UNIVERSAL
ENGINEERING SCIENCES
Consultants in: Geotechnical Engineering • Environmental Engineering
Construction Materials Testing • Threshold Inspection • Private Provider Inspection

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Rockledge
Sarasota
Tampa
West Palm Beach

March 28, 2019

Genesis Group
2507 Callaway Road, Suite 100
Tallahassee, FL 32303

Attention: Mr. David Goree, E.I.

Reference: **Report of Geotechnical Consulting Services**
Andrews Wildlife Management Area Improvements
Stormwater Management System
NW 90th Avenue
Chiefland, Levy County, Florida
UES Project No. 0230.1900027.0000 UES Report No. 1658203

Dear Mr. Goree:

Universal Engineering Sciences, Inc. (UES) has completed geotechnical engineering services for the proposed new stormwater management system at the subject project in Chiefland, Levy County, Florida, as authorized in Proposal 1634085v2, dated February 27, 2019. This report presents the results of our subsurface field exploration, laboratory soil testing programs, and recommendations for the proposed stormwater management facility.

Objectives

The objectives of our geotechnical consulting services on this portion of the project have been summarized as follows:

- Explore the subsurface conditions within the suggested area to gather information concerning the near-surface soil conditions,
- Perform a series of laboratory tests on selected subsurface soil specimens to assist with engineering soil classifications and to establish the relevant soil composition and permeability characteristics,
- Classify and stratify the various soil strata encountered in the soil test borings,
- Evaluate the groundwater level in the area of exploration and make appropriate recommendations,
- Recommend appropriate subsurface soil design parameter values for design of the on-site stormwater management system.
- Present soil tests boring logs for the proposed structures.

Project Information

The subject parcel is located along NW 90th Avenue in Chiefland, Levy County, Florida. Current site development plans include construction of stormwater management facilities. The number and locations of the borings were selected by the design team.

By contract, our exploration was confined to the zone of soil likely to be stressed by the proposed construction. Our work did not address the potential for surface expression of deep geological conditions, such as sinkholes. This evaluation requires a more extensive range of field services than performed in this study. We will be pleased to conduct an exploration to evaluate the probable effect of the regional geology upon the proposed construction, if you desire.

Site Conditions

UES personnel visited the project parcel during the performance of the field portion of this geotechnical study. Our on-site observations have been summarized as follows. At the time of our exploration, the project parcel was partially developed, with existing park facilities, and moderately wooded. The surface soils were observed to be sandy and dry. Surface organic soils, surface debris, were not observed on the project site.

Local Geology

The general geology of Levy County is characterized by 30 to 50 feet of undifferentiated fine to medium grain sand and clayey sand of Holocene Age overlying limestone of the Ocala Group. The Gulf Coastal Lowlands in Levy County are characterized by broad, flat marine erosional plains that are underlain by Eocene limestone and blanketed by thin Pleistocene sands deposited by the regressing Gulf of Mexico. Due to the general lack of overlying sediment layers, save for the thin layers of sands, marls and coquina which are sporadic and are not really confining, the sole aquifer of the region, the Floridan, is unconfined in the coastal zones. The surface of the upper Floridan Aquifer in the general project site area is estimated in the elevation range of +10 feet NGVD.

General Area Soils Information

The *USDA Soil Survey of Levy County, Florida* describes the near-surface soil profile in the general project area as Otela and Shadeville soils. Relevant engineering index properties have been summarized below in Tables 1 and 2.

Table 1 – Relevant Engineering Index Properties of Otela soil (12)

Depth, Inches	Texture	Classification	% Passing #200 Sieve	Plasticity Index	Shrink-swell Potential	Permeability
0-50	Fine sand	SP-SM, SM	5-15	NP	Low	6.0-20 in/hr
50-68	Sandy clay loam, sandy loam, loamy fine sand	SM, SC-SM, SC	20-50	NP-15	Low	0.06-0.6 in/hr
68-80	Sandy clay loam, sandy clay, clay	SC, CL, CH	45-95	20-39	Moderate	0.06-0.6 in/hr

Table 2 – Relevant Engineering Index Properties of Shadeville soil (14)						
Depth, Inches	**Texture**	**Classification**	**% Passing #200 Sieve**	**Plasticity Index**	**Shrink-swell Potential**	**Permeability**
0-8	Fine sand	SP-SM, SM	5-15	NP	Low	6.0-20 in/hr
8-35	Fine sand	SP-SM, SM	5-15	NP	Low	6.0-20 in/hr
35-60	Fine sandy loam, sandy loam, sandy clay loam	SM, SC-SM, SC	20-45	NP-20	Low	0.6-2.0 in/hr
60-64	Fine sandy loam, sandy clay loam, sandy clay	SM, SC, CL, CH	22-60	7-25	Moderate	0.06-0.2 in/hr
64	Weathered bedrock	---	---	---	---	---

Subsurface Exploration

The field geotechnical testing activities were started on March 14, 2019 and completed on March 15, 2019. Field tests for this portion of the geotechnical study included five (5) soil test borings to depths of 15 feet in the area of the proposed improvements, and one Double-Ring Infiltrometer (DRI) test performed at the locations shown on the attached Boring Location Plan. The actual test locations shown were approximate, and were staked in the field by UES personnel using existing landmarks and site features. The boreholes were backfilled to grade upon field work completion.

Standard Penetration Test (SPT) Borings: Penetration tests were performed in accordance with ASTM Procedure D-1586, *Penetration Test and Split-Barrel Sampling of Soils*. This test procedure generally involves driving a 1.4-inch I.D. split-tube sampler into the soil profile in six inch increments for a minimum distance of 18 inches using a 140-pound hammer free-falling 30 inches. The total number of blows required to drive the sampler the second and third 6-inch increments is designated as the N-value, and provides an indication of in-place soil strength, density and consistency.

Auger Borings: Auger borings were performed in accordance with ASTM Procedure D-1452, *Standard Practice for Soil Investigation and Sampling by Auger Borings*. This test procedure advances a solid stem auger into the soil in a manner which reduces soil disturbance. At the selected depth, the auger advance and rotation are stopped, and the auger flight retracted from the borehole. The in-place soil profile is determined by visual inspection of the soils recovered in the auger flights.

Double-Ring Infiltrometer test: A Double-Ring Infiltrometer (DRI) test was performed in accordance with the procedures of ASTM D-3385-88 *Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer*. This test consisted of driving two open cylinders, one inside the other, into the ground partially filling the rings with water, and then maintaining the liquid at a constant level. The drop in water level in the inner ring was recorded on the measuring rod for timed intervals. The test was performed until the drop in water level was the same over the same time interval. The volume infiltrated during timed intervals was converted to an incremental infiltration velocity, expressed in inches/hour, and plotted versus elapsed time. The infiltration rate was the maximum steady state of average incremental infiltration velocity. The basic infiltration rate was obtained once the values of infiltration rates were constant. In-situ infiltration rates of soil results have been presented in **Appendix B**.

The results of the classification and stratification have been shown on the attached Boring Logs. It should be noted that soil conditions might vary between soil test boring locations, and between the subsurface soil strata interfaces which have been shown on the Boring Logs. The soil test boring data reflect information from the specific test locations only. This report presents an evaluation of site conditions on the basis of traditional geotechnical procedures for site characterization. The recovered samples were not examined, either visually or analytically, for chemical composition or environmental hazards.

Subsurface Findings

The field exploration performed for this project disclosed subsurface conditions that are consistent with the local geology and general area soils information described above. The subsurface conditions found in the soil test borings have been summarized in the attached Boring Logs and described below.

Generally soil test borings encountered sand [SP] to depths of 5 to 7 feet followed by silty-clayey sands [SM-SC/SC] to sandy clay [CH] to depths of 8.5 to 21.5 feet. Below the clayey soils, the soil test borings generally encountered limestone to boring termination depths.

The groundwater table was encountered at a depth of 19 feet the soil borings at the time of exploration. Fluctuations of perched groundwater level conditions on this project parcel should be expected to occur seasonally as a result of irrigation, rainfall, surface runoff, and nearby construction activities. Fluctuations of groundwater level conditions on this project parcel should be expected to occur seasonally as a result of rainfall, surface runoff, nearby construction activities, and other factors.

Laboratory Soil Tests

The soil samples recovered from the field exploration program were placed in containers and returned to our soils laboratory, where the Geotechnical Engineer visually classified the samples. Laboratory soil tests are performed to aid in the classification of the soils, and to help in the evaluation of engineering characteristics of the soils. Representative soil samples were selected for percent fines determination, moisture content and permeability tests. The test results have been presented on the attached Boring Logs and summarized in Table 3.

Percent Passing No. 200 Sieve: Certain recovered soil samples were selected to determine the percentage of fines. In these tests the soil samples were dried and washed over a No. 200 mesh sieve. The percent of soil by weight passing the sieve was the percentage of fines or portion of the sample in the silt and clay size range. This test was conducted in accordance with ASTM Procedure D-1140, Amount of Material in Soils Finer Than the #200 Sieve.

Permeability: Representative soil samples were selected to determine the permeability rate of the soil. Constant head permeability tests were performed on remolded representative samples of the near surface soils from the proposed stormwater management area. These tests were conducted following the concepts outlined in ASTM D-2434, Standard Test Method for Permeability of Granular Soils (Constant Head and Falling Head).

Moisture Content: Certain recovered soil samples were selected to determine their moisture content. The moisture content is the ratio expressed as a percentage of the weight of water in a given mass of soil to the weight of the solid particles. This test was conducted in accordance with ASTM Procedure D-2216, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.

Table 3 – Laboratory Soil Test Results				
Test Location	**Sample Depth**	**Type of Test**	**Results**	**Soil Description**
B-2	5.5 feet	% Finer #200	42 %	Very Clayey Sand to Sandy Clay
		Moisture Content	15%	
B-4	14 feet	% Finer #200	40 %	Very Clay Sand to Sandy Clay
		Moisture Content	25 %	
B-5	2.5 feet	% Finer #200	6 %	Sand with silt
		Moisture Content	5 %	
		Permeability	20 feet/day	
B-5	4 feet	% Finer #200	21 %	Clayey Sand
		Moisture Content	12%	

Stormwater Management System

The laboratory test data indicates that the surficial sandy soils within the proposed stormwater management area for this project generally have infiltration rate of 20 to 22 feet per day at the test location. Based upon the above findings, we recommend that you consider the soil parameters presented in Table 4 for design of the stormwater management system on the subject project site. It should be noted that the above referenced values are measured values and do not incorporate factor of safety.

Table 4 – Stormwater Management System Soil Design Parameters	
Corresponding Soil Boring Test Locations	B-5
Average Depth to Confining Layer, feet	5.5
Estimated Unsaturated Vertical Infiltration rate, feet per day	20
Estimated Horizontal Hydraulic Conductivity, feet per day	30
Estimated Fillable Porosity, percentage	30
Estimated Depth of Seasonal High Water Table feet[1]	5

[1]The seasonal high water table will be a result of perched conditions.

Stormwater Management System Fill Suitability

The recovered soil samples were classified using visual and textural means, and limited laboratory testing. We offer the following ***preliminary guidelines*** for the use of on-site soils, such as those excavated from the proposed shallow retention areas, as fill material for the project.

Soil materials excavated and classified as fine sands to sand with silts and sand with clay (SP, SP-SM, SP-SC), with typically 12% fines or less (silt/clay fraction), may be considered suitable for use as utility trench backfill, as well as building pad and pavement subgrade structural fill, provided said materials are properly dried, placed, and compacted.

Soil materials excavated and classified as silty fine sands [SM], with typically 12% to 25% fines, may also be considered suitable for use as utility trench backfill, as well as building pad and pavement subgrade structural fill, after significant drying and some mixing with the fine sand material described above. Proper placement, proof rolling and compaction must also be performed.

Soil materials excavated and classified as clayey sand, silt or clay (SC, ML, MH, CL, and CH) and any organic-laden soils (5% or greater organics by weight) should not be reused as fill beneath buildings or pavement sections. These materials could be used in green areas, if applicable and in non-structural applications where excessive ground subsidence will not create functional or aesthetic problems. It should be noted that silt and clay materials will retain water and if used may become saturated and soft for a significant period of time following a rain event.

Soil borings for a typical geotechnical report are widely spaced and generally not sufficient for reliably detecting the presence of isolated, anomalous surface or subsurface conditions, or reliably estimating unsuitable or suitable material quantities. Accordingly, 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 sufficient exploration for such purpose(s) and within the report we so state that the level of exploration provided should be sufficient to detect such anomalous conditions or estimate such quantities. Therefore, UES will not be responsible for any extrapolation or use of our data by others beyond the purpose(s) for which it is applicable or intended.

Report Limitations

This Report has been prepared for the exclusive use of Genesis Group, and members of the Design/Construction Team for the specific project discussed in this Report. This Report has been prepared in accordance with generally accepted local geotechnical engineering practices; no other warranty is expressed or implied. If any changes in the design or location of the project elements as outlined in this Report are planned, the conclusions and recommendations contained in this Report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved, in writing, by UES.

UES performs hydraulic conductivity tests, including the two most common, i.e., DRI and remolded laboratory permeability testing, using generally accepted practices of the local engineering community. These common tests are the quickest and most economical for stormwater management system design. However, the user of this information is cautioned that the potential variability of results and reproducibility associated with these types of tests can be significant. It is important to note that there are many factors influencing the permeability of a soil. These factors include, but are not limited to, soil grain size, soil particle arrangement and structure, dispersion of soil fines, density, and degree of saturation, soil heterogeneity, and soil anisotropy. Also, the permeability measured by such tests may not be representative of that of the total effective aquifer thickness.

Factors of safety can compensate for part of the inherent test limitations but the Designer must exercise judgment regarding final selection and applicability of provided soil design input parameters. Should the modeling analysis indicate marginally acceptable compliance with Water Management District design criteria, it may be advisable to perform more extensive and representative in-situ permeability testing by collecting “undisturbed” horizontal and vertical soil samples and/or installing grouted piezometers or wells for slug testing. UES can perform these field tests if desired.

Additionally, the actual exfiltration rates from the pond may be influenced by pond geometry, natural soil variability, in-situ depositional characteristics and soil density, retention volume, and groundwater mounding effects. Also, it is important to note that the upper in-situ soil zone is usually altered during the excavation and grading operations by heavy, vibrating earthwork equipment. Due to these numerous factors cited above, published literature suggests that the permeability of a soil

can only be estimated to within an order of magnitude. Therefore, appropriate factors of safety should be incorporated into the design process.

Closure

We have enjoyed being a part of the engineering team on this project, and appreciate the opportunity to have assisted you towards its successful completion. Please contact our office if you have any questions or need further assistance.

Respectfully submitted,

UNIVERSAL ENGINEERING SCIENCES, INC.
Certificate of Authorization Number 549

EDUARDO SUAREZ LICENSE No 60272 STATE OF FLORIDA PROFESSIONAL ENGINEER

Eduardo Suarez
2019.03.28
16:27:11 -04'00'

Timothy E. Kwiatkowski, P.E.
Project Geotechnical Engineer
Florida P.E. No. 86444

Eduardo Suarez, P.E.
Senior Geotechnical Engineer
Florida P.E. No. 60272
Date:

This item has been electronically signed and sealed by Eduardo Suarez, PE on the date adjacent to the seal using Digital Signature.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

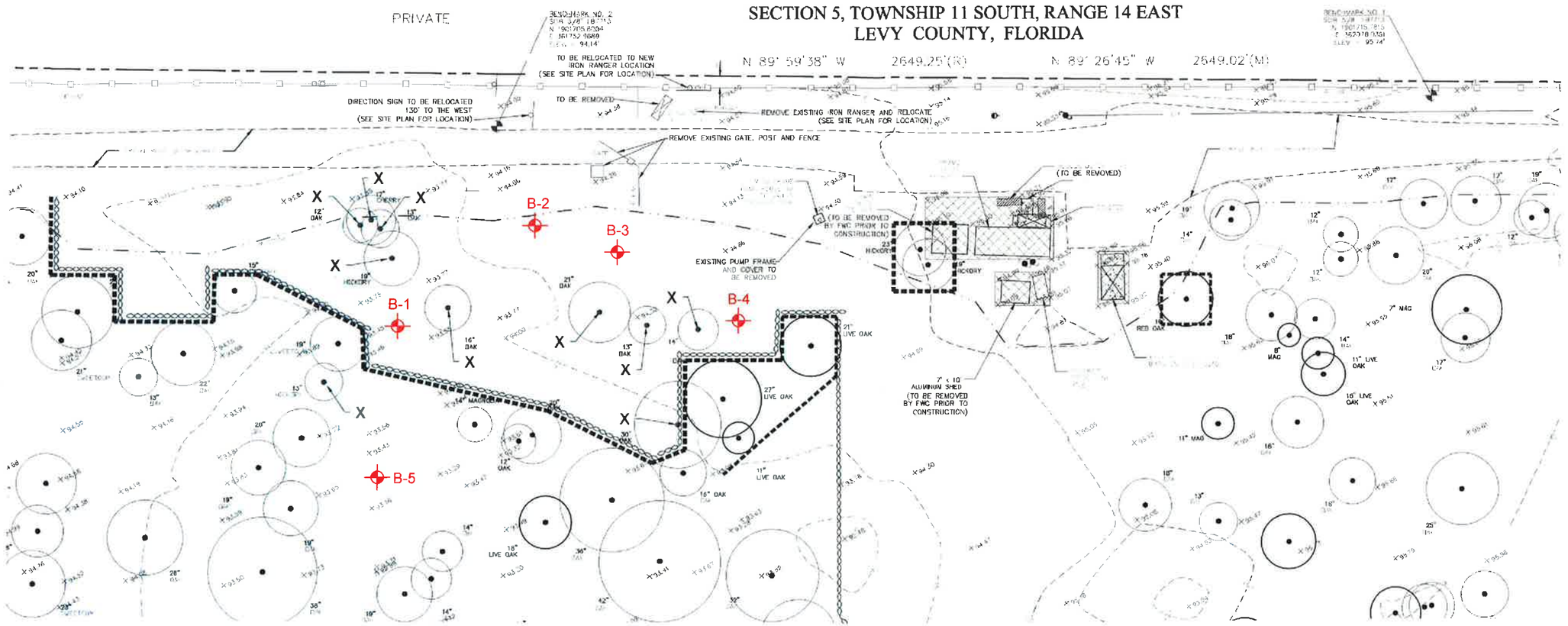
Attachments: Appendix A: Boring Location Plan, Boring Logs, Key to Boring Log,
Appendix B: Double-Ring Infiltrometer (DRI) Results,
Appendix C: Terms and Conditions

APPENDIX A

Boring Location Plan

Boring Logs

Key to Boring Logs



LEGEND

BORING LOCATION

NOTE: ALL SOIL TEST BORING LOCATIONS SHOWN ARE APPROXIMATE.

GENESIS HALFF, INC.

DRAWN BY: KD	DATE: 03/18/19
CHECKED BY: ES	DATE: 03/18/19
SCALE: 1"=40'	ACADFILE:0230.1900027-A
PROJECT NO: 0230.1900027.0000	REPORT NO:1658203

ANDREWS WILDLIFE MANAGEMENT AREA IMPROVEMENTS
NW 90TH AVENUE
CHIEFLAND, FLORIDA

BORING LOCATION PLAN

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PAGE NO:
A - 1

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0230.1900027.0000
REPORT NO.:	1658203
PAGE:	A-2

PROJECT: ANDREWS WILDLIFE MANAGEMENT AREA IMPROVEMENTS
NW 90TH AVENUE
CHIEFLAND, FLORIDA

BORING NO: **B-1** SHEET: 1 of 1

SECTION: TOWNSHIP: RANGE:

CLIENT: GENESIS HALFF, INC.

LOCATION: SEE BORING LOCATION PLAN

REMARKS:

GS ELEVATION(ft):

WATER TABLE (ft): NE

DATE OF READING: NA

EST. WSWT (ft):

DATE STARTED: 3/15/19

DATE FINISHED: 3/15/19

DRILLED BY: M. BOATRIGHT

TYPE OF SAMPLING: ASTM D-1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N VALUE	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG CONT. (%)
0						Very loose light brown and tan SAND [SP]						
1												
2		WOH	WOH			Very loose light tan fine SAND, with silt [SP-SM]						
3												
4		WOH-1	1									
5		1-1-1	2									
6												
7		2-1-2	3			Loose tan, orange clayey SAND [SC]						
8		2-2-3	5									
9												
10		3-3-3	6									
11												
12												
13												
14						Firm tan sandy CLAY [CH], with limestone						
15		3-2-3	5			Boring Terminated at 15'						

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BORING LOG

PROJECT NO.:	0230.1900027.0000
REPORT NO.:	1658203
PAGE:	A-3

PROJECT: ANDREWS WILDLIFE MANAGEMENT AREA IMPROVEMENTS
NW 90TH AVENUE
CHIEFLAND, FLORIDA

BORING NO: **B-2** SHEET: 1 of 1

SECTION: TOWNSHIP: RANGE:

CLIENT: GENESIS HALFF, INC.

LOCATION: SEE BORING LOCATION PLAN

REMARKS:

GS ELEVATION(ft):

WATER TABLE (ft): NE

DATE OF READING: NA

EST. WSWT (ft):

DATE STARTED: 3/15/19

DATE FINISHED: 3/15/19

DRILLED BY: M. BOATRIGHT

TYPE OF SAMPLING: ASTM D-1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N VALUE	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG CONT. (%)
0						Very loose brown and tan SAND [SP]						
1												
2		1-1-1	2									
3						Very loose tan SAND [SP]						
4		1/12"-1	1			Loose light orange silty clayey SAND [SM-SC]						
5		1-1-3	4									
6						Loose brown, gray very clayey SAND to sandy CLAY [SC/CH]						
7		5-5-4	9				42	15				
8		4-3-4	7									
9						Weathered LIMESTONE						
10		7-19-18	37									
11												
12												
13												
14												
15		3-2-2	4			Boring Terminated at 15'						

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BORING LOG

PROJECT NO.:	0230.1900027.0000
REPORT NO.:	1658203
PAGE:	A-4

PROJECT: ANDREWS WILDLIFE MANAGEMENT AREA IMPROVEMENTS
NW 90TH AVENUE
CHIEFLAND, FLORIDA

BORING NO: **B-3** SHEET: 1 of 1

SECTION: TOWNSHIP: RANGE:

CLIENT: GENESIS HALFF, INC.

LOCATION: SEE BORING LOCATION PLAN

REMARKS:

GS ELEVATION(ft):

WATER TABLE (ft): NE

DATE OF READING: NA

EST. WSWT (ft):

DATE STARTED: 3/15/19

DATE FINISHED: 3/15/19

DRILLED BY: M. BOATRIGHT

TYPE OF SAMPLING: ASTM D-1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N VALUE	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG CONT. (%)
0						Very loose brown and light tan SAND, with silt [SP-SM]						
1												
2		1/12"-1	1									
3						Very loose tan SAND [SP]						
4		WOH	WOH									
5		WOH	WOH									
6												
7		1/12"-1	1			Very loose tan clayey SAND [SC]						
8		1-WOH	WOH									
9						Stiff tan sandy CLAY [CH], with limestone						
10		2-3-10	13									
11												
12												
13												
14						Weathered LIMESTONE						
15		15-16-13	29			Boring Terminated at 15'						

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.:	0230.1900027.0000
REPORT NO.:	1658203
PAGE:	A-5

PROJECT: ANDREWS WILDLIFE MANAGEMENT AREA IMPROVEMENTS
NW 90TH AVENUE
CHIEFLAND, FLORIDA

BORING NO: **B-4** SHEET: 1 of 1

SECTION: TOWNSHIP: RANGE:

CLIENT: GENESIS HALFF, INC.

LOCATION: SEE BORING LOCATION PLAN

REMARKS:

GS ELEVATION(ft):

WATER TABLE (ft): 19

DATE OF READING: 3/15/19

EST. WSWT (ft):

DATE STARTED: 3/15/19

DATE FINISHED: 3/15/19

DRILLED BY: M. BOATRIGHT

TYPE OF SAMPLING: ASTM D-1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N VALUE	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/DAY)	ORG CONT. (%)
0						Very loose brown and light tan SAND [SP]						
1												
2		WOH-1/12"	WOH									
3						Very loose tan fine SAND [SP]						
4		WOH-1/12"	WOH									
5		WOH	WOH									
6						Very loose tan clayey SAND [SC]						
7		WOH	WOH									
8		WOH	WOH									
9						Very loose tan very clayey SAND to sandy CLAY [SC/CH]						
10		WOH	WOH									
11		WOH	WOH				40	25				
12												
13												
14						Very soft tan sandy CLAY [CH]						
15		WOH	WOH									
16		WOH	WOH									
17												
18		WOH	WOH			Very soft tan CLAY [CH]						
19				▼								
20		3-1-2	3									
21		1/12"-2	2									
						Boring Terminated at 21.5'						

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BORING LOG

PROJECT NO.:	0230.1900027.0000
REPORT NO.:	1658203
PAGE:	A-2

PROJECT: ANDREWS WILDLIFE MANAGEMENT AREA IMPROVEMENTS
NW 90TH AVENUE
CHIEFLAND, FLORIDA

BORING NO: **B-5** SHEET: 1 of 1

SECTION: TOWNSHIP: RANGE:

CLIENT: GENESIS HALFF, INC.

LOCATION: SEE BORING LOCATION PLAN

REMARKS:

GS ELEVATION(ft):

WATER TABLE (ft): NE

DATE OF READING: NA

EST. WSWT (ft):

DATE STARTED: 3/15/19

DATE FINISHED: 3/15/19

DRILLED BY: M. BOATRIGHT

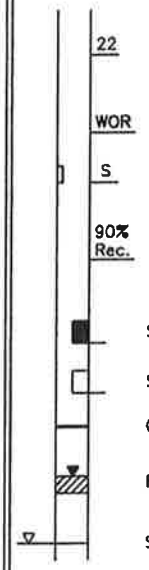
TYPE OF SAMPLING: ASTM D-1452

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N VALUE	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/ DAY)	ORG CONT. (%)
0						Brown SAND [SP]						
1												
2						Tan SAND, with silt [SP-SM]						
3												
4							6	5			20	
5												
6						Light brown clayey SAND [SC]						
7												
8							21	12				
9						Brown and orange clayey SAND [SC], with limestone						
10						LIMESTONE						
11												
12												
13												
14												
15						Boring Terminated at 15'						

UNIVERSAL
ENGINEERING SCIENCES

KEY TO BORING LOGS

SYMBOLS



22	Number of Blows of a 140–lb Weight Falling 30 in. Required to Drive Standard Spoon One Foot
WOR	Weight of Drill Rods
S	Thin–Wall Shelby Tube Undisturbed Sampler Used
90% Rec.	Percent Core Recovery from Rock Core–Drilling Operations
	Sample Taken at this Level
	Sample Not Taken at this Level
	Change in Soil Strata
	Free Ground Water Level
	Seasonal High Ground Water Level

RELATIVE DENSITY
(sand-silt)

Very loose – Less Than 4 Blows/Ft.
Loose – 4 to 10 Blows/Ft.
Medium Dense – 10 to 30 Blows/Ft.
Dense – 30 to 50 Blows/Ft.
Very Dense – More Than 50 Blows/Ft.

CONSISTANCY
(clay)

Very Soft – Less Than 2 Blows/Ft.
Soft – 2 to 4 Blows/Ft.
Firm – 4 to 8 Blows/Ft.
Stiff – 8 to 15 Blows/Ft.
Very Stiff – 15 to 30 Blows/Ft.
Hard – More Than 30 Blows/Ft.

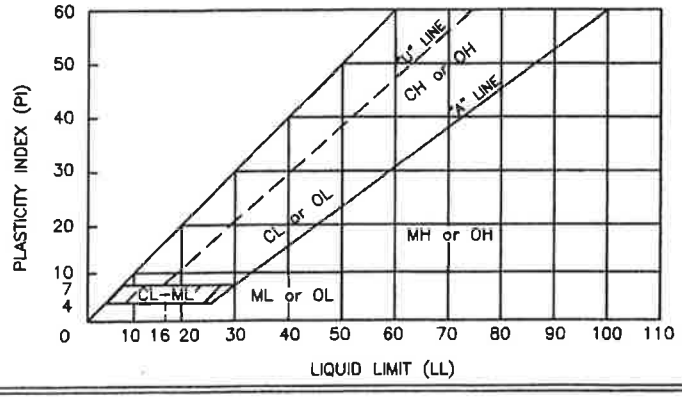
Based on Safety Hammer N–Values

UNIFIED CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 200 sieve	CLEAN GRAVELS	GW	Well–graded gravels and gravel–sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel–sand mixtures, little or no fines
		GRAVELS WITH FINES	GM	Silty gravels, gravel–sand–silt mixtures
			GC	Clayey gravels, gravel–sand–clay mixtures
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well–graded sands and gravelly sands, little or no fines
			SP	Poorly graded sands and gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand–silt mixtures
			SC	Clayey sands, sand–clay mixtures
FINE-GRAINED SOILS 50% or more passes No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			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 diatomacaceous fine sands or silts, elastic silts
			CH	Inorganic clays or high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly organic Soils			PT	Peat, muck and other highly organic soils

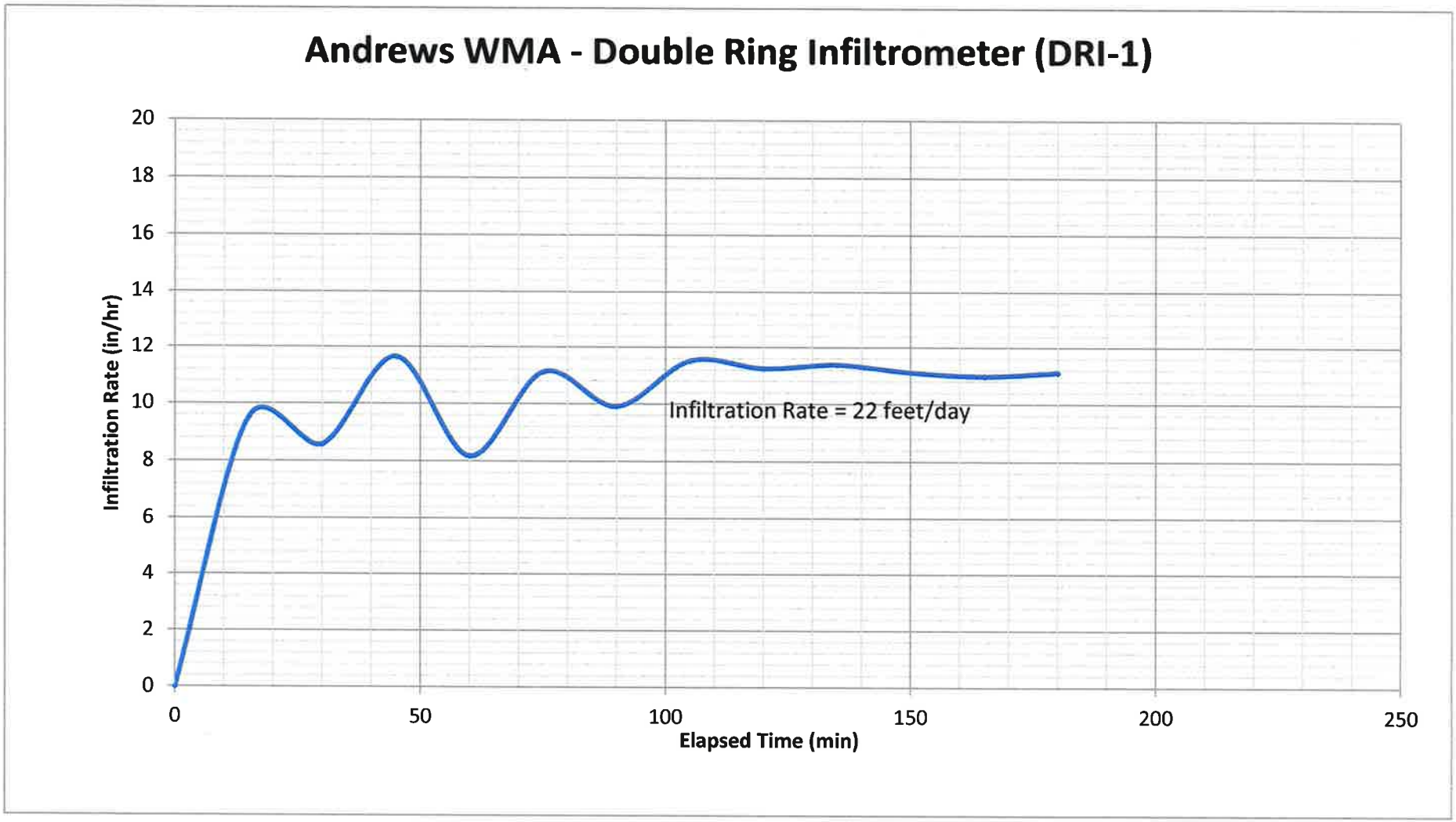
* Based on the material passing the 3–in. (75mm) sieve.

PLASTICITY CHART



APPENDIX B

Double Ring Infiltrometer (DRI) Test Results


Andrews WMA - Double Ring Infiltrometer (DRI-1)
Infiltration Rate (in/hr)
20
18
16
14
12
10
8
6
4
2
0
0
50
100
150
200
250
Elapsed Time (min)
Infiltration Rate = 22 feet/day

APPENDIX C

Important Information About Your Geotechnical Engineering Report
Constraint and Restrictions

Important Information about This

Geotechnical-Engineering Report

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

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

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

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

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

Read this Report in Full

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

You Need to Inform Your Geotechnical Engineer about Change

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

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

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

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

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

This Report May Not Be Reliable

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

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

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

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

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

This Report's Recommendations Are Confirmation-Dependent

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

This Report Could Be Misinterpreted

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

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

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

Give Constructors a Complete Report and Guidance

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

Read Responsibility Provisions Closely

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

Geoenvironmental Concerns Are Not Covered

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

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

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

GEOPROFESSIONAL BUSINESS ASSOCIATION

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e-mail: info@geoprofessional.org www.geoprofessional.org

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CONSTRAINTS & RESTRICTIONS

The intent of this document is to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.

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 CONDITIONS

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 opinions 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 to 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 indicate 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 fluctuations 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 of 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. Universal Engineering Sciences cannot be responsible for any buried man-made 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 exploration. 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.

UNIVERSAL
ENGINEERING SCIENCES

Universal Engineering Sciences, Inc.
GENERAL CONDITIONS

SECTION 1: RESPONSIBILITIES

1.1 *Universal Engineering Sciences, Inc.*, ("UES"), has the responsibility for providing the services described under the Scope of Services section. The work is to be performed according to accepted standards of care and is to be completed in a timely manner. The term "UES" as used herein includes all of *Universal Engineering Sciences, Inc's* agents, employees, professional staff, and subcontractors.

1.2 The Client or a duly authorized representative is responsible for providing UES with a clear understanding of the project nature and scope. The Client shall supply UES with sufficient and adequate information, including, but not limited to, maps, site plans, reports, surveys and designs, to allow UES to properly complete the specified services. The Client shall also communicate changes in the nature and scope of the project as soon as possible during performance of the work so that the changes can be incorporated into the work product.

1.3 The Client acknowledges that UES's responsibilities in providing the services described under the Scope of Services section is limited to those services described therein, and the Client hereby assumes any collateral or affiliated duties necessitated by or for those services. Such duties may include, but are not limited to, reporting requirements imposed by any third party such as federal, state, or local entities, the provision of any required notices to any third party, or the securing of necessary permits or permissions from any third parties required for UES's provision of the services so described, unless otherwise agreed upon by both parties.

1.4 Universal will not be responsible for scheduling our services and will not be responsible for tests or inspections that are not performed due to a failure to schedule our services on the project or any resulting damages.

1.5 **PURSUANT TO FLORIDA STATUTES §558.0035, ANY INDIVIDUAL EMPLOYEE OR AGENT OF UES MAY NOT BE HELD INDIVIDUALLY LIABLE FOR NEGLIGENCE.**

SECTION 2: STANDARD OF CARE

2.1 Services performed by UES under this Agreement will be conducted in a manner consistent with the level of care and skill ordinarily exercised by members of UES's profession practicing contemporaneously under similar conditions in the locality of the project. No other warranty, express or implied, is made.

2.2 The Client recognizes that subsurface conditions may vary from those observed at locations where borings, surveys, or other explorations are made, and that site conditions may change with time. Data, interpretations, and recommendations by UES will be based solely on information available to UES at the time of service. UES is responsible for those data, interpretations, and recommendations, but will not be responsible for other parties' interpretations or use of the information developed.

2.3 Execution of this document by UES is not a representation that UES has visited the site, become generally familiar with local conditions under which the services are to be performed, or correlated personal observations with the requirements of the Scope of Services. It is the Client's responsibility to provide UES with all information necessary for UES to provide the services described under the Scope of Services, and the Client assumes all liability for information not provided to UES that may affect the quality or sufficiency of the services so described.

2.4 Should UES be retained to provide threshold inspection services under Florida Statutes §553.79, Client acknowledges that UES's services thereunder do not constitute a guarantee that the construction in question has been properly designed or constructed, and UES's services do not replace any of the obligations or liabilities associated with any architect, contractor, or structural engineer. Therefore it is explicitly agreed that the Client will not hold UES responsible for the proper performance of service by any architect, contractor, structural engineer or any other entity associated with the project.

SECTION 3: SITE ACCESS AND SITE CONDITIONS

3.1 Client will grant or obtain free access to the site for all equipment and personnel necessary for UES to perform the work set forth in this Agreement. The Client will notify any and all possessors of the project site that Client has granted UES free access to the site. UES will take reasonable precautions to minimize damage to the site, but it is understood by Client that, in the normal course of work, some damage may occur, and the correction of such damage is not part of this Agreement unless so specified in the Proposal.

3.2 The Client is responsible for the accuracy of locations for all subterranean structures and utilities. UES will take reasonable precautions to avoid known subterranean structures, and the Client waives any claim against UES, and agrees to defend, indemnify, and hold UES harmless from any claim or liability for injury or loss, including costs of defense, arising from damage done to subterranean structures and utilities not identified or accurately located. In addition, Client agrees to compensate UES for any time spent or expenses incurred by UES in defense of any such claim with compensation to be based upon UES's prevailing fee schedule and expense reimbursement policy.

SECTION 4: SAMPLE OWNERSHIP AND DISPOSAL

4.1 Soil or water samples obtained from the project during performance of the work shall remain the property of the Client.

4.2 UES will dispose of or return to Client all remaining soils and rock samples 60 days after submission of report covering those samples. Further storage or transfer of samples can be made at Client's expense upon Client's prior written request.

4.3 Samples which are contaminated by petroleum products or other chemical waste will be returned to Client for treatment or disposal, consistent with all appropriate federal, state, or local regulations.

SECTION 5: BILLING AND PAYMENT

5.1 UES will submit invoices to Client monthly or upon completion of services. Invoices will show charges for different personnel and expense classifications.

5.2 Payment is due 30 days after presentation of invoice and is past due 31 days from invoice date. Client agrees to pay a finance charge of one and one-half percent (1 ½ %) per month, or the maximum rate allowed by law, on past due accounts.

5.3 If UES incurs any expenses to collect overdue billings on invoices, the sums paid by UES for reasonable attorneys' fees, court costs, UES's time, UES's expenses, and interest will be due and owing by the Client.

SECTION 6: OWNERSHIP AND USE OF DOCUMENTS

6.1 All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by UES, as instruments of service, shall remain the property of UES.

6.2 Client agrees that all reports and other work furnished to the Client or his agents, which are not paid for, will be returned upon demand and will not be used by the Client for any purpose.

6.3 UES will retain all pertinent records relating to the services performed for a period of five years following submission of the report, during which period the records will be made available to the Client at all reasonable times.

6.4 All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by UES, are prepared for the sole and exclusive use of Client, and may not be given to any other party or used or relied upon by any such party without the express written consent of UES.

SECTION 7: DISCOVERY OF UNANTICIPATED HAZARDOUS MATERIALS

7.1 Client warrants that a reasonable effort has been made to inform UES of known or suspected hazardous materials on or near the project site.

7.2 Under this agreement, the term hazardous materials include hazardous materials (40 CFR 172.01), hazardous wastes (40 CFR 261.2), hazardous substances (40 CFR 300.6), petroleum products, polychlorinated biphenyls, and asbestos.

7.3 Hazardous materials may exist at a site where there is no reason to believe they could or should be present. UES and Client agree that the discovery of unanticipated hazardous materials constitutes a changed condition mandating a renegotiation of the scope of work. UES and Client also agree that the discovery of unanticipated hazardous materials may make it necessary for UES to take immediate measures to protect health and safety. Client agrees to compensate UES for any equipment decontamination or other costs incident to the discovery of unanticipated hazardous waste.

7.4 UES agrees to notify Client when unanticipated hazardous materials or suspected hazardous materials are encountered. Client agrees to make any disclosures required by law to the appropriate governing agencies. Client also agrees to hold UES harmless for any and all consequences of disclosures made by UES which are required by governing law. In the event the project site is not owned by Client, Client recognizes that it is the Client's responsibility to inform the property owner of the discovery of unanticipated hazardous materials or suspected hazardous materials.

7.5 Notwithstanding any other provision of the Agreement, Client waives any claim against UES, and to the maximum extent permitted by law, agrees to defend, indemnify, and save UES harmless from any claim, liability, and/or defense costs for injury or loss arising from UES's discovery of unanticipated hazardous materials or suspected hazardous materials including any costs created by delay of the project and any cost associated with possible reduction of the property's value. Client will be responsible for ultimate disposal of any samples secured by UES which are found to be contaminated.

SECTION 8: RISK ALLOCATION

8.1 Client agrees that UES's liability for any damage on account of any breach of contract, error, omission or other professional negligence will be limited to a sum not to exceed $50,000 or UES's fee, whichever is greater. If Client prefers to have higher limits on contractual or professional liability, UES agrees to increase the limits up to a maximum of $1,000,000.00 upon Client's written request at the time of accepting our proposal provided that Client agrees to pay an additional consideration of four percent of the total fee, or $400.00, whichever is greater. The additional charge for the higher liability limits is because of the greater risk assumed and is not strictly a charge for additional professional liability insurance.

SECTION 9: INSURANCE

9.1 UES represents and warrants that it and its agents, staff and consultants employed by it, is and are protected by worker's compensation insurance and that UES has such coverage under public liability and property damage insurance policies which UES deems to be adequate. Certificates for all such policies of insurance shall be provided to Client upon request in writing. Within the limits and conditions of such insurance, UES agrees to indemnify and save Client harmless from and against loss, damage, or liability arising from negligent acts by UES, its agents, staff, and consultants employed by it. UES shall not be responsible for any loss, damage or liability beyond the amounts, limits, and conditions of such insurance or the limits described in Section 8, whichever is less. The Client agrees to defend, indemnify and save UES harmless for loss, damage or liability arising from acts by Client, Client's agent, staff, and other UESs employed by Client.

SECTION 10: DISPUTE RESOLUTION

10.1 All claims, disputes, and other matters in controversy between UES and Client arising out of or in any way related to this Agreement will be submitted to alternative dispute resolution (ADR) such as mediation or arbitration, before and as a condition precedent to other remedies provided by law, including the commencement of litigation.

10.2 If a dispute arises related to the services provided under this Agreement and that dispute requires litigation instead of ADR as provided above, then:

(a) the claim will be brought and tried in judicial jurisdiction of the court of the county where UES's principal place of business is located and Client waives the right to remove the action to any other county or judicial jurisdiction, and

(b) The prevailing party will be entitled to recovery of all reasonable costs incurred, including staff time, court costs, attorneys' fees, and other claim related expenses.

SECTION 11: TERMINATION

11.1 This agreement may be terminated by either party upon seven (7) days written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof. Such termination shall not be effective if that substantial failure has been remedied before expiration of the period specified in the written notice. In the event of termination, UES shall be paid for services performed to the termination notice date plus reasonable termination expenses.

11.2 In the event of termination, or suspension for more than three (3) months, prior to completion of all reports contemplated by the Agreement, UES may complete such analyses and records as are necessary to complete its files and may also complete a report on the services performed to the date of notice of termination or suspension. The expense of termination or suspension shall include all direct costs of UES in completing such analyses, records and reports.

SECTION 12: ASSIGNS

12.1 Neither the Client nor UES may delegate, assign, sublet or transfer their duties or interest in this Agreement without the written consent of the other party.

SECTION 13. GOVERNING LAW AND SURVIVAL

13.1 The laws of the State of Florida will govern the validity of these Terms, their interpretation and performance.

13.2 If any of the provisions contained in this Agreement are held illegal, invalid, or unenforceable, the enforceability of the remaining provisions will not be impaired. Limitations of liability and indemnities will survive termination of this Agreement for any cause.

SECTION 14. INTEGRATION CLAUSE

14.1 This Agreement represents and contains the entire and only agreement and understanding among the parties with respect to the subject matter of this Agreement, and supersedes any and all prior and contemporaneous oral and written agreements, understandings, representations, inducements, promises, warranties, and conditions among the parties. No agreement, understanding, representation, inducement, promise, warranty, or condition of any kind with respect to the subject matter of this Agreement shall be relied upon by the parties unless expressly incorporated herein.

14.2 This Agreement may not be amended or modified except by an agreement in writing signed by the party against whom the enforcement of any modification or amendment is sought.