Town of Medley
Office of Capital Projects & Development Services
7777 NW 72 Avenue, Medley, Florida 33166

Date:	**April 11, 2016**
Subject:	**RFP for Construction of Lakeview District Utility Crossings**
Solicitation Number:	**ITB 2016-002**
OCPDS Number:	**WS-0110**
Opening Date / Time:	**April 20, 2016 at 3:00 PM**
ADDENDUM Number:	**1**

To all interested proposers:

The Town of Medley defines a solicitation "Addendum" as an addition to or amendment of the original terms, conditions, specifications, or instructions of a procurement solicitation (e.g. Invitation for Bids, Request for Proposals or Request for Qualifications), including but not limited to questions and answers, which are considered a material part of the solicitation.

Please note the following updates:

The sign-in sheet from pre-bid conference and the plan holders list are attached.

Revisions to the Project Manual (Solicitation Documents) as follows:

1. The attached Geotechnical Engineering Report for Town of Medley Water Main Installation Along NW 87th Avenue from NW 74th to NW 90th Street, Town of Medley, Florida Prepared by Universal Engineering Sciences and Dates October 19, 2015 is incorporated by reference. Bidders shall familiarize themselves with the observed conditions and bid items include the necessary excavation and disposal of unsuitable material.

Answers to bidder questions received (all bidder questions shall be sent via email to bidinfo@townofmedley.com):

1. What are the approximate sizes and types of the pipes to be installed on the project?
    a. Refer to project description in bid manual for types, diameters, and lengths of proposed pipe.

    "The Contractor must furnish all supervision, labor, materials, tools, equipment, and perform all operations required to construct the Town of Medley Capital Improvements Project Number WS-0110, Lakeview Utility District Utility Crossings in accordance with the Contract Documents and as described in the Construction Plans.

    Work includes, but is not limited to, the installation of approximately 539 linear feet (LF) of potable water main, 122 LF of sanitary sewer force main, and 84 LF gravity sanitary sewer main. There are a total of three areas of work within the right-of way of N.W. 87th Avenue between N.W. 74th Street and N.W. 90th Street and the right-of way of N.W. 80th Street east of its intersection with N.W. 87th Avenue as well as utility easements within to be adjacent properties in Medley, Florida as depicted in the Construction Plans.

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Work shall include, but is not limited to: excavation as necessary for installation of the pipe segments; installation of pipe segments and associated bedding material, cover material, limerock base or pavement reconstruction, and fixtures; testing of the installed pipe segments in accordance with local, state, and federal requirements; disposal of all construction debris, unused excavated material, and any excavated unsuitable material; and preparation of as-built drawings in accordance with Town of Medley requirements. The forgoing is herein referred to as the "Project" or the "Work", as shown on the Construction Plans prepared by Kimley-Horn and this Project Manual."

2. Are there any portions of the project that will need to be Bored?
    a. No.

3. Are the crossings to be Jack & Bored or Directionally Bored?
    a. No.

4. What are the approximate length and diameter of the portions to be bored?
    a. N/A.

5. How much is the estimated cost of the project?
    a. Engineer's opinion of probable cost is $179,249.00

6. Any further details you wish to provide?
    a. None at this time.

SIGN IN SHEET

MANDATORY PRE-PROPOSAL MEETING

Project:	Lakeview Utility District Master Plan	**Meeting Date:**	April 6, 2016
Project #: WS-0110	Bid Number: 2016-002	**Place/Room:**	Town Council Chamber

Name	Title	Company	Phone	Fax	E-Mail
Manny Quintana	Vice-President	Stonehenge Construction, LLC	786-866-7776	786-866-7777	mquintana@eshc-us.com
Roger Arguello	Estimator	Acosta Tractors, Inc.	305-552-0473	305-552-8268	rarguello@acostatractors.com
Juan Quiroz	Estimator	Caribe Utilities of FL	305-596-0141	305-396-4126	jquiroz@caribeutilities.com
Andres Luna	PM	American Pipeline Construction	786 236-5019	305 513 8350	aluna@american-pipeline.com
Shelley McDougle	PC	Intercounty Engineering Inc	954-972-9800	954-974-0042	smcdougle@intercountyengineering.com
Carlos Tejas	Estimator	Roadway Construction	954-227-0025	954-417-3677	Estimator@Roadway Construction.com
Valeri Poyato	Estimator	JVA Engineering	786-214-0567		estimating@jvaengineering.com
AL Garcia	VP	HG Construction	786-845-8999	(305) 424-4334	al@hgconstruction-us.com
Harold Morales	Supervisor	Metro Express, Inc	(305) 885 1330	(305) 885 1327	delio@metroexpresscorp.com
Emily Cortes	Asst PM	(VEC) V Engineering and consulting	786 305 - 420-5950		AP@veccorp.net

Olga Quin

From: bidinfo@townofmedley.com
Sent: Tuesday, April 05, 2016 3:16 PM
To: Bidinfo
Subject: Registered Plan Holder Information Form Submission

Registered Plan Holder Information Form Submission

Procurement No. ITB 2016-002

CIP Project No. WS-0110

Project Name: Lakeview Utility District Utility Crossing

Date
2016-04-05

Company Name
Metro Express Inc.

Specialty
General Engineering

Street Address
9442 N.W. 109 st

City
Medley

State
Florida

Zip
33178

Contact Person
Delio A Trasobares

Title
President

Phone Number
3058851330

Fax
3058851330

Email
delio@metroexpresscorp.com

Comments
a

Olga Quin

From: bidinfo@townofmedley.com
Sent: Wednesday, March 23, 2016 10:15 AM
To: Bidinfo
Subject: Registered Plan Holder Information Form Submission

Registered Plan Holder Information Form Submission

Procurement No. ITB 2016-002

CIP Project No. WS-0110

Project Name: Lakeview Utility District Utility Crossing

Date
2016-03-23

Company Name
Acosta Tractors, Inc.

Specialty
Engineering Contractor

Street Address
11986 NW 97th Avenue

City
Hialeah Gardens

State
Fl

Zip
33018

Contact Person
Roger Arguello

Title
Estimator

Phone Number
305-556-0473

Fax
305-556-8268

Email
rarguello@acostatractors.com

Comments
What's the budget of this project?

Olga Quin

From: bidinfo@townofmedley.com
Sent: Monday, March 21, 2016 5:02 PM
To: Bidinfo
Subject: Registered Plan Holder Information Form Submission

Registered Plan Holder Information Form Submission

Procurement No. ITB 2016-002

CIP Project No. WS-0110

Project Name: Lakeview Utility District Utility Crossing

Date
2016-03-21

Company Name
JVA Engineering

Specialty
Civil

Street Address
6600 NW 32nd Ave

City
Miami

State
FL

Zip
33147

Contact Person
Jose M. Alvarez

Title
President

Phone Number
3056967902

Fax
3056967903

Email
estimating@jvaengineering.com

Comments
Additional contacts Valeri Poyato (Estimator) Maria Gutierrez (Office Manager)

Olga Quin

From: bidinfo@townofmedley.com
Sent: Thursday, March 17, 2016 2:26 PM
To: Bidinfo
Subject: Registered Plan Holder Information Form Submission

Registered Plan Holder Information Form Submission

Procurement No. ITB 2016-002

CIP Project No. WS-0110

Project Name: Lakeview Utility District Utility Crossing

Date
2016-03-17

Company Name
AMERICAN PIPELINE CONSTRUCTION LLC

Specialty
UNDERGROUND UTILITIES/CGC

Street Address
10117 SW 5 St

City
Miami

State
FL

Zip
33174

Contact Person
ANDRES LUNA

Title
Operations Manager

Phone Number
(786)236-5019

Fax
(305)513-8350

Email
aluna@american-pipeline.com

Comments
STATE CERTIFIFED GENERAL CONTRACTOR

Olga Quin

From: bidinfo@townofmedley.com
Sent: Thursday, March 17, 2016 1:56 PM
To: Bidinfo
Subject: Registered Plan Holder Information Form Submission

Registered Plan Holder Information Form Submission

Procurement No. ITB 2016-002

CIP Project No. WS-0110

Project Name: Lakeview Utility District Utility Crossing

Date
2016-03-17

Company Name
HG Construction

Specialty
Undedrground Utilities

Street Address
7003 N. Watwerway Drive #218

City
Miami

State
Fl

Zip
33155

Contact Person
Al Garcia

Title
VP

Phone Number
786.449.2841

Fax
305.4249334

Email
al@hgconstruction.us

Comments
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UNIVERSAL
ENGINEERING SCIENCES

GEOTECHNICAL ENGINEERING REPORT

TOWN OF MEDLEY WATER MAIN INSTALLATION
ALONG NW 87TH AVENUE
FROM NW 74TH TO NW 90TH STREET
TOWN OF MEDLEY, FLORIDA

UES PROJECT NO. 2130.150064
UES REPORT NO. G00147

Prepared For:

Mr. Barton Fye, P.E., CFM
Kimley-Horn and Associates, Inc.
1221 Brickell Avenue, Suite 400
Miami, FL 33131

Prepared By:

Universal Engineering Sciences
9960 NW 116th Way, Suite 8
Miami, Florida 33178
(305) 249-8434

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- Sarasota
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- Tifton
- West Palm Beach

October 19, 2015

Kimley-Horn and Associates, Inc.
1221 Brickell Avenue, Suite 400
Miami, FL 33131

Attention: Mr. Barton Fye, P.E. CFM

Reference: **Geotechnical Engineering Report**
Town of Medley Water Main Installation
Along NW 87th Avenue
From NW 74th Street to NW 90th Street
Town of Medley, Florida
UES Project No. 2130.1500064 (UES Report No. G00147)

Dear Mr. Fye:

Universal Engineering Sciences, Inc. (UES) has completed a geotechnical exploration and engineering report at the above-referenced site in the Town of Medley, Miami-Dade County, Florida. The scope of this exploration was conducted in general accordance with our opportunity No. 2130.0515.00009, dated May 15, 2015 and authorized by you on September 10, 2015. This exploration was performed in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

The following report presents the results of our field exploration along with our geotechnical evaluations and recommendations for the proposed water main installation. 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

Steve Jaime, E.I.
Staff Engineer

REINALDO JESUS VILLA LICENSE No 72242 STATE OF FLORIDA PROFESSIONAL ENGINEER

10/16/15

Reinaldo Villa, M.S.
Branch Manager / Sr. Geotechnical Engineer
FL Professional Registration No. 72242

Dist: Client (5)
Files (1)

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APPENDICES

1.0 INTRODUCTION

1.1 GENERAL

This report contains the results of a subsurface exploration conducted for the proposed water main installation in the Town of Medley, Miami-Dade County, Florida. This report has been divided into 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

We understand that project consists of installing utility crossings at four (4) locations perpendicular to NW 87th Avenue, between NW 74th Street and NW 90th Street in the Town of Medley, Florida.

Based on our review of plans provided by Kimley-Horn and Associates, Inc. (KHA), the proposed water mains will have invert elevations ranging from about +2.55 to -4.33 feet (NGVD, 1929). Ground surface elevations range from +5 to +8.5 feet (NGVD, 1929). The depth of pipe installation will range from approximately 5.5 to 11.5 feet below existing grades. Three (3) of the utility crossings will consist of 16-inch diameter water mains and one (1) crossing will consist of an 8-inch diameter ductile iron sanitary sewer main.

The results of the field testing and laboratory testing programs were used to derive and provide design soil/rock parameter recommendations for use in the design of the temporary ground support systems that may be used during construction for the installation of the proposed utility crossings. The type and design of the temporary ground support system was not part of our scope of services and we are assuming that it will be performed by others. Additionally, the results of this study were used to provide geotechnical engineering evaluation and recommendations for evaluation of the subsurface materials for the anticipated improvements.

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) test borings with special attention to potential geotechnical considerations that may affect the proposed design, construction, and serviceability of the proposed dining area;

- to provide geotechnical engineering recommendations for groundwater considerations, foundation design and site preparation.

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. UES would be pleased to perform these services, if you desire. Any statements regarding staining of soils or odors are strictly for the information of our client only.

2.2 SITE CONDITIONS

Representatives of our firm visited the project site to observe the conditions prior to mobilization. Sheet A1 of Appendix A presents a Site Vicinity Map. NW 87th Avenue within the project limits consists a partially paved two-way street with industrial areas with heavy truck traffic. The asphalt pavement was observed to be in poor conditions with pot-holes and cracks.

2.3 FIELD EXPLORATION

As requested by KHA, the subsurface conditions at the site were explored by performing a total of eight (8) Standard Penetration Test (SPT) borings (designated as B-1 through B-8) in areas of the proposed utility crossings. The approximate locations of the test borings are presented in Appendix B titled “Test Location Plan”.

SPT borings were performed to depths ranging from 15 to 25 feet below existing grades for the proposed utility crossings. A representative of UES located the test locations in the field based upon estimated distances, relationships to obvious landmarks and the preliminary site plan provided to us. Therefore, consider the indicated test locations and depths to be approximate.

The SPT borings were advanced to a maximum depth of 25 feet below existing grades 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 then at 5-foot sampling intervals. 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. All SPT borings were performed with the use of an automatic hammer.

Samples collected during the SPT were placed in clean sample containers and transported to our laboratory where they were visually classified by a member of our geotechnical engineering staff in accordance with ASTM D-2488.

2.4 LABORATORY TESTING

The soil/rock samples recovered from the test borings were returned to the laboratory where a member of our geotechnical staff visually classified them, reviewed the field descriptions, and selected representative samples for laboratory tests. Tests were performed to aid in classifying the soils and to help evaluate the general engineering characteristics of the site soils. The laboratory classification testing included natural moisture content (ASTM D-2216) and percent passing the No. 200 sieve (AASHTO T-11) and organic content by means of incineration (FM 5-514). The laboratory test results are shown on the Boring Logs in Appendix B of this report.

3.0 GENERALIZED SUBSURFACE CONDITIONS

3.1 MIAMI-DADE COUNTY REGIONAL GEOLOGY

The Miami area of southern Florida is underlain by an alternating sequence of cemented and uncemented Pleistocene sedimentary deposits (Pleistocene Epoch, deposited 10,000 to 2 million years before the present). A near surface Miami Limestone Formation is underlain by a wide variety of loose to dense quartz sands and coarse to fine-grained hard to very hard limestones and sandstones (Fort Thompson Formation). However, in many portions of Miami-Dade, surface sand deposits of the Pamlico Formation and man-made (artificial) fill are encountered. The Pamlico sands and man-made (artificial) fill have a thickness of approximately three (3) to seven (7) feet and overlie the Miami Limestone Formation. In the west part of the county, portions of the Everglades interfingers with the Pamlico sands. The Everglades soils consist of peat, organic silt and calcareous silt marl. The Everglades soils also have a thickness of three (3) to seven (7) feet and overlie the Miami Limestone Formation.

Although the Miami Limestone Formation can be very porous and have a sponge-like, open interconnected network of vugs and small voids, large cavities do not exist and there is no potential for sinkhole activity. The rock formations encountered in the Miami area are typically much softer than the "bedrock" formations encountered in other areas of the country. The strength of the limestone as well as its deformation characteristics depends upon the degree of cementation of the formation and its alteration by solutioning and weathering subsequent to deposition. One of the most important characteristics of the limestone encountered in the project area is the degree of erosion. Past surface solutioning of the limestone has resulted in the formation of a "pinnacle rock" surface. In some cases nearly vertical cylindrical-shaped solution cavities are filled with surficial fine sands extending below the groundwater level. The subsurface conditions encountered at the site are presented in the following section.

3.2 MIAMI-DADE COUNTY SOILS SURVEY

The *Soil Survey of Miami-Dade County Area, Florida*, published by the United States Department of Agriculture (USDA), was reviewed for general near-surface soil information within the general project vicinity. This information indicates that there is one (1) primary mapping unit within the project vicinity, as follows:

- Udorthents-water complex (9): consists of Udorthents and open bodies of water. The Udorthents are very shallow to deep over limestone bedrock. They consist of unconsolidated or heterogeneous geologic material removed during the excavation of ditches, canals, lakes, ponds, and quarries.

4.0 FINDINGS

4.1 SUBSURFACE CONDITIONS

The results of our field exploration and laboratory analysis, together with pertinent information obtained from the SPT borings, such as soil profiles, penetration resistance and groundwater levels are shown on the boring logs and Subsurface Profiles included in Appendix B. The Key to Boring Logs is also included in Appendix B. The stratification lines shown on the boring logs represent the approximate boundaries between soil types, and may not depict exact subsurface soil conditions. The actual soil boundaries may be more transitional than depicted. Generalized profiles of the soils/rocks found at our boring locations is presented in Tables A through D on the following pages. The subsurface profiles were prepared from field logs after the recovered soil samples were visually classified by a member of our geotechnical staff.

TABLE A: GENERALIZED SOIL PROFILE
UTILITY CROSSING AT STATION: 206+95.4 ALONG NW 87TH AVENUE
BORING Nos. B-1 and B-2

Typical Depths Below Grade (feet)	Soil Description
0 to 8	Brown, Dense to Very Dense, Slightly Silty Fine to Medium SAND with Some Limerock Fragments (FILL; SP-SM)
8 to 20*	Light Brown Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)
* Maximum Boring Explored Depth	

Note:

1. The groundwater at this structure location was measured at a depth of 3.6 feet below existing grades in the test borings at the time of drilling. It should be noted that the groundwater levels were recorded during the ending of the wet season.

TABLE B: GENERALIZED SOIL PROFILE UTILITY CROSSING AT STATION: 16+05.5 ALONG NW 80TH STREET BORING Nos. B-3 AND B-4	
Typical Depths Below Grade (feet)	**Soil Description**
0 to 10	Brown to Gray, Medium Dense to Very Dense, Slightly Silty to Silty, Fine to Medium SAND with Some Limerock, Asphalt, Concrete, and Root Fragments (FILL; ASSORTED DEBRIS; SP-SM/SM)
10 to 22	Light Gray, Very Soft to Firm, SILT (FILL; ML)
22 to 25*	Light Brown Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)
* Maximum Boring Explored Depth	

Notes:

1. The groundwater at this structure location was measured at depths ranging from 3.6 to 7.0 feet below existing grades in the test borings at the time of drilling. It should be noted that the groundwater levels were recorded during the ending of the wet season.

2. A notable feature was found in both test borings performed at this structure location, which included the presence assorted debris at depths ranging from 0 to 10 feet below existing grades. Assorted Debris encountered includes asphalt and concrete fragments. Additionally, boring B-4 encountered very soft to firm silt (ML) material at depths ranging from 10 to 22 feet below existing grades.

TABLE C: GENERALIZED SOIL PROFILE UTILITY CROSSING AT STATION: 218+05.5 ALONG NW 87TH AVENUE BORING Nos. B-5 AND B-6	
Typical Depths Below Grade (feet)	**Soil Description**
0 to 2	Brown, Dense to Very Dense, Slightly Silty Fine to Medium SAND with Some Limerock and Asphalt Fragments (FILL; ASSORTED DEBRIS; SP-SM)
2 to 15*	Light Brown Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)
* Maximum Boring Explored Depth	

Notes:

1. The groundwater at this structure location was measured at depths ranging from 6.9 to 7 feet below existing grades in the test borings at the time of drilling. It should be noted that the groundwater levels were recorded during the ending of the wet season.

2. A notable feature was found in both test borings performed at this structure location, which included the presence assorted debris at depths ranging from 0 to 2 feet below existing grades. Assorted Debris encountered includes asphalt fragments.

TABLE D: GENERALIZED SOIL PROFILE UTILITY CROSSING AT STATION: 249+97.3 ALONG NW 87TH AVENUE BORING Nos. B-7 AND B-8	
Typical Depths Below Grade (feet)	**Soil Description**
0 to 6	Brown, Dense to Very Dense, Slightly Silty Fine to Medium SAND with Some Limerock and Asphalt Fragments (FILL; ASSORTED DEBRIS; SP-SM)
6 to 20*	Light Brown Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)
* Maximum Boring Explored Depth	

Notes:

1. Groundwater at this structure location was measured at depths ranging from 3.3 to 3.5 feet below existing grades in the test borings at the time of drilling. It should be noted that the groundwater levels were recorded during the ending of the wet season.

2. A notable feature was found in both test borings performed at this structure location, which included the presence assorted debris at depths ranging from 0 to 6 feet below existing grades. Assorted Debris encountered includes asphalt fragments.

3. The results of the test borings did reveal some gasoline odors in borings B-3 and B-4 at about depths of 8 feet below existing grades. This assessment is based on our observation during the drilling activities and of the recovered soil/rock samples only. No laboratory testing was performed to confirm any environmental contamination in accordance with our scope.

5.0 RECOMMENDATIONS

5.1 GENERAL

The following recommendations are made based upon the attached test boring logs, our stated understanding of the proposed construction, and our experience with similar projects and subsurface conditions. If subsurface conditions are encountered during construction which were not encountered in the borings, those conditions should be reported immediately to UES for evaluation and possible recommendations. In this section of the report, recommendations are presented for groundwater considerations, soil/rock parameters for temporary support of excavation analyses and design and construction related services.

We note that since the applicability of geotechnical recommendations is very dependent upon project characteristics, most specifically: improvement locations, grade alterations, and actual structural loads applied, UES must review the final site and grading plans to validate all recommendations rendered herein. Without such review our recommendations should not be relied upon for final design or construction of any site improvements.

5.2 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 1.5 feet below existing grades. The existing and estimated seasonal high groundwater table at each location appears on the boring logs 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.

UES recommends that all pavement design incorporate assumption of the seasonal high groundwater condition. 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.

6.0 RECOMMENDED SOIL/ROCK PARAMETERS FOR TEMPORARY SUPPORT OF EXCAVATION ANALYSES AND DESIGN

The geotechnical design parameters for this study were obtained on the basis of empirical relationships between the SPT "N"-values and the shear strength of the soil/rock strata, literature review and our local experience. Table E below provides recommended geotechnical soil/rock parameters for use in design of temporary ground support systems as well as for geotechnical evaluation of subsurface materials for support of the proposed utility crossings. The design of temporary support of excavation was not part of our scope of services and we are assuming that it will be performed by others.

TABLE E- SUMMARY OF RECOMMENDED GEOTECHNICAL SOIL/ROCK DESIGN PARAMETERS

GENERAL MATERIAL DESCRIPTION (USCS SYMBOL)	RANGE OF SPT N-VALUES, BPF (AVERAGE) [(1)]	SOIL/ROCK UNIT WEIGHT (pcf)		FRICTION ANGLE (Degrees)	COHESION (psf)	EARTH PRESSURE COEFFICIENTS		
		TOTAL	EFFECTIVE			ACTIVE	PASSIVE	AT-REST
		γ_t	γ_{eff}	ϕ	C	Ka	Kp	Ko
Granular Fill (SP-SM)	16 - 124 (59)	115	53	34	-	0.31	3.25	0.47
Silt (ML)	0 - 6 (3)	80	18	20	-	0.59	1.70	0.74
Miami Limestone Formation	12 - 82 (38)	120	58	0	4,000	-	-	-

Notes:

(1) SPT N-values presented on this table were corrected for hammer efficiency. The field N-values were multiplied by a factor of 1.24 to convert it to the equivalent of a safety hammer N-value in accordance with the Florida Department of Transportation (FDOT) *Soils and Foundations Handbook (2015)*.

(2) An appropriate factor of safety should be applied to these parameters.

(3) Due to the high fines content of the sandy silt (ML) layer, we recommend ignoring any friction between the between the subsurface materials and any temporary ground support system.

7.0 ENGINEERING EVALUATIONS AND RECOMMENDATIONS FOR UTILITY CROSSINGS

7.1 GENERAL

The borings performed generally revealed suitable subsurface conditions for support of the proposed utility crossings. However, test boring B-4 encountered very soft to firm silt (ML) at a depth ranging from 10 to 22 feet below existing grades.

7.2 PIPE INSTALLATION

The borings in general revealed suitable subsurface conditions for support of the proposed pipes (except in the vicinity of test boring B-4). Based on our review of plans provided by Kimley-Horn and Associates, Inc. (KHA), the proposed water mains will have invert elevations ranging from about +2.55 to -4.33 feet (NGVD, 1929). It should be noted that a layer of unsuitable silt (ML) material was encountered at boring location B-4 between depths ranging from 10 to 22 feet below existing grades. The silt (ML) material is highly compressible and has low strength and thus settlement is expected under the weight of the proposed pipes. We understand that an 8-inch diameter gravity sanitary sewer pipe is proposed to be installed in the vicinity of where test boring B-4 was performed. Total and differential settlements may cause movement to the proposed gravity slope if not properly addressed during design and construction. The following sections provide discussions regarding ground improvement alternatives for the proposed pipe installation at boring location B-4.

7.3 GROUND IMPROVEMENT ALTERNATIVES FOR 8-INCH SANITARY SEWER PIPE

The proposed pipe will experience excessive short-term and long-term settlements if it is built directly over the unsuitable sandy silt (ML) soils without any level of soil improvement. The amount of settlement is dependent on the thickness of the silt (ML) materials, additional weight of fill that will be added and compacted to construct the pipes, the soil cover, and any traffic loads. With regular ordinary fill material (unit weight = 125 pcf), an average short-term settlement (primary consolidation) in excess of 2 inches may be expected if the proposed pipes are placed on top of the compressible soils without excavating all of the silt (ML) material prior to placement of the new fill. In addition, long-term settlements (secondary consolidation) in excess of 1 inch may be expected over the life of the pipeline system. Differential settlement is also a concern given that the boring performed at the other end of the pipe (i.e. B-3) did not encounter unsuitable sandy silt (ML) soils. It should be noted that without improvements to the existing unsuitable soils, which consist of silt (ML) material, a significant risk exists to the performance of the pipes. To minimize these risks, the uses of the following ground improvement alternatives were evaluated:

1. Removal of unsuitable soils (sandy silt) and replacement with select fill material.
2. Pile-supported pipes without removal of unsuitable soils.

The following sections provide a general description of the feasible options that are available to mitigate the expected settlements of the proposed pipe. An evaluation of the above alternatives was made to determine the most feasible and economical option for this project. Based on the results of the field exploration program and previous experience with similar types of materials, we recommend option No. 1 above. The final selection should be made by KHA and The Owner after considering utility, accessibility and MOT impacts, construction sequence as well as performing a cost/benefit analyses. These latter evaluations are outside of our scope of service. Table F of this report provides a comparison of each of the ground improvements alternatives.

- **Option No. 1:** Removal of Unsuitable Soils and Replacement with Select Fill - This option requires removal of the compressible and unsuitable sandy silt (ML) soils to firm bearing material (i.e. limestone or natural sand layers) prior to placement of the proposed pipelines to avoid settlement and potential damage to the pipe. The width of the excavation should be kept as small as possible to reduce removal and backfilling costs but wide enough to allow compaction of the backfill above the groundwater level. This option will completely eliminate short and long-term settlements and will not require periodic maintenance. The removal of the unsuitable soils will facilitate construction without impacting the construction schedule because no quarantine period will be required to dissipate excessive consolidation settlements. As stated in Miami-Dade Water and Sewer Department's (MDWASD) Specifications Section 02315 "Trenching and Backfilling for Piping Systems", the excavation shall be continued 2 feet deeper than the excavation required for the 6-inch bedding layer, except if a suitable foundation material is exposed at a lesser depth, further excavation will not be required. If the soil is still unsuitable after the additional excavation as prescribed above, the trench bottom shall be excavated further in one foot increments in accordance with "Trench Overcut" section of the MDWASD Specifications Section 02315. If, after excavating the trench to a depth of 2 feet 6 inches below the outside bottom elevation of the proposed pipe barrel, and the soil at that depth is still unsatisfactory as foundation material, the pipe trench shall be excavated further in one-foot depth increments until a suitable foundation material is found. Select backfill material shall then be compacted in 6-inch layers up to the bottom of the proposed 6-inch thick layer of pipe bedding. Strict inspection and oversight of the Contractor's work will be essential to ensure the pipe is being supported by suitable material. With this option, KHA and The Contractor must determine location of material disposal. In addition, given the relatively deep excavation required, the cost analysis shall include the use of temporary steel sheet piles to maintain a safe excavation. Given the high amount of fines content, these unsuitable (ML) soils shall not be used as backfill material.

- **Option No. 2:** Pile-Supported Pipeline Without Removal of Unsuitable Soils - No surcharge is required with this option and will facilitate construction without impacting the schedule because no quarantine period is needed. There is wide range of piles that may be used to support the proposed pipes. Conventional [i.e., steel H, steel pipe, pre-cast concrete, cast-in-place concrete, and Auger-Cast-In-Place (ACIP) piles] piles may be used for pile-supported pipelines. However, conventional piles have a rather high structural capacity that is seldom required for pipes and are, therefore, economically not as attractive as non-traditional columns. The newer elements that have been used for column support include soil mix columns, Vibro-Concrete Columns (VCC), Combined Soil Stabilization (CSV) and pin piles. The installation method used with any of these piles results in minimal spoil generation, thus no environmental impact. The diameter of the soil reinforcement inclusion is dependent on the type of pile used but generally of small ranging from 3 to 18 inches. The area of the columns will be located directly beneath the pipes. Some of the piles listed herein are not adequate given the level of vibration and size of construction equipment required for their installation. Such is the case for driven steel H-piles, pre-cast concrete piles, and VCC columns. These piles all require large size equipment which impose vibrations that will potentially cause cracking to nearby structures and may damage existing utilities. Therefore, the feasible choices for piles were limited to pin piles, ACIP piles, CSV piles and soil mix columns that may bear 3 to 5 feet below bottoms of the silt (ML) layer into the natural limestone. The required pile spacing is expected to be in the order of 10 to 15 feet to limit mid span deflection of the pipe. It is anticipated to have piles near each pipe joint and between joints. The design of the piles for support of the proposed pipe shall be the responsibility of the Contractor. The Contractor should submit all design, proposed installation procedures, and proposed materials to the Owner for review. The space limitations any easement should be taken into account for equipment accessibility if this option is selected.

7.4 FINAL SELECTION OF GROUND IMPROVEMENT ALTERNATIVE

At this point, we are of the opinion that this is the best, most recent and representative data analyses (Table F) that can be used as a basis of comparison for this project. The final selection of the ground improvement will also depend on the invert elevation of the proposed pipes as well as the construction sequence. The final selection and pricing of the most feasible ground improvement alternative should be made by KHA and The Owner.

TABLE F - SUMMARY OF GROUND IMPROVEMENT ALTERNATIVES

ALTERNATIVE	ADVANTAGES	DISADVANTAGES
Option No. 1 Complete Removal of Unsuitable Soils and Replacement	• Lowest risk to Owner • No quarantine period to dissipate settlement • No future differential settlement • No future maintenance • Proven track record	• Cost of removal and disposal of unsuitable soils • Cannot compact new fill material under water • Requires select fill with less than 10% fines under water • Stability of open trench • Cost of temporary sheeting • Impact to local traffic • MOT required due to open excavations
Option No. 2 Pile Supported Pipeline (Without Removal of Unsuitable Soils)	• Low risk to Owner • Fast construction • Minimal spoil generation • No environmental impact • No future settlements • No future maintenance • No disposal of unsuitable soils • No surcharge/quarantine period • Minimal impact to construction schedule • Proven track record • No additional Mob/Demob.	• High construction cost, except for CSV columns • Tight access may limit equipment mobility • Requires compact equipment for pile construction • Specialty foundation subcontractor required for CSV • Requires construction equipment access • Cost of excavating trench • Heavy equipment may damage landscaping • Requires geotextile to spread load • Number of piles required (10’ to 15’ c-c)

7.5 ALLOWABLE BEARING CAPACITY AND SETTLEMENT

The proposed pipes may rest on the surface of the existing granular soils or on the surface of the natural Miami Limestone Formation. We recommend that the pipes be designed using an allowable bearing capacity of 2,500 pounds per square foot (psf) when resting on the surface of granular soils (i.e. granular fill/SP-SM) or 4,000 psf when resting on the surface of the natural Miami Limestone Formation. Assuming maximum allowable bearing capacities in the range of 2,500 to 4,000 psf, settlements are anticipated to be less than about 1 inch, which is considered to be adequate for this application.

7.6 EXCAVATION RECOMMENDATIONS

The installation of the proposed pipelines will require excavation of the existing subsurface materials. Temporary excavation side slopes of 1V:2H (vertical to horizontal) in the granular subsurface materials, 1V:4H in the silt (ML) layer, and 1V:0.5H in the Miami Limestone Formation are stable and have a minimum factor of safety of 1.3. If steeper sides are used, the excavations will require the need of temporary ground support systems in order to maintain the stability of the excavations and for safety reasons. Based on the results of the soil borings, an unsupported vertical cut is not considered stable or safe during construction. An unsupported vertical cut will cause cracks on the surface of the asphalt-paved roadway because the angle of repose of the granular soils will be exceeded and a failure surface will develop behind the vertical face of the excavation. The existing subsurface materials may be excavated using conventional excavation equipment. It is to be noted that the Miami Limestone Formation may require special equipment to excavate.

The temporary ground support system and sloping should be in conformance with the Occupational Safety and Health Administration (OSHA) Standards. The soil/rock parameters presented in Table E of this report may be used for design of the temporary ground support systems. Materials removed from the excavation should not be stockpiled immediately adjacent to the cut, inasmuch as this load may cause a sudden collapse of the temporary ground support system.

7.7 GROUNDWATER CONTROL

Dewatering may or may not be required depending on the construction technique used. The amount of dewatering will depend on the invert elevation of the proposed pipelines and the time of the year when the construction occurs. Successful removal of the existing subsurface materials and installation of the pipes may necessitate that the work be performed in-the-dry, thereby possibly requiring temporary lowering of the groundwater table in the proposed excavation areas. De-watering involves lowering the ambient groundwater table below the existing groundwater levels. This may be accomplished through use of a wellpoint system. Submersible pumps may not be adequate given the highly permeable nature of the limestone layers. Please refer to MDWASD's specification section 02315 "Trenching and Backfilling For Piping Systems" for dewatering requirements.

The water from the on-site dewatering operations should be directed to a suitable discharge point and must be adequate to satisfy any local, state or federal regulatory agency. The Designer, The Town of Medley and The Contractor are warned that the Miami Limestone Formation is very permeable and quite difficult to dewater.

8.0 CONSTRUCTION CONSIDERATIONS

The following are our suggestions for the installation of the proposed pipelines based on the results of the test borings. All excavations shall be executed in accordance with The Florida Building Codes, the state of Florida Trench safety Act (TSA), OSHA requirements and all applicable requirements of MDWASD's Specifications.

1. If temporary steel sheet piles are used for excavation support, it should be noted that sheet pile refusal may occur on a random and unpredictable basis since zones of dense soils and relatively hard rock materials not revealed by the test borings may be encountered. In this case, we recommend that predrilling be considered prior to the installation of the sheet piles. Predrilling is required in order to prevent refusal conditions, damage of the structural section of the sheeting and minimize vibrations-induced settlements to nearby structures and/or utilities. Following predrilling, the sheet piles should be set in place and vibrated to the required tip elevations.

2. The sheet pile installation equipment will produce vibration and noise levels that may be considered disturbing to people and can produce vibrations noticeable in structures and/or utilities. The potential for damage to any adjacent structures and/or utilities during the sheet pile installations will be dependent on the distance from the adjacent structures to the location of the sheet piles installation, the subsurface conditions, and the level of sensitivity of the structure to any type of vibration. The recommendations provided in Subarticle 455-1.1 of the Florida Department of Transportation (FDOT) *Standard Specifications for Road and Bridge Construction* should be followed for the protection of the existing structures/utilities during sheet piling operations. All structures and/or utilities located adjacent to the proposed excavation shall be surveyed as well as monitored for vibrations and settlements in accordance with Subarticle 455-1.1 of the FDOT *Standard Specifications for Road and Bridge Construction*.

3. After the sheet piles are installed to their required tip elevations, or the temporary ground support is set in place, the excavation of the subsurface materials can be made.

4. Depending on the water levels at the time of construction, the installation of the pipelines may require that the work be performed in dry conditions. Therefore, dewatering may be required depending on the construction technique employed by The Contractor and may vary substantially depending on the invert elevation of the proposed water main and the time of the year when the construction occurs. Caution must be exercised by the Contractor to prevent unnecessary dewatering for prolonged periods of time in order to prevent ground settlement and/or settlement of any nearby structures, utilities, or roadway as a result of the added overburden pressure resulting from lowering of the groundwater table. All structures and/or utilities located adjacent to the proposed excavation shall be surveyed as well as monitored for settlements during the dewatering operations in accordance with the FDOT *Standard Specifications for Road and Bridge Construction*. The water from the on-site dewatering operations should be directed to a suitable discharge point and must be adequate to satisfy any local, state or federal regulatory agency.

5. Any fill materials required to backfill excavations or bedding layers shall be in accordance with MDWASD's specification section 02315 "Trenching and Backfilling For Piping Systems" for further requirements.

6. The select fill should be tested and approved prior to acquisition and placement. Density tests to confirm compaction should be preformed in each fill lift before the next lift is placed. Any fill indicating less than above compaction requirements should be re-compacted until the required density is obtained.

7. The roadway subgrade of backfill in the trenches should be compacted to not less than 98 percent modified Proctor maximum dry density (AASHTO T-180).

8. Prior to initiating compaction operations, we recommend that representative samples of the select fill material to be used and acceptable in-place soils be collected and tested to determine their compaction and classification characteristics. The maximum dry density, optimum moisture content, gradation, and plasticity characteristics should be determined. These tests are needed for compaction quality control of the select fill and existing soils and to determine if the fill material is acceptable. Select backfill material shall be placed under and around the pipe to one foot above the crown in 6-inch layers. Each layer shall be compacted to not less than 90 percent modified Proctor maximum dry density (AASHTO T-180). Backfilling and compacting of material lying above a point one foot above the crown of the pipe and below the pavement base shall be accomplished in layers not exceeding 9 inches in thickness. Each layer shall be compacted to not less than 98 percent modified Proctor maximum dry density (AASHTO T-180). Please refer to MDWASD's specification section 02315 "Trenching and Backfilling For Piping Systems" for further requirements.

9. Upon completion of the pipe installation, the pavement areas should have a stabilized subgrade having a minimum thickness of 12 inches and an LBR of 40 placed to a depth of at least 12 inches below the base course. The base course should have a minimum thickness of 6 inches, and a minimum LBR of 100 meeting the requirements outlined in Section 911 of the FDOT *Standard Specifications for Road and Bridge Construction*.

10. The stabilized subgrade should be compacted to an equivalent density of 98 percent of the modified Proctor maximum dry density (AASHTO T-180). The base material should be compacted to 98 percent of the modified Proctor maximum dry density. The base course should also have a minimum carbonate content of 70 percent. The entire pavement thicknesses should be based on the design requirements.

9.0 RECOMMENDATIONS FOR FUTHER GEOTECHNICAL STUDIES

The results of the test borings encountered very soft and compressible sandy silt (ML) materials at a depth ranging from 10 to 22 feet below existing grades. We recommend performing additional SPT borings near location B-4 to further delineate the extent of this material. We suggest that this supplemental study be performed before construction.

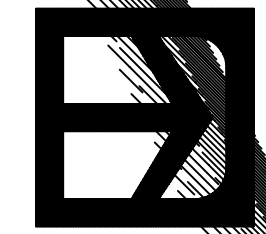
10.0 LIMITATIONS

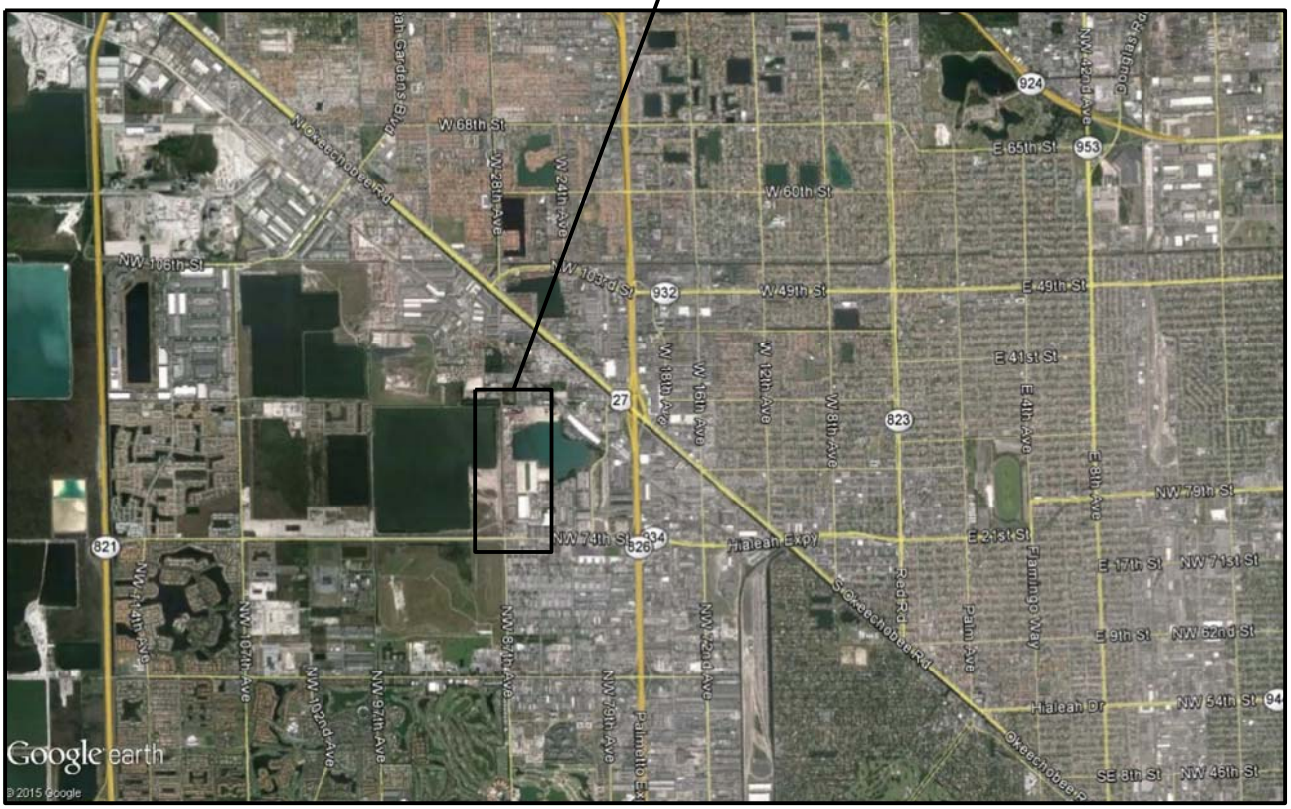
The test borings completed for this report were widely spaced and are not considered sufficient for reliably detecting the presence of isolated, anomalous surface or subsurface conditions, or reliably estimating unsuitable or suitable material quantities. Accordingly, UES does not recommend relying on 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.

APPENDIX A





SITE VICINITY MAP

COUNTY: MIAMI-DADE, FLORIDA

REFERENCE: GOOGLE EARTH, 2015

DATE: SEPTEMBER, 2015

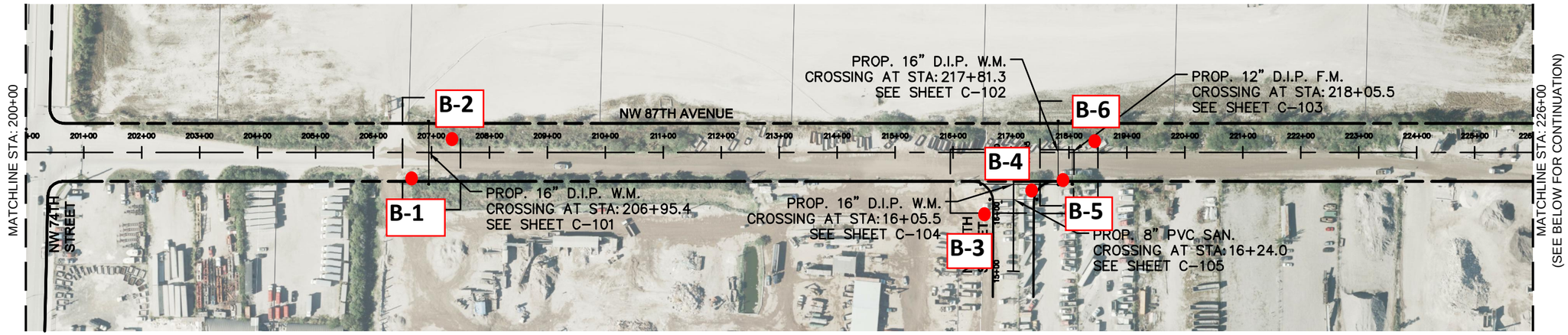
SITE VICINITY MAP

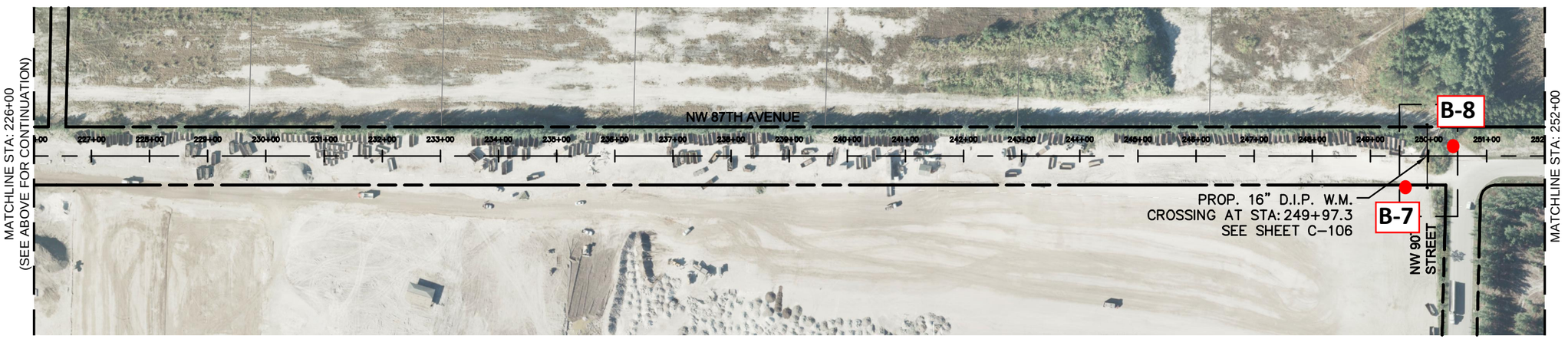
TOWN OF MEDLEY WATER MAIN INSTALLATION
NW 87TH AVENUE FROM NW 74TH TO NW 90TH STREET
MEDLEY, FL

DRAWN	SCALE	PROJ. No.
SJ	N.T.S.	2130.1500064
CHECKED	DATE	SHEET A-1
RV	SEPT., 2015	

APPENDIX B

TEST LOCATION PLAN





LEGEND

● APPROXIMATE SPT BORING LOCATION

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2015 KIMLEY-HORN AND ASSOCIATES, INC.
1221 BRICKELL AVENUE, SUITE 400, MIAMI, FL 33131
PHONE: 305-673-2025
WWW.KIMLEY-HORN.COM CA 00000696

LICENSED PROFESSIONAL
JUAN E. JIMENEZ
FLORIDA LICENSE NUMBER
56704

KHA PROJECT 043637010
DATE ____
SCALE AS SHOWN
DESIGNED BY BF
DRAWN BY AL
CHECKED BY JEJ
DATE: ____

WATER AND SEWER KEY MAP

LAKEVIEW DISTRICT UTILITY CROSSINGS
PREPARED FOR
TOWN OF MEDLEY
MIAMI-DADE FLORIDA

SHEET NUMBER
B-1

UNIVERSAL ENGINEERING SCIENCES
BORING LOGS

PROJECT NO.:	2130.1500064
REPORT NO.:	G0014
PAGE:	1

PROJECT: Town of Medley Water Main Installation
NW 87th Avenue from NW 74th street to NW 90th Street
Town of Medley, Florida

CLIENT: Kimley-Horn and Associates, Inc.

LOCATION: See Test Location Plan

REMARKS: CME-55 (Automatic Hammer)

BORING DESIGNATION: **B-1** SHEET: **1 of 1**

NORTHING (ft): EASTING (ft):

G.S. ELEVATION (ft): N/A SPT DATE: 9/29/15

WATER TABLE (ft): 3.6 CORING DATE: 9/29/15

DATE OF READING: SPT DRILLED BY: JLC/MV

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ORG. CONTENT (%)	ROCK CORING DATA			
										REC (%)	RQD (%)	DOWN PRESSURE (PSI)	TIME (s.)
0						Brown Slightly Silty Fine to Medium SAND with Some Limerock Fragments (FILL; SP-SM)							
		12-15-28-30	43										
		36-38-41-40	79	▼									
5													
		22-15-18-18	33										
		15-16-13-12	29			Brown Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)							
10		10-10-11-11	21			...Lost All Drilling Fluid Circulation							
15		15-22-18-30	40										
20		5-5-6-8	11			SPT Boring Terminated at Depth of 20 Feet. Borehole Backfilled.							

UNIVERSAL ENGINEERING SCIENCES
BORING LOGS

PROJECT NO.:	2130.1500064
REPORT NO.:	G0014
PAGE:	2

PROJECT: Town of Medley Water Main Installation
NW 87th Avenue from NW 74th street to NW 90th Street
Town of Medley, Florida

CLIENT: Kimley-Horn and Associates, Inc.

LOCATION: See Test Location Plan

REMARKS: CME-55 (Automatic Hammer)

BORING DESIGNATION: **B-2** SHEET: **1 of 1**

NORTHING (ft): EASTING (ft):

G.S. ELEVATION (ft): N/A SPT DATE: 9/29/15

WATER TABLE (ft): 3.6 CORING DATE: 9/29/15

DATE OF READING: SPT DRILLED BY: JLC/MV

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ORG. CONTENT (%)	ROCK CORING DATA REC (%)	RQD (%)	DOWN PRESSURE (PSI)	TIME (s.)
0													
		14-21-29-38	50			Brown Slightly Silty Fine to Medium SAND with Some Limerock Fragments (FILL; SP-SM)							
		41-46-47-36	93	▼									
5													
		26-30-18-15	48										
		14-14-14-14	28										
						Brown Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)							
10		10-7-7-12	14										
						...Lost All Drilling Fluid Circulation							
15		10-23-15-33	38										
						SPT Boring Terminated at Depth of 15 Feet. Borehole Backfilled.							

UNIVERSAL ENGINEERING SCIENCES
BORING LOGS

PROJECT NO.:	2130.1500064
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PAGE:	3

PROJECT: Town of Medley Water Main Installation
NW 87th Avenue from NW 74th street to NW 90th Street
Town of Medley, Florida

CLIENT: Kimley-Horn and Associates, Inc.

LOCATION: See Test Location Plan

REMARKS: CME-55 (Automatic Hammer)

BORING DESIGNATION: **B-3** SHEET: **1 of 1**

NORTHING (ft): EASTING (ft):

G.S. ELEVATION (ft): N/A SPT DATE: 9/30/15

WATER TABLE (ft): 3.6 CORING DATE: 9/30/15

DATE OF READING: SPT DRILLED BY: JLC/MV

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ORG. CONTENT (%)	ROCK CORING DATA REC (%)	RQD (%)	DOWN PRESSURE (PSI)	TIME (s.)
0													
		8-12-16-16	28			Brown to Gray Slightly Silty Fine to Medium SAND with Some Limerock, Asphalt, Concrete, and Root Fragments (FILL; ASSORTED DEBRIS; SP-SM)							
		10-10-15-15	25	▼				18	4				
5													
		16-20-26-35	46										
		36-42-40-18	82			...Gasoline Odor							
10		16-10-10-10	20										
15		11-11-8-8	19										
						SPT Boring Terminated at Depth of 15 Feet. Borehole Backfilled.							

UNIVERSAL ENGINEERING SCIENCES
BORING LOGS

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PAGE:	4

PROJECT: Town of Medley Water Main Installation
NW 87th Avenue from NW 74th street to NW 90th Street
Town of Medley, Florida

CLIENT: Kimley-Horn and Associates, Inc.

LOCATION: See Test Location Plan

REMARKS: CME-55 (Automatic Hammer)

BORING DESIGNATION: **B-4** SHEET: **1 of 1**

NORTHING (ft): EASTING (ft):

G.S. ELEVATION (ft): N/A SPT DATE: 9/30/15

WATER TABLE (ft): 3.6 CORING DATE: 9/30/15

DATE OF READING: SPT DRILLED BY: JLC/MV

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ORG. CONTENT (%)	ROCK CORING DATA			
										REC (%)	RQD (%)	DOWN PRESSURE (PSI)	TIME (s.)
0						Brown to Gray Slightly Silty Fine to Medium SAND with Some Limerock, Asphalt, and Concrete Fragments (FILL; ASSORTED DEBRIS; SP-SM)							
		11-18-12-10	30										
		8-9-13-11	22	▼									
5		50/4"	50/4"			...Gasoline Odor							
		10-11-12-11	23			Brown Silty Fine to Medium SAND with Some Limerock Fragments (FILL; SM)							
10		6-6-7-8	13			Light Gray SILT (FILL; ML)							
							98	26					
15		2-2-3-3	5										
20		WOH/24"	WOH/24"			...Lost All Drilling Fluid Circulation							
						Light Brown Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)							
25		5-5-6-6	11										
						SPT Boring Terminated at Depth of 25 Feet. Borehole Backfilled.							

UNIVERSAL ENGINEERING SCIENCES
BORING LOGS

PROJECT NO.:	2130.1500064
REPORT NO.:	G0014
PAGE:	5

PROJECT: Town of Medley Water Main Installation
NW 87th Avenue from NW 74th street to NW 90th Street
Town of Medley, Florida

CLIENT: Kimley-Horn and Associates, Inc.

LOCATION: See Test Location Plan

REMARKS: CME-55 (Automatic Hammer)

BORING DESIGNATION: **B-5** SHEET: **1 of 1**

NORTHING (ft): EASTING (ft):

G.S. ELEVATION (ft): N/A SPT DATE: 9/29/15

WATER TABLE (ft): 7.0 CORING DATE: 9/29/15

DATE OF READING: SPT DRILLED BY: JLC/MV

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ORG. CONTENT (%)	ROCK CORING DATA REC (%)	RQD (%)	DOWN PRESSURE (PSI)	TIME (s.)
0													
		17-30-16-13	46			Brown Slightly Silty Fine to Medium SAND with Some Limerock and Asphalt Fragments (FILL; ASSORTED DEBRIS; SP-SM)							
						Light Gray Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)							
		8-20-25-15	45										
5													
		14-14-15-12	29	▼									
		7-10-7-8	17										
10		4-5-5-5	10										
						...Lost All Drilling Fluid Circulation							
15		6-6-6-35	12										
						SPT Boring Terminated at Depth of 15 Feet. Borehole Backfilled.							

UNIVERSAL ENGINEERING SCIENCES
BORING LOGS

PROJECT NO.:	2130.1500064
REPORT NO.:	G0014
PAGE:	6

PROJECT: Town of Medley Water Main Installation
NW 87th Avenue from NW 74th street to NW 90th Street
Town of Medley, Florida

CLIENT: Kimley-Horn and Associates, Inc.

LOCATION: See Test Location Plan

REMARKS: CME-55 (Automatic Hammer)

BORING DESIGNATION: **B-6** SHEET: **1 of 1**

NORTHING (ft): EASTING (ft):

G.S. ELEVATION (ft): N/A SPT DATE: 9/29/15

WATER TABLE (ft): 6.9 CORING DATE: 9/29/15

DATE OF READING: SPT DRILLED BY: JLC/MV

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ORG. CONTENT (%)	ROCK CORING DATA REC (%)	RQD (%)	DOWN PRESSURE (PSI)	TIME (s.)
0													
		20-16-16-15	32			Brown Slightly Silty Fine to Medium SAND with Some Limerock and Asphalt Fragments (FILL; ASSORTED DEBRIS; SP-SM)							
						Light Gray Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)							
		9-18-18-16	36										
5													
		12-14-15-15	29	▼									
		10-10-8-8	18										
10		5-5-5-6	10										
						...Lost All Drilling Fluid Circulation							
15		6-7-20-28	27										
						SPT Boring Terminated at Depth of 15 Feet. Borehole Backfilled.							

UNIVERSAL ENGINEERING SCIENCES
BORING LOGS

PROJECT NO.:	2130.1500064
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PROJECT: Town of Medley Water Main Installation
NW 87th Avenue from NW 74th street to NW 90th Street
Town of Medley, Florida

CLIENT: Kimley-Horn and Associates, Inc.

LOCATION: See Test Location Plan

REMARKS: CME-55 (Automatic Hammer)

BORING DESIGNATION: **B-7** SHEET: **1 of 1**

NORTHING (ft): EASTING (ft):

G.S. ELEVATION (ft): N/A SPT DATE: 9/29/15

WATER TABLE (ft): 3.3 CORING DATE: 9/29/15

DATE OF READING: SPT DRILLED BY: JLC/MV

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ORG. CONTENT (%)	ROCK CORING DATA REC (%)	RQD (%)	DOWN PRESSURE (PSI)	TIME (s.)
0													
		29-30-30-50/4"	60			Light Brown to Brown Slightly Silty Fine to Medium SAND with Some Limerock and Asphalt Fragments (FILL; ASSORTED DEBRIS; SP-SM)							
		42-50/4"	50/4"	▼									
5													
		21-18-10-10	28			Light Gray Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)							
		28-30-36-38	66										
10		25-25-30-30	55			...Lost All Drilling Fluid Circulation							
15		6-7-11-11	18			SPT Boring Terminated at Depth of 15 Feet. Borehole Backfilled.							

UNIVERSAL ENGINEERING SCIENCES
BORING LOGS

PROJECT NO.:	2130.1500064
REPORT NO.:	G0014
PAGE:	8

PROJECT: Town of Medley Water Main Installation
NW 87th Avenue from NW 74th street to NW 90th Street
Town of Medley, Florida

CLIENT: Kimley-Horn and Associates, Inc.

LOCATION: See Test Location Plan

REMARKS: CME-55 (Automatic Hammer)

BORING DESIGNATION: **B-8** SHEET: **1 of 1**

NORTHING (ft): EASTING (ft):

G.S. ELEVATION (ft): N/A SPT DATE: 9/29/15

WATER TABLE (ft): 3.5 CORING DATE: 9/29/15

DATE OF READING: SPT DRILLED BY: JLC/MV

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

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ORG. CONTENT (%)	ROCK CORING DATA			
										REC (%)	RQD (%)	DOWN PRESSURE (PSI)	TIME (s.)
0						Light Brown to Brown Slightly Silty Fine to Medium SAND with Some Limerock and Asphalt Fragments (FILL; ASSORTED DEBRIS; SP-SM)							
		30-31-29-28	60										
		40-50/3"	50/3"	▼									
5													
		20-20-17-15	37			Light Gray Sandy LIMESTONE (MIAMI LIMESTONE FORMATION)							
		31-33-30-30	63										
10		26-28-32-32	60										
						...Lost All Drilling Fluid Circulation							
15		7-7-8-11	15										
20		19-30-32-36	62										
						SPT Boring Terminated at Depth of 20 Feet. Borehole Backfilled.							

NOTES RELATED TO BORING LOGS

General Notes

- The Groundwater level was encountered and recorded (if shown) following the completion of the soil test borings on the date indicated. Fluctuations in groundwater levels are common; refer to report text for a discussion.
- The boring location on land was identified in the field utilizing standard taping procedures and existing land marks.
- The Boring Logs represent our interpretation of field conditions based on engineering examination of the soil/rock samples.
- The Boring Logs are subject to limitations, conclusions and recommendations presented in the report text.
- The N-values shown in the Boring Logs indicated as 50/1" refers to the Standard Penetration Test (SPT) and means 50 blows per 1 inch of sampler penetration. The SPT uses a 140-pound hammer falling 30 inches (ASTM D-1583).
- The N-value from the SPT is the sum of the hammer blows required to drive the sampler the second and third 6-inch increments.
- The soil/rock strata interfaces shown on the Boring Logs are approximate and may vary from those shown. The soil/rock conditions shown on the Boring Logs refer to conditions at the specific location tested; soil/rock conditions may vary between test locations.
- W.O.H. denotes fell under weight of hammer.

General Descriptors

- The grain-size descriptions are as follows:

Name	Size Limits
Boulder	12 inches or more
Cobbles	3 to 12 inches
Coarse Gravel	¾ to 3 inches
Fine Gravel	No. 4 sieve to ¾ inch
Coarse Sand	No. 10 to No. 4 sieve
Medium Sand	No. 40 to No. 10 sieve
Fine Sand	No. 200 to No. 40 sieve
Fines	Smaller than No. 200 sieve

- Definitions related to adjectives used in soil/rock descriptions:

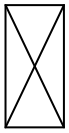
Proportion	Adjective
About 0 to 10 %	trace
About 10% to 25%	little
About 25% to 35%	some
About 35% to 50%	and

NOTES RELATED TO BORING LOGS

- Relative density of sands/gravels and consistency of silts/clays:

Granular Soils		
Relative Density	**Safety Hammer SPT (Blows/Foot)**	**Automatic Hammer SPT (Blows/Foot)**
Very Loose	0-4	0-3
Loose	4-10	3-8
Medium Dense	10-30	8-24
Dense	30-50	24-40
Very Dense	Greater than 50	Greater than 40
Silts and Clays		
Consistency	**Safety Hammer SPT (Blows/Foot)**	**Automatic Hammer SPT (Blows/Foot)**
Very Soft	0-2	0-1
Soft	3-4	1-3
Firm	5-8	3-6
Stiff	9-15	6-12
Very Stiff	16-30	12-24
Hard	Greater than 30	Greater than 24

- Boring Log Symbols



Split spoon sample

Rock core specimen

Groundwater table

Soil Classification Chart

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

USCS_LEGEND 7/18/14

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

APPENDIX C

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.

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 constructor — 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 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 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.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many 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;
- 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. *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 geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this 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 geotechnical-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 confirmation-dependent recommendations included in your report. *Confirmation-dependent 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 confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront 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. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical 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 Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors 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 constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors 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 constructors fail to 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.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* 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 environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental 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, many 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 GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of 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. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

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 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 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 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 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.

APPENDIX D

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.