



Geotechnical Engineering Report

**Annie Gilles Urban Plaza
Pompano Beach, Florida**

June 12, 2018

34185025

Prepared for:

E Sciences, Inc.
Fort Lauderdale, Florida

Prepared by:

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Fort Lauderdale, Florida

terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials

DRC

PZ21-12000012

5/5/2021

June 12, 2018

E Sciences, Inc.
224 SE 9th Street
Fort Lauderdale, Florida 33316



Attn: Ms. Nadia Locke
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Re: Geotechnical Engineering Report
Annie Gilles Urban Plaza
NE Corner of NW 6th Avenue and Hammondville Road
Pompano Beach, Florida
34185025


Dear Ms. Locke:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. P34185025 dated May 14, 2018. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.


Rutugandha H. Nulkar, P.E.
Senior Engineer
Florida Registration No. 70625


Hugo E. Soto, P.E.
Principal
Florida Registration No. 36440

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REPORT SUMMARY

Topic ¹	Overview Statement ²
Project Description	It is proposed to construct a stage area on the northwest end of the property. In addition, there is some stormwater improvements proposed on the south side of the park.
Geotechnical Characterization	The subsurface exploration indicates fine to medium sands for the entire depth of the borings. A layer of sand with organic stain was encountered between a depth of 6 to 10 feet below existing grade. Groundwater was encountered at a depth of 3.5 to 4 feet below existing grade.
Earthwork	Compaction of existing soils or structural fill to 95% of Modified Proctor Value will be required upon completion of the site preparation as presented in this report.
Shallow Foundations	Shallow foundations will be sufficient, however we recommend field observations and testing in the footing excavations Allowable bearing pressure = 2,500 lbs/sq-ft supported on compacted existing or imported soils. Expected settlements: < 1 inch total, < ½ inch differential Detect and remove zones of unsuitable soils as noted in Earthwork
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

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INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed stage area to be located at NE Corner of NW 6th Avenue and Hammondville Road in Pompano Beach, Florida. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Foundation design and construction
- Groundwater conditions
- Site preparation and earthwork

The geotechnical engineering scope of services for this project included the advancement of two (2) test borings to depths ranging from approximately 20 feet below existing site grades. In addition, one (1) exfiltration test was performed to a depth of 10 feet below the existing grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs in the **Exploration Results** section of this report.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in the final report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

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Our scope of services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third party beneficiaries intended. Any third party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at NE Corner of NW 6th Avenue and Hammondville Road in Pompano Beach, Florida. The project site is an existing park.
Existing Improvements	Grass cover with some trees
Current Ground Cover	The project site is an existing park. The site does not have any structures. The current ground cover is landscaped land.
Existing Topography	The site is fairly level
Geology	Our experience near the vicinity of the proposed development indicates subsurface conditions consist of loose to medium dense sands within the top 15-20 feet from existing grade. The limestone formation may be encountered deeper in the profile.

Soil Survey

The Soil Survey of Broward County, Florida as prepared by the United States Department of Agriculture (USDA), Soil Conservation Service (SCS; later renamed the Natural Resource Conservation Service - NRCS) identifies the soil types at the subject site as Duette-Urban Land Complex and Immokalee Urban Land Complex. A Soils Map is included with this **GeoReport**, depicting the applicable Soil Survey map portion for the subject site.

10 – Duette-Urban Land Complex.

This complex consists of 50 to 70 percent Duette soils in open areas and 30 to 50 percent urban Land in which the natural soil cannot be readily observed. The Duette soils are nearly level, moderately well drained, deep and sandy. Included in this complex in mapping are small areas of Basinger, Dade, Immokalee and St. Lucie soils.

17- Immokalee-Urban Land Complex

This complex consists of Immokalee fine sand and Urban land. Depth of the water table depends on the established drainage in the area. About 20 to 45 percent of the complex is open land and about 40 to 70 percent is urban land covered with sidewalks, streets, patios, driveways, buildings where the natural soil cannot be observed.

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Number of Borings	Boring Depth (feet)	Planned Location
2	20	Stage area
1	10	Exfiltration test for Stormwater management

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provide the boring layout. Coordinates are obtained with a handheld GPS unit (estimated horizontal accuracy of about ± 10 feet). If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advance the borings with a truck-mounted, rotary drill rig. Four samples are obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon is driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observe and record groundwater levels during drilling and sampling. For safety purposes, all borings are backfilled with soil cuttings after their completion.

The sampling depths, penetration distances, and other sampling information are recorded on the field boring logs. The samples are placed in appropriate containers and taken to our soil laboratory for testing and classification by a geotechnical engineer. Our exploration team prepares field boring logs as part of the drilling operations. These field logs include visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs are prepared from the field logs. The final boring logs represent the geotechnical engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Exfiltration Test: One (1) exfiltration test was performed on the south end of the project site. The exfiltration test is performed in general accordance with the South Florida Water Management District (SFWMD) procedures for the "Usual Condition Constant Head" Percolation Tests. The test is performed in a 6-inch diameter borehole. A 4-inch diameter perforated PVC pipe is placed in the borehole. Water is then pumped into the borehole in order to raise the water level in the borehole to the ground surface. Once the inflow stabilized with the outflow rate, the average pumping rate and the elevation of the water obtained with this stabilized flow rate are recorded. The hydraulic conductivity value is then calculated from the test results and is reported in units of cubic feet per second per square foot of seepage area per foot of head ($\text{cfs/ft}^2\text{-ft head}$). The results

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of the exfiltration test are presented in the **Exfiltration Test Results** section and are attached to this report.

Laboratory Testing

The project engineer reviews the field data and assigns various laboratory tests to better understand the engineering properties of the various soil strata as necessary for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods are applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- ASTM D2974 Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and other Organic Soils

The laboratory testing program often includes examination of soil samples by an engineer. Based on the material's texture and plasticity, we describe and classify the soil samples in accordance with the Unified Soil Classification System.

GEOTECHNICAL CHARACTERIZATION

Subsurface Profile

We have developed a general characterization of the subsurface soil and groundwater conditions based upon our review of the data and our understanding of the geologic setting and planned construction. The following table provides our geotechnical characterization.

The geotechnical characterization forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. As noted in **General Comments**, the characterization is based upon widely spaced exploration points across the site, and variations are likely.

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/Density
Surface	0.25	Topsoil: brown, friable and contained significant organic matter	N/A
1	6	Light brown to brown fine to medium SAND, trace silt (SP)	Loose (5 to 8 bpf)
2	10	Brown to Dark Brown fine to medium SAND (SP)	Very loose to loose (1 to 5 bpf)
3	20	Light brown to brown fine to medium SAND, trace silt (SP)	Very loose to loose (1 to 7 bpf)

1. bpf – blows per foot

Conditions encountered at each boring location are indicated on the individual boring logs shown in the **Exploration Results** section and are attached to this report. Stratification boundaries on the boring logs represent the approximate location of changes in native soil types; in situ, the transition between materials may be gradual.

Groundwater Conditions

The boreholes were observed while drilling and after completion for the presence and level of groundwater. The water levels observed in the boreholes can be found on the boring logs in **Exploration Results**, and are summarized below.

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Boring Number	Approximate Depth to Groundwater while Drilling (feet) ¹	Approximate Depth to Groundwater after Drilling (feet) ¹
B-1	3.8	3.8
B-2	3.5	3.7
EX-1	4.0	4.0
^{1.} Below ground surface		

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

PROJECT DESCRIPTION

Our understanding of the project conditions is as follows:

Item	Description
Information Provided	Information was provided via email dated May 8, 2018
Project Description	It is proposed to construct a stage area on the northwest end of the property. In addition, there is some stormwater improvements proposed within the area.
Proposed Structure	Proposed pop-up stage will be supported on slab on grade. If the proposed stage has an enclosed roof, the roof may be supported on columns
Maximum Loads (assumed)	Slabs: 150 pounds per square foot (psf). Column Loads: 50-75 kips
Grading/Slopes	Up to 1 foot of cut or fill will be required to develop final grade.

GEOTECHNICAL OVERVIEW

Borings encountered a sandy profile. These materials are generally suitable for construction of the proposed stage construction and stormwater systems following site preparation according to the recommendations provided in the **Site Preparation** section.

Seasonal high groundwater levels should be considered in the civil engineering design for site grading and foundation construction.

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The **Shallow Foundations** section addresses support of the stage foundation bearing on native medium dense sand or structural fill. The **Floor Slabs** section addresses slab-on-grade support of the stage.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

Earthwork will include clearing and grubbing, excavations and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria as necessary to render the site in the state considered in our geotechnical engineering evaluation for foundations and floor slabs.

Site Preparation

Prior to placing fill, existing vegetation and root mat should be removed. Complete stripping of the topsoil should be performed in the proposed stage construction areas.

The subgrade should be proof-rolled with an adequately loaded vehicle such as a fully loaded tandem axle dump truck. The proof-rolling should be performed under the direction of the Geotechnical Engineer. Areas excessively deflecting under the proof-roll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed or modified by stabilizing with limerock. Excessively wet or dry material should either be removed or moisture conditioned and recompact.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for structural and general fill should meet the following material property requirements:

Soil Type ¹	USCS Classification	Acceptable Location for Placement	Maximum Lift Thickness (in.)
General ¹	SP (fines content < 5%)	All locations and elevations	12 ³
	SP-SM (fines content between 5 and 12%) ²	All locations and elevations except strict moisture control will be required during placement, particularly during the rainy season.	8 to 12 ³

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Soil Type ¹	USCS Classification	Acceptable Location for Placement	Maximum Lift Thickness (in.)
<ol style="list-style-type: none">1. Controlled, compacted fill should consist of approved materials that are free of organic matter and debris.2. If fines contents are greater than 12 percent, special design and construction procedures may be necessary.3. Loose thickness when heavy compaction equipment is used in vibratory mode. Lift thickness should be decreased if static compaction is being used, typically to no more than 8 inches, and the required compaction must still be achieved. Use 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is required.			

Fill Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill	General Fill
Maximum Lift Thickness	12 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used	Same as Structural fill
Minimum Compaction Requirements ^{1, 2, 3}	98% of max. below foundations 95% of max. above foundations, below floor slabs, and more than 1 foot below finished pavement subgrade	95% of max.
Water Content Range ¹	Granular: -2% to +2% of optimum	Granular: -2% to +2% of optimum
<ol style="list-style-type: none">1. Maximum density and optimum water content as determined by the Modified Proctor test (ASTM D 1557).2. If the granular material is a coarse sand or gravel, or of a uniform size, or has a low fines content, compaction comparison to relative density may be more appropriate. In this case, granular materials should be compacted to at least 70% relative density (ASTM D 4253 and D 4254).		

Grading and Drainage

All grades must provide effective drainage away from the stage area during and after construction and should be maintained throughout the life of the structure. Water retained next to the stage can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential slab and/or foundation movements and cracked slab.

Exposed ground should be sloped and maintained at a minimum 5 percent away from the stage for at least 10 feet beyond the perimeter of the stage. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After construction and landscaping, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted as necessary as part of the

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structure's maintenance program. Where paving or flatwork abuts the structure a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations, for the proposed structure, are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of floor slabs. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over, or adjacent to, construction areas should be removed. If the subgrade saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompact, prior to floor slab construction.

The groundwater table could affect over-excavation efforts. A temporary dewatering system consisting of sumps with pumps could be necessary to achieve the recommended depth of over-excavation.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local, and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Construction Observation and Testing

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of vegetation and top soil, proof-rolling and mitigation of areas delineated by the proof-roll to require mitigation.

Each lift of compacted fill should be tested, evaluated, and reworked as necessary until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the structure area.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. In the event that unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

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In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

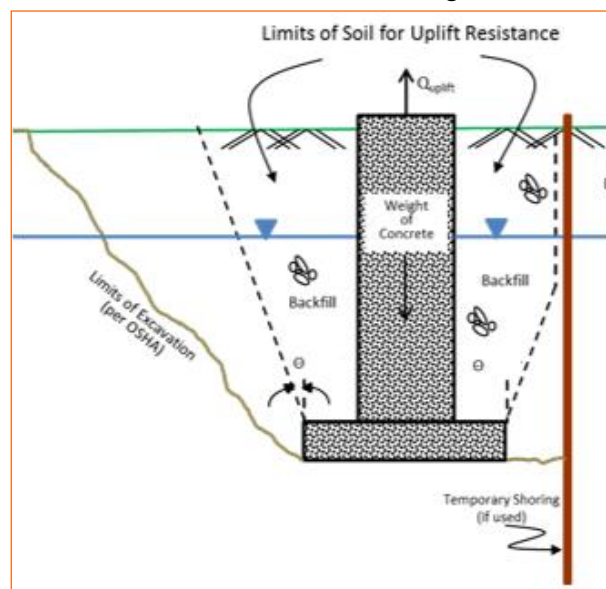
Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing pressure ^{1, 2}	2,500 psf (foundations bearing within compacted existing soil or structural fill)
Minimum Foundation Dimensions	Columns: 30 inches Continuous: 18 inches
Ultimate Passive Resistance ⁴ (equivalent fluid pressures)	300 pcf (granular backfill)
Ultimate Coefficient of Sliding Friction ⁵	0.4 (granular material)
Minimum Embedment below Finished Grade ⁶	24 inches
Estimated Total Settlement from Structural Loads ²	Less than about 1 inch
Estimated Differential Settlement ^{2, 7}	About 2/3 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. These bearing pressures can be increased by 1/3 for transient loads unless those loads have been factored to account for transient conditions. Values assume that exterior grades are no steeper than 20% within 10 feet of structure.
2. Values provided are for maximum loads noted in **Project Description**.
3. Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the **Earthwork**.
4. Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions.
6. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
7. Differential settlements are as measured over a span of 50 feet.

Design Parameters - Uplift Loads

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils. As illustrated on the subsequent figure, the effective weight of the soil prism defined by diagonal planes extending up from the top of the perimeter of the foundation to the ground surface at an angle, θ , of 20 degrees from the vertical can be included in uplift resistance. The maximum allowable uplift capacity should be taken as a sum of the effective weight of soil plus the dead weight of the foundation, divided by an appropriate factor of safety. A maximum total unit weight of 105 pcf should be used for the backfill. This unit weight should be reduced to 42 pcf for portions of the backfill or natural soils below the groundwater elevation.



Foundation Construction Considerations

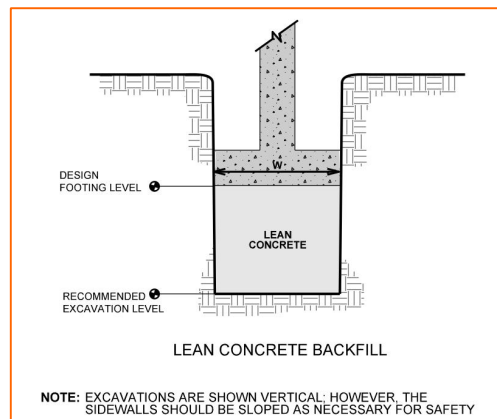
As noted in **Earthwork**, the footing excavations should be evaluated under the direction of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

If unsuitable bearing soils are encountered at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils, and the footings could bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations. This is illustrated on the sketch below.

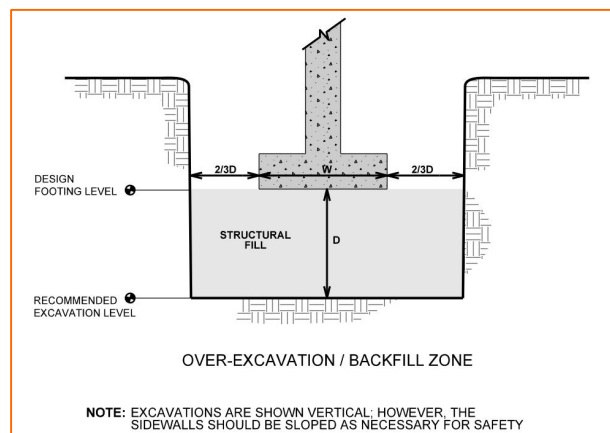
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Over-excavation for structural fill placement below footings should be conducted as shown below. The over-excavation should be backfilled up to the footing base elevation, with structural fill placed, as recommended in the **Earthwork** section.



FLOOR SLABS

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and, positive drainage of the aggregate base beneath the floor slab.

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Floor Slab Design Parameters

Item	Description
Floor Slab Support ¹	Minimum 12 inches of approved on-site soils or structural fill placed and compacted in accordance with the Earthwork section of this report.
Estimated Modulus of Subgrade Reaction ²	150 pounds per square inch per in (psi/in) (The modulus was obtained based on estimates obtained from ACI and USACE design manuals). A factor of safety should be applied by the structural engineer

1. Floor slabs should be structurally independent of stage footings to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower.
3. Free-draining granular material should have less than 5 percent fines (material passing the #200 sieve). Other design considerations such as cold temperatures and condensation development could warrant more extensive design provisions.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Mitigation measures as noted in **Existing Fill** within **Earthwork** are critical to the performance of floor slabs. In addition to the mitigation measures, the floor slab can be stiffened by adding steel reinforcement, grade beams and/or post-tensioned elements.

Floor Slab Construction Considerations

Finished subgrade within and for at least 10 feet beyond the floor slab should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor

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slabs, the affected material should be removed and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

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ATTACHMENTS

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SITE LOCATION AND EXPLORATION PLANS

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SITE LOCATION

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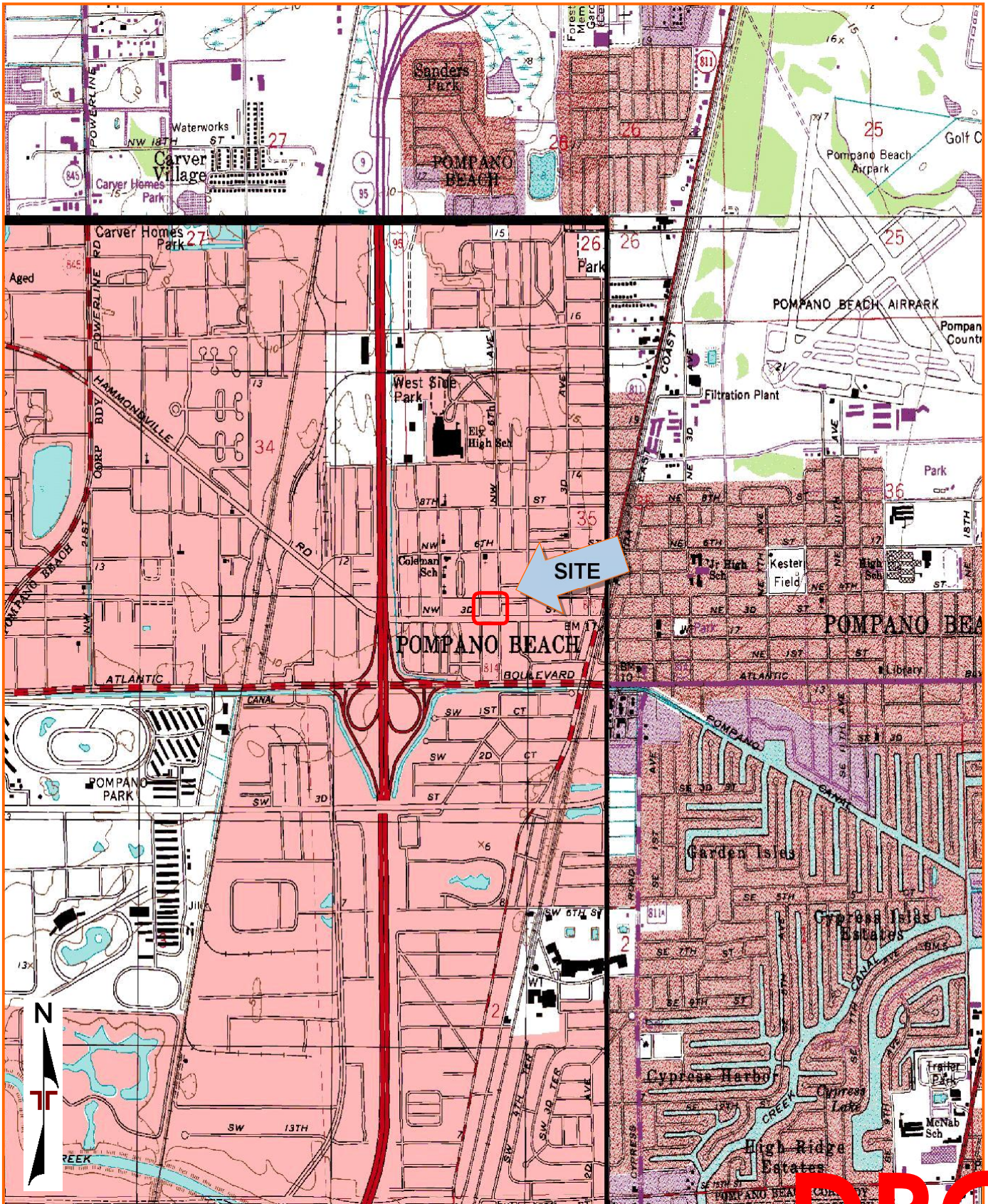


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS
NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: WEST DIXIE BEND, FL (1/1/1983), BELL COUNTY, TN
(1/1/1986), FORT LAUDERDALE NORTH, FL (1/1/1989) and POMPAÑO BEACH, FL
(1/1/1983).

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USDA NRCS SOIL SURVEY MAP

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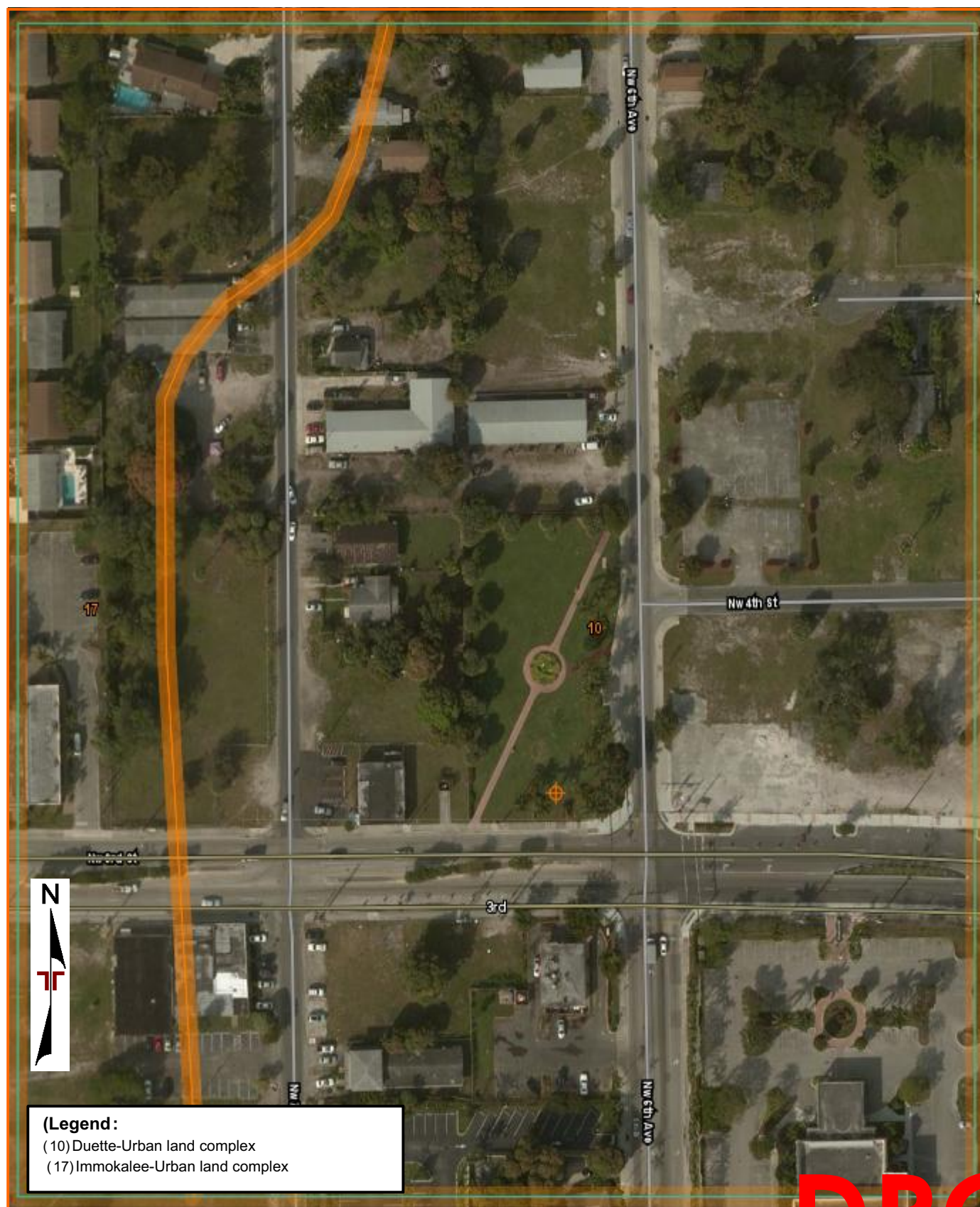


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS
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EXPLORATION PLAN

Annie Gilles Urban Plaza ■ Pompano Beach, FL
June 12, 2018 ■ Terracon Project No. 34185025



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS
NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPH PROVIDED
BY MICROSOFT BING MAPS

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EXPLORATION RESULTS

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BORING LOG NO. B-1

Page 1 of 1

PROJECT: Annie Gilles Urban Plaza

CLIENT: E Sciences Inc
Fort Lauderdale, FL

SITE: NE corner of NW 6th Avenue and Hammondville Road
Pompano Beach, FL

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 26.2349° Longitude: -80.1308°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)
	DEPTH					
	0.3' TOPSOIL brown, (3" thick)				2-2-3-3 N=5	
	FINE TO MEDIUM SAND (SP) , light brown to brown				3-3-2-2 N=5	
					2-2-3-2 N=5	
	5.0' FINE TO MEDIUM SAND, ORGANIC STAIN (SP) , dark brown	5			2-2-3-2 N=5	
					1-1-1-1 N=2	
	10.0' FINE TO MEDIUM SAND (SP) , light brown to brown	10				
					1-1-1 N=2	
					2-3-4 N=7	
	20.0' Boring Terminated at 20 Feet	20				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Rotary Mud Drilling and Casing

Notes:
0: Weight of hammer

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Water Initially Encountered at 3.8'

Terracon

5371 NW 33rd Ave, Ste 201
Ft Lauderdale, FL

Boring Started: 05-29-2018

Drill Rig: CME-55

Project No.: 34185025

Exhibit: A-1

PZ21-12000012

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THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 34185025 ANNIE GILLES URBA.GPJ TERRACON_DATATEMPLATE.GDT 6/12/18

BORING LOG NO. B-2

Page 1 of 1

PROJECT: Annie Gilles Urban Plaza

CLIENT: E Sciences Inc
Fort Lauderdale, FL

SITE: NE corner of NW 6th Avenue and Hammondville Road
Pompano Beach, FL

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 26.2349° Longitude: -80.1307°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)
	DEPTH					
	0.3 TOPSOIL brown, (3" thick)				2-3-3-3 N=6	
	FINE TO MEDIUM SAND (SP) , light brown to brown				3-4-4-3 N=8	
		5			2-3-3-2 N=6	
	6.0 FINE TO MEDIUM SAND, ORGANIC STAIN (SP) , dark brown				1-1-1-1 N=2	
					1-0-1-1 N=1	
	10.0 FINE TO MEDIUM SAND (SP) , light brown to brown	10				
					1-0-1 N=1	
		15				
					3-3-4 N=7	
	20.0 Boring Terminated at 20 Feet	20				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Rotary Mud Drilling and Casing

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Water Initially Encountered at 3.5'

Terracon

5371 NW 33rd Ave, Ste 201
Ft Lauderdale, FL

Boring Started: 05-29-2018

Drill Rig: CME-55

Project No.: 34185025

Exhibit: A-2

PZ21-12000012

5/5/2021

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 34185025 ANNIE GILLES URBA.GPJ TERRACON_DATATEMPLATE.GDT 6/12/18

BORING LOG NO. P-1

Page 1 of 1

PROJECT: Annie Gilles Urban Plaza

CLIENT: E Sciences Inc
Fort Lauderdale, FL

SITE: NE corner of NW 6th Avenue and Hammondville Road
Pompano Beach, FL

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 26.2344° Longitude: -80.1306°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)
	DEPTH					
	0.3 TOPSOIL brown, (3" thick)				2-2-2-3 N=4	
	FINE TO MEDIUM SAND (SP) , light brown to brown				3-3-3-2 N=6	
		5			2-2-3-2 N=5	
	6.0 FINE TO MEDIUM SAND, ORGANIC STAIN (SP) , dark brown				2-2-1-1 N=3	
					1-1-1-1 N=2	
	10.0 Boring Terminated at 10 Feet	10				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Rotary Mud Drilling and Casing

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Water Initially Encountered at 4.0'

Terracon

5371 NW 33rd Ave, Ste 201
Ft Lauderdale, FL

Boring Started: 05-29-2018

Drill Rig: CME-55

Project No.: 34185025

Boring Completed: 05-29-2018

Drill Operator:

Exhibit: A-3

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5/5/2021

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 34185025 ANNIE GILLES URBA.GPJ TERRACON DATATEMPLATE.GDT 6/12/18

EXFILTRATION TEST RESULTS

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HYDRAULIC CONDUCTIVITY TEST RESULTS



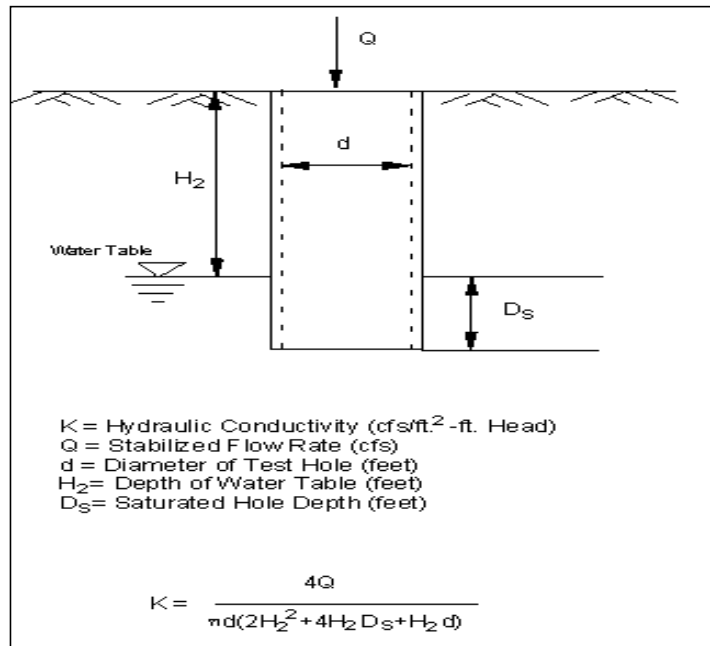
Annie Gilles Urban Plaza
NE Corner of NW 6th Avenue and Hammondville Road
Pompano Beach, FL
Project No 34185025

Test No.	Date Performed	Diameter		Depth of Hole (Feet)	Depth to Groundwater Level Below Ground Surface (Feet)		Saturated Hole Depth Ds (Feet)	Average Flow Rate (gpm)	K, Hydraulic Conductivity (cfs/ft ² -ft Head)
		Hole (inches)	Perforated Casing (inches)		Prior to Test	During Test			
EX-1	05/24/18	6	4	10	4.0	0.00	6.00	1.20	7.90E-05

NOTES:

- 1) The above hydraulic conductivity values are for a French drain installed to the same depth as the borehole tests. The values represent an ultimate value. The designer should decide on the required factor of safety
- 2) The hydraulic conductivity values were calculated based on the South Florida Water Management Districts's USUAL OPEN HOLE CONSTANT HEAD exfiltration test procedure as shown below
- 3) Refer to Exploration Results in the Attachments for the Soil Conditions at the Test Location (EX-1)

USUAL OPEN-HOLE CONSTANT HEAD BOREHOLE PERMEABILITY TEST



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SUPPORTING INFORMATION

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UNIFIED SOIL CLASSIFICATION SYSTEM

Annie Gilles Urban Plaza ■ Pompano Beach, Florida

June 12, 2018 ■ 34185025

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A					Soil Classification	
					Group Symbol	Group Name ^B
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines ^C	$Cu \nless 4$ and $1 \leq Cc \leq 3$ ^E	GW	Well-graded gravel ^F	
			$Cu < 4$ and/or $1 > Cc > 3$ ^E	GP	Poorly graded gravel ^F	
		Gravels with Fines: More than 12% fines ^C	Fines classify as ML or MH	GM	Silty gravel ^{F, G, H}	
			Fines classify as CL or CH	GC	Clayey gravel ^{F, G, H}	
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines ^D	$Cu \nless 6$ and $1 \leq Cc \leq 3$ ^E	SW	Well-graded sand ^I	
			$Cu < 6$ and/or $1 > Cc > 3$ ^E	SP	Poorly graded sand ^I	
		Sands with Fines: More than 12% fines ^D	Fines classify as ML or MH	SM	Silty sand ^{G, H, I}	
			Fines classify as CL or CH	SC	Clayey sand ^{G, H, I}	
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	$PI > 7$ and plots on or above “A”	CL	Lean clay ^{K, L, M}	
			$PI < 4$ or plots below “A” line ^J	ML	Silt ^{K, L, M}	
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay ^{K, L, M, N}
			Liquid limit - not dried		Organic silt ^{K, L, M, O}	
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above “A” line	CH	Fat clay ^{K, L, M}	
			PI plots below “A” line	MH	Elastic Silt ^{K, L, M}	
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay ^{K, L, M, P}
			Liquid limit - not dried		Organic silt ^{K, L, M, Q}	
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat	

^A Based on the material passing the 3-inch (75-mm) sieve

^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

$$^E Cu = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

^F If soil contains $\nless 15\%$ sand, add "with sand" to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add "with organic fines" to group name.

^I If soil contains $\nless 15\%$ gravel, add "with gravel" to group name.

^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

^L If soil contains $\nless 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.

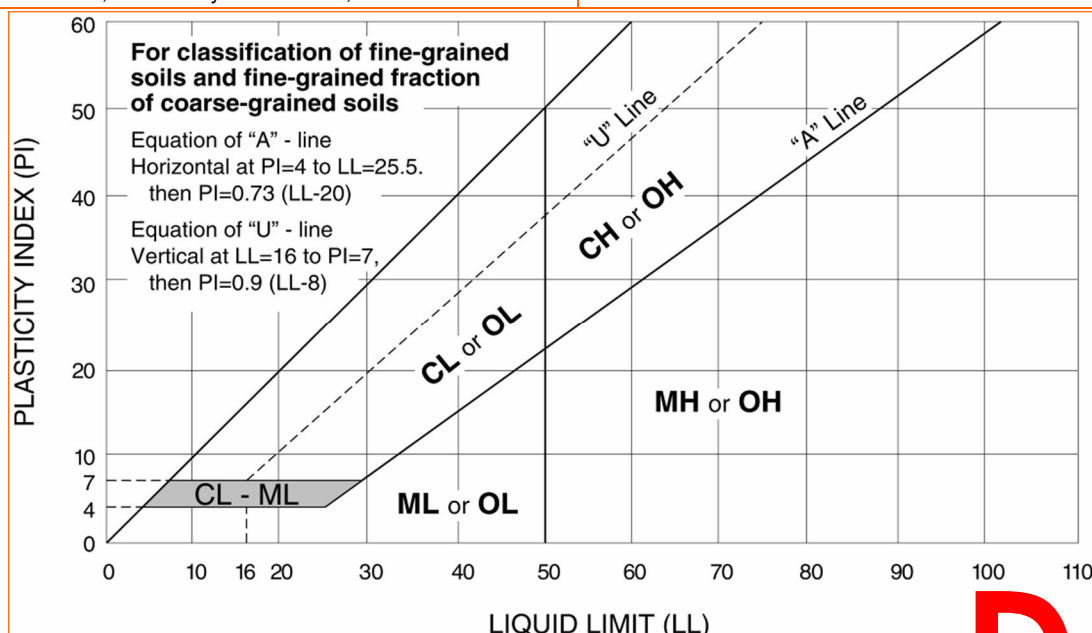
^M If soil contains $\nless 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

^N PI $\nless 4$ and plots on or above "A" line.

^O PI < 4 or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.



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