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Report of Geotechnical Exploration

**Proposed Three Oaks Pkwy. Extension Phase 1 and 2
Fiddlesticks Boulevard
Fort Myers, Lee County, Florida**

**July 10, 2024
UES Project No.: 0530.2300329.0000**

Prepared For:

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Attention: Mr. Albert Martes-Rodriguez
Phone: (239) 573-2077

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July 10, 2024

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**Subject: Geotechnical Exploration
Fiddlesticks Boulevard
Three Oaks Parkway Extension Phase 1 and 2
Fort Myers, Lee County, Florida
UES Project No. 0530.2300329.0000**

Dear Mr. Albert Martes-Rodriguez:

UES has completed the subsurface exploration and geotechnical engineering evaluation for the above-referenced project in accordance with the geotechnical and engineering service agreement for this project. The scope of UES's exploration was planned in conjunction with and authorized by you. This exploration was performed in accordance with generally accepted soil and foundation engineering practices.

EXECUTIVE SUMMARY

The purpose of subsurface exploration was to classify the nature of the subsurface soils and general geomorphic conditions and evaluate their impact upon the proposed construction. This report contains and provides the findings and conclusions. It has been prepared for the exclusive use of Avalon Engineering, Inc. and their consultants for specific application to the subject project in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made.

UES understands that the project under consideration involves the partial first phase and second phase of the planned extension of Three Oaks Parkway, from the current terminus south of the Fiddlesticks canal to Daniels Parkway. This segment of the project will consist of planned construction of roadway alignment from south of Indian Pony Drive to Fiddlesticks Blvd. and then connects to Daniels Parkway [STA 272+00 to STA 314+00] in Fort Myers, Lee County, Florida. This segment also includes a Fiddlesticks connector alignment from the intersection of Indian Pony Drive and Fiddlesticks Blvd. and joins the new alignment at STA 297+00. UES was provided with the plan depicting the location of the proposed construction and desired hand auger boring and pavement core locations. The recommendations provided herein are based upon the above considerations. If the project description has been revised, please inform UES so that UES may review their recommendations with respect to any modifications.

The following testing was completed for this study:

- A total of forty-five (45) Hand Auger (HA) borings to depths of approximately 3 to 5 feet below ground surface (BGS) were completed at the desired locations within the proposed Fiddlesticks Boulevard as a part of the Three Oaks Parkway Extension.
- Six (6) pavement cores were extracted at the existing Fiddlesticks Boulevard (in between Indian Pony Drive and Daniels Parkway) using 3-inch I.D. diamond impregnated core barrel.

The subsurface soil conditions encountered at this site generally consists of sands (SP/A-3) with trace amounts (if any) of clay, silt, gravel, roots and wood fragments and varying amounts (if any) of limestone fragments, sands with silt (SP-SM/A-2-4) with some (if any) limestone fragments and trace amounts (if any) of gravel, and clayey sands (SC/A-2-4) with trace amounts (if any) of roots to the boring termination depths. Please refer to "Appendix D - Record of Hand Auger Boring Logs" for a detailed account of each boring.

The following report presents the project information made available to UES, UES's observation of the existing site conditions, the subsurface geotechnical information obtained during this exploration, and UES's recommendations on the suitability of the soils encountered for the proposed road expansion. Also included with this report are the results of the field and laboratory testing. The assessment of site environmental conditions for the presence of pollutants in the soil, rock, and groundwater at this site was not included as a part of UES's services.

UES appreciates the opportunity to be of service to you on this project and look forward to a continued association. Please do not hesitate to contact UES if you have any questions or comments, or if we may further assist you as your plans proceed.

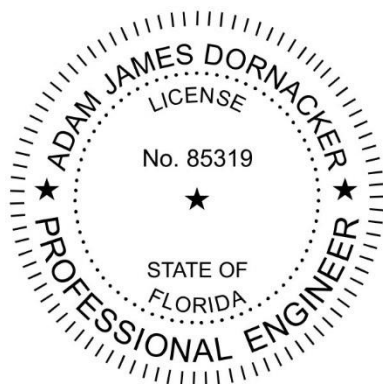
Respectfully Submitted,

UES

Registry Number 4930



Ashok Neela
Staff Engineer



Adam J. Dornacker, P.E. No. 85319
State of Florida
Geotechnical Department Manager

*This document has been digitally
signed and sealed by*

on the date adjacent to the seal.

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electronic copies.*



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1.0 INTRODUCTION

1.1 Scope of Services

The objective of UES's geotechnical services was to collect subsurface data for the subject project, summarize the test results, and discuss any apparent site conditions that may have geotechnical significance for the roadway widening. The following scope of service is provided within this report:

1. Conduct forty-five (45) Hand Auger (HA) borings to determine the nature and condition of the subsurface soils and preparing record logs of these soil borings depicting the subsurface soil conditions encountered during the field exploration.
2. Review each soil sample obtained during the field exploration for classification and additional testing, if necessary.
3. Analyze the existing soil conditions found during our exploration for the suitability of the soils encountered for the roadway expansion.
4. Provide recommendations with respect to backfill material for the roadway expansion.
5. Provide criteria and site preparation procedures to prepare the site for the proposed construction.

1.2 Project Description

UES understands that the project under consideration involves the partial first phase and second phase of the planned extension of Three Oaks Parkway, from the current terminus south of the Fiddlesticks canal to Daniels Parkway. This segment of the project will consist of planned construction of roadway alignment from south of Indian Pony Drive to Fiddlesticks Blvd. and then connects to Daniels Parkway [STA 272+00 to STA 314+00] in Fort Myers, Lee County, Florida. This segment also includes a Fiddlesticks connector alignment from the intersection of Indian Pony Drive and Fiddlesticks Blvd. and joins the new alignment at STA 297+00. UES was provided with the plan depicting the location of the proposed construction and desired hand auger boring and pavement core locations. The recommendations provided herein are based upon the above considerations. If the project description has been revised, please inform UES so that UES may review their recommendations with respect to any modifications.

2.0 OBSERVATIONS

2.1 Site Inspection

The recovered samples were not evaluated, either visually or analytically, for chemical composition or environmental hazards. UES would be pleased to perform these services for an additional fee, if required.



2.2 Field Exploration

The following testing was completed for this study:

- A total of forty-five (45) Hand Auger (HA) borings to depths of approximately 3 to 5 feet below ground surface (BGS) were completed at the desired locations within the proposed Fiddlesticks Boulevard as a part of the Three Oaks Parkway Extension.
- Six (6) pavement cores were extracted at the existing Fiddlesticks Boulevard (in between Indian Pony Drive and Daniels Parkway) using 3-inch I.D. diamond impregnated core barrel.

The locations of the hand auger borings performed are illustrated in “Appendix B – Test Location Plan”. The soil samples recovered from the soil borings were visually classified and their stratification is illustrated in “Appendix D – Record of Hand Auger Boring Logs”. It should be noted that soil conditions might vary between the strata interfaces, which are shown. The soil boring data reflect information from a specific test location only. The indicated depth and location of each test was approximated based upon existing grade and estimated distances and relationships to obvious landmarks. The boring depths were selected based on UES’s knowledge of vicinity soils and to include the zone of soil likely to be stressed by the proposed construction.

2.3 Laboratory Testing

Soil samples recovered from our field exploration were returned to our laboratory where they were visually examined in general accordance with ASTM D-2488. Samples were evaluated to obtain an accurate understanding of the soil properties and site geomorphic conditions. After a thorough visual examination of the recovered site soils, laboratory testing was conducted to determine gradation analysis on individual samples.

All laboratory tests were conducted in general accordance with ASTM, AASHTO, or Florida Methods, as applicable. The method number for each test and the number of tests completed are presented in the following table.

TABLE 1: LABORATORY METHODOLOGIES		
TEST DESCRIPTION	NUMBER OF TESTS	TEST METHOD
Gradation Analysis	14	AASHTO T-27

Bag samples of the soil encountered during the field exploration will be held in UES’s laboratory for your inspection for 45 days and then discarded unless UES is notified otherwise in writing.

2.4 Geomorphic Conditions

Boring logs derived from our field exploration are presented in “Appendix D – Record of Hand Auger Boring Logs”. The hand auger logs depict the observed soils in graphic detail. The classifications and descriptions shown on the logs are generally based upon visual characterizations of the recovered soil samples.



All soil samples reviewed have been depicted and classified in general accordance with the American Association of State Highway and Transportation Officials (AASHTO), modified as necessary to describe typical southwest Florida conditions. See "Appendix E – Discussion of Soil Groups", for a detailed description of various soil groups.

The subsurface soil conditions encountered at this site generally consists of sands (SP/A-3) with trace amounts (if any) of clay, silt, gravel, roots and wood fragments and varying amounts (if any) of limestone fragments, sands with silt (SP-SM/A-2-4) with some (if any) limestone fragments and trace amounts (if any) of gravel, and clayey sands (SC/A-2-4) with trace amounts (if any) of roots to the boring termination depths. Please refer to "Appendix D - Record of Hand Auger Boring Logs" for a detailed account of each boring.

2.5 Hydrogeological Conditions

On the dates of the field exploration, the groundwater table was encountered at depths of approximately 3 inches to 4 feet below the existing ground surface. The groundwater table will fluctuate seasonally depending upon local rainfall and other site specific and/or local influences such as tidal events. Brief ponding of stormwater may occur across the site after heavy rains.

No additional investigation was included in the scope of work in relation to the wet seasonal high groundwater table or any existing well fields in the vicinity. Well fields may influence water table levels and cause significant fluctuations. If a more comprehensive water table analysis is necessary, please contact UES for additional guidance.

The following descriptive characteristics of the nine (9) types of soil surveys encountered during the drilling operations based on the soil survey of Lee County, Florida, published by the United States Department of Agriculture (USDA). A brief summary of the mapped surficial (native) soil type(s) is presented in below Table

TABLE 2: SUMMARY OF PUBLISHED SOIL DATA				
Soil Symbol	Soil Type	Hydrologic Group	Drainage Characteristics	Depth of Published Seasonal High GWT (feet)
14	Valkaria fine sand, 0 to 2 percent slopes	A/D	Poorly drained	About 3 to 18 inches
28	Immokalee sand, 0 to 2 percent slopes	B/D	Poorly drained	About 6 to 18 inches
33	Oldsmar sand, 0 to 2 percent slopes	A/D	Poorly drained	About 6 to 18 inches
34	Malabar fine sand, 0 to 2 percent slopes	A/D	Poorly drained	About 3 to 18 inches
36	Immokalee sand – Urban land complex, 0 to 2 percent slopes	B/D	Poorly drained	About 6 to 18 inches
73	Pineda fine sand, frequently ponded, 0 to 1 percent slopes	A/D	Very Poorly drained	About 0 inches



TABLE 2: SUMMARY OF PUBLISHED SOIL DATA				
Soil Symbol	Soil Type	Hydrologic Group	Drainage Characteristics	Depth of Published Seasonal High GWT (feet)
125	Oldsmar sand – Urban land, 0 to 2 percent slopes	A/D	Poorly drained	About 6 to 18 inches
132	Pompano sand, ponded – Urban land complex, 0 to 1 percent slopes	A/D	Very poorly drained	About 0 inches
136	Valkaria fine sand – Urban land complex, 0 to 2 percent slopes	A/D	Poorly drained	About 3 to 18 inches

Please note that the SCS soil survey data is based on pre-developmental conditions. The native subsurface conditions depicted on the soil survey may have been altered during previous development of the site and are not necessarily representative of the current subsurface conditions encountered during the exploration. Please refer to “Appendix A: Vicinity and Soil Survey Map.”

3.0 ENGINEERING EVALUATION AND RECOMMENDATIONS

3.1 General

The geotechnical evaluations for the proposed construction site are based on the subsurface soil and groundwater conditions encountered during this study, the project information made available, our site observations, and our experience in the vicinity. The test data has been evaluated using established geotechnical parameters of the soils recorded at this site, laboratory test results, and the observed performance of similar soil types.

Based on the soil conditions encountered in the performed borings, the near surface soils generally meet the FDOT Standard Specifications for Road and Bridge Construction, Standard Plans index 120-001, for “select soil” (A-3, A-2-4). The roadway improvement may be designed according to the recommendations and site preparations as discussed below proceed and according to F.D.O.T. indices 120-001 and 120-002.

3.2 Site Preparation Procedures

Site preparation procedures should begin with the removal of existing debris, vegetation, or other unsuitable materials within and beyond the excavation construction.

The organic soils, if encountered during construction, shall be removed and replaced to a required level (the future project specification) with a compacted suitable fill. All suitable fill material shall contain less than 5 percent of fines passing the No. 200 sieve, not contain clay balls and rock fragments greater than 3 inches in diameter. The fill material utilized should consist of a clean sand with less than 5 percent soil fines. Fill materials with soil fines between 5 and 12 percent may be used, so long as strict moisture control is applied (within 2% of optimum moisture).



The soils that extend below the water table should be allowed to dry prior to placement as a backfill material and compaction. This can be accomplished by stockpiling the material and allowing it to drain, or by spreading it in relatively thin lifts on the surface and allowing it to dry prior to compaction. The silty or sands with clay may require moisture conditioning so that the soil moisture content at the time of compaction is at or near the optimum moisture content. During the compaction operation, a geotechnical engineer or an engineering technician working under his direction should observe the soils to verify that the exposed soils are suitable and that unsuitable soils have been removed. Samples of the backfill materials should be obtained to determine the grain size distribution, its maximum dry density and optimum moisture content in the laboratory in accordance with AASTHO T-99.

The fill material should be placed in uniform 10 to 12 inch loose lifts and compacted to 100 percent of the standard Proctor maximum, dry density (AASHTO T-99). Field density tests should be performed on each layer of fill material at a frequency of one test for every 500 linear feet of construction for each lane or associated area.

UES recommends the following compaction requirements for this project:

- Proof Roll And Fill.....100% of a Standard Proctor

The compaction percentages presented above are based upon the maximum dry density as determined by a “standard proctor” test (AASHTO T-99). All density tests should be performed to a depth of 12” below the tested surface unless noted otherwise. All density tests should be performed using the nuclear method (ASTM D-6938) or the sand cone method (ASTM D-1556).

UES recommends all fill placement and quality control to be conducted in accordance with FDOT Standard Specifications for Road and Bridge Construction: Section 120 “Excavation and Embankment” and all underlay material to follow Section 911 “Base and Stabilized Base Materials”. Based upon soils classification and laboratory testing it appears most of the existing subgrade soils will have to be stabilized according to FDOT guidelines to meet the LBR requirements of 40 for a stabilized subgrade.

Using vibratory compaction equipment at this site may disturb adjacent structures. UES recommends that you monitor nearby structures before and during proof-compaction operations. A representative of UES can monitor the vibration disturbance of adjacent structures. A proposal for vibration monitoring during compaction operations can be supplied upon request.

3.3 Pavement Design

UES was provided with Design Memorandum dated April 09, 2019 prepared by McCormick Taylor, Inc. providing the traffic analysis assumptions. The document provided the Fiddlesticks/Three Oaks Boulevard (Alico Road to Daniels Parkway) Equivalent Single Axle Loads (ESALs) as 146,000 for Build 2025 opening year and 244,000 for Build 2040 design year. The accumulated 18 kip Equivalent Single Axle Loads (ESAL) in design lane for the design period is 3,083,000. Based on the LBR test results of bulk samples obtained along the alignment, UES recommends a design LBR value of 30. This correlates to a Resilient Modulus (M_R) of 10,000 psi. Assuming a 2 feet clearance between bottom of the base course and the seasonal high water table the (M_R) value was reduced by 25 percent to 7500 psi for the design purposes.



Finally, a reliability of 90 percent was used for design. Based on the design tables in the 2024 FDOT Flexible Design Manual, the pavement section will need to have a minimum structural number of 4.15. According to the Lee County Land Development Code, Chapter 10, Section 296, Table 3, the minimum pavement design structural number for a principal/minor arterial roadway should be 4.3, and as such we recommend designing per the Lee County requirements with the following minimum thickness values. The pavement section should consist of a friction course consisting of one-inch Type S-III (section 331, FDOT specifications) OR SUPERPAVE 9.5, 2½-inch structural course of asphaltic concrete FDOT Type S-1 or SUPERPAVE 12.5, FDOT Optional Base Group 9 (ten inches of compacted limerock or similar), and twelve-inch-thick stabilized subgrade LBR40 (Type B Stabilization).

3.4 Pavement Cores

It should be noted that UES did not perform a complete asphalt evaluation for this project. A total of six (6) cores were extracted along the existing Fiddlesticks Roadway from Indian Pony Drive to Daniels Parkway, please refer to the test location plan for approximate core locations. The thicknesses of the existing asphalt ranged from 1.75 inches to 4 inches with an average thickness of 3.3 inches. The pavement core results are presented in “Appendix F: Asphalt Thickness by Core Determination.”

4.0 REPORT LIMITATIONS

This consulting report has been prepared for the exclusive use of the current project owners and other members of the design team for the Three Oaks Parkway extension and Fiddlesticks connector in Fort Myers, Lee County, Florida. This report has been prepared in accordance with generally accepted local geotechnical engineering practices; no other warranty is expressed or implied. The evaluation submitted in this report, is based in part upon the data collected during a field exploration, however, the nature and extent of variations throughout the subsurface profile may not become evident until the time of construction. If variations then appear evident, it may be necessary to reevaluate information and professional opinions as provided in this report. In the event changes are made in the nature, design, or locations of the proposed structure, the evaluation and opinions contained in this report shall not be considered valid, unless the changes are reviewed and conclusions modified or verified in writing by UES. UES is not responsible for damage caused by soil improvement and/or construction activity vibrations related to this project. UES is also not responsible for damage concerning drainage or moisture related issues for the proposed or nearby structures.

5.0 BASIS FOR RECOMMENDATIONS

The analysis and recommendations submitted in this report are based on the data obtained from the tests performed at the locations indicated on the attached figure in Appendix B. This report does not reflect any variations, which may occur between borings. While the borings are representative of the subsurface conditions at their respective locations and for their vertical reaches, local variations characteristic of the subsurface soils of the region are anticipated and may be encountered. The delineation between soil types shown on the soil logs is approximate and the description represents UES’s interpretation of the subsurface conditions at the designated boring locations on the particular date drilled.

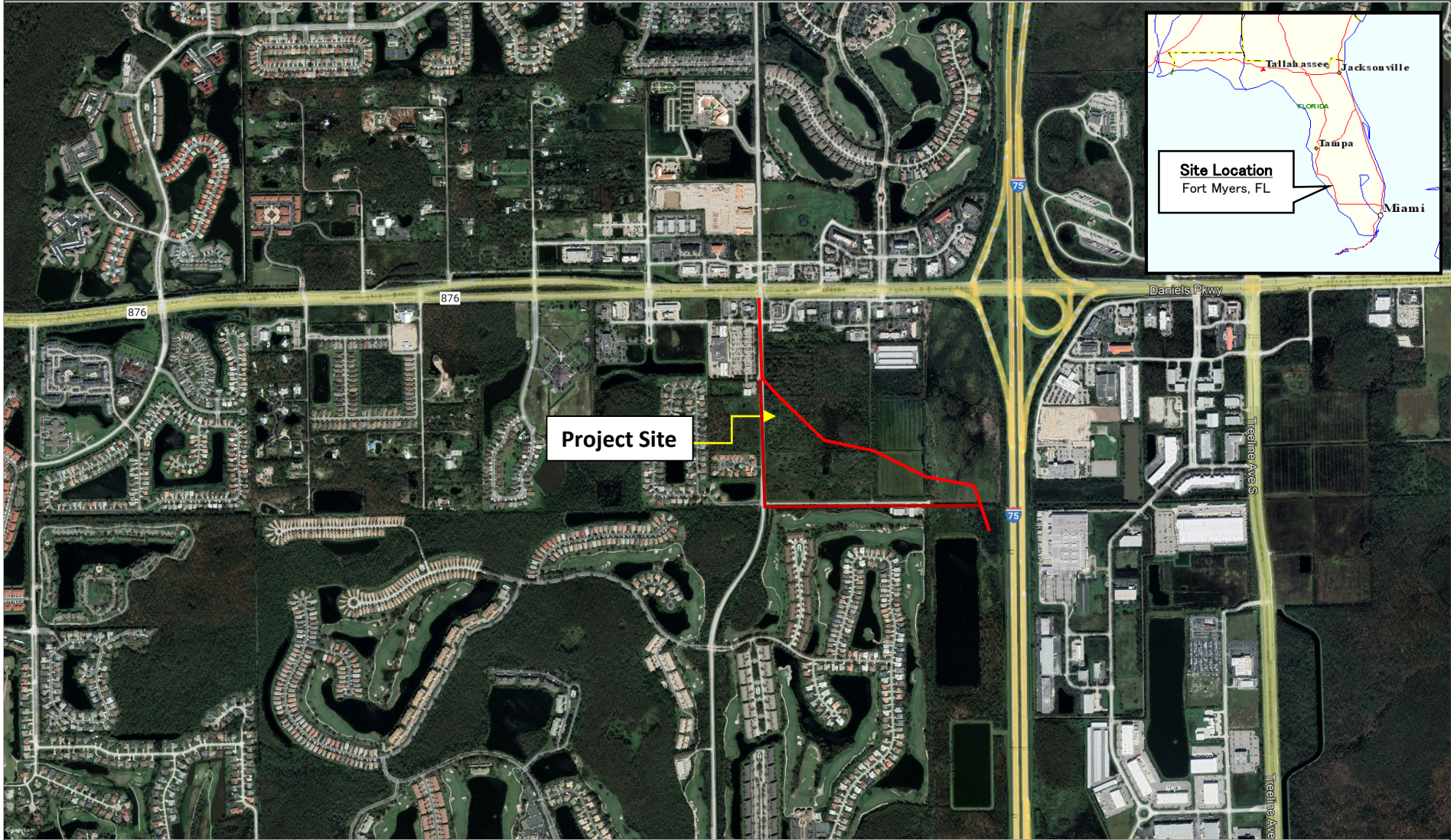


Any third party reliance on this geotechnical report or parts thereof is strictly prohibited without the expressed written consent of UES. The methodology (ASTM D-1586) used in performing our borings and for determining penetration resistance is specific to the sampling tools utilized and does not reflect the ease or difficulty of advancing other tools or materials.

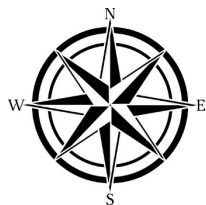


Appendix A – Vicinity & Soil Survey Map





Project Site



VICINITY MAP
SOURCE: GOOGLE EARTH PRO©



**Fiddlesticks Boulevard
Three Oaks Parkway Extension
Fort Myers, Lee County, FL**

Drawn By: Ashok Neela	Checked By: AJD	Date: 06/05/2024
Project No.: 0530.2300329.0000	Approved By: Adam Dornacker, P.E.	



SOIL SURVEY MAP

SOURCE: USDA NRCS Web Soil Survey©

- Soil Map Unit Symbol



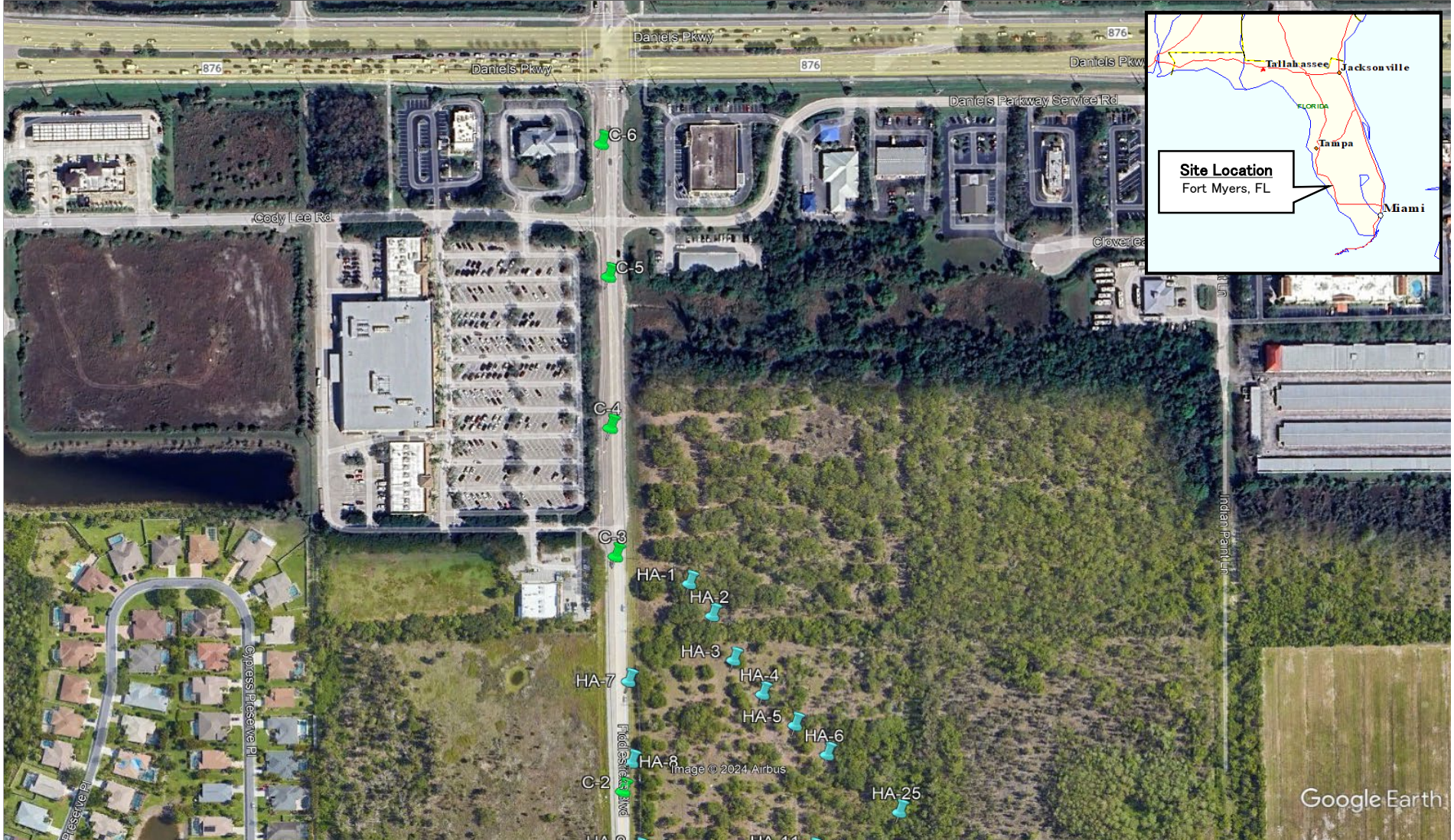
**Fiddlesticks Boulevard
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Project No.: 0530.2300329.0000	Approved By: Adam Dornacker, P.E.
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Appendix B – Test Location Plan





TEST LOCATION PLAN

SOURCE: GOOGLE EARTH PRO ©
 B-# Approximate boring locations
 C-# Approximate Pavement core locations



**Fiddlesticks Boulevard
 Three Oaks Parkway Extension
 Fort Myers, Lee County, FL**

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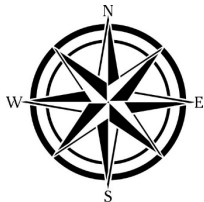
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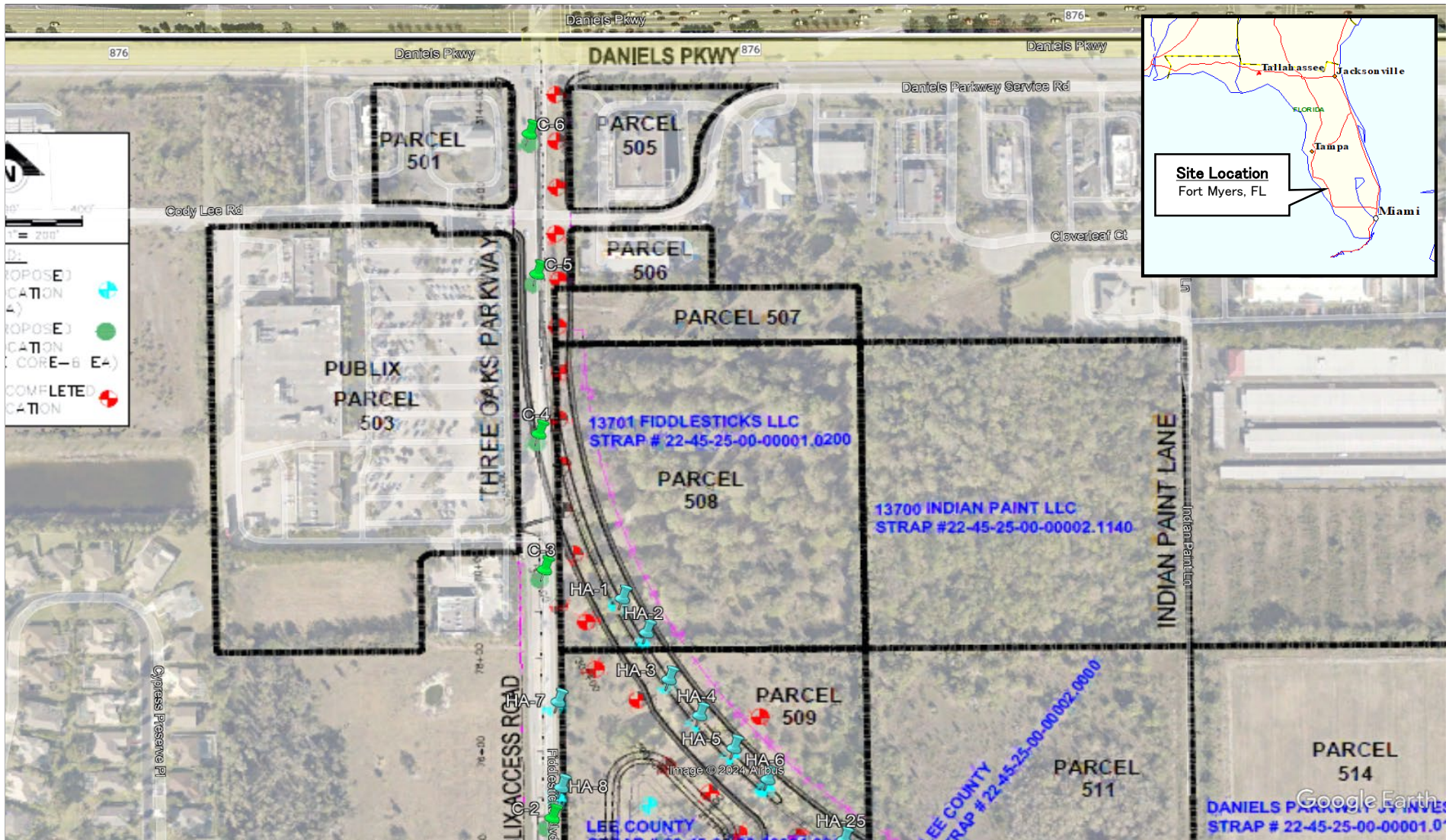
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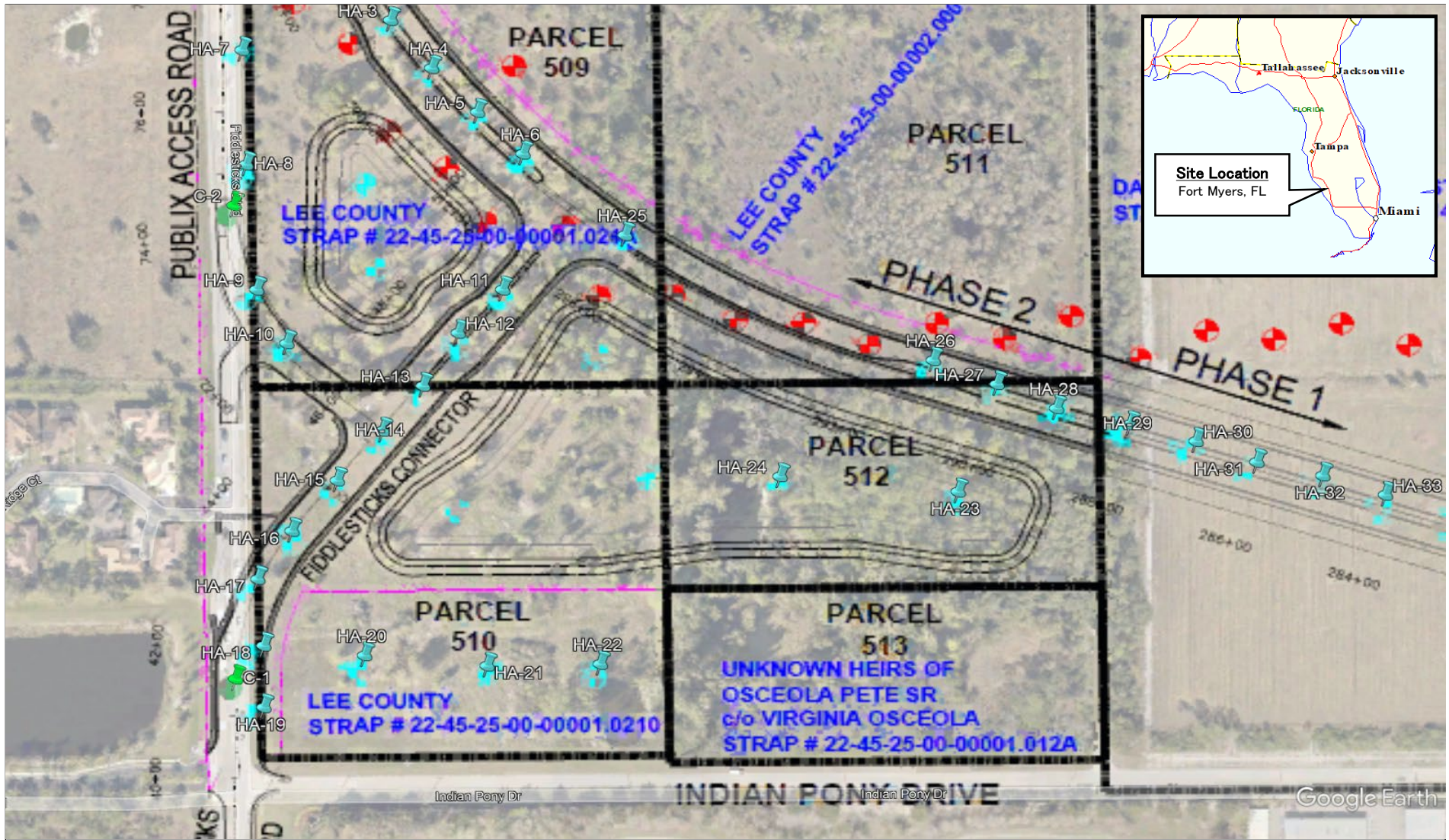
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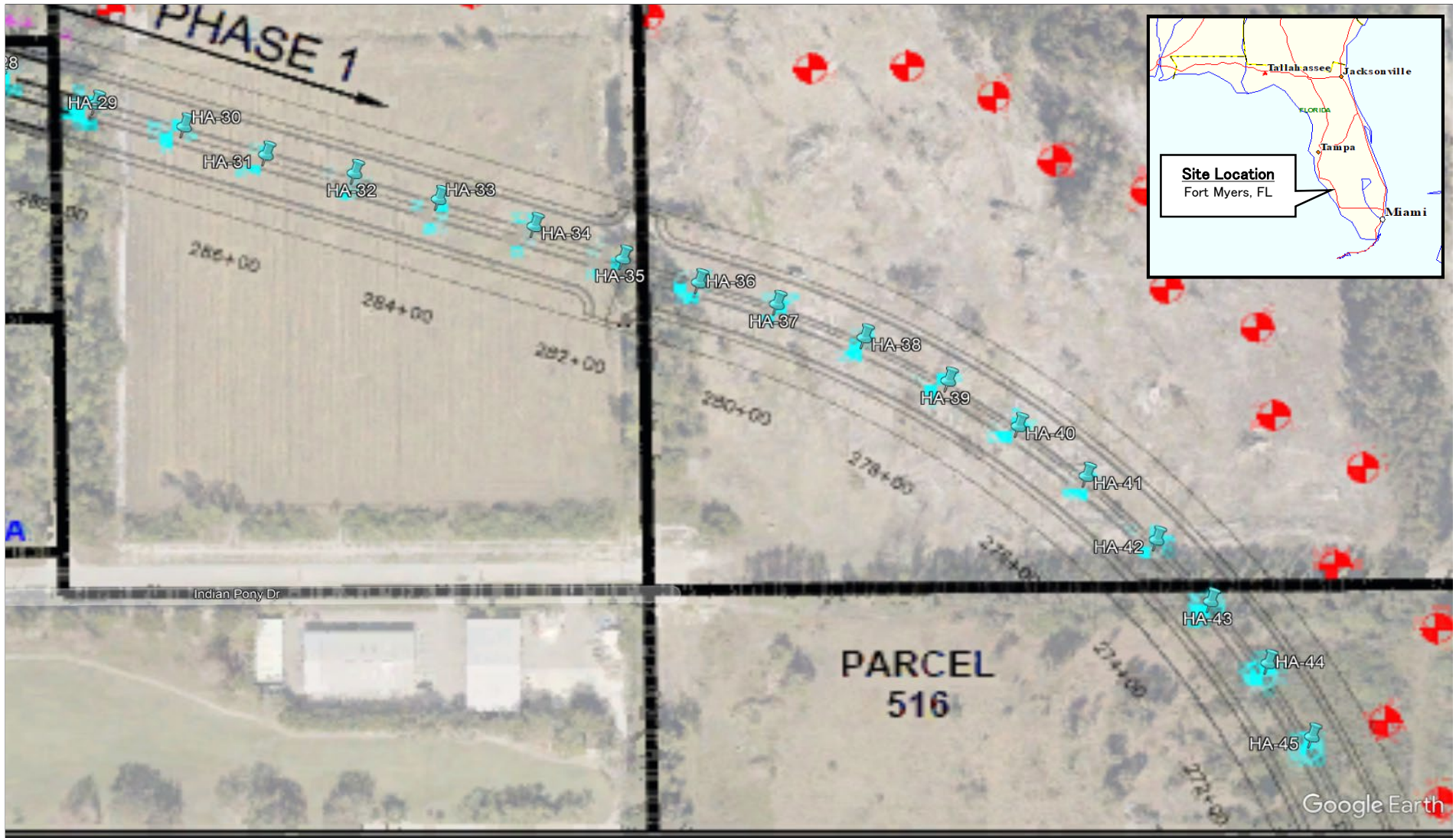
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SOURCE: GOOGLE EARTH PRO©
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Appendix C – Notes Related to Test Borings



**NOTES RELATED TO
RECORDS OF TEST BORING AND
GENERALIZED SUBSURFACE PROFILE**

1. Groundwater level was encountered and recorded (if shown) following the completion of the soil test boring on the date indicated. Fluctuations in groundwater levels are common; consult report text for a discussion.
2. The boring location was identified and located in the field based on measured and estimated distances from existing site features.
3. The borehole was backfilled to site grade following boring completion, patched with asphalt cold patch mix when pavement was encountered.
4. The Record of Test Boring represents our interpretation of field conditions based on engineering examination of the soil samples.
5. The Record of Test Boring is subject to the limitations, conclusions, and recommendations presented in the report text.
6. The soil/rock strata interfaces shown on the Records of Test Boring are approximate and may vary from those in the field. The soil/rock conditions shown on the Records of Test Boring refer to conditions at the specific location tested; soil/rock conditions may vary between test locations.
7. Relative density and consistency for sands/gravels, silts/clays, and limestone are described as follows:
8. Definition of descriptive terms of modifiers for silts/clays/shells/gravels are described as follows:

Percentage of Modifier Material	First Qualifier	Second Qualifier
0 – 5	With a Trace of + Silt, Clay, Shell	With a Trace
5 – 12	Slightly + Silty, Clayey, Shelly	With A Little
12 – 30	Silty, Clayey, Shelly	With Some
30 – 50	Very + Silty, Clayey, Shelly	And

9. Descriptive characteristics for organic content percentages are described as follows:

Percentage of Organic Material	Descriptor
0 – 5	With a Trace
5 – 20	With Organics
20 – 75	Highly Organic
75 – 100	Peat



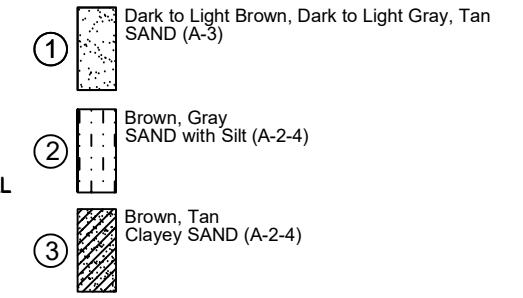
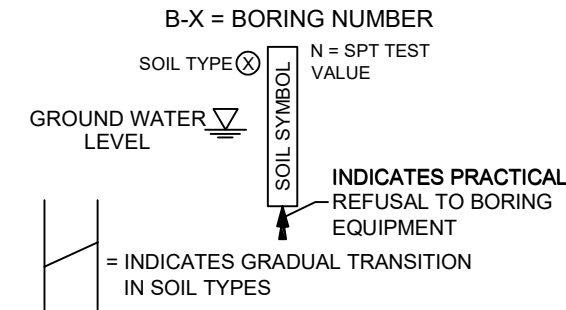
Appendix D – Record of Hand Auger Boring Logs



SOIL PROFILES

SOIL PROFILE LEGEND

SOIL LEGEND

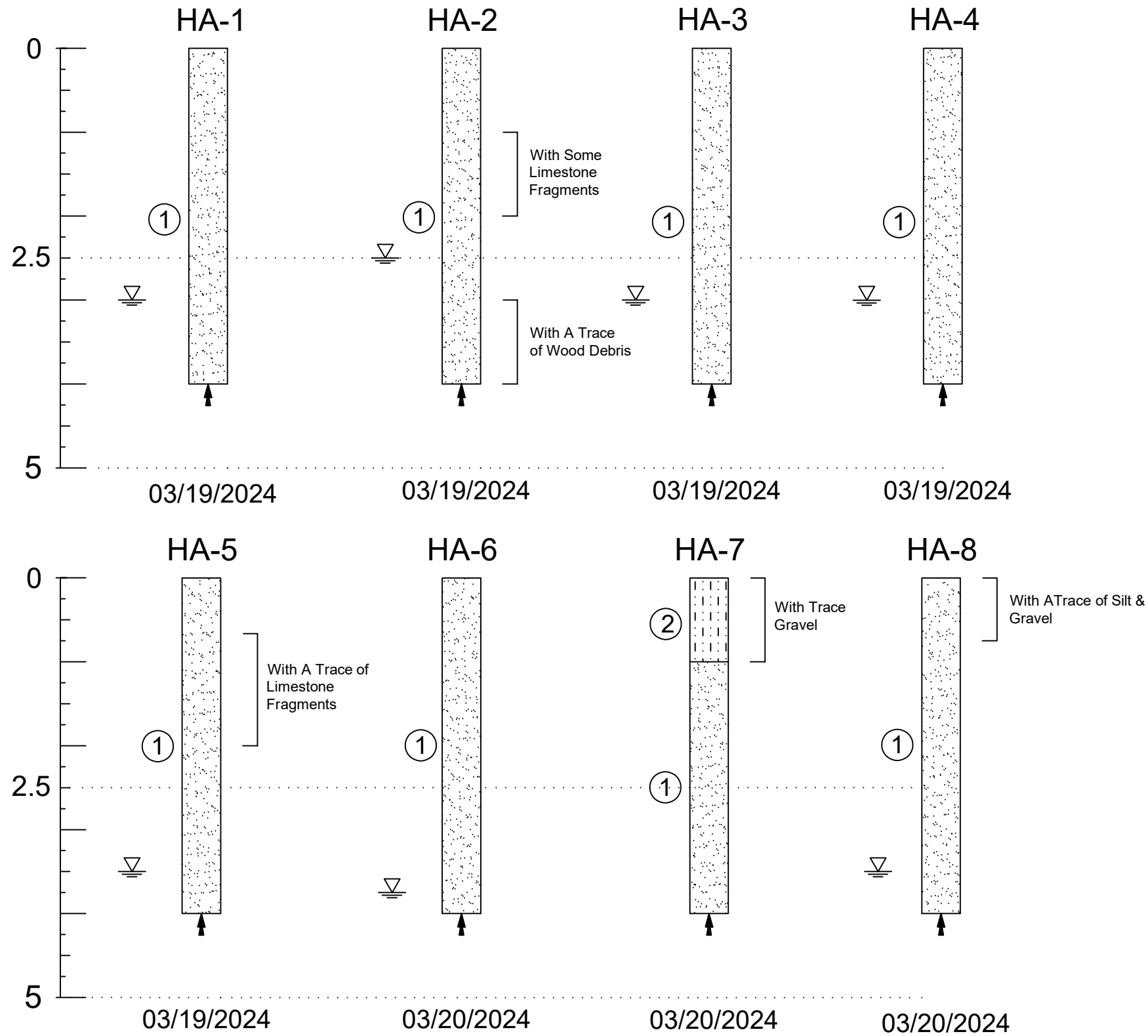


SOIL CLASSIFICATION


SHELL CONTENT	MODIFIERS	APPROXIMATE ORGANIC CONTENT	MODIFIERS
0% TO 5%	NO MENTION	0% TO 2.5%	NO MENTION
5% TO 12%	SLIGHTLY SHELLY	2.5% TO 5%	WITH A TRACE
13% TO 30%	SHELLY	5% TO 20%	WITH ORGANICS
31% TO 50%	VERY SHELLY	20% TO 75%	HIGHLY ORGANIC
		75% TO 100%	PEAT

DEFINITION OF DESCRIPTIVE TERMS OF MODIFIERS FOR SILTS/CLAYS/SHELLS/GRAVELS ARE DESCRIBED AS FOLLOWS:

PERCENTAGE OF MODIFIER MATERIAL	FIRST QUALIFIER	SECOND QUALIFIER
5 - 12	SLIGHTLY + MODIFIER + Y	WITH A LITTLE
12 - 30	MODIFIER + Y	WITH SOME
30 - 50	VERY + MODIFIER + Y	AND



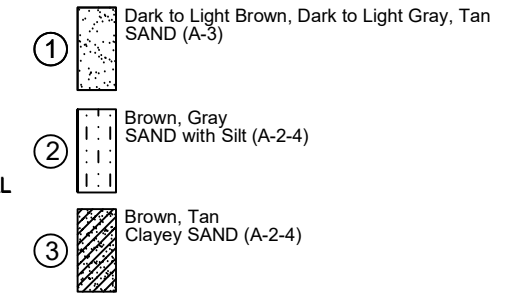
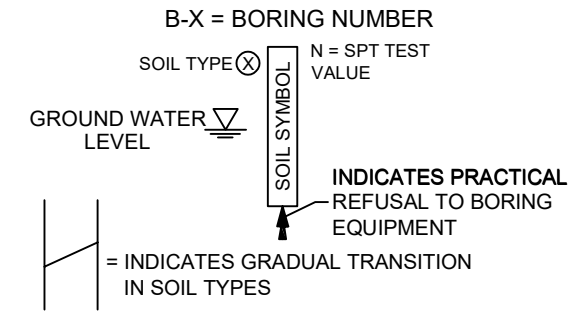
RECORD OF TEST BORINGS

	UES 201 Waldo Ave. N. Lehigh Acres, Florida 33971 239-489-2443 www.teamues.com	Client: Avalon Engineering Project No.: 0530.2300329.0000 Project: Three Oaks Parkway Extension Phase 2 - Fiddlesticks Blvd. Fort Myers, Lee County, Florida	Date: 05/15/2024 Drilled By: DB Drawn By: AN Approved by: AD
	RECORD OF TEST BORINGS		

SOIL PROFILES

SOIL PROFILE LEGEND

SOIL LEGEND

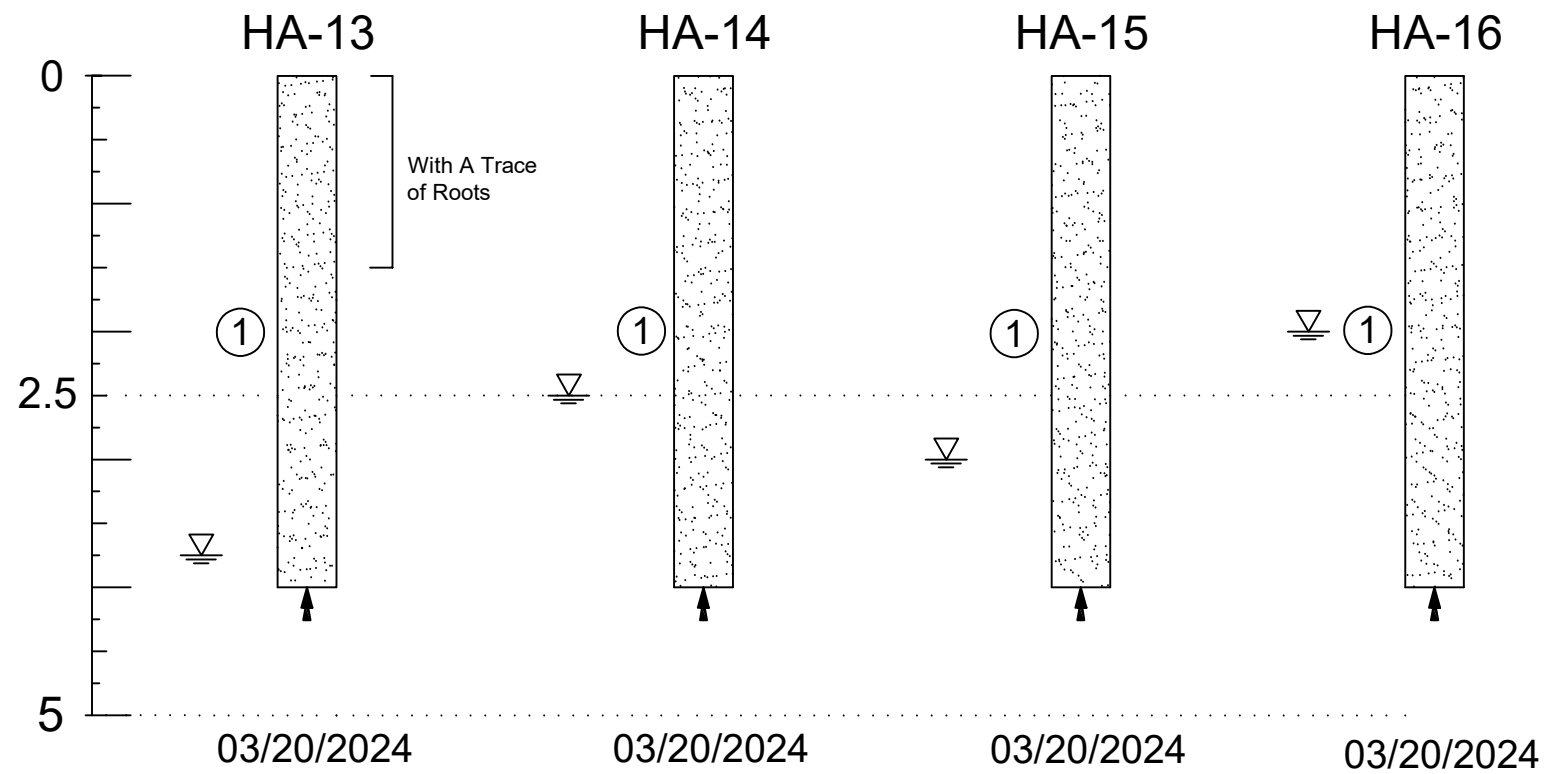
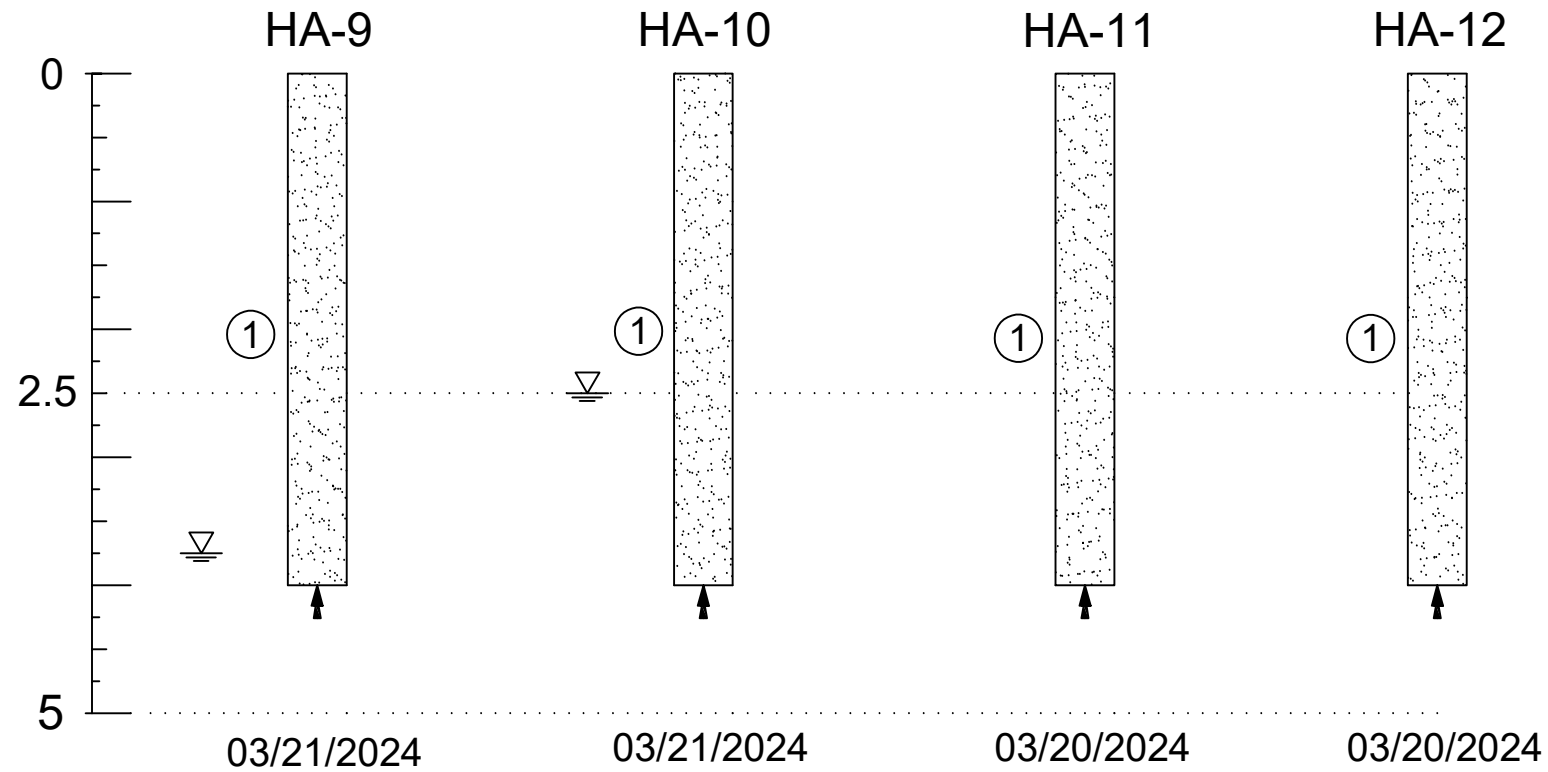


SOIL CLASSIFICATION

APPROXIMATE SHELL CONTENT	MODIFIERS	APPROXIMATE ORGANIC CONTENT	MODIFIERS
0% TO 5%	NO MENTION	0% TO 2.5%	NO MENTION
5% TO 12%	SLIGHTLY SHELLY	2.5% TO 5%	WITH A TRACE
13% TO 30%	SHELLY	5% TO 20%	WITH ORGANICS
31% TO 50%	VERY SHELLY	20% TO 75%	HIGHLY ORGANIC
		75% TO 100%	PEAT

DEFINITION OF DESCRIPTIVE TERMS OF MODIFIERS FOR SILTS/CLAYS/SHELLS/GRAVELS ARE DESCRIBED AS FOLLOWS:

PERCENTAGE OF MODIFIER MATERIAL	FIRST QUALIFIER	SECOND QUALIFIER
5 - 12	SLIGHTLY + MODIFIER + Y	WITH A LITTLE
12 - 30	MODIFIER + Y	WITH SOME
30 - 50	VERY + MODIFIER + Y	AND



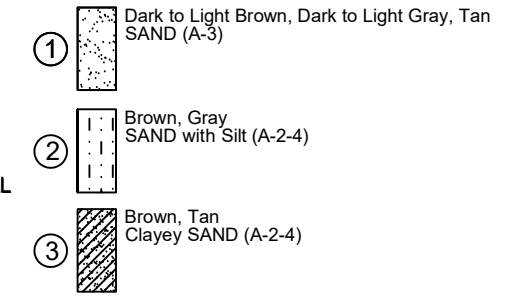
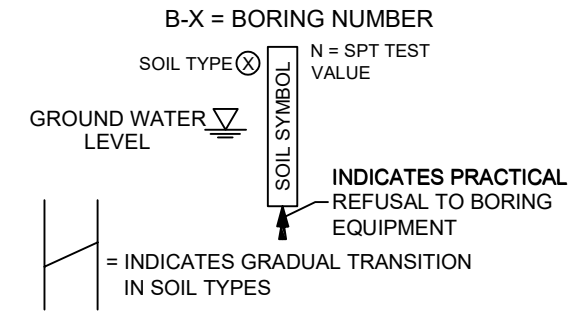
RECORD OF TEST BORINGS

	UES 201 Waldo Ave. N. Lehigh Acres, Florida 33971 239-489-2443 www.teamues.com	Client: Avalon Engineering Project No.: 0530.2300329.0000 Project: Three Oaks Parkway Extension Phase 2 - Fiddlesticks Blvd. Fort Myers, Lee County, Florida	Date: 05/15/2024 Drilled By: DB/LSR/JS Drawn By: AN Approved by: AD
	RECORD OF TEST BORINGS		

SOIL PROFILES

SOIL PROFILE LEGEND

SOIL LEGEND

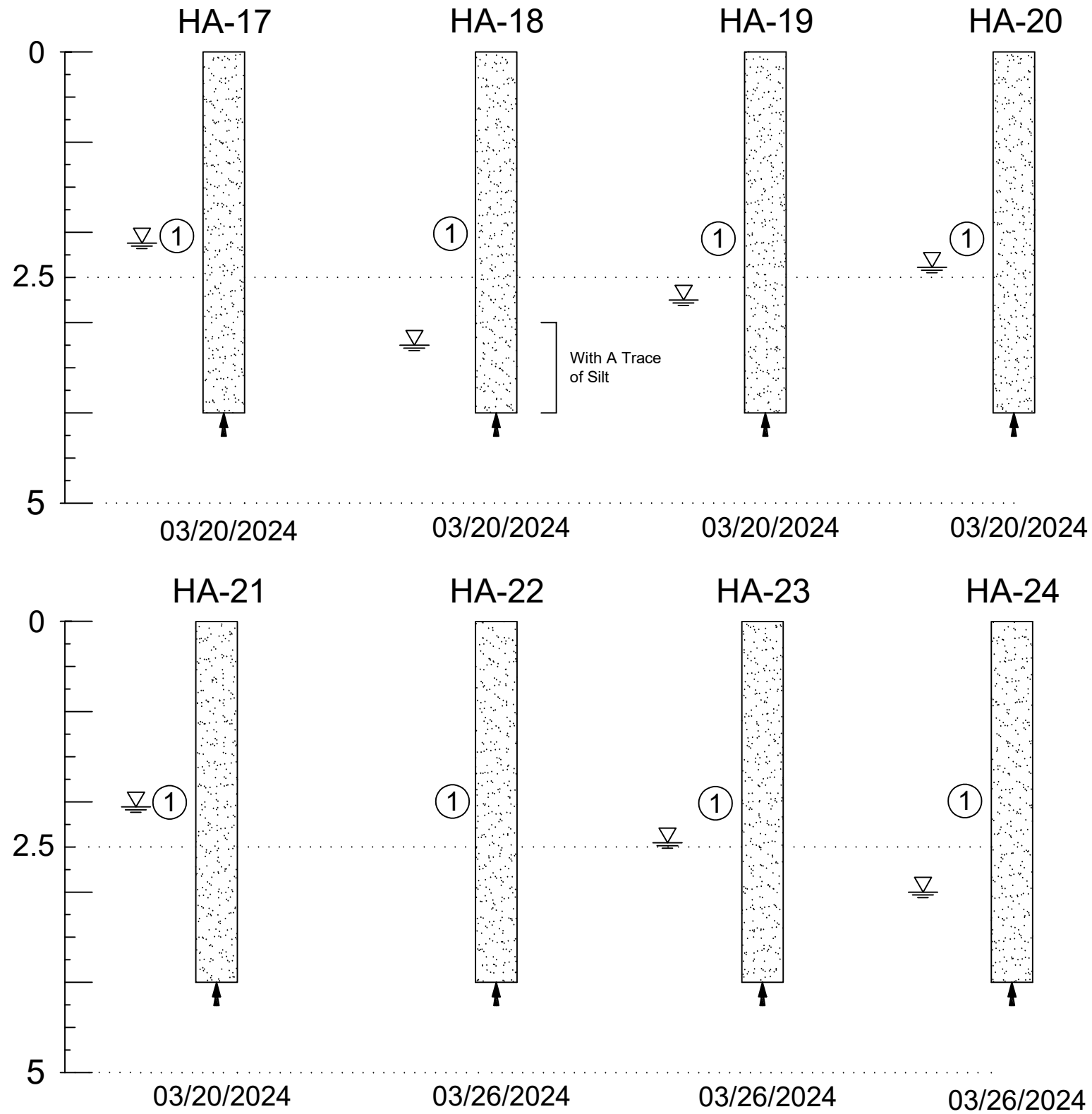


SOIL CLASSIFICATION

APPROXIMATE SHELL CONTENT	MODIFIERS	APPROXIMATE ORGANIC CONTENT	MODIFIERS
0% TO 5%	NO MENTION	0% TO 2.5%	NO MENTION
5% TO 12%	SLIGHTLY SHELLY	2.5% TO 5%	WITH A TRACE
13% TO 30%	SHELLY	5% TO 20%	WITH ORGANICS
31% TO 50%	VERY SHELLY	20% TO 75%	HIGHLY ORGANIC
		75% TO 100%	PEAT

DEFINITION OF DESCRIPTIVE TERMS OF MODIFIERS FOR SILTS/CLAYS/SHELLS/GRAVELS ARE DESCRIBED AS FOLLOWS:

PERCENTAGE OF MODIFIER MATERIAL	FIRST QUALIFIER	SECOND QUALIFIER
5 - 12	SLIGHTLY + MODIFIER + Y	WITH A LITTLE
12 - 30	MODIFIER + Y	WITH SOME
30 - 50	VERY + MODIFIER + Y	AND



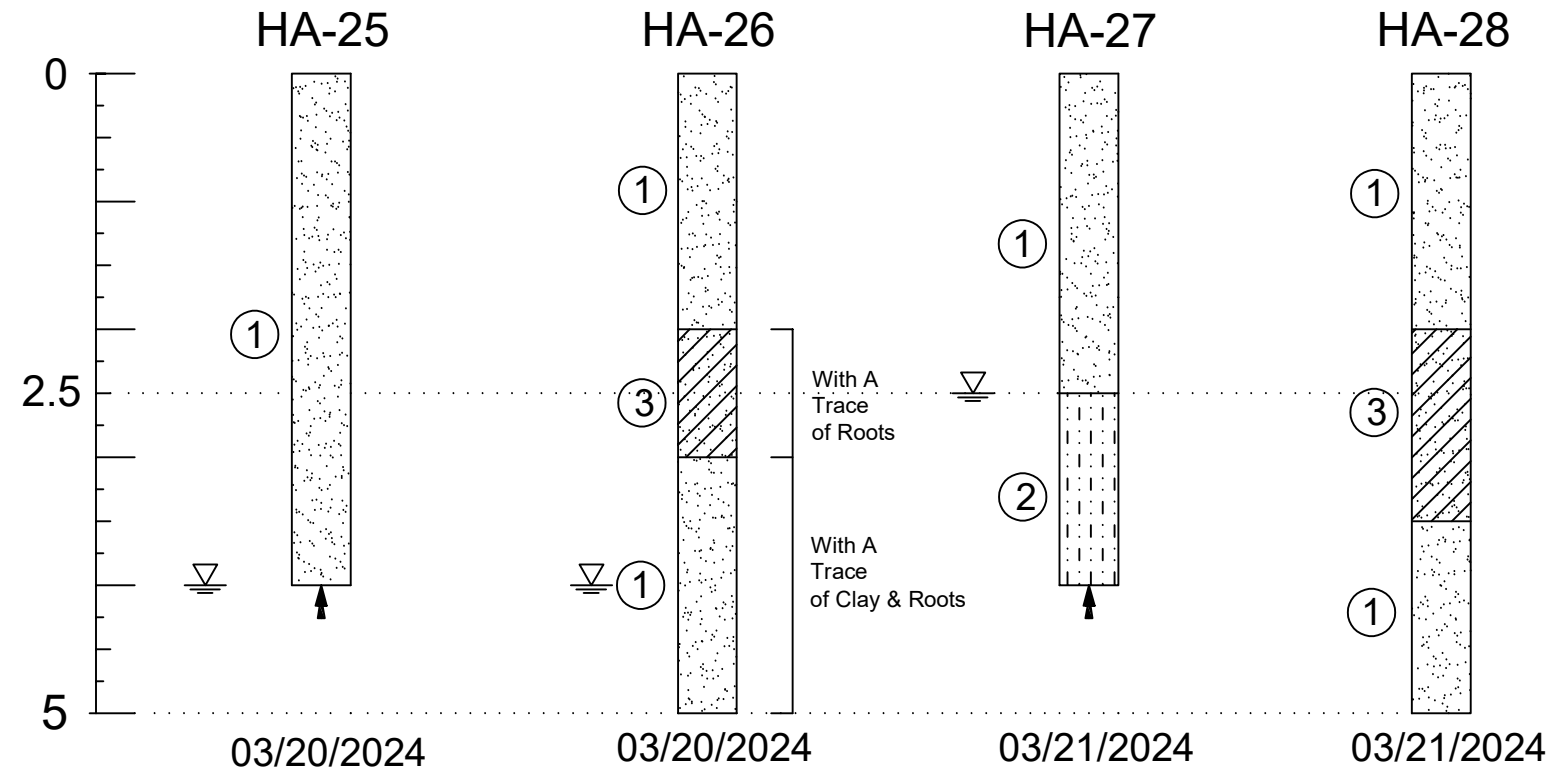
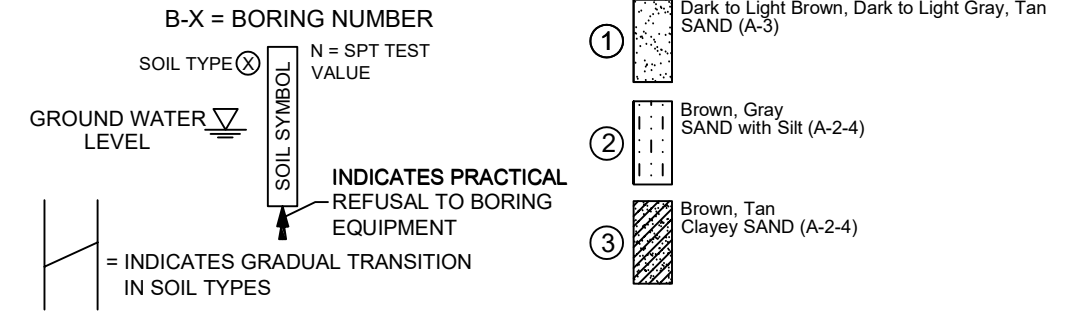
RECORD OF TEST BORINGS

	UES 201 Waldo Ave. N. Lehigh Acres, Florida 33971 239-489-2443 www.teamues.com	Client: Avalon Engineering Project No.: 0530.2300329.0000 Project: Three Oaks Parkway Extension Phase 2 - Fiddlesticks Blvd. Fort Myers, Lee County, Florida	Date: 05/15/2024 Drilled By: DB/LSR/JS Drawn By: AN Approved by: AD
	(Empty space for additional notes or signatures)		

SOIL PROFILES

SOIL PROFILE LEGEND

SOIL LEGEND

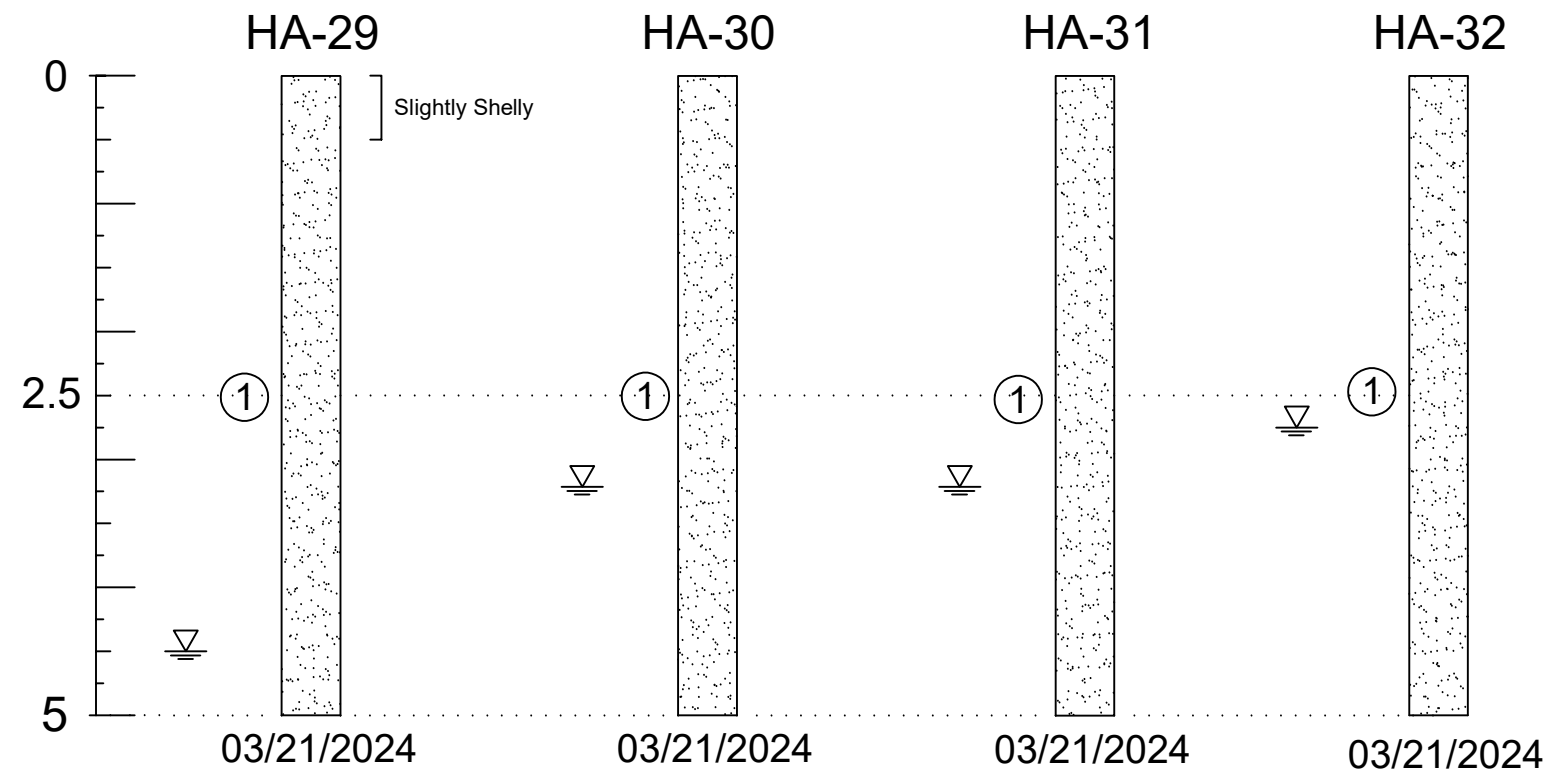


SOIL CLASSIFICATION


SHELL CONTENT	MODIFIERS	APPROXIMATE ORGANIC CONTENT	MODIFIERS
0% TO 5%	NO MENTION	0% TO 2.5%	NO MENTION
5% TO 12%	SLIGHTLY SHELLY	2.5% TO 5%	WITH A TRACE
13% TO 30%	SHELLY	5% TO 20%	WITH ORGANICS
31% TO 50%	VERY SHELLY	20% TO 75%	HIGHLY ORGANIC
		75% TO 100%	PEAT

DEFINITION OF DESCRIPTIVE TERMS OF MODIFIERS FOR SILTS/CLAYS/SHELLS/GRAVELS ARE DESCRIBED AS FOLLOWS:

PERCENTAGE OF MODIFIER MATERIAL	FIRST QUALIFIER	SECOND QUALIFIER
5 - 12	SLIGHTLY + MODIFIER + Y	WITH A LITTLE
12 - 30	MODIFIER + Y	WITH SOME
30 - 50	VERY + MODIFIER + Y	AND



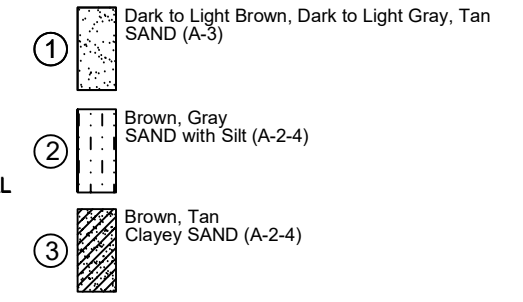
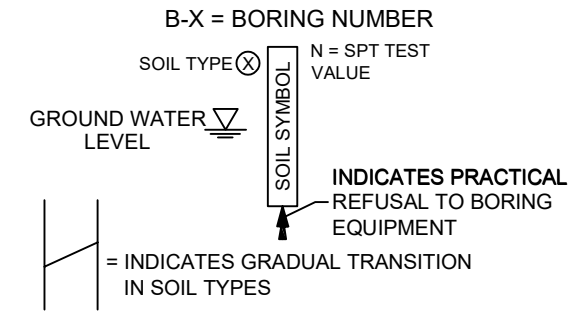
RECORD OF TEST BORINGS

	UES 201 Waldo Ave. N. Lehigh Acres, Florida 33971 239-489-2443 www.teamues.com	Client: Avalon Engineering Project No.: 0530.2300329.0000 Project: Three Oaks Parkway Extension Phase 2 - Fiddlesticks Blvd. Fort Myers, Lee County, Florida	Date: 05/15/2024 Drilled By: DB/LSR/JS Drawn By: AN Approved by: AD
	RECORD OF TEST BORINGS		

SOIL PROFILES

SOIL PROFILE LEGEND

SOIL LEGEND

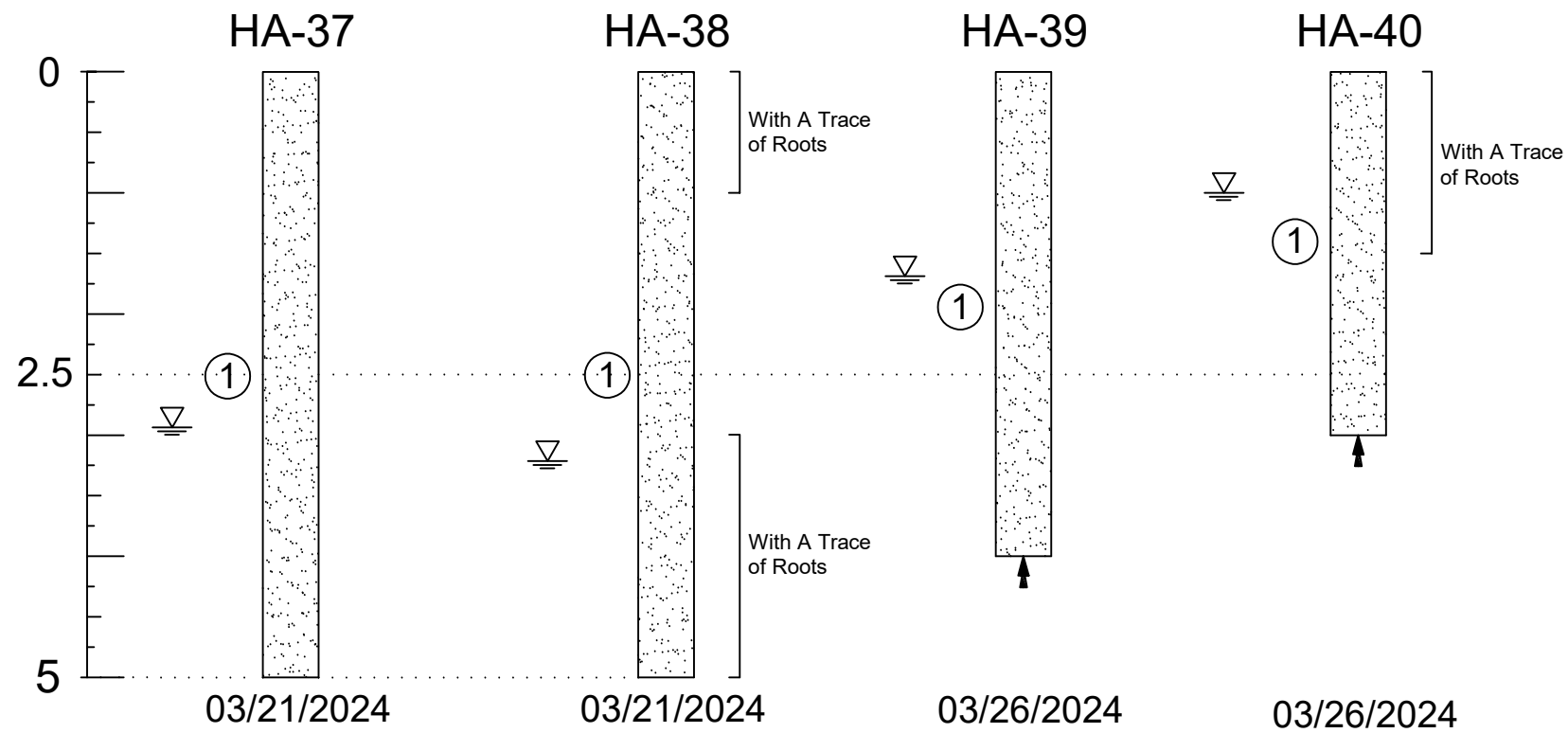
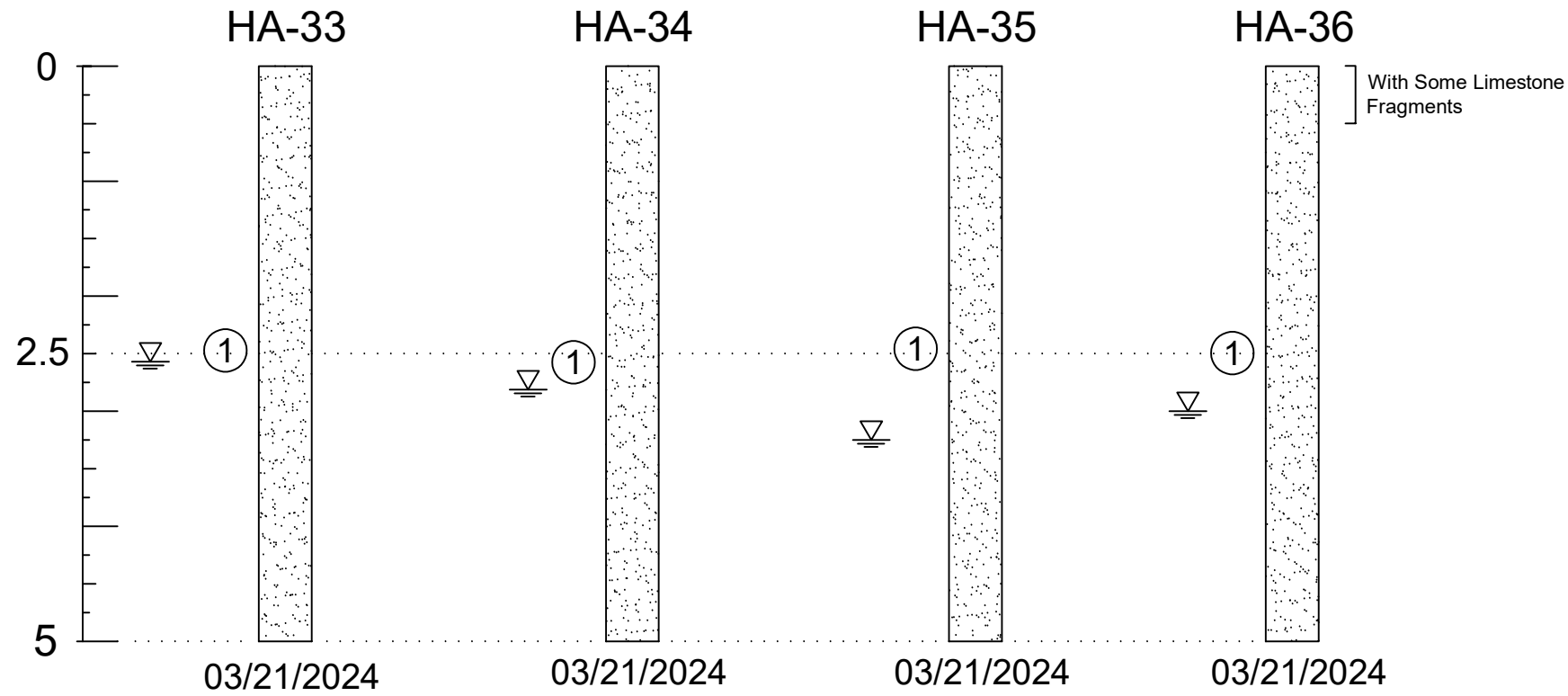


SOIL CLASSIFICATION


APPROXIMATE SHELL CONTENT	MODIFIERS	APPROXIMATE ORGANIC CONTENT	MODIFIERS
0% TO 5%	NO MENTION	0% TO 2.5%	NO MENTION
5% TO 12%	SLIGHTLY SHELLY	2.5% TO 5%	WITH A TRACE
13% TO 30%	SHELLY	5% TO 20%	WITH ORGANICS
31% TO 50%	VERY SHELLY	20% TO 75%	HIGHLY ORGANIC
		75% TO 100%	PEAT

DEFINITION OF DESCRIPTIVE TERMS OF MODIFIERS FOR SILTS/CLAYS/SHELLS/GRAVELS ARE DESCRIBED AS FOLLOWS:

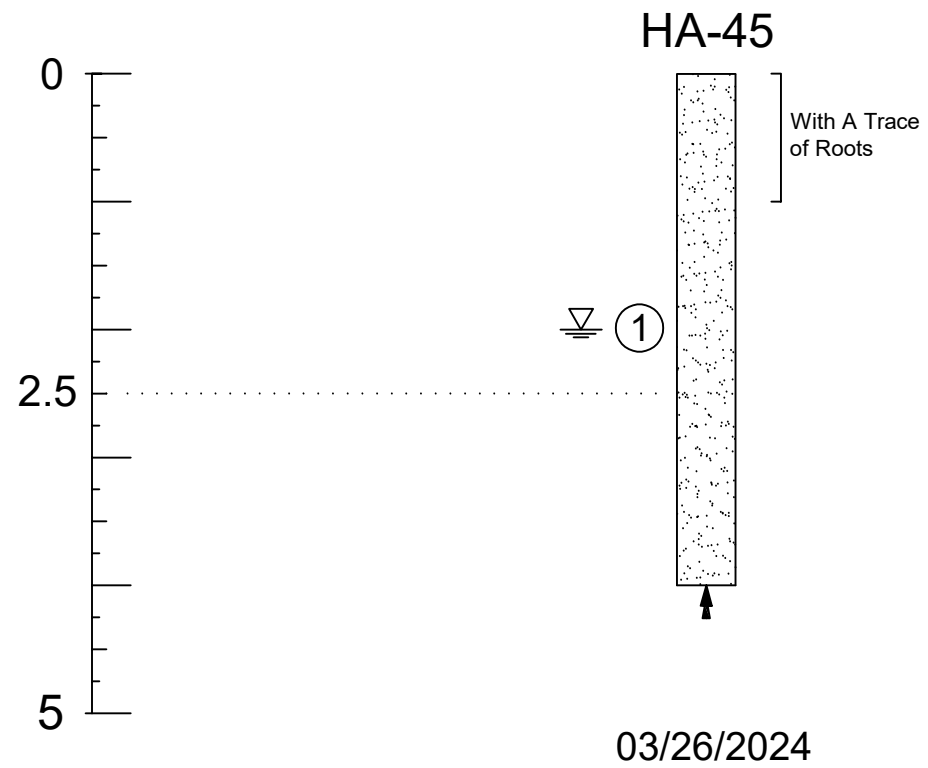
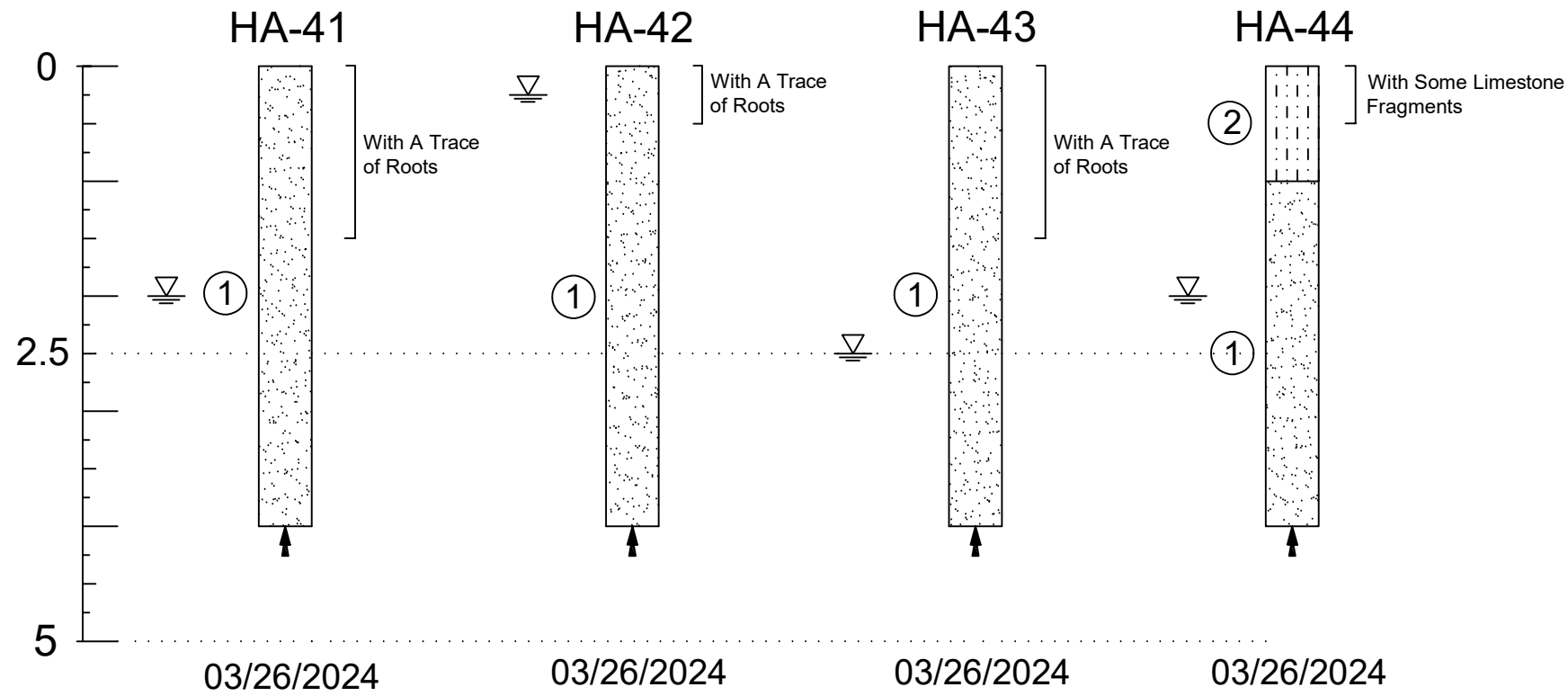
PERCENTAGE OF MODIFIER MATERIAL	FIRST QUALIFIER	SECOND QUALIFIER
5 - 12	SLIGHTLY + MODIFIER + Y	WITH A LITTLE
12 - 30	MODIFIER + Y	WITH SOME
30 - 50	VERY + MODIFIER + Y	AND



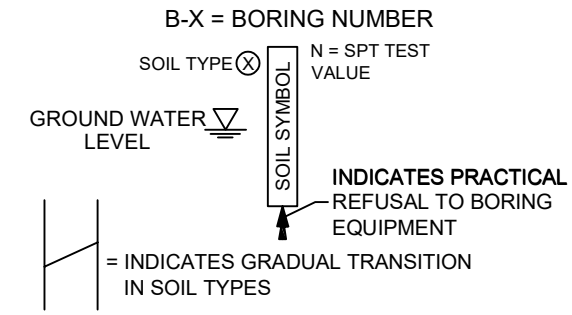
RECORD OF TEST BORINGS

	UES 201 Waldo Ave. N. Lehigh Acres, Florida 33971 239-489-2443 www.teamues.com	Client: Avalon Engineering Project No.: 0530.2300329.0000 Project: Three Oaks Parkway Extension Phase 2 - Fiddlesticks Blvd. Fort Myers, Lee County, Florida	Date: 05/15/2024 Drilled By: DB/LSR/JS Drawn By: AN Approved by: AD
	UES 201 Waldo Ave. N. Lehigh Acres, Florida 33971 239-489-2443 www.teamues.com		

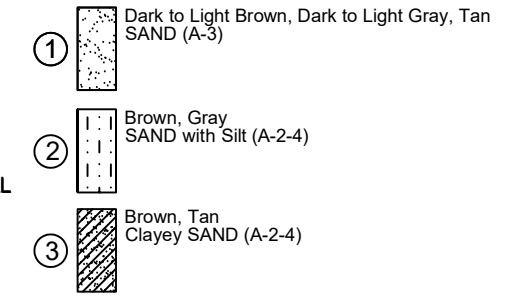
SOIL PROFILES



SOIL PROFILE LEGEND



SOIL LEGEND




SOIL CLASSIFICATION

APPROXIMATE SHELL CONTENT	MODIFIERS	APPROXIMATE ORGANIC CONTENT	MODIFIERS
0% TO 5%	NO MENTION	0% TO 2.5%	NO MENTION
5% TO 12%	SLIGHTLY SHELLY	2.5% TO 5%	WITH A TRACE
13% TO 30%	SHELLY	5% TO 20%	WITH ORGANICS
31% TO 50%	VERY SHELLY	20% TO 75%	HIGHLY ORGANIC
		75% TO 100%	PEAT

DEFINITION OF DESCRIPTIVE TERMS OF MODIFIERS FOR SILTS/CLAYS/SHELLS/GRAVELS ARE DESCRIBED AS FOLLOWS:

PERCENTAGE OF MODIFIER MATERIAL	FIRST QUALIFIER	SECOND QUALIFIER
5 - 12	SLIGHTLY + MODIFIER + Y	WITH A LITTLE
12 - 30	MODIFIER + Y	WITH SOME
30 - 50	VERY + MODIFIER + Y	AND

RECORD OF TEST BORINGS

	UES 201 Waldo Ave. N. Lehigh Acres, Florida 33971 239-489-2443 www.teamues.com	Client: Avalon Engineering Project No.: 0530.2300329.0000 Project: Three Oaks Parkway Extension Phase 2 - Fiddlesticks Blvd. Fort Myers, Lee County, Florida	Date: 05/15/2024 Drilled By: DB/LSR/JS Drawn By: AN Approved by: AD
	RECORD OF TEST BORINGS		

Appendix E – Discussion of Soil Groups



DISCUSSION OF SOIL GROUPS: AASHTO CLASSIFICATION

COARSE GRAINED SOILS

- **Group A-1:** The typical material of this group is a well-graded mixture of stone fragments or gravel, coarse sand, fine sand, and a nonplastic or feebly-plastic soil binder. However, this group also includes stone fragments, gravel, coarse sand, volcanic cinders, etc., without a soil binder.
 - **Subgroup A-1-a:** Includes those materials consisting predominantly of stone fragments or gravel, either with or without a well-graded binder of fine material.
 - **Subgroup A-1-b:** Includes those materials consisting predominantly of coarse sand, either with or without a well-graded soil binder.

- **Group A-3:** The typical material of this group is fine beach sand or fine desert-blow sand without silty or clay fines, or with a very small amount of nonplastic silt. This group also includes stream-deposited mixtures of poorly-graded fine sand and limited amounts of coarse sand and gravel.

- **Group A-2:** This group includes a wide variety of “granular” materials which are borderline between the materials falling in Groups A-1 and A-3, and the silt-clay materials of Groups A-4, A-5, A-6, and A-7. It includes all materials containing 35% or less passing a No. 200 (75- μ m) sieve which cannot be classified in Groups A-1 or A-3, due to the fines content or the plasticity indexes, or both, in excess of the limitations for those groups.
 - **Subgroups A-2-4 and A-2-5:** Include various granular materials containing 35% or less passing a No. 200 (75- μ m) sieve and with a minus No. 40 (425- μ m) portion having the characteristics of Groups A-4 and A-5, respectively. These groups include such materials as gravel and coarse sand with silt contents or plasticity indexes in excess of the limitations of Group A-1 and fine sand with nonplastic-silt content in excess of the limitations of Group A-3.
 - **Subgroups A-2-6 and A-2-7:** Include materials similar to those described under Subgroups A-2-4 and A-2-5, except that the fine portion contains plastic clay having the characteristics of the A-6 or A-7 group, respectively.



FINE GRAINED SOILS

- **Group A-4:** The typical material of this group is a nonplastic or moderately plastic silty soil usually having 75% or more passing a No. 200 (75- μ m) sieve. This group also includes mixtures of fine silty soil and up to 64% of sand and gravel retained on a No. 200 sieve.
- **Group A-5:** The typical material of this group is similar to that described under Group A-4, except that it is usually of diatomaceous or micaceous character and may be highly elastic as indicated by the high liquid limit.
- **Group A-6:** The typical material of this group is a plastic clay soil usually having 75% or more passing a No. 200 (75- μ m) sieve. This group also includes mixtures of fine clayey soil and up to 64% of sand and gravel retained on a No. 200 sieve. Materials of this group usually have a high volume change between wet and dry states.
- **Group A-7:** The typical material of this group is similar to that described under Group A-6, except that it has the high liquid limits characteristic of Group A-5 and may be elastic as well as subject to high-volume change.
 - **Subgroup A-7-5:** Includes those materials with moderate plasticity indexes in relation to the liquid limit and which may be highly elastic as well as subject to considerable volume change.
 - **Subgroup A-7-6:** Includes those materials with high plasticity indexes in relation to liquid limit and which are subject to extremely high volume change.

HIGHLY ORGANIC SOILS

- **Group A-8:** Highly organic soils (peat or muck) may be classified in this group. Classification of these materials is based on visual inspection and is not dependent on the percentage passing the No. 200 (75- μ m) sieve liquid limit, or plasticity index. The material is composed primarily of partially decayed organic matter, generally has a fibrous texture, a dark brown or black color, and an odor of decay. These organic materials are unsuitable for use in embankments and subgrades. They are highly compressible and have low strength.



Appendix F – Roadway Soil Survey



UES
CROSS SECTION OF SOIL SURVEY
REPORT OF TESTS

DISTRICT: LEE COUNTY
SUBMITTED BY: UES

THREE OAKS PARKWAY EXTENSION PHASE 2 - FIDDLESTICKS BOULEVARD
LEE COUNTY, FLORIDA

TOWNSHIP: 45
RANGE: 25
SECTION: 22, 27
COUNTY: LEE

DATES OF SURVEY: MARCH 19 TO 26, 2024

SURVEYED BY: UES

PROJECT BEGINS APPROXIMATE STA. NO.: 272+00
PROJECT ENDS APPROXIMATE STA. NO.: 314+00
DATE REPORTED: JUNE 05, 2024

STRATUM NO.	MAX. LBR VALUE	ORGANIC CONTENT			SIEVE ANALYSIS RESULTS (% PASSING)						ATTERBERG LIMITS (%)			AASHTO GROUP	DESCRIPTION	CORROSION TEST RESULTS				SUBSTRUCTURE ENVIRONMENTAL CLASSIFICATION	
		NO. OF TESTS	% ORGANIC	MOISTURE CONTENT %	NO. OF TESTS	#10 MESH	#40 MESH	#60 MESH	#100 MESH	#200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTICITY INDEX			RESISTIVITY ohm-cm	CHLORIDES ppm	SULFATES ppm	pH	STEEL	CONCRETE
1	--	--	--	--	9	60-100	54-97	--	24-51	2.2-7	--	--	--	A-3	FINE SAND	--	--	--	--	--	--
2	--	--	--	--	3	83-99	78-96	--	39-50	10.8-11	--	--	--	A-2-4	SAND WITH SILT	--	--	--	--	--	--
3	--	--	--	--	2	100	98	--	50-57	14-21	--	--	--	A-2-4	CLAYEY SAND	--	--	--	--	--	--
4	--	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5	--	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

NOTES

- 1) STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. ANY STRATUM CONNECTING LINES SHOWN ARE FOR ESTIMATING EARTHWORK ONLY AND DO NOT INDICATE ACTUAL STRATUM LIMITS. SUBSURFACE VARIATIONS BETWEEN BORINGS SHOULD BE ANTICIPATED AS INDICATED IN SECTION 2-4. FOR FURTHER DETAILS SEE SECTION 120-3.
- 2) GROUNDWATER TABLE SHOWN AS ∇ WHERE ENCOUNTERED AT TIME OF SURVEY.
- 3) REMOVAL OF MUCK AND PLASTIC MATERIAL OCCURING WITHIN ROADWAY SHALL BE ACCOMPLISHED IN ACCORDANCE WITH INDEX NO. 500, UNLESS OTHERWISE SHOWN ON PLANS. THE MATERIAL USED IN EMBANKMENT CONSTRUCTION SHALL BE IN ACCORDANCE WITH INDEX 505 OF FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS.
- 4) SOIL ANALYSIS INCLUDES DATA FROM PROPOSED ROADWAY AREAS.
- 5) THE SYMBOL "--" REPRESENTS AN UNMEASURED SOIL PARAMETER.
- 6) THE MATERIAL FROM STRATA 1 AND 2 CAN BE CLASSIFIED AS SELECT (S).
- 7) THE MATERIAL FROM STRATA 3 ARE LIKELY TO RETAIN EXCESS MOISTURE AND MAY BE DIFFICULT TO DRY AND COMPACT.
- 8) THE MATERIAL FROM STRATUM 3 SHOULD NOT BE PLACED BELOW WATER TABLE.

REVISIONS

Date	By	Description	Date	By	Description

Drawn by	Names	Dates
AN	AN	06/03/24
Checked by	AD	06/05/24
Designed by		
Checked by		
Approved by	Engineer's Name	PE #

ENGINEER OF RECORD:
UES
201 Waldo Avenue North
Lehigh Acres, Florida 33971
Phone: (239) 489-2443
Cert. of Authorization #4930

FOR: Avalon Engineering Inc.		
ROAD NO.	COUNTY	U.S. REPORT NO.
	LEE	

SHEET TITLE: ROADWAY SOIL SURVEY		PROJECT NAME: THREE OAKS PARKWAY EXTENSION PHASE 2 - FIDDLESTICKS BOULEVARD	SHEET NO. 1

??-??-??-??

Appendix G – Laboratory Testing Results





SIEVE ANALYSIS AASHTO T27

Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA2
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1425
Material Location: HA2 (Depth: 1'-2')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Light Brown Sand with Trace Gravel & Silt
Material Classification: A-3
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
350.0	332.7	17.3

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1/2"	21.1	94%	-	-
3/8"	24.3	93%	-	-
No. 4	25.3	93%	-	-
No. 10	27.8	92%	-	-
No. 40	43.6	88%	-	-
No. 100	224.8	36%	-	-
No. 200	329.6	6%	-	-
PAN	332.5	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A **Respectfully Submitted,**
Curvature Coefficient, Cc: N/A **GFA d/b/a UES**
 REGISTRY #4930

This item has been digitally signed & sealed by the Professional Engineer to the right, on the date adjacent to the seal. Printed copies of this document are not considered signed & sealed and the S.H.A. authentication code must be verified on any electronic copies.

5/15/2024
 Adam J. Dornacker, P.E.
 Registered Engineer # 85319
 State of Florida

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SIEVE ANALYSIS AASHTO T27

Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA2
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1426
Material Location: HA2 (Depth: 2'-3')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Light Brown Sand with Trace Gravel & Silt
Material Classification: A-3
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
410.4	397.1	13.3

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1"	0.0	100%		
3/4"	10.3	97%	-	-
1/2"	13.2	97%	-	-
3/8"	13.2	97%	-	-
No. 4	15.1	96%	-	-
No. 10	17.7	96%	-	-
No. 40	34.4	92%	-	-
No. 100	263.6	36%	-	-
No. 200	395.4	3.7%	-	-
PAN	397.3	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A
Curvature Coefficient, Cc: N/A

Respectfully Submitted,
GFA d/b/a UES
 REGISTRY #4930

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5/15/2024
 Adam J. Dornacker, P.E
 Registered Engineer # 85319
 State of Florida

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SIEVE ANALYSIS AASHTO T27

Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA08
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1427
Material Location: HA7 (Depth: 0-1')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand with Silt & Trace Gravel
Material Classification: A-2-4
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
408.7	368.6	40.1

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1"	0.0	100%		
3/4"	20.1	95%	-	-
1/2"	45.6	89%	-	-
3/8"	49.3	88%	-	-
No. 4	58.8	86%	-	-
No. 10	67.6	83%	-	-
No. 40	88.7	78%	-	-
No. 100	248.4	39%	-	-
No. 200	363.9	10.9%	-	-
PAN	368.2	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A **Respectfully Submitted,**
Curvature Coefficient, Cc: N/A **GFA d/b/a UES**
 REGISTRY #4930

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5/15/2024
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SIEVE ANALYSIS AASHTO T27

Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA7
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1428
Material Location: HA7 (Depth:1'-2')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand with Trace Gravel & Silt
Material Classification: A-3
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
488.0	464.6	23.4

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
3/4"	0.0	100%	-	-
1/2"	6.7	99%	-	-
3/8"	6.7	99%	-	-
No. 4	13.2	97%	-	-
No. 10	16.2	97%	-	-
No. 40	35.3	93%	-	-
No. 100	279.7	43%	-	-
No. 200	461.1	5%	-	-
PAN	464.2	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A
Curvature Coefficient, Cc: N/A

Respectfully Submitted,
GFA d/b/a UES
 REGISTRY #4930

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SIEVE ANALYSIS AASHTO T27

Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA08
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1430
Material Location: HA8 (Depth: 0-1')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand with Trace Silt and Gravel
Material Classification: A-3
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
464.8	438.9	25.9

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1"	0.0	100%		
3/4"	16.2	97%	-	-
1/2"	16.2	97%	-	-
3/8"	18.7	96%	-	-
No. 4	27.3	94%	-	-
No. 10	33.9	93%	-	-
No. 40	54.4	88%	-	-
No. 100	280.5	40%	-	-
No. 200	436.0	6.1%	-	-
PAN	438.4	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A
Curvature Coefficient, Cc: N/A

Respectfully Submitted,
GFA d/b/a UES
 REGISTRY #4930

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 Registered Engineer # 85319
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SIEVE ANALYSIS AASHTO T27

Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA18
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1429
Material Location: HA18 (Depth: 36"-48")
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand with Trace Silt
Material Classification: A-3
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
465.2	435.7	29.5

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
3/4"	0.0	100%	-	-
1/2"	15.9	97%	-	-
3/8"	15.9	97%	-	-
No. 4	16.1	97%	-	-
No. 10	17.4	96%	-	-
No. 40	31.7	93%	-	-
No. 100	227.5	51%	-	-
No. 200	432.6	7%	-	-
PAN	435.3	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A
Curvature Coefficient, Cc: N/A

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Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA22
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1431
Material Location: HA22 (Depth:1'-3')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand
Material Classification: A-3
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
453.8	446.5	7.3

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1/2"	0.0	100%	-	-
3/8"	2.6	99%	-	-
No. 4	2.6	99%	-	-
No. 10	2.8	99%	-	-
No. 40	20.7	95%	-	-
No. 100	280.6	38%	-	-
No. 200	444.0	2.2%	-	-
PAN	446.5	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A **Respectfully Submitted,**
Curvature Coefficient, Cc: N/A **GFA d/b/a UES**
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Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA26
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1432
Material Location: HA26 (Depth: 2'-3')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Clayey Sand
Material Classification: A-2-4
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
350.5	279.2	71.3

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1/2"	0.0	100%	-	-
3/8"	0.0	100%	-	-
No. 4	0.0	100%	-	-
No. 10	0.6	100%	-	-
No. 40	6.7	98%	-	-
No. 100	152.0	57%	-	-
No. 200	277.2	21%	-	-
PAN	279.3	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A **Respectfully Submitted,**
Curvature Coefficient, Cc: N/A **GFA d/b/a UES**
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SIEVE ANALYSIS AASHTO T27

Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA26
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1433
Material Location: HA26 - (3'-5')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand with A Trace of Silt
Material Classification: A-3
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
416.1	390.3	25.8

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1/2"	0.0	100%	-	-
3/8"	0.0	100%	-	-
No. 4	0.0	100%	-	-
No. 10	0.0	100%	-	-
No. 40	11.4	97%	-	-
No. 100	207.6	50%	-	-
No. 200	168.5	7%	-	-
PAN	170.9	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A **Respectfully Submitted,**
Curvature Coefficient, Cc: N/A **GFA d/b/a UES**
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SIEVE ANALYSIS AASHTO T27

Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA27
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1434
Material Location: HA27 (Depth: 2.5' - 4')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand with Silt
Material Classification: A-2-4
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
410.5	368.6	41.9

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1/2"	0.0	100%	-	-
3/8"	2.2	99%	-	-
No. 4	3.9	99%	-	-
No. 10	5.4	99%	-	-
No. 40	14.6	96%	-	-
No. 100	206.2	50%	-	-
No. 200	365.7	10.8%	-	-
PAN	368.2	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A **Respectfully Submitted,**
Curvature Coefficient, Cc: N/A **GFA d/b/a UES**
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Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA28
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1435
Material Location: HA28 (Depth :2.0'-3.5')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Tan Clayey Sand
Material Classification: A-2-4
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
499.3	431.8	67.5

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1/2"	0.0	100%	-	-
3/8"	0.0	100%	-	-
No. 4	0.0	100%	-	-
No. 10	0.1	100%	-	-
No. 40	12.0	98%	-	-
No. 100	248.1	50%	-	-
No. 200	429.7	14%	-	-
PAN	431.7	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A **Respectfully Submitted,**
Curvature Coefficient, Cc: N/A **GFA d/b/a UES**
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Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA29
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1436
Material Location: HA29 (Depth: 4.5'-5')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand with A Trace of Silt
Material Classification: A-3
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
454.9	434.9	20.0

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
3/4"	0.0	100%	-	-
1/2"	15.0	97%	-	-
3/8"	15.0	97%	-	-
No. 4	15.5	97%	-	-
No. 10	16.6	96%	-	-
No. 40	28.9	94%	-	-
No. 100	236.2	48%	-	-
No. 200	431.7	5%	-	-
PAN	434.7	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A
Curvature Coefficient, Cc: N/A

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Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA36
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1437
Material Location: HA36 (Depth 0-6")
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand with some Limestone Fragments
Material Classification: A-3
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
442.2	433.8	8.4

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1 1/2"	0.0	100%	-	-
1"	63.9	86%	-	-
3/4"	99.9	77%	-	-
1/2"	99.9	77%	-	-
3/8"	140.8	68%	-	-
No. 4	160.9	64%	-	-
No. 10	175.9	60%	-	-
No. 40	203.2	54%	-	-
No. 100	337.8	24%	-	-
No. 200	429.9	3%	-	-
PAN	433.3	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A **Respectfully Submitted,**
Curvature Coefficient, Cc: N/A **GFA d/b/a UES**
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Project: Three Oaks Parkway - Fiddlesticks **Project ID:** 0530.2300329.0000
Client: Avalon Engineering, Inc. **Report ID:** HA44
Client Address: 2503 Del Prado Boulevard, South, Suite 200, Cape Coral, F **Lab/MAC ID:** 24-1438
Material Location: HA44 - (Depth: 0-1')
Sampled By: Luis S. **Date Sampled:** 4/19/2024
Tested By: K. Hazard **Date Tested:** 4/25/2024
Material Description: Brown Sand with Silt
Material Classification: A-2-4
Comments: _____

MATERIAL FINER THAN No. 200 SIEVE BY WASHING		
Original Sample Weight (g):	Washed Sample Weight (g):	Weight Passing No. 200 Sieve (g):
501.2	446.2	55.0

SIEVE No.	CUMMULATIVE WT. RETAINED (g)	% PASSING	SPECIFICATION	PASS/FAIL
1"	0.0	100%		
3/4"	18.3	96%	-	-
1/2"	18.3	96%	-	-
3/8"	18.3	96%	-	-
No. 4	27.4	95%	-	-
No. 10	35.6	93%	-	-
No. 40	64.8	87%	-	-
No. 100	280.3	44%	-	-
No. 200	442.9	11%	-	-
PAN	445.0	-	-	-

Fineness Modulus: N/A
Uniformity Coefficient, Cu: N/A
Curvature Coefficient, Cc: N/A

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Appendix H – Asphalt Thickness By Core Determination



**THREE OAKS PARKWAY EXTENSION – PHASE 1 & 2
 FIDDLESTICKS BOULEVARD
 FORT MYERS, LEE COUNTY, FLORIDA**

0530.2300329.0000

SUMMARY PAVEMENT CORE RESULTS

Core #	Location	Asphalt Thickness	Base Thickness	Stabilized Subgrade/Subbase Thickness
C-1	Refer to test location plan	1.75"	-----	-----
C-2	Refer to test location plan	4.3"	-----	-----
C-3	Refer to test location plan	4.0"	-----	-----
C-4	Refer to test location plan	3.9"	-----	-----
C-5	Refer to test location plan	3.0"	-----	-----
C-6	Refer to test location plan	2.75"	-----	-----