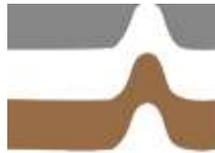


**Preliminary Subsurface Soil Exploration and
Geotechnical Engineering Evaluation
Proposed Single Family Residence
7 First Court
Windermere, Orange County, Florida**



Ardaman & Associates, Inc.

CORPORATE HEADQUARTERS

8008 S. Orange Avenue, Orlando, FL 32809 - Phone: (407) 855-3860 Fax: (407) 859-8121

Branch Office Locations

Florida: Bartow, Cocoa, Fort Myers, Miami, Orlando, Port St. Lucie, Sarasota, Tallahassee, Tampa, West Palm Beach
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MEMBERS:

ASTM International
American Concrete Institute
Geoprofessional Business Association
Society of American Military Engineers
American Council of Engineering Companies



Mr. Don Shaver
3530 Homestead Road
Park City, Utah 84098

Subject: Preliminary Subsurface Soil Exploration and
Geotechnical Engineering Evaluation
Proposed Single Family Residence
7 First Court
Windermere, Orange County, Florida

Dear Mr. Shaver:

As requested and authorized, we have completed a preliminary shallow subsurface soil exploration for the subject project. The purposes of performing this exploration were to evaluate soil stratigraphy and groundwater levels at selected locations within the subject property and to preliminarily evaluate the compatibility of the conditions encountered as they relate to the proposed residence. This report documents our findings.

SITE LOCATION AND SITE DESCRIPTION

The site for the proposed residence is located at 7 First Court in Windermere, Orange County, Florida (Section 8, Township 23 South, Range 28 East). The general site location is shown superimposed on the Winter Garden and Windermere, Florida U.S.G.S. quadrangle maps presented on Figure 1.

The site is currently gently sloping land with an existing residence along Wauseon Bay in the Butler Chain of Lakes. We understand that the existing home will be razed and replaced with the proposed residence.

FIELD EXPLORATION PROGRAM

SPT and Hand Auger Borings

The field exploration program included performing 5 Standard Penetration Test (SPT) borings and 1 hand auger boring. The SPT borings were advanced to a depth of 20 feet below the ground surface using the methodology outlined in ASTM D-1586. A summary of this field procedure is included in the Appendix. Split-spoon soil samples recovered during performance of the borings were visually classified in the field and representative portions of the samples were transported to our laboratory in sealed sample jars.

The hand auger boring was conducted using a 3-inch diameter manual bucket auger to a depth of 5 feet below the existing ground surface. A summary of the hand auger boring procedure is

included in the Appendix. Representative soil samples were recovered from the auger borings and transported to our laboratory for further analysis.

The groundwater level at each of the boring locations was measured during drilling. The borings were backfilled with soil cuttings upon completion.

Test Locations

The approximate locations of the borings are schematically illustrated on an aerial photograph shown on Figure 2. These locations were determined in the field by estimating distances from existing site features and should be considered accurate only to the degree implied by the method of locating used.

LABORATORY PROGRAM

Representative soil samples obtained during our field sampling operation were packaged and transferred to our laboratory for further visual examination and classification. The soil samples were visually classified in general accordance with the Unified Soil Classification System (ASTM D-2488). The resulting soil descriptions are shown on the soil boring profiles presented on Figure 3.

GENERAL SUBSURFACE CONDITIONS

General Soil Profile

The results of the field exploration is graphically summarized on the soil boring profiles presented on Figure 3. The stratification of the boring profiles represents our interpretation of the field boring logs and the results of laboratory examinations of the recovered samples. The stratification lines represent the approximate boundary between soil types. The actual transitions may be more gradual than implied.

The results of the borings indicate the following general soil profile:

Depth Below Ground Surface (feet)		Description
From	To	
0	5	Organic topsoil, fine sand (SP), fine sand with silt (SP-SM) and silty fine sand (SM). In addition, organic peat (Pt) was encountered between approximate depths of 4.2 to 4.6 feet in Boring TH-5.
5	20	Loose to medium dense fine sand (SP), fine sand with silt (SP-SM) and clayey fine sand (SC).

The above soil profile is outlined in general terms only. Please refer to Figure 3 for soil profile details.

Groundwater Level

The groundwater level was measured in the boreholes during drilling. As shown on Figure 3, groundwater was encountered at depths that ranged from 2.2 to 2.5 feet below the existing ground surface on the dates indicated. Fluctuation in groundwater levels should be anticipated throughout the year primarily due to seasonal variations in rainfall and other factors that may vary from the time the borings were conducted.

CONCLUSIONS

With typical site preparation procedures, the soils as encountered during this preliminary exploration, with exception of the organic peat (Stratum 6), are compatible with the proposed development of a single family residence. Organic peat was encountered at depths of 4.2 to 4.6 feet below the existing ground surface in Boring TH-5. We note that the Orange County Soil Survey, the results of our soil borings and the existing sea wall at the property indicate that the backyard contains fill soils. The organic peat encountered in Boring TH-5 alludes to the potential for more peat to be contained within the fill soils used on this property. The depth and thickness of the organic peat may be greater at unexplored locations.

The organic peat is not suitable for providing shallow foundation support and would need to be completely removed and replaced with suitable compacted fill prior to construction of the residence. Due to the shallow groundwater, dewatering would be required to perform the excavation and backfilling in the dry. In order to dewater, there will need to be a location to dispose of the water that can be permitted by the regulatory agency. It will likely not be feasible to discharge the water directly into the lake. An alternative to muck removal and replacement is to support structures on a pile foundation that transfers foundation loads to competent soil beneath the peat.

Other than the organic peat removal and replacement with competent backfill (or piling), site preparation is anticipated to include stripping, grubbing, proof-rolling, and compacting existing soil and fill soil.

CLOSURE

The findings submitted herein are based on the data obtained from the soil borings presented on Figure 3. This report does not reflect any variations which may occur adjacent to or between the borings. We recommend additional exploration and analyses in the proposed residence area prior to final design.

This preliminary study is based on a relatively shallow exploration and is not intended to be an evaluation for sinkhole potential. This study does not include an evaluation of the environmental (ecological or hazardous/toxic material related) condition of the site and subsurface.

This report has been prepared for the exclusive use of Mr. Don Shaver in accordance with generally accepted geotechnical engineering practices for the proposed single family residence located at 7 First Court in Windermere, Florida. No other warranty, expressed or implied, is made.

We are pleased to be of assistance to you on this phase of the project. When we may be of further service to you or should you have any questions, please contact us.

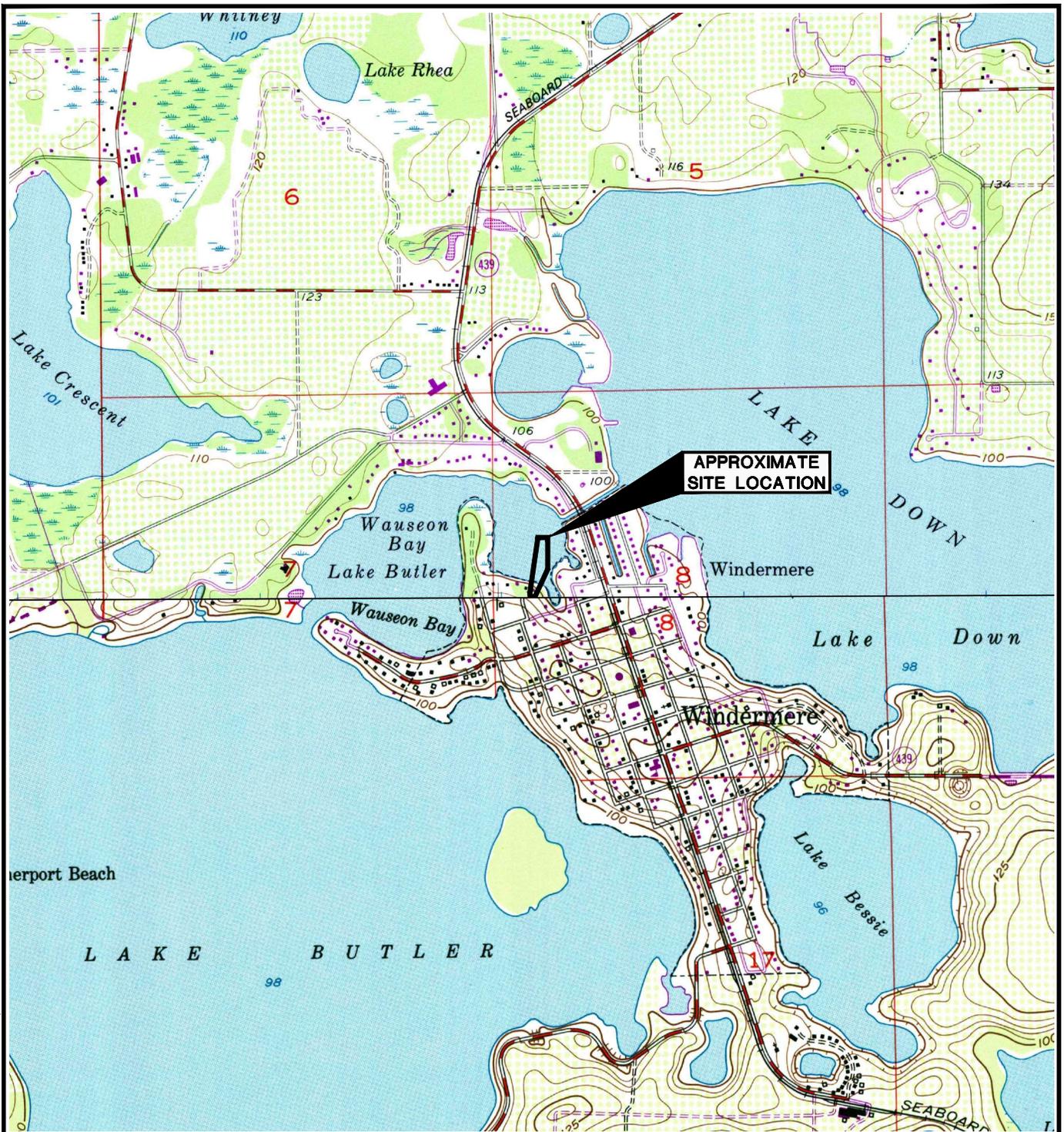
Very truly yours,
ARDAMAN & ASSOCIATES, INC.
Certificate of Authorization No. 5950



Eric C. Balog, E.I.
Assistant Project Engineer

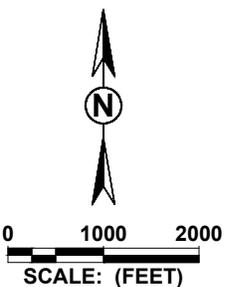


Charles H. Cunningham, P.E.
Orlando Branch Manager



SECTION 8
TOWNSHIP 23 SOUTH
RANGE 28 EAST

OBTAINED FROM U.S.G.S. QUAD MAPS: WINTER GARDEN, FLORIDA 1956
(PHOTOREVISED 1984)
WINDERMERE, FLORIDA 1953
(PHOTOREVISED 1980)



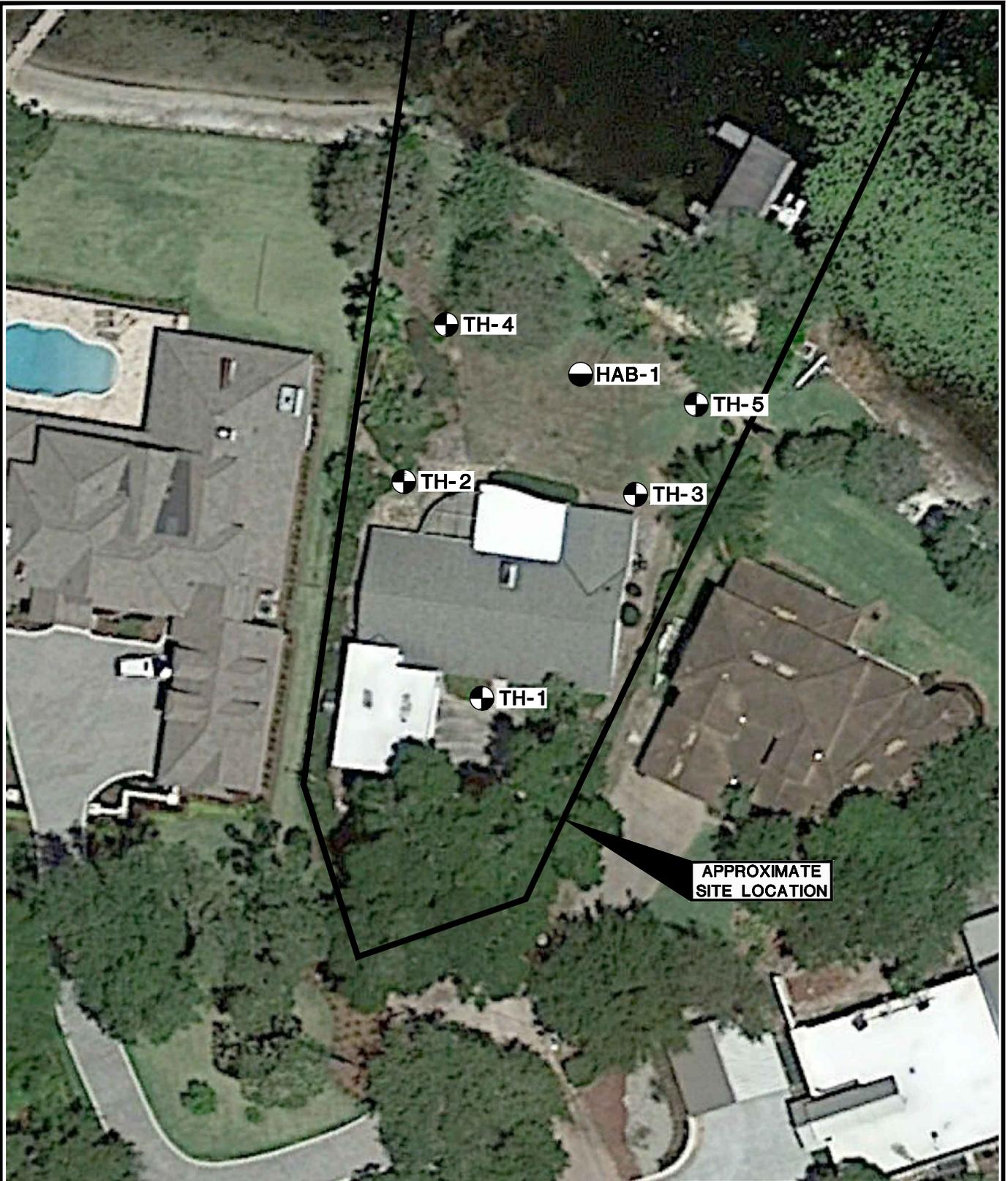
SITE LOCATION MAP

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

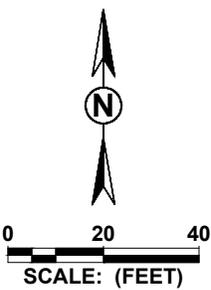
**PRELIMINARY SUBSURFACE
SOIL EXPLORATION
PROPOSED SINGLE FAMILY RESIDENCE
7 FIRST COURT
WINDERMERE, ORANGE COUNTY, FLORIDA**

DRAWN BY: DP	CHECKED BY:	DATE: 06/12/19
FILE NO. 19-6385	APPROVED BY:	FIGURE: 1

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- LEGEND
-  **TH** STANDARD PENETRATION TEST (SPT) BORING LOCATION
 -  **HAB** HAND AUGER BORING LOCATION

NOTE: THE AERIAL PHOTOGRAPH FOR THE BORING LOCATION PLAN WAS OBTAINED FROM GOOGLE EARTH PRO, DATED 12/17/2018.

BORING LOCATION PLAN

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

**PRELIMINARY SUBSURFACE
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DRAWN BY: DP	CHECKED BY:	DATE: 06/12/19	
FILE NO. 19-6385	APPROVED BY:	FIGURE: 2	

LEGEND

SOIL DESCRIPTIONS

- ① FINE SAND (SP)
- ② FINE SAND WITH SILT (SP-SM)
- ③ SILTY FINE SAND (SM)
- ④ CLAYEY FINE SAND (SC)
- ⑤ ORGANIC TOPSOIL
- ⑥ ORGANIC PEAT (Pt)

COLORS

- Ⓐ GRAYISH BROWN
- Ⓑ LIGHT BROWN
- Ⓒ LIGHT GRAY
- Ⓓ DARK BROWN

TH STANDARD PENETRATION TEST (SPT) BORING

HAB HAND AUGER BORING

N STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT

GROUNDWATER LEVEL MEASURED ON DATE DRILLED

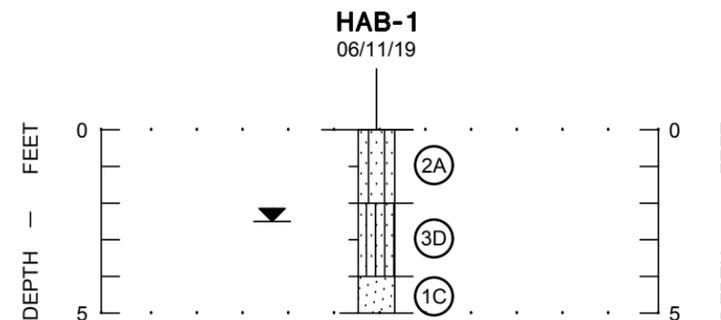
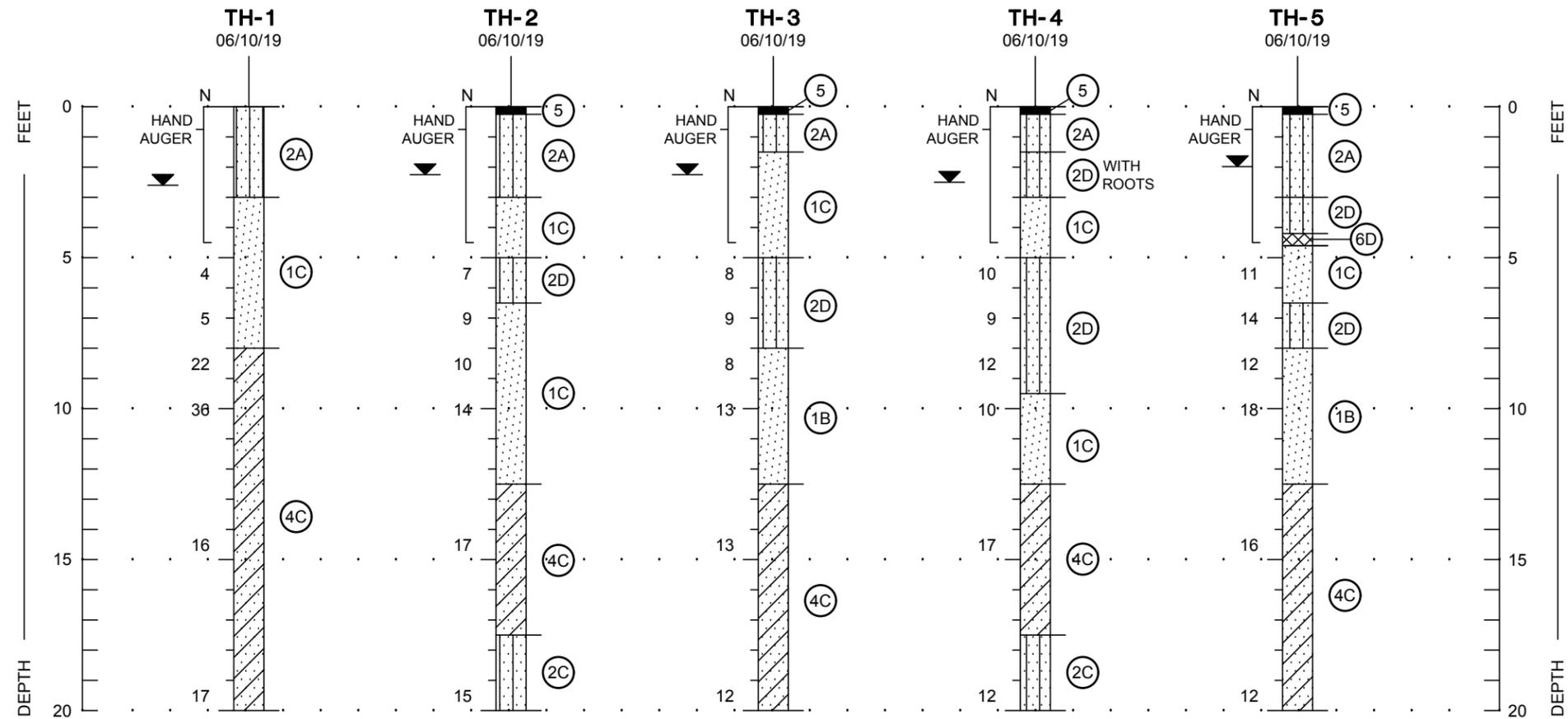
SP, SP-SM UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)
SM, SC, CH

- NOTES: 1. UPON COMPLETION OF EACH BORING, THE BOREHOLE WAS BACKFILLED WITH SOIL CUTTINGS.
2. ALL SPT BORINGS WERE PERFORMED USING A SAFETY HAMMER TO THE BORING TERMINATION DEPTH.

ENGINEERING CLASSIFICATION

I COHESIONLESS SOILS

DESCRIPTION	BLOW COUNT "N"
VERY LOOSE	<4
LOOSE	4 TO 10
MEDIUM DENSE	10 TO 30
DENSE	30 TO 50
VERY DENSE	>50



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WHILE THE BORINGS ARE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THEIR RESPECTIVE LOCATIONS AND FOR THEIR RESPECTIVE VERTICAL REACHES, LOCAL VARIATIONS CHARACTERISTIC OF THE SUBSURFACE MATERIALS OF THE REGION ARE ANTICIPATED AND MAY BE ENCOUNTERED. THE BORING LOGS AND RELATED INFORMATION ARE BASED ON THE DRILLER'S LOGS AND VISUAL EXAMINATION OF SELECTED SAMPLES IN THE LABORATORY. THE DELINEATION BETWEEN SOIL TYPES SHOWN ON THE LOGS IS APPROXIMATE AND THE DESCRIPTION REPRESENTS OUR INTERPRETATION OF SUBSURFACE CONDITIONS AT THE DESIGNATED BORING LOCATIONS ON THE PARTICULAR DATE DRILLED.

GROUNDWATER ELEVATIONS SHOWN ON THE BORING LOGS REPRESENT GROUNDWATER SURFACES ENCOUNTERED ON THE DATES SHOWN. FLUCTUATIONS IN WATER TABLE LEVELS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.

SOIL BORING PROFILES



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DRAWN BY: DP	CHECKED BY:	DATE: 06/12/19	
FILE NO. 19-6385	APPROVED BY:	FIGURE: 3	

APPENDIX

Standard Penetration Test and Hand Auger Boring Procedures

STANDARD PENETRATION TEST

The standard penetration test is a widely accepted test method of *in situ* testing of foundation soils (ASTM D 1586). A 2-foot long, 2-inch O.D. split-barrel sampler attached to the end of a string of drilling rods is driven 18 inches into the ground by successive blows of a 140-pound hammer freely dropping 30 inches. The number of blows needed for each 6 inches of penetration is recorded. The sum of the blows required for penetration of the second and third 6-inch increments of penetration constitutes the test result or N-value. After the test, the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample. The N-value has been empirically correlated with various soil properties allowing a conservative estimate of the behavior of soils under load.

The tests are usually performed at 5-foot intervals. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. The circulating fluid, which is a bentonitic drilling mud, is also used to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, NX-size flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or prevent the loss of circulating fluid.

Representative split-spoon samples from the soils are brought to our laboratory in air-tight jars for further evaluation and testing, if necessary. Samples not used in testing are stored for 30 days prior to being discarded.

HAND AUGER BORINGS

Auger borings are used when continuous sampling of soil strata close to ground surface is desired. A 3-inch diameter, hand-held bucket auger with a cutting head at its end is screwed into the ground in 1-foot sections. The sample is recovered by withdrawing the auger out of the ground without rotating it. The soil sample so obtained, is classified and representative samples put in bags or jars and brought back to the laboratory for classification testing.