

# UNIVERSAL ENGINEERING SCIENCES

**GEOTECHNICAL ENGINEERING REPORT  
DRAINAGE IMPROVEMENTS  
CITY OF HALLANDALE BEACH  
HALLANDALE BEACH, FLORIDA**

**PROJECT NO. 0630.1300070  
REPORT NO. 12467**

**Prepared For:**

Mr. Abidemi "AJ" Ajayi, E.I.  
City of Hallandale Beach  
630 NW 2nd Street  
Hallandale Beach, Florida 33009

**Prepared By:**

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# UNIVERSAL ENGINEERING SCIENCES

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November 5, 2013

Mr. Abidemi "AJ" Ajayi, E.I.  
City of Hallandale Beach  
630 NW 2<sup>nd</sup> Street  
Hallandale Beach, Florida 33009

Reference: Geotechnical Engineering Report  
City of Hallandale Beach Drainage Improvements  
Various Locations  
Hallandale Beach, Broward County, Florida  
Project No. 0630.1300070  
UES Report No. 12467

Dear Mr. Ajayi:

Universal Engineering Sciences, Inc. (UES) has completed the geotechnical exploration and engineering report for the above referenced project in Hallandale Beach, Broward County, Florida. The completed services were conducted in general accordance with UES Proposal No. 0620.0913.00009 dated September 9, 2013. These completed services were performed in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

This report contains the results of the subsurface exploration, an engineering interpretation of the results with respect to the project characteristics as described, and recommendations for groundwater considerations and site preparation.

We appreciate the opportunity to work with you on this project and look forward to a continued association. If you have any questions, or when preliminary or final project design plans are available for our recommended review, please contact the undersigned.

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

Allan G. Abubakar, P.E.  
Project Engineer  
Florida Professional Engineer No. 69952



Peter G. Read, P.E.  
Regional Manager  
Florida Professional Engineer No. 35604

Dist: Client (2)

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## **1.0 INTRODUCTION**

### **1.1 GENERAL**

This report contains the results of a subsurface exploration conducted for the proposed drainage improvements at five (5) locations in Hallandale Beach, Broward County, Florida. A general location map of the project area appears in Appendix A: Site Location Map. This report includes the following sections:

- SCOPE OF SERVICES - Defines what services were completed
- FINDINGS - Describes what was encountered
- RECOMMENDATIONS - Describes what we encourage you to do
- LIMITATIONS - Describes the restrictions inherent in this report
- SUMMARY - Reviews the material in this report
- APPENDICES - Presents support materials referenced in this report.

### **1.2 PROJECT DESCRIPTION**

Our understanding of the proposed construction is based on review of site plans provided by City of Hallandale Beach dated January 25, 2013. The site plans show the locations of proposed improvements and was referenced for our subsurface exploration and geotechnical engineering report.

The project consists of installation of catch basins and rehabilitation measures for drainage improvements at the following locations:

- SW 9 Street and SW 8<sup>th</sup> Avenue
- 923 SE 2<sup>nd</sup> Avenue at SE 9 Ct.
- Fashion Row Parking Lots
- SE 5<sup>th</sup> Avenue between Hallandale Beach Boulevard and SE 2<sup>nd</sup> Street
- SE 2<sup>nd</sup> Street between SE 5<sup>th</sup> Avenue and US 1

The locations are shown on the Boring Location Plans in Appendix B.

The recommendations contained herein are based upon the above considerations. If any of this information is incorrect or if you anticipate any changes, UES should be notified immediately to review and possibly amend the recommendations contained in this report.



## **2.0 SCOPE OF SERVICES**

### **2.1 PURPOSE**

The purposes of this geotechnical exploration were:

- to explore and evaluate the subsurface conditions at the site by advancing SPT (Standard Penetration Test) soil borings with special attention to potential geotechnical considerations that may affect the proposed design, construction, and serviceability of the proposed improvements; and
- to provide geotechnical engineering recommendations for groundwater considerations and site preparation.

This report presents an evaluation of site conditions on the basis of traditional geotechnical procedures for site characterization. UES would be pleased to perform these services, if you desire.

### **2.2 FIELD EXPLORATION**

The subsurface conditions at the sites were explored with a total of five (5) soil borings. We drilled five (5) Standard Penetration Test (SPT) borings designated as B-1 through B-5. The approximate locations of the soil borings are presented in Appendix B. Boring Location Plans.

Our drilling crew located the borings based upon estimated distances and relationships to obvious landmarks. Consider the indicated locations and depths to be approximate. Further, the boring locations are based on the site plans provided.

The SPT borings were advanced to a depth of 15 feet below existing grade using the rotary wash method; samples were collected while performing the SPT at regular intervals. We completed the SPT in general accordance with ASTM D-1586 guidelines, with continuous sampling from 0 to 10 feet, and additional sampling interval of 5 feet. The SPT test consists of driving a standard split-barrel sampler (split-spoon) into the subsurface 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.



### **3.0 FINDINGS**

#### **3.1 SURFACE CONDITIONS**

At the time of exploration, the subject sites were covered with grass. Based on the 1984 Soil Survey for Broward County, Florida, as prepared by the US Department of Agriculture, Natural Resources Conservation Service (NRCS), the predominant soil types at the sites are Arents-Urban land complex (B-1), Immokalee, limestone substratum-Urban land complex (B-2 and B-4), and Urban land (B-3 and B-5).

Arents-Urban land complex consists of Arents in open areas and of Urban land, or areas covered by concrete and building. About 50 to 70 percent is Arents, and about 30 to 50 percent is Urban land.

Immokalee, limestone substratum-Urban land complex consists of Immokalee, limestone substratum, and Urban land. The areas of these components are so intermixed or so small that mapping them separately was not practical. Depth to the water table depends on the established drainage in the area and the amount of fill material that has been added, but the water table is deeper in most areas than is normal for undrained Immokalee soils.

Urban land consists of various materials that are so intermixed or so small that separation at the scale of mapping is impractical. Depth to the water table depends on the established drainage area. About 20 to 45 percent of the complex is open land, such as lawns and vacant lots; and about 40 to 70 percent is Urban land, or areas covered by sidewalks, streets, patios, driveways, and buildings, where the natural soil cannot be observed.

#### **3.2 SUBSURFACE CONDITIONS**

The results of our field exploration, together with pertinent information obtained from the SPT boring, such as soil profiles, penetration resistance and groundwater levels are shown on the boring logs included in Appendix B. The Key to Boring Logs is also included in Appendix B. The stratification lines shown on the boring log represent the approximate boundaries between soil types, and may not depict exact subsurface soil conditions. The actual soil boundaries may be more transitional than depicted. A soil profile of each location is presented in Tables 1 through 5. The soil profile was prepared from field logs after the recovered soil samples were visually classified by a member of our geotechnical staff.



<b>TABLE 1: SOIL PROFILE</b>	
<b>SW 9 Street and SW 8<sup>th</sup> Avenue (B-1)</b>	
<b>Typical Depths Below Grade (feet)</b>	<b>Soil Description</b>
0 – 4.5	Medium dense, tan sand with trace rocks [SP]
4.5 – 7	Loose, dark brown peat/organics [PT]
7 – 12.5	Loose to very loose, brown sand with trace roots [SP]
12.5 – 15*	Loose, light gray sandy limestone [GP]
* Boring Termination depth Water table was measured at 6.8 feet below grade	

Our field exploration found evidence of loose dark brown peat/organics from 4.5 to 7 feet below the existing grade. These materials are not suitable for support of foundations and other site improvements. It is not uncommon for natural and/or man-made deposits of sandy silt materials to lie randomly in lateral extent and thickness. Our borings are about 2 inches in diameter and explore only a very limited spatial area. For example, a 50 foot grid of borings over a one acre site only exposes about one square foot of the 43000 square feet of ground surface (0.002%).

For perspective, this is roughly comparable to the ratio of the size of this dot ■ to the entire sheet of paper. It should be obvious that the exploration already performed is inadequate to estimate the extent of organic materials across the site. **Therefore, if you wish to estimate the quantity of unsuitable organic materials on this site, additional exploration must be performed.** UES would be pleased to develop a scope of exploration to assist you and we envision a combination of mechanical or hand borings, probes and test pits for this purpose.



<b>TABLE 2: SOIL PROFILE</b> <b>923 SE 2 Avenue (B-2)</b>	
<b>Typical Depths Below Grade (feet)</b>	<b>Soil Description</b>
0 – 8	Loose to very loose, light gray to brown sand [SP]
8 – 10	Very loose, brown silty sand [SM]
10 – 15*	Very loose, brown sand [SP]
* Boring Termination depth Water table was measured at 4.2 feet below grade	

<b>TABLE 3: SOIL PROFILE</b> <b>Fashion Row Parking (B-3)</b>	
<b>Typical Depths Below Grade (feet)</b>	<b>Soil Description</b>
0 – 12	Loose to very loose, brown to light brown sand [SP]
12 – 15*	Loose, light gray sandy limestone [GP]
* Boring Termination depth Water table was measured at 5.3 feet below grade	

<b>TABLE 4: SOIL PROFILE</b> <b>SE 5<sup>th</sup> Avenue between Hallandale Beach Blvd &amp; SE 2 St. (B-4)</b>	
<b>Typical Depths Below Grade (feet)</b>	<b>Soil Description</b>
0 – 7	Loose to very loose, brown to dark brown sand [SP]
7 – 15*	Very loose to loose, light brown to light gray sandy limestone [GP]
* Boring Termination depth Water table was measured at 4 feet below grade	



<b>TABLE 5: SOIL PROFILE</b>	
<b>SE 2 St. between US 1 &amp; SE 4 Ave. (B-5)</b>	
<b>Typical Depths Below Grade (feet)</b>	<b>Soil Description</b>
0 – 5	Loose to very loose, brown sand with trace rocks [SP]
5 – 15*	Very loose to loose, light gray sandy limestone [GP]
* Boring Termination depth Water table was measured at 3.8 feet below grade	

## **4.0 RECOMMENDATIONS**

### **4.1 GENERAL**

In this section of the report, detailed recommendations are presented for groundwater considerations, site preparation, and construction related services. The following recommendations are based upon the attached soil test data, our stated understanding of the proposed construction, and experience with similar projects and subsurface conditions. UES should be retained to observe the proposed construction, and provide updated recommendations as required.

### **4.2 GROUNDWATER CONSIDERATIONS**

The groundwater table will fluctuate seasonally depending upon local rainfall. The rainy season in South Florida is normally between May and October. Based upon the test boring data, a reasonable estimate for the seasonal high groundwater table is approximately 2 to 4 feet below existing grade. The existing and estimated seasonal high groundwater table appears on the boring log in Appendix B.

Note that our estimate of seasonal high groundwater level is based on limited data and does not provide any assurance that groundwater levels will not exceed the estimated level during any given year in the future. If the rainfall intensity and duration or total rainfall quantities exceed those normally anticipated, then groundwater levels will likely exceed the seasonal high estimate.

The estimate of seasonal high groundwater level is made for the site at the present time. Future development of adjoining or nearby properties and development on a regional scale may affect the local seasonal high groundwater table. Universal makes no warranty on the estimate of the seasonal high groundwater table.



We recommend that positive drainage be established and maintained on the site during construction. UES further recommends that permanent measures be implemented to maintain positive drainage throughout the life of the project.

#### **4.3 SITE PREPARATION**

The contractor should provide a plan for dewatering of excavations below groundwater. Organic soils (peat) and sandy silt should be removed from the utility runs and replaced with clean, compacted fill to provide adequate support for the proposed pipe system. A more detailed description of this work is as follows:

1. Utility runs installed below the groundwater table should be dewatered to allow excavation, inspection and backfill in the dry.
2. Organic soils and sandy silt found beneath the proposed utility invert should be removed and replaced with clean compacted fill.
3. After excavation to design invert elevations, in-situ bedding soils should be compacted to at least 95 percent of the Modified Proctor test maximum dry density (ASTM D 1557) to a depth of 12 inches below the bedding level. Compaction in confined areas should be accomplished using equipment such as jumping jacks and 'walk-behind' vibratory plates and rollers.
4. Utility backfill may consist of excavated, non-organic materials that include rock fragments no larger than 3 inches in diameter. Offsite fill material (if required) should consist of clean granular soils with less than 10 percent soil fines. Place fill in uniform 6-inch thick (loose) lifts and compact each lift to a minimum density of 95 percent of the Modified Proctor maximum dry density (ASTM D1557).

Excavation work should meet OSHA Excavation Standard Subpart P regulations for 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 that a Florida registered Professional Engineer design any required sheeting/bracing system. During excavation, excavated material should not be stockpiled at the top of the slope within a horizontal distance equal to the excavation depth. Provisions for maintaining workman safety within excavations is the sole responsibility of the contractor.

#### **4.4 CONSTRUCTION RELATED SERVICES**

We recommend the owner retain UES to perform construction material testing and observations on this project. Field tests and observations could include items such as verification of foundation subgrade by cone penetration testing, monitoring of proof-rolling operations, pile installation, and performing quality assurance tests on the placement of compacted structural fill.



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

### **5.0 LIMITATIONS**

Our field exploration found unsuitable or unexpected materials (i.e. peat/organics at B-1) at the time of occurrence. The test borings completed for this report are not considered 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 the presence of anomalous materials or for estimation of material 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.

During the early stages of this construction project, 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 problems. An (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.



## **6.0 SUMMARY**

In summary, we understand that you propose to install catch basins at various locations for drainage improvements. Limited field tests have been performed to provide geotechnical engineering recommendations for groundwater considerations and site preparation.

The soils encountered generally consist of very loose to medium dense, tan to brown sand with trace of rocks [SP] from 0 to 4.5 feet below land surface (bls) followed by very loose to loose, light gray to dark brown peat/organics (B-1), sand with rocks to trace rocks, silty sand, and sandy limestone [PT, SP, SM, GP] to the maximum explored depth of 15 feet (bls).

Groundwater was measured at depths ranging from 4 to 6 feet below the existing land surface in the test borings. A reasonable estimate for an average wet seasonal high groundwater table is approximately 2 to 4 feet below land surface (bls).

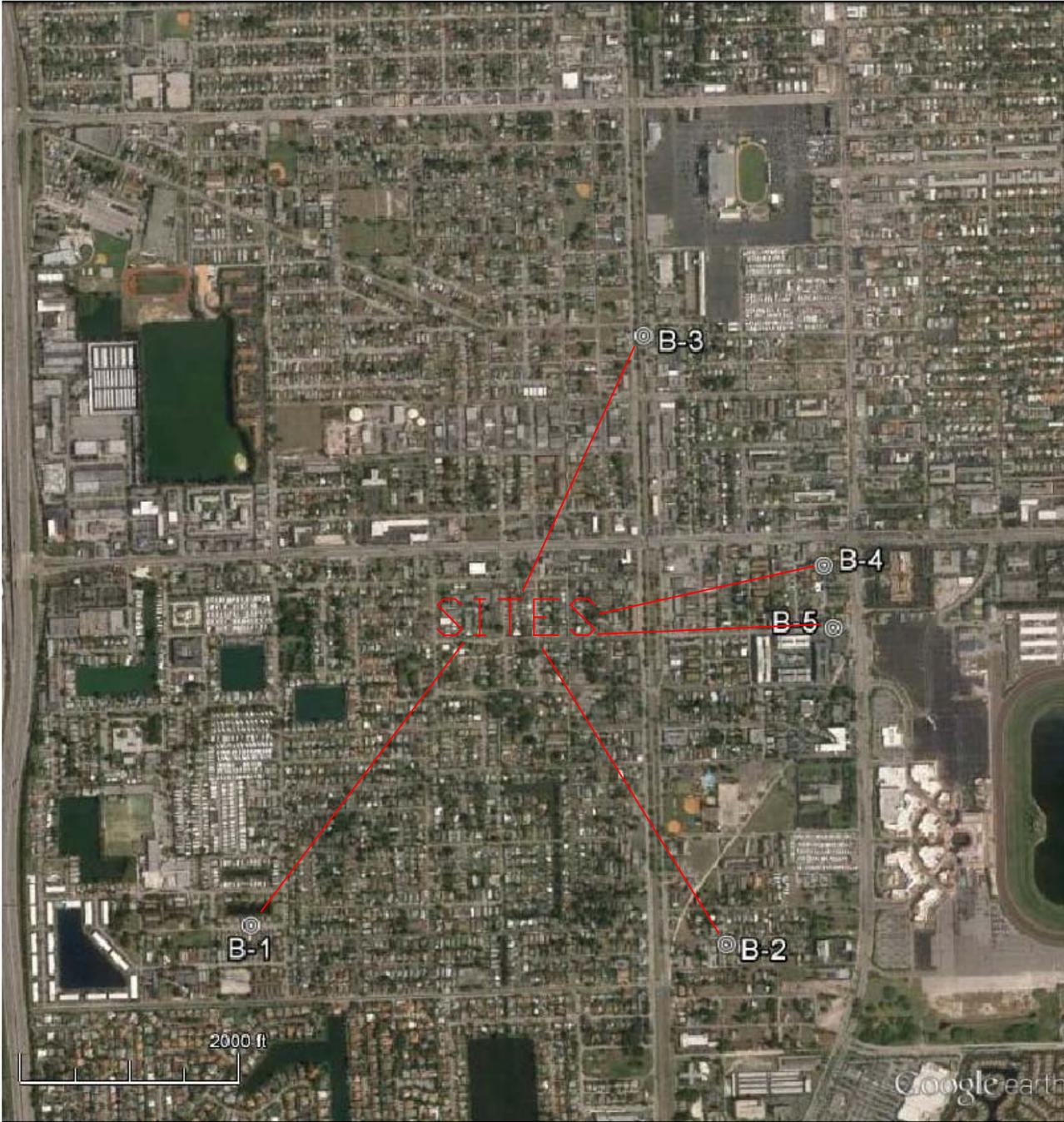
UES recommends normal, good practice site preparation procedures for the installation of catch basins.

Our field exploration found evidence of peat/organics at boring B-1. These materials are not suitable for support of foundations in the retaining wall area and other site improvements. It is not uncommon for natural and/or man-made deposits of peat/organics to lie randomly in lateral extent and thickness. Our borings are about 2 inches in diameter and explore only a very limited spatial area. For example, a 50 foot grid of borings over a one acre site only exposes about one square foot of the 43000 square feet of ground surface (0.002%). For perspective, this is roughly comparable to the ratio of the size of this dot ■ to the entire sheet of paper. It should be obvious that the exploration already performed is inadequate to estimate the extent of organic materials across the site. **Therefore, if you wish to estimate the quantity of peat/organics on this site, additional exploration must be performed.** UES would be pleased to develop a scope of exploration to assist you and we envision a combination of mechanical or hand borings, probes and test pits for this purpose.



APPENDIX A





#



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**GEOTECHNICAL EXPLORATION SERVICES  
DRAINAGE IMPROVEMENTS  
HALLANDALE BEACH, BROWARD COUNTY, FLORIDA**

**SITE LOCATION MAP**

<b>DRAWN BY:</b> A.G.A.	<b>DATE:</b> 11/05/13	<b>CHECKED BY:</b> P.G.R.	<b>DATE:</b> 11/05/13
<b>SCALE:</b> AS SHOWN	<b>PROJECT NO:</b> 0630.1300070	<b>REPORT NO:</b> 12467	<b>PAGE NO:</b> A-1

**APPENDIX B**



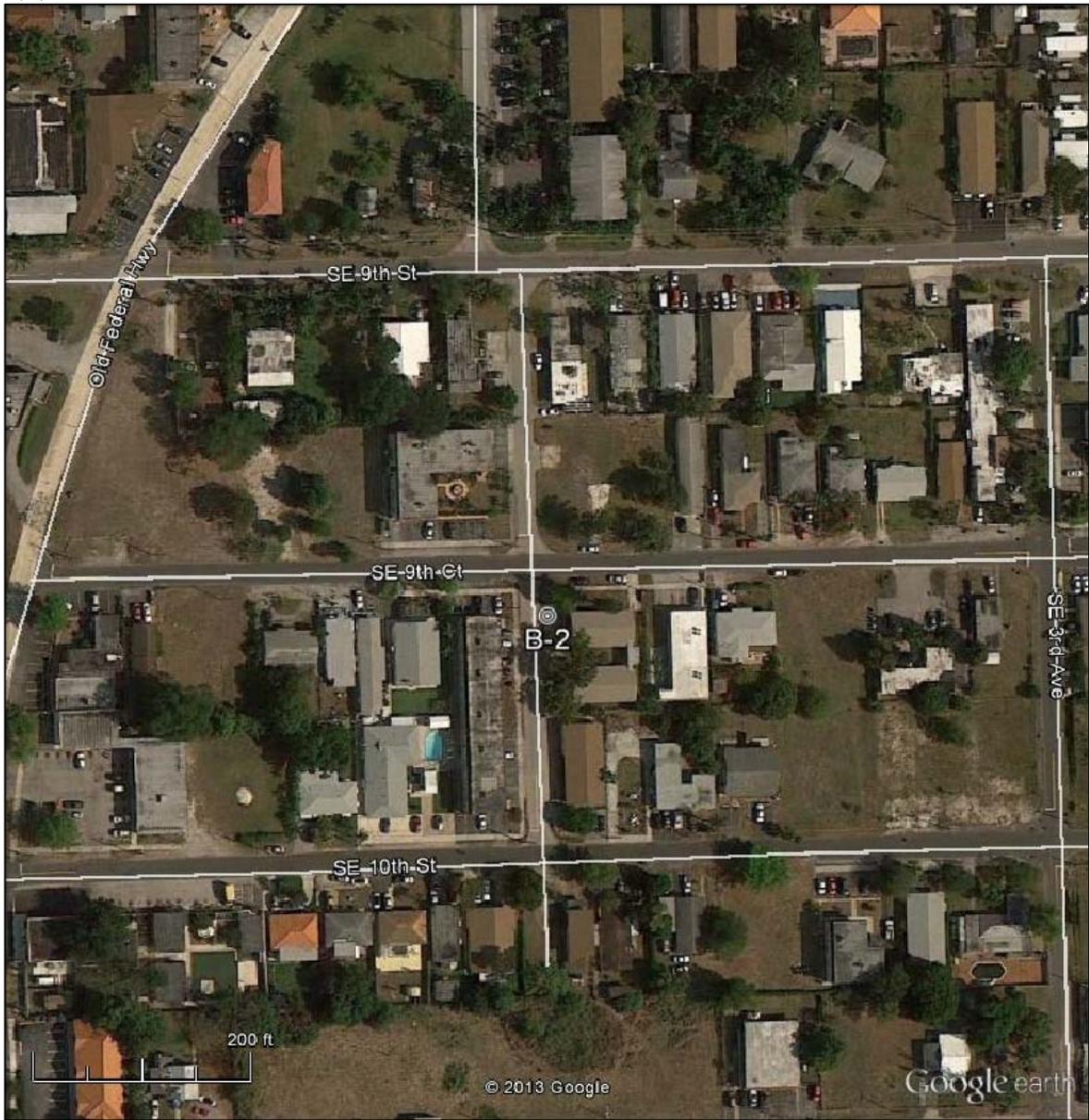


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GEOTECHNICAL EXPLORATION SERVICES  
DRAINAGE IMPROVEMENTS  
HALLANDALE BEACH, BROWARD COUNTY, FLORIDA

BORING LOCATION PLAN

DRAWN BY: A.G.A.	DATE: 11/05/13	CHECKED BY: P.G.R.	DATE: 11/05/13
SCALE: AS SHOWN	PROJECT NO: 0620.1300011	REPORT NO: 12467	PAGE NO: B-1

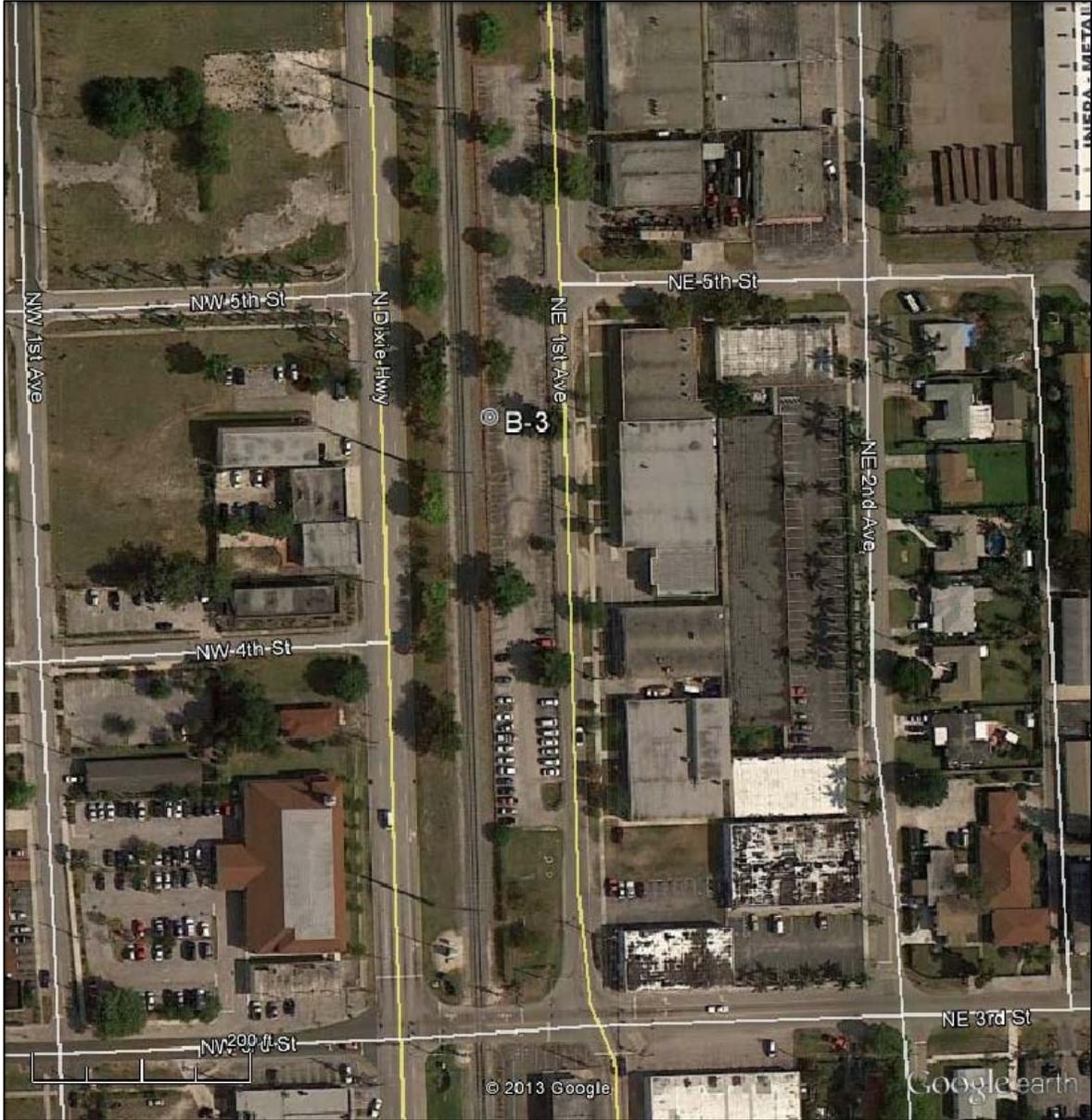


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GEOTECHNICAL EXPLORATION SERVICES  
DRAINAGE IMPROVEMENTS  
HALLANDALE BEACH, BROWARD COUNTY, FLORIDA

BORING LOCATION PLAN

DRAWN BY:	A.G.A.	DATE:	11/05/13	CHECKED BY:	P.G.R.	DATE:	11/05/13
SCALE:	AS SHOWN	PROJECT NO:	0630.1300070	REPORT NO:	12467	PAGE NO:	B-2

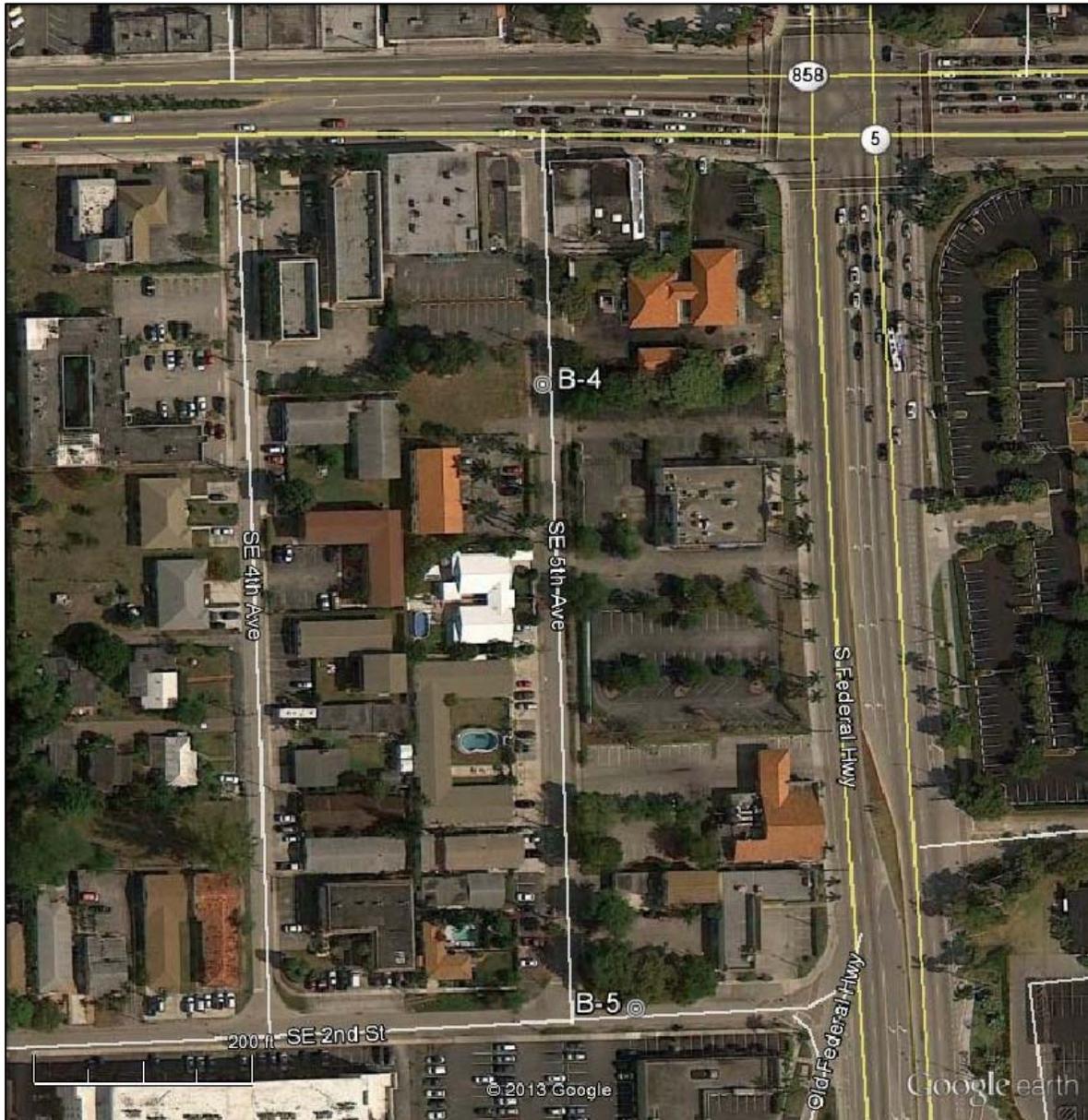


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GEOTECHNICAL EXPLORATION SERVICES  
DRAINAGE IMPROVEMENTS  
HALLANDALE BEACH, BROWARD COUNTY, FLORIDA

BORING LOCATION PLAN

DRAWN BY: A.G.A.	DATE: 11/05/13	CHECKED BY: P.G.R.	DATE: 11/05/13
SCALE: AS SHOWN	PROJECT NO: 0630.1300070	REPORT NO: 12467	PAGE NO: B-3



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GEOTECHNICAL EXPLORATION SERVICES  
DRAINAGE IMPROVEMENTS  
HALLANDALE BEACH, BROWARD COUNTY, FLORIDA

BORING LOCATION PLAN

DRAWN BY: A.G.A.	DATE: 11/05/13	CHECKED BY: P.G.R.	DATE: 11/05/13
SCALE: AS SHOWN	PROJECT NO: 0630.1300070	REPORT NO: 12467	PAGE NO: B-4



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1300070

REPORT NO.: 12467

PAGE: B-5

PROJECT: Drainage Improvements  
Various Locations  
Hallandale Beach, Florida

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

SHEET: **1 of 1**  
RANGE:

CLIENT: City of Hallandale Beach  
LOCATION: See Boring Location Plan

G.S. ELEVATION (ft): DATE STARTED: 10/30/13

WATER TABLE (ft): 6.8 DATE FINISHED: 10/30/13

DATE OF READING: 10/30/13 DRILLED BY: JA / JC

EST. W.S.W.T. (ft): 4 TYPE OF SAMPLING: SPT

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		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Tan sand with trace rocks [SP]						
		6-4-7-9	11			.....medium dense						
		6-8-8-9	16	▽								
5		8-2-3-2	5			Loose, dark brown peat/organics [PT]						
		2-2-3-4	5	▽		Loose to very loose, brown sand trace roots [SP]						
10		2-2-2-1	4									
15		2-4-3-4	7			Loose, light gray sandy limestone [GP]						
						SPT Soil Boring Terminated at 15 Feet in Depth						



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1300070

REPORT NO.: 12467

PAGE: B-6

PROJECT: Drainage Improvements  
Various Locations  
Hallandale Beach, Florida

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

SHEET: **1 of 1**  
RANGE:

CLIENT: City of Hallandale Beach  
LOCATION: See Boring Location Plan

G.S. ELEVATION (ft): DATE STARTED: 10/30/13

WATER TABLE (ft): 4.2 DATE FINISHED: 10/30/13

DATE OF READING: 10/30/13 DRILLED BY: JA / JC

EST. W.S.W.T. (ft): 3 TYPE OF SAMPLING: SPT

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		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Light gray sand [SP]						
		5-3-3-5	6			....loose						
				▽								
		3-3-3-3	6									
				▽								
5		2-2-1-1	3			Very loose, gray sand [SP]						
		1-1-1/12"	2			Very loose, brown sand with roots [SP]						
10		1-1-1/12"	2			Very loose, brown silty sand [SM]						
15		WH/24"	0			Very loose, brown sand [SP]						
						SPT Soil Boring Terminated at 15 Feet in Depth						



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1300070

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PROJECT: Drainage Improvements  
Various Locations  
Hallandale Beach, Florida

BORING DESIGNATION: **B-3**  
SECTION: TOWNSHIP:

SHEET: **1 of 1**  
RANGE:

CLIENT: City of Hallandale Beach  
LOCATION: See Boring Location Plan

G.S. ELEVATION (ft): DATE STARTED: 10/30/13  
WATER TABLE (ft): 5.3 DATE FINISHED: 10/30/13

REMARKS:

DATE OF READING: 10/30/13 DRILLED BY: JA / JC  
EST. W.S.W.T. (ft): 4 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Brown sand [SP]						
		2-2-4-4	6			....loose						
		3-3-3-3	6	▽		Loose, tan sand [SP]						
5				▽								
		2-1-2-2	3			Very loose, light brown to brown sand [SP]						
		1-1-1-2	2									
10		1-1-1-1	2									
15		5-6-4-4	10			Loose, light gray sandy limestone [GP]						
						SPT Soil Boring Terminated at 15 Feet in Depth						



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1300070

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PROJECT: Drainage Improvements  
Various Locations  
Hallandale Beach, Florida

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

SHEET: **1 of 1**  
RANGE:

CLIENT: City of Hallandale Beach  
LOCATION: See Boring Location Plan

G.S. ELEVATION (ft): DATE STARTED: 10/30/13

WATER TABLE (ft): 4.0 DATE FINISHED: 10/30/13

DATE OF READING: 10/30/13 DRILLED BY: JA / JC

EST. W.S.W.T. (ft): 3 TYPE OF SAMPLING: SPT

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		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Brown sand with trace rocks [SP]						
		2-3-2-3	5			Loose, tan sand [SP]						
				▽								
		3-3-2-2	5									
				▼								
5												
		1-1-2-2	3			Very loose, dark brown sand [SP]						
		1-1-1-1	2			Very loose to loose, light brown to light gray sandy limestone [GP]						
10		2-2-2-5	4									
15		4-3-4-4	7			SPT Soil Boring Terminated at 15 Feet in Depth						



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1300070

REPORT NO.: 12467

PAGE: B-9

PROJECT: Drainage Improvements  
Various Locations  
Hallandale Beach, Florida

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

SHEET: **1 of 1**  
RANGE:

CLIENT: City of Hallandale Beach  
LOCATION: See Boring Location Plan

G.S. ELEVATION (ft): DATE STARTED: 10/30/13

WATER TABLE (ft): 3.8 DATE FINISHED: 10/30/13

DATE OF READING: 10/30/13 DRILLED BY: JA / JC

EST. W.S.W.T. (ft): 3 TYPE OF SAMPLING: SPT

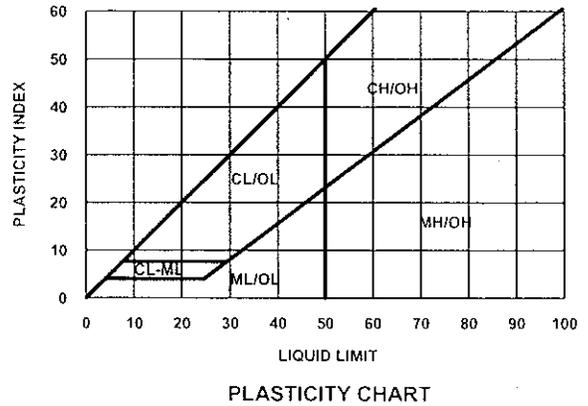
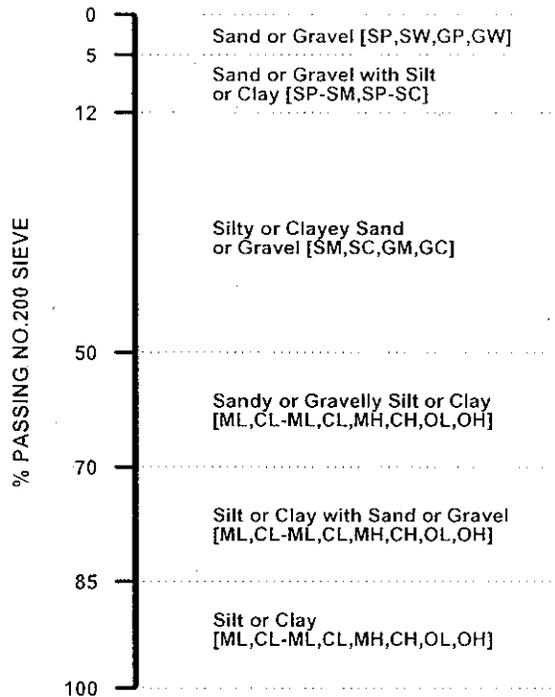
DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Brown sand with trace rocks [SP]						
		3-5-2-2	7			....loose						
				▽								
		2-1-2-2	3	▽		....very loose						
5												
		1-1-2-1	3			Very loose to loose, light gray sandy limestone [GP]						
		2-2-2-2	4									
10		2-3-4-4	7									
		4-5-3-4	8									
15						SPT Soil Boring Terminated at 15 Feet in Depth						

# KEY TO BORING LOGS

## SOIL CLASSIFICATION CHART\*



UNIVERSAL  
ENGINEERING  
SCIENCES, INC.



### GROUP NAME AND SYMBOL

#### COARSE GRAINED SOILS

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

#### FINE GRAINED SOILS

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

#### HIGHLY ORGANIC SOILS

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

#### RELATIVE DENSITY (SAND AND GRAVEL)

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

#### CONSISTENCY (SILT AND CLAY)

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

\* IN ACCORDANCE WITH ASTM D 2487 - UNIFIED SOIL CLASSIFICATION SYSTEM.

\*\* LOCALLY MAY BE KNOWN AS MUCK.

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

# SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
<p><b>COARSE GRAINED SOILS</b></p> <p>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE</p>	<p>GRAVEL AND GRAVELLY SOILS</p> <p>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE</p>	<p>CLEAN GRAVELS</p> <p>(LITTLE OR NO FINES)</p>		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	<p>SAND AND SANDY SOILS</p> <p>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE</p>	<p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p>		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES
				<b>SC</b>	CLAYEY SANDS, SAND - CLAY MIXTURES
				<b>ML</b>	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
	<p><b>FINE GRAINED SOILS</b></p> <p>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE</p>	<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT LESS THAN 50</p>		<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
			<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT GREATER THAN 50</p>			<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY	
			<b>OH</b>	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
<p>HIGHLY ORGANIC SOILS</p>				<b>PT</b>	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

USCS LEGEND 10/02/07

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



# Important Information About Your Geotechnical Engineering Report

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

*The following information is provided to help you manage your risks.*

## **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 you ASFE-member geotechnical engineer for more information.



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UGER06D45.0M

## **CONSTRAINTS AND RESTRICTIONS**

### **WARRANTY**

UES 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 boring performed at the location indicated on the Boring Location Plan. This report does not reflect any variations which may occur in the boring.

The nature and extent of variations in the boring 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 UES of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of UES 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**

UES 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 UES.

### **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 UES.

## **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. UES cannot be responsible for any interpretations made from this report or the attached boring log with regard to its adequacy in reflecting subsurface conditions which will affect construction operations.

## **STRATA CHANGES**

Strata changes are indicated by a definite line on the boring log 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 UES to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by UES to locate any such buried objects. UES 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 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.



**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 **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.