



UNIVERSAL ENGINEERING SCIENCES

GEOTECHNICAL EXPLORATION

**Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, Florida**

UES Project No. 0530.1900227.0000

PREPARED FOR:

**Lee County Lee County Division of Natural Resources
1500 Monroe Street
Fort Myers, FL 33901**

PREPARED BY:

**Universal Engineering Sciences
5971 Country Lakes Drive
Fort Myers, Florida 33905
(239) 995-1997**

January 02, 2020

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January 02, 2020

Lee County Division of Natural Resources
1500 Monroe Street
Fort Myers, FL 33901

Attention: Mr. David Warthen

Reference: **Geotechnical Exploration**
Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, Florida
UES Project No. 0530.1900227.0000

Dear Mr. Warthen:

Universal Engineering Sciences, Inc. (UES) has completed a geotechnical exploration on the above-referenced site in Cape Coral, Lee County, Florida. Our scope of services was in general accordance with Lee County Professional Service Agreement #CN180442GWT, Contract #8272 dated September 6, 2019.

This report contains the results of our study, an engineering interpretation of the subsurface data obtained with respect to the project characteristics described to us, geotechnical design recommendations, and general construction and site preparation considerations.

We appreciate the opportunity to have worked with you on this project and look forward to a continued association with your firm. Please contact us if you have any questions, or if we may further assist you as your plans proceed.

Respectfully Submitted,
UNIVERSAL ENGINEERING SCIENCES, INC.
Certificate of Authorization No. 549


Ashok Neela
Staff Engineer

1 – Client (email only)



Lindsey N. Weaver, P.E.
Regional Manager
Florida Registration

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EXECUTIVE SUMMARY

The following summary was prepared to provide a quick overview of UES's findings. Please review and rely on the full report for recommendations and other considerations.

Project Description

We understand the project under consideration involves design and construction of a reservoir, pump station and associated pipe alignment. We understand the proposed pump station will transfer water from Leets Canal in Cape Coral Surface Water Basin1, south under Del Prado Boulevard N to a shallow reservoir that is proposed to be constructed on the Yellow Fever Creek Preserve. The materials excavated from the proposed reservoir are planned as a source of structural fill material. We understand the reservoir will be excavated to around 12 feet below existing grade.

Soil and Groundwater Conditions

The soils found at the proposed reservoir consist of brown, gray, light brown and light gray fine sand with trace of roots, phosphates varying amounts of clay fines, silt fines, rock and shell fragments in very loose, loose, medium dense, dense and very dense states to the maximum depth explored of 15 feet below ground surface. Hard rock or soil conditions indicative of fractured rock were encountered at many boring locations at varying depths around 4 to 9 feet below ground surface. The rock strata did not appear to be as prominent in the southwest portion of reservoir.

The groundwater was measured at depths of 2.2 to 5.0 feet below ground surface. Estimated seasonal high ground water levels could be around 0 to 2 feet below ground surface.

Pump Station

Based on the geotechnical exploration and analyses the pump station can be supported on conventional foundations. However due to the presence of fractured and hard rock difficulty in excavating the pump station will likely be encountered.

Reservoir Excavation

Difficulty may be encountered when excavating the reservoir between a depth of 4 to 10 feet. Further, significant quantities of large rocks may be generated during the excavation. With the exception of soils contain greater than 12 percent soil fines remaining soil encountered at the test borings would be suitable for use as structural fill material.



1.0 INTRODUCTION

1.1 GENERAL

In this report we present the results of our geotechnical exploration on the site of the proposed reservoir, pipe alignment along Del Prado Boulevard North and pump station associated with the Yellow Fever Creek Restoration project in Cape Coral, Lee County, Florida. This report contains the results of our study, an engineering interpretation of the subsurface data obtained with respect to the project characteristics described to us, and our recommendations for geotechnical design and general construction considerations. Our scope of services was in general accordance with Lee County Professional Service Agreement #CN180442GWT, Contract #8272 dated September 6, 2019.

1.2 PROJECT DESCRIPTION

We understand the project under consideration involves design and construction of a reservoir, pump station and associated pipe alignment. We understand the proposed pump station will transfer water from Leets Canal in Cape Coral Surface Water Basin1, south under Del Prado Boulevard N to a shallow reservoir that is proposed to be constructed on the Yellow Fever Creek Preserve. The materials excavated from the proposed reservoir are planned as a source of structural fill material. We understand the reservoir will be excavated to around 12 feet below existing grade.

No anticipated structural information for the pump station was available for our analyses. It is anticipated the pump equipment pad will be relatively lightly loaded with a maximum loading condition on the order of 500 psf. The invert elevation for the wet well is anticipated to be approximately 15 feet bgs.

We were provided with an site plan depicting the layout of the proposed improvements. We used this information to perform our exploration.

Based on current site grades, it is anticipated nominal amounts (0 to 2 feet) of fill will be required to raise site grades to finished levels.

Our geotechnical recommendations are based upon the above provided information, assumptions, and considerations. ***If UES is not informed of changes to final design information, the recommendations contained herein are not considered valid, as we cannot be responsible for the consequences of changes of which we were not informed.***

A general location map of the project area appears in Appendix A: Site Location Map.



2.0 PURPOSE AND METHODOLOGIES

2.1 PURPOSE

The purpose of our services was:

- to generally characterize the shallow subsurface conditions at the site using a limited amount of Standard Penetration Test (SPT) boring;
- to evaluate the soil/structure relationships using subsurface information interpreted from the boring and project information described to us or assumed by us; and
- to provide geotechnical engineering design information and recommendations, and general recommendations for equipment pad subgrade preparation and pipe support.

This report presents an evaluation of site conditions based on traditional geotechnical procedures for site characterization. The recovered samples were not examined, visually or analytically, for either chemical composition or environmental hazards.

The studies were confined to the zone of soil likely to be influenced by the proposed structural foundation systems. The scope of services did not address the potential for surface expression of deep geological conditions, such as sinkhole development related to karst activity.

2.2 FIELD EXPLORATION

The subsurface conditions in the proposed reservoir area were explored with forty two (42) borings each completed to a depth of 15 feet below ground surface. The subsurface conditions in the proposed pump station was explored with one (1) boring completed to a depth of 25 feet below ground surface. The subsurface conditions in the proposed pipe alignment were explored with seven (7) borings each completed to a depth of 10 feet below ground surface. These boring were advanced using the rotary wash method, and samples were collected while performing the Standard Penetration Test (SPT) at regular intervals.

The SPT tests were performed in general accordance with ASTM D-1586 guidelines. However, at depths of 10 feet or less we sampled continuously to note variations in the upper soil profile. In general, the SPT test consists of a standard split-barrel sampler (split-spoon) driven into the soil using a 140-pound hammer free-falling 30 inches. The number of hammer blows required to drive the sampler 12 inches, after first seating it 6 inches, is designated the penetration resistance, or SPT-N value. This value is used as an index to soil strength and consistency.

Consider the indicated location, elevations, and depths to be approximate. The drilling crew located the boring based upon estimated distances and spatial relations from existing site features. If more precise location and elevation data are desired, a registered professional land



surveyor should be retained to locate the boring and determine their ground surface elevations. The Boring Location Plan is presented in Appendix B.

Soil, rock, water, and/or other samples obtained from the project site are the property of the client. Unless other arrangements are agreed upon in writing, UES will store such samples for no more than 60 calendar days from the date UES issued the first document that includes the data obtained from these samples. After that date, UES will dispose of all samples.

2.3 LABORATORY TESTING

The soil samples recovered from the test borings were returned to our laboratory and visually classified by our technical staff. For classification purposes, we performed the following laboratory tests:

- Twenty (20) Moisture content tests
- Twenty (20) #200 sieve wash tests

The results of the tests are presented at the respective boring and depth where the sample was obtained on the Boring Logs and summary of laboratory test results in Appendix B.

3.0 FINDINGS

3.1 SURFACE CONDITIONS

The reservoir site is a moderately wooded vacant parcel of land on the south side of Del Prado Boulevard in northeast Cape Coral. It is relatively level. The pipe alignment and pump station are generally located along existing residential streets and vacant residential lot. No standing water or surficial debris was encountered during the time of the exploration. At the start of the geotechnical exploration, aerial photographs available from the Lee County Property Appraiser's office and USGS topographic quadrangle maps were reviewed. According to USGS topographic information, the elevation across the property is about approximately +14 to +16 feet NGVD.

3.2 SUBSURFACE CONDITIONS

3.2.1 SOIL SURVEY

We also reviewed current USDA Soil Conservation Service (SCS) data for Lee County. According to SCS, the following soil groups underlying this site. A summary of selected properties for the identified soil groups on the site are included below in Table 1.



Table 1: Summary of Soil Information					
Soil Map Unit & Name	Hydrologic Soil Group	Indications of Shallow Rock	Water Table Type	SHWT Depth	Location
42 - Wabasso sand, limestone substratum, 0 to 2 percent slopes	C/D	13 to 54 inches to lithic bedrock	Apparent	About 6 to 18 inches	East side of Reservoir
26 - Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	A/D	>80 inches	Apparent	About 6 to 18 inches	Southwest corner of Reservoir
74 - Boca fine sand, slough, 0 to 1 percent slopes	A/D	8 to 40 inches to lithic bedrock	Apparent	About 0 inches	West side of Reservoir
122 - Matlacha gravelly fine sand, limestone substratum-Urban land complex, 0 to 2 percent slopes	B	36 to 80 inches to lithic bedrock	Apparent	About 18 to 42 inches	Pump Station and Pipe Alignment Area

3.2.2 SOIL BORING

The boring location and detailed subsurface conditions are illustrated in Appendix B: Boring Location Plan and Boring Log. The classifications and descriptions shown on the log are based upon visual characterizations of the recovered soil samples. Refer to Appendix B: Soils Classification Chart, for further explanation of the symbols and placement of data on the Boring Log. The general subsurface soil profile on the site, based on the soil boring information, is described below. For more detailed information, please refer to the boring logs.

The soils found at the proposed reservoir consist of brown, gray, light brown and light gray fine sand with trace of roots, phosphates varying amounts of clay fines, silt fines, rock and shell fragments in very loose, loose, medium dense, dense and very dense states to the maximum depth explored of 15 feet below ground surface. Hard rock or soil conditions indicative of fractured rock were encountered at most boring locations from around 4 to 9 feet below ground surface. The rock strata did not appear to be as prominent in the southwest portion of reservoir.

The shallow water table was encountered at depths of 2.2 to 5.0 feet below existing grade at the boring locations during geotechnical exploration. These readings are unstabilized and are subject to fluctuation.



The boring log and related information included in this report are indicators of subsurface conditions only at the specific location and times noted. The field exploration did not find unsuitable or unexpected materials at the time of occurrence. However, boring for a typical geotechnical report are widely spaced and generally not enough for reliably detecting the presence of isolated, anomalous surface or subsurface conditions, or reliably estimating unsuitable or suitable material quantities. Accordingly, UES does not recommend relying on the boring information to negate presence of anomalous materials or for estimation of material quantities unless our contracted services **specifically** include enough exploration for such purpose(s) and within the report, it is stated that the level of exploration provided should be enough to detect such anomalous conditions or estimate such quantities. Therefore, UES will not be responsible for any extrapolation or use of the data by others beyond the purpose(s) for which it is applicable or intended.

4.0 RECOMMENDATIONS

4.1 GENERAL

In this section of the report the geotechnical design recommendations is presented, general site preparation recommendations and information pertaining to the construction related services UES can provide. Our recommendations are made based upon a review of the attached soil test data, the understanding of the proposed construction as it was described to us, and the stated assumptions. ***If UES is not informed of changes to the provided final design information, the recommendations contained herein are not considered valid, as we cannot be responsible for performance issues that may arise from design changes of which we are unaware.*** Additionally, if subsurface conditions are encountered during construction that was not found in the test boring, report those conditions immediately to us for observation and recommendations.

4.2 GROUNDWATER

Based on visual review of the recovered soil samples, review of information obtained from SWFWMD and the USDA Soil Survey of Lee County, and UES general knowledge of local and regional hydrogeology, the estimated seasonal high groundwater level in the undeveloped portions of the site could be around 0 to 2 feet below existing grade at the test boring location, on average.

Several factors influence the determination of the seasonal high-water table (SHWT). Over time natural, undisturbed soils are subjected to alternating cycles of saturation and drying, resulting in discoloration, or staining that is not part of the dominant soil color occurs. This is called mottling, and manifests itself in various shades of gray, brown, red, or yellow. There are numerous processes that lead to discoloration, including mineral accretions, oxidation, and bacteria growth within the soil. The presence of this discoloration indicates that groundwater has repetitively reached that elevation and remained there long enough to cause any or all these processes to occur. The SHWT elevation is assumed the highest level at which mottling is observed in the natural soil profile, regardless of whether water is present at the time of observation. This estimate is independent of the actual location of the groundwater table. Because the mottling process takes time and repetitive episodes, man-made soil fills do not exhibit such mottling and seasonal high estimates cannot be made in this manner.



It should be noted that the estimated SHWT does not provide any assurance that groundwater levels will not exceed this level in the future. Should impediments to surface water drainage exist on the site or should rainfall intensity and duration exceed the normally anticipated amounts, groundwater levels may exceed our seasonal high estimate. In addition, future development around the site could alter surface runoff and drainage characteristics and cause our seasonal high estimate to be exceeded. We therefore recommend positive drainage be established and maintained on the site during construction. Further, construct UES recommend permanent measures to maintain positive drainage from the site throughout the life of the project. Finally, UES recommend all foundation and pavement grades account for the seasonal high groundwater conditions.

Temporary dewatering may likely be required for some parts of this site if construction proceeds during the wet season, particularly for the deeper excavations. Therefore, it is recommended that the contract documents be provided for determining the depth to the groundwater table just prior to construction, and for any required remedial dewatering. Further, UES recommend that the groundwater table be maintained at least 24 inches below all earthwork and compaction surfaces.

4.3 PUMP STATION

4.3.1 GENERAL

The soils found consists of light brown and light gray fine sand with rock, trace of silt fines and varying amounts of clay fines in loose, medium dense, dense and very dense states up to around 13 feet below ground surface underlain by hard rock to the maximum depth explored of 25 feet below ground surface.

The soil strata found at the SPT boring locations should be adaptable to support pump equipment and wet well using normal good practice site preparation procedures.

4.3.2 EQUIPMENT SLAB

The pump station and equipment floor slab may be ground supported and in the case of a monolithic floor slab adequately reinforced to prevent distress due to differential movements. A conservative modulus of subgrade reaction of 100 pci can be used for equipment slab design, assuming the slab is supported on compacted structural fill or well compacted existing subgrade soils (minimum 95% MPMDD).

4.3.3 WET WELL

Difficulty will likely be encountered during the excavation of the wet well. Dense and very dense sands with rock fragments, indicative of fractured rock were encountered as shallow as 4 feet below existing grade. Additionally, hard rock was encountered below a depth of 13 feet. If encountered at the wet well invert elevation, we recommend a layer of #57 stone be placed below the wet wall to provide a uniform bearing surface.



4.3.4 ESTIMATED STRUCTURAL SETTLEMENT

For foundations designed as recommended and site earthwork accomplished according to the recommendations provided later in this report, UES estimate total and differential foundation settlement due to structure loads of less than one inch, and less than one half inch, respectively. However, if the site is not prepared according to the guidelines provided later in this report, our estimates of total and differential settlement may be exceeded during the design life of the structure. We note that our settlement estimates do not include potential settlement from the following: erosion of foundation subgrade soils; ground subsidence from sinkhole activity; localized hydraulic compaction of soils from storm or irrigation waters; undermining of foundations from adjacent excavation; or any other cause not related to the actual soil stresses induced by the structural building loads.

4.3.5 SITE PREPARATION

We recommend normal, good-practice site preparation procedures for the pump station site. These procedures include clearing and grubbing the site, proof-rolling, and proof-compacting the subgrade, and filling to grade with engineered fill as needed. We recommend the existing soils to a depth of 1 foot in the proposed pump station areas and any additional fill be compacted to at least 95 percent of the Modified Proctor maximum dry density. Test the fill areas and subgrade for compaction at a frequency of not less than one test per 500 square feet per foot of depth improvement in the pump station area or at a minimum of two-test location, whichever is greater. The fill and backfill excavations should consist of fine sand with less than 5 percent soil fines. You may use fill materials with soil fines between 5 and 12 percent, but strict moisture control may be required. Place fill in uniform 10 to 12-inch loose lifts and compact each lift to a minimum density of 95% MPMDD at a moisture content of +/- 2% of optimum (OMC). Backfill excavations in uniform 10 to 12-inch loose lifts and compact each lift to a minimum density of 98 percent of the Modified Proctor maximum dry density at a frequency of every 2500 square feet or a minimum of 2 tests per lift per excavation area, whichever is greater.

4.5 UTILITY LINE

4.5.1 GENERAL

We understand that proposed utility piping will be constructed under Del Pardo Boulevard N from the proposed pump station to the proposed reservoir at Yellow Fever Creek. In general, the soils found consists of brown, gray, light brown and light gray fine sand with silt fines, rock, shell, trace of roots and varying amounts of clay fines to the maximum depth explored of 10 feet below ground surface. Dense to very dense sand with rock fragments indicative of fractured rock were encountered below a depth of 3 to 4 feet. Additionally, hard rock was encountered at some boring locations at depths of 9 to 10 feet below ground surface. In general, the soils encountered near the presumed invert elevation should be suitable for support of the planned pipe line.

4.5.2 TRENCH EXCAVATION AND BACKFILL

The following are our recommendations for construction of proposed underground utility lines.



1. If deemed necessary by the contractor, install a dewatering system capable of maintaining a groundwater level at least 2 feet below bottom of pipe level.
2. After constructing the utility lines, backfill with suitable sand fill placed in 4 to 6 inch thick loose lifts. Each lift of backfill should be compacted to at least 95 percent of the Modified Proctor test maximum dry density (ASTM D 1557). Compaction in confined areas can probably be achieved using jumping jacks or light weight walk-behind vibratory sleds and/or rollers. Beneath pavement areas, the top 12 inches of backfill should be compacted to at least 98 percent. Additionally, local jurisdictional compaction requirements should be followed when stricter than the recommendations herein.
3. If difficult compaction operations are encountered beneath the utilities due to excessive fines and/or wet conditions, the geotechnical engineer should be contacted. It may be an option for the saturated soils to be over-excavated and replaced with FDOT No. 57 stone. Further, if hard rock is present at the invert elevation a layer of #57 stone should be placed below the pipe to provide a uniform bearing surface.
4. All excavation work must meet OSHA Excavation Standard Subpart P regulations, Type C Soils. Either a trench box, braced sheet pile structure or an excavation with temporary side slopes cut back at 1.5 horizontal to 1.0 vertical can be implemented. The side slope of 1.5 horizontal to 1.0 vertical is contingent upon the dewatering system adequately controlling slope seepage. Sheet piling should be designed according to OSHA sheeting and bracing requirements. We recommend a Florida registered Professional Engineer design any required sheeting/bracing system. Provisions for maintaining workman safety within excavations is the sole responsibility of the contractor.

Backfill above and around any thrust blocks should consist of clean fine sands (SP) compacted at least 98 percent of Modified Proctor maximum dry density (ASTM D 1557). For a design criteria, we recommend using an allowable passive earth pressure coefficient of $K_p=3.0$.

4.6 RESERVOIR EXCAVATION

The primary soil characteristic used to evaluate fill suitability was the percent fine content. The soils typically encountered at this site are fine sand [SP], fine sand with silt fines [SP-SM], silty sand [SM], fine sand with clay fines [SP-SC] and clayey sand [SC] to the maximum depth explored of 15 feet below ground surface. Hard rock or soil conditions indicative of fractured rock was encountered at many boring locations at varying depths around 4 to 9 feet below ground surface. The rock strata did not appear to be as prominent in the southwest portion of reservoir.

Sands with less than 5% soil fines [SP] are generally preferred for use as structural fill. Sands with less than 12 % soil fines [SP-SM] and [SP-SC] may be used as a source of structural fill but requires great attention during placement and compaction. The moisture content of these soils should not be higher than the optimum during placement and compaction in order to reduce the potential for moisture related suitability.

Silty sands [SM] which contain 12 to 20% soil fines and clayey sands, which contain 12 to 20% soil fines [SP-SC], [SW-SC], and [SC], are not well suited for use as structural fill. These soils are typically moisture sensitive and difficult to compact when wet. These soils are generally



suitable to use in yards, particularly if maintained at a minimum 2% surface slope to provide surface drainage.

Soils with greater than 20% fines [SM], [SC], [ML] and [CL] are not recommended for use as structural fill due to high fine contents in the soil.

Any zones of hard rock and fractured rock would generally not be a suitable source of structural fill unless the materials are processed and larger rocks crushed to achieve a smaller particle size range. In order to facilitate the use of this material for structural fill, the rock will need to be run through a crusher. In general, we recommend a maximum particle size in fill placed in the building and pavement areas are limited to 4 to 6 inches. Additionally, in order to mitigate the impact of larger rock particles in foundation we recommend the maximum particle size in the upper 2 to 3 feet of fill placed in the building areas are limited to 3 inches.

4.7 EXCAVATION CONSIDERATIONS

Hard rock and soil conditions indicative of fractured rock (dense to very dense sand with rock fragments) were encountered through the reservoir, pump station and pipe alignment at various depths. We anticipate the fractured rock can likely be excavated with a large track hoe by using the seams, voids and crevices in the rock to pry and dislodge the large material. However, specialized procedures such as pneumatic rams or blasting may be necessary to excavate into or through any hard rock layers

4.8 CONSTRUCTION RELATED SERVICES

Universal Engineering Sciences (UES) operates and maintains an in-house, Florida Department of Transportation Certified Construction Materials Testing laboratory. Our technicians are highly trained and experienced, and our engineering staff is already familiar with the details of your project. Therefore, we recommend the owner retain UES to perform construction materials testing and field observations on this project. This includes monitoring all stripping and grading, observation of foundation excavation and construction and all other construction testing and inspection services that may be needed on this project.

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



5.0 LIMITATIONS

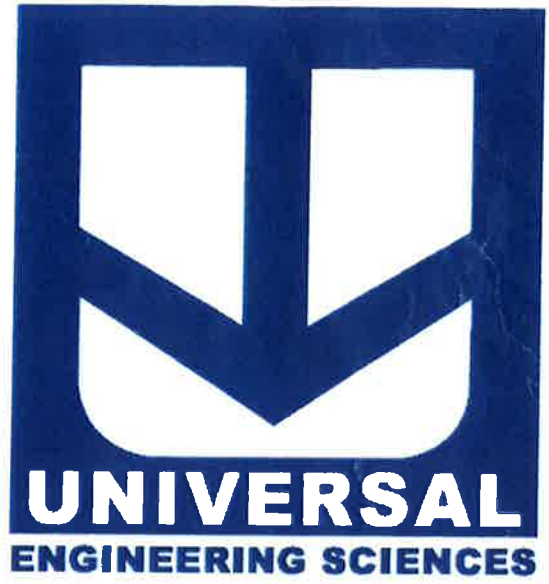
Our services are rendered in general accordance with generally accepted principles and practices of the geotechnical community and our proposal contract agreement. It is common for project plans to change or for more specific project information to become known after completion of our geotechnical services. We strongly recommend that UES be contacted to review final design plans and modify or amend the recommendations contained herein as appropriate. ***If UES is not informed of changes to the final design information, the recommendations contained herein are not considered valid, as we cannot be responsible for the consequences of changes of which we were not informed.***

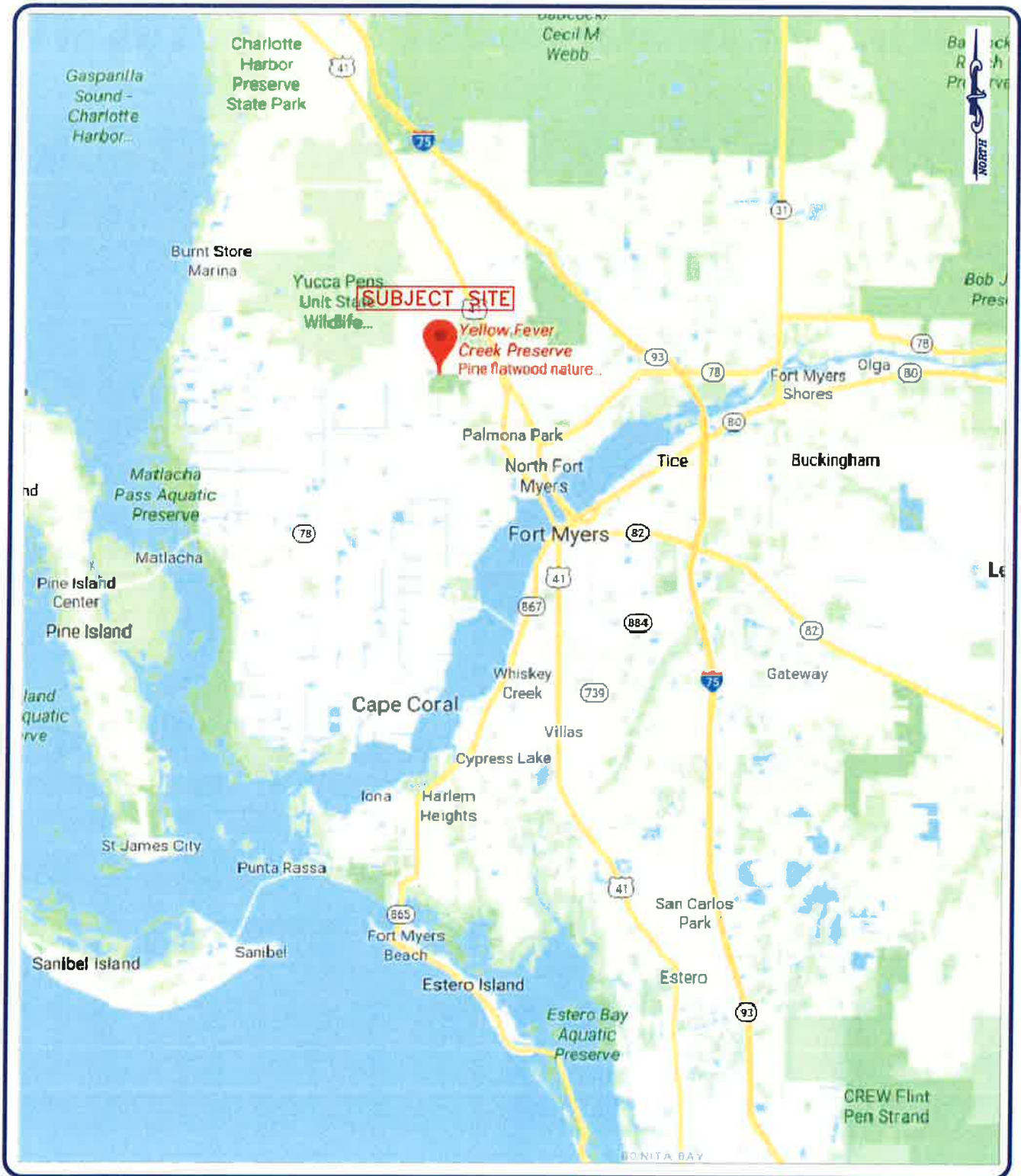
The field exploration did not find unsuitable or unexpected materials at the time of occurrence. However, boring for a typical geotechnical report are widely spaced and generally not enough for reliably detecting the presence of isolated, anomalous surface or subsurface conditions, or reliably estimating unsuitable or suitable material quantities. Accordingly, UES 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 enough exploration for such purpose(s) and within the report, it is stated that the level of exploration provided should be enough to detect such anomalous conditions or estimate such quantities. Therefore, UES will not be responsible for any claims, damages, or liability associated with any extrapolation, interpretation, or use of our data by others beyond the purpose(s) for which it is applicable or intended.

During the early stages of most construction projects, geotechnical issues not addressed in this report may arise. Because of the natural limitations inherent in working with the subsurface, it is not possible for a geotechnical engineer to predict and address all possible subsurface variations. An Association of Engineering Firms Practicing in the Geosciences (ASFE) publication, "Important Information about Your Geotechnical Engineering Report" appears in Appendix C and will help explain the nature of geotechnical issues. Further, we present documents in Appendix C: Constraints and Restrictions, to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.



APPENDIX A





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YELLOW FEVER CREEK RESTORATION PROJECT
DEL PRADO BLVD N
CAPE CORAL, LEE COUNTY, FLORIDA

SITE LOCATION MAP

CLIENT: LEE COUNTY DIVISION OF NATURAL RESOURCES

DRAWN BY: AN

DATE: 1/2/2020

SCALE: NOT TO SCALE

PROJECT NO: 0530.1900227

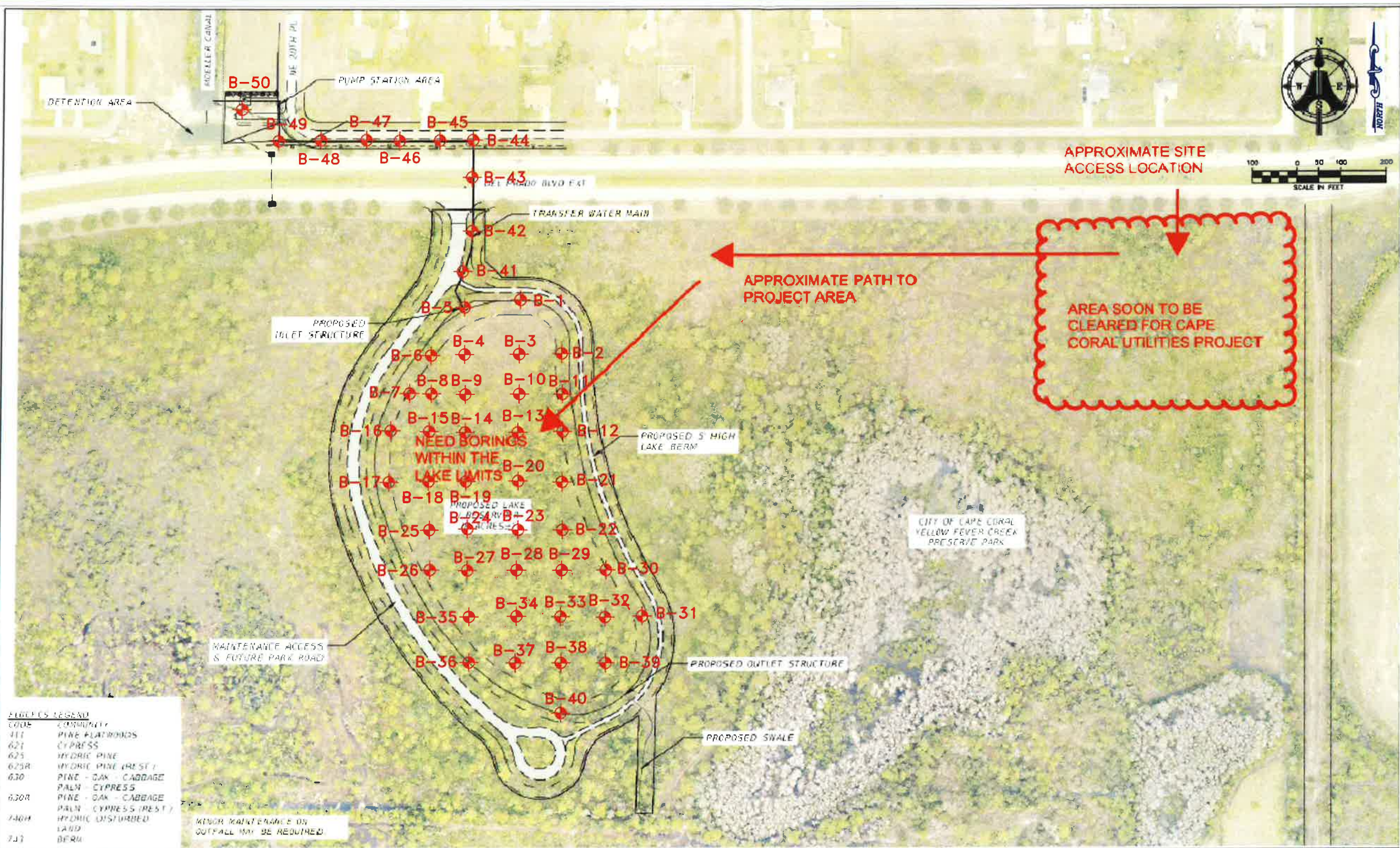
REVIEWED BY: LW

APPENDIX: A

APPENDIX B



UNIVERSAL
ENGINEERING SCIENCES



FIELD CS LEGEND

600E	COMMUNITY
411	PIKE FLATWOODS
621	CYPRESS
625	HYDRIC PINE
625R	HYDRIC PINE (REST.)
630	PINE - OAK - CABBAGE
630R	PINE - OAK - CABBAGE
740H	PALM - CYPRESS (REST.)
740	HYDRIC DISTURBED
740D	LAND
7J1	BERM

MINOR MAINTENANCE ON
OUTFALL MAY BE REQUIRED

NO.	DATE	DESCRIPTION
1	FEB 2019	REV
2	FEB 20 2020	REV
3		
4		

AIM Engineering & Surveying, Inc.
 CIVIL ENGINEERING • LAND SURVEYING • S.U.E. • TRANSPORTATION UTILITIES
 PROJECT MANAGEMENT • CONSTRUCTION ENGINEERING & MANAGEMENT
 2161 FGUYLER ST. FORT MYERS, FL 33901 • E-Mail: engineering@aimengr.com
 PHONE: 238-332-4368 • CERTIFICATION OF AUTHORIZATION No. 3114

LEE COUNTY DIVISION OF
 NATURAL RESOURCES

DATE APPROVED
DATE: 02/1/2021
DESIGNER

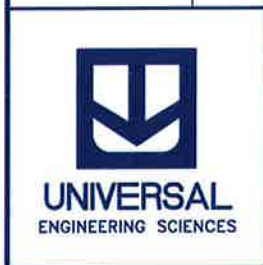
YELLOW FEVER CREEK
 RESTORATION PROJECT
 MASTER PLAN

DATE	16
DATE	02/22

⊕ B-1 Approximate SPT boring location

CLIENT: LEE COUNTY DIVISION OF NATURAL RESOURCES	
DRAWN BY: AN	DATE: JAN 02, 2020
REVIEWED BY: LW	DATE: JAN 02, 2020
REPORT NO:	SCALE: NOT TO SCALE
PROJECT NO: 0530.1900227.0000	

YELLOW FEVER CREEK RESTORATION
 DEL PRADO BOULEVARD N
 CAPE CORAL, LEE COUNTY, FLORIDA
 BORING LOCATION PLAN



APPENDIX:
 B



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0530.1900227.0000

REPORT NO.:

PAGE: 1

PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-1**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/10/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 2.2 DATE FINISHED: 12/10/19

REMARKS:

DATE OF READING: 12/10/2019 DRILLED BY: L/L JR/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0												
		3-5-7	12			Medium Dense Brown and Gray Fine Sand with trace of Roots (SP)						
		7-4-7	11	▼		Medium Dense Gray Fine Sand with Clay Fines (SP-SC)	10	16				
		7-8-40	48			Dense Light Brown and Light Gray Fine Sand with Rock and Shell Fragments (SP)						
5		12-29-9	38									
		6-5-9	14			Medium Dense to Loose Gray, Light Brown and Light Gray Fine Sand with Shell and trace of Phosphates (SP)						
		6-7-7	14									
10		5-2-2	4									
15		5-3-3	6			BORING TERMINATED						

BORING_LOG_0530.1900227.0000.GPJ_UNIENGSC.GDT_12/20



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0530.1900227.0000

REPORT NO.:

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-2**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/10/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.8

DATE FINISHED: 12/10/19

REMARKS:

DATE OF READING: 12/10/2019

DRILLED BY: L/L JR/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Medium Dense Gray, Light Brown and Light Gray Fine Sand with trace of Roots (SP)						
		5-5-9	14									
		7-10-7	17									
		2-2-2	4			Loose Gray Clayey Sand with trace of Shell Fragments (SC)						
5						Medium Dense Light Brown Fine Sand with Silt Fines and Rock Fragments (SP-SM)						
		10-7-7	14				7	13				
		5-13-15	28			Medium Dense Gray and Light Gray Fine Sand with trace of Rock, Shell and Phosphates (SP)						
		5-8-11	19									
10		5-7-8	15									
15		8-9-7	16			BORING TERMINATED						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0530.1900227.0000
REPORT NO.:
PAGE: 3

PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-3** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/10/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): DATE FINISHED: 12/10/19

REMARKS:

DATE OF READING: 12/10/2019 DRILLED BY: L/L JR/ED
 EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown, Dark Brown and Gray Fine Sand with trace of Roots (SP)						
		2-3-2	5									
		3-5-4	9									
		2-2-2	4									
5						Loose Light Gray Fine Sand with Rock, Shell and trace of Silt Fines (SP)						
		2-5-3	8									
		14-14-7	21			Medium Dense to Loose Gray and Light Gray Fine Sand with Rock, trace of Shell and Phosphates (SP)						
		3-3-5	8									
10						Loose Light Gray Silty Sand with Rock Fragments (SM)	16	17				
		1-3-1	4									
						Very Loose Gray Fine Sand with Silt Fines and Shell Fragments (SP-SM)						
15		3-1-1	2			BORING TERMINATED						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0530.1900227.0000

REPORT NO.:

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-4**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/10/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.3

DATE FINISHED: 12/10/19

REMARKS:

DATE OF READING: 12/10/2019

DRILLED BY: L/L JR/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLING	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Medium Dense Brown and Dark Gray Fine Sand with trace of Roots (SP)						
		4-7-10	17			Medium Dense Brown Fine Sand with Clay Fines (SP-SC)						
		8-10-10	20			Medium Dense Brown and Light Brown Fine Sand with trace of Roots and Shell Fragments (SP)						
		8-10-20	30	▼								
5		8-10-15	25									
		8-12-15	27									
		12-13-15	28			Meidum Dense Gray and Light Gray Fine Sand with Rock, trace of Shell and Phosphates (SP)						
10		13-22-6	28									
15		8-9-7	16			BORING TERMINATED						

BORING LOG 0530.1900227.0000.GPJ UNIENGS.C.GDT 1/2/20



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0530.1900227.0000

REPORT NO.:

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-5**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/10/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.3

DATE FINISHED: 12/10/19

REMARKS:

DATE OF READING: 12/10/2019

DRILLED BY: L/L JR/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		4-4-6	10			Loose Light Brown and Light Gray Fine Sand with trace of Roots (SP)						
		3-6-3	9			Loose Brown, Light Brown and Light Gray Clayey Sand (SC)						
		2-3-7	10			Hard Rock						
5		50/1"-14-7	21			Medium Dense Light Gray Fine Sand with Silt Fines (SP-SM)						
		8-10-13	23			Medium Dense Light Gray Fine Sand with Rock, trace of Shell and Phosphates (SP)						
		13-13-6	19			Medium Dense Gray Fine Sand with trace of Silt Fines, Shell and Phosphates (SP)						
10		5-17-7	24									
15		7-5-10	15			BORING TERMINATED						

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UNIVERSAL ENGINEERING SCIENCES BORING LOG

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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-6** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/10/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): 5.1 DATE FINISHED: 12/10/19

REMARKS:

DATE OF READING: 12/10/2019 DRILLED BY: L/L JR/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Medium Dense Light Brown and Light Gray Fine Sand with trace of Roots (SP)						
		5-5-7	12				1	3				
		5-7-5	12			Dense Brown and Light Brown Clayey Sand with trace of Roots (SC)						
		5-13-28	41									
5				▼		Medium Dense Light Brown Fine Sand with Rock Fragments (SP)						
		7-13-15	28									
		5-7-5	12			Medium Dense Light Gray Fine Sand with Rock, trace of Shell and Phosphates (SP)						
		7-9-10	19									
10												
		14-8-14	22									
15		6-4-8	12			BORING TERMINATED						



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PROJECT NO.: 0530.1900227.0000

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-7**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/11/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.1 DATE FINISHED: 12/11/19

REMARKS:

DATE OF READING: 12/11/2019 DRILLED BY: JE/ED
EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLING	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown and Light Brown Fine Sand with trace of Silt Fines (SP)						
		3-3-7	10									
		6-4-30	34			Dense Light Brown Clayey Sand with Rock Fragments (SC)						
		10-20-20	40	▼								
5		26-21-15	36			Dense and Medium Dense Brown and Light Brown Fine Sand with varying amounts of Rock Fragments (SP)						
		15-10-10	20									
		20-13-20	33			Dense to Medium Dense Gray Fine Sand with Rock and trace of Phosphates (SP)						
10		10-8-20	28									
15						BORING TERMINATED						

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-8**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/11/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.5 DATE FINISHED: 12/11/19

REMARKS:

DATE OF READING: 12/11/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLING	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown and Gray Fine Sand with trace of Roots (SP)						
		3-3-4	7			Medium Dense Brown and Gray Clayey Sand (SC)						
		4-5-8	13			Medium Dense Gray Fine Sand with trace of Roots (SP)						
		7-7-9	16	▼		Very Dense Gray Fine Sand with Silt Fines and Rock Fragments (SP-SM)						
5		26-41-23	64			Medium Dense and Dense Gray Fine Sand with Rock, trace of Shell and Phosphates (SP)	10	10				
		8-12-12	24			Medium Dense Gray Fine Sand with Silt Fines and trace of Phosphates (SP-SM)						
		10-12-20	32									
10		7-10-6	16									
15		8-8-12	20			BORING TERMINATED						

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-9**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/11/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.5 DATE FINISHED: 12/11/19

REMARKS:

DATE OF READING: 12/11/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown Fine Sand with trace of Roots (SP)						
		3-5-5	10			Loose Brown Clayey Sand with trace of Roots (SC)						
		6-4-5	9			Loose to Medium Dense Brown and Gray Fine Sand with Shell Fragments (SP)						
		5-3-1	4	▼								
5		2-6-12	18									
		7-7-9	16									
		9-8-7	15									
10		10-10-12	22			Medium Dense Gray Fine Sand with Rock and trace of Phosphates (SP)						
						Medium Dense Gray Silty Sand with trace of Rock and Phosphates (SM)						
15		5-5-6	11			BORING TERMINATED						

BORING LOG 0530.1900227.0000.GPJ UNIENSC.GDT 1/2/20



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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-10** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners
LOCATION: See Boring Locaton Plan

G.S. ELEVATION (ft): DATE STARTED: 12/11/19
WATER TABLE (ft): 5.0 DATE FINISHED: 12/11/19
DATE OF READING: 12/11/2019 DRILLED BY: JE/ED
EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

REMARKS:

DEPTH (FT.)	SAMPLING	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Medium Dense Light Gray Fine Sand with trace of Roots (SP)						
		3-4-9	13			Medium Dense Brown Fine Sand with Clay Fines (SP-SC)						
		8-8-8	16			Very Dense Brown and Light Brown Fine Sand with Rock and trace of Shell Fragments (SP)						
		36-41-27	68									
5				▼		Dense Brown and Gray Fine Sand with Rock, trace of Shell (SP)						
		15-23-23	46									
		15-15-17	32									
		14-16-19	35									
10						Dense Gray Silty Sand with Rock Fragments and trace of Phosphates (SM)	13	15				
		17-17-17	34									
15						BORING TERMINATED						
		14-14-18	32									

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-11** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/11/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.1 DATE FINISHED: 12/11/19

REMARKS:

DATE OF READING: 12/11/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown and Gray Fine Sand with trace of Roots (SP)						
		3-4-5	9			Medium Dense Light Brown Clayey Sand with trace of Roots (SC)						
		5-5-6	11									
		7-7-7	14	▼		Medium Dense and Loose Brown and Light Brown Fine Sand with Shell Fragments (SP)						
5		6-8-11	19									
		13-4-4	8									
		3-5-7	12									
10		8-10-10	20									
						Medium Dense Brown Fine Sand with Rock and Shell Fragments (SP)						
15		11-12-12	24			BORING TERMINATED						

BORING_LOG_0530.1900227.0000.GPJ_UNIENGSC.GDT_1/2/20



UNIVERSAL ENGINEERING SCIENCES BORING LOG

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-12**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/11/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.0

DATE FINISHED: 12/11/19

REMARKS:

DATE OF READING: 12/11/2019

DRILLED BY: JE/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLING	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown Fine Sand with trace of Roots (SP)						
		2-3-4	7			Medium Dense Brown Clayey Sand with trace of Roots (SC)						
		4-5-6	11			Medium Dense Gray and Light Brown Fine Sand (SP)	14	14				
		6-6-8	14			Dense Light Brown Silty Sand with Rock Fragments (SM)						
5		13-16-18	34			Hard Rock						
		50/2"	50+									
10		14-26-22	48			Dense to Medium Dense Gray Fine Sand with Rock, trace of Silt Fines and Phosphates (SP)						
15		9-9-9	18			BORING TERMINATED						

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UNIVERSAL ENGINEERING SCIENCES BORING LOG

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-13**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/12/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.0

DATE FINISHED: 12/12/19

REMARKS:

DATE OF READING: 12/12/2019

DRILLED BY: JE/MA/MT

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0												
		3-3-5	8		▼	Loose and Medium Dense Brown and Gray Fine Sand with trace of Roots (SP)						
		4-5-5	10									
		5-6-7	13									
5						Medium Dense Brown and Light Gray Fine Sand with Shell Fragments (SP)						
		6-6-5	11		▼							
		6-7-7	14									
		7-8-7	15									
		7-7-6	13									
10						Medium Dense Gray Fine Sand with Rock and trace of Phosphates (SP)						
		13-14-16	30									
15						BORING TERMINATED						

BORING LOG 0530.1900227.0000.GPJ UNIENGSC.GDT 1/2/20



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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-14** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/12/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.6 DATE FINISHED: 12/12/19

REMARKS:

DATE OF READING: 12/12/2019 DRILLED BY: JE/MA/MT

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown Fine Sand with trace of Roots (SP)						
		3-2-4	6									
		6-7-5	12			Medium Dense Brown Clayey Sand with trace of Roots (SC)						
		8-6-10	16			Medium Dense Brown Fine Sand with trace of Roots (SP)						
5				▼		Medium Dense Brown and Light Brown Fine Sand with Shell Fragments (SP)						
		12-10-10	20									
		11-13-14	27									
		10-13-15	28			Medium Dense Gray Fine Sand with Silt Fines, Shell and trace of Phosphates (SP-SM)						
10		10-16-6	22									
15		7-15-10	25			BORING TERMINATED						

BORING_LOG_0530.1900227.0000.GPJ_UNIENGSC.GDT_1/2/20



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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-15**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/12/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.4

DATE FINISHED: 12/12/19

REMARKS:

DATE OF READING: 12/12/2019

DRILLED BY: JE/MA/MT

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown Fine Sand with trace of Roots (SP)						
		4-5-5	10			Medium Dense to Loose Brown and Gray Clayey Sand with trace of Shell Fragments (SC)						
		4-6-8	14									
		10-4-4	8	▼		Medium Dense Brown Fine Sand with Rock Fragments (SP)	17	23				
5		11-13-13	26			Hard Rock						
		50/3"	50+									
10		13-15-17	32			Dense to Medium Dense Gray Fine Sand with Silt Fines, Rock, trace of Shell and Phosphates (SP-SM)						
15		8-9-9	18			BORING TERMINATED						

BORING LOG 0530.1900227.0000.GPJ UNIENSC.GDT 12/20



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REPORT NO.:

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-16** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/12/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.1 DATE FINISHED: 12/12/19

REMARKS:

DATE OF READING: 12/12/2019 DRILLED BY: JE/MA/MT

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Light Brown Fine Sand with trace of Roots (SP)						
		3-3-5	8									
		6-6-4	10									
		3-3-4	7	▼		Loose, Medium Dense and Dense Gray and Light Brown Fine Sand with Rock and trace of Shell Fragments (SP)						
5												
		10-13-13	26									
		10-10-11	21									
		11-14-19	33									
10						Medium Dense Gray Fine Sand with Silt Fines, Rock, trace of Shell and Phosphates (SP-SM)						
		12-7-6	13									
15						BORING TERMINATED	10	12				
		7-7-8	15									

BORING_LOG_0530.1900227.0000.GPJ_UNIENGSC.GDT_1/2/20



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PROJECT NO.:	0530.1900227.0000
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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-17** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/12/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 3.6 DATE FINISHED: 12/12/19

REMARKS:

DATE OF READING: 12/12/2019 DRILLED BY: JE/MA/MT
 EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Light Brown Fine Sand with trace of Roots and Shell Fragments (SP)						
		1-3-3	6									
		5-4-4	8									
		5-6-7	13	▼		Medium Dense Gray Clayey Sand (SC)						
5		10-25-36	61			Medium Dense, Dense and Very Dense Gray and Light Brown Fine Sand with Rock, trace of Silt Fines, Shell and Phosphates (SP)						
		12-8-7	15									
		6-6-9	15									
10		5-5-6	11									
15		14-16-18	34			BORING TERMINATED						

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UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0530.1900227.0000

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-18**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/12/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 3.7

DATE FINISHED: 12/12/19

REMARKS:

DATE OF READING: 12/12/2019

DRILLED BY: JE/MA/MT

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0												
		4-4-6	10			Loose to Medium Dense Brown Fine Sand with trace of Roots (SP)						
		5-7-8	15									
		8-6-9	15			Medium Dense Brown Clayey Sand with trace of Roots (SC)						
5						Hard to Fractured Rock						
		12-20-50/5"	50+									
		50-13-15	28									
		13-10-11	21			Medium Dense Gray and Light Brown Fine Sand with Rock, Shell and trace of Phosphates (SP)						
10		16-7-10	17									
15		9-15-10	25			Medium Dense Light Gray Fine Sand with Silt Fines, trace of Rock, Shell and Phosphates (SP-SM)						
						BORING TERMINATED						

BORING LOG 0530.1900227.0000.GPJ UNIENGSC.GDT 1/2/20



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0530.1900227.0000
REPORT NO.:	
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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-19** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/13/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): 3.7 DATE FINISHED: 12/13/19

REMARKS:

DATE OF READING: 12/13/2019 DRILLED BY: JE/MA/MT

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Medium Dense Light Gray Fine Sand (SP)						
		4-5-6	11			Medium Dense Light Brown and Gray Fine Sand with Clay Fines (SP-SC)						
		9-8-12	20	▼		Medium Dense Gray Clayey Sand (SC)	10	19				
		5-6-5	11			Medium Dense Gray and Light Gray Fine Sand with Rock and Shell Fragments (SP)						
5		4-6-9	15									
		6-15-15	30									
		12-10-10	20			Medium Dense Gray Fine Sand with Rock, trace of Shell and Phosphates (SP)						
10		12-16-10	26									
15		9-11-13	24			BORING TERMINATED						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0530.1900227.0000
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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-20** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/13/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 3.4 DATE FINISHED: 12/13/19

REMARKS:

DATE OF READING: 12/13/2019 DRILLED BY: JE/MA/MT

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Medium Dense Light Brown Fine Sand with trace of Roots (SP)						
		3-5-8	13									
		7-6-6	12	▼		Medium Dense Light Brown Silty Sand with trace of Shell Fragments (SM)						
		6-6-4	10			Loose and Medium Dense Gray Fine Sand with Rock and varying amounts of Shell Fragments (SP)						
5		4-5-4	9									
		8-8-8	16									
		7-7-5	12									
10		3-4-6	10									
						Medium Dense Gray Fine Sand with Rock, trace of Shell and Phosphates (SP)						
15		11-8-6	14			BROING TERMINATED						

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UNIVERSAL ENGINEERING SCIENCES BORING LOG

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-21**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/13/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.0 DATE FINISHED: 12/13/19

REMARKS:

DATE OF READING: 12/13/2019 DRILLED BY: JE/MA/MT

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		2-3-3	6		▼	Loose to Medium Dense Brown Fine Sand with trace of Roots (SP)						
		4-5-6	11			Medium Dense and Loose Brown and Light Gray Fine Sand with trace of Shell and Rock (SP)						
		5-5-7	12									
5		6-5-5	10									
		6-7-8	15									
		9-10-10	20									
10		10-9-9	18				Medium Dense Gray Fine Sand with Rock, trace of Silt Fines, Shell and Phosphates (SP)					
15		9-8-9	17				BORING TERMINATED					

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-22**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/13/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.2

DATE FINISHED: 12/13/19

REMARKS:

DATE OF READING: 12/13/2019

DRILLED BY: JE/MA/MT

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown Fine Sand with trace of Roots and Wood Pieces (SP)						
		2-3-4	7									
		3-3-6	9			Medium Dense Gray Fine Sand (SP)						
		6-6-6	12	▼		Medium Dense Brown and Light Brown Clayey Sand with trace of Shell Fragments (SC)						
5		5-5-6	11			Fractured Rock						
		12-16-16	32									
		17-19-20	39									
10		9-8-9	17			Medium Dense Brown Fine Sand with Shell and trace of Rock Fragments (SP)						
15		8-8-7	15			Medium Dense Gray Fine Sand with Silt Fines, trace of Rock and Shell Fragments (SP-SM)						
						BORING TERMINATED						



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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-23** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners
 LOCATION: See Boring Locaton Plan
 REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 12/13/19
 WATER TABLE (ft): 4.4 DATE FINISHED: 12/13/19
 DATE OF READING: 12/13/2019 DRILLED BY: JE/MA/MT
 EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Medium Dense Gray and Light Brown Fine Sand with trace of Roots (SP)						
		3-5-6	11									
		5-6-6	12									
		7-7-8	15	▼		Medium Dense Light Brown Clayey Sand (SC)						
5		10-11-11	22			Medium Dense Light Brown Fine Sand with Rock Fragments (SP)	13	15				
		4-5-6	11			Medium Dense and Very Dense Gray and Light Brown Fine Sand with Rock, Shell and trace of Phosphates (SP)						
		12-24-29	53									
10		9-9-9	18									
						Medium Dense Light Gray Fine Sand with Silt Fines, trace of Rock and Shell Fragments (SP-SM)						
15		8-10-11	21			BORING TERMINATED						



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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-24**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/13/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.5

DATE FINISHED: 12/13/19

REMARKS:

DATE OF READING: 12/13/2019

DRILLED BY: JE/MA/MT

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown Fine Sand with trace of Roots (SP)						
		3-3-4	7			Medium Dense Light Brown Fine Sand (SP)						
		5-5-7	12			Medium Dense Light Brown and Light Gray Clayey Sand with trace of Rock and Roots (SC)						
		6-8-9	17	▼		Dense, Very Dense and Medium Dense Brown, Gray, Light Brown and Light Gray Fine Sand with varying amounts of Rock and Shell Fragments (SP)						
5		23-36-12	48									
		14-26-29	55									
		11-13-11	24									
10		9-10-10	20									
15		10-11-28	39			BORING TERMINATED						

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-25** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners
LOCATION: See Boring Locaton Plan

G.S. ELEVATION (ft): DATE STARTED: 12/16/19
WATER TABLE (ft): 4.5 DATE FINISHED: 12/16/19
DATE OF READING: 12/16/2019 DRILLED BY: JE/ED
EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

REMARKS:

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Gray Fine Sand with Roots (SP)						
		3-4-6	10			Medium Dense and Loose Brown and Light Brown Clayey Sand with trace of Shell Fragments (SC)	13	11				
		4-6-5	11									
		3-3-2	5	▼								
5		4-5-8	13			Medium Dense Brown and Light Brown Fine Sand with Shell Fragments (SP)						
		8-11-17	28			Medium Dense Light Brown Fine Sand with Rock and Shell Fragments (SP)						
		13-10-7	17									
10		6-10-12	22									
						Medium Dense Gray Fine Sand with Silt Fines, Rock, Shell and trace of Phosphates (SP-SM)						
15		7-7-6	13			BORING TERMINATED						

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PROJECT NO.:	0530.1900227.0000
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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-26**
 SECTION: TOWNSHIP:

SHEET: **1 of 1**
 RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/16/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.4

DATE FINISHED: 12/16/19

REMARKS:

DATE OF READING: 12/16/2019

DRILLED BY: JE/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Gray Fine Sand with trace of Roots (SP)						
		3-3-6	9			Loose Brown Clayey Sand with trace of Roots (SC)						
		6-5-5	10			Medium Dense Light Brown Fine Sand (SP)						
		6-7-6	13	▼								
5		6-6-5	11			Medium Dense Light Brown and Light Gray Fine Sand with Shell Fragments (SP)						
		7-8-8	16									
		7-7-5	12			Medium Dense Light Brown and Light Gray Fine Sand with Shell and trace of Phosphates (SP)						
10		6-5-6	11									
						Medium Dense Gray Silty Sand with Rock, trace of Shell and Phosphates (SM)						
15		9-10-9	19			BORING TERMINATED						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-27** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/16/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.5 DATE FINISHED: 12/16/19

REMARKS:

DATE OF READING: 12/16/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown and Gray Fine Sand with trace of Roots (SP)						
		3-4-6	10									
		6-5-4	9			Medium Dense Light Brown Fine Sand (SP)						
		6-7-7	14	▼		Medium Dense Brown Clayey Sand (SC)						
5		7-8-9	17			Medium Dense Light Brown and Light Gray Fine Sand with Shell Fragments (SP)	15	16				
		9-10-8	18									
		8-8-8	16			Medium Dense Gray, Light Brown and Light Gray Fine Sand with Shell, trace of Silt, Fines and Phosphates (SP)						
10		8-7-6	13									
15		8-9-11	20			BORING TERMINATED						

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UNIVERSAL ENGINEERING SCIENCES BORING LOG

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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-28** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/16/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.2 DATE FINISHED: 12/16/19

REMARKS:

DATE OF READING: 12/16/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Gray Fine Sand with trace of Roots (SP)						
		2-3-4	7			Loose Brown Fine Sand with trace of Roots and Clay Fines (SP)						
		4-4-3	7			Medium Dense Brown and Gray Clayey Sand (SC)						
		6-7-8	15	▼		Medium Dense Gray and Light Brown Fine Sand with Rock, trace of Shell and Phosphates (SP)						
5		6-12-13	25			Medium Dense Brown and Gray Fine Sand with trace of Shell and Phosphates (SP)						
		12-13-11	24									
		9-9-8	17									
10		8-7-9	16									
15		6-5-6	11			BORING TERMINATED						

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UNIVERSAL ENGINEERING SCIENCES BORING LOG

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-29**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/16/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): 4.2

DATE FINISHED: 12/16/19

REMARKS:

DATE OF READING: 12/16/2019

DRILLED BY: JE/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose to Medium Dense Brown and Gray Fine Sand with trace of Roots (SP)						
		3-5-5	10				1	7				
		6-5-6	11			Medium Dense Brown Silty Sand (SM)						
		5-8-5	13	▼								
5		36-38-41	79			Very Dense, Dense and Medium Dense Gray and Light Brown Fine Sand with Rock, trace of Shell and Phosphates (SP)						
		27-24-15	39									
		14-13-13	26									
10		4-7-4	11			Medium Dense Gray Fine Sand with trace of Silt and Phosphates (SP)						
15		4-5-6	11			BORING TERMINATED						



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PROJECT NO.: 0530.1900227.0000

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-30**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/16/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.5

DATE FINISHED: 12/16/19

REMARKS:

DATE OF READING: 12/16/2019

DRILLED BY: JE/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown Fine Sand with trace of Roots (SP)						
		3-3-4	7			Medium Dense Brown Clayey Sand with trace of Roots (SC)						
		3-5-6	11			Medium Dense Light Brown Silty Sand with Rock Fragments (SM)						
		6-5-6	11	▼		Medium Dense Light Brown Fine Sand with Rock and trace of Shell Fragments (SP)	12	10				
5		6-6-7	13			Medium Dense Gray Fine Sand with Rock and trace of Phosphates (SP)						
		8-9-9	18									
		8-10-7	17									
10		9-9-7	16									
						Medium Dense Gray Silty Sand with trace of Phosphates (SM)						
15		8-9-11	20			BORING TERMINATED						

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-31**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/17/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.1

DATE FINISHED: 12/17/19

REMARKS:

DATE OF READING: 12/17/2019

DRILLED BY: JE/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		2-3-4	7		[Stippled]	Loose to Medium Dense Brown and Light Brown Fine Sand (SP)						
		3-4-7	11		[Diagonal lines]	Medium Dense Gray Clayey Sand with Roots (SC)						
		5-6-5	11	▼	[Stippled]	Medium Dense Brown Fine Sand with Rock and trace of Shell Fragments (SP)						
5		13-12-10	22		[Brick pattern]	Fractured Rock						
		18-22-26	48		[Stippled]	Medium Dense Gray Fine Sand with trace of Shell Fragments (SP)						
		8-8-7	15		[Stippled]	Medium Dense Gray Fine Sand with Rock, trace of Silt Fines, Shell and Phosphates (SP)						
10		8-10-11	21		[Stippled]	Medium Dense Gray Fine Sand with Rock, trace of Silt Fines, Shell and Phosphates (SP)						
		9-9-9	18		[Stippled]	Medium Dense Gray Fine Sand with Rock, trace of Silt Fines, Shell and Phosphates (SP)						
15						BORING TERMINATED						

BORING_LOG_0530.1900227.0000.GPJ_UNIENEGSC.GDT_1/2/20



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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-32** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/17/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): 4.0 DATE FINISHED: 12/17/19

REMARKS:

DATE OF READING: 12/17/2019 DRILLED BY: JE/ED
EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		3-4-5	9		[Symbol: Dotted]	Loose to Medium Dense Brown, Gray and Light Brown Fine Sand with trace of Roots (SP)						
		6-7-6	13									
		8-6-5	11	▼	[Symbol: Diagonal Lines]	Medium Dense Light Brown Clayey Sand (SC)						
5		7-7-8	15		[Symbol: Dotted]	Medium Dense to Loose Brown and Gray Fine Sand with Shell Fragments (SP)						
		3-2-2	4									
		7-8-11	19		[Symbol: Dotted]	Medium Dense Gray Fine Sand with trace of Shell and Phosphates (SP)						
10		9-10-12	22									
					[Symbol: Vertical Lines]	Medium Dense Gray Fine Sand with Silt Fines, Rock, trace of Shell and Phosphates (SP-SM)						
15		9-7-10	17			BORING TERMINATED						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0530.1900227.0000
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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-33** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/17/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 3.6 DATE FINISHED: 12/17/19

REMARKS:

DATE OF READING: 12/17/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)	
									LL	PI			
0													
		2-3-3	6		▼	Loose to Medium Dense Brown, Gray and Light Brown Fine Sand (SP)							
		4-5-6	11										
		6-8-8	16										
5		10-10-11	21		▼	Medium Dense Gray, Light Brown and Light Gray Silty Sand with Rock and trace of Shell Fragments (SM)							
		11-11-12	23										
		8-9-10	19					15	16				
10		11-12-13	25										
15		9-11-11	22			Medium Dense Gray Fine Sand with Silt Fines, Shell and trace of Phosphates (SP-SM)							
						BORING TERMINATED							



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PROJECT NO.: 0530.1900227.0000

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-34** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/17/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.7 DATE FINISHED: 12/17/19

REMARKS:

DATE OF READING: 12/17/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		3-3-4	7			Loose to Medium Dense Brown, Gray and Light Brown Fine Sand with trace of Roots (SP)						
		6-6-9	15									
		8-8-8	16									
5		7-8-10	18			Medium Dense Brown and Gray Clayey Sand with trace of Roots and Shell Fragments (SC)						
		8-9-9	18			Medium Dense Light Brown Fine Sand with Rock and Shell Fragments (SP)						
		7-10-11	21									
10		6-5-4	9			Loose and Medium Dense Gray, Light Brown and Light Gray Fine Sand with Shell, trace of Silt and Phosphates (SP)						
15		5-5-6	11			BORING TERMINATED						



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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-35** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/17/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.3 DATE FINISHED: 12/17/19

REMARKS:

DATE OF READING: 12/17/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Gray Fine Sand with trace of Roots (SP)						
		3-4-5	9			Medium Dense Brown and Light Brown Fine Sand (SP)						
		5-5-6	11									
		6-6-6	12	▼		Medium Dense Brown, Light Brown and Light Gray Fine Sand with Shell Fragments (SP)						
5		6-7-5	12									
		8-10-13	23									
		11-13-14	27									
10		8-10-10	20			Medium Dense Light Brown and Light Gray Fine Sand with Rock, trace of Silt, Shell and Phosphates (SP)						
15		7-9-9	18			BORING TERMINATED						



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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-36** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/17/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.1 DATE FINISHED: 12/17/19

REMARKS:

DATE OF READING: 12/17/2019 DRILLED BY: JE/ED
 EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Gray Fine Sand with trace of Roots (SP)						
		3-4-6	10			Loose Light Brown Clayey Sand with trace of Roots (SC)	13	13				
		5-5-4	9									
		6-5-7	12	▼		Medium Dense Light Brown and Light Gray Fine Sand with Shell Fragments (SP)						
5		7-7-8	15			Medium Dense Light Brown and Light Gray Fine Sand with Rock and Shell Fragments (SP)						
		9-10-11	21			Medium Dense Gray and Light Brown Fine Sand with Rock, Shell, trace of Silt and Phosphates (SP)						
		12-13-12	25									
10		10-10-9	19									
		9-10-12	22									
15						BORING TERMINATED						



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PROJECT NO.: 0530.1900227.0000

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-37**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/18/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.1

DATE FINISHED: 12/18/19

REMARKS:

DATE OF READING: 12/18/2019

DRILLED BY: JE/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0												
		1-3-5	8			Loose to Medium Dense Brown, Gray and Light Brown Fine Sand with trace of Roots (SP)						
		7-6-8	14									
		7-8-7	15	▼								
5						Medium Dense Brown and Light Brown Fine Sand with Shell and Rock Fragments (SP)						
		8-5-7	12									
		6-10-9	19									
		12-10-11	21			Medium Dense Brown and Gray Fine Sand with Rock, trace of Shell and Phosphates (SP)						
10		4-7-9	16									
							Loose Gray Fine Sand with Silt Fines, Rock, trace of Shell and Phosphates (SP-SM)					
		6-5-4	9									
15						BORING TERMINATED						

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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-38**
 SECTION: TOWNSHIP:

SHEET: **1 of 1**
 RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/18/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): 4.0 DATE FINISHED: 12/18/19

REMARKS:

DATE OF READING: 12/18/2019 DRILLED BY: JE/ED
 EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		3-4-6	10			Loose to Medium Dense Brown and Gray Fine Sand with trace of Roots (SP)						
		6-6-5	11			Medium Dense Brown Clayey Sand (SC)						
		7-8-6	14	▼		Medium Dense Brown and Gray Fine Sand with Rock and Shell Fragments (SP)						
5		8-8-10	18									
		10-11-9	20									
		2-2-2	4			Loose to Medium Dense Brown and Gray Fine Sand with Rock, trace of Shell and Phosphates (SP)						
10		7-6-7	13									
15		9-8-6	14			Medium Dense Gray Fine Sand with Silt Fines, Rock, trace of Shell and Phosphates (SP-SM)	9	11				
						BORING TERMINATED						



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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-39** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/18/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): 3.6 DATE FINISHED: 12/18/19

REMARKS:

DATE OF READING: 12/18/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		3-3-4	7			Loose Brown, Gray and Light Brown Fine Sand with trace of Roots (SP)						
		4-3-4	7									
		4-4-5	9									
5		6-7-9	16			Medium Dense Light Brown Fine Sand with Shell and Rock Fragments (SP)						
		7-7-7	14									
		10-11-12	23									
10		9-9-10	19			Medium Dense Gray and Light Gray Fine Sand with Rock, Shell, trace of Silt Fines and Phosphates (SP)						
		10-12-13	25									
15						BORING TERMINATED						



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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-40**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/18/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): 4.4

DATE FINISHED: 12/18/19

REMARKS:

DATE OF READING: 12/18/2019

DRILLED BY: JE/ED

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

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Gray Fine Sand with trace of Roots (SP)						
		2-3-4	7			Medium Dense Light Brown Clayey Sand (SC)						
		6-7-7	14			Medium Dense Light Gray Silty Sand with Rock Fragments (SM)						
		7-9-9	18	▼		Loose Light Brown Fine Sand with Rock and trace of Shell Fragments (SP)	15	7				
5		5-4-4	8			Medium Dense Gray Fine Sand with Rock, Shell and trace of Phosphates (SP)						
		6-7-10	17			Medium Dense Gray Silty Sand with Rock and trace of Phosphates (SM)						
		7-9-11	20			Medium Dense Gray Fine Sand with Shell and trace of Phosphates (SP)						
10		8-9-10	19			BORING TERMINATED						
15		8-7-7	14									

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-41** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/19/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.2 DATE FINISHED: 12/19/19

REMARKS:

DATE OF READING: 12/19/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLING	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Gray Fine Sand with trace of Roots (SP)						
		3-4-5	9			Medium Dense Light Brown Fine Sand with Clay Fines and trace of Roots (SP-SC)						
		6-6-7	13			Medium Dense Gray and Light Brown Fine Sand with Rock Fragments (SP)						
		8-7-6	13	▼								
5												
		10-11-13	24			Fractured Rock						
		19-23-26	49									
		8-10-11	21			Medium Dense Gray Fine Sand with trace of Rock, Shell and Phosphates (SP)						
						Medium Dense Light Brown Silty Sand with trace of Shell and Phosphates (SM)						
10		8-8-8	16				43	22				
						Medium Dense Gray Fine Sand with Silt Fines and trace of Shell and Phosphates (SP)						
15		6-6-5	11			BORING TERMINATED						

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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-42** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/19/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 3.7 DATE FINISHED: 12/19/19

REMARKS:

DATE OF READING: 12/19/2019 DRILLED BY: JE/ED

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0												
		3-3-5	8			Loose Brown, Gray and Dark Gray Fine Sand with trace of Roots (SP)						
		4-3-4	7			Medium Dense Light Gray Fine Sand with Rock Fragments (SP)						
		9-9-10	19	▼		Fractured Rock						
5		12-28-33	61			Medium Dense Light Brown and Light Gray Fine Sand with Shell Fragments (SP)						
		6-6-8	14			Medium Dense Gray and Light Gray Fine Sand with Rock, Shell, trace of Silt Fines and Phosphates (SP)						
		12-10-10	20									
10		11-13-13	26									
15		12-11-11	22			BORING TERMINATED						

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UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0530.1900227.0000
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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-43** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/21/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.5 DATE FINISHED: 12/21/19

REMARKS:

DATE OF READING: 12/21/2019 DRILLED BY: MA/MT

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Medium Dense to Dense Brown, Light Brown and Light Gray Fine Sand (SP)						
		7-4-11	15									
		10-24-12	36									
		18-19-10	29	▼		Medium Dense Light Brown Fine Sand with Clay Fines (SP-SC)						
5		10-14-16	30			Medium Dense Light Brown and Light Gray Silty Sand with Rock Fragments (SM)						
		8-10-9	19									
		15-10-5	15			Medium Dense Gray and Light Brown Fine Sand with Rock and Shell Fragments (SP)						
10		6-50/6"	50+			Hard Rock BORING TERMINATED						

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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-44**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/21/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.5

DATE FINISHED: 12/21/19

REMARKS:

DATE OF READING: 12/21/2019

DRILLED BY: MA/MT

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

TYPE OF SAMPLING: MA/MT

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		3-4-4	8			Loose to Medium Dense Brown and Light Brown Fine Sand with Rock Fragments (SP)						
		6-7-9	16			Medium Dense to Loose Dark Gray Clayey Sand with Roots (SC)						
		6-8-7	15	▼								
5		6-4-3	7			Loose Gray Silty Sand with Rock Fragments (SM)						
		8-6-4	10			Very Loose Gray Fine Sand with Rock and trace of Phosphates (SP)						
		2-2-2	4									
10		1-1-1	2			BORING TERMINATED						



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PROJECT: Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, FL

BORING DESIGNATION: **B-45**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/21/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 3.9 DATE FINISHED: 12/21/19

REMARKS:

DATE OF READING: 12/21/2019 DRILLED BY: MA/MT

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

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown and Light Brown Fine Sand with Rock Fragments (SP)						
		4-3-3	6									
		5-5-5	10									
		7-12-11	23			Medium Dense Dark Gray and Light Brown Fine Sand with trace of Clay Fines (SP)						
5												
		13-45-8	53			Very Dense to Medium Dense Dark Gray Clayey Sand with trace of Roots (SC)						
		9-10-11	21									
		6-5-4	9			Loose to Medium Dense Light Gray Silty Sand with Rock (SM)						
10												
		6-6-5	11									
						BORING TERMINATED						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0530.1900227.0000
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PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-46** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/21/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): 4.2 DATE FINISHED: 12/21/19

REMARKS:

DATE OF READING: 12/21/2019 DRILLED BY: MA/MT

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		7-10-11	21			Medium Dense Gray and Light Brown Fine Sand with trace of Rock Fragments (SP)						
		14-10-16	26			Medium Dense to Dense Light Brown Fine Sand with Clay Fines and Rock Fragments (SP-SC)						
		14-17-20	37	▼		Very Dense Brown and Light Brown Fine Sand with Rock (SP)						
5		19-22-30	52			Very Dense Brown and Light Brown Fine Sand with Rock (SP)						
		16-32-90	122			Very Dense Brown and Light Brown Fine Sand with Rock (SP)						
		60-50/2"	50+			Hard Rock						
						BORING TERMINATED						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0530.1900227.0000
REPORT NO.:	
PAGE:	47

PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-47**
 SECTION: TOWNSHIP:

SHEET: **1 of 1**
 RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/21/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.5

DATE FINISHED: 12/21/19

REMARKS:

DATE OF READING: 12/21/2019

DRILLED BY: MA/MT

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

TYPE OF SAMPLING: MA/MT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0						Loose Brown Fine Sand with Rock Fragments (SP)						
		7-4-5	9			Medium Dense Gray and Light Brown Fine Sand (SP)						
		4-6-9	15			Medium Dense Dark Gray Clayey Sand (SC)						
		5-6-7	13	▼		Medium Dense Gray Fine Sand (SP)						
5		7-9-12	21			Medium Dense Dark Gray Clayey Sand (SC)						
		10-6-9	15			Hard Rock						
		5-50/4"	50+									



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0530.1900227.0000
REPORT NO.:	
PAGE:	48

PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-48**
 SECTION: TOWNSHIP:

SHEET: **1 of 1**
 RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft):

DATE STARTED: 12/21/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft):

DATE FINISHED: 12/21/19

REMARKS:

DATE OF READING: 12/21/2019

DRILLED BY: MA/MT

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

TYPE OF SAMPLING: MA/MT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0												
		7-8-6	14			Medium Dense Brown Fine Sand with trace of Roots and Clay Fines (SP)						
		9-7-10	17			Medium Dense Light Brown Fine Sand with Rock Fragments (SP)						
		7-11-10	21			Medium Dense Light Brown Fine Sand with trace of Clay Fines (SP)						
5		14-50-26	76			Very Dense, Dense and Medium Dense Brown, Gray and Light Brown Fine Sand with Rock and trace of Roots (SP)						
		15-19-25	44									
		10-7-6	13									
10		5-10-9	19									
						BORING TERMINATED						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0530.1900227.0000
REPORT NO.:	
PAGE:	49

PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-49** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/21/19

LOCATION: See Boring Location Plan

WATER TABLE (ft): DATE FINISHED: 12/21/19

REMARKS:

DATE OF READING: 12/21/2019 DRILLED BY: MA/MT

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0		6-5-4	9		[Symbol: Dotted]	Loose to Medium Dense Gray and Light Gray Silty Sand with Rock Fragments (SM)						
		9-9-14	23		[Symbol: Horizontal Lines]	Medium Dense Gray Fine Sand with Clay Pieces (SP-SC)						
		9-10-17	27		[Symbol: Diagonal Lines /]	Loose Dark Gray Clayey Sand with trace of Roots (SC)						
5		5-5-4	9		[Symbol: Diagonal Lines \]	Very Dense Dark Gray and Gray Fine Sand with Clay Fines (SP-SC)						
		9-48-30	78		[Symbol: Diagonal Lines /]	Medium Dense Brown and Dark Brown Clayey Sand with trace of Roots (SC)						
		12-13-10	23		[Symbol: Diagonal Lines \]							
10		17-10-14	24		[Symbol: Diagonal Lines /]							
						BORING TERMINATED						

BORING LOG 0530.1900227.0000.GPJ UNIENGS.GDT 1/2/20



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0530.1900227.0000
REPORT NO.:	
PAGE:	50

PROJECT: Yellow Fever Creek Restoration Project
 Del Prado Boulevard N
 Cape Coral, Lee County, FL

BORING DESIGNATION: **B-50** SHEET: **1 of 1**
 SECTION: TOWNSHIP: RANGE:

CLIENT: Lee County Board of County Commissioners

G.S. ELEVATION (ft): DATE STARTED: 12/21/19

LOCATION: See Boring Locaton Plan

WATER TABLE (ft): 4.8 DATE FINISHED: 12/21/19

REMARKS:

DATE OF READING: 12/21/2019 DRILLED BY: MA/MT

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

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		UCS (tsf)	ORG. CONT. (%)
									LL	PI		
0												
		10-11-13	24			Medium Dense, Dense and Loose Light Brown and Light Gray Fine Sand with Rock and trace of Silt Fines (SP)						
		14-19-21	40									
		8-6-4	10									
5				▼								
		19-21-46	67			Very Dense Light Brown Fine Sand with Clay Pieces and Rock Fragments (SP-SC)						
		13-21-50/4"	50+									
		27-19-44	63			Very Dense Light Brown and Light Gray Fine Sand with Rock Fragments (SP)						
10												
		29-31-47	78			Very Dense Light Brown Clayey Sand with Rock Fragments (SC)						
						Hard Rock						
15		50/1"	50+									
20		50/1"	50+									
25						BORING TERMINATED						

BORING_LOG_0530.1900227.0000.GPJ_UNIENGSC.GDT_1/2/20

SUMMARY OF LABORATORY TEST RESULTS

Yellow Fever Creek Restoration Project
Del Prado Boulevard N
Cape Coral, Lee County, Florida

Boring No.	Depth (ft)	Moisture Content (%)	Sieve Analysis (Percent Passing) #200	Unified Soil Classification
B-1	2 - 3	16	10	SP-SC
B-2	4.5 - 6	13	7	SP-SM
B-3	9 - 10.5	16	17	SM
B-6	0 - 1.5	3	1	SP
B-8	4.5 - 6	10	10	SP-SM
B-10	9 - 10.5	15	13	SM
B-12	1.5 - 3	14	14	SC
B-15	3 - 4.5	23	17	SC
B-16	13.5 - 15	12	10	SP-SM
B-19	1.5 - 3	19	10	SP-SC
B-23	3 - 4.5	15	13	SC
B-25	1.5 - 3	11	13	SC
B-27	4.5 - 6	16	15	SC
B-29	0 - 1.5	7	1	SP
B-30	3 - 4.5	10	12	SM
B-33	7.5 - 9	16	15	SM
B-36	1.5 - 3	13	13	SC
B-38	13.5 - 15	11	9	SP-SM
B-40	3 - 4.5	7	15	SM
B-41	9 - 10.5	22	43	SM



KEY TO BORING LOGS

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): Includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms	Relative Density	SPT Blow Count
Very loose	0 to 15 %	< 4
Loose	15 to 35 %	4 to 10
Medium dense	35 to 65 %	10 to 30
Dense	65 to 85 %	30 to 50
Very dense	85 to 100 %	> 50

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

Descriptive Terms	Unconfined Compressive	
	Strength kPa	SPT Blow Count
Very soft	< 25	< 2
Soft	25 to 50	2 to 4
Medium stiff	50 to 100	4 to 8
Stiff	100 to 200	8 to 15
Very stiff	200 to 400	15 to 30
Hard	> 400	> 30

GENERAL NOTES

- Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.
- Surface elevations are based on topographic maps and estimated locations.
- Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were made. They are not guaranteed to be representative of subsurface conditions at other locations or times.

SYMBOLS

- Measured Water Table Level
 Estimated Seasonal High Water Table

Major Divisions	Group Symbols	Typical Names	Laboratory Classification Criteria	Particle Size					
Coarse-Grained soils (More than half the material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is smaller than No. 4 sieve size)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve) coarse-grained soils are classified as follows: Less than 5 percent..... GW, GP, SW, SP More than 12 percent..... GM, GC, SM, SC 5 to 12 percent..... Borderline cases requiring dual symbols*	Sieve sizes < #200 #200 to #40 #40 to #10 #10 to #4				
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines						
	Sands (More than half of coarse fraction is larger than No. 4 sieve size)	GM	Silty gravels, gravel-sand-silt mixtures			Not meeting all gradation requirements for GW Atterberg limits below "A" line or P.I. less than 4 Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols			
		GC	Clayey gravels, gravel-sand-silt mixtures			Atterberg limits above "A" line or P.I. greater than 7 $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3			
	Sands with fines (Appreciable amount of fines)	SW	Well-graded sands, gravelly sands, little or no fines			Not meeting all gradation requirements for SW Atterberg limits below "A" line or P.I. less than 4 Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols	mm < 0.074 0.074 to 0.42 0.42 to 2.00 2.00 to 4.75		
		SP	Poorly-graded sands, gravelly sands, little or no fines						
		SM	Silty sands, sand-silt mixtures						
		SC	Clayey sands, sand-clay mixtures						
		Sands with fines (Little or no fines)	GW					Well-graded gravels, gravel-sand mixtures, little or no fines	Atterberg limits below "A" line or P.I. less than 4 Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			GP					Poorly-graded gravels, gravel-sand mixtures, little or no fines	
Fine-Grained soils (More than half the material is smaller than No. 200 sieve size)	Silts and Clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	Plasticity Chart 					
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays						
	OL	Organic silts and organic silty clays of low plasticity							
	Silts and Clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or distomaceous fine sandy or silty soils, organic silts						
		CH	Inorganic clays of high plasticity, fat clays						
		OH	Organic clays of medium to high plasticity, organic silts						
	Highly Organic Soils	Pt	Peat and other highly organic soils		Material Gravel Fine Coarse Cobble Boulders				

* When the percent passing a No. 200 sieve is between 5% and 12%, a dual symbol is used to denote the soil. For example: SP-SC, poorly-graded sand with clay content between 5% and 12%.

APPENDIX C



Important Information about Your 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.

Geotechnical 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 civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- 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,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- 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. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.*

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of 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 equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/THE BEST PEOPLE ON EARTH exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE THE GEOPROFESSIONAL BUSINESS ASSOCIATION

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CONSTRAINTS AND RESTRICTIONS

WARRANTY

Universal Engineering Sciences has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

UNANTICIPATED SOIL

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the boring Location Plan. This report does not reflect any variations which may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Universal Engineering Sciences, as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and Universal Engineering Sciences of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of Universal Engineering Sciences to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

MISINTERPRETATION OF SOIL ENGINEERING REPORT

Universal Engineering Sciences is responsible for the conclusions and opinion contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data presented are made by others, those conclusions or recommendations are not the responsibility of Universal Engineering Sciences.

CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by Universal Engineering Sciences.

USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations.

Bidders are urged to make their own soil borings, test pits, test caissons or other investigations determine those conditions that may affect construction operations. Universal Engineering Sciences cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicated normally occurring conditions. Water levels may not have been stabilized at the last reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuation in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions and variations.

LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for Universal Engineering Sciences to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by Universal Engineering Sciences to locate any such buried objects which are subsequently encountered during construction that are not discussed within the text of this report.

TIME

This report reflects the soil conditions at the time of investigation. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.