June 30, 2023

Kimley-Horn and Associates, Inc.
201 North Franklin St. Suite 1400
Tampa, FL 33602

Attn: Ms. Shari Barnwell, P.E.

RE: Roadway Soil Survey Report
Phase III Plans Submittal
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Kimley-Horn Project No.: 148400100
Tierra Project No. 6511-22-127

Ms. Barnwell:

Tierra, Inc. (Tierra) has completed a Roadway Soil Survey Report for the above referenced project. This report is being provided to support the Phase III plans submittal. The results of our field exploration program and laboratory testing performed to date and subsequent geotechnical recommendations are presented herein.

Tierra, Inc. appreciates the opportunity to be of service to Kimley-Horn and Associates, Inc. (KHA) on this project. If you have any questions or comments regarding this report, please contact our office at your earliest convenience.

Sincerely,

TIERRA, INC.

Trevor J. Bianco, E.I.
Geotechnical Engineer Intern

Kevin H. Scott, P.E.
Senior Geotechnical Engineer
Florida License No. 65514

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1.0 PROJECT INFORMATION

1.1 Project Authorization

Authorization to proceed with this project was issued by KHA in accordance with the Subconsultant Agreement for the referenced project.

1.2 Project Description

The project, as we understand it, consists of preparing construction plans for proposed roadway improvements consisting of 84 feet of right of way containing a two-lane roadway with 11-foot travel lanes, an 18-foot wide median or a 14-foot two way left turn lane, a 12-foot shared use path on the west side of the road and a 5-foot sidewalk on the east side of the road in Manatee County, Florida.

The purpose of this report is to provide geotechnical (i.e. soils and groundwater) input to the design team to assist in design of the proposed roadway improvements. This report concentrates on the roadway and drainage portions of the project and is provided to be included with the Phase III plans submittal.

1.3 General Site Conditions

The existing typical section along Lena Road is a 2-lane roadway with 12-foot travel lanes and unpaved shoulders. The southern portion of Lena Road provides a 5-foot sidewalk on the east side of the roadway and a 10-foot sidewalk outside of the roadway right of way on the west side. The right of way varies throughout the project limits with typical widths of 90-feet, 50-feet, and finally widening to 96-feet approaching SR 64, starting from the southern end. The southern portion of the proposed Lena Road alignment from Station 218+20 to approximately 241+75 consists of undeveloped wooded land and two (2) existing stormwater ponds. The proposed alignment traverses across these existing pond areas.

2.0 PURPOSE AND SCOPE OF SERVICES

This geotechnical study was performed to obtain information on the existing subsurface conditions along the limits of the proposed roadway, FPC and stormwater improvements to assist in design of the construction plans for the project. The following services were provided:

1. Reviewed published soil information obtained from the “Soil Survey of Manatee County, Florida” published by the United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS). Reviewed topographic data obtained from the “Lorraine, Florida” Quadrangle Map. Reviewed potentiometric surface elevations obtained from the “Potentiometric Surface of the Upper Floridan Aquifer” maps published by the USGS.

2. Conducted a visual reconnaissance of the project site and coordinated utility clearances via Sunshine State One Call.

3. Performed a geotechnical field study to evaluate the existing subsurface conditions along the project alignments consisting of borings, pavement cores, subsurface sampling and field-testing.

4. Performed test pits in Parcel 103 to explore the depths and boundaries of the encountered landfill debris.

5. Installed 11 piezometers to monitor groundwater levels to assist in estimating SHGWT levels.

6. Coordinated with the project surveyor to provide survey data (location and elevation) for the piezometers installed and borings performed along the project alignment and with the stormwater ponds where the Seasonal High Groundwater Table (SHGWT) was estimated.

7. Visually classified and stratified recovered soil samples in the laboratory. Performed laboratory tests on selected representative samples to develop the soil legend for the project in accordance with the American Association of State Highway and Transportation Officials (AASHTO) soil classification system.

8. Prepared this Roadway Soil Survey Report for the project.

3.0 REVIEW OF PUBLISHED DATA

3.1 Regional Geology

The following paragraphs on the geology of Manatee County were paraphrased from the Florida Geological Survey, Open-File Report 80, 2001 and other geologic references.

The near surface geologic deposits and formations from youngest to oldest in Manatee County include: Undifferentiated sediments (Qu, TQu), Shelly sediments (TQsu), the Hawthorn Group Peace River Formation (Thp), the Hawthorn Group Peace River Formation Bone Valley Member (Thpb), the Hawthorn Group Arcadia Formation (Tha), and the Hawthorn Group Arcadia Formation Tampa Member (That).

The Undifferentiated sediments and Beach and Ridge dunes are siliciclastics that are light gray, tan or brown to black in color, unconsolidated to poorly consolidated, clean to clayey silty, unfossiliferous, variably organic-bearing sands to blue green to olive green, poorly to moderately consolidated, sandy, silty clays. The Shelly sediments are variably calcareous and fossiliferous quartz sands to well indurated, sandy, fossiliferous limestones with clayey sands and sandy clays.

The Peace River Formation is primarily found near the surface in northwestern Manatee County and is composed of interbedded sands, clays and carbonates. The sands are generally light gray to olive gray in hue, poorly consolidated, clayey, variably dolomitic, very fine to medium grained and phosphatic. The clays are yellowish gray to olive gray in color, poorly to moderately consolidated sandy, silty, phosphatic and dolomitic. The carbonates are light gray to yellowish gray, poorly to well indurated, variably sandy and clayey, and phosphatic. The carbonates often include opaline chert. The Bone Valley Member is a clastic unit consisting of sand-sized and

larger phosphate grains in a matrix of quartz sand, silt and clay. The lithology is highly variable ranging from sandy, silty, phosphatic clays and relatively pure clays to clayey, phosphatic sand to sandy, clayey phosphorites and is found within 50 feet of the surface in eastern Manatee County. The Peace River Formation is a semi-confining unit and forms an intermediate aquifer system in eastern Manatee County.

The Arcadia Formation is predominantly a carbonate unit with a variable siliciclastic component. The Arcadia Formation is composed of yellowish gray to light olive gray to light brown, micro to finely crystalline, variably sandy, clayey and phosphatic, fossiliferous limestones and dolostones. Thin beds of sand and clay are common. The sands are yellowish gray, very fine to medium grained, poorly to moderately indurated, clayey, dolomitic and phosphatic. The clays are yellowish gray to light olive gray in hue, poorly to moderately indurated, sandy, silty, phosphatic and dolomitic.

The Tampa member of the Arcadia Formation is white to yellowish gray in color, fossiliferous and variably sandy and clayey mudstones, wackestone and packstone with minor to no phosphate grains. In Manatee County, the Tampa member is found about 300 feet below land surface (bls), is approximately 100 to 150 feet thick and is part of the Floridan Aquifer System.

3.2 USDA Soil Survey

Based on a review of the Manatee County Soil Survey published by the USDA, it appears that there are eight (8) primary soil-mapping units noted along the project alignment and within the proposed pond sites. An illustration of the **USDA Soil Survey Map** is provided in **Appendix A** and a summary of each soil unit is provided in **Appendix A**.

It should be noted that information contained in the USDA Soil Survey may not be reflective of actual soil and groundwater conditions, particularly if recent development in the project vicinity has modified soil conditions or surface/subsurface drainage.

3.3 USGS Quadrangle Maps

Based on a review of the USGS Quadrangle Map titled “Lorraine, Florida”, it appears that the project site natural elevations range from approximately +20 feet to +35 feet National Geodetic Vertical Datum of 1929 (NGVD 29) as illustrated on the **USGS Quadrangle Map** provided in **Appendix A**.

3.4 Potentiometric Surface Elevation

Based on a review of the “Potentiometric Surface of the Upper Floridan Aquifer” maps published by the USGS; the potentiometric surface elevation of the upper Floridan Aquifer in the project vicinity ranges from approximately +20 to +30 feet, NGVD 1929.

As indicated in Section 3.3, the project site natural ground elevations range from approximately +20 to +35 feet NGVD 1929. Artesian conditions were not encountered at the time of our field activities; however, the Contractor should be prepared to address artesian levels up to a head of +30 feet NGVD 1929.

4.0 SUBSURFACE EXPLORATION

Prior to commencing our subsurface explorations, boring location plans for the proposed roadway alignment were produced. The boring location plans were generated based on a review of the project design files provided by KHA, general guidance provided in the FDOT "Soils and Foundations Handbook" and our engineering judgment.

To evaluate the subsurface conditions and groundwater table levels, over 250 hand auger borings were advanced to depths ranging from approximately 1½ to 8 feet below the existing ground surface and over 40 Standard Penetration Test (SPT) borings were performed to depths of 10 to 50 feet below the existing ground surface along the project alignments and within the proposed stormwater ponds and FPC sites. A total of twelve (12) pavement cores were performed within the existing lanes of Lena Road to identify the existing pavement section. In addition, a series of test pits were performed using a mechanical excavator to further explore the encountered landfill material in Parcel 103.

The hand auger borings were performed by manually twisting and advancing a bucket auger into the ground, typically in 6-inch increments. As each soil type was revealed, representative samples were collected and returned to our office for confirmation of the field classification by a geotechnical engineer. Hand auger borings were performed to depths ranging from 1 foot to 5 feet below the existing pavement surface at each core location to evaluate the subgrade material. Following completion of the borings, the auger holes were backfilled with sand and compacted. The pavement cores were then patched with an FDOT approved pavement-patching product.

The SPT borings were performed using mechanical and barge mounting drilling equipment utilizing bentonite mud drilling procedures. The soil sampling was performed in general accordance with the American Society for Testing and Materials (ASTM) test designation D-1586. In general, the SPT borings were advanced by hand auger from the ground surface to depths of 4 and 6 feet to verify utility clearance. SPT resistance N values were then taken continuously to a depth of 10 feet and on intervals of 5 feet thereafter to the boring termination depth.

The pavement cores were performed with the use of a 4-inch outside diameter core bit. The asphalt pavement was visually classified using standard FDOT nomenclature. Core samples of the existing pavement section were collected and the thickness of the pavement and base was measured. In addition, observed cracking, rut depths, general pavement condition, subgrade material and measured cross slopes are presented along with the pavement core data on the **Pavement Data and Condition** sheet in **Appendix E**. Photographs of the asphalt pavement cores are included in the **Pavement Core Photographs** sheets in **Appendix E**.

The locations and ground surface elevations of the majority of the borings performed for evaluation of the SHGWT were determined by the project surveyor. The locations of the remainder of the borings and cores were estimated using the GPS coordinates obtained in the field by representatives of Tierra using hand-held, non-survey grade Garmin eTrex® Global Positioning System (GPS) devices with a manufacturer's reported accuracy of ±10 feet and therefore should be considered approximate.

The locations of the borings and cores performed for this study are shown on the **Boring Location Plan** sheets in **Appendix B**. The Station and Offset of each boring are labeled on the **Roadway Soil Profiles** and **Pond Soil Survey** sheets in **Appendix B**. The approximate Station and Offset and State Plane West coordinates of the core locations are presented on the **Pavement Data and Condition Sheet** table in **Appendix E.**

4.1 Piezometers

Tierra installed eleven (11) piezometers to depths of approximately 5½ feet below the existing ground surface along the project corridor. The purpose of the piezometers was to monitor groundwater levels to assist in estimating SHGWT levels. The groundwater table levels within the piezometers were monitored and recorded three times between July and November of 2022. A summary table of the recorded water levels in the piezometers to date is included in **Appendix D**.

4.2 Bulk Sampling and LBR Testing

Bulk samples for Limerock Bearing Ratio (LBR) testing were retrieved at fourteen (14) locations along the proposed roadway alignment and within the pond areas. In general, these samples were collected within the top 2 feet of the near-surface soils encountered. The results of the LBR tests are presented in **Appendix C**.

4.3 Double Ring Infiltration Tests (DRIT)

One (1) Double Ring Infiltration Test (DRIT) was performed within a proposed stormwater pond area. The test was performed at a depth of 1 foot below grade. The test location is depicted on the **Boring Location Plan** sheets and the results are presented in the **Hydraulic Conductivity Test Results** table in **Appendix C**.

5.0 LABORATORY TESTING

5.1 General

Representative soil samples collected from the borings performed along the project alignments were classified and stratified in general accordance with the AASHTO soil classification system. Our classification was based on visual observations, using the results from the laboratory testing as confirmation. These tests included grain-size analyses, fines content, organic content, Atterberg limits and natural moisture content determination. In addition, environmental corrosion tests were performed on selected soil samples to evaluate the corrosive nature of the subsurface soils encountered.

5.2 Test Designation

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

- Fines Content Analyses - The fines content tests were conducted in general accordance with the AASHTO test designation T-088 (ASTM test designation D-1140).

- Grain-Size Analyses - The grain-size analyses were conducted in general accordance with the AASHTO test designation T-088 (ASTM test designation D-422).

- Atterberg Limits - The liquid limit and the plastic limit tests ("Atterberg Limits") were conducted in general accordance with the AASHTO test designations T-089 and T-090, respectively (ASTM test designation D-4318).

- Organic Content - The organic content tests were conducted in general accordance with the AASHTO test designation T-267.

- Natural Moisture Content - The moisture content tests were conducted in general accordance with the AASHTO test designation T-265 (ASTM test designation D-2216).

- Environmental Corrosion - The environmental corrosion tests were conducted in general accordance with the FDOT test designations FM 5-550, FM 5-551, FM 5-552 and FM 5-553.

A summary of the laboratory test results for each soil stratum encountered along the project alignments and pond sites is presented on the **Roadway Soil Survey** sheet in **Appendix B**. These sheets include ranges of laboratory test results for different stratum soil samples collected from borings performed along the project alignment. A detailed summary of the laboratory test results performed for this report is presented in **Appendix D**.

6.0 RESULTS OF SUBSURFACE EXPLORATION

6.1 General Soil Conditions

The soil types encountered during this exploration have been assigned a stratum number. The stratum number and soil types associated with the roadway portion of this project are provided below:

Stratum Number	Typical Soil Description	AASHTO Classification
1	Brown to Light Brown to Gray to Light Gray Sand to Sand with Silt	A-3
2	Brown to Light Brown to Gray to Light Gray Silty Sand	A-2-4
3	Brown to Light Brown to Gray Silty Sand to Silty-Clayey Sand	A-2-4
4	Gray to Brown Clayey Sand to Sandy Clay	A-2-6/A-4/A-6
5	Dark Gray to Black Organic Sand to Organic Silty Sand to Peat	A-8
6	Gray to Brown Silt to Clay	A-7-6/A-7-5
7	Calcareous Clay to Weathered Limestone	---(1)
8	Landfill Debris	---
(1) USCS does not include nomenclature for Limestone		

A geotechnical engineer bases soil stratification on a visual review of the recovered samples, laboratory testing and interpretation of the field boring logs. The boring stratification lines represent the approximate boundaries between soil types of significantly different engineering properties; however, the actual transition may be gradual. In some cases, small variations in properties within the same boring not considered pertinent to our engineering evaluation may have been abbreviated or omitted for clarity. The boring profiles represent the conditions at the particular boring location and variations do occur among the borings.

The results of the borings performed for this project along with the boring location plans are presented in **Appendix B** of this report.

6.2 Groundwater

The groundwater table was recorded at each of the boring locations during our field exploration. The depths to the groundwater table along the project alignments were found to range from approximately at or above natural grade to 6½ feet below the existing ground surface at the locations of the borings performed. The groundwater table measured at each of the boring locations is presented on the **Roadway Soil Profiles** sheets in **Appendix B**. The groundwater table was not encountered within some borings performed prior to termination of the boring. As a result, GNE (Groundwater Not Encountered) is indicated on those soil profiles on the **Roadway Soil Profiles** sheets. Likewise, the groundwater table was not recorded in the test pits and muck hand auger borings. As a result, GNR (Groundwater Not Recorded) is indicated on those soil profiles.

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences (i.e., existing water management canals, swales, drainage ponds, underdrains, and areas of covered soils, such as paved parking lots and sidewalks).

6.3 Seasonal High Groundwater Estimates

Tierra performed hand auger borings at selected locations along the project alignment and within the ponds sites to estimate the SHGWT. The SHGWT levels at these boring locations were estimated based on a review of the soil samples, natural indicators within the soils such as stain lines/mottles, measured groundwater levels in the borings, and the USDA Manatee County Soil Survey information. A summary of the SHGWT estimates are presented in **Appendix C**.

6.4 Organic Soils

Organic sandy/silty soils (Stratum 5, A-8) were encountered during our roadway soil survey along portions of the project roadway alignment. The organic soils were encountered at depths ranging from approximately at grade to 5 feet below the existing ground surface. It is recommended that these soils be removed in accordance with FDOT Standard Plans Index 120-002 and utilized in accordance with FDOT Standard Plans Index 120-001. The borings that encountered organics are presented on the **Muck Delineation Plan** sheets in **Appendix B**. Tierra has coordinated with KHA to include hatching on the roadway cross-sections identifying the approximate limits of organic soil removal prior to the next submittal.

6.5 Landfill Debris

Landfill debris consisting of glass, metal, plastic, wood and petroleum-like products were encountered along the proposed roadway alignment from approximately Station 233+50 to 244+00 and elsewhere within Parcel 103. These materials were encountered to depths exceeding 12 feet below existing grade. Soil borings and test pits were performed in these areas to delineate the approximate extents of the landfill debris. The locations and depths of the encountered landfill debris are shown on the **Debris Delineation Plan** sheet in **Appendix B**. Representative photographs of the encountered debris material and a historical photograph of the approximate limits of the landfill are included in **Appendix F**. If encountered, the debris materials should be removed and disposed of offsite.

7.0 ENGINEERING EVALUATIONS AND RECOMMENDATIONS

7.1 General

In general, the existing subsurface soils encountered in the borings performed along the project alignment are suitable for supporting the proposed roadway improvements after proper subgrade preparation.

All earthwork activities including the site preparation, clearing and grubbing, removal and utilization/placement of soils, compaction of subgrade soils and selection of backfill materials should be accomplished in accordance with the current County Specifications and/or FDOT Standards and Specifications.

7.2 Landfill Debris

In Parcel 103, debris material (Stratum 8) was encountered within many borings beginning at grade and extending to a depth beyond 12 feet below grade. The encountered debris consisted of glass, metal, plastic, wood and petroleum-like products. **Debris can cause differential and/or excessive settlement in the roadway alignment and proposed mitigation area.** If encountered, these materials shall be removed and not used within the project limits and disposed of offsite. The boring soil profiles performed in Parcel 103 are presented on **Debris Soil Profiles** sheets in **Appendix B**. Additionally, the borings that encountered Strata 8 materials is presented on the **Debris Delineation Plan** sheets in **Appendix B**. Representative photographs of the encountered debris along with a historical photograph showing the affected area of Parcel 103 are included in **Appendix F**.

7.3 Embankment Settlement

Embankment fill soils should be placed and compacted in accordance with the project specifications. For the anticipated embankment construction, we expect total settlements on the order of 2 inches or less, and differential settlements on the order of half the total settlements. The total and differential settlements are expected to occur predominately during construction.

7.4 Slope Stability

The embankment side slopes for the proposed roadway widening are minor. Based on soil conditions encountered throughout the site and based on our engineering judgement, the slopes will achieve factors of safety exceeding the minimum required safety factor of 1.3. As a result, Tierra does not anticipate limitations to the proposed roadway performance with the proposed embankments sloped provided that the embankments are constructed in accordance with current County Specifications and/or FDOT Specifications.

7.5 Temporary Slopes and Trenches

Temporary side slopes and excavations should comply with the Occupational Safety and Health Administration's (OSHA) trench safety standards, 29 C.F.R., s. 1926.650, Subpart P, all subsequent revisions or updates of OSHA's referenced standard adopted by the Department of Labor and Employment Security and Florida's Trench Safety Act, Section 553.62, Florida Statutes. Excavated materials should not be stockpiled at the top of the slope within a horizontal distance equal to the excavation depth.

7.6 Groundwater Control

The groundwater levels presented in this report are the levels that were measured at the time of our field activities. Fluctuation should be anticipated. Tierra recommends that the Contractor determine the actual groundwater levels at the time of the construction to determine groundwater impacts on the planned construction procedure.

7.7 Existing Pavement Conditions

To evaluate the existing pavement conditions along the project alignment, Tierra performed twelve (12) pavement cores. Observed cracking, rut depths, general pavement condition, subgrade material and measured cross slopes are presented along with the pavement core data on the **Pavement Data and Condition** sheet in **Appendix E**. Photographs of the asphalt pavement cores are included in the **Pavement Core Photographs** sheets in **Appendix E**.

The pavement design engineer should review the current FDOT Flexible Pavement Design Manual for roadway projects to ensure an adequate Structural Number (SN) value is obtained based on the corresponding ESAL value over the design life of the roadway improvements. In addition, due to cracking of the structural asphalt layer at some of the pavement core locations along the project alignment, layer reduction coefficients for the existing pavement section should be reviewed and applied as necessary.

7.8 Pavement Design Considerations

As previously mentioned, bulk samples were collected and LBR tests were performed by Tierra on the soil samples obtained along the project alignment. The Design LBR value was obtained by applying the ±2% of Optimum Method and 90% Method in accordance with the FDOT Soils and Foundations Handbook. The design LBR value was chosen by taking the lower of the two LBR values determined by the two methods per FDOT Soils and Foundations Handbook.

Based on the LBR test results and the FDOT Flexible Pavement Design Manual, a design M_R value of 9,750 psi is recommended for use in pavement design for project roadway. It should be noted that the design M_R value obtained from the tests performed may not be representative of borrow materials which may support some of the proposed roadway.

In accordance with FDOT guidelines, grades for this type of roadway should be ideally set to provide a minimum separation per FDOT, PPM between the bottom of the base and the estimated seasonal high groundwater levels. Correspondingly, the base should remain equally above sustained water treatment levels in roadside ditches, making positive drainage of the ditches important. The choice of base material would depend upon the relationship of final roadway improvement grades and the bottom of the base to the estimated seasonal high groundwater table levels.

7.9 On-Site Soil Suitability

The general suitability and evaluations of the soils encountered during our geotechnical exploration is presented on the **Roadway Soil Survey** sheet in **Appendix B**. FDOT Standard Plans, Indices 120-001 and 120-002 of the Design Standards should be consulted to determine the specific use/suitability of the soil types present within the project limits.

7.10 General Roadway Construction

The overall site preparation and mechanical densification work for the construction of the proposed roadway should be in accordance with the current County Specifications and/or FDOT Specifications.

8.0 REPORT LIMITATIONS

Our services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices at the time of this report. Our geotechnical engineering evaluation of the site and subsurface conditions with respect to the planned roadway construction, and our recommendations are based upon the following: (1) site observations, (2) the field exploratory test data obtained during the geotechnical study, and (3) our understanding of the project information and anticipated grades as presented in this report. This company is not responsible for the conclusions, opinions or recommendations made by others based on these data.

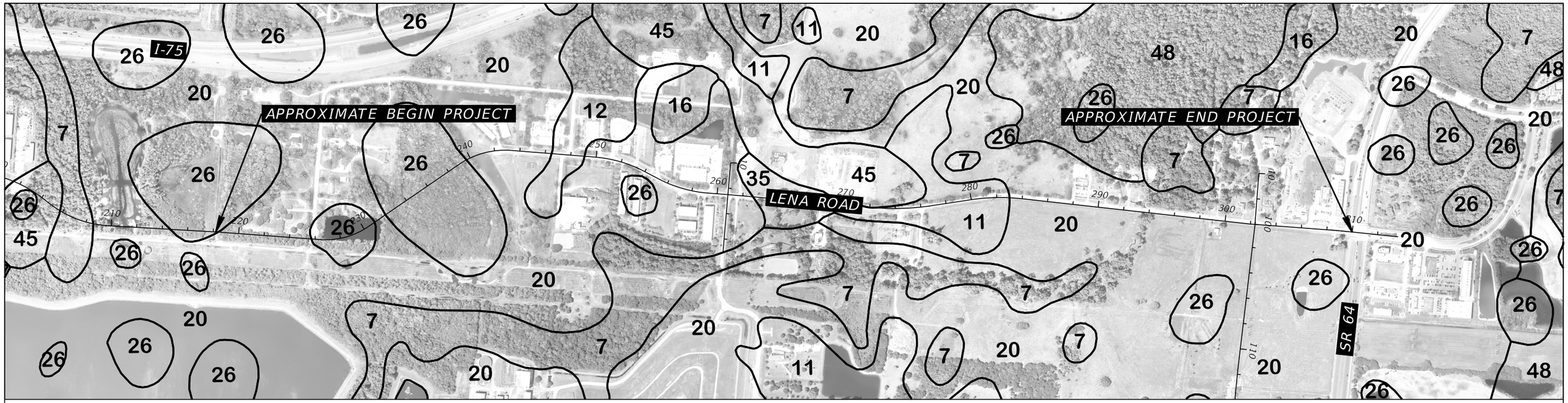
The scope of the exploration was intended to evaluate soil conditions within the influence of the proposed roadway construction. The analyses and recommendations submitted in this report are based upon the anticipated location and type of construction and data obtained from the soil borings performed at the locations indicated and does not reflect any variations which may occur among these borings. If any variations become evident during the course of construction, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered.

The scope of services, included herein, did not include any environmental assessment for the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on the site, below, and around the site. Any statements in this report or on the boring logs regarding odors, colors, unusual or suspicious items and conditions are strictly for the information of Kimley-Horn and Associates, Inc. and the Manatee County.

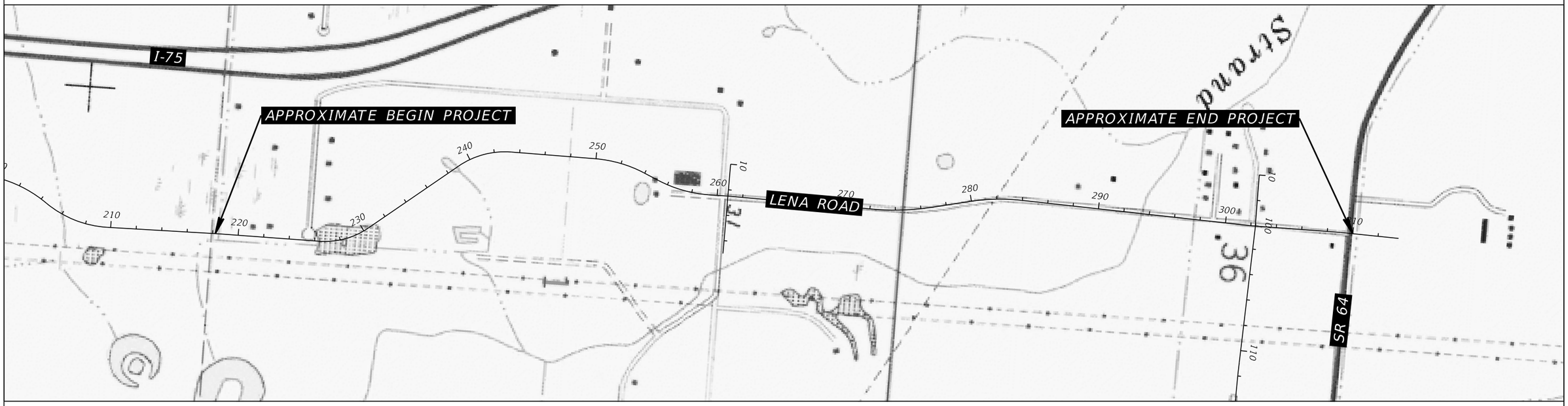
APPENDIX A

USDA Soil Survey and USGS Quadrangle Maps

Summary of USDA Soil Survey Information



REFERENCE: USDA SOIL SURVEY OF MANATEE COUNTY, FLORIDA



REFERENCE: USGS QUADRANGLE MAP OF "LORRAINE, FLORIDA"

TOWNSHIP:	34S	35S
RANGE:	18E	18E
SECTION:	36	1

N

0 200 800

Feet

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

Manatee County FLORIDA

LENA ROAD

MANATEE COUNTY FL

LICENSED PROFESSIONAL

KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514

DATE:

USDA SOIL SURVEY & USGS QUADRANGLE MAPS

SHEET NUMBER

Summary of USDA Soil Survey
Manatee County, Florida

USDA Map Symbol and Soil Name	Soil Classification				pH	Seasonal High Water Table	
	Depth (in)	USCS	AASHTO	Permeability (in/hr)		Depth (feet)	Months
(7) Canova Anclote Okeelanta	0-8	PT	A-8	6.0 - 20.0	3.5-6.0	+2.0 - 0.0	Jan - Dec
	8-24	SP, SP-SM	A-3	6.0 - 20.0	6.1-8.4		
	24-68	SC, SC-SM, SM	A-2-4, A-3	0.6 - 6.0	7.4-8.4		
	0-16	SM, SP-SM	A-2-4, A-3	6.0 - 20.0	5.6-8.4	+1.0 - 0.0	Jun - Dec
	16-80	SM, SP, SP-SM	A-2-4, A-3	6.0 - 20.0	5.6-8.4		
	0-20	PT	A-8	6.0 - 20.0	4.5-6.5	+1.0 - 0.0	Jan Jun - Dec
	20-54	SM, SP, SP-SM	A-2-4, A-3	6.0 - 20.0	5.1-7.8		
(11) Cassia Fine Sand, 0 to 2 percent slopes	0-5	SM, SP-SM	A-2-4, A-3	6.0 - 20.0	3.5-6.5	1.5 - 3.5	Jun - Nov
	5-26	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	3.5-6.0		
	26-42	SM, SP-SM	A-2-4	0.6 - 6.0	3.5-5.5		
	42-80	SP-SM, SM	A-2-4, A-3	6.0 - 20.0	3.5-6.5		
(12) Cassia Fine Sand, mod well drained	0-5	SP, SP-SM	A-3	20.0 - 50.0	4.5-6.0	3.5 - 5.0	Jan Jul - Dec
	5-29	SP, SP-SM	A-3	6.0 - 20.0	4.5-6.0		
	29-41	SP, SP-SM	A-2-4, A-3	2.0 - 6.0	4.5-6.0		
	41-80	SP, SP-SM	A-3	20.0 - 50.0	4.5-6.0		
(16) Delray Complex	0-15	SC-SM, SM, SP-SM	A-3, A-2-4	6.0 - 20.0	5.6-7.3	0.0 - 0.5	Jan - Mar Jun - Dec
	15-55	SP-SM	A-3, A-2-4	6.0 - 20.0	5.6-7.3		
	55-80	SC, SC-SM, SM	A-2-6, A-2-4	0.6 - 6.0	6.6-7.8		
(20) EauGallie EauGallie Wet	0-6	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	3.5-6.0	0.5 - 1.5	Jun - Nov
	6-23	AM, SP-SM	A-2-4, A-3	6.0 - 20.0	3.5-6.0		
	23-47	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	3.5-7.3		
	47-55	SM, SP-SM	A-2-4, A-3	0.6 - 6.0	3.5-7.8		
	55-80	SM, SC	A-2-4, A-6, A-4	0.1 - 0.2	3.5-7.8		
	0-5	SP-SM, SM	A-2-4, A-3	6.0 - 20.0	3.5-6.0	0.3 - 1.5	Jul - Oct
	5-17	SP-SM, SM	A-3, A-2-4	6.0 - 20.0	3.5-6.0		
	17-26	SP-SM, SM	A-2-4, A-3	6.0 - 20.0	3.5-7.3		
	26-48	SP-SM, SM	A-2-3, A-3	0.6 - 2.0	3.5-7.8		
	48-72	SP-SM, SM	A-3, A-2-4	0.6 - 2.0	3.5-7.8		
	72-80	SC, CL, SC-SM	A-4, A-6, A-2-4	0.6 - 2.0	3.5-7.8		
(26) Floridana Immokalee Okeelanta	0-19	SP-SM, SM	A-3, A-2-4	6.0 - 20.0	5.6-7.8	+2.0 - 0.0	Jan - Feb Jun - Dec
	19-36	SP-SM, SP	A-3	6.0 - 20.0	5.6-7.8		
	36-63	SC-SM, SC	A-2-6, A-2-4	0.1 - 2.0	5.6-7.8		
	63-80	SP-SM, SM	A-3, A-2-4	6.0 - 20.0	5.6-7.8		
	0-10	SP-SM, SP	A-3	6.0 - 20.0	4.5-5.5	+2.0 - 0.0	Jan - Feb Jun - Dec
	10-34	SP-SM, SP	A-3	6.0 - 20.0	4.5-5.5		
	34-43	SP-SM, SM	A-3, A-2-4	0.6 - 2.0	4.5-5.5		
	43-80	SP-SM, SP	A-3	6.0 - 20.0	4.5-5.5		
	0-20	PT	A-8	6.0 - 20.0	5.6-8.4	+1.0 - 0.0	Jun - Oct
	20-54	SP-SM, SP, SM	A-3, A-2-4	6.0 - 20.0	5.6-8.4		
(35) Ona Fine Sand, non hydric and hydric	0-5	SP, SP-SM	A-3	6.0 - 20.0	4.5-6.0	0.5 - 1.5	Jun - Nov
	5-16	SM, SP-SM	A-2-4, A-3	0.6 - 2.0	4.5-6.0		
	16-52	SP, SP-SM	A-3	6.0 - 20.0	4.5-6.0		
	52-68	SM, SP-SM	A-2-4	0.1 - 0.2	4.5-6.0		
	68-80	SM, SP-SM	A-2-4	0.1 - 0.6	4.5-6.0		
	0-5	SP, SP-SM	A-3	6.0 - 20.0	4.5-6.0	0.0 - 1.0	Jun - Nov
	5-16	SM, SP-SM	A-2-4, A-3	0.6 - 2.0	4.5-6.0		
	16-52	SP, SP-SM	A-3	6.0 - 20.0	4.5-6.0		
	52-68	SM, SP-SM	A-2-4	0.1 - 0.2	4.5-6.0		
	68-80	SM, SP-SM	A-2-4	0.1 - 0.6	4.5-6.0		
(45) Tavares Fine Sand	0-6	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	3.5-6.0	1.5 - 3.5	Jun - Oct
	6-80	SP-SM, SM	A-3, A-2-4	6.0 - 20.0	3.5-6.0		

APPENDIX B

Roadway Soil Survey

Boring Location Plan

Roadway Soil Profiles

Pond Soil Survey

Debris Soil Profiles

Debris Delineation Plan

Muck Delineation Plan

DATE OF SURVEY: JULY 2022 TO JUNE 2023
SURVEY MADE BY: TIERRA, INC.
SUBMITTED BY: KEVIN H. SCOTT, P.E.

MANATEE COUNTY, FLORIDA

MANATEE COUNTY PROJECT #6107560
PROJECT NAME: LENA ROAD FROM NORTH OF 44TH AVENUE EAST TO SR 64

CROSS SECTION SOIL SURVEY FOR THE DESIGN OF ROADS

SURVEY BEGINS STA. : 218+28.36 SURVEY ENDS STA. : 309+85.00 REFERENCE: CENTERLINE CONSTRUCTION LENA ROAD

	ORGANIC CONTENT		MOISTURE CONTENT		SIEVE ANALYSIS RESULTS PERCENT PASS (%)						ATTERBERG LIMITS (%)					CORROSION TEST RESULTS				
STRATUM NO.	NO. OF TESTS	% ORGANIC	NO. OF TESTS	MOISTURE CONTENT	NO. OF TESTS	10 MESH	40 MESH	60 MESH	100 MESH	200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTIC INDEX	AASHTO GROUP	DESCRIPTION	NO. OF TESTS	RESISTIVITY ohm-cm	CHLORIDE ppm	SULFATES ppm	pH
1	8	2-4	11	19-27	51	82-100	72-95	54-77	26-41	2-10	2	NP	NP	A-3	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT	7	2,300-20,000	30-90	<5-270	7.4-8.1
2	2	4	4	20-27	11	100	92-95	74-78	40-42	11-14	2	NP	NP	A-2-4	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND	--	--	--	--	--
3	--	--	14	12-27	20	91	83	69	45	15-35	13	NP-26	NP-10	A-2-4	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND	--	--	--	--	--
4	--	--	10	20-46	12	100	97	89	70	21-78	10	NP-39	NP-19	A-2-6/A-6/ A-4	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT	--	--	--	--	--
5	10	8-28	10	41-133	10	--	--	--	--	10-32	--	--	--	A-8	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT	--	--	--	--	--
6	--	--	5	46-82	5	--	--	--	--	44-99	5	47-101	22-46	A-7-6/A-7-5	GRAY TO BROWN SILT TO CLAY	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	CALCAREOUS CLAY TO WEATHERED LIMESTONE	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	LANDFILL DEBRIS	--	--	--	--	--

NOTES:

1. THE MATERIAL FROM STRATUM 1 AND 2 (A-3/A-2-4) APPEARS SATISFACTORY FOR USE IN THE EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-001.
2. THE MATERIAL FROM STRATUM 3 (A-2-4) APPEARS SATISFACTORY FOR USE IN THE EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-001. HOWEVER, THIS MATERIAL IS LIKELY TO RETAIN EXCESS MOISTURE AND MAY BE DIFFICULT TO DRY AND COMPACT. IT SHOULD BE USED IN THE EMBANKMENT ABOVE THE WATER LEVEL EXISTING AT THE TIME OF CONSTRUCTION.
3. THE MATERIAL FROM STRATUM 4 (A-2-6/A-4/A-6) IS PLASTIC MATERIAL AND SHALL BE REMOVED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-002 AND UTILIZED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-001.
4. THE MATERIAL FROM STRATUM 5 (A-8) IS MUCK MATERIAL AND SHALL BE REMOVED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-002 AND UTILIZED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-001. THE REMOVAL LIMITS ARE SHOWN ON THE ROADWAY CROSS SECTIONS.
5. THE MATERIAL FROM STRATUM 6 (A-7-6/A-7-5) IS HIGH PLASTIC MATERIAL AND SHALL BE REMOVED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-002 AND UTILIZED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-001.
6. THE MATERIAL FROM STRATUM 7 IS A NATURAL LIMESTONE FORMATION. SPECIAL TOOLS AND EQUIPMENT WILL BE REQUIRED TO EXCAVATE AND/OR DEWATER THIS MATERIAL.

EMBANKMENT AND SUBGRADE MATERIAL

STRATA BOUNDARIES ARE APPROXIMATE. MAKE FINAL CHECK AFTER GRADING.

▼ - WATER TABLE ENCOUNTERED

▼+ - GROUNDWATER TABLE AT OR ABOVE GRADE

▽ - ESTIMATED SEASONAL HIGH GROUNDWATER TABLE

▽+ - ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE

GNE - GROUNDWATER NOT ENCOUNTERED

NP - NON-PLASTIC

7. THE MATERIAL FROM STRATUM 8 IS LANDFILL DEBRIS. THIS MATERIAL WAS ENCOUNTERED WITHIN PARCEL 103. IF ENCOUNTERED, THESE MATERIALS SHALL BE REMOVED AND NOT USED WITHIN THE PROJECT LIMITS AND DISPOSED OF OFFSITE. EXCAVATIONS INTO AND THROUGH THIS MATERIAL WILL BE DIFFICULT AND SPECIALIZED EQUIPMENT WILL BE REQUIRED. DEWATERING IN THESE MATERIALS WILL BE DIFFICULT.
8. CEMENTED SAND/HARDPAN WAS ENCOUNTERED WITHIN THE BORINGS. THIS MATERIAL IS ROCK-LIKE AND IS LOCATED AT SHALLOW DEPTHS. EXCAVATIONS INTO AND/OR THROUGH THIS MATERIAL WILL BE DIFFICULT AND WILL REQUIRE NON CONVENTIONAL CONSTRUCTION TECHNIQUES AND SPECIALIZED EQUIPMENT.
9. THE "--" INDICATES AN UNMEASURED PARAMETER.

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

Manatee County FLORIDA

LENA ROAD

MANATEE COUNTY FL

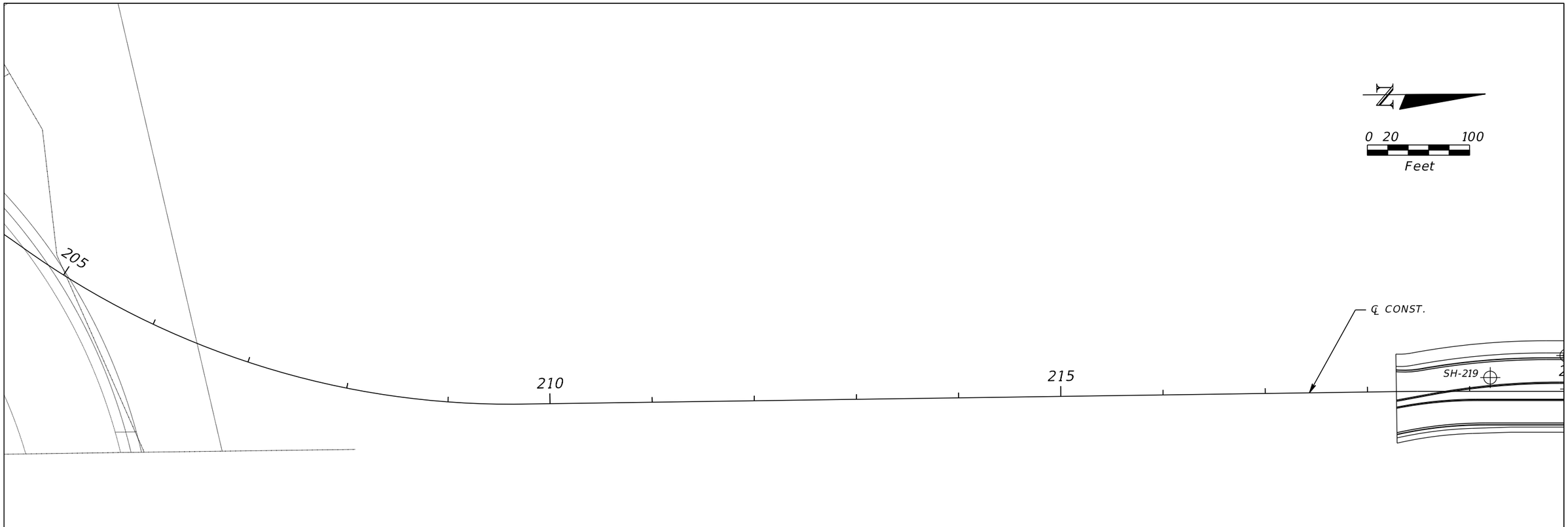
LICENSED PROFESSIONAL

KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL SURVEY

SHEET NUMBER

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



LEGEND

- APPROXIMATE AUGER BORING LOCATION
- APPROXIMATE SPT BORING LOCATION
- APPROXIMATE LBR LOCATION
- APPROXIMATE PAVEMENT CORE LOCATION
- APPROXIMATE TEST PIT LOCATION

No.	REVISIONS	DATE	BY

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MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
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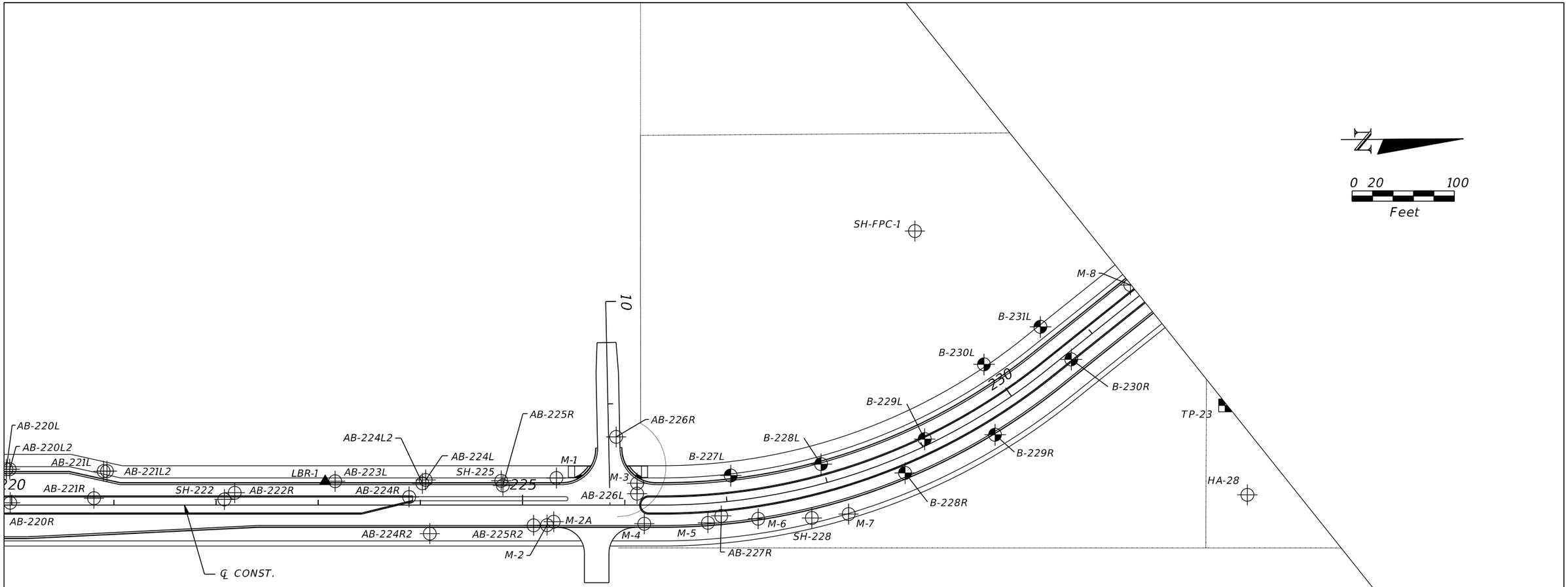
BORING LOCATION PLAN (1)

SHEET NUMBER



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MANATEE COUNTY — LENA ROAD — FL

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KEVIN H. SCOTT, P.E.
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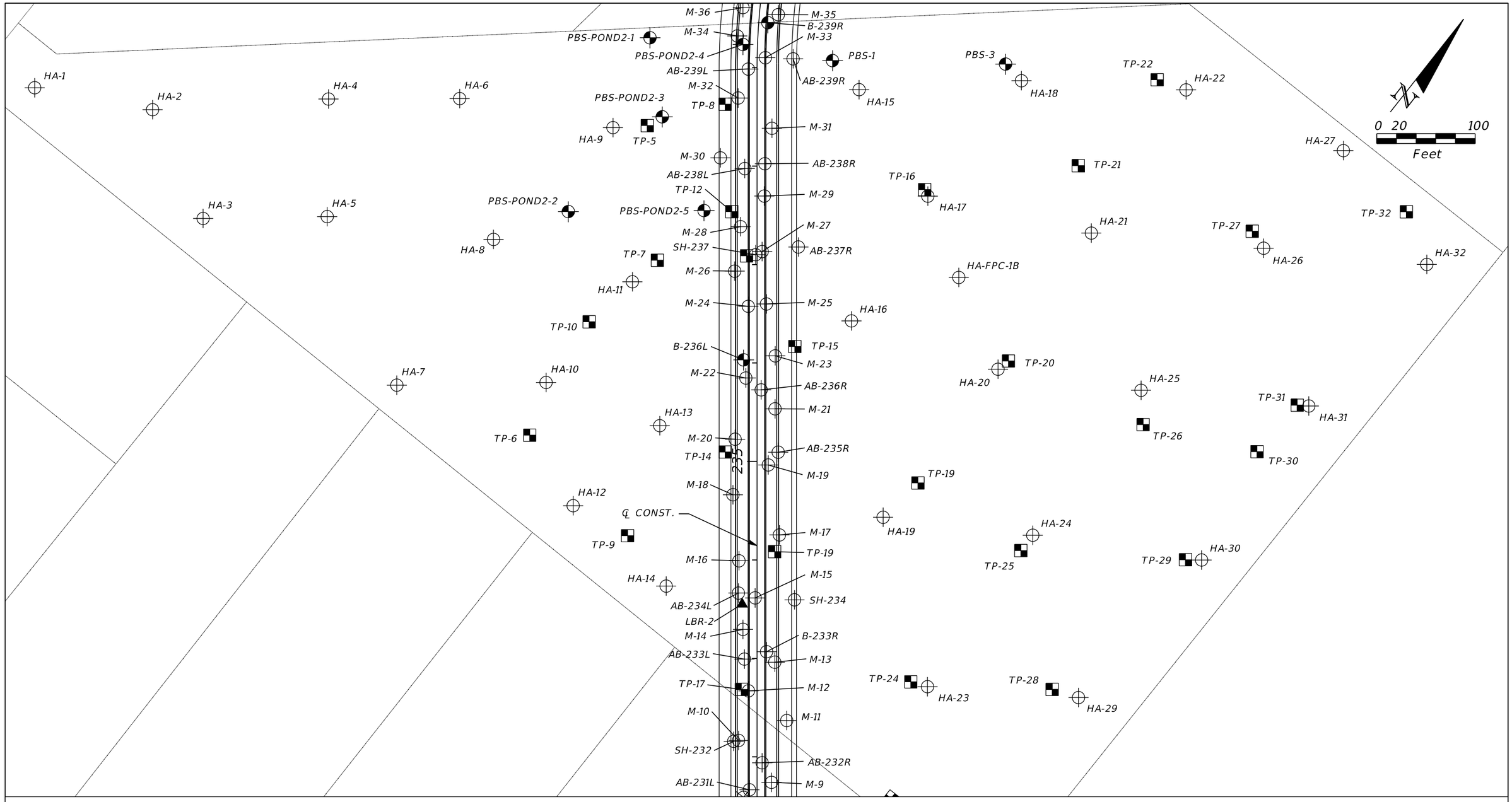
BORING LOCATION PLAN (2)

SHEET NUMBER



LEGEND

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Manatee County Florida

LENA ROAD
MANATEE COUNTY FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
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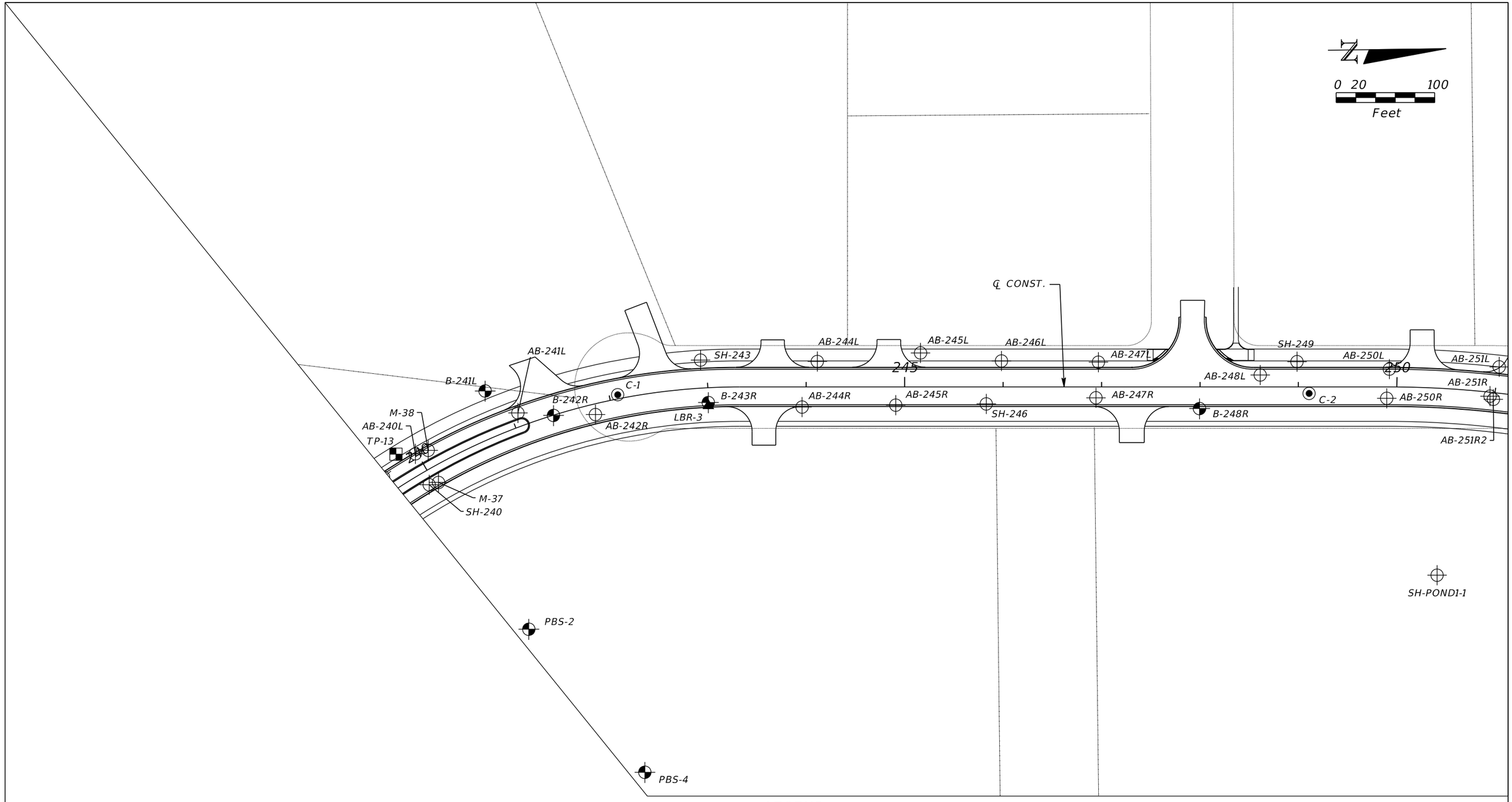
BORING LOCATION PLAN (3)

SHEET NUMBER



LEGEND

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MANATEE COUNTY FL

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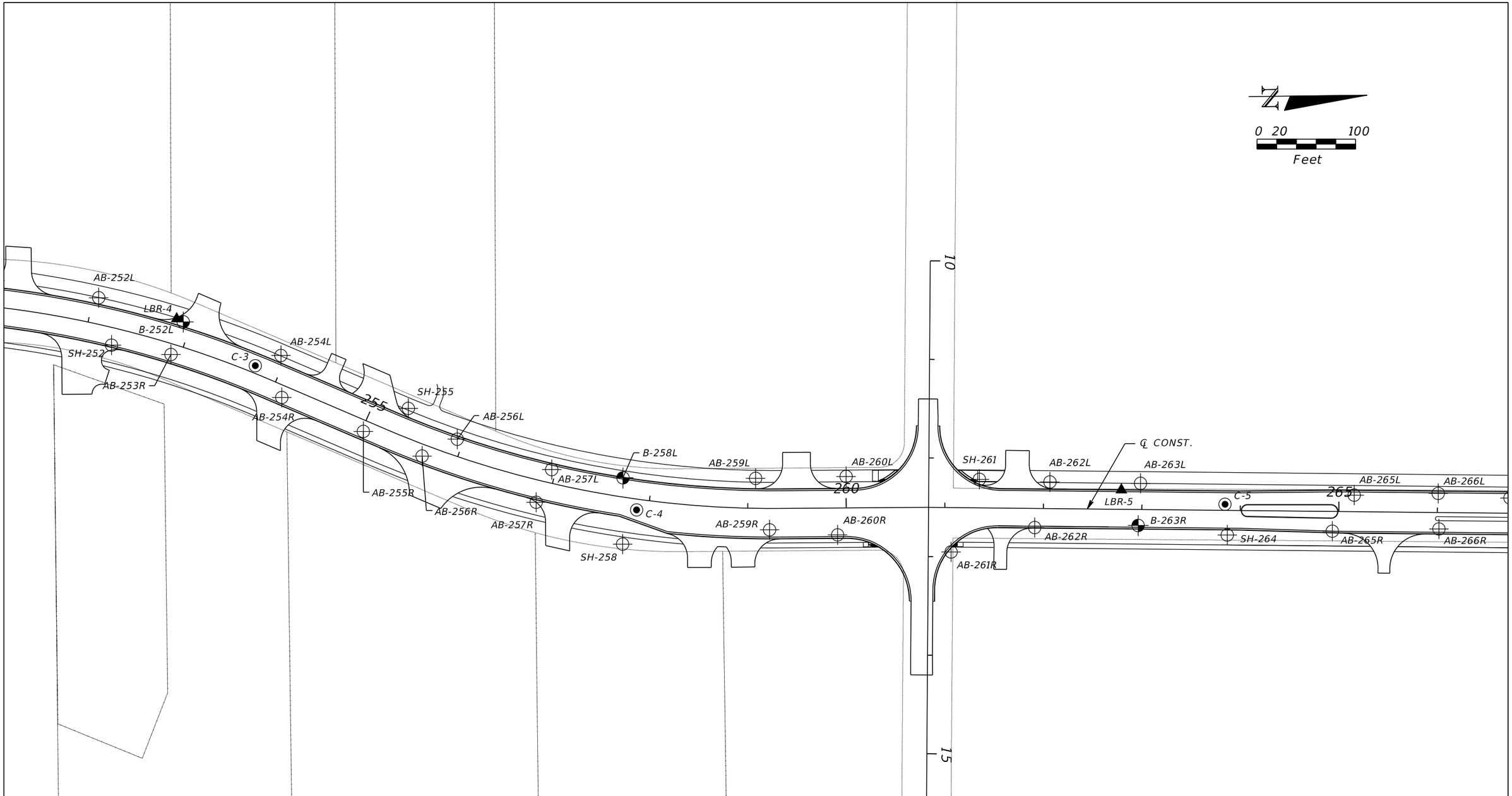
BORING LOCATION PLAN (4)

SHEET NUMBER



LEGEND

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- APPROXIMATE LBR LOCATION
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LENA ROAD

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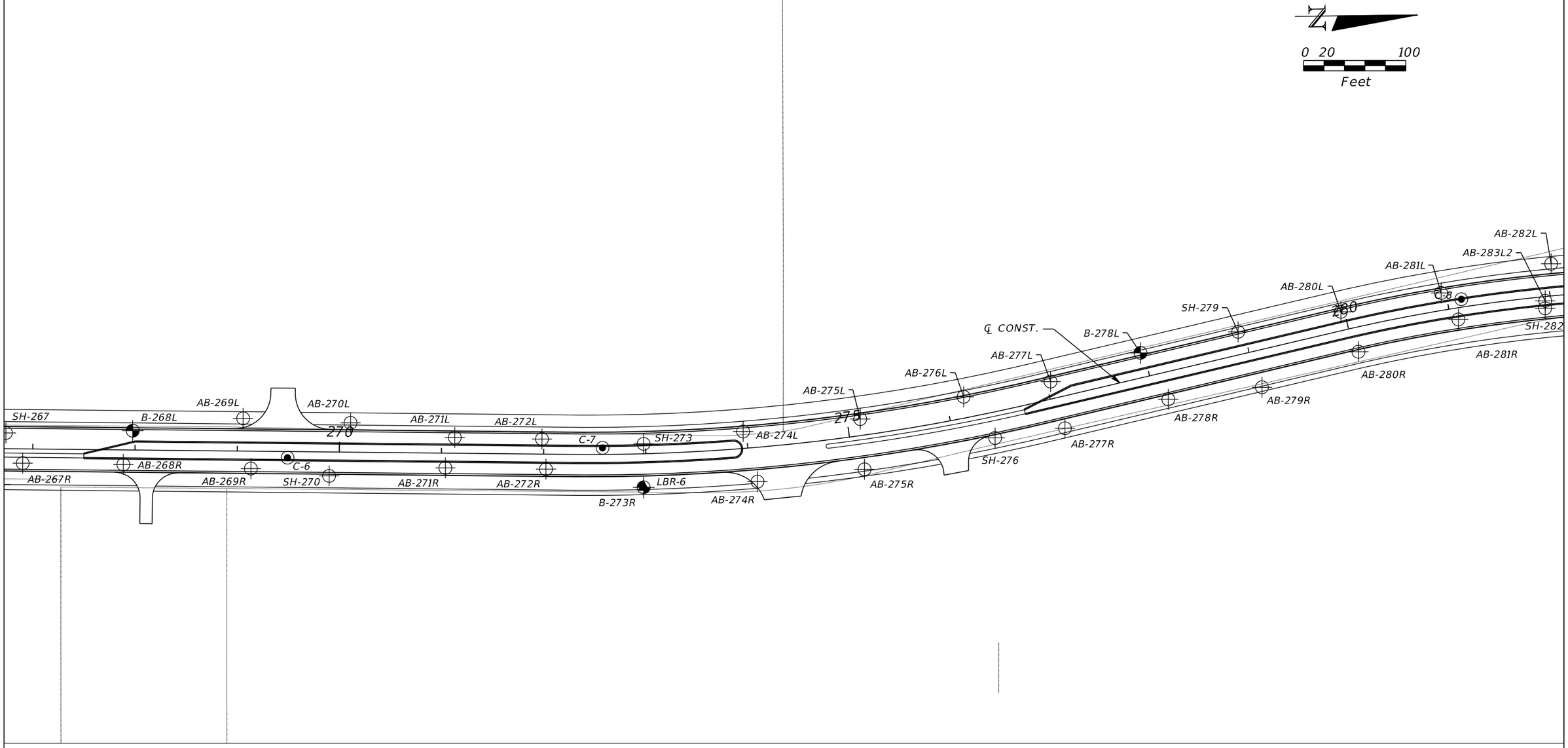
BORING LOCATION PLAN (5)

SHEET NUMBER



LEGEND

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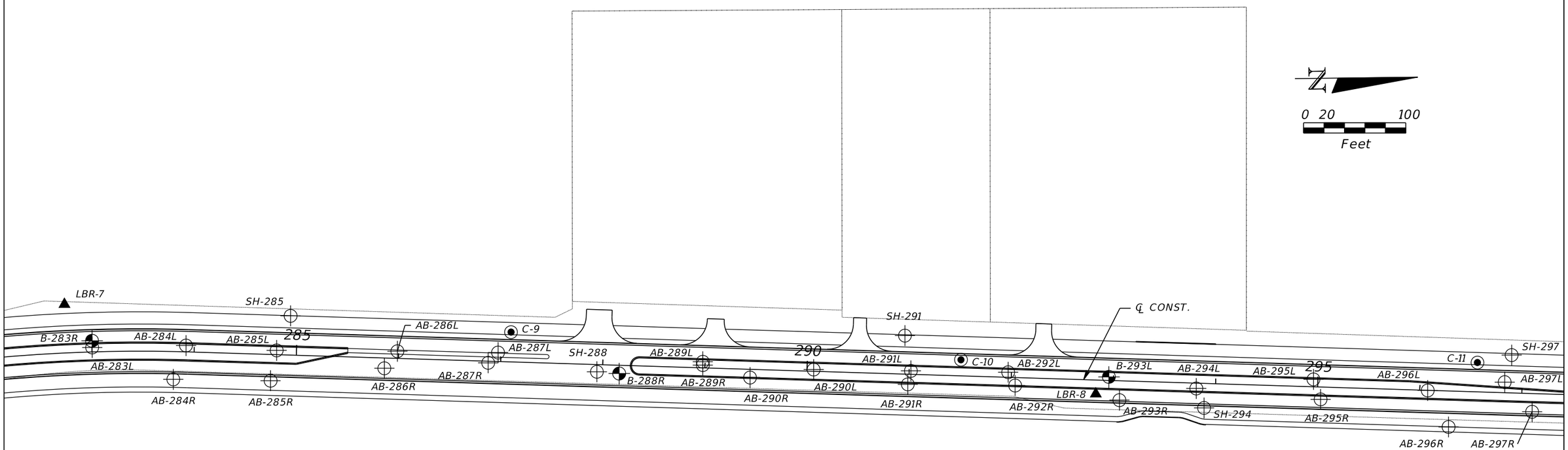
DATE:

BORING LOCATION PLAN (6)

SHEET NUMBER



LEGEND

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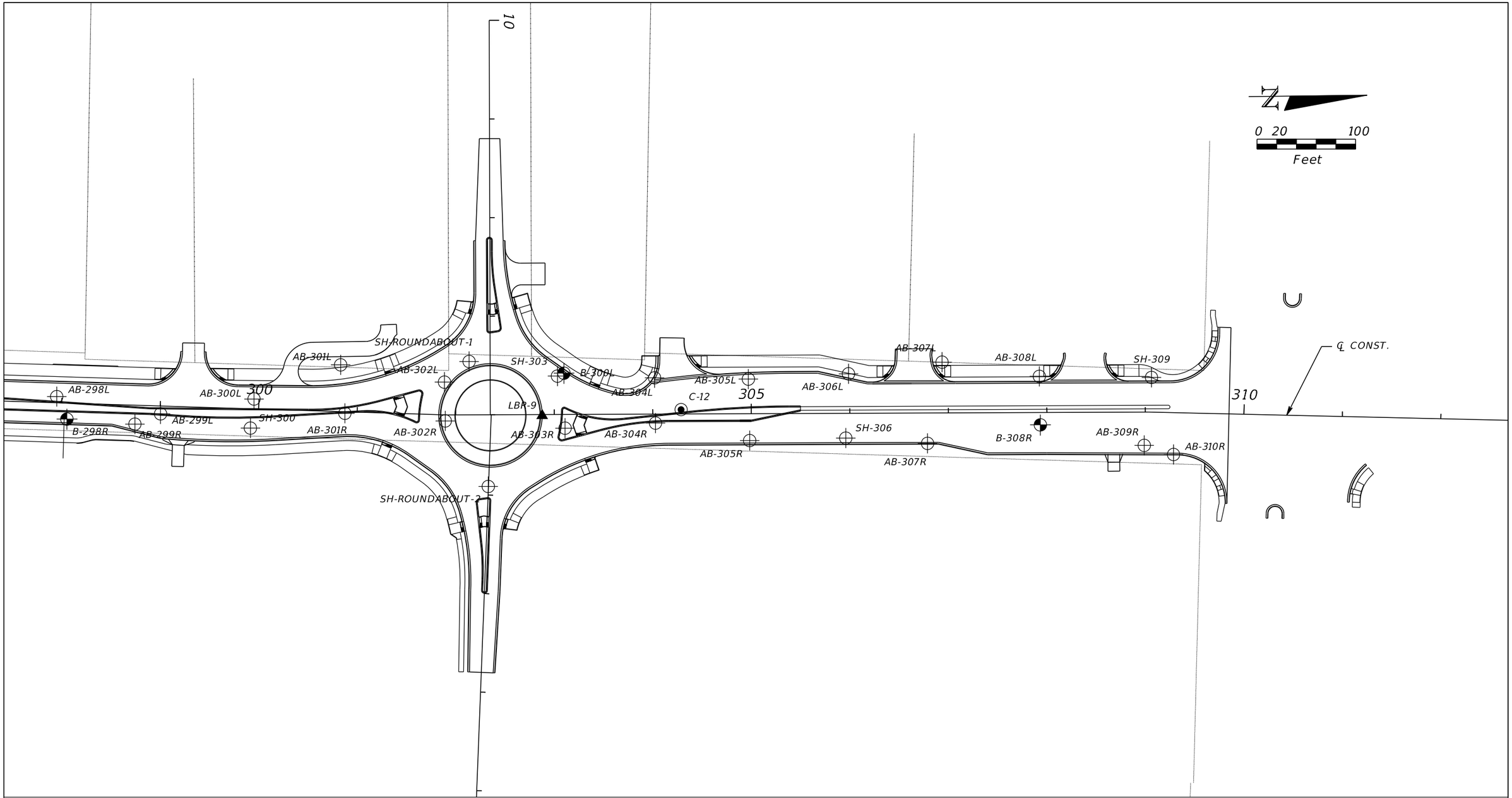
BORING LOCATION PLAN (7)

SHEET NUMBER



LEGEND

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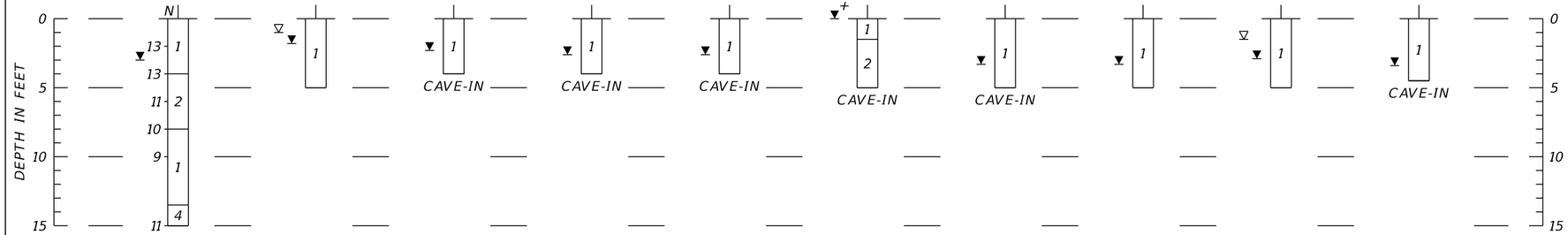
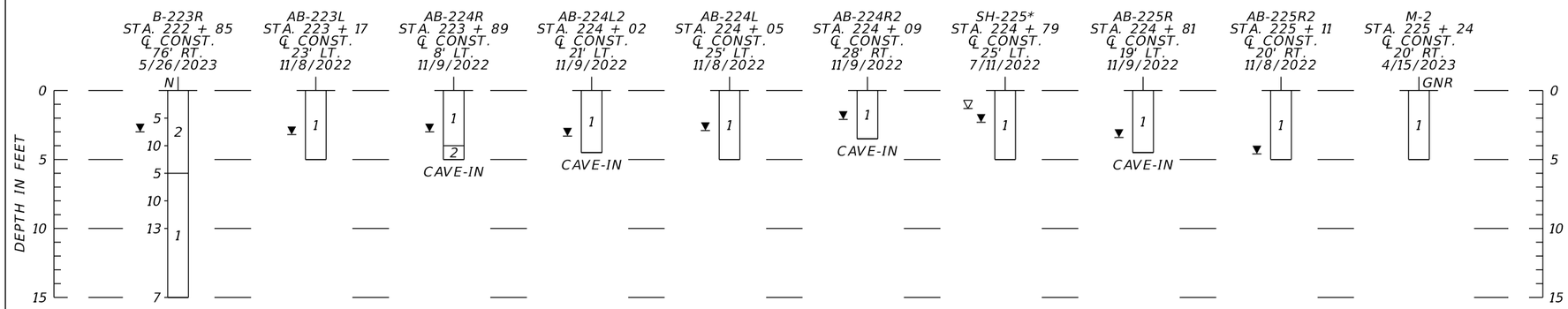
BORING LOCATION PLAN (8)

SHEET NUMBER





LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
8.	LANDFILL DEBRIS
W	WATER
P	PAVEMENT AND BASE MATERIAL
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
WH	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
GNE	GROUNDWATER NOT ENCOUNTERED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON WOOD, ROCK MATERIAL, CEMENTED SANDS/HARDPAN AND/OR LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTES:
1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.
2. THE STANDARD PENETRATION TEST BORINGS DENOTED WITH A "(1)" WERE PERFORMED UTILIZING A SAFETY HAMMER. THE REMAINING BORINGS WERE PERFORMED UTILIZING AN AUTOMATIC HAMMER.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
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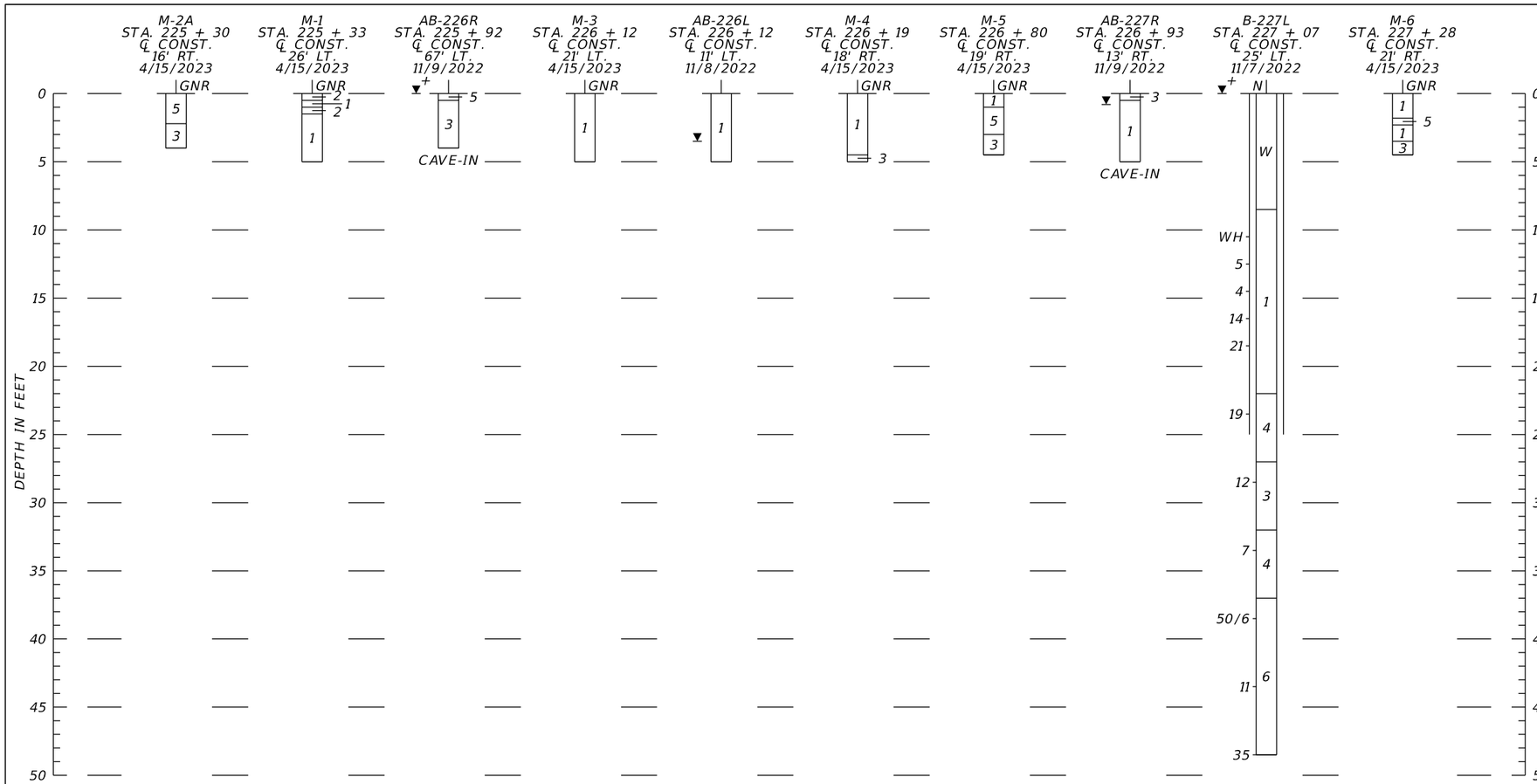
CHECKED BY TB

MANATEE COUNTY FLORIDA
LENA ROAD
MANATEE COUNTY FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (1)

SHEET NUMBER



LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
8.	LANDFILL DEBRIS
W	WATER
P	PAVEMENT AND BASE MATERIAL
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
WH	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
GNE	GROUNDWATER NOT ENCOUNTERED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON WOOD, ROCK MATERIAL, CEMENTED SANDS/HARDPAN AND/OR LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTES:
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2. THE STANDARD PENETRATION TEST BORINGS DENOTED WITH A "(1)" WERE PERFORMED UTILIZING A SAFETY HAMMER. THE REMAINING BORINGS WERE PERFORMED UTILIZING AN AUTOMATIC HAMMER.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

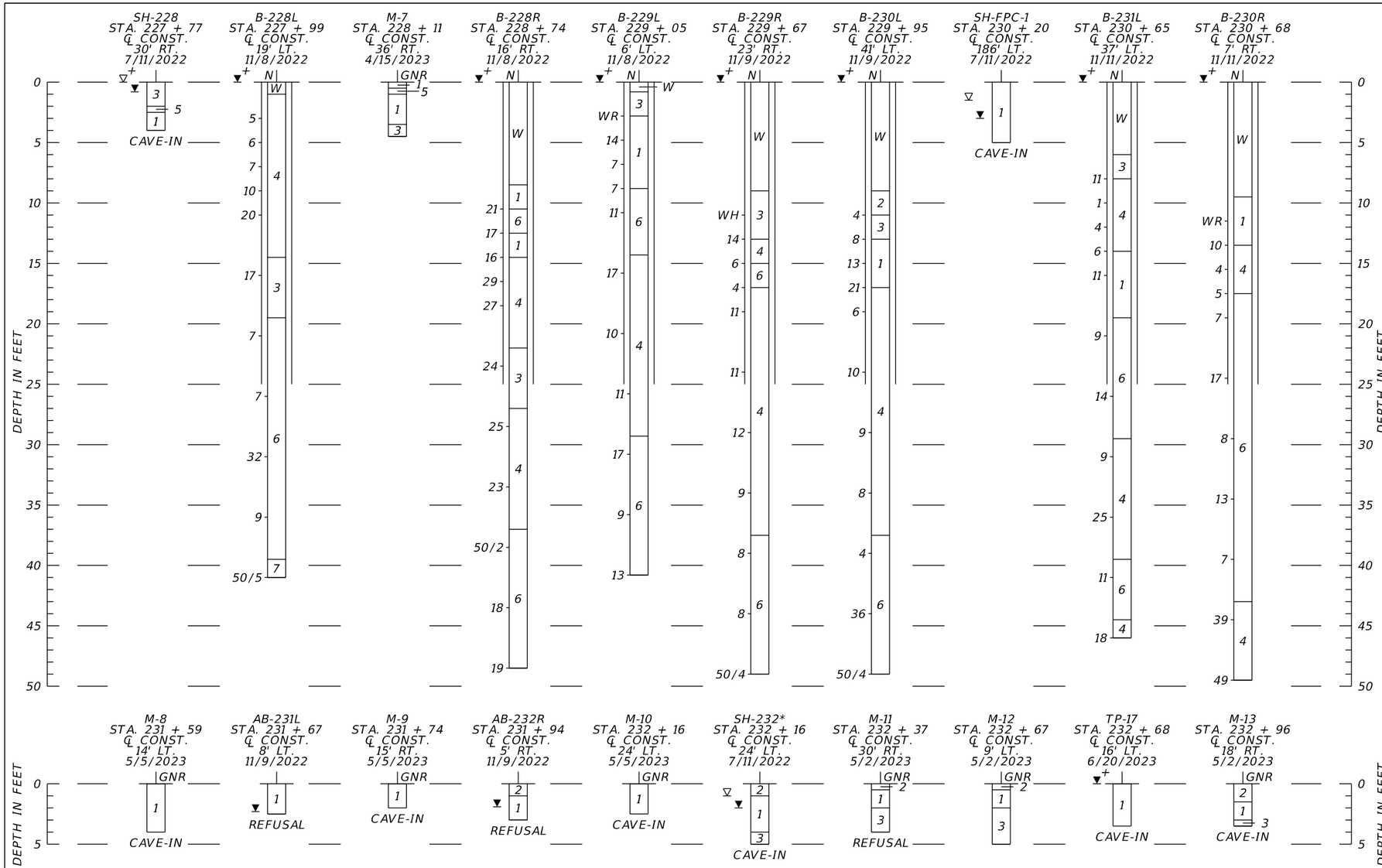
KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

MANATEE COUNTY
LENA ROAD
FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (2)

SHEET NUMBER



LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
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6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
8.	LANDFILL DEBRIS
W	WATER
P	PAVEMENT AND BASE MATERIAL
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
WH	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
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GNR	GROUNDWATER LEVEL NOT RECORDED
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CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON WOOD, ROCK MATERIAL, CEMENTED SANDS/HARDPAN AND/OR LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

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	SAFETY HAMMER	AUTOMATIC HAMMER
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SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
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SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
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VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

Manatee County FLORIDA

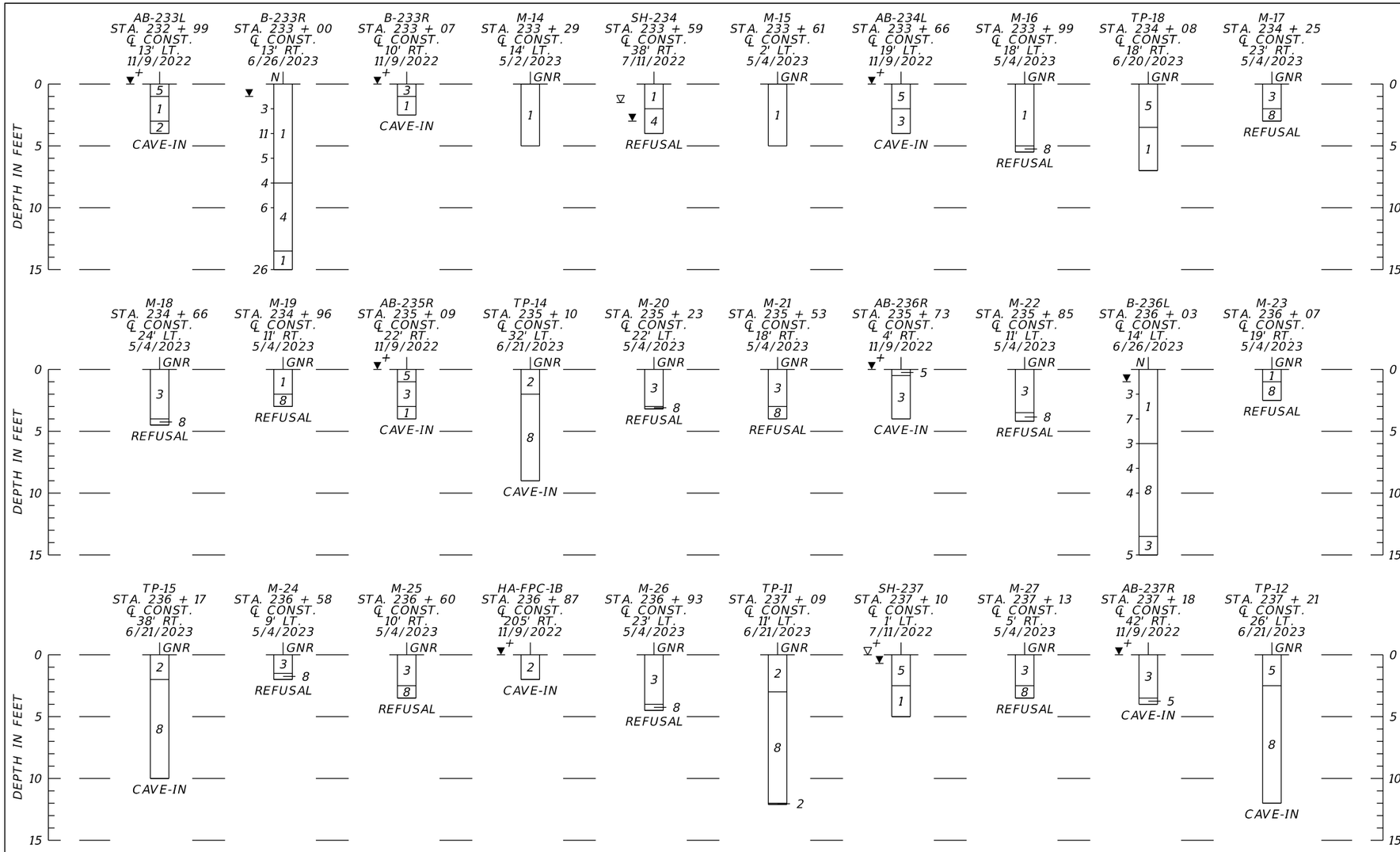
LENA ROAD

MANATEE COUNTY FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (3)

SHEET NUMBER



LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
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7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
8.	LANDFILL DEBRIS
W	WATER
P	PAVEMENT AND BASE MATERIAL
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
WH	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
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HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
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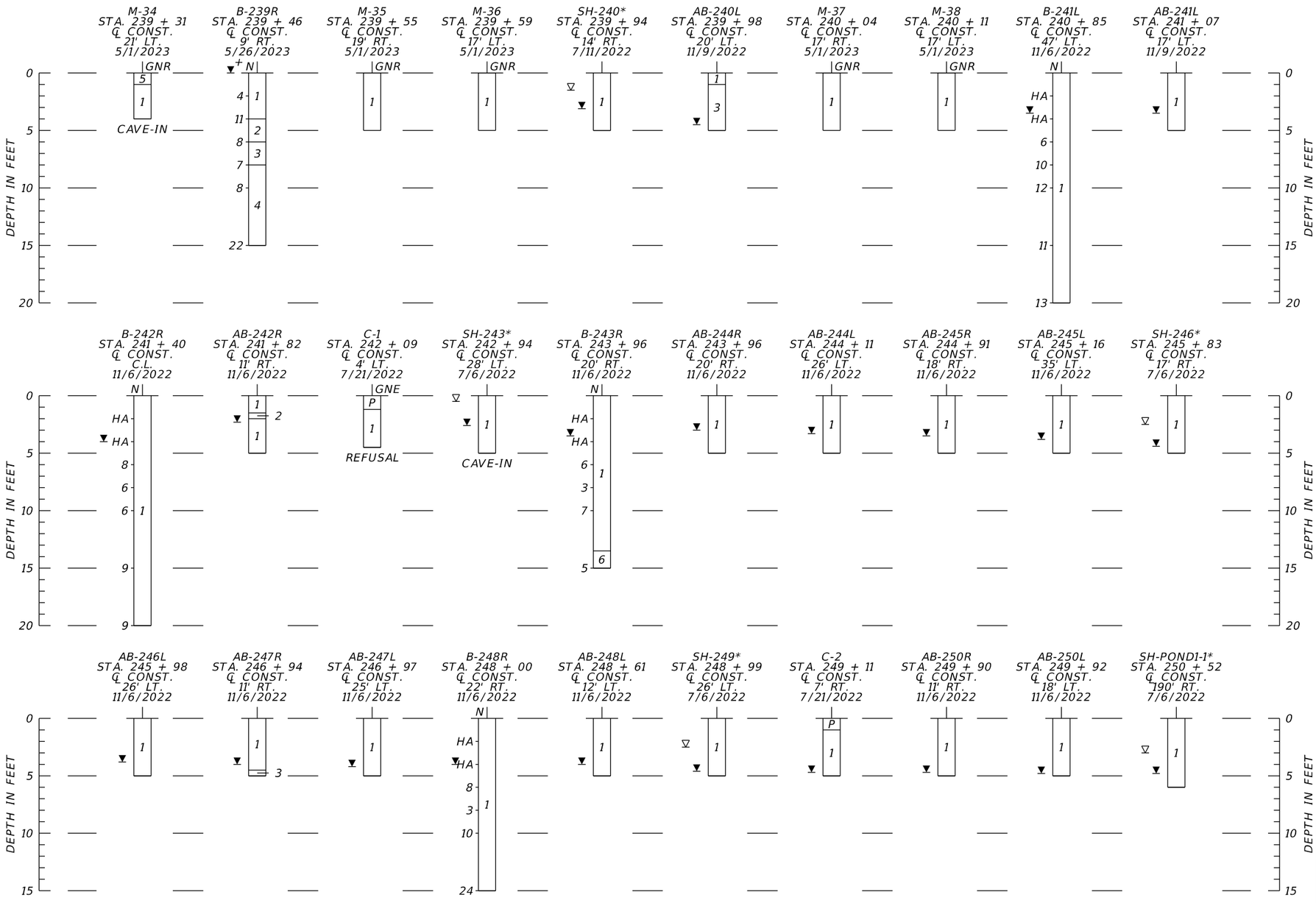
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (4)

SHEET NUMBER



LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
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8.	LANDFILL DEBRIS
W	WATER
P	PAVEMENT AND BASE MATERIAL
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
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HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
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No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

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MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (5)

SHEET NUMBER

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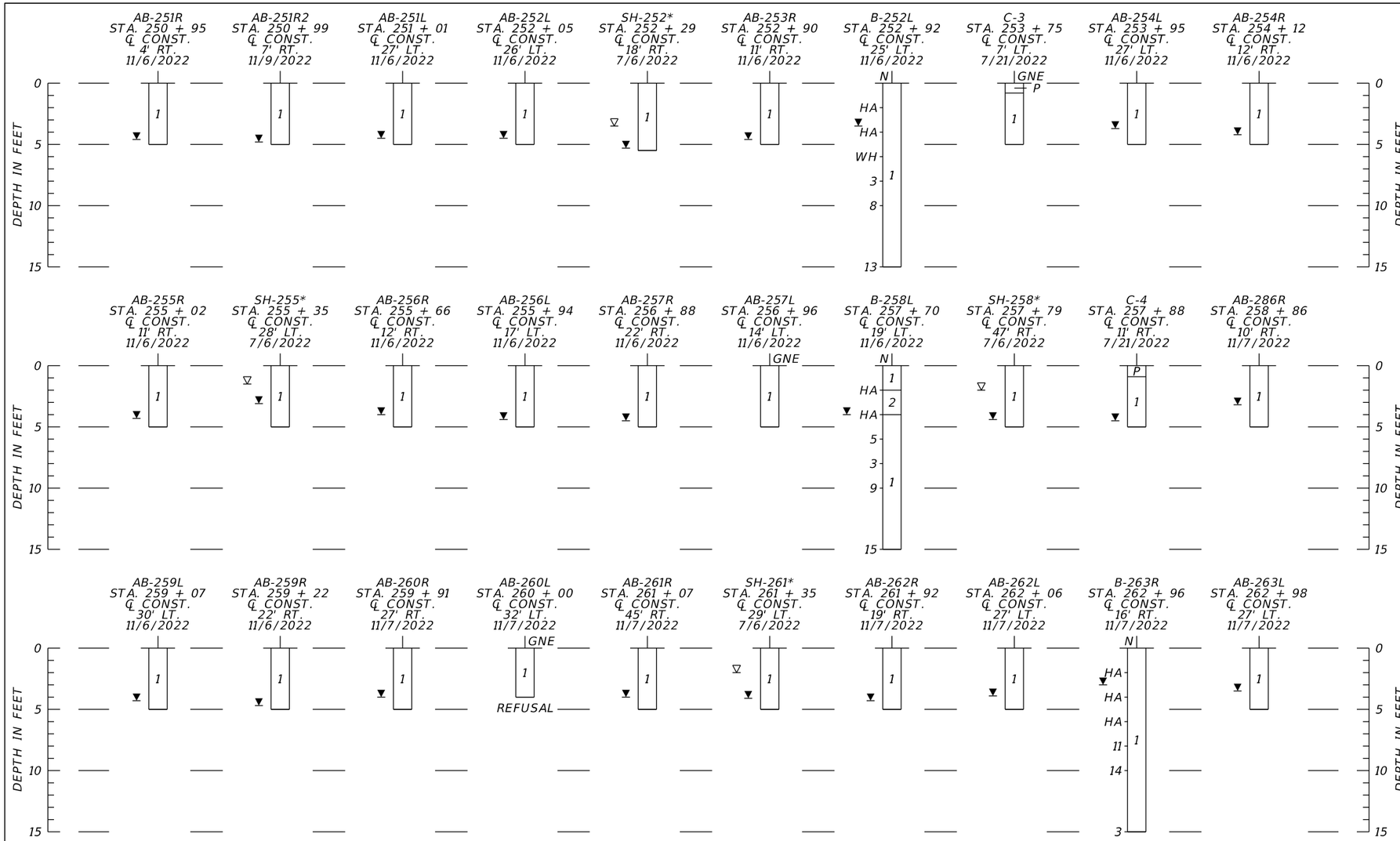

LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
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No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
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7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

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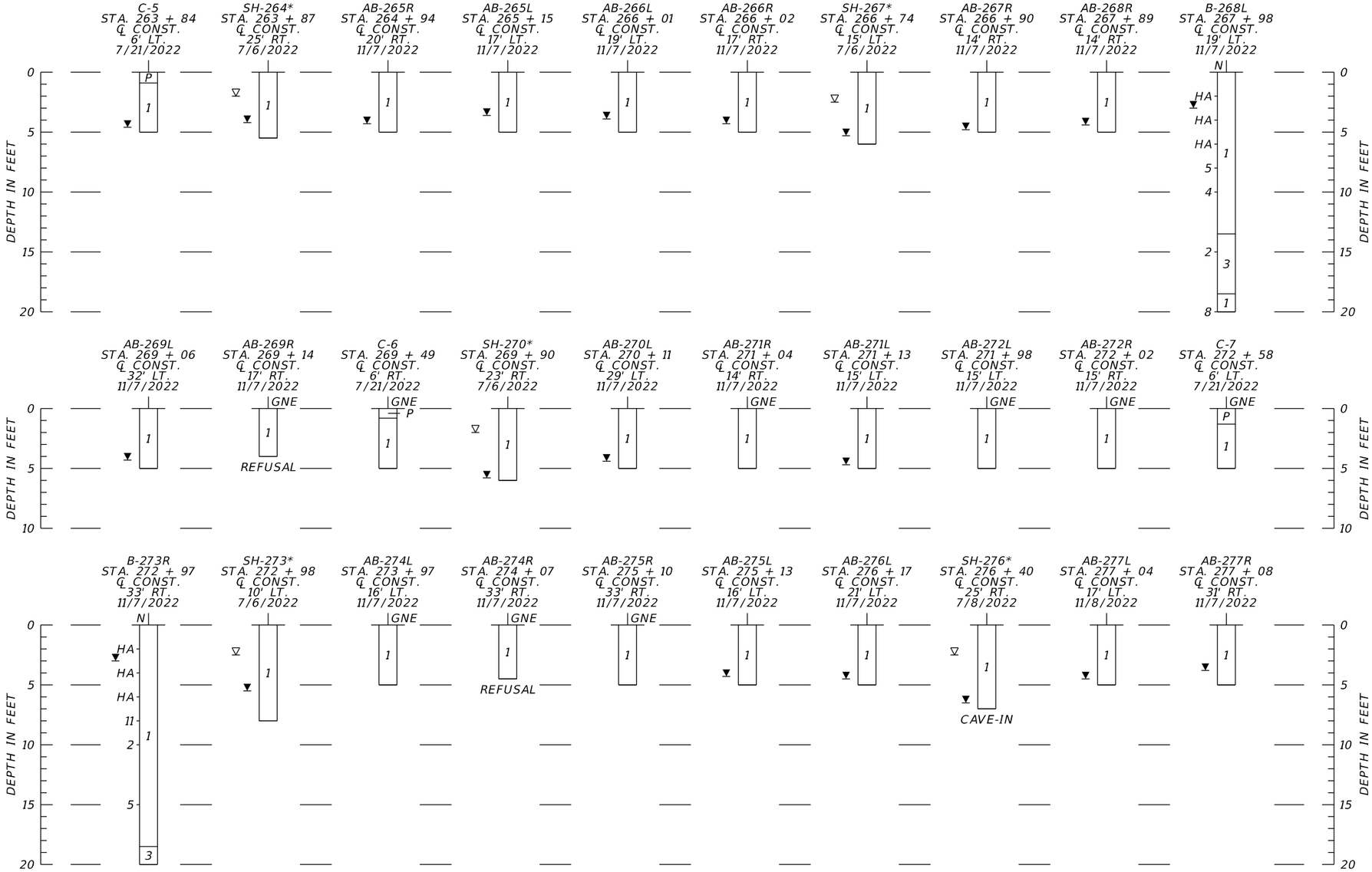
Manatee County FLORIDA

LENA ROAD
MANATEE COUNTY FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (6)

SHEET NUMBER



LEGEND

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DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

Manatee County FLORIDA

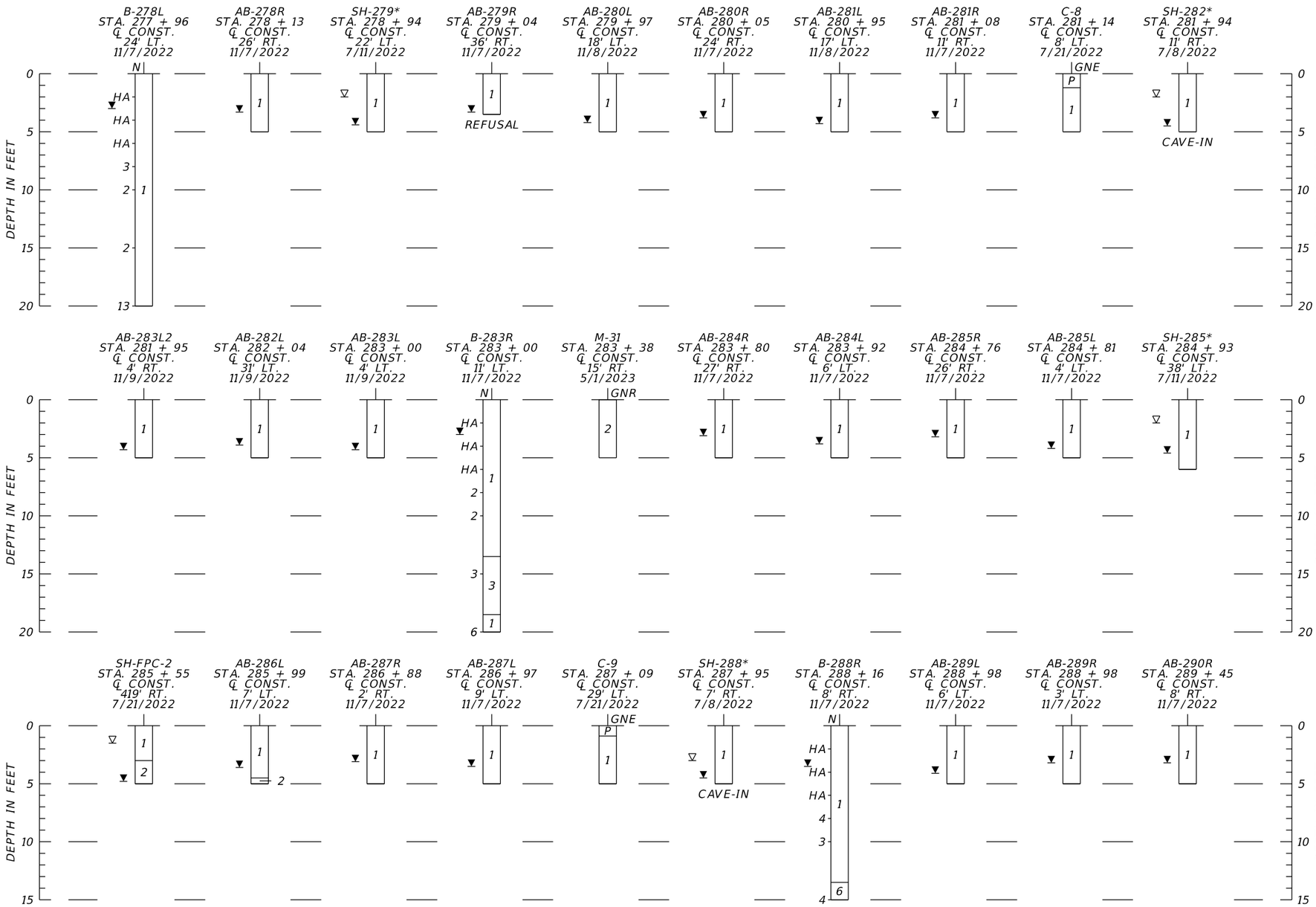
LENA ROAD

MANATEE COUNTY FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (7)

SHEET NUMBER



LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
8.	LANDFILL DEBRIS
W	WATER
P	PAVEMENT AND BASE MATERIAL
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
WH	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
GNE	GROUNDWATER NOT ENCOUNTERED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON WOOD, ROCK MATERIAL, CEMENTED SANDS/HARDPAN AND/OR LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTES:
1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.
2. THE STANDARD PENETRATION TEST BORINGS DENOTED WITH A "(1)" WERE PERFORMED UTILIZING A SAFETY HAMMER. THE REMAINING BORINGS WERE PERFORMED UTILIZING AN AUTOMATIC HAMMER.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

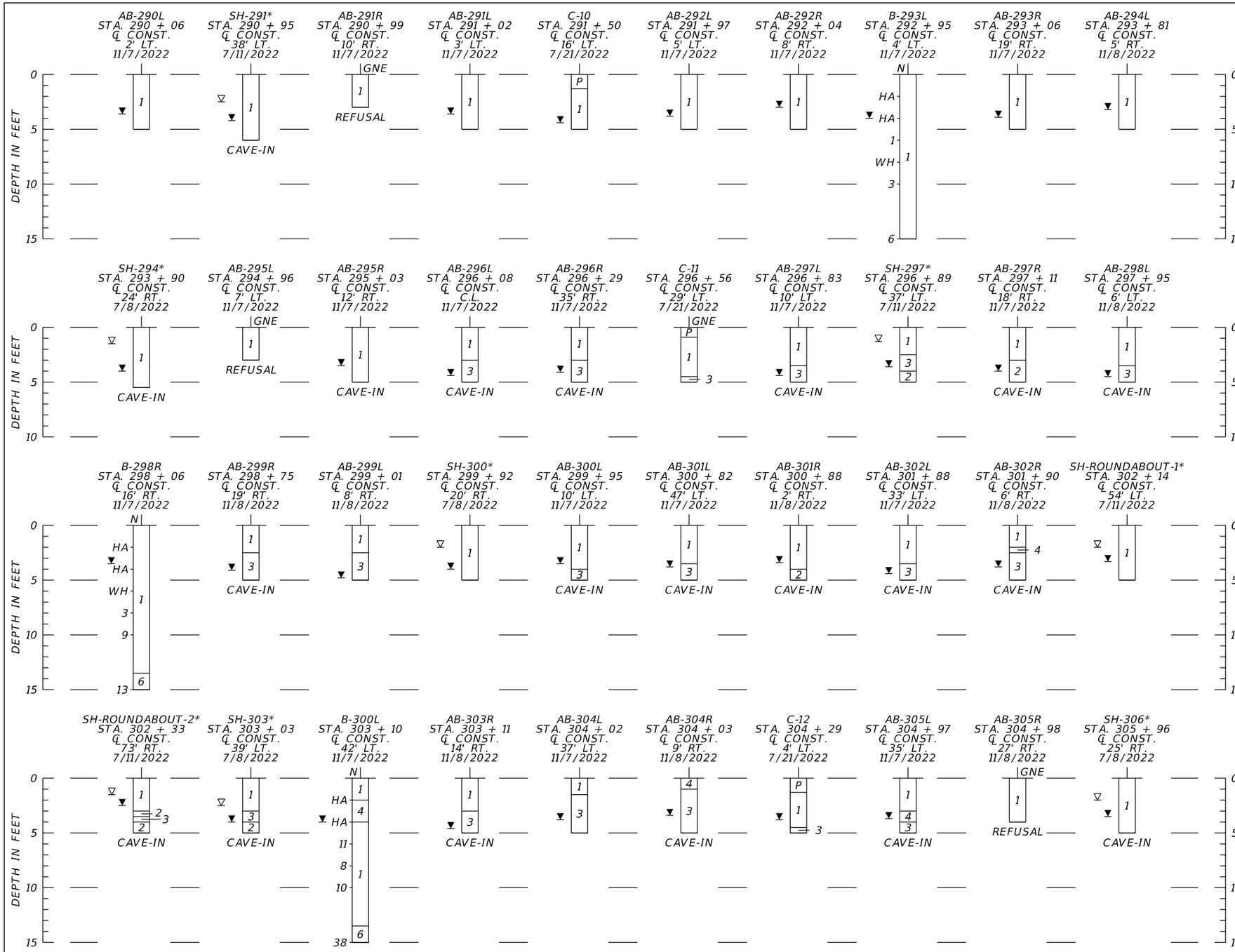
KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (8)

SHEET NUMBER



LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
8.	LANDFILL DEBRIS
W	WATER
P	PAVEMENT AND BASE MATERIAL
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
WH	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
GNE	GROUNDWATER NOT ENCOUNTERED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON WOOD, ROCK MATERIAL, CEMENTED SANDS/HARDPAN AND/OR LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTES:

1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.
2. THE STANDARD PENETRATION TEST BORINGS DENOTED WITH A "(1)" WERE PERFORMED UTILIZING A SAFETY HAMMER. THE REMAINING BORINGS WERE PERFORMED UTILIZING AN AUTOMATIC HAMMER.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
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VERY SOFT	LESS THAN 2	LESS THAN 1
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FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

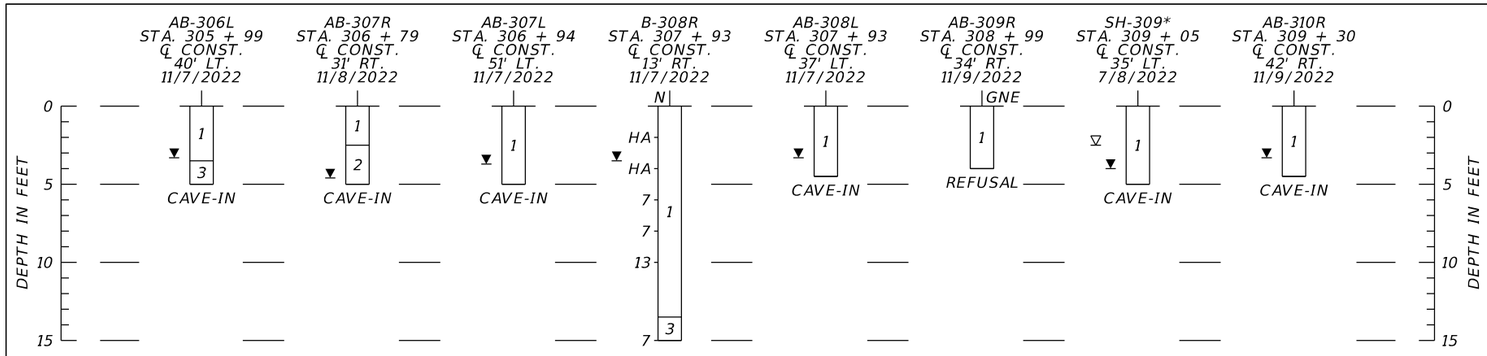
MANATEE COUNTY FL

LENA ROAD

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (9)

SHEET NUMBER



LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
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4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
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6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
8.	LANDFILL DEBRIS
W	WATER
P	PAVEMENT AND BASE MATERIAL
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
WH	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
GNE	GROUNDWATER NOT ENCOUNTERED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON WOOD, ROCK MATERIAL, CEMENTED SANDS/HARDPAN AND/OR LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTES:
1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.
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	SAFETY HAMMER	AUTOMATIC HAMMER
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SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
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FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

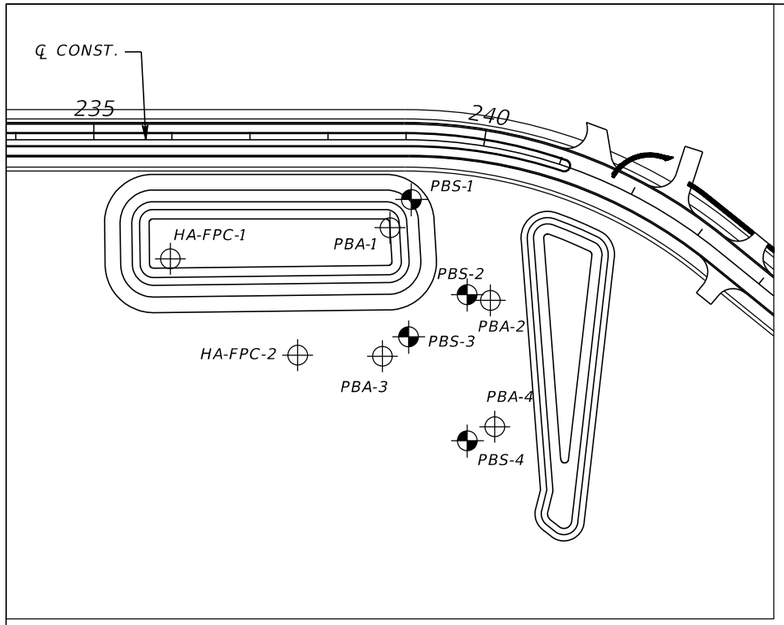
Manatee County FLORIDA

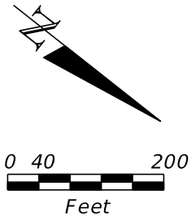
LENA ROAD
MANATEE COUNTY FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

ROADWAY SOIL PROFILES (10)

SHEET NUMBER





BORING LOCATION PLAN

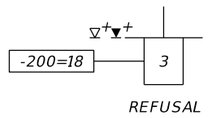
NOTE:

THE BORINGS WERE SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
OC	ORGANIC CONTENT (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
⊕	APPROXIMATE AUGER BORING LOCATION
▲	APPROXIMATE DRIT LOCATION
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
CAVE-IN	BORING TERMINATED DUE TO CAVE-IN FROM GROUNDWATER INTRUSION
REFUSAL	BORING TERMINATED DUE TO HAND AUGER REFUSAL ON CEMENTED SANDS/HARDPAN AND/OR ROCK MATERIAL
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

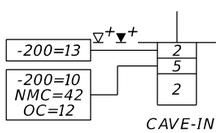
BOR # HA-FPC-1
STA. 235+98
REF. ℄ CONST.
OFF. 153' RT.
ELEV. 28.5
DATE 10/30/2022



REFUSAL

BORING TERMINATED AT ELEVATION 25.5 FT (NAVD 88)

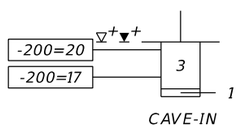
BOR # HA-FPC-2
STA. 237+61
REF. ℄ CONST.
OFF. 276' RT.
ELEV. 28.2
DATE 10/30/2022



CAVE-IN

BORING TERMINATED AT ELEVATION 25.2 FT (NAVD 88)

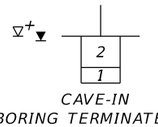
BOR # PBA-1
STA. 238+80
REF. ℄ CONST.
OFF. 113' RT.
ELEV. 28.8
DATE 10/30/2022



CAVE-IN

BORING TERMINATED AT ELEVATION 25.3 FT (NAVD 88)

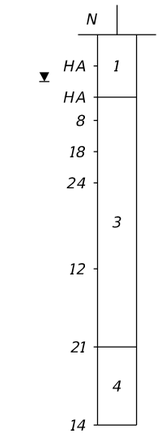
BOR # PBA-3
STA. 238+70
REF. ℄ CONST.
OFF. 277' RT.
ELEV. 28.6
DATE 10/30/2022



CAVE-IN

BORING TERMINATED AT ELEVATION 25.6 FT (NAVD 88)

BOR # PBS-3
STA. 239+06
REF. ℄ CONST.
OFF. 252' RT.
ELEV. 28.7
DATE 6/15/2023



BORING TERMINATED AT ELEVATION 3.7 FT (NAVD 88)

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

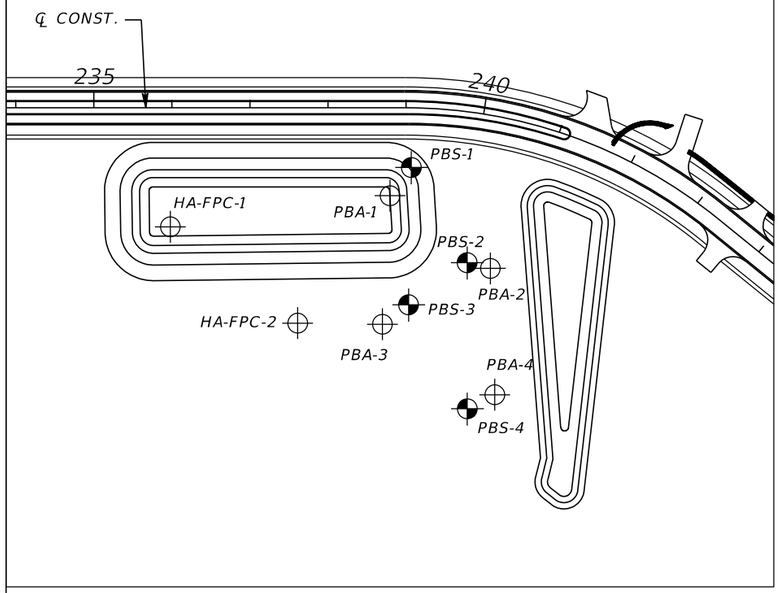
MANATEE COUNTY — LENA ROAD — FL

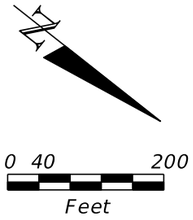
LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: JAN 2023

POND SOIL SURVEY (1)

SHEET NUMBER

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.





BORING LOCATION PLAN

NOTE:

THE BORINGS WERE SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
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7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
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50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
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NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
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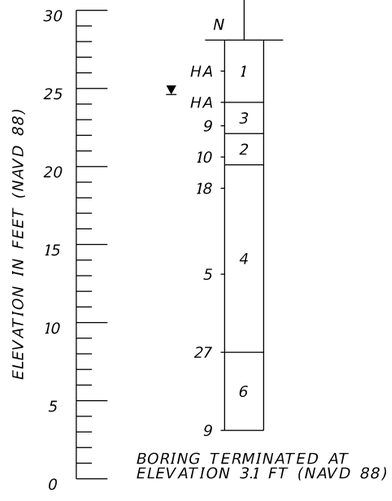
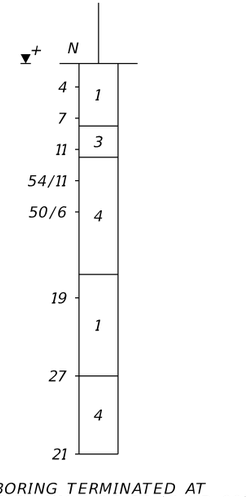
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
CAVE-IN	BORING TERMINATED DUE TO CAVE-IN FROM GROUNDWATER INTRUSION
REFUSAL	BORING TERMINATED DUE TO HAND AUGER REFUSAL ON CEMENTED SANDS/HARDPAN AND/OR ROCK MATERIAL
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

BOR # PBS-1
STA. 239+08
REF. ℄ CONST.
OFF. 77' RT.
ELEV. 28.1
DATE 6/14/2023



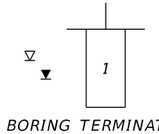
BORING TERMINATED AT ELEVATION 3.1 FT (NAVD 88)

BOR # PBS-2
STA. 240+13
REF. ℄ CONST.
OFF. 191' RT.
ELEV. 28.7
DATE 5/26/2023



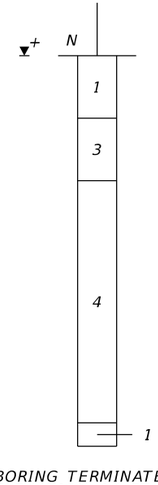
BORING TERMINATED AT ELEVATION 3.7 FT (NAVD 88)

BOR # PBA-2
STA. 240+57
REF. ℄ CONST.
OFF. 192' RT.
ELEV. 30.9
DATE 10/30/2022



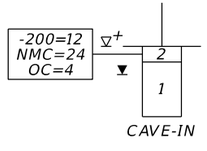
BORING TERMINATED AT ELEVATION 25.9 FT (NAVD 88)

BOR # PBS-4
STA. 240+95
REF. ℄ CONST.
OFF. 373' RT.
ELEV. 29.2
DATE 5/26/2023



BORING TERMINATED AT ELEVATION 4.2 FT (NAVD 88)

BOR # PBA-4
STA. 241+56
REF. ℄ CONST.
OFF. 344' RT.
ELEV. 29.8
DATE 10/30/2022



BORING TERMINATED AT ELEVATION 25.3 FT (NAVD 88)

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

Manatee County FLORIDA

LENA ROAD

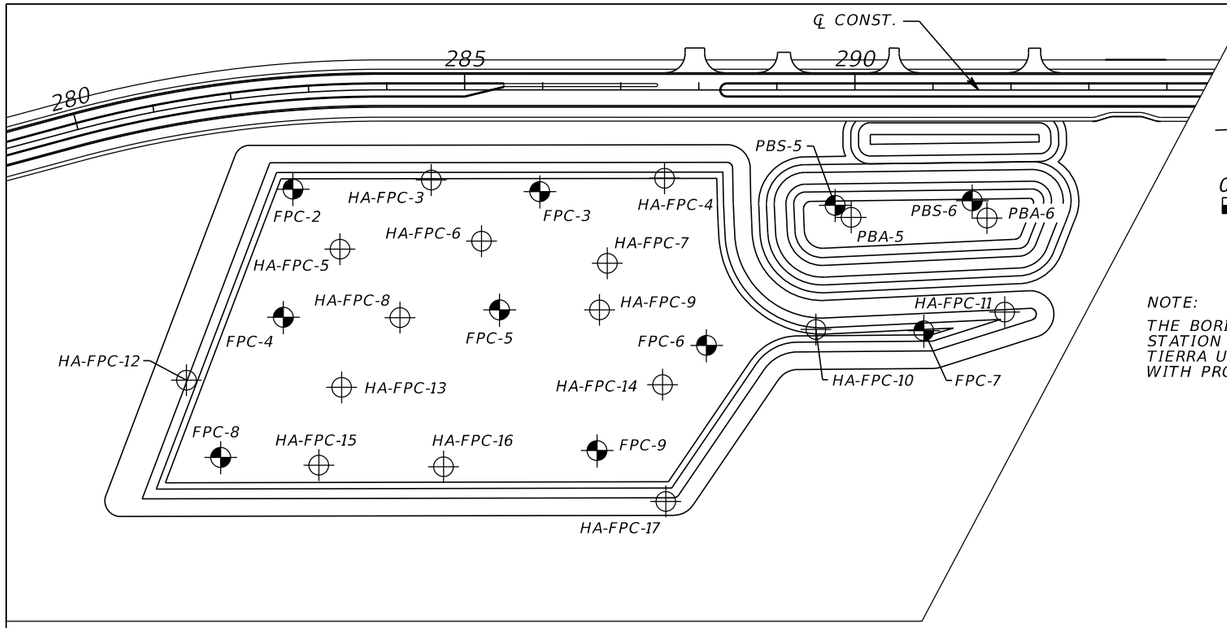
MANATEE COUNTY FL

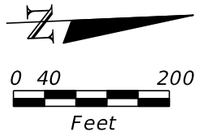
LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: JAN 2023

POND SOIL SURVEY (2)

SHEET NUMBER

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.





NOTE:

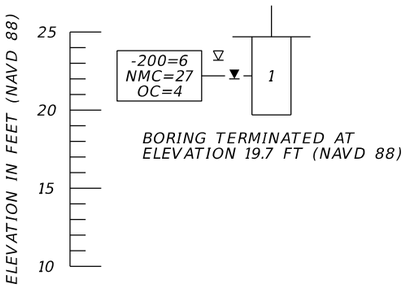
THE BORINGS WERE SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

BORING LOCATION PLAN

LEGEND

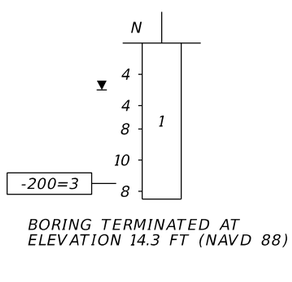
1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
OC	ORGANIC CONTENT (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
⊕	APPROXIMATE AUGER BORING LOCATION
▲	APPROXIMATE DRIT LOCATION
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
CAVE-IN	BORING TERMINATED DUE TO CAVE-IN FROM GROUNDWATER INTRUSION
REFUSAL	BORING TERMINATED DUE TO HAND AUGER REFUSAL ON CEMENTED SANDS/HARDPAN AND/OR ROCK MATERIAL
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

BOR # HA-FPC-12
STA. 280+68
REF. ℄ CONST.
OFF. 345' RT.
ELEV. 24.7
DATE 10/12/2022



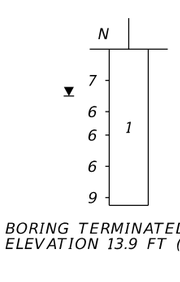
BORING TERMINATED AT ELEVATION 19.7 FT (NAVD 88)

BOR # FPC-8
STA. 280+99
REF. ℄ CONST.
OFF. 451' RT.
ELEV. 24.3
DATE 10/28/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



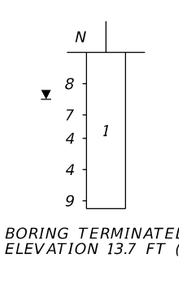
BORING TERMINATED AT ELEVATION 14.3 FT (NAVD 88)

BOR # FPC-4
STA. 282+38
REF. ℄ CONST.
OFF. 285' RT.
ELEV. 23.9
DATE 10/28/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



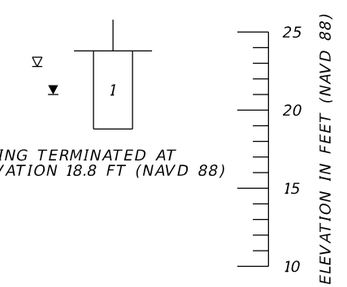
BORING TERMINATED AT ELEVATION 13.9 FT (NAVD 88)

BOR # FPC-2
STA. 282+70
REF. ℄ CONST.
OFF. 122' RT.
ELEV. 23.7
DATE 10/28/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT ELEVATION 13.7 FT (NAVD 88)

BOR # HA-FPC-15
STA. 282+76
REF. ℄ CONST.
OFF. 477' RT.
ELEV. 23.8
DATE 10/12/2022



BORING TERMINATED AT ELEVATION 18.8 FT (NAVD 88)

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

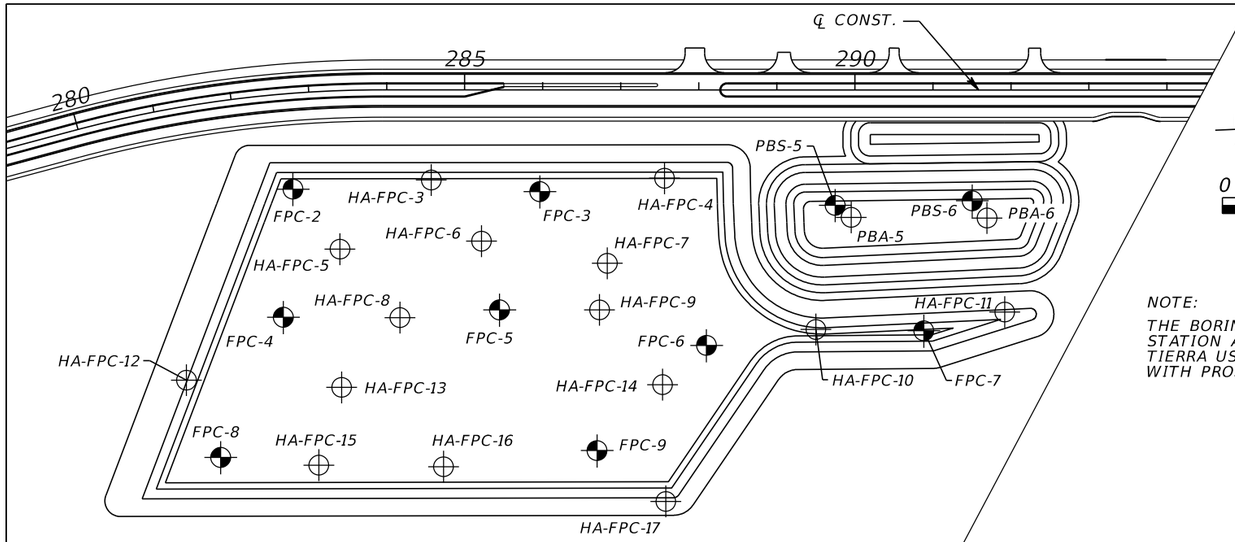
MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: JAN 2023

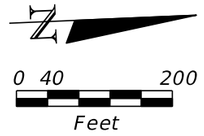
POND SOIL SURVEY (3)

SHEET NUMBER

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



BORING LOCATION PLAN



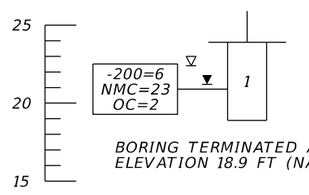
NOTE:

THE BORINGS WERE SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

LEGEND

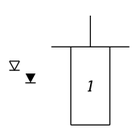
1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
OC	ORGANIC CONTENT (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
⊕	APPROXIMATE AUGER BORING LOCATION
▲	APPROXIMATE DRIT LOCATION
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
CAVE-IN	BORING TERMINATED DUE TO CAVE-IN FROM GROUNDWATER INTRUSION
REFUSAL	BORING TERMINATED DUE TO HAND AUGER REFUSAL ON CEMENTED SANDS/HARDPAN AND/OR ROCK MATERIAL
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

BOR # HA-FPC-13
STA. 283+25
REF. ℄ CONST.
OFF. 380' RT.
ELEV. 23.9
DATE 10/12/2022



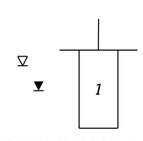
BORING TERMINATED AT ELEVATION 18.9 FT (NAVD 88)

BOR # HA-FPC-5
STA. 283+32
REF. ℄ CONST.
OFF. 203' RT.
ELEV. 23.6
DATE 10/12/2022



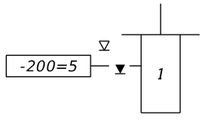
BORING TERMINATED AT ELEVATION 18.6 FT (NAVD 88)

BOR # HA-FPC-8
STA. 284+17
REF. ℄ CONST.
OFF. 292' RT.
ELEV. 23.4
DATE 10/12/2022



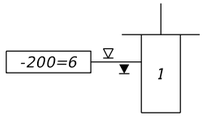
BORING TERMINATED AT ELEVATION 18.4 FT (NAVD 88)

BOR # HA-FPC-16
STA. 284+73
REF. ℄ CONST.
OFF. 483' RT.
ELEV. 23.1
DATE 10/12/2022



BORING TERMINATED AT ELEVATION 18.1 FT (NAVD 88)

BOR # HA-FPC-3
STA. 284+57
REF. ℄ CONST.
OFF. 116' RT.
ELEV. 23.3
DATE 10/12/2022



BORING TERMINATED AT ELEVATION 18.3 FT (NAVD 88)

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: JAN 2023

POND SOIL SURVEY (4)

SHEET NUMBER

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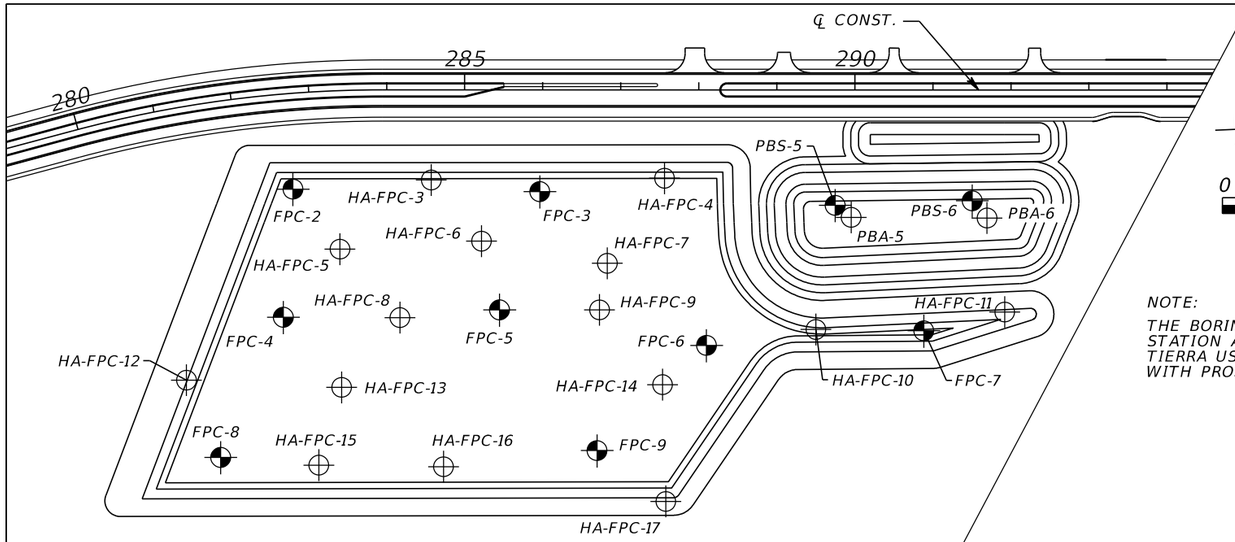
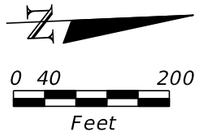


BORING LOCATION PLAN



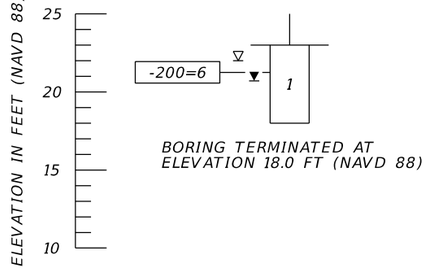
NOTE:

THE BORINGS WERE SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

LEGEND

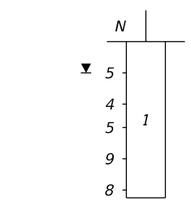
1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
OC	ORGANIC CONTENT (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
⊕	APPROXIMATE AUGER BORING LOCATION
▲	APPROXIMATE DRIT LOCATION
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
CAVE-IN	BORING TERMINATED DUE TO CAVE-IN FROM GROUNDWATER INTRUSION
REFUSAL	BORING TERMINATED DUE TO HAND AUGER REFUSAL ON CEMENTED SANDS/HARDPAN AND/OR ROCK MATERIAL
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

BOR # HA-FPC-6
STA. 285+22
REF. ℄ CONST.
OFF. 194' RT.
ELEV. 23.0
DATE 10/12/2022



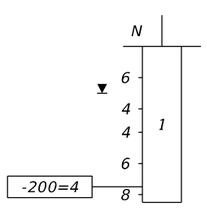
BORING TERMINATED AT ELEVATION 18.0 FT (NAVD 88)

BOR # FPC-5
STA. 285+45
REF. ℄ CONST.
OFF. 282' RT.
ELEV. 22.9
DATE 10/27/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



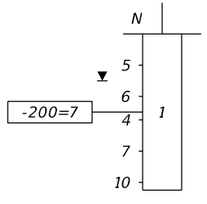
BORING TERMINATED AT ELEVATION 12.9 FT (NAVD 88)

BOR # FPC-3
STA. 285+96
REF. ℄ CONST.
OFF. 130' RT.
ELEV. 22.6
DATE 10/28/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



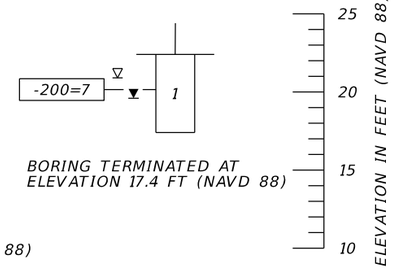
BORING TERMINATED AT ELEVATION 12.6 FT (NAVD 88)

BOR # FPC-9
STA. 286+70
REF. ℄ CONST.
OFF. 462' RT.
ELEV. 22.3
DATE 10/27/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT ELEVATION 12.3 FT (NAVD 88)

BOR # HA-FPC-9
STA. 286+73
REF. ℄ CONST.
OFF. 281' RT.
ELEV. 22.4
DATE 10/13/2022



BORING TERMINATED AT ELEVATION 17.4 FT (NAVD 88)

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

Manatee County FLORIDA

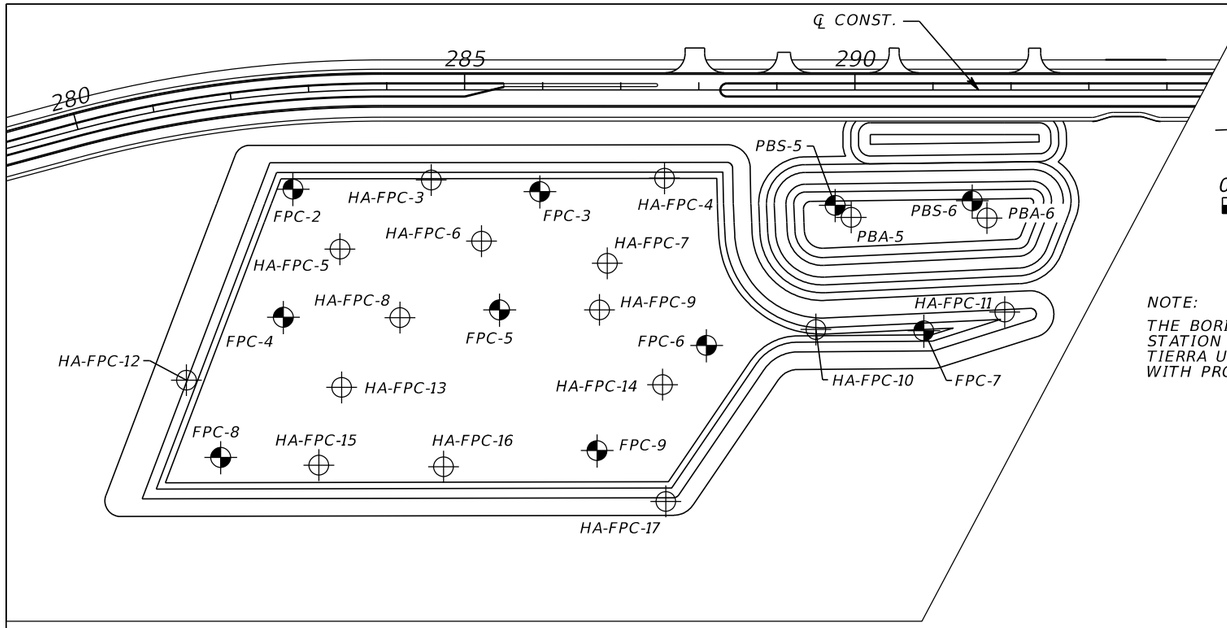
LENA ROAD
MANATEE COUNTY FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: JAN 2023

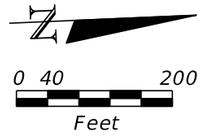
POND SOIL SURVEY (5)

SHEET NUMBER

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



BORING LOCATION PLAN



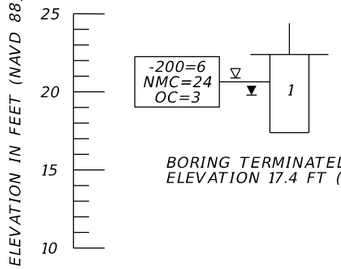
NOTE:

THE BORINGS WERE SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

LEGEND

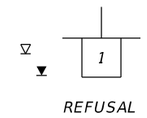
1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
OC	ORGANIC CONTENT (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
⊕	APPROXIMATE AUGER BORING LOCATION
▲	APPROXIMATE DRIT LOCATION
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
CAVE-IN	BORING TERMINATED DUE TO CAVE-IN FROM GROUNDWATER INTRUSION
REFUSAL	BORING TERMINATED DUE TO HAND AUGER REFUSAL ON CEMENTED SANDS/HARDPAN AND/OR ROCK MATERIAL
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

BOR # HA-FPC-7
STA. 286+83
REF. ℄ CONST.
OFF. 222' RT.
ELEV. 22.4
DATE 10/13/2022



BORING TERMINATED AT ELEVATION 17.4 FT (NAVD 88)

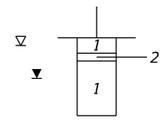
BOR # HA-FPC-17
STA. 287+57
REF. ℄ CONST.
OFF. 527' RT.
ELEV. 21.4
DATE 10/12/2022



REFUSAL

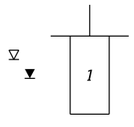
BORING TERMINATED AT ELEVATION 18.9 FT (NAVD 88)

BOR # HA-FPC-14
STA. 287+54
REF. ℄ CONST.
OFF. 377' RT.
ELEV. 22.0
DATE 10/13/2022



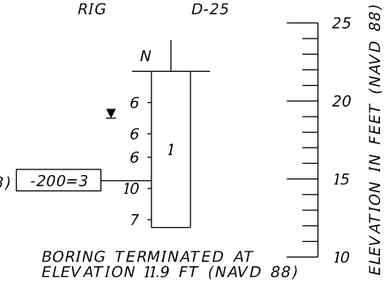
BORING TERMINATED AT ELEVATION 17.0 FT (NAVD 88)

BOR # HA-FPC-4
STA. 287+56
REF. ℄ CONST.
OFF. 113' RT.
ELEV. 22.1
DATE 10/13/2022



BORING TERMINATED AT ELEVATION 17.1 FT (NAVD 88)

BOR # FPC-6
STA. 288+14
REF. ℄ CONST.
OFF. 333' RT.
ELEV. 21.9
DATE 10/27/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT ELEVATION 11.9 FT (NAVD 88)

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

Manatee County FLORIDA

LENA ROAD
MANATEE COUNTY FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: JAN 2023

POND SOIL SURVEY (6)

SHEET NUMBER

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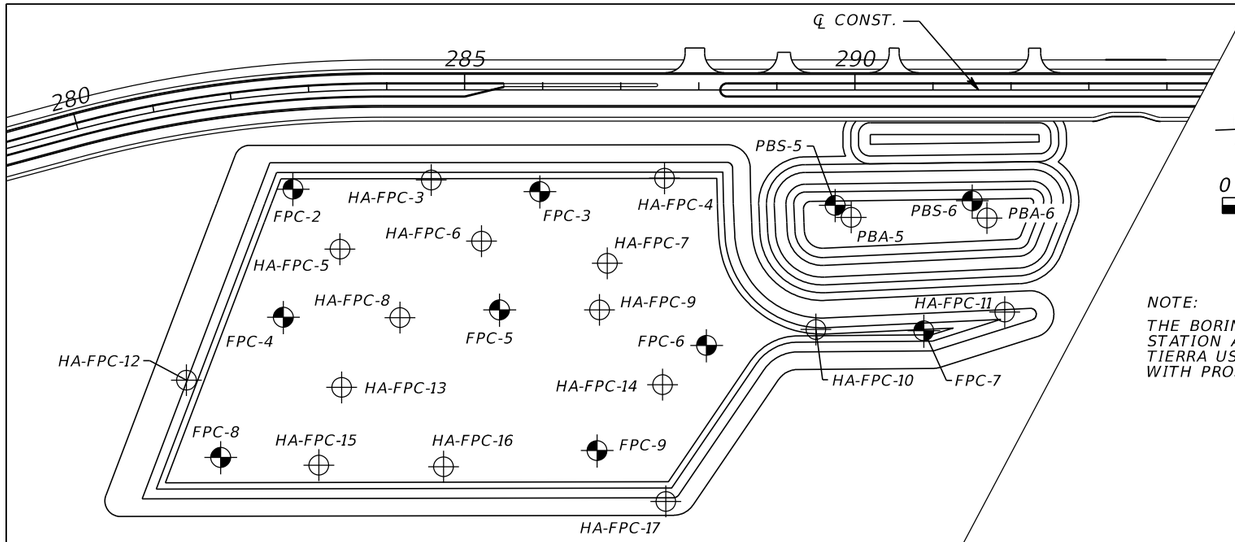

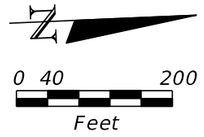

NOTE:

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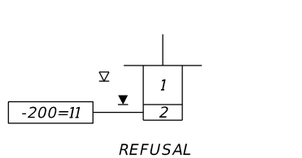
LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
OC	ORGANIC CONTENT (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
⊕	APPROXIMATE AUGER BORING LOCATION
▲	APPROXIMATE DRIT LOCATION
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
CAVE-IN	BORING TERMINATED DUE TO CAVE-IN FROM GROUNDWATER INTRUSION
REFUSAL	BORING TERMINATED DUE TO HAND AUGER REFUSAL ON CEMENTED SANDS/HARDPAN AND/OR ROCK MATERIAL
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

BORING LOCATION PLAN

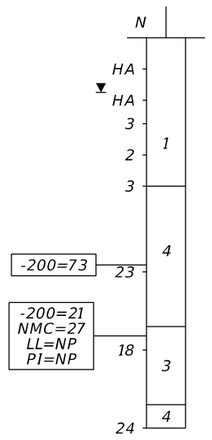
BOR # HA-FPC-10
STA. 289+50
REF. ℄ CONST.
OFF. 307' RT.
ELEV. 21.5
DATE 10/12/2022



REFUSAL

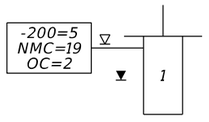
BORING TERMINATED AT ELEVATION 18.0 FT (NAVD 88)

BOR # PBS-5
STA. 289+76
REF. ℄ CONST.
OFF. 149' RT.
ELEV. 21.3
DATE 10/27/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



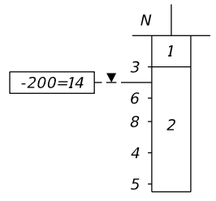
BORING TERMINATED AT ELEVATION -3.7 FT (NAVD 88)

BOR # PBA-5
STA. 289+95
REF. ℄ CONST.
OFF. 163' RT.
ELEV. 21.2
DATE 10/13/2022



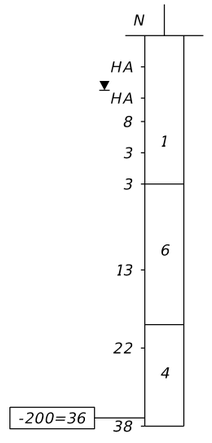
BORING TERMINATED AT ELEVATION 16.2 FT (NAVD 88)

BOR # FPC-7
STA. 290+88
REF. ℄ CONST.
OFF. 308' RT.
ELEV. 20.6
DATE 10/27/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT ELEVATION 10.6 FT (NAVD 88)

BOR # PBS-6
STA. 291+50
REF. ℄ CONST.
OFF. 142' RT.
ELEV. 20.6
DATE 10/27/2022
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT ELEVATION -4.4 FT (NAVD 88)

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

MANATEE COUNTY

LENA ROAD

FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: JAN 2023

POND SOIL SURVEY (7)

SHEET NUMBER

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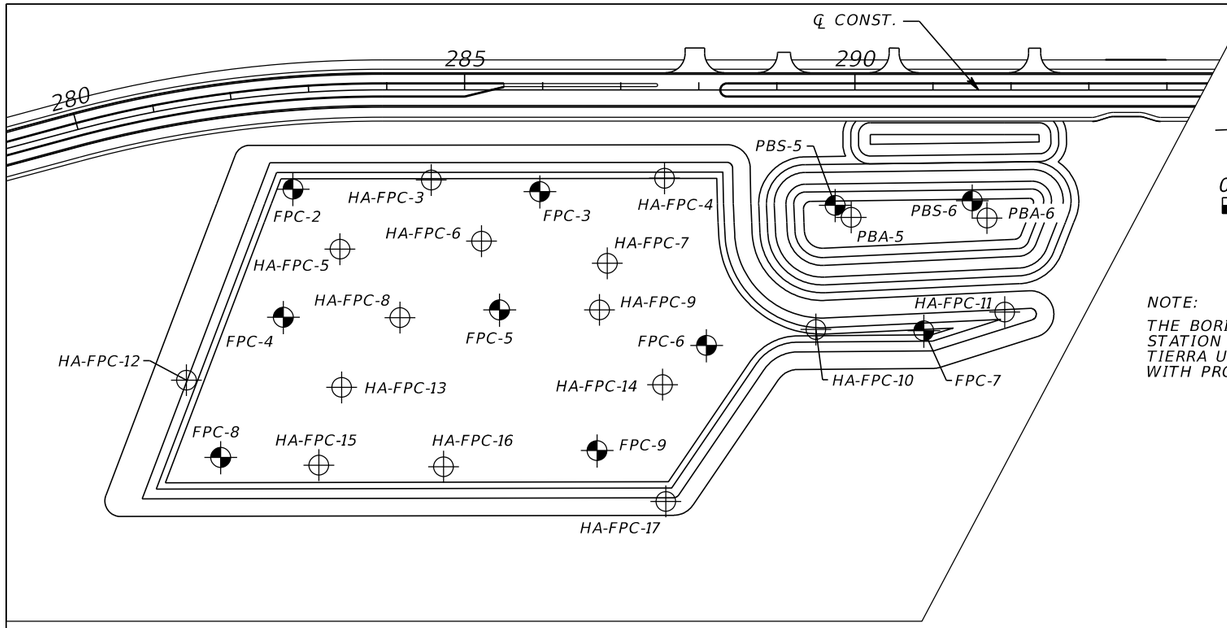
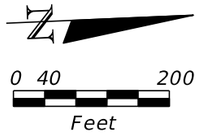


BORING LOCATION PLAN



NOTE:

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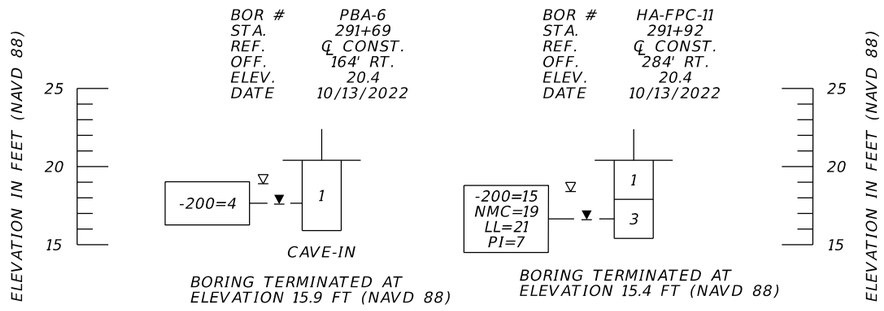
LEGEND

1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
OC	ORGANIC CONTENT (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
⊕	APPROXIMATE AUGER BORING LOCATION
▲	APPROXIMATE DRIT LOCATION
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
CAVE-IN	BORING TERMINATED DUE TO CAVE-IN FROM GROUNDWATER INTRUSION
REFUSAL	BORING TERMINATED DUE TO HAND AUGER REFUSAL ON CEMENTED SANDS/HARDPAN AND/OR ROCK MATERIAL
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD



	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

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No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
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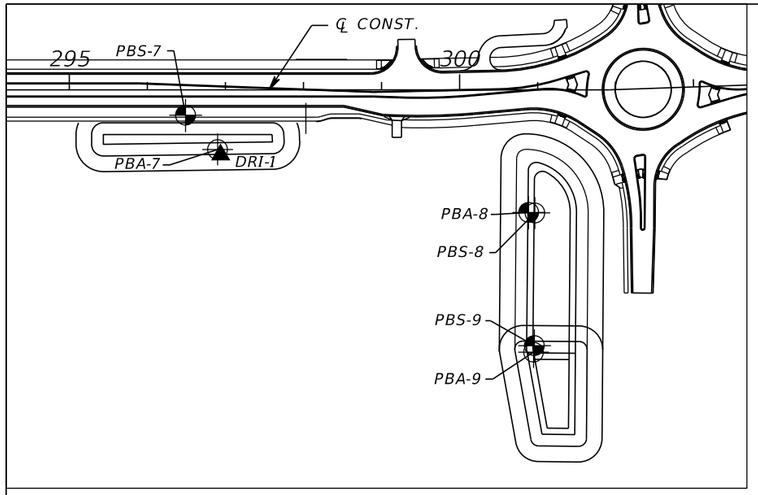
DRAWN BY BJS
CHECKED BY TB

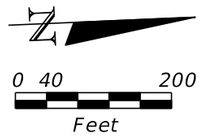
MANATEE COUNTY
LENA ROAD
FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: JAN 2023

POND SOIL SURVEY (8)

SHEET NUMBER





BORING LOCATION PLAN

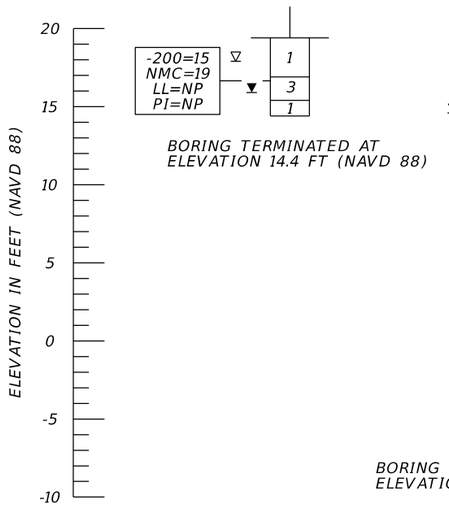
NOTE:

THE BORINGS WERE SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

LEGEND

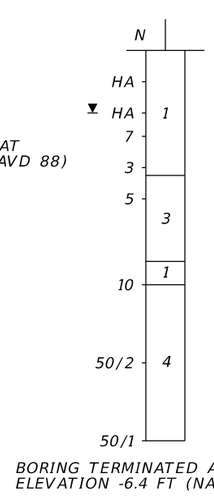
1.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2.	BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3.	BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4.	GRAY TO BROWN CLAYEY SAND TO SANDY CLAY (A-2-6/A-6/A-4)
5.	DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6.	GRAY TO BROWN SILT TO CLAY (A-7-6)
7.	CALCAREOUS CLAY TO WEATHERED LIMESTONE
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
OC	ORGANIC CONTENT (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
	APPROXIMATE SPT BORING LOCATION
	APPROXIMATE AUGER BORING LOCATION
	APPROXIMATE DRIT LOCATION
	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
CAVE-IN	BORING TERMINATED DUE TO CAVE-IN FROM GROUNDWATER INTRUSION
REFUSAL	BORING TERMINATED DUE TO HAND AUGER REFUSAL ON CEMENTED SANDS/HARDPAN AND/OR ROCK MATERIAL
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

BOR #	PBA-7
STA.	296+90
REF.	℄ CONST.
OFF.	76' RT.
ELEV.	19.4
DATE	10/30/2022
DRILLER	K. CAUDILL
HAMMER	AUTOMATIC
RIG	D-25



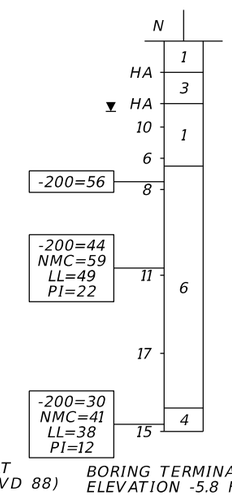
BORING TERMINATED AT ELEVATION 14.4 FT (NAVD 88)

BOR #	PBS-7
STA.	296+49
REF.	℄ CONST.
OFF.	32' RT.
ELEV.	18.6
DATE	11/5/2022
DRILLER	K. CAUDILL
HAMMER	AUTOMATIC
RIG	D-25



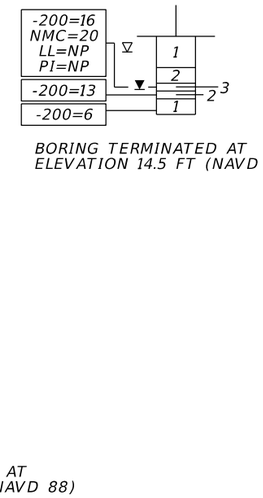
BORING TERMINATED AT ELEVATION -6.4 FT (NAVD 88)

BOR #	PBS-8
STA.	300+89
REF.	℄ CONST.
OFF.	157' RT.
ELEV.	19.2
DATE	11/5/2022
DRILLER	K. CAUDILL
HAMMER	AUTOMATIC
RIG	D-25



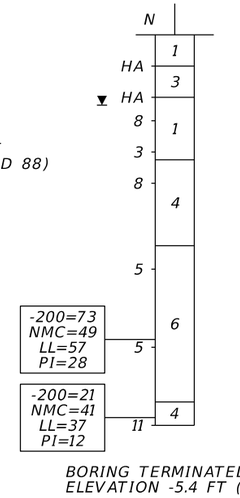
BORING TERMINATED AT ELEVATION -5.8 FT (NAVD 88)

BOR #	PBA-9
STA.	300+95
REF.	℄ CONST.
OFF.	336' RT.
ELEV.	19.5
DATE	10/13/2022



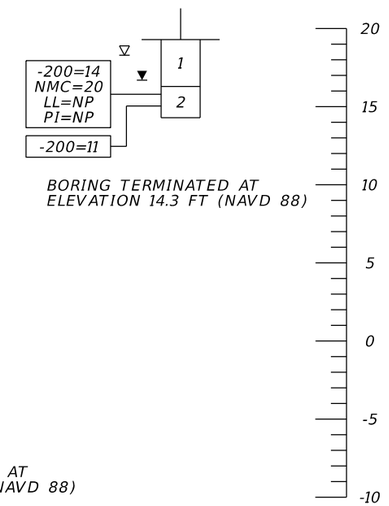
BORING TERMINATED AT ELEVATION 14.5 FT (NAVD 88)

BOR #	PBS-9
STA.	300+96
REF.	℄ CONST.
OFF.	327' RT.
ELEV.	19.6
DATE	11/5/2022
DRILLER	K. CAUDILL
HAMMER	AUTOMATIC
RIG	D-25



BORING TERMINATED AT ELEVATION -5.4 FT (NAVD 88)

BOR #	PBA-8
STA.	300+96
REF.	℄ CONST.
OFF.	157' RT.
ELEV.	19.3
DATE	10/13/2022



BORING TERMINATED AT ELEVATION 14.3 FT (NAVD 88)

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 11/2022
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

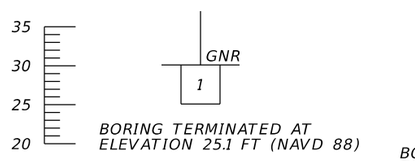
MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: JAN 2023

POND SOIL SURVEY (9)

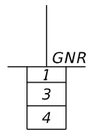
SHEET NUMBER

BOR # HA-28
STA. 231+20
REF. ℄ CONST.
OFF. 218' RT.
ELEV. 30.1
DATE 5/2/2023



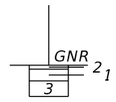
BORING TERMINATED AT ELEVATION 25.1 FT (NAVD 88)

BOR # TP-23
STA. 231+59
REF. ℄ CONST.
OFF. 136' RT.
ELEV. 29.1
DATE 6/20/2023



BORING TERMINATED AT ELEVATION 21.1 FT (NAVD 88)

BOR # M-11
STA. 232+37
REF. ℄ CONST.
OFF. 30' RT.
ELEV. 29.3
DATE 5/2/2023



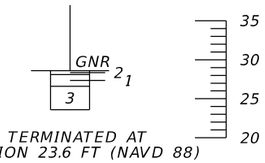
REFUSAL

BORING TERMINATED AT ELEVATION 25.3 FT (NAVD 88)

BOR # HA-29
STA. 232+60
REF. ℄ CONST.
OFF. 327' RT.
ELEV. 28.8
DATE 5/2/2023

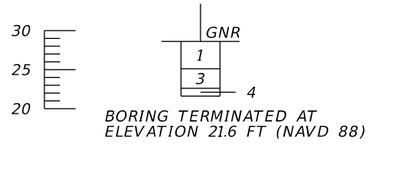
BORING TERMINATED AT ELEVATION 25.8 FT (NAVD 88)

BOR # M-12
STA. 232+67
REF. ℄ CONST.
OFF. 9' LT.
ELEV. 28.6
DATE 5/2/2023



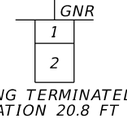
BORING TERMINATED AT ELEVATION 23.6 FT (NAVD 88)

BOR # TP-17
STA. 232+68
REF. ℄ CONST.
OFF. 16' LT.
ELEV. 28.6
DATE 6/20/2023



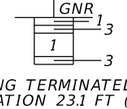
BORING TERMINATED AT ELEVATION 21.6 FT (NAVD 88)

BOR # TP-28
STA. 232+69
REF. ℄ CONST.
OFF. 300' RT.
ELEV. 28.8
DATE 6/20/2023



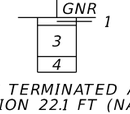
BORING TERMINATED AT ELEVATION 20.8 FT (NAVD 88)

BOR # HA-23
STA. 232+71
REF. ℄ CONST.
OFF. 173' RT.
ELEV. 29.1
DATE 5/5/2023



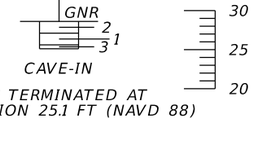
BORING TERMINATED AT ELEVATION 23.1 FT (NAVD 88)

BOR # TP-24
STA. 232+76
REF. ℄ CONST.
OFF. 156' RT.
ELEV. 29.1
DATE 6/20/2023



BORING TERMINATED AT ELEVATION 22.1 FT (NAVD 88)

BOR # M-13
STA. 232+96
REF. ℄ CONST.
OFF. 18' RT.
ELEV. 28.6
DATE 5/2/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 25.1 FT (NAVD 88)

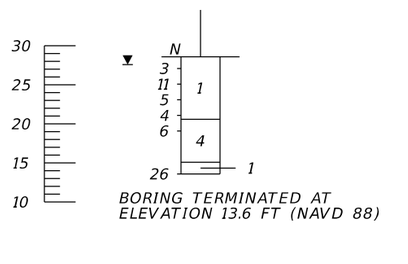
BOR # B-233R
STA. 233+00
REF. ℄ CONST.
OFF. 13' RT.
ELEV. 28.6
DATE 6/26/2023

BOR # AB-233R
STA. 233+07
REF. ℄ CONST.
OFF. 10' RT.
ELEV. 28.6
DATE 11/9/2022

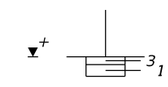
BOR # M-14
STA. 233+29
REF. ℄ CONST.
OFF. 14' LT.
ELEV. 28.4
DATE 5/2/2023

BOR # SH-234*
STA. 233+59
REF. ℄ CONST.
OFF. 38' RT.
ELEV. 28.5
DATE 7/11/2022

BOR # M-15
STA. 233+61
REF. ℄ CONST.
OFF. 2' LT.
ELEV. 28.9
DATE 5/4/2023

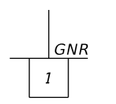


BORING TERMINATED AT ELEVATION 13.6 FT (NAVD 88)

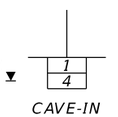


CAVE-IN

BORING TERMINATED AT ELEVATION 26.1 FT (NAVD 88)

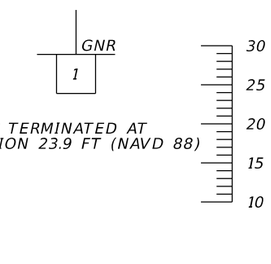


BORING TERMINATED AT ELEVATION 23.4 FT (NAVD 88)



CAVE-IN

BORING TERMINATED AT ELEVATION 24.5 FT (NAVD 88)



BORING TERMINATED AT ELEVATION 23.9 FT (NAVD 88)

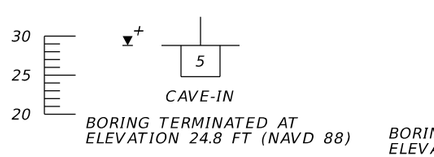
BOR # AB-234L
STA. 233+66
REF. ℄ CONST.
OFF. 19' LT.
ELEV. 28.8
DATE 11/9/2022

BOR # HA-14
STA. 233+73
REF. ℄ CONST.
OFF. 92' LT.
ELEV. 27.7
DATE 5/2/2023

BOR # M-16
STA. 233+99
REF. ℄ CONST.
OFF. 18' LT.
ELEV. 28.7
DATE 5/4/2023

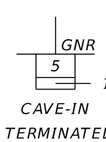
BOR # HA-30
STA. 234+00
REF. ℄ CONST.
OFF. 452' RT.
ELEV. 28.5
DATE 5/2/2023

BOR # TP-29
STA. 234+00
REF. ℄ CONST.
OFF. 435' RT.
ELEV. 28.2
DATE 6/20/2023



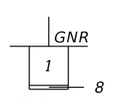
CAVE-IN

BORING TERMINATED AT ELEVATION 24.8 FT (NAVD 88)



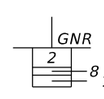
CAVE-IN

BORING TERMINATED AT ELEVATION 23.2 FT (NAVD 88)

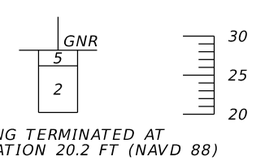


REFUSAL

BORING TERMINATED AT ELEVATION 23.2 FT (NAVD 88)



BORING TERMINATED AT ELEVATION 23.5 FT (NAVD 88)



BORING TERMINATED AT ELEVATION 20.2 FT (NAVD 88)

LEGEND

1. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3. BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4. GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5. DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6. GRAY TO BROWN SILT TO CLAY (A-7-6)
7. CALCAREOUS CLAY TO WEATHERED LIMESTONE
8. LANDFILL DEBRIS

A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTE: 1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

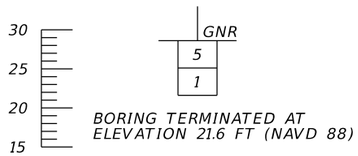
MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

DEBRIS SOIL PROFILES (1)

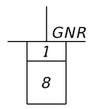
SHEET NUMBER

BOR # TP-18
STA. 234+08
REF. ℄ CONST.
OFF. 18' RT.
ELEV. 28.6
DATE 6/20/2023



BORING TERMINATED AT ELEVATION 21.6 FT (NAVD 88)

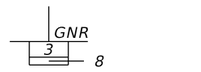
BOR # TP-25
STA. 234+10
REF. ℄ CONST.
OFF. 268' RT.
ELEV. 28.5
DATE 6/20/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 20.5 FT (NAVD 88)

BOR # M-17
STA. 234+25
REF. ℄ CONST.
OFF. 23' RT.
ELEV. 28.5
DATE 5/4/2023



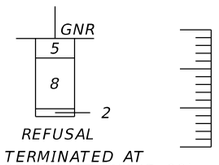
BORING TERMINATED AT ELEVATION 25.5 FT (NAVD 88)

BOR # HA-24
STA. 234+25
REF. ℄ CONST.
OFF. 280' RT.
ELEV. 28.4
DATE 5/5/2023

REFUSAL

BORING TERMINATED AT ELEVATION 24.4 FT (NAVD 88)

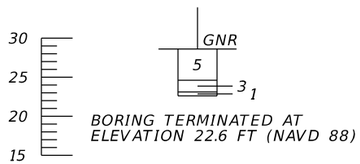
BOR # TP-9
STA. 234+25
REF. ℄ CONST.
OFF. 131' LT.
ELEV. 28.9
DATE 6/21/2023



REFUSAL

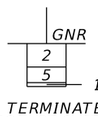
BORING TERMINATED AT ELEVATION 18.9 FT (NAVD 88)

BOR # HA-19
STA. 234+43
REF. ℄ CONST.
OFF. 128' RT.
ELEV. 28.6
DATE 5/5/2023



BORING TERMINATED AT ELEVATION 22.6 FT (NAVD 88)

BOR # HA-12
STA. 234+55
REF. ℄ CONST.
OFF. 187' LT.
ELEV. 29.3
DATE 5/2/2023



BORING TERMINATED AT ELEVATION 23.8 FT (NAVD 88)

BOR # M-18
STA. 234+66
REF. ℄ CONST.
OFF. 24' LT.
ELEV. 28.4
DATE 5/4/2023

REFUSAL

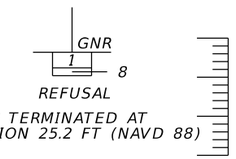
BORING TERMINATED AT ELEVATION 23.9 FT (NAVD 88)

BOR # TP-19
STA. 234+78
REF. ℄ CONST.
OFF. 163' RT.
ELEV. 28.6
DATE 6/20/2023

CAVE-IN

BORING TERMINATED AT ELEVATION 18.6 FT (NAVD 88)

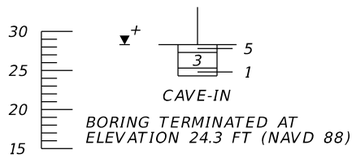
BOR # M-19
STA. 234+96
REF. ℄ CONST.
OFF. 11' RT.
ELEV. 28.2
DATE 5/4/2023



REFUSAL

BORING TERMINATED AT ELEVATION 25.2 FT (NAVD 88)

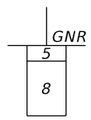
BOR # AB-235R
STA. 235+09
REF. ℄ CONST.
OFF. 22' RT.
ELEV. 28.3
DATE 11/9/2022



CAVE-IN

BORING TERMINATED AT ELEVATION 24.3 FT (NAVD 88)

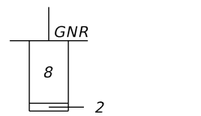
BOR # TP-14
STA. 235+10
REF. ℄ CONST.
OFF. 32' LT.
ELEV. 28.2
DATE 6/20/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 19.2 FT (NAVD 88)

BOR # TP-30
STA. 235+10
REF. ℄ CONST.
OFF. 508' RT.
ELEV. 28.8
DATE 6/21/2023

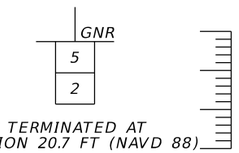


BORING TERMINATED AT ELEVATION 19.8 FT (NAVD 88)

BOR # M-20
STA. 235+23
REF. ℄ CONST.
OFF. 22' LT.
ELEV. 28.2
DATE 5/4/2023

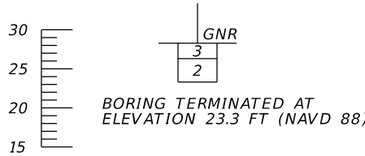
BORING TERMINATED AT ELEVATION 25.0 FT (NAVD 88)

BOR # TP-6
STA. 235+27
REF. ℄ CONST.
OFF. 231' LT.
ELEV. 28.7
DATE 6/21/2023



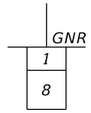
BORING TERMINATED AT ELEVATION 20.7 FT (NAVD 88)

BOR # HA-13
STA. 235+36
REF. ℄ CONST.
OFF. 99' LT.
ELEV. 28.3
DATE 5/4/2023



BORING TERMINATED AT ELEVATION 23.3 FT (NAVD 88)

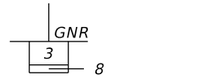
BOR # TP-26
STA. 235+37
REF. ℄ CONST.
OFF. 392' RT.
ELEV. 27.8
DATE 6/20/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 19.8 FT (NAVD 88)

BOR # M-21
STA. 235+53
REF. ℄ CONST.
OFF. 18' RT.
ELEV. 28.5
DATE 5/4/2023



REFUSAL

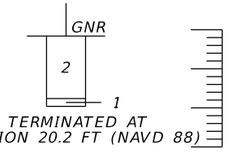
BORING TERMINATED AT ELEVATION 24.5 FT (NAVD 88)

BOR # HA-31
STA. 235+56
REF. ℄ CONST.
OFF. 560' RT.
ELEV. 29.5
DATE 5/3/2023

REFUSAL

BORING TERMINATED AT ELEVATION 25.5 FT (NAVD 88)

BOR # TP-31
STA. 235+57
REF. ℄ CONST.
OFF. 549' RT.
ELEV. 29.2
DATE 6/20/2023



BORING TERMINATED AT ELEVATION 20.2 FT (NAVD 88)

LEGEND

1. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3. BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4. GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5. DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6. GRAY TO BROWN SILT TO CLAY (A-7-6)
7. CALCAREOUS CLAY TO WEATHERED LIMESTONE
8. LANDFILL DEBRIS

A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTE: 1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

MANATEE COUNTY FL

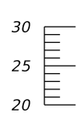
LENA ROAD

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

DEBRIS SOIL PROFILES (2)

SHEET NUMBER

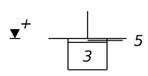
BOR # HA-25
STA. 235+72
REF. ℄ CONST.
OFF. 390' RT.
ELEV. 28.3
DATE 5/5/2023



REFUSAL

BORING TERMINATED AT ELEVATION 23.3 FT (NAVD 88)

BOR # AB-236R
STA. 235+73
REF. ℄ CONST.
OFF. 4' RT.
ELEV. 28.5
DATE 11/9/2022



CAVE-IN

BORING TERMINATED AT ELEVATION 24.5 FT (NAVD 88)

BOR # HA-7
STA. 235+77
REF. ℄ CONST.
OFF. 366' LT.
ELEV. 29.1
DATE 5/4/2023

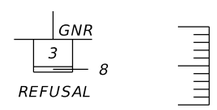
CAVE-IN

BORING TERMINATED AT ELEVATION 26.1 FT (NAVD 88)

BOR # HA-10
STA. 235+80
REF. ℄ CONST.
OFF. 214' LT.
ELEV. 28.1
DATE 5/2/2023

BORING TERMINATED AT ELEVATION 21.6 FT (NAVD 88)

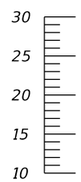
BOR # M-22
STA. 235+85
REF. ℄ CONST.
OFF. 11' LT.
ELEV. 28.4
DATE 5/4/2023



REFUSAL

BORING TERMINATED AT ELEVATION 24.2 FT (NAVD 88)

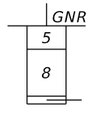
BOR # HA-20
STA. 235+94
REF. ℄ CONST.
OFF. 245' RT.
ELEV. 29.8
DATE 5/5/2023



REFUSAL

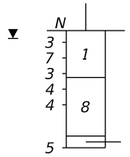
BORING TERMINATED AT ELEVATION 23.8 FT (NAVD 88)

BOR # TP-20
STA. 236+02
REF. ℄ CONST.
OFF. 255' RT.
ELEV. 29.1
DATE 6/20/2023



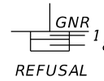
BORING TERMINATED AT ELEVATION 19.1 FT (NAVD 88)

BOR # B-236L
STA. 236+03
REF. ℄ CONST.
OFF. 14' LT.
ELEV. 28.5
DATE 6/26/2023



BORING TERMINATED AT ELEVATION 13.5 FT (NAVD 88)

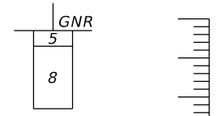
BOR # M-23
STA. 236+07
REF. ℄ CONST.
OFF. 19' RT.
ELEV. 28.4
DATE 5/4/2023



REFUSAL

BORING TERMINATED AT ELEVATION 25.9 FT (NAVD 88)

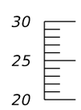
BOR # TP-15
STA. 236+17
REF. ℄ CONST.
OFF. 38' RT.
ELEV. 28.5
DATE 6/21/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 18.5 FT (NAVD 88)

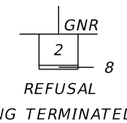
BOR # TP-10
STA. 236+42
REF. ℄ CONST.
OFF. 171' LT.
ELEV. 28.3
DATE 6/21/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 21.3 FT (NAVD 88)

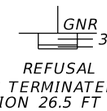
BOR # HA-16
STA. 236+43
REF. ℄ CONST.
OFF. 96' RT.
ELEV. 28.4
DATE 5/5/2023



REFUSAL

BORING TERMINATED AT ELEVATION 23.9 FT (NAVD 88)

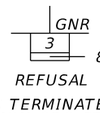
BOR # M-24
STA. 236+58
REF. ℄ CONST.
OFF. 9' LT.
ELEV. 28.5
DATE 5/4/2023



REFUSAL

BORING TERMINATED AT ELEVATION 26.5 FT (NAVD 88)

BOR # M-25
STA. 236+60
REF. ℄ CONST.
OFF. 10' RT.
ELEV. 28.5
DATE 5/4/2023



REFUSAL

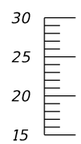
BORING TERMINATED AT ELEVATION 25.0 FT (NAVD 88)

BOR # HA-11
STA. 236+82
REF. ℄ CONST.
OFF. 127' LT.
ELEV. 28.1
DATE 5/2/2023

REFUSAL

BORING TERMINATED AT ELEVATION 24.1 FT (NAVD 88)

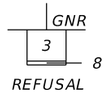
BOR # HA-FPC-1B
STA. 236+87
REF. ℄ CONST.
OFF. 205' RT.
ELEV. 28.6
DATE 11/9/2022



CAVE-IN

BORING TERMINATED AT ELEVATION 26.6 FT (NAVD 88)

BOR # M-26
STA. 236+93
REF. ℄ CONST.
OFF. 23' LT.
ELEV. 28.6
DATE 5/4/2023



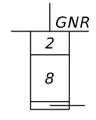
REFUSAL

BORING TERMINATED AT ELEVATION 24.1 FT (NAVD 88)

BOR # HA-32
STA. 237+00
REF. ℄ CONST.
OFF. 680' RT.
ELEV. 28
DATE 5/3/2023

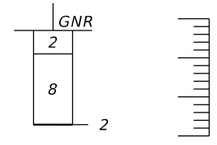
BORING TERMINATED AT ELEVATION 23.0 FT (NAVD 88)

BOR # TP-7
STA. 237+04
REF. ℄ CONST.
OFF. 101' LT.
ELEV. 28.4
DATE 6/21/2023



BORING TERMINATED AT ELEVATION 18.4 FT (NAVD 88)

BOR # TP-11
STA. 237+09
REF. ℄ CONST.
OFF. 11' LT.
ELEV. 28.5
DATE 6/21/2023



BORING TERMINATED AT ELEVATION 16.4 FT (NAVD 88)

LEGEND

1. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3. BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4. GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5. DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6. GRAY TO BROWN SILT TO CLAY (A-7-6)
7. CALCAREOUS CLAY TO WEATHERED LIMESTONE
8. LANDFILL DEBRIS

A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTE: 1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

Manatee County FLORIDA

LENA ROAD

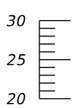
MANATEE COUNTY FL

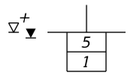
LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

DEBRIS SOIL PROFILES (3)

SHEET NUMBER

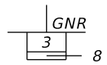
BOR # SH-237*
STA. 237+10
REF. ℄ CONST.
OFF. 1' LT.
ELEV. 28.5
DATE 7/11/2022





BORING TERMINATED AT ELEVATION 23.5 FT (NAVD 88)

BOR # M-27
STA. 237+13
REF. ℄ CONST.
OFF. 5' RT.
ELEV. 28.5
DATE 5/4/2023



REFUSAL

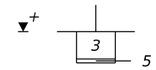
BORING TERMINATED AT ELEVATION 25.0 FT (NAVD 88)

BOR # HA-26
STA. 237+17
REF. ℄ CONST.
OFF. 515' RT.
ELEV. 27.9
DATE 5/5/2023

REFUSAL

BORING TERMINATED AT ELEVATION 24.9 FT (NAVD 88)

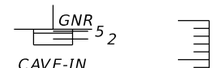
BOR # AB-237R
STA. 237+18
REF. ℄ CONST.
OFF. 42' RT.
ELEV. 28.6
DATE 11/9/2022



CAVE-IN

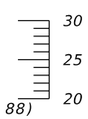
BORING TERMINATED AT ELEVATION 24.6 FT (NAVD 88)

BOR # HA-8
STA. 237+25
REF. ℄ CONST.
OFF. 268' LT.
ELEV. 28.9
DATE 5/4/2023

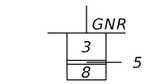


CAVE-IN

BORING TERMINATED AT ELEVATION 26.9 FT (NAVD 88)



BOR # HA-21
STA. 237+32
REF. ℄ CONST.
OFF. 340' RT.
ELEV. 28.5
DATE 5/5/2023



REFUSAL

BORING TERMINATED AT ELEVATION 22.5 FT (NAVD 88)

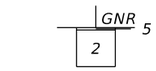
BOR # TP-27
STA. 237+34
REF. ℄ CONST.
OFF. 503' RT.
ELEV. 28.0
DATE 6/20/2023

BORING TERMINATED AT ELEVATION 21.0 FT (NAVD 88)

BOR # M-28
STA. 237+38
REF. ℄ CONST.
OFF. 17' LT.
ELEV. 28.4
DATE 5/4/2023

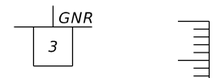
BORING TERMINATED AT ELEVATION 23.4 FT (NAVD 88)

BOR # HA-3
STA. 237+47
REF. ℄ CONST.
OFF. 563' LT.
ELEV. 29.2
DATE 5/4/2023

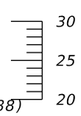


BORING TERMINATED AT ELEVATION 24.2 FT (NAVD 88)

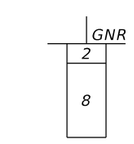
BOR # HA-5
STA. 237+49
REF. ℄ CONST.
OFF. 437' LT.
ELEV. 29.3
DATE 5/4/2023



BORING TERMINATED AT ELEVATION 24.3 FT (NAVD 88)



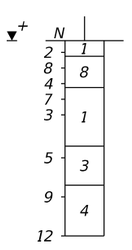
BOR # TP-12
STA. 237+54
REF. ℄ CONST.
OFF. 26' LT.
ELEV. 28.5
DATE 6/20/2023



CAVE-IN

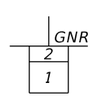
BORING TERMINATED AT ELEVATION 16.5 FT (NAVD 88)

BOR # PBS-POND2-2
STA. 237+54
REF. ℄ CONST.
OFF. 192' LT.
ELEV. 28.9
DATE 6/21/2023



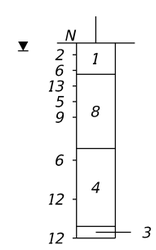
BORING TERMINATED AT ELEVATION 3.9 FT (NAVD 88)

BOR # TP-32
STA. 237+54
REF. ℄ CONST.
OFF. 660' RT.
ELEV. 28.2
DATE 6/23/2023



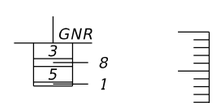
BORING TERMINATED AT ELEVATION 22.2 FT (NAVD 88)

BOR # PBS-POND2-5
STA. 237+55
REF. ℄ CONST.
OFF. 54' LT.
ELEV. 28.6
DATE 6/23/2023

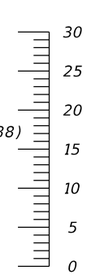


BORING TERMINATED AT ELEVATION 3.6 FT (NAVD 88)

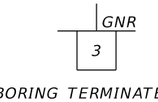
BOR # HA-17
STA. 237+69
REF. ℄ CONST.
OFF. 173' RT.
ELEV. 28.6
DATE 5/4/2023



BORING TERMINATED AT ELEVATION 23.1 FT (NAVD 88)

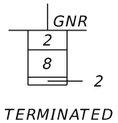


BOR # M-29
STA. 237+70
REF. ℄ CONST.
OFF. 7' RT.
ELEV. 28.5
DATE 5/4/2023



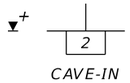
BORING TERMINATED AT ELEVATION 23.5 FT (NAVD 88)

BOR # TP-16
STA. 237+76
REF. ℄ CONST.
OFF. 170' RT.
ELEV. 28.6
DATE 6/21/2023



BORING TERMINATED AT ELEVATION 21.6 FT (NAVD 88)

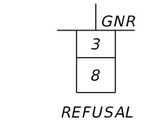
BOR # AB-238L
STA. 237+97
REF. ℄ CONST.
OFF. 12' LT.
ELEV. 28.5
DATE 11/9/2022



CAVE-IN

BORING TERMINATED AT ELEVATION 25.5 FT (NAVD 88)

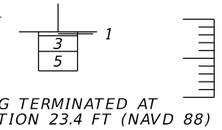
BOR # TP-21
STA. 238+00
REF. ℄ CONST.
OFF. 326' RT.
ELEV. 28.6
DATE 6/20/2023



REFUSAL

BORING TERMINATED AT ELEVATION 20.6 FT (NAVD 88)

BOR # AB-238R
STA. 238+02
REF. ℄ CONST.
OFF. 8' RT.
ELEV. 28.4
DATE 11/9/2022



BORING TERMINATED AT ELEVATION 23.4 FT (NAVD 88)

LEGEND

1. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3. BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4. GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5. DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6. GRAY TO BROWN SILT TO CLAY (A-7-6)
7. CALCAREOUS CLAY TO WEATHERED LIMESTONE
8. LANDFILL DEBRIS

A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTE:
1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

Manatee County FLORIDA

LENA ROAD

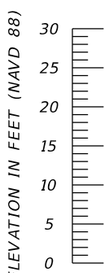
MANATEE COUNTY FL

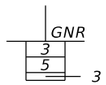
LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

DEBRIS SOIL PROFILES (4)

SHEET NUMBER

BOR # M-30
STA. 238+08
REF. ℄ CONST.
OFF. 37' LT.
ELEV. 28.4
DATE 5/2/2023



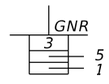


BORING TERMINATED AT ELEVATION 23.4 FT (NAVD 88)

BOR # HA-27
STA. 238+16
REF. ℄ CONST.
OFF. 596' RT.
ELEV. 28.5
DATE 5/3/2023

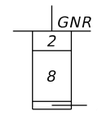
BORING TERMINATED AT ELEVATION 23.5 FT (NAVD 88)

BOR # HA-9
STA. 238+39
REF. ℄ CONST.
OFF. 146' LT.
ELEV. 29.2
DATE 5/4/2023



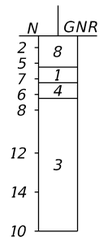
BORING TERMINATED AT ELEVATION 24.2 FT (NAVD 88)

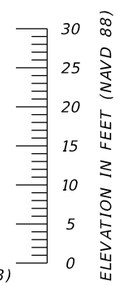
BOR # TP-5
STA. 238+41
REF. ℄ CONST.
OFF. 112' LT.
ELEV. 29.7
DATE 6/21/2023



BORING TERMINATED AT ELEVATION 19.7 FT (NAVD 88)

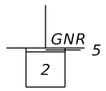
BOR # PBS-POND2-3
STA. 238+50
REF. ℄ CONST.
OFF. 96' LT.
ELEV. 29.1
DATE 6/23/2023





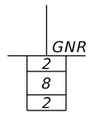
BORING TERMINATED AT ELEVATION 4.1 FT (NAVD 88)

BOR # HA-2
STA. 238+57
REF. ℄ CONST.
OFF. 614' LT.
ELEV. 28.6
DATE 5/3/2023



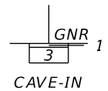
BORING TERMINATED AT ELEVATION 23.6 FT (NAVD 88)

BOR # TP-8
STA. 238+63
REF. ℄ CONST.
OFF. 32' LT.
ELEV. 27.6
DATE 6/21/2023



BORING TERMINATED AT ELEVATION 20.6 FT (NAVD 88)

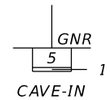
BOR # HA-4
STA. 238+68
REF. ℄ CONST.
OFF. 435' LT.
ELEV. 29.2
DATE 5/3/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 26.7 FT (NAVD 88)

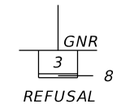
BOR # HA-6
STA. 238+68
REF. ℄ CONST.
OFF. 302' LT.
ELEV. 28.6
DATE 5/3/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 25.6 FT (NAVD 88)

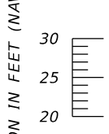
BOR # M-32
STA. 238+69
REF. ℄ CONST.
OFF. 19' LT.
ELEV. 28.3
DATE 5/1/2023

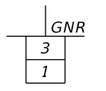


REFUSAL

BORING TERMINATED AT ELEVATION 24.8 FT (NAVD 88)

BOR # HA-22
STA. 238+77
REF. ℄ CONST.
OFF. 436' RT.
ELEV. 29.9
DATE 5/5/2023

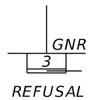




CAVE-IN

BORING TERMINATED AT ELEVATION 23.9 FT (NAVD 88)

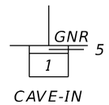
BOR # HA-15
STA. 238+78
REF. ℄ CONST.
OFF. 104' RT.
ELEV. 27.7
DATE 5/4/2023



REFUSAL

BORING TERMINATED AT ELEVATION 25.2 FT (NAVD 88)

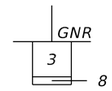
BOR # HA-1
STA. 238+80
REF. ℄ CONST.
OFF. 734' LT.
ELEV. 28.7
DATE 5/3/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 24.7 FT (NAVD 88)

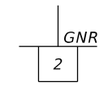
BOR # HA-18
STA. 238+87
REF. ℄ CONST.
OFF. 269' RT.
ELEV. 29.2
DATE 5/5/2023



REFUSAL

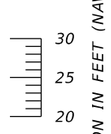
BORING TERMINATED AT ELEVATION 23.7 FT (NAVD 88)

BOR # TP-22
STA. 238+88
REF. ℄ CONST.
OFF. 406' RT.
ELEV. 28.6
DATE 6/20/2023



CAVE-IN

BORING TERMINATED AT ELEVATION 24.1 FT (NAVD 88)



LEGEND

1. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3. BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4. GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5. DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6. GRAY TO BROWN SILT TO CLAY (A-7-6)
7. CALCAREOUS CLAY TO WEATHERED LIMESTONE
8. LANDFILL DEBRIS

A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
∇^+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
∇	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
$▼^+$	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTE: 1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

MANATEE COUNTY FL

Manatee County FLORIDA

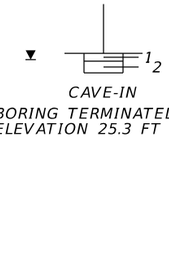
LENA ROAD

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

DEBRIS SOIL PROFILES (5)

SHEET NUMBER

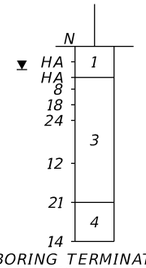
BOR # AB-239L
STA. 238+98
REF. ℄ CONST.
OFF. 9' LT.
ELEV. 27.8
DATE 11/9/2022



CAVE-IN

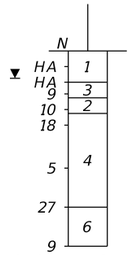
BORING TERMINATED AT ELEVATION 25.3 FT (NAVD 88)

BOR # PBS-3
STA. 239+06
REF. ℄ CONST.
OFF. 252' RT.
ELEV. 28.7
DATE 6/15/2023



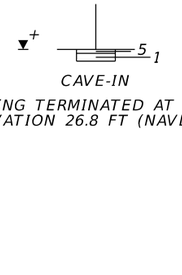
BORING TERMINATED AT ELEVATION 3.7 FT (NAVD 88)

BOR # PBS-1
STA. 239+08
REF. ℄ CONST.
OFF. 77' RT.
ELEV. 28.1
DATE 6/14/2023



BORING TERMINATED AT ELEVATION 3.1 FT (NAVD 88)

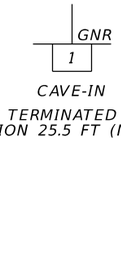
BOR # AB-239R
STA. 239+09
REF. ℄ CONST.
OFF. 37' RT.
ELEV. 28.3
DATE 11/9/2022



CAVE-IN

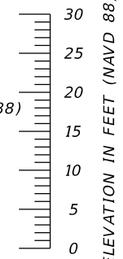
BORING TERMINATED AT ELEVATION 26.8 FT (NAVD 88)

BOR # M-33
STA. 239+10
REF. ℄ CONST.
OFF. 8' RT.
ELEV. 29
DATE 5/1/2023

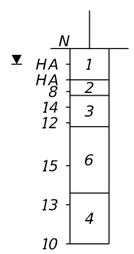


CAVE-IN

BORING TERMINATED AT ELEVATION 25.5 FT (NAVD 88)

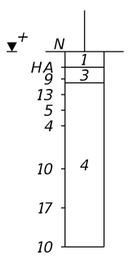


BOR # PBS-POND2-4
STA. 239+23
REF. ℄ CONST.
OFF. 15' LT.
ELEV. 28.7
DATE 6/15/2023



BORING TERMINATED AT ELEVATION 3.7 FT (NAVD 88)

BOR # PBS-POND2-1
STA. 239+26
REF. ℄ CONST.
OFF. 109' LT.
ELEV. 28.3
DATE 6/14/2023



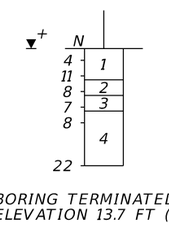
BORING TERMINATED AT ELEVATION 3.3 FT (NAVD 88)

BOR # M-34
STA. 239+31
REF. ℄ CONST.
OFF. 21' LT.
ELEV. 28.6
DATE 5/1/2023

CAVE-IN

BORING TERMINATED AT ELEVATION 24.6 FT (NAVD 88)

BOR # B-239R
STA. 239+46
REF. ℄ CONST.
OFF. 9' RT.
ELEV. 28.7
DATE 5/26/2023

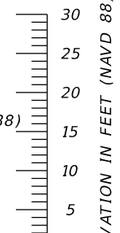


BORING TERMINATED AT ELEVATION 13.7 FT (NAVD 88)

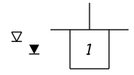
BOR # TP-13
STA. 239+82
REF. ℄ CONST.
OFF. 30' LT.
ELEV. 29.9
DATE 6/21/2023

CAVE-IN

BORING TERMINATED AT ELEVATION 23.9 FT (NAVD 88)

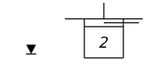


BOR # SH-240*
STA. 239+94
REF. ℄ CONST.
OFF. 14' RT.
ELEV. 30.9
DATE 7/11/2022



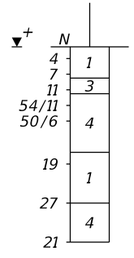
BORING TERMINATED AT ELEVATION 25.9 FT (NAVD 88)

BOR # AB-240L
STA. 239+98
REF. ℄ CONST.
OFF. 20' LT.
ELEV. 32.3
DATE 11/9/2022



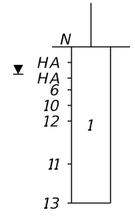
BORING TERMINATED AT ELEVATION 27.3 FT (NAVD 88)

BOR # PBS-2
STA. 240+13
REF. ℄ CONST.
OFF. 191' RT.
ELEV. 28.7
DATE 5/26/2023



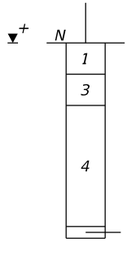
BORING TERMINATED AT ELEVATION 3.7 FT (NAVD 88)

BOR # B-241L
STA. 240+85
REF. ℄ CONST.
OFF. 47' LT.
ELEV. 28.7
DATE 11/6/2022



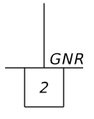
BORING TERMINATED AT ELEVATION 8.7 FT (NAVD 88)

BOR # PBS-4
STA. 240+95
REF. ℄ CONST.
OFF. 373' RT.
ELEV. 29.2
DATE 5/26/2023

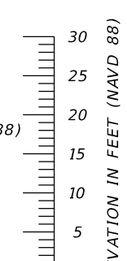


BORING TERMINATED AT ELEVATION 4.2 FT (NAVD 88)

BOR # M-31
STA. 283+38
REF. ℄ CONST.
OFF. 15' RT.
ELEV. 28.7
DATE 5/1/2023



BORING TERMINATED AT ELEVATION 23.7 FT (NAVD 88)



LEGEND

1. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (A-3)
2. BROWN TO LIGHT BROWN TO GRAY TO LIGHT GRAY SILTY SAND (A-2-4)
3. BROWN TO LIGHT BROWN TO GRAY SILTY SAND TO SILTY-CLAYEY SAND (A-2-4)
4. GRAY TO BROWN CLAYEY SAND TO SANDY CLAY TO SILT (A-2-6/A-6/A-4)
5. DARK GRAY TO BLACK ORGANIC SAND TO ORGANIC SILTY SAND TO PEAT (A-8)
6. GRAY TO BROWN SILT TO CLAY (A-7-6)
7. CALCAREOUS CLAY TO WEATHERED LIMESTONE
8. LANDFILL DEBRIS

A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
▽+	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
▽	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
▼	GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
▼+	GROUNDWATER LEVEL ENCOUNTERED AT OR ABOVE GRADE DURING FIELD EXPLORATIONS
GNR	GROUNDWATER LEVEL NOT RECORDED
CAVE-IN	CAVE-IN DUE TO SHALLOW GROUNDWATER INTRUSION
REFUSAL	REFUSAL DUE TO HAND AUGER REFUSAL ON LANDFILL DEBRIS
℄ CONST.	CENTERLINE CONSTRUCTION LENA ROAD

NOTE: 1. THE BORINGS WERE LOCATED IN THE FIELD BY A REPRESENTATIVE OF TIERRA USING A HAND-HELD GARMIN ETREX GPS UNIT. THE BORINGS INDICATED WITH AN "*" WERE LATER SURVEY LOCATED BY THE PROJECT SURVEYOR. STATION AND OFFSET FOR THE BORINGS WERE DETERMINED BY TIERRA USING THE FROM FIELD GPS AND THE SURVEYED COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES PROVIDED BY KIMLEY HORN.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

MANATEE COUNTY FL

LENA ROAD

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE:

DEBRIS SOIL PROFILES (6)

SHEET NUMBER

LEGEND

2.0-2.5 — DEBRIS ENCOUNTERED 2.0-2.5 FEET BELOW EXISTING GRADE

NE-5.0 — DEBRIS NOT ENCOUNTERED TO DEPTH SHOWN

4.0-6.0R — DEBRIS MATERIAL ENCOUNTERED FROM A DEPTH OF 4.0 TO 6.0 FEET BELOW GROUND SURFACE. BORING TERMINATED DUE TO REFUSAL MATERIAL.

2.5-7.0C — DEBRIS MATERIAL ENCOUNTERED FROM A DEPTH OF 2.5 TO 7.0 FEET BELOW GROUND SURFACE. BORING TERMINATED DUE TO CAVE-IN FROM GROUND WATER INTRUSION.

APPROXIMATE AREA OF ENCOUNTERED DEBRIS

℄ CONST.

N

0 20 100
Feet

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 06/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

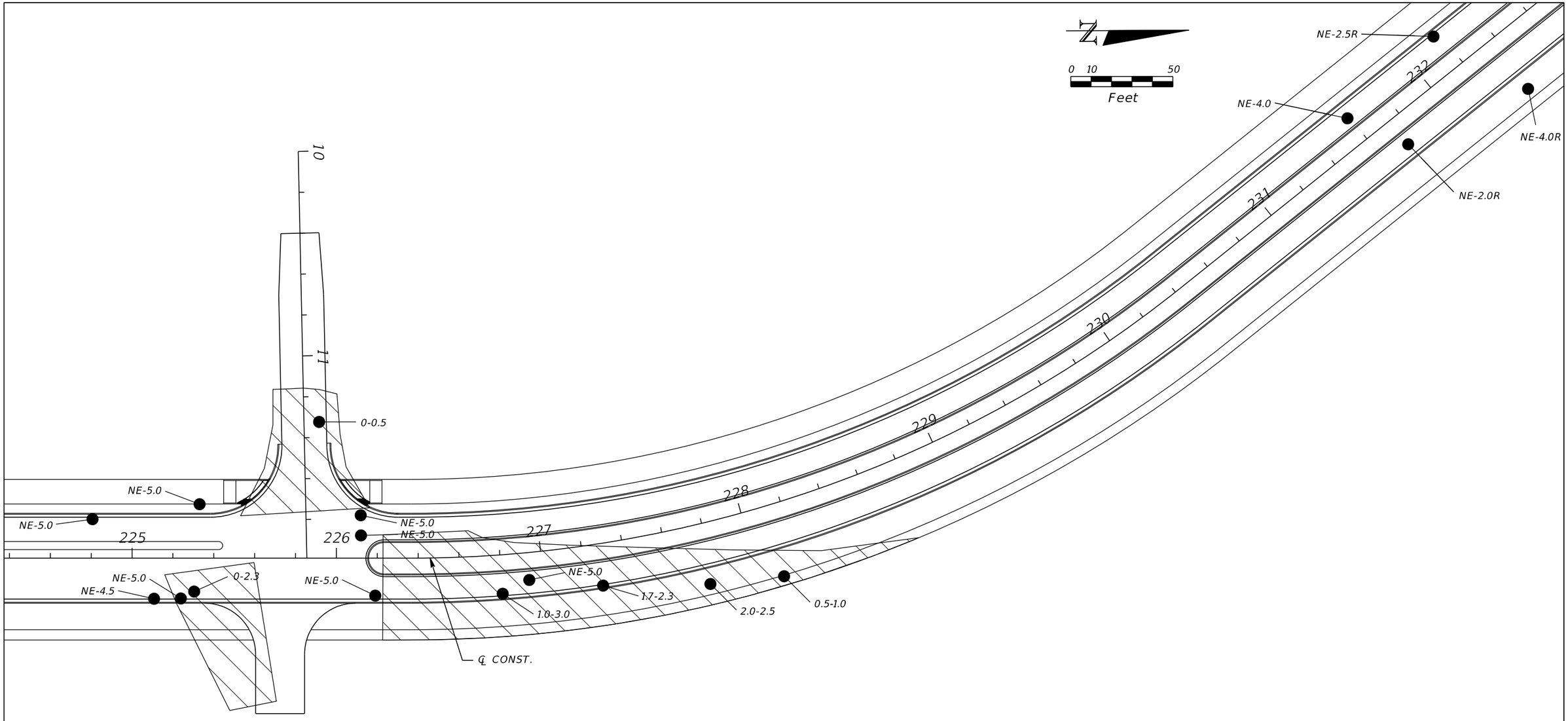
MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: 06/2023

DEBRIS DELINEATION PLAN (1)

SHEET NUMBER

bsawaska 6/30/2023 2:31:42 PM Default J:\6511\2022 Files\6511-22-127 Manatee Lena Rd Kimley\Microstation\Geotech\MBORRD_DEBRIS01.dgn



LEGEND

2.0-2.5 — ORGANICS ENCOUNTERED 2.0-2.5 FEET BELOW EXISTING GRADE

NE-5.0 — ORGANICS NOT ENCOUNTERED TO DEPTH SHOWN

APPROXIMATE LOCATION OF ORGANICS

4.0-6.0R — ORGANIC MATERIAL ENCOUNTERED FROM A DEPTH OF 4.0 TO 6.0 FEET BELOW GROUND SURFACE. BORING TERMINATED DUE TO REFUSAL MATERIAL.

2.5-7.0C — ORGANIC MATERIAL ENCOUNTERED FROM A DEPTH OF 2.5 TO 7.0 FEET BELOW GROUND SURFACE. BORING TERMINATED DUE TO CAVE-IN FROM GROUND WATER INTRUSION.

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

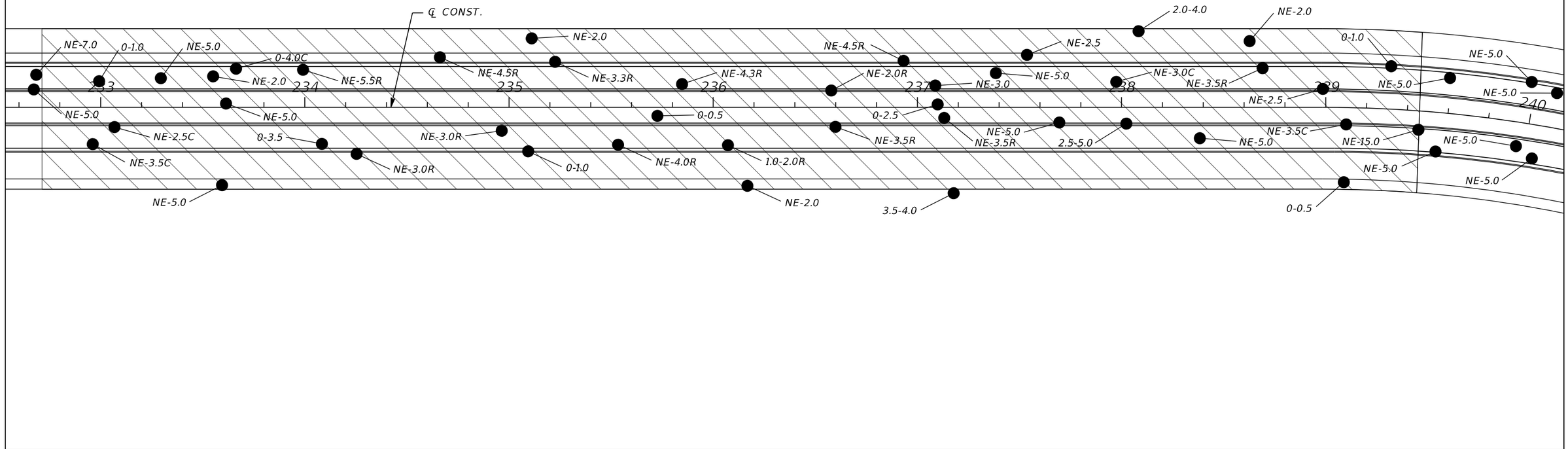
MANATEE COUNTY
LENA ROAD
FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: 6/2023

MUCK DELINEATION PLAN (1)

SHEET NUMBER

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



LEGEND

2.0-2.5 — ORGANICS ENCOUNTERED 2.0-2.5 FEET BELOW EXISTING GRADE

NE-5.0 — ORGANICS NOT ENCOUNTERED TO DEPTH SHOWN

APPROXIMATE LOCATION OF ORGANICS

4.0-6.0R — ORGANIC MATERIAL ENCOUNTERED FROM A DEPTH OF 4.0 TO 6.0 FEET BELOW GROUND SURFACE. BORING TERMINATED DUE TO REFUSAL MATERIAL.

2.5-7.0C — ORGANIC MATERIAL ENCOUNTERED FROM A DEPTH OF 2.5 TO 7.0 FEET BELOW GROUND SURFACE. BORING TERMINATED DUE TO CAVE-IN FROM GROUND WATER INTRUSION.

No.	REVISIONS	DATE	BY

KEVIN H. SCOTT, P.E.
P.E. LICENSE NUMBER 65514
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

KHA PROJECT 148400100
DATE 6/2023
SCALE AS SHOWN
DESIGNED BY BJS
DRAWN BY BJS
CHECKED BY TB

MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL
KEVIN H. SCOTT, P.E.
FL LICENSE NUMBER 65514
DATE: 6/2023

MUCK DELINEATION PLAN (2)

SHEET NUMBER

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

APPENDIX C

Summary of Seasonal High Groundwater Table Estimates for Roadway

Summary of Seasonal High Groundwater Table Estimates for Ponds

Summary of Groundwater Table Measurements from Piezometers

Summary of Seasonal High Groundwater Table Estimates for Roadway
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Boring Name	Boring Location[1]				Boring Depth[2] (feet)	Ground Elevation[1] (feet, NAVD 88)	Measured Groundwater Table			USDA Soil Survey		Estimated SHGWT[5]	
	Station (feet)	Offset (feet)	FL West NAD 83 Easting (feet)	FL West NAD 83 Northing (feet)			Date Recorded	Depth[3] (feet)	Elevation (feet, NAVD 88)	Map Symbol	Estimated SHGWT[4] Depth (feet)	Depth[3] (feet)	Elevation (feet, NAVD 88)
SH-219	219+20	13' LT.	508655	1137310	5.0	23.1	7/11/2022	1.8	21.3	20	0.3-1.5	1.0	22.1
SH-222	222+08	5' LT.	508665	1137598	5.0	30.8	7/11/2022	2.9	27.9	20	0.3-1.5	1.5	29.3
SH-225	224+79	24' LT.	508648	1137869	5.0	31.1	7/11/2022	1.5	29.6	20	0.3-1.5	1.3	29.8
SH-228	227+77[7]	30' RT.[7]	508686[7]	1138173[7]	4.0	28.8[7]	7/11/2022	0.8	28.0	26	+2.0-0.0	ABG[6]	>28.8
SH-232	232+16	24' LT.	508418	1138525	5.0	29.6	7/11/2022	2.5	27.1	26	+2.0-0.0	1.0	28.6
SH-234	233+59[7]	38' RT.[7]	508377[7]	1138676[7]	4.0	28.5[7]	7/11/2022	3.0	25.5	26	+2.0-0.0	1.5	27.0
SH-237	237+10[7]	1' LT.[7]	508129[7]	1138927[7]	5.0	28.5[7]	7/11/2022	0.7	27.8	26	+2.0-0.0	ABG[6]	>28.5
SH-240	239+94	14' RT.	507972	1139162	5.0	30.9	7/11/2022	3.1	27.8	20	0.3-1.5	1.5	29.4
SH-243	242+94	28' LT.	507849	1139439	5.0	30.2	7/6/2022	2.6	27.6	20	0.3-1.5	0.5	29.7
SH-246	245+83	17' RT.	507897	1139729	5.0	32.5	7/6/2022	4.4	28.1	20	0.3-1.5	2.5	30.0
SH-249	248+99	26' LT.	507858	1140045	5.0	32.0	7/6/2022	4.6	27.4	12	3.5-5.0	2.5	29.5
SH-252	252+29	18' RT.	507933	1140368	5.5	32.9	7/6/2022	5.3	27.6	20	0.3-1.5	3.5	29.4
SH-255	255+35	28' LT.	508001	1140668	5.0	30.9	7/6/2022	3.1	27.8	20	0.3-1.5	1.5	29.4
SH-258	257+79	47' RT.	508141	1140884	5.0	31.2	7/6/2022	4.4	26.8	20	0.3-1.5	2.0	29.2
SH-261	261+35	29' LT.	508080	1141247	5.0	30.2	7/6/2022	4.1	26.1	20	0.3-1.5	2.0	28.2
SH-264	263+87	25' RT.	508140	1141498	5.5	29.6	7/6/2022	4.2	25.4	35	0.0-1.5	2.0	27.6
SH-267	266+74	15' LT.	508106	1141785	6.0	30.1	7/6/2022	5.3	24.8	35	0.0-1.5	2.5	27.6
SH-270	269+90	23' RT.	508152	1142101	6.0	28.7	7/6/2022	5.8	22.9	11	1.5-3.5	2.0	26.7

[1] The boring locations and ground elevations were provided by the project surveyor unless otherwise noted. Project design files were utilized in conjunction with the coordinates provided by the project surveyor to determine the station and offset of the boring locations. Station and Offset are referenced to the Centerline Construction Lena Road alignment.

[2] Depth of boring below existing grades. Shallow borings less than 5 feet in depth caved in due to groundwater intrusion.

[3] Depth below grade at time of boring.

[4] Seasonal high groundwater table depth based on the Manatee County, Florida USDA Soil Survey information.

[5] Seasonal high groundwater table depth estimated based on soil stratigraphy, measured groundwater levels from the borings, the Manatee County, Florida USDA Soil Survey information, and past experience with similar soil conditions in the project area.

[6] We recommend the project biologist be consulted to assist with determining seasonal high groundwater table levels using biological indicators and/or available wetland information at these locations.

[7] These borings were not survey located. The boring locations were determined in the field using hand-held, non-survey grade GPS equipment with a manufacturer's reported accuracy of ± 10 feet. Station, offset and elevation of the boring locations were determined using the GPS coordinates recorded in the field in conjunction with project design files provided by Kimley-Horn and Associates. The boring locations and elevations should be considered approximate.

ABG: At or Above Existing Grade

Summary of Seasonal High Groundwater Table Estimates for Roadway
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Boring Name	Boring Location[1]				Boring Depth[2] (feet)	Ground Elevation[1] (feet, NAVD 88)	Measured Groundwater Table			USDA Soil Survey		Estimated SHGWT[5]	
	Station (feet)	Offset (feet)	FL West NAD 83 Easting (feet)	FL West NAD 83 Northing (feet)			Date Recorded	Depth[3] (feet)	Elevation (feet, NAVD 88)	Map Symbol	Estimated SHGWT[4] Depth (feet)	Depth[3] (feet)	Elevation (feet, NAVD 88)
SH-273	272+98	10' LT.	508124	1142409	8.0	29.1	7/6/2022	5.5	23.6	45	1.5-3.5	2.5	26.6
SH-276	276+40	25' RT.	508123	1142753	7.0	27.2	7/8/2022	6.5	20.7	11	1.5-3.5	2.5	24.7
SH-279	278+94	22' LT.	508022	1142992	5.0	25.5	7/11/2022	4.4	21.1	11	1.5-3.5	2.0	23.5
SH-282	281+94	11' RT.	508003	1143293	5.0	23.9	7/8/2022	4.5	19.4	11	1.5-3.5	2.0	21.9
SH-285	284+93	38' LT.	507953	1143592	6.0	21.2	7/11/2022	4.6	16.6	20	0.3-1.5	2.0	19.2
SH-288	287+95	7' RT.	508011	1143891	5.0	22.1	7/8/2022	4.5	17.6	20	0.3-1.5	3.0	19.1
SH-291	290+95	38' LT.	507980	1144193	6.0	20.6	7/11/2022	4.2	16.4	20	0.3-1.5	2.0	18.6
SH-294	293+90	24' RT.	508054	1144485	5.5	18.8	7/8/2022	4.0	14.8	20	0.3-1.5	1.5	17.3
SH-297	296+89	37' LT.	508006	1144787	5.0	19.0	7/11/2022	3.6	15.4	20	0.3-1.5	1.3	17.7
SH-300	299+92	20' RT.	508076	1145087	5.0	19.3	7/8/2022	2.5	16.8	20	0.3-1.5	2.0	17.3
SH-303	303+03	39' LT.	508027	1145400	5.0	19.7	7/8/2022	4.0	15.7	20	0.3-1.5	2.5	17.2
SH-306	305+96	25' RT.	508094	1145692	5.0	18.6	7/8/2022	3.5	15.1	20	0.3-1.5	2.0	16.6
SH-309	309+05	35' LT.	508036	1146003	5.0	18.9	7/8/2022	4.0	14.9	20	0.3-1.5	2.5	16.4
SH-FPC-1	230+20[7]	186' LT.[7]	508407[7]	1138276[7]	5.0	30.3[7]	7/11/2022	3.0	27.3	26	+2.0-0.0	1.5	28.8
SH-FPC-2	285+55[7]	419' RT.[7]	508413[7]	1143634[7]	5.0	22.8[7]	7/21/2022	4.8	18.0	20	0.3-1.5	1.5	21.3
SH-POND1-1	250+52	190' RT.	508076	1140184	6.0	32.3	7/6/2022	4.8	27.5	20	0.3-1.5	3.0	29.3
SH-ROUNDABOUT-1	302+14	54' LT.	508011	1145310	5.0	19.5	7/11/2022	3.3	16.2	20	0.3-1.5	2.0	17.5
SH-ROUNDABOUT-2	302+33	73' RT.	508138	1145328	5.0	19.0	7/11/2022	2.5	16.5	20	0.3-1.5	1.5	17.5

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[2] Depth of boring below existing grades. Shallow borings less than 5 feet in depth caved in due to groundwater intrusion.

[3] Depth below grade at time of boring.

[4] Seasonal high groundwater table depth based on the Manatee County, Florida USDA Soil Survey information.

[5] Seasonal high groundwater table depth estimated based on soil stratigraphy, measured groundwater levels from the borings, the Manatee County, Florida USDA Soil Survey information, and past experience with similar soil conditions in the project area.

[6] We recommend the project biologist be consulted to assist with determining seasonal high groundwater table levels using biological indicators and/or available wetland information at these locations.

[7] These borings were not survey located. The boring locations were determined in the field using hand-held, non-survey grade GPS equipment with a manufacturer's reported accuracy of ± 10 feet. Station, offset and elevation of the boring locations were determined using the GPS coordinates recorded in the field in conjunction with project design files provided by Kimley-Horn and Associates. The boring locations and elevations should be considered approximate.

ABG: At or Above Existing Grade

Summary of Seasonal High Groundwater Table Estimates for Ponds
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Boring Name	Boring Location[1]				Boring Depth[2] (feet)	Ground Elevation[1] (feet, NAVD 88)	Measured Groundwater Table			USDA Soil Survey		Estimated SHGWT[5]	
	Station (feet)	Offset (feet)	FL West NAD 83 Easting (feet)	FL West NAD 83 Northing (feet)			Date Recorded	Depth[3] (feet)	Elevation (feet, NAVD 88)	Map Symbol	Estimated SHGWT[4] Depth (feet)	Depth[3] (feet)	Elevation (feet, NAVD 88)
HA-FPC-1	235+98	153' RT.	508319	1138934	3.0	28.5	10/30/2022	0.00	28.5	26	+2.0-0.0	ABG[6]	28.5
HA-FPC-2	237+61	276' RT.	508315	1139139	4.0	28.2	10/30/2022	0.00	28.2	26	+2.0-0.0	ABG[6]	28.2
PBA-3	238+70	277' RT.	508249	1139225	3.0	28.6	10/30/2022	0.30	28.3	26	+2.0-0.0	ABG[6]	28.6
PBA-1	238+80	113' RT.	508114	1139131	3.5	28.8	10/30/2022	0.00	28.8	26	+2.0-0.0	ABG[6]	28.8
PBA-2	240+57	192' RT.	508107	1139289	5.0	30.9	10/30/2022	3.20	27.7	20/26	0.3-1.5/+2.0-0.0	2.0	28.9
PBA-4	241+56	344' RT.	508231	1139394	4.5	29.8	10/30/2022	1.80	28.0	20/26	0.3-1.5/+2.0-0.0	ABG[6]	29.8
HA-FPC-12	280+68	345' RT.	508347	1143225	5.0	24.7	10/12/2022	2.70	22.0	11	1.5-3.5	1.5	23.2
HA-FPC-15	282+76	477' RT.	508463	1143390	5.0	23.8	10/12/2022	2.80	21.0	20	0.3-1.5	1.5	22.3
HA-FPC-13	283+25	380' RT.	508365	1143423	5.0	23.9	10/12/2022	2.70	21.2	20	0.3-1.5	1.5	22.4
HA-FPC-5	283+32	203' RT.	508188	1143429	5.0	23.6	10/12/2022	2.30	21.3	20	0.3-1.5	1.5	22.1
HA-FPC-8	284+17	292' RT.	508279	1143502	5.0	23.4	10/12/2022	2.60	20.8	20	0.3-1.5	1.0	22.4
HA-FPC-3	284+57	116' RT.	508105	1143550	5.0	23.3	10/12/2022	2.50	20.8	20	0.3-1.5	1.5	21.8
HA-FPC-16	284+73	483' RT.	508472	1143549	5.0	23.1	10/12/2022	2.50	20.6	20	0.3-1.5	1.0	22.1
HA-FPC-6	285+22	194' RT.	508186	1143611	5.0	23.0	10/12/2022	2.30	20.7	20	0.3-1.5	1.0	22.0
HA-FPC-9	286+73	281' RT.	508280	1143758	5.0	22.4	10/13/2022	2.80	19.6	20	0.3-1.5	1.5	20.9
HA-FPC-7	286+83	222' RT.	508221	1143770	5.0	22.4	10/13/2022	2.60	19.8	20	0.3-1.5	1.5	20.9
HA-FPC-14	287+54	377' RT.	508380	1143834	5.0	22.0	10/13/2022	2.60	19.4	20	0.3-1.5	0.5	21.5
HA-FPC-4	287+56	113' RT.	508116	1143848	5.0	22.1	10/13/2022	2.70	19.4	20	0.3-1.5	1.5	20.6
HA-FPC-17	287+57	527' RT.	508529	1143832	2.5	21.4	10/12/2022	2.40	19.0	20	0.3-1.5	1.0	20.4
HA-FPC-10	289+50	307' RT.	508318	1144034	3.5	21.5	10/12/2022	2.50	19.0	20	0.3-1.5	1.0	20.5
PBA-5	289+95	163' RT.	508176	1144085	5.0	21.2	10/13/2022	2.80	18.4	20	0.3-1.5	0.5	20.7
PBA-6	291+69	164' RT.	508184	1144259	4.5	20.4	10/13/2022	2.80	17.6	20	0.3-1.5	1.5	18.9
HA-FPC-11	291+92	284' RT.	508306	1144276	5.0	20.4	10/13/2022	3.80	16.6	20	0.3-1.5	2.0	18.4
PBA-7	296+90	76' RT.	508120	1144783	5.0	19.4	10/30/2022	3.50	15.9	20	0.3-1.5	1.5	17.9
PBA-9	300+95	336' RT.	508396	1145176	5.0	19.5	10/13/2022	3.40	16.1	20	0.3-1.5	1.0	18.5
PBA-8	300+96	157' RT.	508218	1145186	5.0	19.3	10/13/2022	2.60	16.7	20	0.3-1.5	1.0	18.3

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[2] Depth of boring below existing grades. Shallow borings less than 5 feet in depth caved in due to groundwater intrusion.

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ABG: At or Above Existing Grade

Summary of Groundwater Table Measurements from Piezometers
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Piezometer Boring Identification	Piezometer Location[1]				Ground Elevation[2] (feet, NAVD 88)	Groundwater Elevation[3] (feet, NAVD 88)				
	Station (feet)	Offset (feet)	FL West NAD 83			07/21/22	08/15/22	11/16/22	Future Measurements	
			Easting (feet)	Northing (feet)						
PZ-1	222+09	4' LT.	508666	1137599	29.8	27.2	27.6	27.4	---	---
PZ-2	232+16	22' LT.	508418	1138526	29.8	27.8	28.8	29.3	---	---
PZ-3	242+94	30' LT.	507847	1139438	30.3	29.0	29.1	29.7	---	---
PZ-4	252+31	16' RT.	507932	1140370	33.0	28.5	28.6	29.1	---	---
PZ-5	261+36	29' LT.	508080	1141247	30.5	27.4	27.5	28.5	---	---
PZ-6	273+00	11' LT.	508123	1142410	28.7	22.5	22.7	24.2	---	---
PZ-7	281+94	13' RT.	508004	1143293	24.1	20.2	19.9	21.7	---	---
PZ-8	290+96	39' LT.	507978	1144194	21.4	17.6	17.9	19.1	---	---
PZ-9	303+05	39' LT.	508027	1145401	20.1	17.0	16.6	17.7	---	---
PZ-10	309+05	38' LT.	508034	1146002	18.7	16.1	15.5	15.8	---	---
PZ-POND1-1	250+54	190' RT.	508077	1140186	32.7	28.7	28.5	29.1	---	---

[1] The boring locations and ground elevations were provided by the project surveyor. Project design files were utilized in conjunction with the coordinates provided by the project surveyor to determine the station and offset of the boring locations. Station and Offset are referenced to the Centerline Construction Lena Road alignment.

[2] Ground elevations were provided by the project surveyor.

[3] Groundwater elevations calculated by subtracting the depth to the groundwater from the surveyed ground elevation.

APPENDIX D

Summary of Laboratory Test Results for Soil Classification

Summary of Laboratory Test Results for Environmental Classification

Hydraulic Conductivity Test Results

Design LBR and MR Summary Table

Results of Limerock Bearing Ratio Test

Summary of Laboratory Test Results for Soil Classification
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Boring Name	Sample Depth (feet)	Stratum	AASHTO	% Finer					Atterberg Limits			Organic Content	Moisture Content
				#10	#40	#60	#100	#200	LL	PL	PI		
LBR-5	1.0 - 2.0	1	A-3	100	91	69	34	2	-	-	-	-	-
LBR-3	1.0 - 2.0	1	A-3	100	93	72	36	3	-	-	-	-	-
FPC-6	6.0 - 8.0	1	A-3	-	-	-	-	3	-	-	-	-	-
SH-309	4.0 - 4.5	1	A-3	100	91	72	34	3	-	-	-	-	-
LBR-4	1.0 - 2.0	1	A-3	100	92	71	33	3	-	-	-	-	-
FPC-8	8.0 - 10.0	1	A-3	-	-	-	-	3	-	-	-	-	-
PBA-6	2.5 - 3.0	1	A-3	100	92	73	35	4	-	-	-	-	-
SH-276	2.5 - 3.0	1	A-3	-	-	-	-	4	-	-	-	-	-
SH-264	0.5 - 1.5	1	A-3	-	-	-	-	4	-	-	-	-	-
SH-270	0.5 - 1.0	1	A-3	-	-	-	-	4	-	-	-	-	-
FPC-3	8.0 - 10.0	1	A-3	-	-	-	-	4	-	-	-	-	-
LBR-1	1.0 - 2.0	1	A-3	100	93	72	35	4	-	-	-	-	-
PBA-5	0.5 - 1.0	1	A-3	-	-	-	-	5	-	-	-	2	19
SH-258	2.0 - 2.5	1	A-3	-	-	-	-	5	-	-	-	-	-
SH-POND1-1	4.5 - 5.0	1	A-3	100	95	77	40	5	-	-	-	-	-
SH-219	0.0 - 1.0	1	A-3	-	-	-	-	5	-	-	-	-	-
LBR-7	1.0 - 2.0	1	A-3	82	72	54	26	5	-	-	-	-	-
SH-264	3.0 - 3.5	1	A-3	-	-	-	-	5	-	-	-	-	-
SH-294	0.5 - 1.5	1	A-3	-	-	-	-	5	-	-	-	-	-
B-293L	6.0 - 8.0	1	A-3	-	-	-	-	5	-	-	-	-	-
LBR-8	1.0 - 2.0	1	A-3	96	85	65	31	5	-	-	-	-	-
SH-267	1.0 - 1.5	1	A-3	-	-	-	-	5	-	-	-	-	-
SH-294	1.5 - 2.0	1	A-3	100	90	71	34	5	-	-	-	-	-
HA-FPC-16	1.5 - 2.5	1	A-3	100	89	67	35	5	-	-	-	-	-
LBR-9	1.0 - 2.0	1	A-3	95	87	68	35	5	-	-	-	-	-
SH-252	3.5 - 4.0	1	A-3	-	-	-	-	5	-	-	-	-	-
LBR-6	1.0 - 2.0	1	A-3	100	94	75	38	5	-	-	-	-	-

Summary of Laboratory Test Results for Soil Classification
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Boring Name	Sample Depth (feet)	Stratum	AASHTO	% Finer					Atterberg Limits			Organic Content	Moisture Content
				#10	#40	#60	#100	#200	LL	PL	PI		
HA-FPC-13	2.5 - 3.5	1	A-3	100	90	68	35	6	-	-	-	2	23
SH-249	0.5 - 1.5	1	A-3	-	-	-	-	6	-	-	-	-	-
PBA-9	4.5 - 5.0	1	A-3	-	-	-	-	6	NP	NP	NP	-	22
HA-FPC-7	1.5 - 2.0	1	A-3	-	-	-	-	6	-	-	-	3	24
HA-FPC-3	1.5 - 2.0	1	A-3	-	-	-	-	6	-	-	-	-	-
SH-222	2.5 - 3.0	1	A-3	-	-	-	-	6	-	-	-	3	22
SH-279	0.5 - 1.5	1	A-3	-	-	-	-	6	-	-	-	-	-
HA-FPC-12	2.0 - 3.0	1	A-3	-	-	-	-	6	-	-	-	4	27
HA-FPC-6	1.5 - 2.0	1	A-3	100	91	69	33	6	-	-	-	-	-
SH-222	1.5 - 2.0	1	A-3	100	93	73	39	6	-	-	-	-	-
LBR-5	1.0 - 2.0	1	A-3	100	94	76	41	6	-	-	-	-	-
SH-234	0.5 - 1.0	1	A-3	-	-	-	-	6	-	-	-	2	21
SH-309	1.0 - 2.0	1	A-3	-	-	-	-	6	-	-	-	-	-
HA-FPC-9	2.0 - 2.5	1	A-3	-	-	-	-	7	-	-	-	-	-
B-258L	2.0 - 4.0	1	A-3	-	-	-	-	7	-	-	-	3	25
LBR-3	1.0 - 2.0	1	A-3	100	92	74	36	7	-	-	-	-	-
FPC-9	4.0 - 6.0	1	A-3	-	-	-	-	7	-	-	-	-	-
LBR-4	1.0 - 2.0	1	A-3	100	90	71	36	7	-	-	-	-	-
B-288R	13.5 - 15.0	1	A-3	-	-	-	-	7	NP	NP	NP	-	21
AB-299R	2.5 - 5.0	1	A-3	-	-	-	-	9	-	-	-	-	19
SH-ROUNDABOUT-2	3.0 - 3.5	1	A-3	-	-	-	-	9	-	-	-	2	20
LBR-POND-2	1.0 - 2.0	1	A-3	100	88	65	29	9	-	-	-	-	-
SH-219	4.5 - 5.0	1	A-3	-	-	-	-	9	-	-	-	-	-
PBA-8	4.0 - 4.5	1	A-3	100	90	71	38	10	-	-	-	-	-
HA-FPC-10	2.5 - 3.5	2	A-2-4	-	-	-	-	11	-	-	-	-	-
PBA-4	0.0 - 0.5	2	A-2-4	-	-	-	-	12	-	-	-	4	24
SH-232	0.0 - 0.5	2	A-2-4	-	-	-	-	12	-	-	-	4	27

Summary of Laboratory Test Results for Soil Classification
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Boring Name	Sample Depth (feet)	Stratum	AASHTO	% Finer					Atterberg Limits			Organic Content	Moisture Content
				#10	#40	#60	#100	#200	LL	PL	PI		
LBR-2	1.0 - 2.0	2	A-2-4	100	95	78	42	12	-	-	-	-	-
PBA-9	3.5 - 4.0	2	A-2-4	100	92	74	40	13	-	-	-	-	-
HA-FPC-2	0.0 - 1.0	2	A-2-4	-	-	-	-	13	-	-	-	-	-
AB-303R	3.0 - 5.0	2	A-2-4	-	-	-	-	13	NP	NP	NP	-	20
FPC-7	2.0 - 4.0	2	A-2-4	-	-	-	-	14	-	-	-	-	-
B-228R	13.5 - 15.0	2	A-2-4	-	-	-	-	14	-	-	-	-	-
PBA-8	3.0 - 3.5	2	A-2-4	-	-	-	-	14	NP	NP	NP	-	20
PBA-7	2.5 - 3.0	3	A-2-4	-	-	-	-	15	NP	NP	NP	-	19
SH-ROUNDABOUT-2	3.5 - 4.0	3	A-2-4	-	-	-	-	15	NP	NP	NP	-	12
HA-FPC-11	2.5 - 3.0	3	A-2-4	-	-	-	-	15	21	14	7	-	19
SH-232	4.5 - 5.0	3	A-2-4	-	-	-	-	16	NP	NP	NP	-	22
AB-305L	3.0 - 4.0	3	A-2-4	-	-	-	-	16	-	-	-	-	20
PBA-9	3.0 - 3.5	3	A-2-4	-	-	-	-	16	NP	NP	NP	-	20
AB-302R	2.0 - 2.5	3	A-2-4	-	-	-	-	17	NP	NP	NP	-	22
SH-228	1.5 - 2.0	3	A-2-4	-	-	-	-	17	NP	NP	NP	-	22
PBA-1	1.5 - 2.0	3	A-2-4	-	-	-	-	17	-	-	-	-	-
SH-297	2.5 - 3.0	3	A-2-4	-	-	-	-	18	25	15	10	-	21
B-233R	0.0 - 1.0	3	A-2-4	-	-	-	-	18	-	-	-	-	-
HA-FPC-1	0.0 - 3.0	3	A-2-4	-	-	-	-	18	-	-	-	-	-
SH-303	3.0 - 3.5	3	A-2-4	-	-	-	-	19	26	16	10	-	27
PBA-1	0.0 - 0.5	3	A-2-4	-	-	-	-	20	-	-	-	-	-
PBS-5	18.5 - 20.0	3	A-2-4	-	-	-	-	21	NP	NP	NP	-	27
B-228L	0.0 - 2.0	3	A-2-4	-	-	-	-	22	NP	NP	NP	-	21
B-298R	4.0 - 6.0	3	A-2-4	-	-	-	-	28	-	-	-	-	-
LBR-POND-1	1.0 - 2.0	3	A-2-4	91	83	69	45	28	-	-	-	-	-
AB-238R	0.5 - 2.5	3	A-2-4	-	-	-	-	29	NP	NP	NP	-	20
PBS-6	23.5 - 25.0	3	A-2-4	-	-	-	-	35	NP	NP	NP	-	20

Summary of Laboratory Test Results for Soil Classification
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Boring Name	Sample Depth (feet)	Stratum	AASHTO	% Finer					Atterberg Limits			Organic Content	Moisture Content
				#10	#40	#60	#100	#200	LL	PL	PI		
PBS-9	23.5 - 25.0	4	A-2-6	-	-	-	-	21	37	25	12	-	41
B-300L	2.0 - 4.0	4	A-2-6	-	-	-	-	22	28	16	12	-	25
SH-234	2.5 - 3.0	4	A-2-6	-	-	-	-	26	28	9	19	-	32
PBS-8	23.5 - 25.0	4	A-2-6	-	-	-	-	30	38	26	12	-	41
B-219L	8.0 - 10.0	4	A-4	-	-	-	-	37	-	-	-	-	-
B-243R	13.5 - 15.0	4	A-4	-	-	-	-	45	NP	NP	NP	-	27
B-229R	33.5 - 35.0	4	A-4	100	97	89	70	51	-	-	-	-	-
PBS-8	8.0 - 10.0	4	A-4	-	-	-	-	56	NP	NP	NP	-	20
PBS-5	13.5 - 15.0	4	A-4	-	-	-	-	73	NP	NP	NP	-	28
B-236L	8.0 - 10.0	4	A-6	-	-	-	-	45	27	16	11	-	23
C-300L	13.5 - 15.0	4	A-6	-	-	-	-	76	39	26	13	-	26
B-308R	13.5 - 15.0	4	A-6	-	-	-	-	78	39	23	16	-	46
HA-FPC-2	1.0 - 2.0	5	A-8	-	-	-	-	10	-	-	-	12	42
AB-234L	2.0 - 3.5	5	A-8	-	-	-	-	10	-	-	-	8	41
AB-238R	3.0 - 4.5	5	A-8	-	-	-	-	10	-	-	-	12	52
SH-237	1.5 - 2.0	5	A-8	-	-	-	-	13	-	-	-	12	52
SH-237	1.0 - 1.5	5	A-8	-	-	-	-	14	-	-	-	11	47
AB-233L	0.0 - 1.0	5	A-8	-	-	-	-	17	-	-	-	9	51
AB-238R	2.5 - 3.0	5	A-8	-	-	-	-	18	-	-	-	28	133
B-239R	0.0 - 0.5	5	A-8	-	-	-	-	29	-	-	-	14	57
SH-228	2.0 - 2.5	5	A-8	-	-	-	-	32	-	-	-	19	89
AB-236R	0.0 - 0.5	5	A-8	-	-	-	-	19	-	-	-	13	119
B-228R	38.5 - 40.0	6	A-7-5	-	-	-	-	91	73	38	35	-	74
B-227L	33.5 - 35.0	6	A-7-5	-	-	-	-	99	101	55	46	-	82
PBS-8	13.5 - 15.0	6	A-7-6	-	-	-	-	44	49	27	22	-	59
B-228R	2.0 - 4.0	6	A-7-6	-	-	-	-	53	47	21	26	-	46
PBS-9	18.5 - 20.0	6	A-7-6	-	-	-	-	73	57	29	28	-	49

Summary of Laboratory Test Results for Environmental Classification
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Boring Name	Depth (feet)	Stratum	pH (FM 5-550)	Resistivity (ohm-cm) (FM 5-551)	Chlorides (ppm) (FM 5-552)	Sulfates (ppm) (FM 5-553)	Environmental Classification* (Soil)	
							Steel	Concrete
SH-219	0.0 - 1.0	1	7.4	4,200	90	<5	Moderately Aggressive	Slightly Aggressive
SH-234	0.0 - 0.5	1	7.8	2,300	90	270	Moderately Aggressive	Moderately Aggressive
SH-249	0.5 - 1.5	1	7.4	9,400	45	<5	Slightly Aggressive	Slightly Aggressive
SH-264	0.5 - 1.5	1	7.8	20,000	30	<5	Slightly Aggressive	Slightly Aggressive
SH-279	0.5 - 1.5	1	7.8	8,200	30	<5	Slightly Aggressive	Slightly Aggressive
SH-294	0.5 - 1.5	1	8.1	12,000	30	<5	Slightly Aggressive	Slightly Aggressive
SH-309	1.0 - 2.0	1	8.1	8,600	30	15	Slightly Aggressive	Slightly Aggressive

* Based on the current FDOT Structures Design Guidelines

Hydraulic Conductivity Test Results
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No: 6511-22-127

Boring Number	Boring Location[1]				Test Designation	Test Depth Below Ground Surface (feet)	Stratum Tested	Percentage Passing the #200 Sieve	Vertical Unsaturated Hydraulic Conductivity, k_v (feet/day)[2]	Horizontal Saturated Hydraulic Conductivity, k_H (feet/day)[2]
	Station (feet)	Offset (feet)	FL West NAD 83							
			Easting (feet)	Northing (feet)						
DRI-1	296+52	37' RT.	508126	1144787	DRIT	1	1	N/A	11.0	11.0

[1] Boring location was determined using the GPS coordinates obtained in the field and therefore should be considered approximate. The coordinates are referenced to the FL State Plane West Coordinate System.

[2] The hydraulic conductivity values presented are for the soil stratum indicated in the table and are **not** factored. The design engineer should apply an appropriate factor of safety.

N/A: Not Available

Design LBR Calculation - 2% of Optimum Method
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Test No.	Bulk Sample Location	Maximum LBR	LBR at Moisture Contents (of Optimum LBR):	
			- 2%	+ 2%
LBR #1	LBR-1	49	41	33
LBR #2	LBR-2	66	29	47
LBR #3	LBR-3	45	36	23
LBR #4	LBR-4	32	29	24
LBR #5	LBR-5	31	24	14
LBR #6	LBR-6	33	25	15
LBR #7	LBR-7	25	18	8
LBR #8	LBR-8	57	47	35
LBR #9	LBR-9	67	47	34
Mean LBR Value		45	33	26

Design LBR = 29

Design M_R (Resilent Modulus)[1] = 9,750 psi

[1] Based on FDOT Flexible Pavement Manual for conversion of LBR to M_R.

Design LBR Calculation - 90% Method
Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Test No.	Bulk Sample Location	Maximum LBR	Rank	Percent of Samples with equal or greater value
LBR #7	LBR-7	25	1	100
LBR #5	LBR-5	31	2	89
LBR #4	LBR-4	32	3	78
LBR #6	LBR-6	33	4	67
LBR #3	LBR-3	45	5	56
LBR #1	LBR-1	49	6	44
LBR #8	LBR-8	57	7	33
LBR #2	LBR-2	66	8	22
LBR #9	LBR-9	67	9	11

Design LBR = 30

Design M_R (Resilent Modulus)[1] = 10,000 psi

[1] Based on FDOT Flexible Pavement Manual for conversion of LBR to M_R.

TIERRA

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

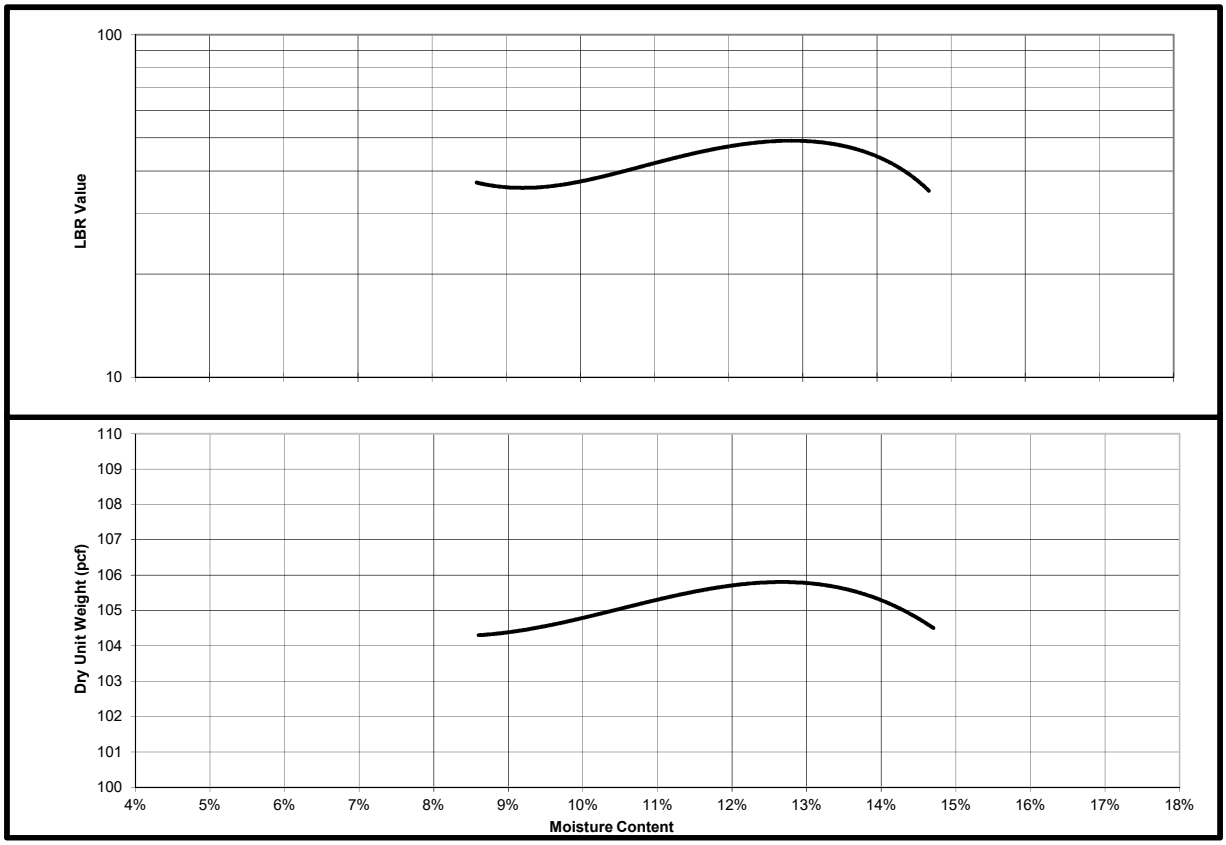
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 7/18/2022

Report No. LBR #1

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	49	Description:
Maximum Density	105.8 pcf	Gray Fine Sand
Optimum Moisture	12.8 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing						
Atterberg Limits - 40 Material		AASHTO Group	A-3			
Liquid Limit	-					
Plastic Limit	-	Percent Passing Standard Sieve Sizes				
Plastic Index	-	#4	#10	#40	#60	#100	#200
		100	100	93.1	72.2	35	4.5

Respectfully Submitted,
TIERRA INC.

TIERRA

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

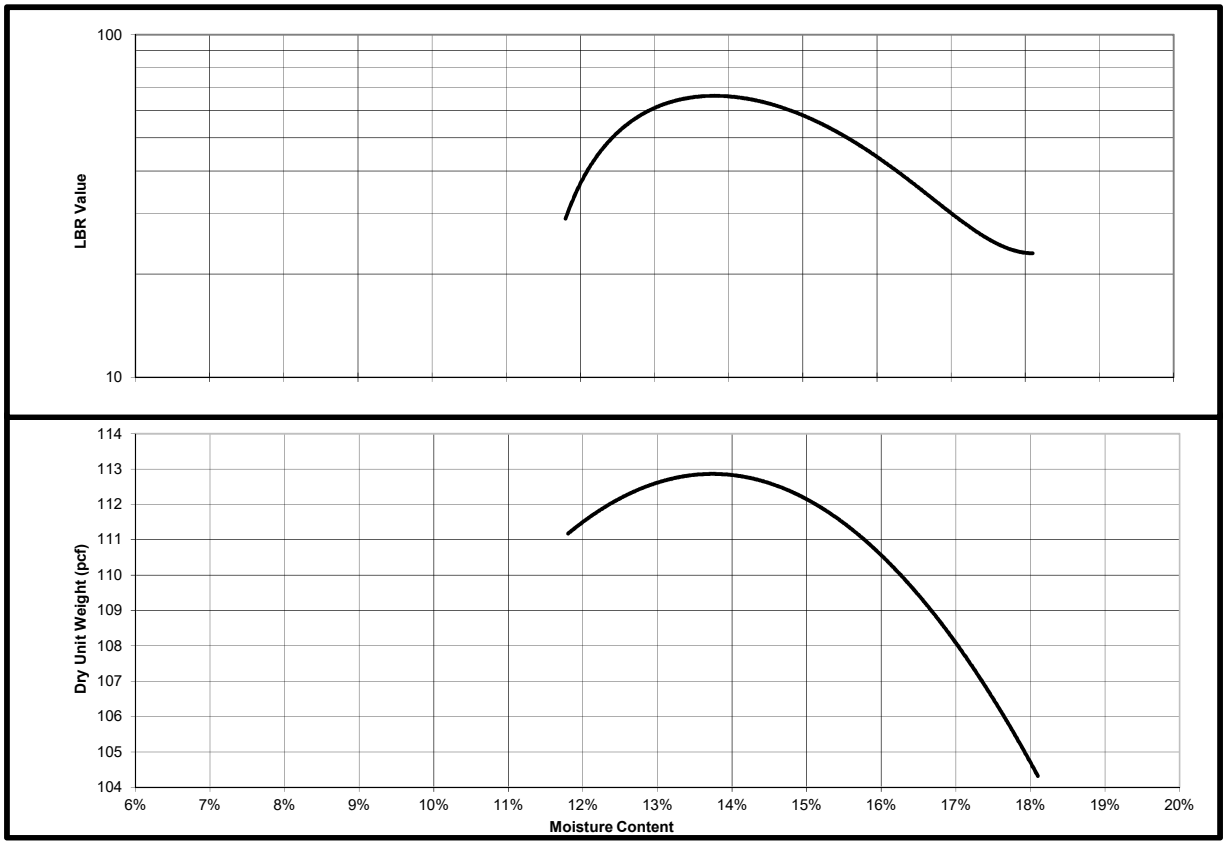
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 7/18/2022

Report No. LBR #2

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	66	Description:
Maximum Density	112.8 pcf	Dark Brown Silty Sand with trace Organics
Optimum Moisture	13.7 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing							
Atterberg Limits - 40 Material		AASHTO Group		A-2-4			
Liquid Limit	-						
Plastic Limit	-	Percent Passing Standard Sieve Sizes					
Plastic Index	-	#4	#10	#40	#60	#100	#200
		100	100	94.6	77.7	41.6	12.4

Respectfully Submitted,
TIERRA INC.

TIERRA

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

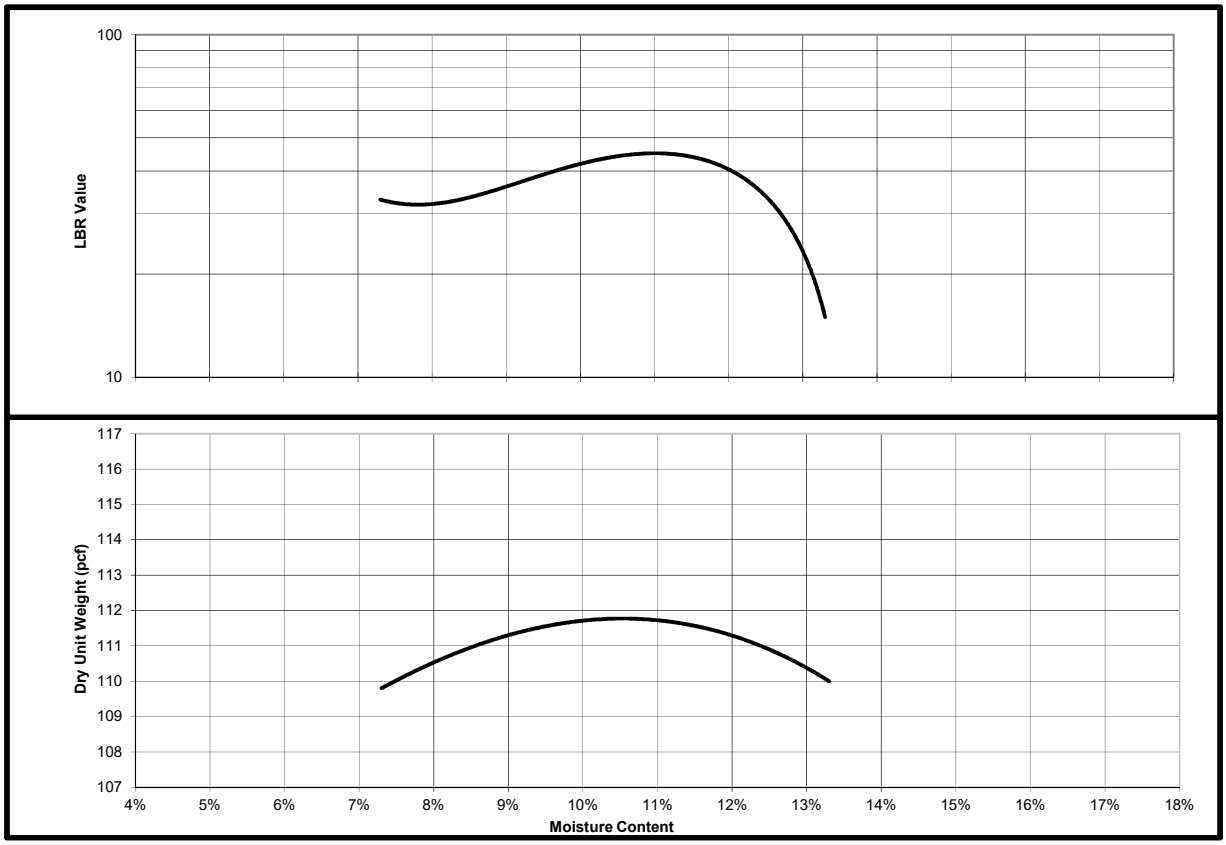
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 7/18/2022

Report No. LBR #3

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	45	Description:
Maximum Density	111.8 pcf	Brown Slightly Silty Sand with Rock
Optimum Moisture	10.7 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing						
Atterberg Limits - 40 Material		AASHTO Group	A-3			
Liquid Limit	-					
Plastic Limit	-	Percent Passing Standard Sieve Sizes				
Plastic Index	-	#4	#10	#40	#60	#100	#200
		100	100	92	73.7	36.5	6.9

Respectfully Submitted,
TIERRA INC.

TIERRA

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

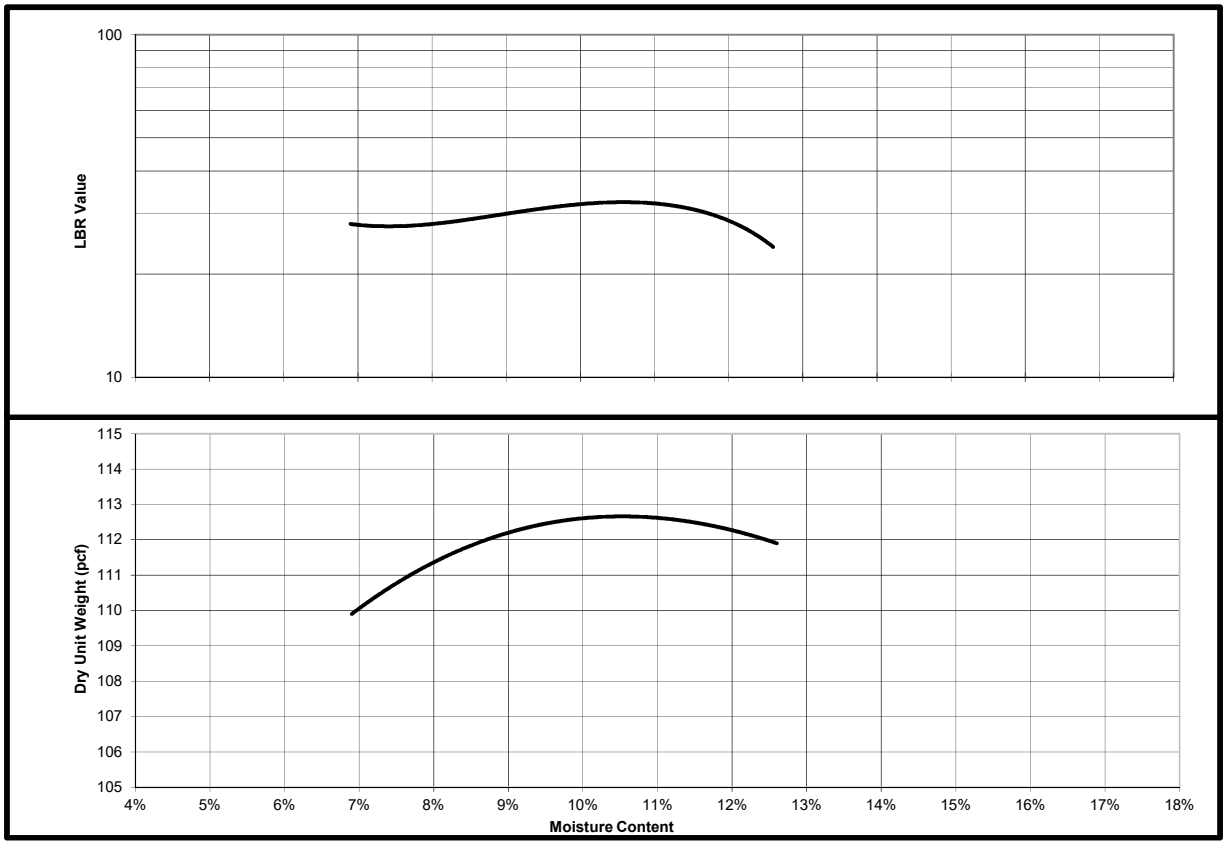
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 7/18/2022

Report No. LBR #4

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	32	Description:
Maximum Density	112.6 pcf	Light Brown Silty Fine Sand with Shell
Optimum Moisture	10.6 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing						
Atterberg Limits - 40 Material		AASHTO Group	A-3			
Liquid Limit	-					
Plastic Limit	-	Percent Passing Standard Sieve Sizes				
Plastic Index	-	#4	#10	#40	#60	#100	#200
		100	100	89.5	71.5	36.1	7.4

Respectfully Submitted,
TIERRA INC.

TIERRA

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

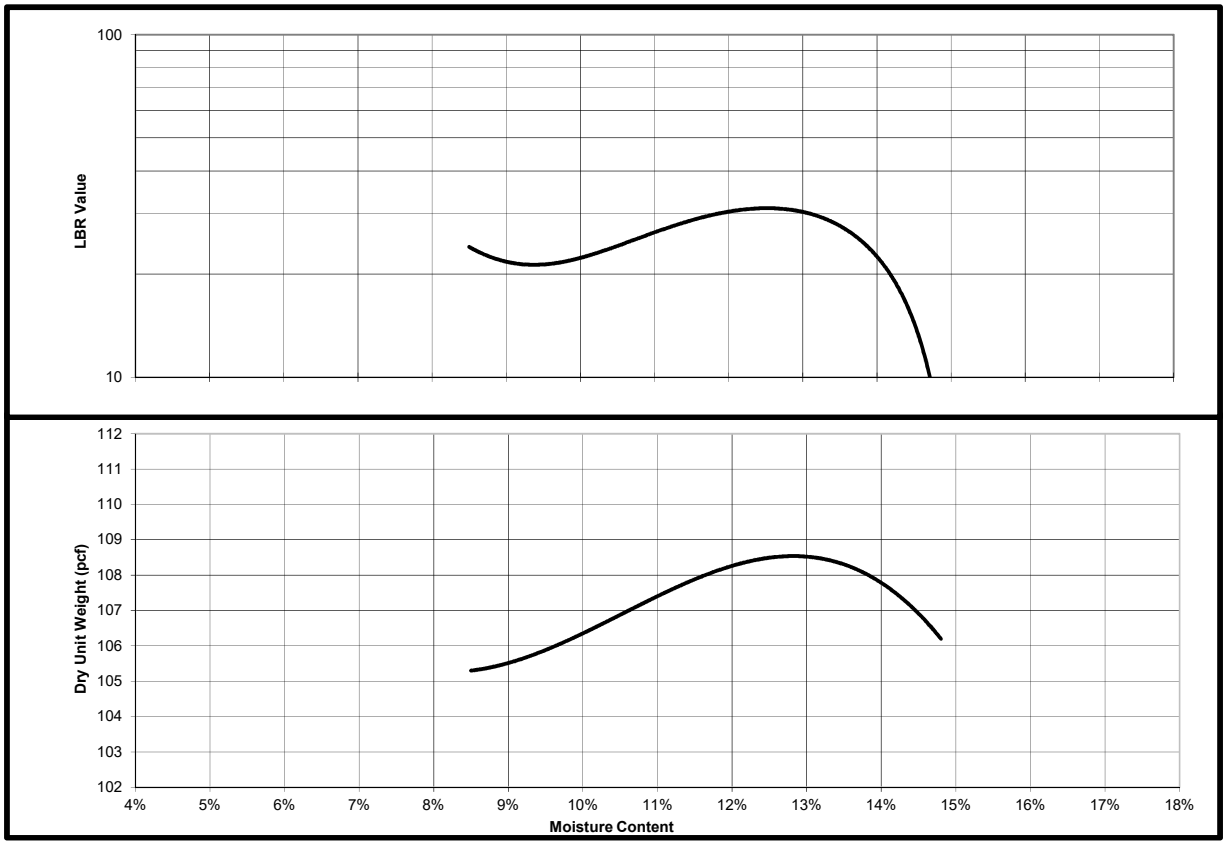
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 7/18/2022

Report No. LBR #5

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	31	Description:
Maximum Density	108.5 pcf	Brown Slightly Silty Fine Sand
Optimum Moisture	12.9 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing						
Atterberg Limits - 40 Material		AASHTO Group	A-3			
Liquid Limit	-					
Plastic Limit	-	Percent Passing Standard Sieve Sizes				
Plastic Index	-	#4	#10	#40	#60	#100	#200
		100	100	94.4	76.2	40.8	6.2

Respectfully Submitted,
TIERRA INC.

TIERRA

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

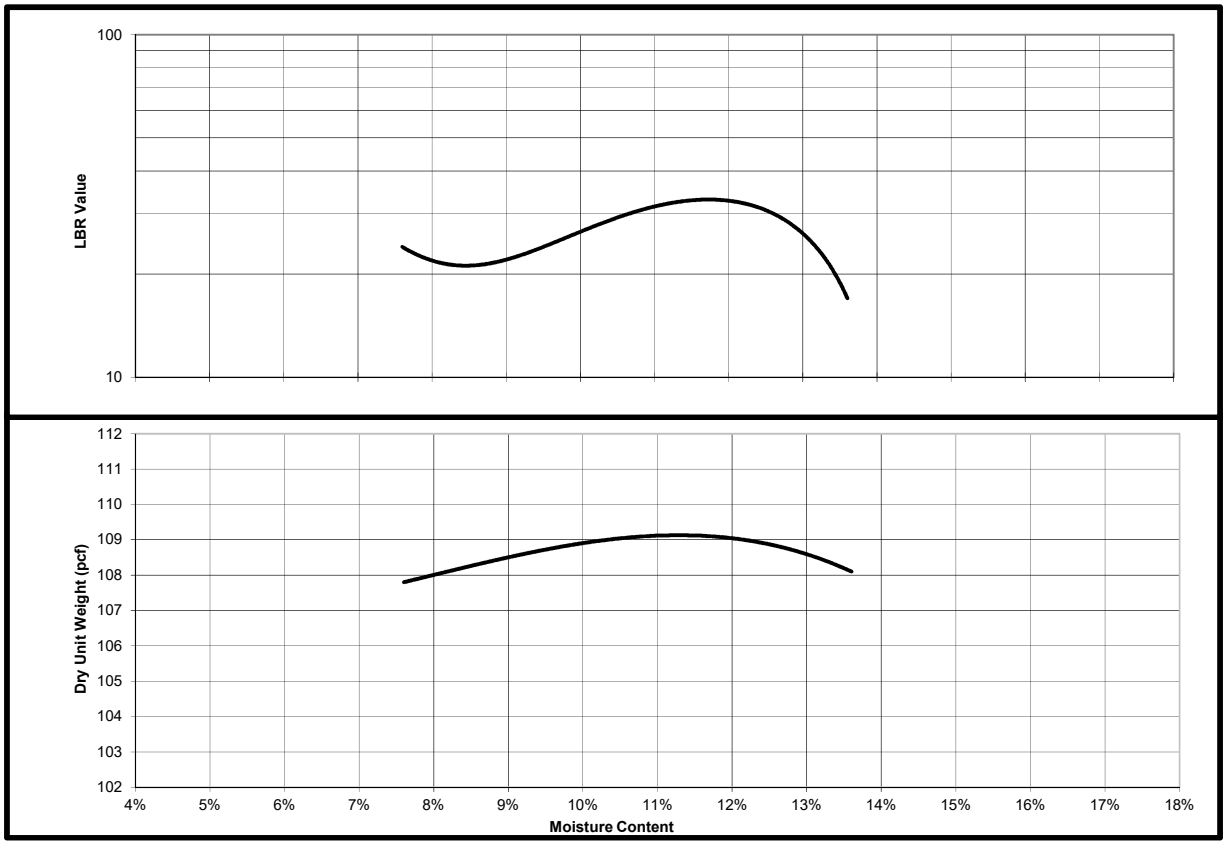
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 7/18/2022

Report No. LBR #6

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	33	Description:
Maximum Density	109.2 pcf	Light Brown Slightly Silty Fine Sand
Optimum Moisture	11.3 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing						
Atterberg Limits - 40 Material		AASHTO Group	A-3			
Liquid Limit	-					
Plastic Limit	-	Percent Passing Standard Sieve Sizes				
Plastic Index	-	#4	#10	#40	#60	#100	#200
		100	100	93.7	75.4	37.8	5.5

Respectfully Submitted,
TIERRA INC.

TIERRA

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

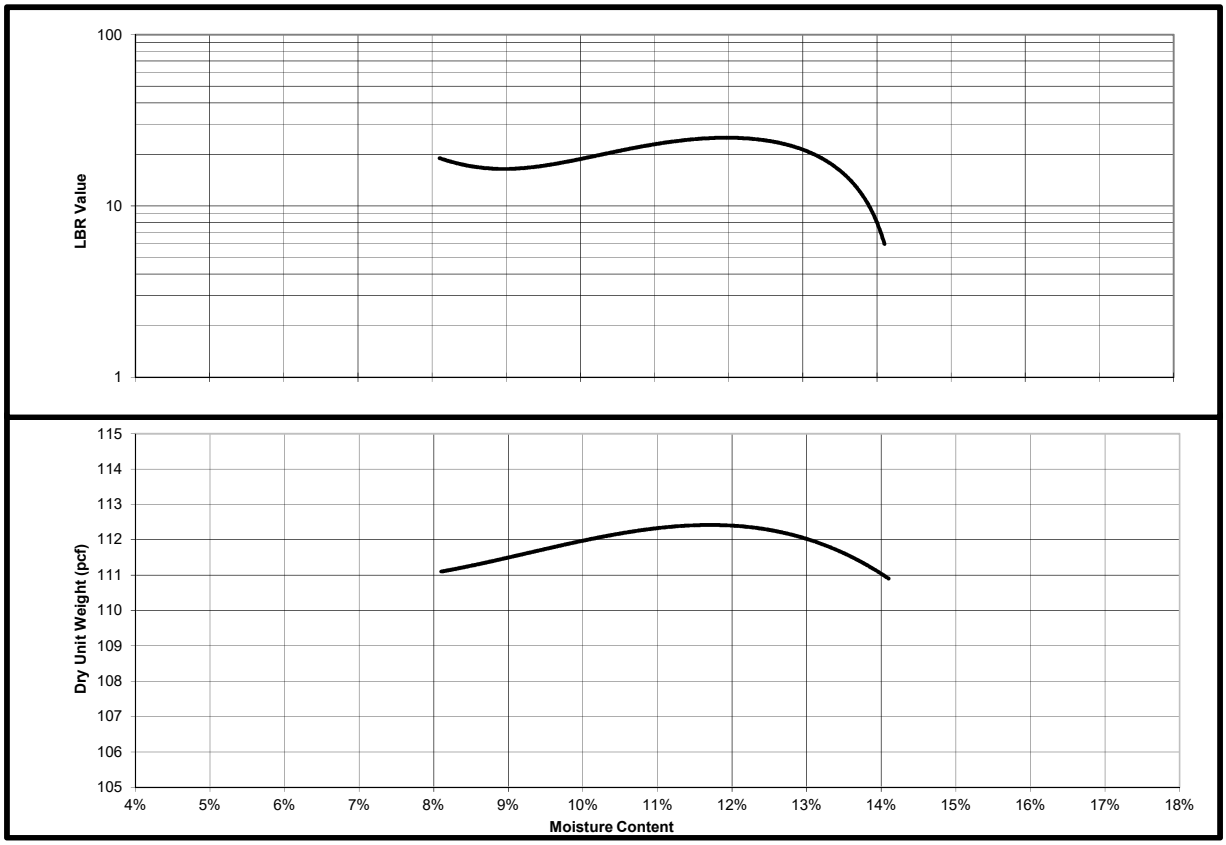
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 7/18/2022

Report No. LBR #7

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	25	Description:
Maximum Density	112.4 pcf	Brown Fine Sand with shell
Optimum Moisture	11.8 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing						
Atterberg Limits - 40 Material		AASHTO Group	A-3			
Liquid Limit	-					
Plastic Limit	-	Percent Passing Standard Sieve Sizes				
Plastic Index	-	#4	#10	#40	#60	#100	#200
		86.7	81.9	72.5	54.3	26.2	4.8

Respectfully Submitted,
TIERRA INC.

TIERRA

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

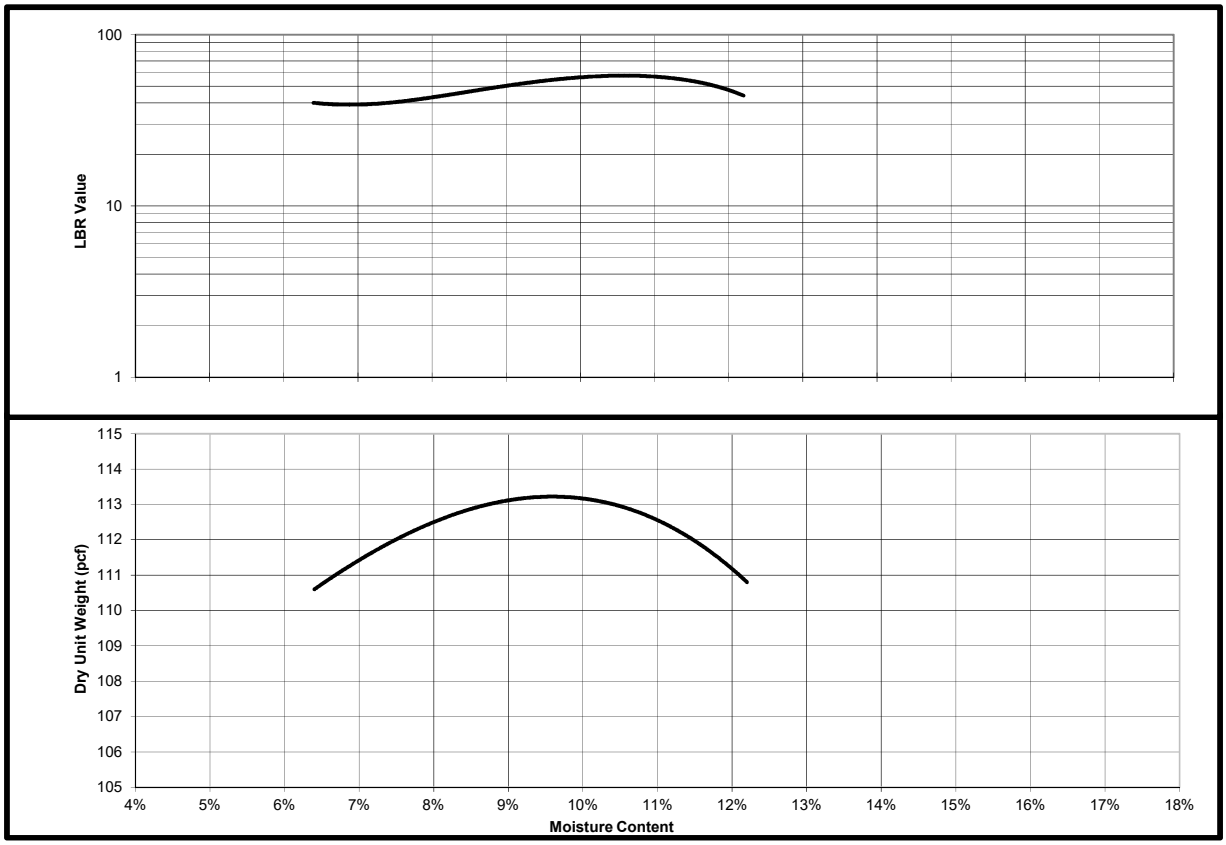
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 7/18/2022

Report No. LBR #8

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	57	Description:
Maximum Density	113.2 pcf	Brown Fine Sand with shell
Optimum Moisture	9.7 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing						
Atterberg Limits - 40 Material		AASHTO Group	A-3			
Liquid Limit	-					
Plastic Limit	-	Percent Passing Standard Sieve Sizes				
Plastic Index	-	#4	#10	#40	#60	#100	#200
		97.5	95.6	85.2	65.4	30.7	5.0

Respectfully Submitted,
TIERRA INC.

TIERRA

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

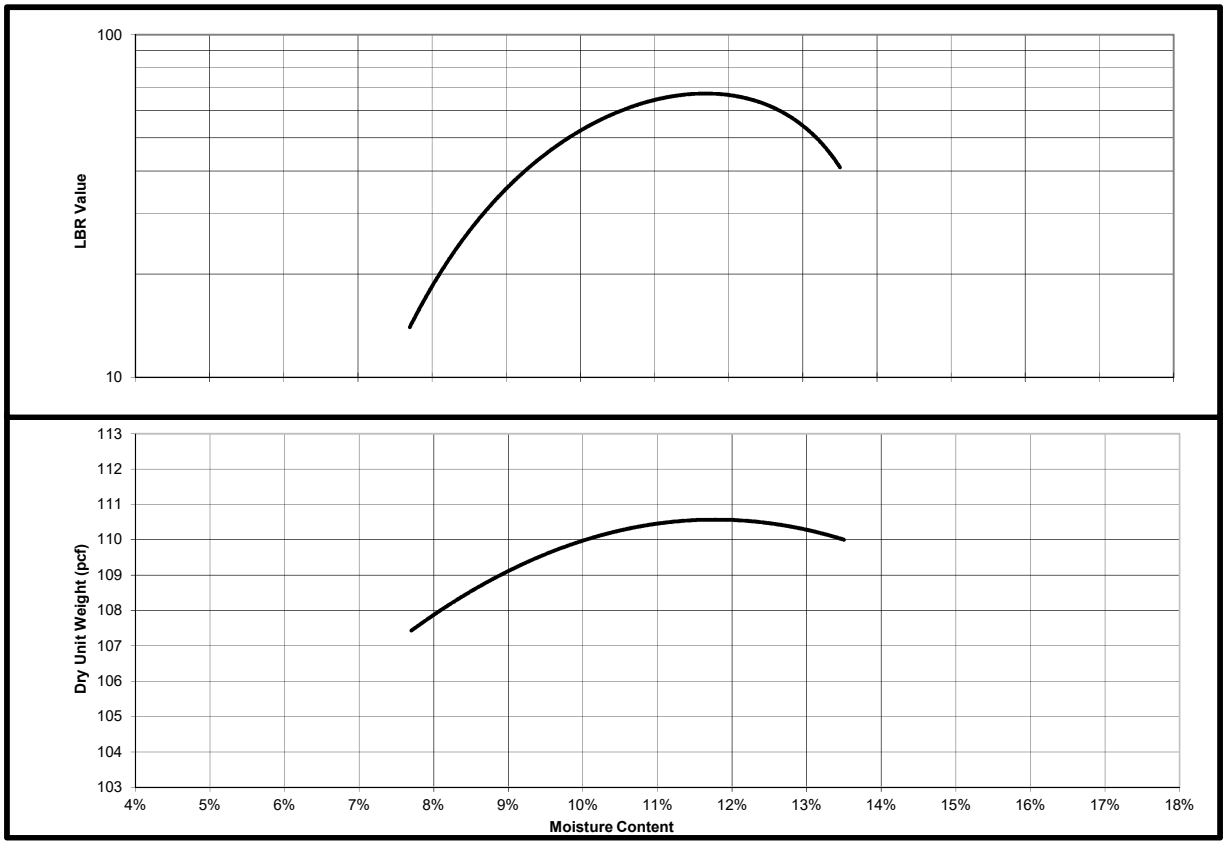
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 7/18/2022

Report No. LBR #9

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	67	Description:
Maximum Density	110.6 pcf	Brown Fine Sand with Rock and Shell
Optimum Moisture	11.9 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing						
Atterberg Limits - 40 Material		AASHTO Group	A-3			
Liquid Limit	-					
Plastic Limit	-	Percent Passing Standard Sieve Sizes				
Plastic Index	-	#4	#10	#40	#60	#100	#200
		97	95.1	86.9	68.2	35.2	5.4

Respectfully Submitted,
TIERRA INC.

TIERRA INC.

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

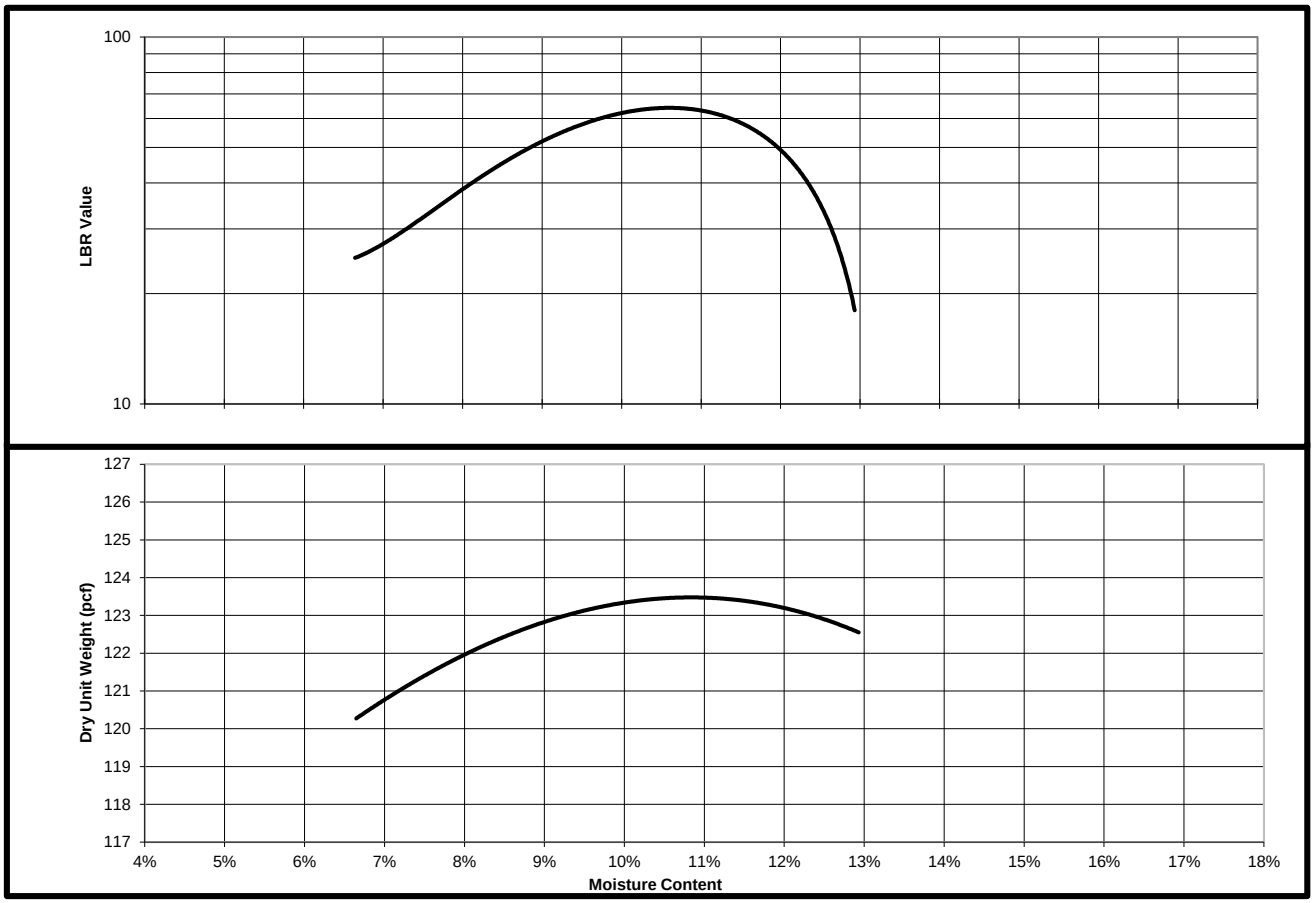
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 5/11/2023

Report No. LBR-POND-1 238+40, 121' LT.

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	65	
Maximum Density	123.5 pcf	
Optimum Moisture	10.8 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	
Tested By:	J. Shuey	

Description:
Dark Brown Clayey Sand

Sample Depth:
1' - 2'
Pond -1

TIERRA INC.

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

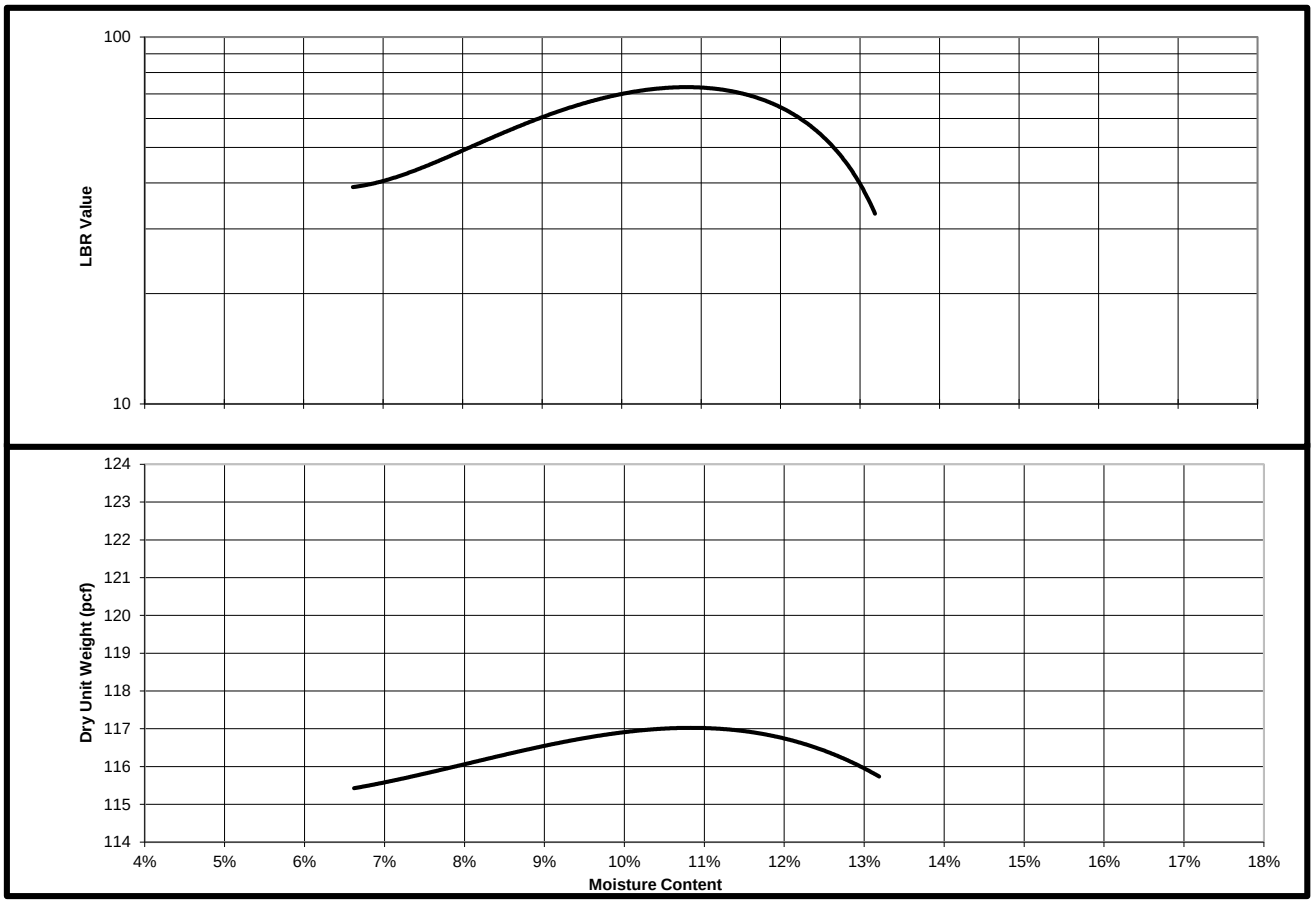
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 5/11/2023

Report No. LBR-POND-2 238+24, 183' RT.

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	74	
Maximum Density	117 pcf	
Optimum Moisture	10.8 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	
Tested By:	J. Shuey	

Description:
Brown Slightly Silty Sand

Sample Depth:
1' - 2'
Pond -2

TIERRA INC.

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

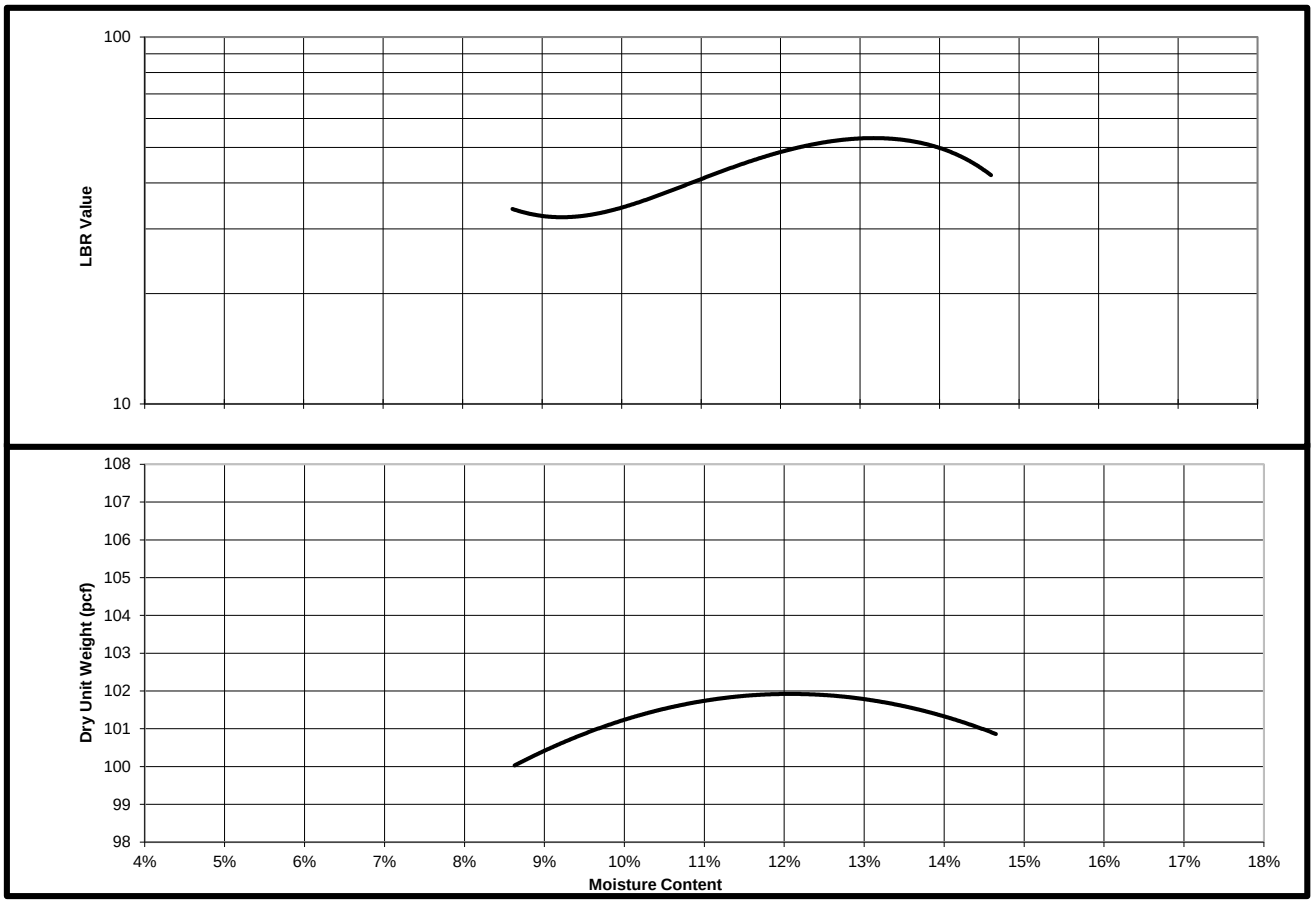
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 5/2/2023

Report No. LBR-POND-3 290+92, 122' RT.

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	52	Description:
Maximum Density	101.9 pcf	Gray Fine Sand
Optimum Moisture	12.2 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing							
Atterberg Limits - 40 Material		AASHTO Group		A-3			
Liquid Limit	-						
Plastic Limit	-	Percent Passing Standard Sieve Sizes					
Plastic Index	-	#4	#10	#40	#60	#100	#200
		100	100	92.5	72.2	35.9	2.7

TIERRA INC.

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

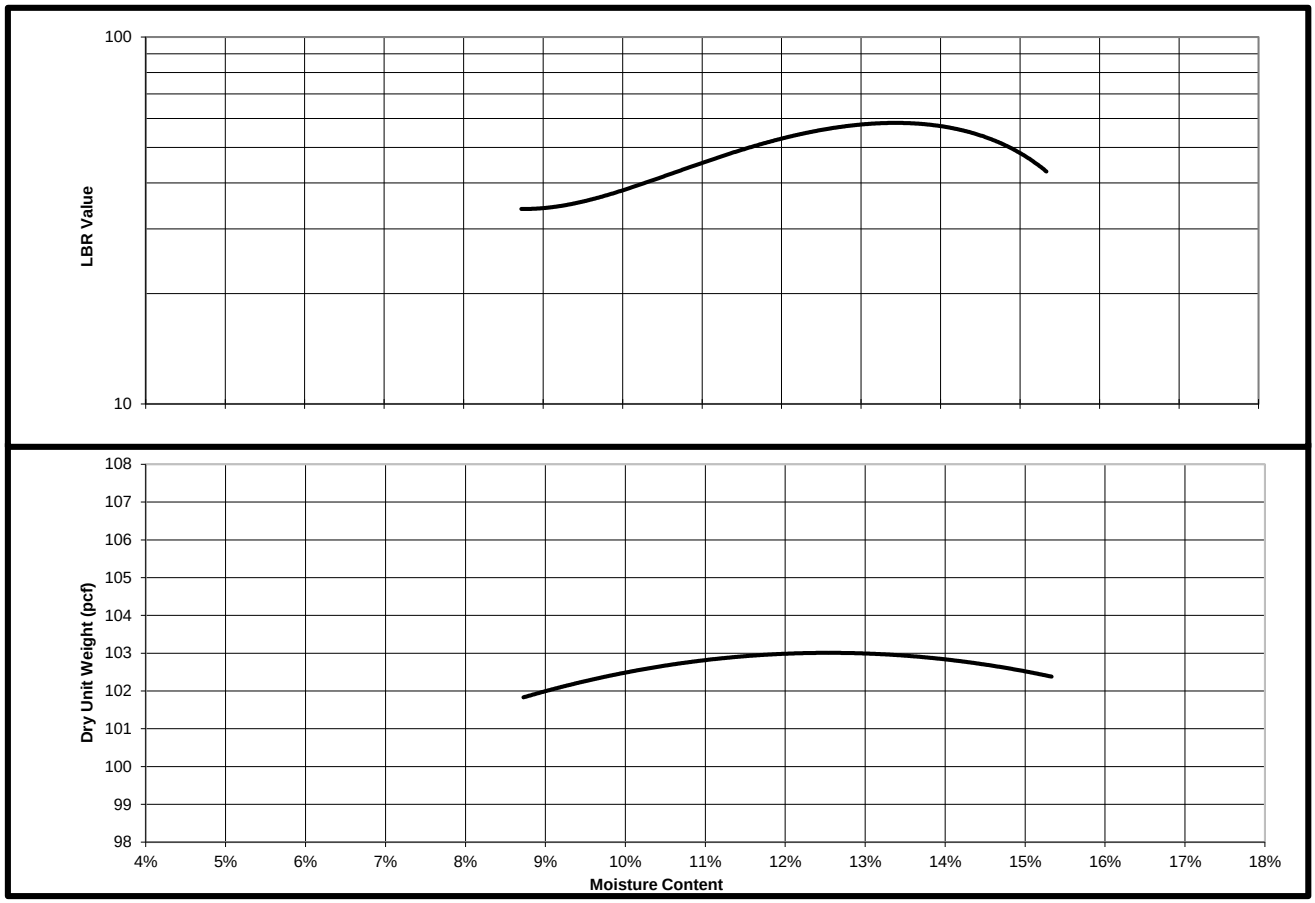
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 5/2/2023

Report No. LBR-POND-4 296+54, 63' RT.

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	56	Description:
Maximum Density	103 pcf	Gray Fine Sand
Optimum Moisture	12.5 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing							
Atterberg Limits - 40 Material		AASHTO Group		A-3			
Liquid Limit	-						
Plastic Limit	-	Percent Passing Standard Sieve Sizes					
Plastic Index	-	#4	#10	#40	#60	#100	#200
		100	100	92.3	70.6	33.1	3.4

TIERRA INC.

RESULTS OF LIMEROCK BEARING RATIO TEST

Tested For: Kimley-Horn and Associates, Inc.

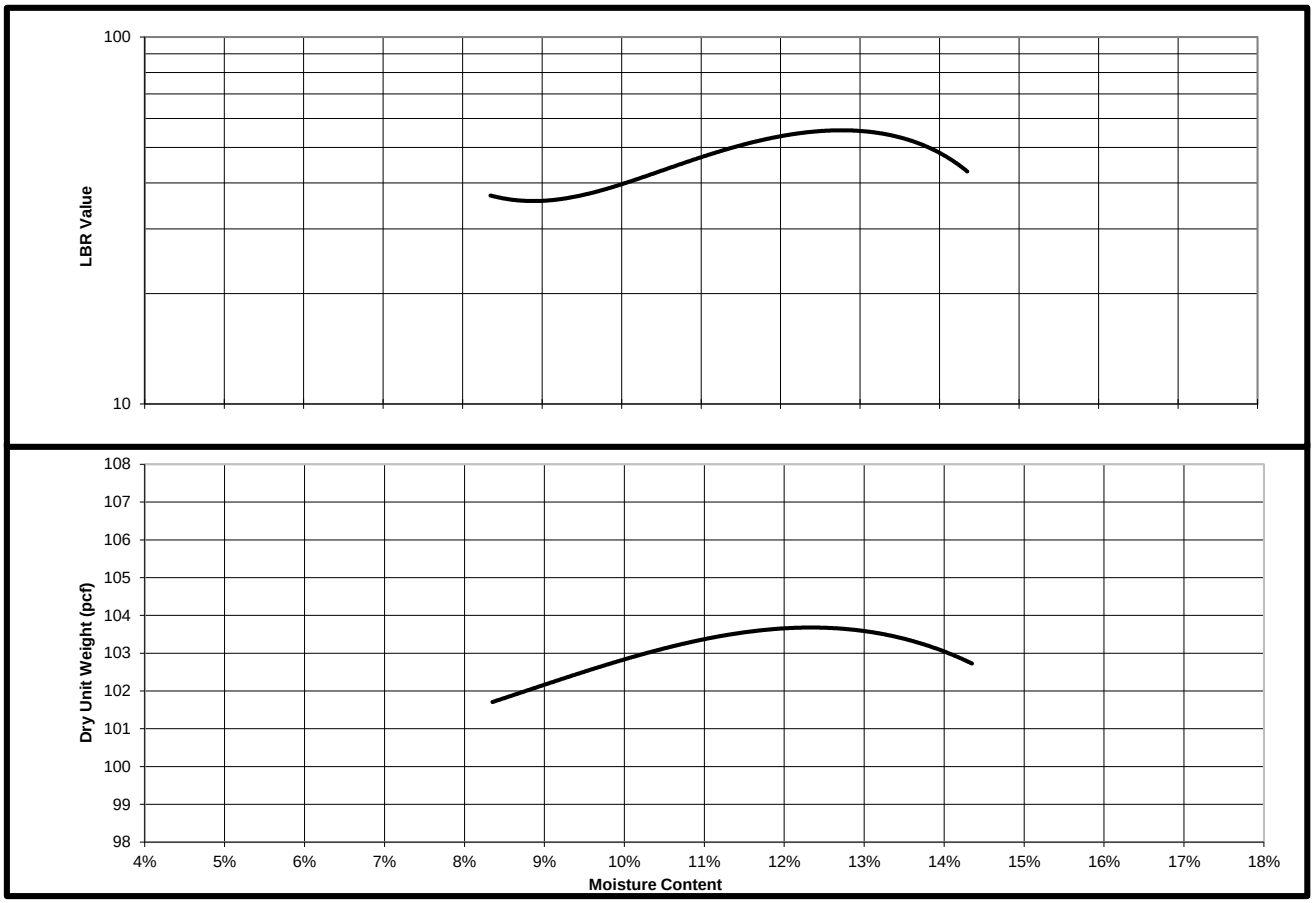
Project: Lena Road
Manatee County, Florida

Project No. 6511-22-127

Date: 5/2/2023

Report No. LBR-POND-5 301+14, 250' RT.

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	55	Description:
Maximum Density	103.7 pcf	Gray Fine Sand
Optimum Moisture	12.4 %	
Test Method:	FSTM FM 5-515 (15 lb Surcharge)	Sample Depth:
Tested By:	J. Shuey	1' - 2'

Classification Testing							
Atterberg Limits - 40 Material		AASHTO Group		A-3			
Liquid Limit	-						
Plastic Limit	-	Percent Passing Standard Sieve Sizes					
Plastic Index	-	#4	#10	#40	#60	#100	#200
		100	100	90.7	69.4	33.8	2.4

APPENDIX E

Pavement Data and Condition Sheet

Pavement Core Photographs

Pavement Data and Condition Sheet

Lena Road from North of 44th Avenue East to SR 64
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No.: 6511-22-127

Core No.	Approximate Core Location[1] (FL West NAD 83)		Lane Designation	Asphalt Layer							Base for Paved Roadway		Subgrade		Crack Depth (inches)	Pavement Condition[5]	Rut Depth (inches)	Cross Slope	Groundwater Depth[7] (feet)	Comments
				Thickness (inches)			Type[2]			Total Asphalt Core Length (inches)										
	Easting (feet)	Northing (feet)		Top Layer	2nd Layer	3rd Layer	Top Layer	2nd Layer	3rd Layer		Type	Thickness (inches)	Type	Depth[7] (feet)						
C-1	507883	1139354	Northbound	1.0	3.0	1.4	S-3	SP-9.5	S-3	5.4	Limerock	8.7	A-3	1.2 to 4.5	---[3]	F	---[6]	1.9% Outside	GNE	Boring terminated due to refusal conditions
C-2	507890	1140057	Northbound	0.8	1.6	1.4	S-3	SP-12.5	S-1	3.8	Soil Cement	8.2	A-3	1 to 5	---[3]	F	---[6]	3.0% Outside	4.7	
C-3	507955	1140513	Southbound	4.5	---	---	S-1	---	---	4.5	Sand w/Shell	5.5	A-3	0.8 to 5	---[3]	G	0.1	2.6% Outside	GNE	
C-4	508107	1140898	Northbound	1.0	1.4	1.9	S-3	SP-9.5	S-1	4.3	Soil Cement	6.7	A-3	0.9 to 5	---[3]	G	---[6]	2.8% Outside	4.5	
C-5	508108	1141496	Southbound	3.0	1.4	---	SP-12.5	S-3	---	4.4	ABC-3 SAHM	2.1 4.1	A-3	0.9 to 5	3.0	F	---[6]	1.6% Outside	4.6	
C-6	508133	1142060	Northbound	2.3	1.2	---	SP-12.5	S-3	---	3.5	ABC-3 SAHM	1.8 4.7	A-3	0.8 to 5	2.0	P	0.3	0.7% Outside	GNE	Sloughing
C-7	508128	1142369	Southbound	2.2	0.9	---	S-1	S-3	---	3.1	ABC-3 SAHM Sand w/Shell	2.9 4.0 6.0	A-3	1.3 to 5	---[3]	F	0.1	1.9% Outside	GNE	
C-8	507993	1143211	Northbound	1.6	2.2	---	SP-12.5	S-3	---	3.8	ABC-3 SAHM Sand w/Shell	2.3 4.2 7.8	A-3	1.5 to 5	1.8	P	0.1	0.3% Outside	GNE	
C-9	507972	1143808	Southbound	3.0	1.3	---	S-1	S-3	---	4.3	ABC-3 SAHM	1.2 5.8	A-3	0.9 to 5	3.0	P	0.1	3.3% Outside	GNE	
C-10	508004	1144248	Northbound	2.5	1.8	---	SP-12.5	S-3	---	4.3	ABC-3 SAHM Sand w/Shell	3.3 3.1 5.3	A-3	1.3 to 5	3.3	P	0.1	0.5% Outside	4.4	
C-11	508013	1144753	Southbound	3.4	1.5	---	S-1	S-3	---	4.9	ABC-3 SAHM	4.5 1.8	A-3 A-2-4	0.9 to 4.5 4.5 to 5	4.9[4]	P	0.1	2.3% Outside	GNE	
C-12	508063	1145525	Northbound	1.5	1.5	---	SP-9.5	S-3	---	3.0	ABC-3 SAHM Sand w/Shell	2.0 5.0 6.0	A-3 A-2-4	1.3 to 4.5 4.5 to 5	---[3]	G	---[6]	3.1% Outside	3.8	New Pavement

Notes:
[1] Pavement Core locations were estimated utilizing GPS coordinates referenced to the Florida State Plane West coordinate system obtained by Tierra, Inc. in the field and should be considered approximate.
[2] Pavement layer identification based on visual review using FDOT nomenclature. Actual pavement layer may be a local mix. Pavement layers are classified in descending order from the top of the core sample to the bottom.
[3] No cracks were observed within the pavement cores at these locations.
[4] Full depth cracking observed within the pavement core at these locations.
[5] Pavement condition based on visual observation; Good, Fair, or Poor.
[6] No visible ruts were observed at the pavement core locations.
[7] Depth measured from pavement surface.
SAHM: Sand Asphalt Hot Mix

Pavement Core Photographs

Photograph 1. Pavement Core No. C-1 Field

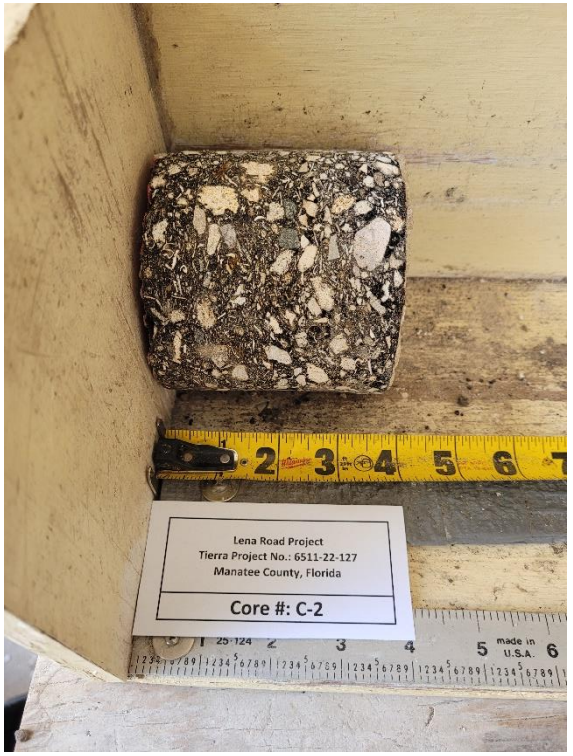
Photograph 2. Pavement Core No. C-1 Top View

Photograph 3. Pavement Core No. C-1 Side View

Pavement Core Photographs

Photograph 4. Pavement Core No. C-2 Field

Photograph 5. Pavement Core No. C-2 Top View



Photograph 6. Pavement Core No. C-2 Side View

Pavement Core Photographs

Photograph 7. Pavement Core No. C-3 Field

Photograph 8. Pavement Core No. C-3 Top View

Photograph 9. Pavement Core No. C-3 Side View

Pavement Core Photographs

Photograph 10. Pavement Core No. C-4 Field

Photograph 11. Pavement Core No. C-4 Top View

Photograph 12. Pavement Core No. C-4 Side View

Pavement Core Photographs

Photograph 13. Pavement Core No. C-5 Field

Photograph 14. Pavement Core No. C-5 Top View

Photograph 15. Pavement Core No. C-5 Side View

Pavement Core Photographs

Photograph 16. Pavement Core No. C-6 Field

Photograph 17. Pavement Core No. C-6 Top View

Photograph 18. Pavement Core No. C-6 Side View

Pavement Core Photographs

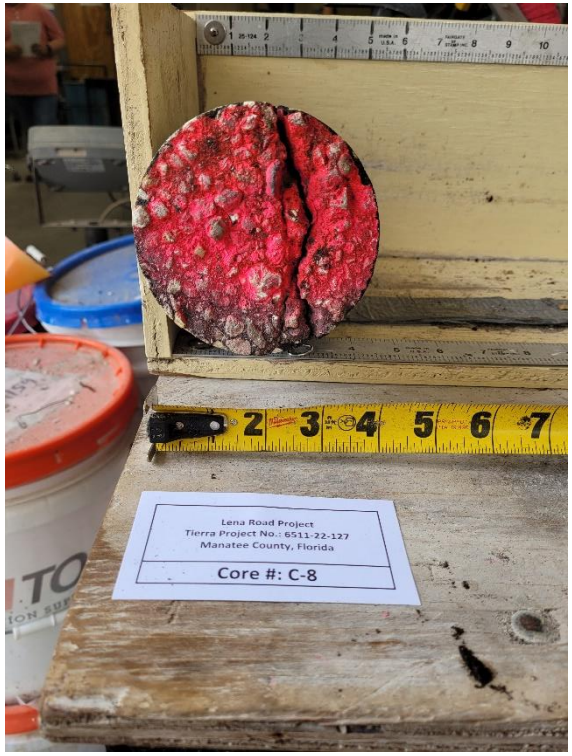
Photograph 19. Pavement Core No. C-7 Field

Photograph 20. Pavement Core No. C-7 Top View

Photograph 21. Pavement Core No. C-7 Side View

Pavement Core Photographs

Photograph 22. Pavement Core No. C-8 Field



Photograph 23. Pavement Core No. C-8 Top View

Photograph 24. Pavement Core No. C-8 Side View

Pavement Core Photographs

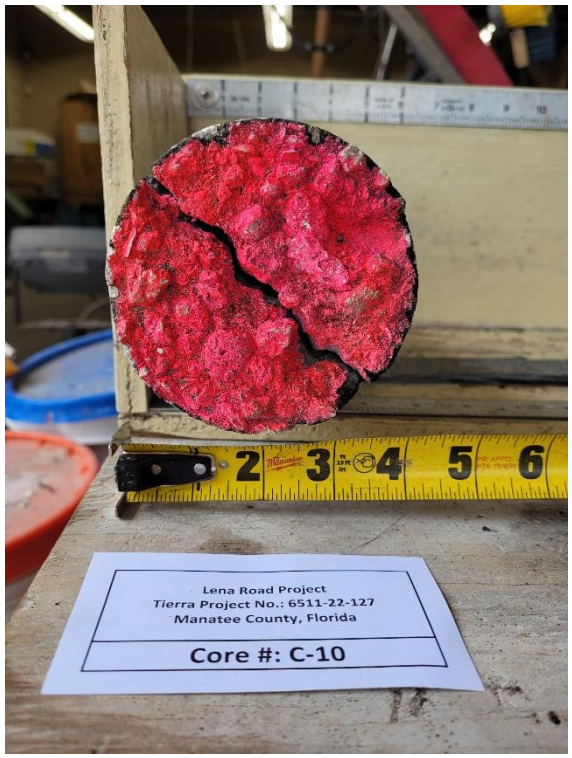
Photograph 25. Pavement Core No. C-9 Field

Photograph 26. Pavement Core No. C-9 Top View

Photograph 27. Pavement Core No. C-9 Side View

Pavement Core Photographs

Photograph 28. Pavement Core No. C-10 Field



Photograph 29. Pavement Core No. C-10 Top View

Photograph 30. Pavement Core No. C-10 Side View

Pavement Core Photographs

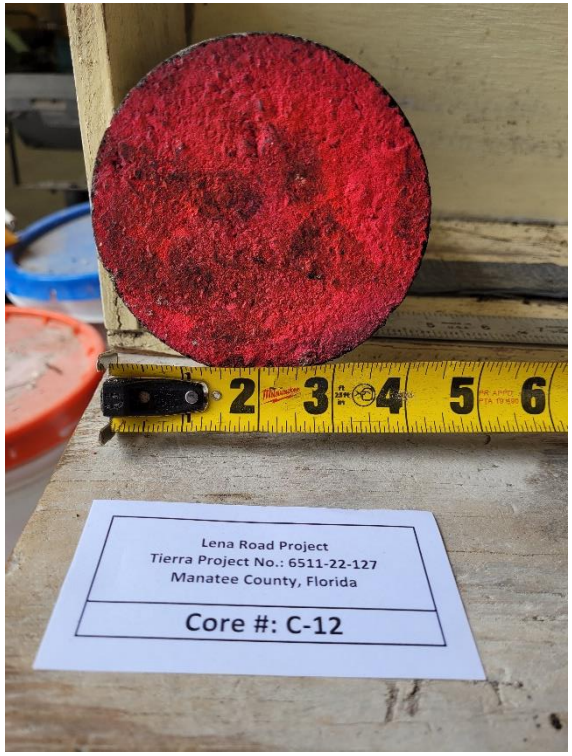
Photograph 31. Pavement Core No. C-11 Field

Photograph 32. Pavement Core No. C-11 Top View

Photograph 33. Pavement Core No. C-11 Side View

Pavement Core Photographs

Photograph 34. Pavement Core No. C-12 Field



Photograph 35. Pavement Core No. C-12 Top View

Photograph 36. Pavement Core No. C-12 Side View

APPENDIX F

Test Pit Sample Photographs

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Historical Photograph

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-11

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-11

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-21

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-21

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-21

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-25

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-25

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-25

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-15

Test Pit Sample Photographs
Lena Road – Parcel 103
Manatee County, Florida
Manatee County Project #6107560
Tierra Project No. 6511-22-127

Test Pit TP-15