SECTION 00200

INFORMATION AVAILABLE TO BIDDERS

0.1 GEOTECHNICAL REPORT

A. The Owner has contracted with the firm of Universal Engineering Sciences, LLC for determination of geotechnical data on the Project site.

B. The report of this investigation titled Mike Erdman Cadillac – Subsurface Exploration Report dated February 14, 2024 is included and follows this page.

0.2 DISCLAIMER

A. The Owner and the Architect disclaim any liability for use of or interpretation of data from the reports on the Project.

END OF SECTION

UNIVERSAL ENGINEERING SCIENCES

SUBSURFACE EXPLORATION

Proposed Showroom & Services Buildings
Mike Erdman Cadillac, SR 520
Cocoa, Brevard County, Florida
Universal Project No. 0330.2400021.0000

February 14, 2024

PREPARED FOR:
Mike Erdman Cadillac
4650 Highway 520
Cocoa, Florida 32926

PREPARED BY:

Universal Engineering Sciences, LLC.
820 Brevard Avenue
Rockledge, Florida 32955
(321) 638-0808

February 14, 2024

Mike Erdman Cadillac
4650 Highway 520
Cocoa, Florida 32926

Attention: Ms. Tracy Howard

Reference: **Subsurface Exploration**
Proposed Showroom & Services Buildings
Mike Erdman Cadillac, SR 520
Cocoa, Brevard County, Florida
Universal Project No. 0330.2400021.0000

Dear Ms. Howard:

Universal Engineering Sciences, LLC. (Universal) has completed a subsurface exploration at the above referenced site in Cocoa, Brevard County, Florida. Our exploration was authorized by Mr. Michael Erdman of Mike Erdman Cadillac and was conducted as outlined in Universal's Proposal No. 0330.0124.00024. This exploration was performed in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

The following report presents the results of our field exploration together with a geotechnical engineering interpretation of those results with respect to the project characteristics as such were provided to us. We have included our general engineering recommendations concerning site preparation procedures and foundation design parameters and our estimates of the typical wet season high groundwater levels at the boring locations.

We appreciate the opportunity to have worked with you on this project and look forward to a continued association. Please do not hesitate to contact us if you should have any questions, or if we may further assist you as your plans proceed.

Sincerely yours,
UNIVERSAL ENGINEERING SCIENCES, LLC
Certificate of Authorization No. 549

Brad Faucett, M.S. P.E.
Regional Engineer
Florida Professional Engineer No. 33123

1 – Addressee (by e-mail) UES DOCS #2070843

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1.0 INTRODUCTION

Universal Engineering Sciences, LLC. (Universal) has completed a subsurface exploration for the proposed showroom & service buildings at the Mike Erdman Cadillac facility on SR 520 in Cocoa, Brevard County, Florida. Our exploration was authorized by Mr. Michael Erdman of Mike Erdman Cadillac and was conducted as outlined in Universal's Proposal No. 0330.0124.00024. This exploration was performed in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

2.0 PROJECT DESCRIPTION

Universal understands from review of a partial information submitted by the client, that the proposed project will include the construction of a series of three (3) interconnected buildings, namely: a Service/Parts Department, a Service Reception building, and a Showroom/Sales building at the Mike Erdman Cadillac facility in Cocoa, Florida. As can be seen on the attached Figure 1, these buildings will range in plan area from 1,744 square feet to 8,880 square feet. Building height will range from one to two stories. We assume that finished first floor levels of the proposed structures will be approximately 1 to 3 feet above presently existing grades.

We assume that the proposed construction will consist of a combination of reinforced concrete, masonry and steel framing. Specific structural details are not yet available; however, based on our previous work with similar structures, we assume that maximum loading conditions will be on the order of 150 kips per column, 6 kips per lineal foot for structural walls, and 150 pounds per square foot for on grade floor slabs.

The recommendations contained in this report are based on the specific assumptions set forth herein. If the building design contemplated for the proposed project is inconsistent with any of our assumptions, then the project owner should contact Universal to determine if our recommendations require revision in any manner. In order to verify that our recommendations are properly interpreted and implemented, Universal should be allowed to review the final design and specifications prior to the start of construction.

3.0 PURPOSE

The purposes of this exploration were:

- to explore and evaluate the subsurface conditions at the site with special attention to potential problems that may hinder the proposed development,
- to provide our estimates of the typical wet season high groundwater levels at the boring locations,
- to provide geotechnical engineering recommendations for site preparation procedures and foundation design parameters for the proposed buildings.

4.0 SITE DESCRIPTION

The subject site is located within Section 26, Township 24 South, Range 35 East in Brevard County, Florida. More specifically, the site is located in the northwestern quadrant of the intersection of SR 520 and I-95 in Cocoa, Florida. At the time of our recent exploration program,

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the site was relatively level and had recently been cleared of vegetation, filled, and contoured. The area to the east of the site is traversed by high overhead power lines.

Please note that Universal has performed a previous subsurface exploration of this property as referenced in Project #0330.1900087.0000, Report dated August 2, 2019 when portions of the site were heavily vegetated and development plans were significantly different than currently envisioned. Several of the boring logs from this previous exploration are included in Appendix B of this report and the approximate locations of the previous borings are shown on the attached Figure 1.

4.1 SOIL SURVEY

There are three (3) primary soil types (pre-development) within the area of the project according to the Brevard County Soil Survey (BCSS), dated 1974, (updated using USDA-NCSS SSURGO and STATSGO Soil Survey). A brief description of these soils is shown in the following Table I.

TABLE I
BCSS DESIGNATED SOIL TYPES

Soil Type (Map Symbol)	Brief Description
Anclote sand (An)	Nearly level, very poorly drained sandy soil in marshy depressions in the flatwoods, in broad areas on flood plains, and in poorly defined drainage ways.
Eau Gallie fine sand (Eg)	Nearly level, poorly drained soil on broad, low ridges in the flatwoods.
Malabar sand (Ma)	Nearly level, poorly drained soil in broad low areas, in sloughs, and in poorly defined drainageways.

4.2 TOPOGRAPHY

According to information obtained from the United States Geologic Survey (USGS) Lake Poinsett, Florida quadrangle map dated 2021, ground surface elevation (pre-developmental) across the site area ranges from approximately +15 to +20 feet National Geodetic Vertical Datum (NGVD).

5.0 SCOPE OF SERVICES

The services completed by Universal for our recent subsurface exploration program were as follows:

- Drill three (3) Standard Penetration Test (SPT) borings within the proposed building footprints to depths of 25 and 30 feet below the existing land surface (bls).

- Secure samples of representative soils encountered in the soil borings for review, laboratory analysis and classification by a Geotechnical Engineer.

- Measure the existing site groundwater levels and provide an estimate of the typical wet season high groundwater levels at the recent boring locations.

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- Conduct soil gradation tests on selected soil samples obtained in the field to help determine their engineering properties.

- Assess the existing soil conditions with respect to the proposed construction.

- Prepare a report that documents the results of our subsurface exploration and analysis with geotechnical engineering recommendations.

6.0 LIMITATIONS

This report has been prepared in order to aid the Client/engineer/architect in the design of the proposed Showroom & Service Buildings at the Mike Erdman Cadillac facility on SR 520, Cocoa, Brevard County, Florida. The scope is limited to the specific project and locations described herein. Our description of the project's design parameters represents our understanding of the significant aspects relevant to soil and foundation characteristics. In the event that any changes in the design or location of the structures as outlined in this report are planned, we should be informed so the changes can be reviewed and the conclusions of this report modified, if required, and approved in writing by Universal.

The recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated on the Boring Location Plan and from other information as referenced. This report does not reflect any variations that may occur between the boring locations. The nature and extent of such variations may not become evident until the course of construction. If variations become evident, it will then be necessary for a re-evaluation of the recommendations of this report after performing on-site observations during the construction period and noting the characteristics of the variations.

Deleterious soils were not encountered at any of the borehole locations; however, we cannot preclude their presence between boring locations, or within unexplored portions of the property. Therefore, this report should not be used for estimating such items as cut and fill quantities.

Borings for a typical geotechnical report are widely spaced and generally not sufficient for reliably detecting the presence of isolated, anomalous surface or subsurface conditions, or reliably estimating unsuitable or suitable material quantities. Accordingly, Universal does not recommend relying on our boring information to negate presence of anomalous materials or for estimation of material quantities unless our contracted services ***specifically*** include sufficient exploration for such purpose(s) and within the report we so state that the level of exploration provided should be sufficient to detect such anomalous conditions or estimate such quantities. Therefore, Universal will not be responsible for any extrapolation or use of our data by others beyond the purpose(s) for which it is applicable or intended.

All users of this report are cautioned that there was no requirement for Universal to attempt to locate any manmade buried objects or identify any other potentially hazardous conditions that may exist at the site during the course of this exploration. Therefore, no attempt was made by Universal to locate or identify such concerns. Universal cannot be responsible for any buried manmade objects or environmental hazards which may be subsequently encountered during construction that are not discussed within the text of this report. We can provide this service if requested.

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For a further description of the scope and limitations of this report, please review the document attached within Exhibit 1, "Important Information about Your Geotechnical Engineering Report", prepared by GBA/The Geoprofessional Business Association.

7.0 FIELD METHODOLOGIES

7.1 STANDARD PENETRATION TEST BORINGS

The three (3) recent SPT borings, designated B1 through B3 on the attached Figure No. 1, were performed in general accordance with the procedures of ASTM D 1586 (Standard Method for Penetration Test and Split-Barrel Sampling of Soils). The SPT drilling technique involves driving a standard split-barrel sampler into the soil by a 140-pound hammer, free falling 30 inches. The number of blows required to drive the sampler 1 foot, after an initial seating of 6 inches, is designated the penetration resistance, or N-value, an index to soil strength and consistency.

The soil samples recovered from the split-barrel sampler were visually inspected and classified in general accordance with the guidelines of ASTM D 2487 (Standard Classification of Soils for Engineering Purposes [Unified Soil Classification System]).

The SPT soil borings were performed with a CME 55 truck-mounted drilling rig. The boring locations were determined in the field using a hand held GPS receiver. No survey control was provided on-site, and our boring locations should be considered only as accurate as implied by the methods of measurement used. The approximate recent boring locations are shown on the attached Figure No. 1.

8.0 LABORATORY METHODOLOGIES

8.1 PARTICLE SIZE ANALYSIS

We completed #200 sieve particle size analyses on three (3) representative soil samples. These samples were tested according to the procedures listed in ASTM D 1140 (Standard Test Method for Amount of Material in Soils Finer than the No. 200 Sieve). The percentage of materials passing the #200 sieve in each tested sample is shown on the appropriate boring log (attached).

9.0 SOIL STRATIGRAPHY

The results of our field exploration and laboratory analysis, together with pertinent information obtained from the recent SPT borings, such as soil profiles, penetration resistance and stabilized groundwater levels are shown on the boring logs included in Appendix A. The Key to Boring Logs, Soil Classification Chart is also included in Appendix A. The soil profiles were prepared from field logs after the recovered soil samples were examined by a Geotechnical Engineer.

The stratification lines shown on the boring logs represent the approximate boundaries between soil types, and may not depict exact subsurface soil conditions. The actual soil boundaries may be more transitional than depicted. A generalized profile of the soils encountered at our recent boring locations is presented in the following Table II. For more detailed soil profiles, please refer to the attached boring logs.

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TABLE II
GENERALIZED SOIL PROFILE

Depth Encountered (feet, bls)	Approximate Thickness (feet)	Soil Description
Surface	4 to 7	Fill soils consisting of fine sands with varying amounts of silt, clay, broken shell, and clay lumps [SC, SP-SM], medium dense.
4 to 7	4 to 8	Interlayered fine sands with silt [SP-SM], fine sands [SP], and occasional cemented rock layers, loose to medium dense.
9 to 12	10 to 21	Clayey fine sand [SC], loose.
22	3+	Fine sand with silt, broken shell, and occasional cemented rock layers [SP-SM], loose to medium dense. Stratum is absent within the drilled depths of boring location B3.

NOTE: [ ] denotes Unified Soil Classification system designation.
+ indicates strata encountered at boring termination, total thickness undetermined.

10.0 GROUNDWATER CONDITIONS

10.1 EXISTING GROUNDWATER CONDITIONS

We measured the water levels in the recent SPT boreholes on February 7, 2024 after the groundwater was allowed to stabilize. The groundwater levels are shown on the attached boring logs. The groundwater level depths ranged from 6.8 feet bls at boring location B1 to 7.8 feet bls at boring location B3. Fluctuations in groundwater levels should be anticipated throughout the year, primarily due to seasonal variations in rainfall, surface runoff, and other factors that may vary from the time the borings were conducted.

10.2 TYPICAL WET SEASON HIGH GROUNDWATER LEVELS

The typical wet season high groundwater level is defined as the highest groundwater level sustained for a period of 2 to 4 weeks during the "wet" season of the year, for existing site conditions, in a year with average normal rainfall amounts. Based on historical data, the rainy season in Brevard County, Florida is between June and October of the year. In order to estimate the wet season high water level at the boring locations, many factors are examined, including the following:

a. Measured groundwater level
b. Drainage characteristics of existing soil types
c. Season of the year (wet/dry season)
d. Current & historical rainfall data (recent and year-to-date)
e. Natural relief points (such as lakes, rivers, swamp areas, etc.)
f. Man-made drainage systems (ditches, canals, etc.)
g. Distances to relief points and man-made drainage systems
h. On-site types of vegetation

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i. Area topography (ground surface elevations)

Groundwater level readings were taken on February 7, 2024. According to data from the National Weather Service, the total rainfall in the previous month of January for Central Brevard County was 5.5 inches, approximately 2.9 inches above the normal levels for January. Total precipitation in 2024 as of February 7th was approximately 5.8 inches, roughly 2.6 inches above the normal levels for this time period. Rainfall for calendar year 2023 was 58.7 inches, about 8 inches above normal levels.

Based on this information and factors listed above, we estimate that the typical wet season high groundwater levels at the boring locations will be approximately ½ foot above the existing measured levels. Please note, however, that peak stage elevations immediately following various intense storm events, may be somewhat higher than the estimated typical wet season levels.

Please note that due to the silt/clay content of the near surface soils at this site, we strongly suspect that there may be occasional isolated pockets of "perched" groundwater within the project area, particularly after periods of prolonged wet weather. Such temporary perched water table levels may be higher than the estimated wet season groundwater levels indicated above.

11.0 LABORATORY RESULTS

11.1 PARTICLE SIZE ANALYSIS

The soil samples submitted for analysis were classified as fine sand with silt [SP-SM] and clayey fine sand [SC]. The percentage of soil particles passing the #200 sieve size in each sample tested is shown on the boring logs at the approximate depth sampled.

12.0 PROPOSED BUILDINGS

12.1 ANALYSIS

Based upon the results of the soil borings, the existing fill soils within the proposed building areas have a generally medium dense consistency. The mass grading fill soils at this site appear to have received significant compactive efforts. This has helped to create a soil mat capable of dissipating the building loads over any remaining loose strata at depth.

The only remaining concern would be the densification of any soil pockets that are disturbed during construction activities. This could be accomplished by re-compacting such pockets with vibratory plates or rollers to a density of at least 95% of the modified Proctor test (ASTM D-1557).

The following recommendations are made based upon a review of the attached soil test data, our understanding of the proposed construction, and experience with similar projects and subsurface conditions. If the structural loadings, building locations or grading plans change from those discussed previously, we request the opportunity to review and possibly amend our recommendations with respect to those changes.

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12.2 RECOMMENDATIONS

Provided our suggested site preparation procedures are followed, we recommend designing conventional, shallow spread footings foundations for a maximum allowable soil-contact pressure of 2,500 pounds per square foot (psf). Even though computed soil-contact pressures may not warrant it, strip and square footings should have minimum widths of at least 18 and 24 inches, respectively to prevent "shear punch" deformations. The base of all footings should be at least 18 inches below finished grade elevation, with the exception of a thickened-edge slab foundation system for which a minimum depth of 14 inches is acceptable.

Assuming any loosened pockets are densified and the footings are designed according to our recommendations, we estimate maximum total vertical settlements of the proposed structures will be less than 1 inch and maximum differential settlements will be less than ½ inch. Almost all of the expected settlement will take place as soon as the soil fill and structural loads have been applied to the densified existing sandy soils.

We recommend using a sheet vapor barrier, such as visqueen, beneath the building slab-on-grade to help control moisture migration through the slab. Floor slabs can be supported upon the compacted fill and should be structurally isolated from other foundations elements or adequately reinforced to prevent distress due to differential movements.

We recommend that the project floor slabs be designed using an assumed modulus of subgrade reaction of k = 150 pounds per cubic inch (pci). However, in no case should the floor slabs have a thickness of less than 6 inches where heavy loads are anticipated. In lightly loaded pedestrian walk areas, we recommend a minimum thickness of at least 4 inches be maintained.

12.3 SITE PREPARATION PROCEDURES

The following is a list of our recommended site preparation procedures to prepare the site for the proposed construction.

1. Strip the footprints of the proposed buildings, plus a minimum margin of at least 5 feet beyond foundation lines, of any remaining vegetation, organic topsoils, root mats, debris, etc. Any collapsible or leak prone utilities which may be encountered during this work should be completely removed from within the location of the proposed structures.

   It has been our experience that the subsoils adjacent to previously developed areas sometimes contain pockets of buried rubble, muck, debris or other deleterious materials. Therefore, we strongly recommend that the stripped surfaces be observed and probed by representatives of Universal. Any deleterious matter remaining should be removed and replaced with clean fine sands [SP].

2. The subsurface soils beneath the proposed building footprints, including the 5 feet margin, should be densified to at least 95 percent of the Modified Proctor test maximum dry density (ASTM D 1557, Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3))) to at least 12 inches below the stripped surface.

3. If vibratory equipment is used for proof rolling and to compact fill, then we recommend using vibratory rollers weighing less than 1 ton within 20 feet of existing structures, less than 2 tons within distances of 20 to 40 feet, less than 6 tons between 40 to 100 feet, and up to 10

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tons beyond 100 feet. The use of heavier vibratory equipment may damage existing nearby structures. Otherwise, static rollers weighing more than 5 tons should be used.

4. Proof-roll the exposed subsurface soils under the observation of Universal, to locate any unforeseen soft areas of unsuitable soils, and to increase the density of the shallow loose fine sand soils. Each pass should overlap the proceeding pass by roughly 30 percent to insure complete coverage. If deemed necessary by Universal, in areas that continue to "yield", remove any deleterious materials and replace with a clean, compacted sand backfill.

5. Depending on weather conditions or other factors, the addition or removal (dewatering) of water may be necessary to aid compactive efforts. Please note that portions of the near surface soils at this project contain varying amounts of silt & clay. These soil types tend to readily hold moisture and may require more compactive efforts than clean fine sand [SP] soils. Additional passes with compaction equipment or over excavation and replacement in compacted layers may be necessary if the minimum density requirements are not achieved by the recommended proof-rolling.

6. Within the building areas, fill to floor slab grade as necessary with select structural fill, placed in maximum 12 inch loose lifts. We recommend using fill soils consisting of sands with less than 10% passing the #200 sieve size [SP, SP-SM, or SP-SC]. Each lift of structural fill should be densified to at least 95 percent of the Modified Proctor test maximum dry density of the soil (ASTM D 1557) and tested for compaction and approved before the placement of subsequent lifts.

7. Footing and utility excavations and other construction activities frequently disturb compacted subsoils to various depths; therefore, compaction beneath all floor slabs and footings should be verified to a depth of 1 foot immediately prior to the placement of reinforcing steel and concrete, and should meet at least 95 percent of the Modified Proctor test maximum dry density of the soil (ASTM D 1557).

8. Field density tests should be performed by Universal at appropriate times during earthwork operations in order to verify that the compaction requirements have been satisfied. These tests should be performed after compaction in the existing soils, after placement of each lift of new structural fill, within all footing excavations, and beneath all concrete slab-on-grade locations. Compaction tests should be performed at a frequency of not less than three tests per building per each foot of compacted increment as specified herein. In addition, we recommend that at least every-other column footing be tested with at least one test per every 50 linear feet of wall footing.

13.0 SEWER AND UTILITY LINES

13.1 GENERAL RECOMMENDATIONS

We assume that the proposed sewer and other utility lines at this site may have invert elevations roughly 2 to 5 feet below existing grades. Based on the results of the soil borings and our general knowledge of the area, we suspect there may be occasional soft/deleterious pockets or cemented rock layers at this invert level. If encountered, such layers/pockets should be over excavated and replaced with approved backfill or open graded gravel.

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13.2 SITE PREPARATION PROCEDURES

The following is our recommended procedure to prepare the site soils for construction of the proposed utility lines.

1. If necessary, install a dewatering system capable of maintaining a groundwater level at least 2 feet below bottom of pipe level.

2. Excavate and install the proposed utility lines. Any deleterious soils, or cemented rock layers, encountered at pipe bedding level should be examined by representatives of Universal for possible removal and replacement with approved backfill as previously discussed. All replacement soils should consist of clean fine sands [SP] compacted to at least 98 percent of the Modified Proctor test maximum dry density (ASTM D1557) with small vibratory plates or rollers.

3. Backfill to grade with approved fill [SP, SP-SM, or SP-SC] placed in 12 inch loose lifts with each lift compacted, with vibratory rollers or plates weighing less than 4 tons, to at least 98 percent of the Modified Proctor test maximum dry density (ASTM D 1557).

Backfill above and around thrust blocks should be compacted at least 98 percent of Modified Proctor test maximum dry density (ASTM D1557). For a design criteria, we recommend using an allowable passive earth pressure coefficient of K_p=3.0.

14.0 DEWATERING

Based on the water level conditions encountered including time of year that construction is performed, control of the groundwater may be necessary to achieve the necessary excavation, construction, backfilling and compaction requirements presented in the preceding sections. If dewatering becomes necessary and regardless of the method(s) used, we suggest drawing down the water level at least 2 feet below the bottom of the excavations to preclude "pumping" and/or compaction-related problems with the foundation and/or subgrade soils. The actual method(s) of dewatering should be determined by the contractor.

Dewatering should be accomplished with the knowledge that the permeability of soils decreases with increasing silt [ML] and/or clay [CL] content. Therefore, a silty fine sand [SM] is less permeable than a fine sand [SP]. The fine sand, fine sand with silt and silty fine sand [SP, SP-SM and SM] soil types can usually be dewatered by well pointing.

It should be noted that the typical wet season groundwater levels previously listed may be temporarily exceeded during any given year in the future. Should impediments to surface water drainage exist on the site, or should rainfall intensity and duration, or total rainfall quantities exceed the normally anticipated rainfall quantities, groundwater levels may exceed our seasonal high estimates.

We recommend positive drainage be established and maintained on the site during construction. We further recommend permanent measures be constructed to maintain positive drainage from the site throughout the life of the project. We recommend that the contract documents provide for determining the depth to the groundwater table just prior to construction, and for any required remedial dewatering.

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15.0 EXCAVATIONS

Excavations should be sloped as necessary to prevent slope failure and to allow backfilling. As a minimum, temporary excavations below 4-foot depth should be sloped in accordance with OSHA regulations (29 CFR Par 1926) dated October 31, 1989. Where lateral confinement will not permit slopes to be laid back, the excavation should be shored in accordance with OSHA requirements. During excavation, excavated material should not be stockpiled at the top of the slope within a horizontal distance equal to the excavation depth. Provisions for maintaining workman safety within excavations is the sole responsibility of the contractor.

16.0 SPECIAL CONSIDERATIONS

Vibrations produced during vibratory compaction operations at the site may be significantly noticeable within 100 feet and may cause settlement distress of adjacent structures if not properly regulated. Therefore, provisions should be made to monitor these vibrations by Universal so that any necessary modifications in the compaction operations can be made in the field before potential damages occur. In addition, the conditions of the existing adjacent structures should be ascertained and documented prior to vibratory operations. Slight cosmetic damage (e.g. hairline cracks in stucco, plaster, or masonry) may occur in conjunction with compaction operations.

Please note that occasional cemented (coquina) rock layers were encountered at various depths & locations at this site, perhaps forming dense boulders and/or ledges. More extensive (or shallower) rock layers may exist at this site. Where cementation is the greatest these layers may hinder excavation with typical backhoes or similar equipment. If these rock strata are excavated as borrow materials, clumps/boulders greater than 3 inches in diameter should be either removed or broken up prior to inclusion within structural fills at the site.

17.0 CLOSURE

The soil and groundwater conditions encountered during our subsurface exploration of the project site and the results of the laboratory analysis identified no geotechnical issues that would significantly impact the proposed construction, as we currently understand it, using conventional construction practices. Standard methods of surficial stripping, excavation, proof rolling, compaction and backfilling should adequately prepare the site.

The geotechnical engineering design does not end with the advertisement of the construction documents. The design is an on-going process throughout construction. Because of our familiarity with the site conditions and the intent of the engineering design, we are most qualified to address site problems or construction changes, which may arise during construction, in a timely and cost-effective manner.

We recommend the owner retain the Universal Rockledge office to provide inspection services during the site preparation procedures for confirmation of the adequacy of the earthwork operations. Field tests and observations include verification of foundation subgrades by monitoring proof-rolling operations and performing quality assurance tests of the placement of compacted structural fill courses.

*** * * * * * ***

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FIGURES

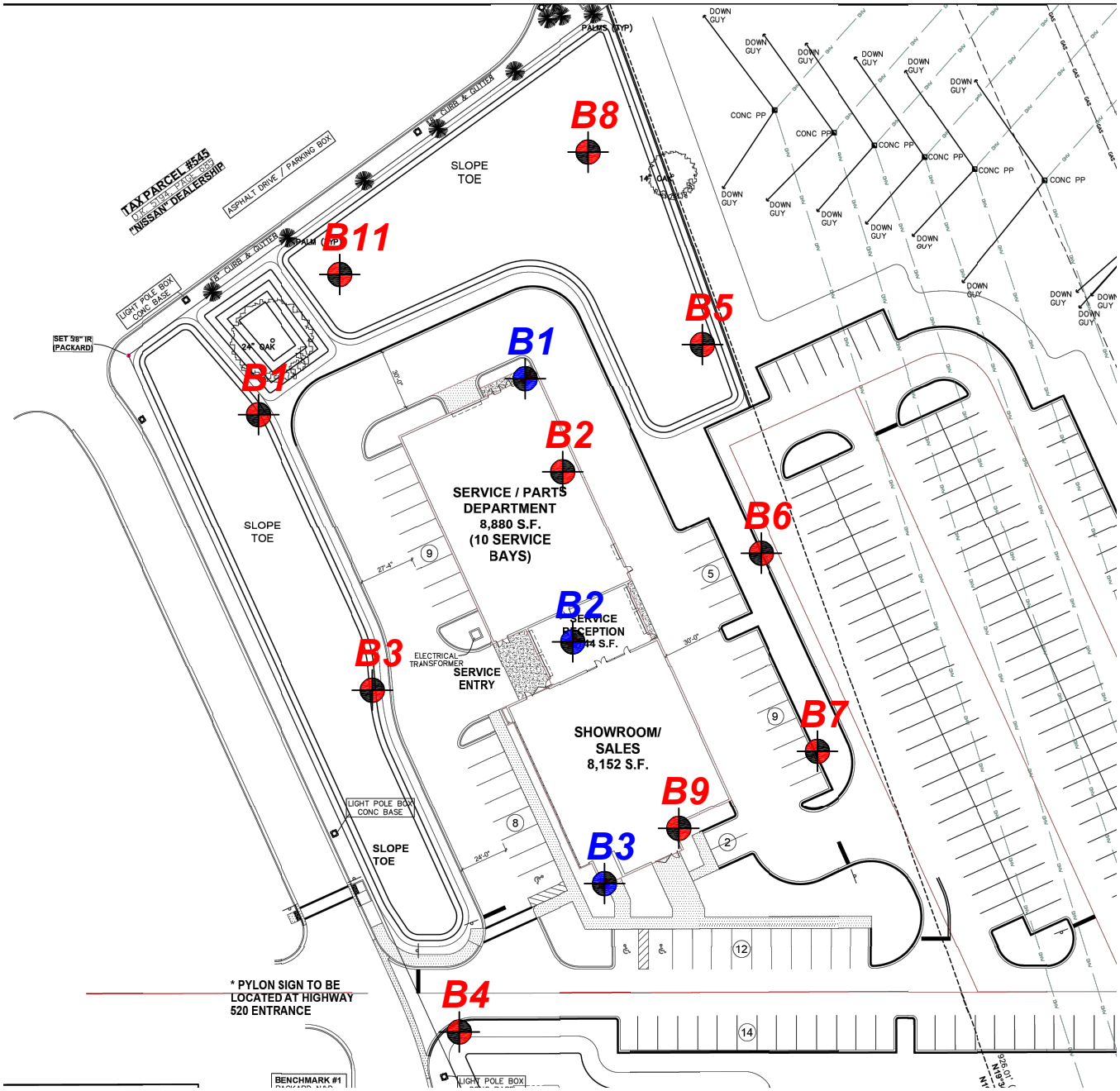


FIGURE IS BASED UPON A DRAWING PROVIDED BY THE CLIENT

UNIVERSAL
ENGINEERING SCIENCES

ERDMAN CADILLAC SHOWROOM AND SERVICE BUILDINGS
SR 520 AND I-95
COCOA, FLORIDA

BORING LOCATION PLAN

DRAWN BY:	AD	DATE:	2.14.2024	CHECKED BY:	BF	DATE:	2.14.2024
SCALE:	1" = 80'	PROJECT NO:	0330.2400021.0000			PAGE NO:	FIGURE 1

APPENDIX A

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.2400021.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: ERDMAN CADILLAC SHOWROOM AND SERVICE BUILDING
I95 AND SR 520
COCOA, FLORIDA

BORING DESIGNATION: **B1** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT:

LOCATION: SEE BORING LOCATION PLAN

REMARKS:

G.S. ELEVATION (ft):
WATER TABLE (ft): 6.8
DATE OF READING: 2/7/2024
EST. W.S.W.T. (ft):

DATE STARTED: 2/5/24
DATE FINISHED: 2/5/24
DRILLED BY: JL, JH
TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		7-9-12	21			**clayey fine SAND with broken shell and clay lumps**, grey, [SC] (fill)						
		14-11-10	21				13.5	14.6				
		4-3-4	7			**fine SAND with silt**, brown, [SP-SM]						
5		4-3-3	6									
				▼		**fine SAND**, brown, [SP]						
		2-3-6	9									
		5-4-4	8									
10												
						clayey fine SAND, grey, [SC]						
		2-2-1	3									
15												
		2-1-3	4									
20												
						fine SAND with silt, broken shell and occasional cemented rock layers, gray, [SP-SM]						
		5-5-5	10									
25						BORING TERMINATED AT 25'						
30												
35												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.2400021.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: ERDMAN CADILLAC SHOWROOM AND SERVICE BUILDING
I95 AND SR 520
COCOA, FLORIDA

BORING DESIGNATION: **B2** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT:

LOCATION: SEE BORING LOCATION PLAN

REMARKS:

G.S. ELEVATION (ft):
WATER TABLE (ft): 6.9
DATE OF READING: 2/7/2024
EST. W.S.W.T. (ft):

DATE STARTED: 2/5/24
DATE FINISHED: 2/5/24
DRILLED BY: JL, JH
TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		8-11-12	23			**clayey fine SAND, trace of broken shell**, brown, [SC] (fill)	18.8	15.4				
		10-9-8	17			**fine SAND with silt, broken shell and clay lumps**, brown, [SP-SM] (fill)						
5		3-5-5	10									
		6-5-6	11	▼								
		3-5-6	11			**fine SAND**, brown, [SP]						
		8-8-4	12									
10												
						clayey fine SAND, grey, [SC]						
		2-1-1	2									
15												
		1-2-2	4									
20												
						fine SAND with silt and broken shell, brown, [SP-SM]						
		3-3-3	6									
25						BORING TERMINATED AT 25'						
30												
35												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.2400021.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: ERDMAN CADILLAC SHOWROOM AND SERVICE BUILDING
I95 AND SR 520
COCOA, FLORIDA

BORING DESIGNATION: **B3** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT:

LOCATION: SEE BORING LOCATION PLAN

REMARKS:

G.S. ELEVATION (ft):
WATER TABLE (ft): 7.8
DATE OF READING: 2/7/2024
EST. W.S.W.T. (ft):

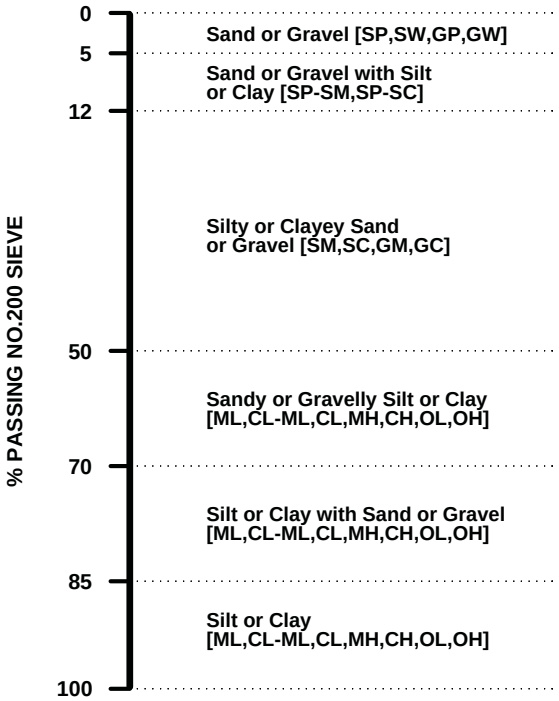
DATE STARTED: 2/5/24
DATE FINISHED: 2/5/24
DRILLED BY: JL, JH
TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		3-3-5	8			**fine SAND with silt, broken shell and clay lumps**, brown, [SP-SM] (fill)						
		12-13-15	28									
		9-10-12	22									
5						**fine SAND**, grey, [SP]						
		14-16-14	30									
		6-7-8	15	▼		**fine SAND with silt and occasional cemented rock layers**, brown, [SP-SM]	5.3	17.0				
		5-2-2	4			**clayey fine SAND**, grey, [SC]						
10												
		1-2-2	4									
15												
		1-2-3	5									
20												
		1-2-2	4									
25												
		3-2-2	4									
30						BORING TERMINATED AT 30'						
35												

BL3

KEY TO BORING LOGS

SOIL CLASSIFICATION CHART*



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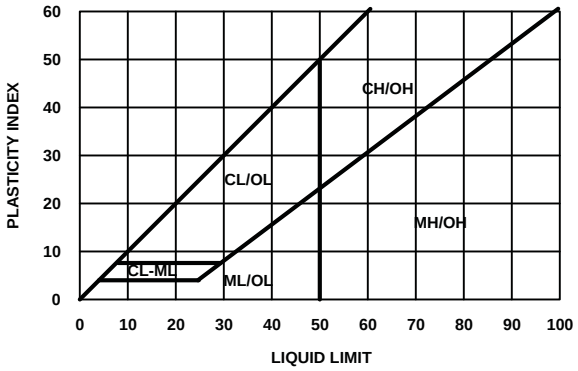

PLASTICITY CHART

GROUP NAME AND SYMBOL

COARSE GRAINED SOILS

- WELL-GRADED SANDS [SW]
- POORLY-GRADED SANDS [SP]
- POORLY-GRADED SANDS WITH SILT [SP-SM]
- POORLY-GRADED SANDS WITH CLAY [SP-SC]
- SILTY SANDS [SM]
- CLAYEY SANDS [SC]
- SILTY CLAYEY SANDS [SC-SM]
- WELL-GRADED GRAVELS [GW]
- POORLY-GRADED GRAVELS [GP]
- POORLY-GRADED GRAVELS WITH SILT [GP-GM]
- POORLY-GRADED GRAVELS WITH CLAY [GP-GC]
- SILTY GRAVELS [GM]
- CLAYEY GRAVELS [GC]

FINE GRAINED SOILS

- INORGANIC SILTS SLIGHT PLASTICITY [ML]
- INORGANIC SILTY CLAY LOW PLASTICITY [CL-ML]
- INORGANIC CLAYS LOW TO MEDIUM PLASTICITY [CL]
- INORGANIC SILTS HIGH PLASTICITY [MH]
- INORGANIC CLAYS HIGH PLASTICITY [CH]

HIGHLY ORGANIC SOILS

- ORGANIC SILTS/CLAYS LOW PLASTICITY [OL]**
- ORGANIC SILTS/CLAYS MEDIUM TO HIGH PLASTICITY [OH]**
- PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS [PT]**

IN ACCORDANCE WITH ASTM D 2487 - UNIFIED SOIL

* CLASSIFICATION SYSTEM.

** LOCALLY MAY BE KNOWN AS MUCK.

RELATIVE DENSITY

(SAND AND GRAVEL)

VERY LOOSE - 0 to 4 Blows/ft.
LOOSE - 5 to 10 Blows/ft.
MEDIUM DENSE - 11 to 30 Blows/ft.
DENSE - 31 to 50 Blows/ft.
VERY DENSE - more than 50 Blows/ft.

CONSISTENCY

(SILT AND CLAY)

VERY SOFT - 0 to 2 Blows/ft.
SOFT - 3 to 4 Blows/ft.
FIRM - 5 to 8 Blows/ft.
STIFF - 9 to 16 Blows/ft.
VERY STIFF - 17 to 30 Blows/ft.
HARD - more than 30 Blows/ft.

NOTES:
8* - DENOTES DYNAMIC CONE PENETROMETER (DCP) VALUE
R - DENOTES REFUSAL TO PENETRATION
P - DENOTES PENETRATION WITH ONLY WEIGHT OF DRIVE HAMMER
N/E - DENOTES GROUNDWATER TABLE NOT ENCOUNTERED

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

APPENDIX B

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements

Cocoa, Florida

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

BORING DESIGNATION: **B1** SHEET: **1 of 1**

SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft):

WATER TABLE (ft): 0.7

DATE OF READING: 7/31/19

EST. W.S.W.T. (ft):

DATE STARTED: 7/30/19

DATE FINISHED: 7/30/19

DRILLED BY:

TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		3-3-6	3*	▼		**fine SAND with silt and trace of roots (top soil)**, dark brown, [SP-SM]						
		3-5-7	5*			**fine SAND**, brown, [SP]						
		5-10-9	10*				3.0	20.3				
		5-8-7	8*									
		6-15-12	15*			**clayey fine SAND**, brown, [SC]						
5												
		7-12-15	12*									
		16-14-18	14*									
						* DYNAMIC CONE PENETROMETER (DCP) VALUES BORING TERMINATED AT 7'						
10												
15												
20												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements

Cocoa, Florida

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

BORING DESIGNATION: **B2** SHEET: **1 of 1**

SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft):

WATER TABLE (ft): 4.7

DATE OF READING: 7/31/19

EST. W.S.W.T. (ft):

DATE STARTED: 7/30/19

DATE FINISHED: 7/30/19

DRILLED BY:

TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		13-20-21	20*			**fine SAND with silt and trace of roots (top soil),** dark brown, [SP-SM]						
		9-17-20	17*			**fine SAND**, brown, [SP]						
		15-15-18	15*									
		15-27-31	27*									
		8-17-23	17*	▼								
5						**fine SAND with silt**, dark brown, (hardpan) [SP-SM]						
		15-20-24	20*									
		10-18-28	18*									
						* DYNAMIC CONE PENETROMETER (DCP) VALUES BORING TERMINATED AT 7'						
10												
15												
20												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements

Cocoa, Florida

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

BORING DESIGNATION: **B3** SHEET: **1 of 1**

SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft):

WATER TABLE (ft): 4.8

DATE OF READING: 7/31/19

EST. W.S.W.T. (ft):

DATE STARTED: 7/30/19

DATE FINISHED: 7/30/19

DRILLED BY:

TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		18-24-24	24*			**fine SAND with silt and trace of roots (top soil)**, dark brown, [SP-SM]						
		13-18-27	18*									
		13-17-30	17*			**fine SAND**, brown, [SP]						
		10-20-22	20*									
		6-14-13	14*	▼								
5												
		8-11-14	11*				4.3	21.1				
		8-8-6	8*									
						* DYNAMIC CONE PENETROMETER (DCP) VALUES BORING TERMINATED AT 7'						
10												
15												
20												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements

Cocoa, Florida

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

BORING DESIGNATION: **B4** SHEET: **1 of 1**

SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft):

WATER TABLE (ft): 1.8

DATE OF READING: 7/31/19

EST. W.S.W.T. (ft):

DATE STARTED: 7/30/19

DATE FINISHED: 7/30/19

DRILLED BY:

TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		3-4-4	4*			**fine SAND with trace of roots**, grey, [SP]						
		2-6-10	6*	▼								
		3-6-7	6*									
		5-7-8	7*			**fine SAND with clay**, brown, [SP-SC]						
		5-5-8	5*									
5		1-2-3	2*			**fine SAND**, brown, [SP]						
						* DYNAMIC CONE PENETROMETER (DCP) VALUES BORING TERMINATED AT 6'						
10												
15												
20												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements

Cocoa, Florida

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

BORING DESIGNATION: **B5** SHEET: **1 of 1**

SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft):

WATER TABLE (ft): 4.4

DATE OF READING: 7/31/19

EST. W.S.W.T. (ft):

DATE STARTED: 7/30/19

DATE FINISHED: 7/30/19

DRILLED BY:

TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		7-12-12	12*			**fine SAND with silt and trace of roots (top soil)**, dark brown, [SP-SM]						
		3-7-9	7*			**fine SAND with silt, trace of roots and clay lumps (fill)**, brown, [SP-SM]						
		2-6-13	6*									
		7-12-15	12*			**fine SAND**, grey, [SP]						
		6-7-11	7*	▼			2.7	16.9				
5		30+	R									
						* DYNAMIC CONE PENETROMETER (DCP) VALUES **R - DENOTES REFUSAL TO PENETRATION WITH DYNAMIC CONE PENETROMETER.** BORING TERMINATED AT 6'						
10												
15												
20												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements

Cocoa, Florida

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

BORING DESIGNATION: **B6** SHEET: **1 of 1**

SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft): DATE STARTED: 7/30/19

WATER TABLE (ft): 5.6 DATE FINISHED: 7/30/19

DATE OF READING: 7/31/19 DRILLED BY:

EST. W.S.W.T. (ft): TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./DAY)	ORG. CONT. (%)
0												
		5-9-10	9*			**fine SAND with silt, trace of roots and clay lumps (fill)**, brown, [SP-SM]						
		4-9-9	9*									
		1-7-9	7*									
		4-16-22	16*			**fine SAND**, grey, [SP]						
		3-9-14	9*									
5				▼								
		6-30+	R									
		1-16-21	16*			**fine SAND with silt**, dark brown, (hardpan) [SP-SM]						
						* DYNAMIC CONE PENETROMETER (DCP) VALUES **R - DENOTES REFUSAL TO PENETRATION WITH DYNAMIC CONE PENETROMETER.** BORING TERMINATED AT 7'						
10												
15												
20												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements
Cocoa, Florida

BORING DESIGNATION: **B7** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

G.S. ELEVATION (ft):
WATER TABLE (ft): 5.6
DATE OF READING: 7/31/19
EST. W.S.W.T. (ft):

DATE STARTED: 7/30/19
DATE FINISHED: 7/30/19
DRILLED BY:
TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		1-7-7	7*			**fine SAND with silt and trace of roots (top soil),** dark brown, [SP-SM]						
		4-10-11	10*									
		3-6-6	6*			**fine SAND**, grey, [SP]						
		4-14-19	14*									
		6-14-17	14*									
5				▼								
		18-30+	R									
		5-30+	R			**fine SAND with silt**, dark brown, (hardpan) [SP-SM]						
						* DYNAMIC CONE PENETROMETER (DCP) VALUES **R - DENOTES REFUSAL TO PENETRATION WITH DYNAMIC CONE PENETROMETER.** BORING TERMINATED AT 7'						
10												
15												
20												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements

Cocoa, Florida

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

BORING DESIGNATION: **B8** SHEET: **1 of 1**

SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft):

WATER TABLE (ft): 1.1

DATE OF READING: 7/31/19

EST. W.S.W.T. (ft):

DATE STARTED: 7/30/19

DATE FINISHED: 7/30/19

DRILLED BY:

TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0						**fine SAND with silt and trace of roots (top soil)**, dark brown, [SP-SM]						
		3-4-6	4*	▼		**fine SAND**, brown, [SP]						
		3-7-8	7*									
		6-12-15	12*									
		4-6-8	14			**clayey fine SAND**, brown, [SC]						
5		8-8-7	15				12.7	17.5				
		3-3-3	6									
		2-3-4	7			**clayey fine SAND with trace of broken shell**, brown, [SC]						
10												
		3-5-7	12									
15						* DYNAMIC CONE PENETROMETER (DCP) VALUES BORING TERMINATED AT 15'						
20												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements
Cocoa, Florida

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

BORING DESIGNATION: **B9** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft):
WATER TABLE (ft): 5.4
DATE OF READING: 7/31/19
EST. W.S.W.T. (ft):

DATE STARTED: 7/30/19
DATE FINISHED: 7/30/19
DRILLED BY:
TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0						**fine SAND with silt and trace of roots (top soil),** dark brown, [SP-SM]						
		2-2-3	5			**fine SAND**, grey, [SP]						
		3-1-2	3									
		2-4-5	9				3.0	15.1				
5				▼								
		6-7-6	13									
		7-7-8	15			**fine SAND with silt**, dark brown, (hardpan) [SP-SM]						
		6-8-13	21									
						clayey fine SAND, grey, [SC]						
10												
		1-1-3	4									
15						BORING TERMINATED AT 15'						
20												

BL3

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0330.1900087.0000
REPORT NO.:	
APPENDIX:	A

PROJECT: Fountain Property Retention & Pavements

Cocoa, Florida

CLIENT:

LOCATION: SEE EXPLORATION LOCATION PLAN

REMARKS:

BORING DESIGNATION: **B11** SHEET: **1 of 1**

SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft): DATE STARTED: 7/30/19

WATER TABLE (ft): 0.1 S.W. DATE FINISHED: 7/30/19

DATE OF READING: 7/31/19 DRILLED BY:

EST. W.S.W.T. (ft): TYPE OF SAMPLING:

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT./ DAY)	ORG. CONT. (%)
0												
		4-7-8	7*			**fine SAND with silt and trace of roots (top soil)**, dark brown, [SP-SM]						
		2-6-11	6*			**fine SAND**, grey, [SP]						
		3-9-7	9*									
		10-16-15	16*									
		4-11-13	11*			**fine SAND with silt**, gray, [SP-SM]						
5						* DYNAMIC CONE PENETROMETER (DCP) VALUES BORING TERMINATED AT 5' S.W. - Indicates standing water						
10												
15												
20												

BL3

EXHIBIT 1

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

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

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

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

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

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

This Report's Recommendations Are Confirmation-Dependent

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

This Report Could Be Misinterpreted

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

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

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

Give Constructors a Complete Report and Guidance

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

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

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