REPORT OF PRELIMINARY GEOTECHNICAL EXPLORATION

# MEDITERRANEAN DRIVE PROPERTY

**Poinciana, Polk County, Florida**

May 1, 2023

Prepared For:

**Spatial Architecture, LLC**
1420 Celebration Boulevard, Suite 104
Celebration, FL 34787

Attn: Mr. Nicholas Caceres, Principal Architect

Prepared By:

**GEO-TECHNOLOGY ASSOCIATES, INC.**
*Geotechnical and Environmental Consultants*
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Orlando, Florida 32808
(321) 482-4239

GTA Job No: 31222176

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**GEO-TECHNOLOGY ASSOCIATES, INC.**

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

*A Practicing Geoprofessional Business Association Member Firm*

May 1, 2023

**Spatial Architecture, LLC**
1420 Celebration Boulevard, Suite 104
Celebration, FL 34787

Attn: Mr. Nicholas Caceres, Principal Architect

Re: Report of Preliminary Geotechnical Exploration
***Mediterranean Drive Property***
Poinciana, Polk County, Florida

Dear Mr. Caceres:

In general accordance with our proposal, dated October 07, 2022, Geo-Technology Associates, Inc. (GTA) has performed a preliminary geotechnical exploration for the proposed residential development located in Poinciana, Polk County, Florida. Transmitted herein is a report of our findings and our geotechnical recommendations regarding preliminary design and construction of the proposed improvements.

Please note that soil samples collected by GTA will be discarded 10 days after the date of this report, unless other arrangements are made by the Client. Thank you for the opportunity to assist with this project. Should you have any questions or require additional information, please do not hesitate to contact our office.

Very truly yours,
**GEO-TECHNOLOGY ASSOCIATES, INC.**
**Certificate of Authorization No. 35088**

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Florida. License No.: 82816, Expiration Date: 02/28/2025. GSP

Gautham S. Pillappa, P.E.
Vice President

David N. Zmijewski, P.E.
President

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GTA Project No. 31222176

**REPORT OF PRELIMINARY GEOTECHNICAL EXPLORATION**

**MEDITERRANEAN DRIVE PROPERTY**
**POINCIANA, POLK COUNTY, FLORIDA**
**MAY 1, 2023**

## INTRODUCTION

Geo-Technology Associates, Inc. (GTA) is pleased to submit this report to Spatial Architecture, LLC for the proposed residential development planned in Polk County, Florida. Based on our discussions, GTA understands you are in the due diligence phase for a residential subdivision. We were provided with the following documents to assist in our report generation:

- Subdivision Sketch, undated.
- Aerial Maps showing the parcel boundary.
- Polk County property appraiser ID.

The scope of this study included a field exploration, limited laboratory testing and geotechnical engineering analysis. Please note that additional and deeper borings may be necessary once the final development footprint has been finalized.

## SITE CONDITIONS

The planned subdivision is an approximately 8-acre area located south-east of Mediterranean Dr. in Poinciana, Polk County, Florida. A Site Location Map is included as Figure No. 1 in Appendix A. An Aerial Map is included as Figure No. 2 within Appendix A. Figure No. 2 was adapted from an aerial photograph obtained via Google Earth Pro.

Topographically, the site can be characterized as relatively flat. According to information obtained from the United States Geologic Survey (USGS) "Dundee, Florida" quadrangle map, the pre-development ground surface elevations across the site area range from approximately +65 to +70 feet National Geodetic Vertical Datum (NGVD). The site is located east of Lake Marion. According to the USGS map, the normal water level in the lake is approximately +67 feet NGVD.

Refer to the Site Location Map and Aerial Map for further information regarding the site location and existing conditions in the vicinity.

## PROPOSED CONSTRUCTION

GTA understands that the proposed development will include the construction of *single-family* residential units and associated infrastructure, including private roadways and utilities. There was no site plan available at the time of this report. The site is relatively flat; therefore, we assume that fills less than 3 to 4 feet in thickness may be necessary over the majority of the site to achieve final site grades.

## SITE GEOLOGY

Based on a review of the *Geologic Map of the USGS Kissimmee* quadrangle (2018), published by the Florida Geological Survey, the project site lies in the Dunes Tertiary-Quaternary sediments, which is characterized by fine to medium quartz sands with varying amounts of disseminated organic matter. Refer to the Geologic Map, included as Figure No. 3, within Appendix A, for further information on the site geology.

## SUBSURFACE EXPLORATION

### SPT BORINGS

GTA performed a subsurface exploration consisting of five (5) SPT borings in November of 2022. These SPT borings are referenced as Borings G-01 through G-05. The exploration locations were selected based on our discussions and were staked and drilled in the field by GTA's subcontract driller. The approximate boring locations are shown on the Exploration Location Plan, included as Figure No. 4, within Appendix A. The boring logs are included in Appendix B.

The SPT borings were drilled to a maximum depth of 25 feet below the existing surface grades using a track drill rig, equipped with mud rotary equipment, split-spoon samplers, and a manual hammer. The SPT borings were performed in general accordance with the procedures of ASTM D 1586

"Standard Method for Penetration Test and Split-Barrel Sampling of Soils". Standard Penetration Tests and soil samples were continuous in the top 10 feet of each boring and at 5-foot intervals thereafter. Standard Penetration Testing involves driving a 2-inch outside diameter (O.D.), 1⅜-inch inside diameter (I.D.) split spoon sampler with a 140-pound hammer freefalling 30 inches. The SPT N-value, given as blows per foot (bpf), is defined as the total number of blows required to advance the sampler from 6 to 18 inches.

Groundwater levels were measured after the completion of the boreholes. All the borings were backfilled with soil cuttings from the borings and hole-plugged.

Soil samples obtained from the explorations were returned to GTA's laboratory for visual classification and limited laboratory testing. The soil classifications shown on the boring logs are in general accordance with the Unified Soil Classification System (USCS) by visual/manual methods, supplemented by limited laboratory testing.

We note that the recovered samples from the SPT borings were not evaluated for chemical composition, environmental hazards or karst concerns. GTA can provide you with a proposal for these services if needed.

## SUBSURFACE CONDITIONS

The conditions encountered in GTA's subsurface explorations generally confirmed the descriptions presented in the *Site Geology* section of this report. A topsoil layer was encountered at the existing ground surface, generally ranging from 3 to 5 inches thick. Below the topsoil, the borings encountered loose to very dense sandy soils with low fines content [SP] to the maximum termination depth of 25 feet. Blow counts (SPT N-values) varied between 1 blow per foot (bpf) and 50/5" (50 blows for 5 inches of penetration). We note that the dense soil conditions may hinder earthwork activity for smaller equipment. The contractor should select their equipment accordingly.

Groundwater was encountered during drilling at a depth of about 1 foot below existing grades. We estimate that the seasonal high groundwater level may form above existing grade (standing water).

Please note that the seasonal high is an estimate and does not provide any assurance that the groundwater will not exceed this level in the future. Changes in subsurface conditions, rainfall intensity and time durations, on-site or off-site changes etc. can all impact the seasonal high groundwater level.

## LABORATORY TESTING

Selected samples obtained from the test borings were submitted for limited laboratory testing. Five (5) samples were subjected to fines content and moisture content tests. The results of these classification tests are shown on the boring logs in Appendix B.

## CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of this study, it is GTA's opinion that construction of the proposed improvements is feasible, given that the geotechnical recommendations are followed, and that the standard level of care is maintained during construction. The proposed construction may be slightly impacted by the presence of moisture- and disturbance-sensitive, fine-grained soils. Shallow groundwater may also impact construction in most areas of the property. GTA's recommendations are provided in the following paragraphs. This information was derived from engineering analysis of field and laboratory data and our understanding of the project at the time of this study.

### Site Preparation and Structural Fill

Prior to the placement of any controlled, compacted fill, the area to receive fill should be stripped of any deleterious material. GTA anticipates greater stripping thicknesses may be required where tree roots extend several feet below the ground surface. The actual stripping thickness will be dependent on the season of construction, soil moisture, depth of topsoil development, and contractor care. The areas to receive fill should then be proof-rolled to identify any loose, soft, wet, or otherwise unsuitable subgrade materials. Any surficial materials identified as unstable or unsuitable should be undercut to a stable stratum and backfilled with controlled, compacted fill as recommended in the field by the geotechnical engineer. The on-site materials classified as SP are considered suitable for use in structural fill construction. Structural fills should be placed and compacted in a controlled

manner in accordance with project and county specifications. The proof rolling of fill subgrades, undercutting of any uncontrolled or unsuitable material, and the placement of controlled, compacted fill should be observed and tested by GTA or a qualified representative.

## Foundations

Based on experience with similar construction, we assume that the buildings are 1- to 2-story residential structures with column loads not exceeding 20 kips and maximum wall loads not exceeding 5 kips/foot. Based on the results of GTA's borings, the proposed buildings can be founded on shallow spread footings proportioned for a net allowable soil bearing pressure of 2,500 pounds per square foot (psf). The design bearing pressure will need to be confirmed by performing additional borings within the finalized building footprints.

## Pavements

We understand that the traffic on the proposed roadways will mainly be typical residential with some heavy-duty traffic (garbage trucks, moving trucks, etc.). Hence, we assume that a combination of rigid and flexible pavement types will be built for this project.

Based on the subsurface conditions encountered in our borings, the surficial soils appear suitable to support typical residential traffic. A three-layer pavement may be suitable for this development.

It is very critical to evaluate the separation between the pavement base course and the seasonal high groundwater level. Sufficient separation will need to be maintained between the bottom of base course and the anticipated seasonal high groundwater level in accordance with local County/City requirements. We recommend that the seasonal high groundwater and the bottom of the base course be separated by at least 24 inches. The separation should be confirmed by reviewing the final site grading and paving plan.

## Stormwater Pond

The groundwater conditions on this site appear to make it feasible for "wet" ponds. The seasonal high at most of the boring locations may form above existing grade (standing water). The design

parameters for the stormwater pond should be confirmed once the pond location is finalized. The slopes and bottom of the pond should be stabilized in accordance with applicable Water Management District and County/City guidelines.

**Design Level Exploration**

Please note that this exploration was preliminary in nature and should not be used for final design. Once the final site plan is established, GTA recommends a design level exploration be performed within the developmental areas to supplement this exploration.

## LIMITATIONS

This report, including all supporting exploration logs, field data, field notes, laboratory test data, calculations, estimates and other documents prepared by GTA in connection with this project have been prepared for the exclusive use of Spatial Architecture, LLC pursuant to the agreement between GTA and Spatial Architecture, LLC in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions attached thereto are incorporated herein by reference. No warranty, express or implied, is made herein. Use and reproduction of this report by any other person without the expressed written permission of GTA and Spatial Architecture, LLC is unauthorized and such use is at the sole risk of the user.

The analysis and recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Test borings indicate soil conditions only at specific locations and times and only at the depths penetrated. They do not necessarily reflect strata or variations that may exist between test boring locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. Geo-Technology Associates, Inc. is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of Geo-Technology Associates, Inc.

The scope of our services for this geotechnical exploration did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around this site. Any statements in this report or on the logs regarding odors or unusual or suspicious items or conditions observed are strictly for the information of our client.

This report and the attached logs are instruments of service. The subject matter of this report is limited to the facts and matters stated herein. Absence of a reference to any other conditions or subject matter shall not be construed by the reader to imply approval by the writer.

**31222176** **GEO-TECHNOLOGY ASSOCIATES, INC.**

# 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.**

**The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.**

## Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

## Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

*Do not rely on this report* if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

## Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

## You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

*responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

## Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

## This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

## This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

## Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

## Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include 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.

## Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

## Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org


# APPENDIX A

# FIGURES


**Notes**

1. Base image was obtained from AutoCAD 2022 Geolocation tool

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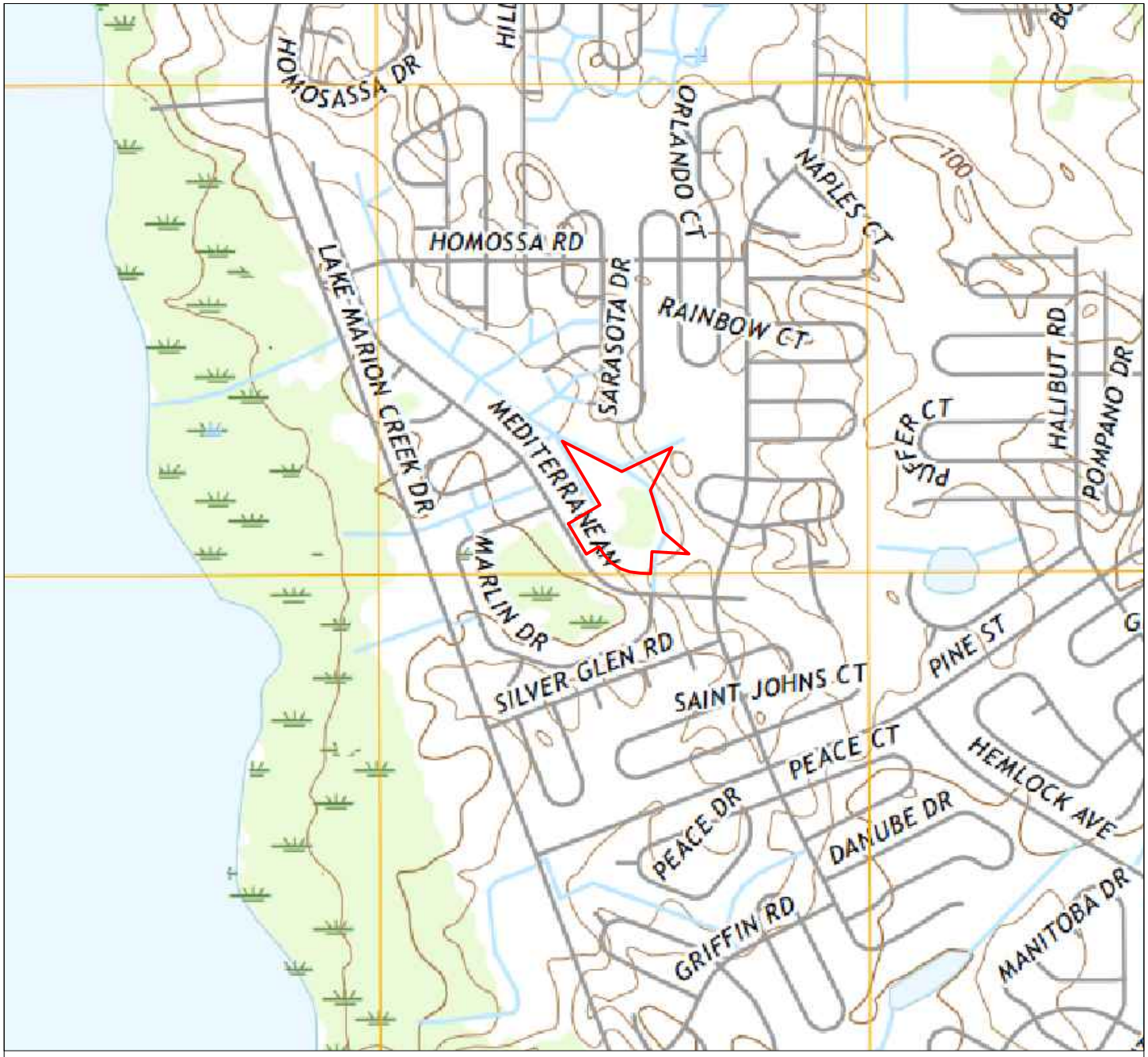
# MEDITERRANEAN DRIVE

KISSIMMEE, POLK COUNTY, FLORIDA

## SITE AERIAL

| PROJECT: 31222176 | DATE: 1/5/2023 | SCALE: 1:3000 | DRAWN BY: KLJ | REVIEW BY: GSP | FIGURE: 2 |
|---|---|---|---|---|---|




**Legend**

Approximate Subject Property Boundary

0 1000 2000 Feet

N

**Notes**

1. Source: Base image was obtained from USGS US Topo 7.5-minute map for Dundee, FL 2021
2. Contour interval of 5 feet

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MEDITERRANEAN DRIVE
KISSIMMEE, POLK COUNTY, FLORIDA

# USGS SITE LOCATION MAP

| PROJECT: 31222176 | DATE: 1/5/2023 | SCALE: 1:1000 | DRAWN BY: KLJ | REVIEW BY: GSP | FIGURE: 1 |
|---|---|---|---|---|---|


**Legend**

Approximate Subject Property Boundary

0 1500 3000 Feet

N

**Tertiary/Quaternary dunes (TQd) -** While not a formally recognized lithostratigraphic unit, this unit is mapped in order to facilitate a better understanding of Florida's geology. Where LiDAR is available these dunes are readily differentiated from other units by their distinct topographic expression. These dune sediments are fine-to medium quartz sand with varying amounts of disseminated organic matter. They are generally found at elevations above 100 feet (30.5 meters) mean sea level, although there are areas along the flanks of the Lake Wales Ridge Complex where elevations of these dune sands can be lower. Sands forming these dunes are derived from re-working of sediments from the Cypresshead Formation (TQc) and undifferentiated Quaternary sediments (Qu).

Base map & legend obtained from the Florida Geologic Survey, Open File Map series 110, plate 1

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MEDITERRANEAN DRIVE
KISSIMMEE, POLK COUNTY, FLORIDA

**GEOLOGIC MAP**

| PROJECT: 31222176 | DATE: 4/28/2023 | SCALE: 1:1500 | DRAWN BY: KLJ | REVIEW BY: GSP | FIGURE: 3 |
|---|---|---|---|---|---|


**Legend**

G-01

Borings G-01 through G-05 were staked and drilled in Nov. 2022 using hand held GPS devices. No survey control was provided.

N

0 150 300 Feet

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MEDITERRANEAN DRIVE

KISSIMMEE, POLK COUNTY, FLORIDA

**EXPLORATION LOCATION PLAN**

| PROJECT: 31222176 | DATE: 4/28/2023 | SCALE: 1:150 | DRAWN BY: KLJ | REVIEW BY: GSP | FIGURE: 4 |
|---|---|---|---|---|---|

# APPENDIX B

# EXPLORATION LOGS

# NOTES FOR EXPLORATION LOGS

## KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

| MAJOR DIVISIONS (BASED UPON ASTM D 2488) | | | | SYMBOLS: GRAPHIC | SYMBOLS: LETTER | |
|---|---|---|---|---|---|---|
| COARSE-GRAINED SOILS: MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVEL AND GRAVELLY SOILS: MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | CLEAN GRAVELS (LESS THAN 5% PASSING THE NO. 200 SIEVE) | | | GW | Well-Graded GRAVEL |
| | | | | | GP | Poorly Graded GRAVEL |
| | | GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE) | | | GM | Silty GRAVEL |
| | | | | | GC | Clayey GRAVEL |
| | SAND AND SANDY SOILS: MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | CLEAN SANDS (LESS THAN 5% PASSING THE NO. 200 SIEVE) | | | SW | Well-Graded SAND |
| | | | | | SP | Poorly Graded SAND |
| | | SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE) | | | SM | Silty SAND |
| | | | | | SC | Clayey SAND |
| FINE-GRAINED SOILS: MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILT OR CLAY (<15% RETAINED ON THE NO. 200 SIEVE); SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED ON THE NO. 200 SIEVE); SANDY OR GRAVELLY SILT OR CLAY (>30% RETAINED ON THE NO. 200 SIEVE) | SILTS AND LEAN CLAYS: LIQUID LIMIT LESS THAN 50 | | | ML | SILT |
| | | | | | CL | Lean CLAY |
| | | | | | OL | |
| | | ELASTIC SILTS AND FAT CLAYS: LIQUID LIMIT GREATER THAN 50 | | | MH | Elastic SILT |
| | | | | | CH | Fat CLAY |
| | | | | | OH | |
| HIGHLY ORGANIC SOILS | | | | | PT | |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS WHICH CONTAIN AN ESTIMATED 5 TO 15% FINES BASED ON VISUAL CLASSIFICATION OR BETWEEN 5 AND 12% FINES BASED ON LABORATORY TESTING; AND FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSS-HATCHED AREA. FINE-GRAINED SOILS ARE CLASSIFIED AS ORGANIC (OL OR OH) WHEN ENOUGH ORGANIC PARTICLES ARE PRESENT TO INFLUENCE ITS PROPERTIES. LABORATORY TEST RESULTS ARE USED TO SUPPLEMENT SOIL CLASSIFICATION BY THE VISUAL-MANUAL PROCEDURES OF ASTM D 2488.

## ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

| | DESCRIPTION | | GRAPHIC SYMBOLS |
|---|---|---|---|
| ADDITIONAL DESIGNATIONS | TOPSOIL | | |
| | MAN MADE FILL | | |
| | GLACIAL TILL | | |
| | COBBLES AND BOULDERS | | |
| RESIDUAL SOIL DESIGNATIONS | DESCRIPTION | "N" VALUE | |
| | HIGHLY WEATHERED ROCK | 50 TO 50/1" | |
| | PARTIALLY WEATHERED ROCK | MORE THAN 50 BLOWS FOR LESS THAN 1" OF PENETRATION, AUGER PENETRABLE | |

### COARSE-GRAINED SOILS
(GRAVEL AND SAND)

| DESIGNATION | BLOWS PER FOOT (BPF) "N" |
|---|---|
| VERY LOOSE | 0 - 4 |
| LOOSE | 5 - 10 |
| MEDIUM DENSE | 11 - 30 |
| DENSE | 31 - 50 |
| VERY DENSE | >50 |

NOTE: "N" VALUE DETERMINED AS PER ASTM D 1586

### FINE-GRAINED SOILS
(SILT AND CLAY)

| CONSISTENCY | BPF "N" |
|---|---|
| VERY SOFT | <2 |
| SOFT | 2 - 4 |
| MEDIUM STIFF | 5 - 8 |
| STIFF | 9 - 15 |
| VERY STIFF | 16 - 30 |
| HARD | >30 |

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

### SAMPLE TYPE

| DESIGNATION | SYMBOL |
|---|---|
| SOIL SAMPLE | S- |
| SHELBY TUBE | U- |
| ROCK CORE | R- |

### WATER DESIGNATION

| DESCRIPTION | SYMBOL |
|---|---|
| ENCOUNTERED DURING DRILLING | ▽ |
| UPON COMPLETION OF DRILLING | ▼ |
| 24 HOURS+ AFTER COMPLETION | ▼ |

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

# LOG OF BORING NO. G-01

PROJECT: **Mediterranean Drive**
PROJECT NO.: **31222176**
PROJECT LOCATION: **Polk County, Florida**

WATER LEVEL (ft): **1.0**
DATE: **11/14/2022**
CAVED (ft):

DATE STARTED: **11/14/2022**
DATE COMPLETED: **11/14/2022**
DRILLING CONTRACTOR: **AGD**
DRILLER: **AGD**
DRILLING METHOD: **Mud Rotary**
SAMPLING METHOD: **Split Spoon/Automatic Hammer**

WATER ENCOUNTERED DURING DRILLING (ft) **1.0**
GROUND SURFACE ELEVATION:
DATUM:
EQUIPMENT: **Beaver Truck**
LOGGED BY: **SHG**
CHECKED BY: **GSP**

| SAMPLE NUMBER | SAMPLE DEPTH (ft.) | SAMPLE RECOVERY (in.) | SAMPLE BLOWS/6 inches | N (blows/ft.) | ELEVATION (ft.) | DEPTH (ft.) | USCS | GRAPHIC SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.0 | 0 | SP | | Brown, moist, very loose, poorly graded SAND. | ▼ |
| S-1 | 0.0 | | 2-2-2-1 | 4 | | | | | | |
| S-2 | 2.0 | | 3-3-5-4 | 8 | | | | | Same, wet, loose | |
| S-3 | 4.0 | | 6-7-9-15 | 16 | | 5 | | | Same, medium dense | |
| S-4 | 6.0 | | 5-6-8-10 | 14 | | | | | Same, gray/brown | |
| S-5 | 8.0 | | 5-7-10-15 | 17 | | | | | | M/C= 19%<br>F/C= 1% |
| | | | | | | 10 | | | | |
| S-6 | 13.5 | | 7-10-12 | 22 | | | | | | |
| | | | | | | 15 | | | | |
| S-7 | 18.5 | | 15-25-28 | 53 | | | | | Same, brown, very dense | |
| | | | | | | 20 | | | | |
| S-8 | 23.5 | | 13-20-22 | 42 | | | | | Same, dense | |
| | | | | | -25.0 | 25 | | | Boring terminated at 25 feet. | |
| | | | | | | 30 | | | | |

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
4617 Parkbreeze Court
Orlando, FL 32808

LOG OF BORING NO. G-01

# LOG OF BORING NO. G-02

PROJECT: **Mediterranean Drive**
PROJECT NO.: **31222176**
PROJECT LOCATION: **Polk County, Florida**

WATER LEVEL (ft): **1.0**
DATE: **11/14/2022**
CAVED (ft):

DATE STARTED: **11/14/2022**
DATE COMPLETED: **11/14/2022**
DRILLING CONTRACTOR: **AGD**
DRILLER: **AGD**
DRILLING METHOD: **Mud Rotary**
SAMPLING METHOD: **Split Spoon/Automatic Hammer**

WATER ENCOUNTERED DURING DRILLING (ft) **1.0**
GROUND SURFACE ELEVATION:
DATUM:
EQUIPMENT: **Beaver Truck**
LOGGED BY: **SHG**
CHECKED BY: **GSP**

| SAMPLE NUMBER | SAMPLE DEPTH (ft.) | SAMPLE RECOVERY (in.) | SAMPLE BLOWS/6 inches | N (blows/ft.) | ELEVATION (ft.) | DEPTH (ft.) | USCS | GRAPHIC SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.0 | 0 | | | | |
| S-1 | 0.0 | | 2-2-2-4 | 4 | | | SP | | Dark brown, moist, very loose, poorly graded SAND with trace organics. | ▼ |
| S-2 | 2.0 | | 5-7-7-6 | 14 | | | | | Same, brown, wet, medium dense | |
| S-3 | 4.0 | | 6-7-7-8 | 14 | | 5 | | | | |
| S-4 | 6.0 | | 7-6-9-8 | 15 | | | | | | |
| S-5 | 8.0 | | 8-12-16-16 | 28 | | | | | Same, light brown | |
| | | | | | | 10 | | | | |
| S-6 | 13.5 | | 9-10-12 | 22 | | | | | | |
| | | | | | | 15 | | | | |
| S-7 | 18.5 | | 6-10-10 | 20 | | | | | | |
| | | | | | | 20 | | | | |
| S-8 | 23.5 | | 9-14-17 | 31 | | | | | Same, brown, dense | M/C= 23%<br>F/C= 2% |
| | | | | | -25.0 | 25 | | | Boring terminated at 25 feet. | |
| | | | | | | 30 | | | | |

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
4617 Parkbreeze Court
Orlando, FL 32808

LOG OF BORING NO. G-02

# LOG OF BORING NO. G-03

PROJECT: **Mediterranean Drive**
PROJECT NO.: **31222176**
PROJECT LOCATION: **Polk County, Florida**

WATER LEVEL (ft): **1.0**
DATE: **11/14/2022**
CAVED (ft):

DATE STARTED: **11/14/2022**
DATE COMPLETED: **11/14/2022**
DRILLING CONTRACTOR: **AGD**
DRILLER: **AGD**
DRILLING METHOD: **Mud Rotary**
SAMPLING METHOD: **Split Spoon/Automatic Hammer**

WATER ENCOUNTERED DURING DRILLING (ft) **1.0**
GROUND SURFACE ELEVATION:
DATUM:
EQUIPMENT: **Beaver Truck**
LOGGED BY: **SHG**
CHECKED BY: **GSP**

| SAMPLE NUMBER | SAMPLE DEPTH (ft.) | SAMPLE RECOVERY (in.) | SAMPLE BLOWS/6 inches | N (blows/ft.) | ELEVATION (ft.) | DEPTH (ft.) | USCS | GRAPHIC SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.0 | 0 | | | | |
| S-1 | 0.0 | | 2-4-8-8 | 12 | | | SP | | Dark gray, moist, medium dense, poorly graded SAND. | ▼ |
| S-2 | 2.0 | | 6-8-8-9 | 16 | | | | | Same, wet | |
| S-3 | 4.0 | | 50/5 | 50/5 | | 5 | | | Same, very dense | |
| S-4 | 6.0 | | 7-12-11-13 | 23 | | | | | Same, brown, medium dense | |
| S-5 | 8.0 | | 2-6-7-8 | 13 | | | | | | |
| | | | | | | 10 | | | | |
| S-6 | 13.5 | | 7-16-40 | 56 | | | | | Same, gray/brown, very dense | |
| | | | | | | 15 | | | | |
| S-7 | 18.5 | | 7-9-15 | 24 | | | | | Same, medium dense | M/C= 22%<br>F/C= 1% |
| | | | | | | 20 | | | | |
| S-8 | 23.5 | | 12-28-45 | 73 | | | | | Same, brown, very dense | |
| | | | | | -25.0 | 25 | | | Boring terminated at 25 feet. | |
| | | | | | | 30 | | | | |

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
4617 Parkbreeze Court
Orlando, FL 32808

LOG OF BORING NO. G-03

# LOG OF BORING NO. G-04

PROJECT: **Mediterranean Drive**
PROJECT NO.: **31222176**
PROJECT LOCATION: **Polk County, Florida**

WATER LEVEL (ft): **1.0**
DATE: **11/14/2022**
CAVED (ft):

DATE STARTED: **11/14/2022**
DATE COMPLETED: **11/14/2022**
DRILLING CONTRACTOR: **AGD**
DRILLER: **AGD**
DRILLING METHOD: **Mud Rotary**
SAMPLING METHOD: **Split Spoon/Automatic Hammer**

WATER ENCOUNTERED DURING DRILLING (ft) **1.0**
GROUND SURFACE ELEVATION:
DATUM:
EQUIPMENT: **Beaver Truck**
LOGGED BY: **SHG**
CHECKED BY: **GSP**

| SAMPLE NUMBER | SAMPLE DEPTH (ft.) | SAMPLE RECOVERY (in.) | SAMPLE BLOWS/6 inches | N (blows/ft.) | ELEVATION (ft.) | DEPTH (ft.) | USCS | GRAPHIC SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.0 | 0 | | | | |
| S-1 | 0.0 | | 3-2-3-2 | 5 | | | SP | | Brown/gray, moist, loose, poorly graded SAND. | ▼ |
| S-2 | 2.0 | | 5-5-7-4 | 12 | | | | | Same, gray, medium dense | |
| S-3 | 4.0 | | 5-5-4-7 | 9 | | 5 | | | Same, wet | |
| S-4 | 6.0 | | 6-5-7-10 | 12 | | | | | Same, medium dense | M/C= 20%<br>F/C= 1% |
| S-5 | 8.0 | | 7-5-8-11 | 13 | | | | | Same, brown | |
| | | | | | | 10 | | | | |
| S-6 | 13.5 | | 10-15-20 | 35 | | | | | Same, dense | |
| | | | | | | 15 | | | | |
| S-7 | 18.5 | | 9-17-21 | 38 | | | | | | |
| | | | | | | 20 | | | | |
| S-8 | 23.5 | | 10-12-15 | 27 | | | | | Same, medium dense | |
| | | | | | -25.0 | 25 | | | Boring terminated at 25 feet. | |
| | | | | | | 30 | | | | |

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
4617 Parkbreeze Court
Orlando, FL 32808

LOG OF BORING NO. G-04

# LOG OF BORING NO. G-05

PROJECT: **Mediterranean Drive**
PROJECT NO.: **31222176**
PROJECT LOCATION: **Polk County, Florida**

WATER LEVEL (ft): **1.0**
DATE: **11/14/2022**
CAVED (ft):

DATE STARTED: **11/14/2022**
DATE COMPLETED: **11/14/2022**
DRILLING CONTRACTOR: **AGD**
DRILLER: **AGD**
DRILLING METHOD: **Mud Rotary**
SAMPLING METHOD: **Split Spoon/Automatic Hammer**

WATER ENCOUNTERED DURING DRILLING (ft) **1.0**
GROUND SURFACE ELEVATION:
DATUM:
EQUIPMENT: **Beaver Truck**
LOGGED BY: **SHG**
CHECKED BY: **GSP**

| SAMPLE NUMBER | SAMPLE DEPTH (ft.) | SAMPLE RECOVERY (in.) | SAMPLE BLOWS/6 inches | N (blows/ft.) | ELEVATION (ft.) | DEPTH (ft.) | USCS | GRAPHIC SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.0 | 0 | SP | | Brown/gray, moist, loose, poorly graded SAND. | ▼ |
| S-1 | 0.0 | | 2-3-4-6 | 7 | | | | | | |
| S-2 | 2.0 | | 6-8-9-8 | 17 | | | | | Same, medium dense | |
| S-3 | 4.0 | | 4-6-8-10 | 14 | | 5 | | | Same, wet | M/C= 22%<br>F/C= 1% |
| S-4 | 6.0 | | 7-10-15-17 | 25 | | | | | Same, brown | |
| S-5 | 8.0 | | 9-12-13-15 | 25 | | | | | | |
| | | | | | | 10 | | | | |
| S-6 | 13.5 | | 8-13-18 | 31 | | | | | Same, dense | |
| | | | | | | 15 | | | | |
| S-7 | 18.5 | | 10-15-21 | 36 | | | | | | |
| | | | | | | 20 | | | | |
| S-8 | 23.5 | | 14-10-18 | 28 | | | | | Same, medium dense | |
| | | | | | -25.0 | 25 | | | Boring terminated at 25 feet. | |
| | | | | | | 30 | | | | |

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
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Orlando, FL 32808

LOG OF BORING NO. G-05