]
- CLAYEY GRAVELS [GC]

FINE GRAINED SOILS

- INORGANIC SILTS SLIGHT PLASTICITY [ML]
- INORGANIC SILTY CLAY LOW PLASTICITY [CL-ML]
- INORGANIC CLAYS LOW TO MEDIUM PLASTICITY [CL]
- INORGANIC SILTS HIGH PLASTICITY [MH]
- INORGANIC CLAYS HIGH PLASTICITY [CH]

HIGHLY ORGANIC SOILS

- ORGANIC SILTS/CLAYS LOW PLASTICITY [OL]**
- ORGANIC SILTS/CLAYS MEDIUM TO HIGH PLASTICITY [OH]**
- PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS [PT]**

* IN ACCORDANCE WITH ASTM D 2487 - UNIFIED SOIL CLASSIFICATION SYSTEM.

** LOCALLY MAY BE KNOWN AS MUCK.

RELATIVE DENSITY

(SAND AND GRAVEL)

VERY LOOSE - 0 to 4 Blows/ft.
LOOSE - 5 to 10 Blows/ft.
MEDIUM DENSE - 11 to 30 Blows/ft.
DENSE - 31 to 50 Blows/ft.
VERY DENSE - more than 50 Blows/ft.

CONSISTENCY

(SILT AND CLAY)

VERY SOFT - 0 to 2 Blows/ft.
SOFT - 3 to 4 Blows/ft.
FIRM - 5 to 8 Blows/ft.
STIFF - 9 to 16 Blows/ft.
VERY STIFF - 17 to 30 Blows/ft.
HARD - more than 30 Blows/ft.

MISCELLANEOUS SYMBOLS

▼	ENCOUNTERED WATER TABLE
▽	ESTIMATED SEASONAL HIGH WATER TABLE
-200	PERCENT PASSING NO. 200 SIEVE
MC	MOISTURE CONTENT, %
WOR	SPOON ADVANCES DUE TO WEIGHT OF RODS AND/OR HAMMER

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

APPENDIX C

UNIVERSAL
ENGINEERING SCIENCES

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

CONSTRAINTS & RESTRICTIONS

The intent of this document is to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.

WARRANTY

Universal Engineering Sciences has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

UNANTICIPATED SOIL CONDITIONS

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Universal Engineering Sciences, as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and Universal Engineering Sciences of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of Universal Engineering Sciences to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

MISINTERPRETATION OF SOIL ENGINEERING REPORT

Universal Engineering Sciences is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data presented are made by others, those conclusions or recommendations are not the responsibility of Universal Engineering Sciences.

CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by Universal Engineering Sciences.

USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations.

Bidders are urged to make their own soil borings, test pits, test caissons or other investigations to determine those conditions that may affect construction operations. Universal Engineering Sciences cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicate normally occurring conditions. Water levels may not have been stabilized at the last reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions of variations.

LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for Universal Engineering Sciences to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by Universal Engineering Sciences to locate any such buried objects. Universal Engineering Sciences cannot be responsible for any buried man-made objects which are subsequently encountered during construction that are not discussed within the text of this report.

TIME

This report reflects the soil conditions at the time of exploration. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.

UNIVERSAL
ENGINEERING SCIENCES