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Reference: Geotechnical Exploration Report

Proposed Residential Construction

306 North Excelda Avenue

Tampa, Hillsborough County, Florida

Test Lab Project No.: 24-5425

Dear Mr. and Mrs. Keefe:

Test Lab, Inc. (Test Lab) has completed a geotechnical exploration for the above-referenced project, and we are submitting our findings in this report. We conducted this project in general accordance with our proposal, which was authorized by you through the execution of Test Lab's Proposal Acceptance Sheet (PAS).

This report explains our understanding of the project and provides a description of the site and subsurface conditions encountered and presents our recommendations regarding site preparation and building foundation design.

Test Lab appreciates the opportunity to be of service to you. We look forward to helping you through project completion. Please contact us if you have any questions.

Respectfully submitted,

PETER D. 3 YDEK

Test Lab, Inc.

4112 West Osborne Avenue, Tampa, Florida 33614 Florida Certificate of Authorization No. 1450

Peter J. Zydek

Geotechnical Engineering Intern

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This item has been digitally signed and sealed by Igon (Igor) Kratser, P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Copies Submitted: One (1) Electronic (PDF) Copy – Brandon and Michaela Keefe

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Sheet 1

Test Location Plan & Soil Profile(s)

GEOTECHNICAL EXPLORATION REPORT PROPOSED RESIDENTIAL CONSTRUCTION 306 NORTH EXCELDA AVENUE TAMPA, HILLSBOROUGH COUNTY, FLORIDA TEST LAB PROJECT NO. 24-5425

1.0 EXECUTIVE SUMMARY

The following is a summary of the geotechnical exploration findings and our recommendations. This summary should not be used for planning and design without reading the entire report, which contains more detailed information, and the assumptions made in developing the recommendations.

- Our Standard Penetration Test (SPT) borings generally encountered very loose to medium dense Sand to Sand with Silt (SP/SP-SM), underlain by loose to medium dense Silty Clayey Sand (SM-SC) to the boring completion depths of approximately 20 feet below grade. In boring SPT-1, Silty Clayey Sand was underlain by stiff Sandy Clay (CL) with organics from 13½ to 15 feet below grade.
- 2. Groundwater was encountered in our borings at depths ranging between 4 and 4½ feet below existing grade at the time of our exploration. Based on the Soil Survey of Hillsborough County, Florida, prepared by the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) the subject property is underlain by Myakka-Urban Land Complex and Wabasso-Urban Land Complex, soil types which is reported to have a Seasonal High Ground Water Table (SHGWT) of 0.5-1.5 feet below existing grade.
- Due to the presence of very loose sand in the upper 2 feet in the borings performed, we recommend over-excavation to a depth of 2 feet below existing grade, followed by backfilling with structural fill in maximum 12-inch lifts and compacted to 98% of the modified Proctor maximum dry density.
- 4. The upper 12 inches of soil beneath the foundation and the upper 12 inches of soil beneath the slab area must be compacted to at least 98% of its modified Proctor maximum dry density. Additionally, all structural fill used to raise the finished grade elevation should be placed in loose lifts not exceeding 12 inches in thickness and should be compacted to a minimum density of 98% of the modified Proctor maximum dry density.
- 5. After proper subgrade preparation in accordance with the recommendations provided in this report, the proposed structure can be supported by a conventional shallow foundation (spread footings and continuous wall footings) designed for a maximum soil bearing pressure of 2,000 psf. Based on the presumed loading and the site preparation recommendations contained in this report, the total settlement should be less than 1 inch with differential settlement less than ½ of an inch.
- 6. The foundation should be embedded so that the bottoms of the foundations are a minimum of 18 inches below adjacent compacted grades on all sides. We recommend that the foundation width be at least 24 inches wide; however, variations in the footing size and

embedment depth will impact the settlement and bearing capacity values provided in this report. We recommend that once the final foundation plan, building loads and finished site grades have been developed, that Test Lab be provided the opportunity to re-evaluate the expected settlement and bearing capacity of the foundations.

- 7. The proposed residential building loads and site grading information were not provided. We have assumed wall loads will be a maximum of 4 kips per linear foot and column loads will be a maximum of 40 kips.
- 8. We strongly recommend that Test Lab remain involved throughout the design and construction process to verify that our recommendations are properly interpreted and implemented.

2.0 INTRODUCTION

2.1 GENERAL DISCUSSION

The purpose of the exploration was to evaluate the subsurface conditions and provide geotechnical engineering recommendations regarding site preparation, earthwork procedures, and foundation design for the proposed residential building. This report presents a brief discussion of our understanding of the project, the exploration procedures, results, and our conclusions and recommendations regarding the above-referenced project.

2.2 EXISTING SITE

The project site is in a residential neighborhood approximately ½ mile from the intersection of State Road 60 and N MacDill Ave. in Tampa, Hillsborough County, Florida. The project is bordered in all directions by residential parcels with single-family homes. A review of historical aerial photography indicates that the subject parcel was occupied by a former structure. However, at the time of our field exploration, the former structure had been demolished and the parcel is currently vacant. The property appeared to be at a similar elevation to the surrounding development.

2.3 PROPOSED CONSTRUCTION

We understand that the proposed construction is a 2-story structure that will have an approximate footprint of 2,080 square feet. Test Lab has not been provided with information regarding the loads or site grading information of the proposed construction. We have presumed wall loads will be a maximum of 4 kips per linear foot and column loads will be a maximum of 40 kips. Test Lab requests the opportunity to review the foundation plan, site/grading plan and applicable portions of the project specifications when the design is finalized. This review will allow us to check whether these documents are consistent with the intent of our recommendations.

3.0 SITE INFORMATION

3.1 SOIL SURVEY INFORMATION

According to the Soil Survey of Hillsborough County, Florida, prepared by the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS, formerly the Soil Conservation Service), the subject property is underlain by Myakka-Urban land complex (Unit 32) and Wabasso-Urban land complex (Unit 58). Urban Land refers to soils that have been modified, disturbed, or transported due to human development.

Myakka-Urban land complex (Unit 32) has a landform setting of flatwoods on marine terraces and a parent material of sandy marine deposits. The typical soil profile consists of fine sand to loamy fine sand (SP/SP-SM) to a depth of 80 inches. The estimated Seasonal High Ground Water Table (SHGWT) ranges from about 0.5 to 1.5 feet below natural grade from June to September during typical years.

Wabasso-Urban land complex (Unit 58) has a landform setting of flatwoods on marine terraces and a parent material of sandy and loamy marine deposits. The typical soil profile consists of fine sand to loamy fine sand (SP/SP-SM) to a depth of 37 inches, underlain by sandy clay loam to a depth of 48 inches (SM-SC), underlain by fine sand to loamy fine sand (SP/SP-SM) to a depth of 80 inches. The estimated Seasonal High Ground Water Table (SHGWT) ranges from about 0.5 to 1.5 feet below natural grade from June to September during typical years.

3.2 FEMA MAP INFORMATION

Based on the applicable "Flood Insurance Rate Map", prepared by the Federal Emergency Management Agency (FEMA)'s National Flood Insurance Program, the project area is within Zone X. Zone X is an area with a low to moderate risk of flooding. This information should be reviewed by the Engineer of Record to ensure that the necessary design standards are met for this Zone.

4.0 EXPLORATION AND TESTING METHODS

4.1 SCOPE OF EXPLORATION

The site exploration consisted of two (2) Standard Penetration Test (SPT) borings performed to a depth of 20-feet below the existing grade within the footprint of the proposed residential construction. The boring locations were identified in the field by Test Lab with a handheld Global Positioning System (GPS) device. The approximate locations of the borings are illustrated on **Sheet 1**. Following the field exploration, the soil samples were analyzed in our laboratory and classified by a geotechnical engineer.

4.2 FIELD EXPLORATION AND TESTING

The SPT borings were performed in general accordance with ASTM D-1586 entitled "Standard Method for Penetration Test and Split-Barrel Sampling of Soils." After drilling to the required depth and cleaning the bore hole, the sampler (2" O.D.) was driven 18 or 24 inches into the undisturbed soil by a 140-pound drop-hammer falling 30 inches. The number of blows required to drive the sampler the second and third 6-inch increments is known as the Standard Penetration Resistance ("N"-value). The various soils encountered in the borings were visually classified in the field and representative soil samples were obtained and transported to our laboratory for further examination by a geotechnical engineer. The soils encountered in the borings were classified utilizing the Unified Soil Classification System (USCS). At the completion of the drilling operations, the boreholes were plugged in accordance with Southwest Florida Water Management District guidelines. The procedures used by Test Lab for field sampling and testing are in general accordance with ASTM procedures and established engineering practice. The subsurface conditions encountered at the SPT borings performed and their locations are shown on the attached **Sheet 1** along with other pertinent information.

5.0 LABORATORY TESTING

Representative soil samples collected from the borings performed within the proposed building footprint were classified and stratified in general accordance with the Unified Soil Classification System (USCS). The classification was based on visual observations, using the results of laboratory testing as confirmation. These tests included minus 200 wash, Atterberg limits, natural moisture content and organic content.

5.1 TEST DESIGNATIONS

The following list summarizes the laboratory tests performed and respective test methods utilized.

- i. Minus 200 Wash The minus 200 wash tests were conducted in general accordance with the AASHTO test designation T-11 (ASTM test designation D-1140).
- ii. <u>Atterberg Limits</u> The liquid limit and the plastic limit tests ("Atterberg Limits") were conducted in general accordance with the AASHTO test designations T-089 and T-090, respectively (ASTM test designation D-4318).
- iii. <u>Natural Moisture Content</u> The moisture content tests were conducted in general accordance with the AASHTO test designation T-265 (ASTM test designation D-2216).
- iv. <u>Organic Content</u> The organic content tests were conducted in general accordance with the AASHTO test designation-267 (ASTM test designation D-2974).

The results of laboratory testing are presented adjacent to the soil profiles indicating the depth of the sample tested on **Sheet 1**.

6.0 SUBSURFACE CONDITIONS

6.1 SOIL STRATA

The soil strata encountered at the site are summarized in the table below, with the respective soil stratum number, soil description, and USCS soil classification.

<u>Stratum</u>	Soil Description	USCS Classification
1	Light Brown to Very Dark Brown to Light Yellowish Brown to Yellowish Brown Sand to Sand with Silt	SP/SP-SM
2	Light Brownish Gray to Light Gray Silty Clayey Sand	SM-SC
3	Very Dark Bown to Dark Brown Sandy Clay with Organics	CL

The table above provides only a brief and general description of subsurface conditions encountered in the borings. Detailed soil profiles that delineate the approximate depths and density/consistency of each soil stratum are presented on **Sheet 1**. When reviewing the soil profile, the indicated boundaries between soil strata are approximate and the transitions between strata are typically more gradual. Also, variations in subsurface conditions from those encountered may exist between the boring locations. Some of the borings completed for this study contained

decaying vegetative matter and/or trace organics, and when a discernable amount was observed it was noted with an A or B adjacent to the soil profile.

6.2 GROUNDWATER INFORMATION

Groundwater levels were recorded, during the time of the subsurface exploration, immediately after drilling and corroborated through a visual examination of the obtained soil samples. The groundwater table was found at depths ranging between approximately 4 to $4\frac{1}{2}$ feet below existing ground surface. It should be noted that groundwater levels tend to fluctuate during periods of prolonged drought and extended rainfall and may be affected by man-made influences. A seasonal effect will occur in which higher groundwater levels are normally recorded in rainy seasons. Groundwater table fluctuations higher than the levels recorded in this exploration should be anticipated.

Based on NRCS data, the soil types are reported to have a seasonal high groundwater table ranging between 0.5-1.5 feet below grade from June to September. We recommend that the contractor determine the actual groundwater levels at the time of construction to evaluate groundwater impacts on the foundation installation procedures. We assume that the building foundation will be at the same elevation as the adjacent residential homes and should meet the recommended minimum of two feet of separation between the bottom of the floor slab and the seasonal high groundwater table.

7.0 EVALUATION AND RECOMMENDATIONS

7.1 GENERAL

Due to the presence of very loose sand in the upper 2 feet in the borings performed, we recommend over-excavation to a depth of 2 feet below existing grade, followed by backfilling with structural fill in maximum 12-inch lifts and compacted to 98% of the modified Proctor maximum dry density.

Sandy Clay with organics [Stratum 3] was encountered in SPT-1 from approximately 13½ to 15 feet below existing grade. Due to its depth, consistency, low organic content and depth below the groundwater table, it is our opinion that this material will not adversely affect the ability of the soil to support the planned structure.

7.2 SITE PREPARATION

7.2.1 Site Stripping

To prepare the site for construction, clearing and grubbing operations shall be performed in the proposed development area. This includes removal of vegetation, root systems, and any organic materials. **Any remnants of infrastructure related to previous development, should be removed.** As a minimum, it is recommended that the clearing operations extend at least five (5) feet beyond the development perimeters.

7.2.2 Over-Excavation

Please be advised that very loose SAND to SAND with Silt [Stratum 1] was encountered from the existing ground surface to a depth of approximately 2 feet below existing grade in both borings.

The contractor should be prepared to over-excavate the very loose sand within 2 feet of the existing grade. The over-excavation should extend 5 feet beyond the structure perimeter. The excavation should be backfilled with structural fill placed in maximum 12-inch lifts and compacted to 98% of the modified Proctor maximum dry density. Structural fill material is defined later in this report. At a minimum, one field density test should be performed per lift for every 2,500 square feet of the excavation. The tests must be performed in each fill lift before the next lift is placed.

7.2.3 Subgrade Preparation

Following the clearing and grubbing operations, the exposed subgrade should be compacted and proofrolled as directed by representatives of Test Lab to confirm that all unsuitable materials have been removed. The compaction/proofrolling of the exposed subgrade should be performed using a vibratory drum roller. The vibratory drum roller should have a static drum weight on the order of 8 to 10 tons and should be capable of exerting a minimum impact force of 36,000 pounds. A DYNAPAC CA-250 or equivalent is expected to provide acceptable results. The vibratory drum roller should be operated in static mode when used within 50 feet of existing structures, to avoid damage to any close proximity structures. Due to the close proximity of the adjacent buildings, we anticipate that much of the compaction/proofrolling will be completed in static mode.

Proofrolling should be closely monitored by our engineering technician to observe for unusual deflection of the soils beneath the wheel loads. If unusual or excessive deflection is observed, then the areas should be undercut to firm soils and backfilled with structural fill placed in maximum one-foot thick loose lifts. The proofrolling equipment should make a minimum of eight (8) overlapping passes over the development area with the successive passes aligned perpendicular.

7.3 FILL PLACEMENT

Following satisfactory site preparation, the soil may be brought to finished subgrade levels, as needed. Specifications for the fill material and fill placement are provided below.

7.3.1 Structural Fill Definition

The preferred soil used for structural fill is fine sand free of organics and debris and containing less than 12% material by weight that is finer than a number 200 sieve (fines) (materials conforming to SP and SP-SM in the USCS).

A modified Proctor test (ASTM D-1557) must be performed on the fill material to determine the maximum dry density and optimum moisture content of the soil. All fill should be approved by the engineer before placement.

7.3.2 Structural Fill Availability

In general, SP/SP-SM soils may be used and moved for grading purposes, site leveling, general engineering fill and structural fill. SP/SP-SM soils (Stratum 1) were generally encountered in our borings from existing grade to depths around 6 feet.

7.3.3 Fill Placement Requirements

The upper 12 inches of soil beneath the foundation and upper 12 inches of soil beneath the slab areas should be compacted to at least 98% of its modified Proctor maximum dry density. In-place field density tests should be performed in accordance with ASTM D-6938 to confirm compaction. A minimum of one density test must be performed for every 100 linear feet within the footing excavations.

All structural fill used to raise the finished grade elevation should be placed in loose lifts not exceeding 12 inches in thickness and should be compacted to a minimum density of 98% of the modified Proctor maximum dry density. In-place field density tests should be performed in accordance with ASTM D-6938 to confirm compaction. At a minimum, one field density test should be performed per lift for every 2,500 square feet of the slab. The tests must be performed in each fill lift before the next lift is placed.

Use of a vapor retarder must be determined by a qualified structural engineer. We assess that no extraordinary floor slab performance criteria, such as very low allowable deflection/settlement, are expected.

Backfill soils placed adjacent to the foundation or walls should be carefully compacted with a light rubber-tired roller or vibratory plate compactor to avoid damaging the foundation or walls. This material should be placed in loose lifts not exceeding 6 inches in thickness and compacted.

7.3.4 Footings Excavation

Following satisfactorily backfilling/construction of the building pad area, the proposed footing alignment(s) should be excavated to the proposed bottom of footing elevation. The upper 12 inches of soil beneath the foundation footings should be compacted to at least 98% of its modified Proctor maximum dry density. At a minimum, one field density test should be performed per every 100 linear feet within the footing excavations.

7.4 SITE DEGRADATION DURING CONSTRUCTION

It has been our experience that prior to slab construction, slab subgrades can be significantly disrupted by construction equipment, utility construction, and/or inclement weather. The soils exposed at the slab subgrade will consist primarily of sand, which is particularly susceptible to disturbance. Placement of concrete or fill upon these areas must occur promptly, or these areas will need re-compaction and re-testing prior to concrete placement.

7.5 FOUNDATIONS

7.5.1 Shallow Foundation

After proper site preparation, including the recommended over-excavation, fill placement and compaction in accordance with the preceding sections, the proposed structure can be supported by a conventional shallow foundation (spread footings or continuous wall footing) bearing on densified residual soil.

We recommend use of a maximum allowable net soil bearing pressure of 2,000 psf, based on dead load plus design live load, to size column and strip footings supported by these materials.

Total settlement is anticipated to be less than 1 inch with differential settlement less than $\frac{1}{2}$ inch. We have assumed the strip footings will be at least 24 inches wide, and that the loads will not exceed those previously referenced; however, variations in the building load and footing size will impact the settlement and bearing capacity values provided above. We recommend that once the final foundation plan, building loads and finished site grades has been developed, that Test Lab be provided the opportunity to re-evaluate the expected settlement and bearing capacity of the foundations.

Exterior footings should be embedded a minimum depth of 18 inches below the final exterior grade. Interior footings can be placed on properly compacted fill at nominal depths (minimum 12 inches) compatible with architectural and structural considerations.

7.6 FLOOR SLAB RECOMMENDATIONS

Slab-on-grade construction should be supported on soils compacted to a minimum dry density of at 98% of their modified Proctor value. We have assumed no extraordinary floor slab performance requirements such as very low allowable deflections or smoothness requirements. Any cuts that are made in the building pad for utility installation should be backfilled with clean granular materials that are compacted to 98% of their ASTM D-1557 maximum dry density. Materials to be placed within 12 inches of the bottom of the slab should have no single particle greater than 3 inches in size and should contain a maximum fines content of 12 percent. The floor slab should be reinforced to reduce the risk of cracking due to settlement.

An impervious membrane should be installed between the soil subgrade and bottom of floor slabs to be overlain with moisture sensitive coverings to avoid slab moisture problems. Floor slab design should conform with American Concrete Institute (ACI) design standard practices.

7.7 WATER CONTROL

Water should not be allowed to collect in the foundation excavation, on the floor slab areas, or on prepared subgrades of the construction areas either during or after construction. Groundwater control may be necessary for the proposed construction due to the possibility of a relatively shallow SHGWT. The groundwater levels presented in this report are the levels that were measured at the time of our field activities. Fluctuation should be anticipated. We recommend that the Contractor determine the actual groundwater levels at the time of the construction to determine groundwater impact on this construction procedure. Groundwater can normally be controlled in shallow excavations or rim ditches with a sump pump, with well-points being utilized for deeper excavations, if necessary.

Surficial water runoff must be directed away from the foundation during and after construction in accordance with the Florida Building Code 5th Edition (2014).

7.8 QUALITY CONTROL

We strongly recommend that Test Lab be involved throughout the design and construction process to verify that the following recommendations are properly interpreted and implemented. We should be provided with the opportunity to review project plans and specifications with the designers as they become available to see that our recommendations are fully incorporated. We can also provide field verification and materials testing services. We recommend that we be retained by the owner to observe earthwork and foundation construction in addition to monitoring site preparation and verifying that correct fill and fill compaction procedures are applied. Our trained personnel are qualified to recognize unanticipated ground conditions and can offer responsive remedial recommendations should these unanticipated conditions occur.

8.0 EXCAVATIONS

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, Part 1926, Subpart P". This document was issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavations or foundation excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractors "responsible persons", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in all local, state, and federal safety regulations.

We are providing this information solely as a service to our client. Test Lab does not assume responsibility for construction site safety or the contractor's or other party's compliance with local, state, and federal safety or other regulations.

9.0 LIMITATIONS OF REPORT

This report has been prepared for the exclusive use of **Brandon and Michaela Keefe** and their designers for specific application to the referenced project. This report may not contain sufficient information for other uses or for the purposes of other parties; therefore, we cannot assume responsibility for conclusions or recommendations based upon this data made by others. Our conclusions and recommendations have been prepared using generally accepted standards of geotechnical engineering practice in the State of Florida. No other warranty is expressed or implied.

Our conclusions and recommendations are based on the design information furnished to us, the data obtained from the site exploration and our experience. They do not necessarily reflect variations in the subsurface conditions, which are likely to exist intermediate of our borings and in unexplored areas of the site due to the inherent variability of the subsurface conditions in this geologic region as well as past land use. Should such variations become apparent during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon on-site observation of the conditions.

If changes are made in the overall design or location of the building and grading scheme, then the recommendations presented in this report may no longer be valid. In such cases, our firm should review the proposed changes to evaluate whether our recommendations need to be modified. The results of this review should be provided in writing. We also request the opportunity to review the foundation plan, grading plan and applicable portions of the project specifications when the design is finalized. This review will allow us to check whether these documents are consistent with the intent of our recommendations.

The site is underlain by limestone bedrock that is susceptible to dissolution and the subsequent development of karst features such as voids and sinkholes in the natural soil overburden. Construction in a sinkhole prone area is therefore accompanied by some risk that internal soil erosion and ground subsidence could affect new structures in the future. It is not possible to investigate or design to completely eliminate the possibility of future sinkhole related problems. In any event, the Owner must understand and accept this risk.

TEST LOCATION PLAN



L AERIAL OBTAINED FROM GOOGLE EARTH. THE HOUSE SHOWN IN AERIAL HAS BEEN DEMOLISHED AND REMOVED PRIOR TO OUR SOILS EVALUATION. THE ABOVE INFORMATION IS INTENDED FOR GENERAL ILLUSTRATION OF TEST LOCATIONS AND SHOULD BE CONSIDERED APPROXIMATE.

LEGEND

Light Brown to Very Dark Brown to Light Yellowish Brown to Yellowish Brown Sand to Sand with Silt (SP/SP-SM)



Light Brownish Gray to Light Gray Silty Clayey Sand



Very Dark Brown to Dark Brown Sandy Clay with Organics

- With Trace Organics
- With Decaying Vegetative Matter
- Unified Soil Classification System (ASTM D 2488) Group Symbol As Determined By Visual Review And/Or Laboratory Testing
- Numbers To The Left Of Borings Indicate Standard Penetration Test (SPT) Value For 12 Inches Of Penetration (Unless Otherwise Noted)
- Groundwater Level At Time Of Drilling

SPT-1

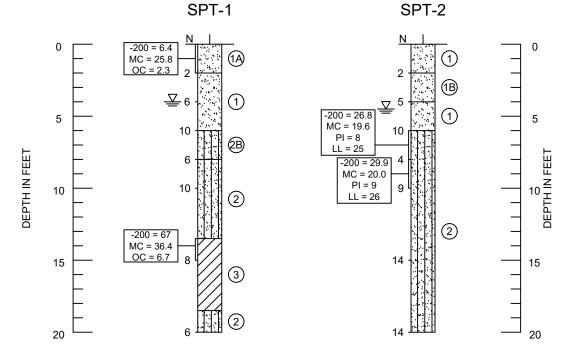
Approximate SPT Boring Location

- Fines Passing The #200 Standard Sieve (%)
- Natural Moisture Content
- Plasticity Index
- Liquid Limit (%)
- OC Organic Content (%)

SPT BORING N-VALUE (BLOW/FOOT)

Granular Materials		Silts and Clays	
Relative Density	Automatic Hammer SPT N-Value (Blow/Foot)	Consistency	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 3	Very Soft	Less than 1
Loose	3 - 8	Soft	1 - 3
Medium Dense	8 - 24	Firm	3 - 6
Dense	24 - 40	Stiff	6 - 12
Very Dense	Greater than 40	Very Stiff	12 - 24
		Hard	Greater than 24

SOIL PROFILES



SOIL PROFILE NOTES:

- 1. The profiles depicted are of a generalized nature to highlight the major subsurface stratification features and material characteristics. The soil profiles include soil description, stratifications and penetration resistances. The stratifications shown on the boring profiles represent the conditions only at the actual boring location. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual.
- 2. Groundwater levels generally fluctuate during periods of prolonged drought and extended rainfall and may be affected by man-made influences. In addition, a seasonal effect will also occur in which higher groundwater levels or temporary perched conditions are normally recorded in rainy seasons.

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Test Location Plan & Soil Profile(s)

