

June 27, 2017

Mr. Carlos Mazorra, P.E.
R.J. Behar & Company, Inc.
6861 SW 196 Street, Suite 302
Pembroke Pines, Florida 33332

cmazorra@rjbehar.com

Subject: **Report of Geotechnical Exploration**
SW 25TH Street Complete Streetscape Improvements
City of West Park
Broward County, Florida
AREHNA Project B-17-052

Dear Mr. Mazorra,

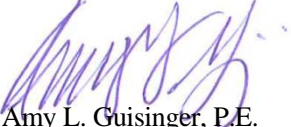
AREHNA Engineering, Inc. (AREHNA) is pleased to submit this Report of Geotechnical Exploration for the above referenced project. Services were conducted in general accordance with AREHNA Proposal dated November 15, 2016. The purpose of our geotechnical study was to obtain information on the general subsurface conditions for the proposed streetscape improvements.

AREHNA appreciates the opportunity to have assisted R.J. Behar and Company, Inc. on this project. Should you have any questions with regards to this report, or if we can be of any further assistance, please contact this office.

Best Regards,

AREHNA ENGINEERING, INC.
FLORIDA BOARD OF PROFESSIONAL ENGINEERS CERTIFICATE OF AUTHORIZATION NO. 28410

Kristina LaCava, P.E.
Geotechnical Engineer
Florida Registration No. 77594



Amy L. Guisinger, P.E.
Senior Geotechnical Engineer
Florida Registration No. 63989

2.0 REVIEW OF AVAILABLE DATA

2.1 USGS TOPOGRAPHIC DATA

The topographic survey map published by the United States Geological Survey was reviewed for ground surface features at the proposed project location (**USGS Vicinity Map, Appendix A**). Based on this review, ground surface elevations are approximately +10 feet.

2.2 USDA NATURAL RESOURCES CONSERVATION SERVICE DATA

The “Soil Survey of Broward County, Florida,” published by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) was reviewed for general near-surface soil information within the general project vicinity (see **USDA Vicinity Map in Appendix A**). This information indicates that there are two primary mapping units within the vicinity of the proposed project area. The soil map unit characteristics are indicated in the table below.

Map Unit Symbol	Map Unit Name	Reported Seasonal High Groundwater Table (feet below natural ground surface)
11	Dade-Urban land complex	5 – 6
40	Urban land	N/A

2.3 REGIONAL GEOLOGY

The Miami Limestone (formerly the Miami Oolite) occurs at or near the surface in southeastern peninsular Florida from Palm Beach County to Dade and Monroe Counties. It forms the Atlantic Coastal Ridge and extends beneath the Everglades where it is commonly covered by thin organic and freshwater sediments. To the north, in Palm Beach County, the Miami Limestone grades laterally northward into the Anastasia Formation. The Miami Limestone consists of two facies, an oolitic facies and a bryozoan facies. The oolitic facies consists of white to orangish gray, poorly to moderately indurated, sandy, oolitic limestone (grainstone) with scattered concentrations of fossils. The bryozoan facies consists of white to orangish gray, poorly to well indurated, sandy, fossiliferous limestone (grainstone and packstone). Beds of quartz sand are also present as unindurated sediments and indurated limey sandstones. The highly porous and permeable Miami Limestone forms much of the Biscayne Aquifer of the surficial aquifer system.



4.3 GROUNDWATER

The groundwater table was measured at each of the boring locations performed during our field exploration. The groundwater table was not encountered within the hand auger borings performed along the project alignment. However, the groundwater table was encountered at depths between 5 and 6 feet in the SPT borings performed. If the groundwater table was not encountered within the depth of our boring, GNE (Groundwater Not Encountered) is indicated adjacent to the boring profile.

Since groundwater table variations are anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based on the assumption that water level variation will occur. All boreholes were backfilled after the completion of the drilling operations, and consequently, no long-term groundwater level readings were obtained.

4.4 SFWMD USUAL CONDITION OPEN-HOLE TEST RESULTS

The calculated coefficient of hydraulic conductivity was obtained in accordance with the SFWMD Constant Head “Usual Condition” Open-Hole Test Method. The following table summarizes the calculated hydraulic conductivity coefficient:

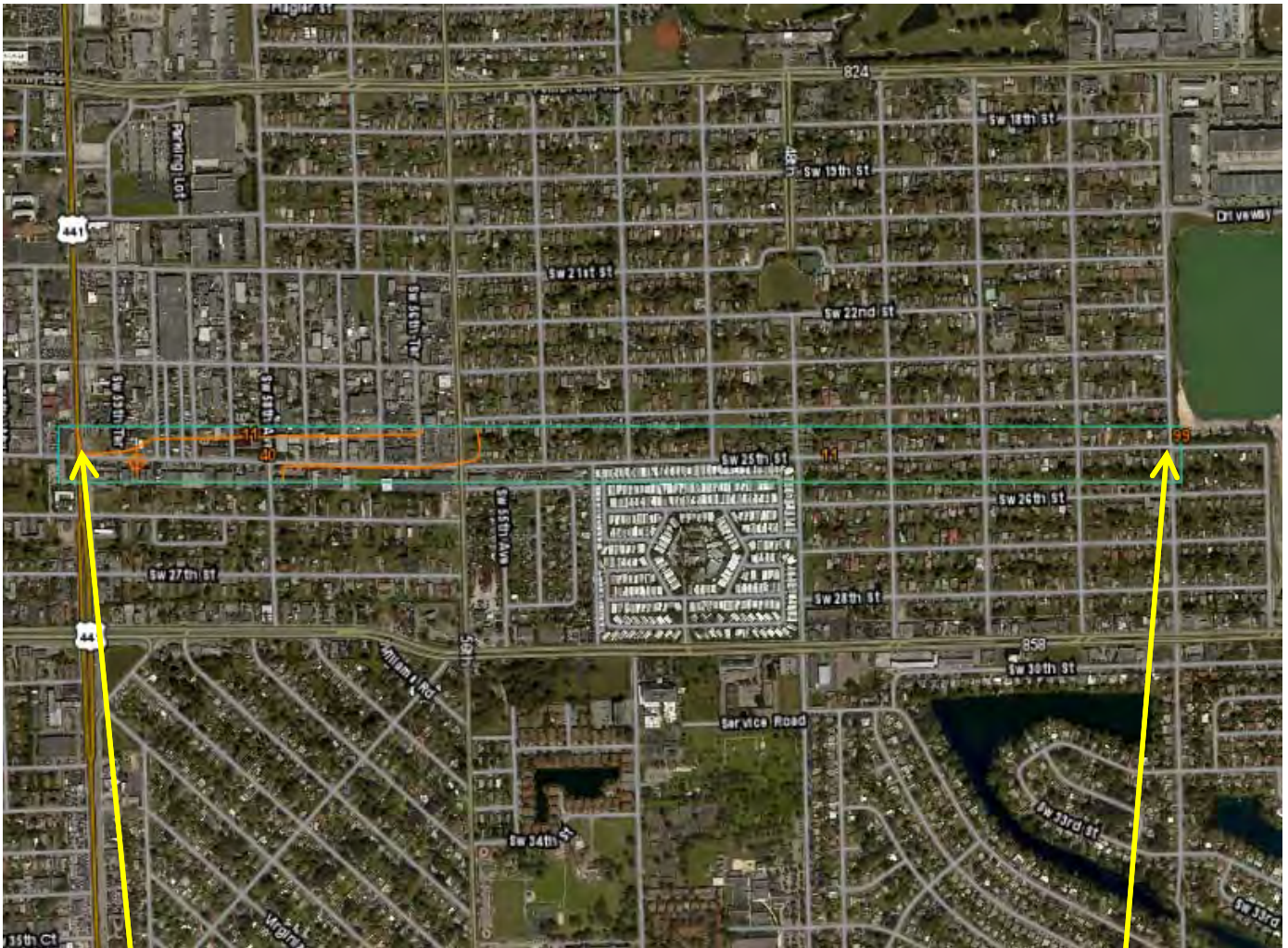
USUAL OPEN-HOLE TEST CONSTANT HEAD	
TEST NO.	k, Hydraulic Conductivity (cfs/ft ² – ft of Head)
P-1	1.1E-04
P-2	1.3E-04
P-3	1.1E-04
P-4	1.2E-04
P-5	1.2E-04

The Percolation Field Data Sheets along with a table including the test results is presented in **Appendix B** of this report.

4.5 SEASONAL HIGH GROUNDWATER ESTIMATES

The Seasonal High Water Table (SHWT) is the highest average depth of soil saturation during the wet season in a normal year (South Florida Water Management District, SFWMD, Volume IV). Based on SFWMD guidelines, the procedures for estimating SHWT elevations include an examination of county soil surveys and field verification by observation and identification of indicators within the soil profile. However, due to the nature of the subsurface soils (reworked and fill soils) encountered at the site, a direct field measurement or estimate of the SHWT was not possible.





Start Project Limit

End Project Limit

Soil Mapping Unit

11 – Dade-Urban land complex
40 – Urban land



SW 25th Street Complete Streetscape
Improvements
City of West Park, Florida

Client: R.J. Behar & Company, Inc.
Project: B-17-052
Date: June 21, 2017



AREHNA | Engineering, Inc.
5012 West Lemon Street, Tampa, FL 33609
Phone 813.944.3464 ▪ Fax 813.944.4959




USDA SOIL SURVEY

Designed By: KSL
Checked By: ALG
Drawn By: KSL

**FIGURE
2**

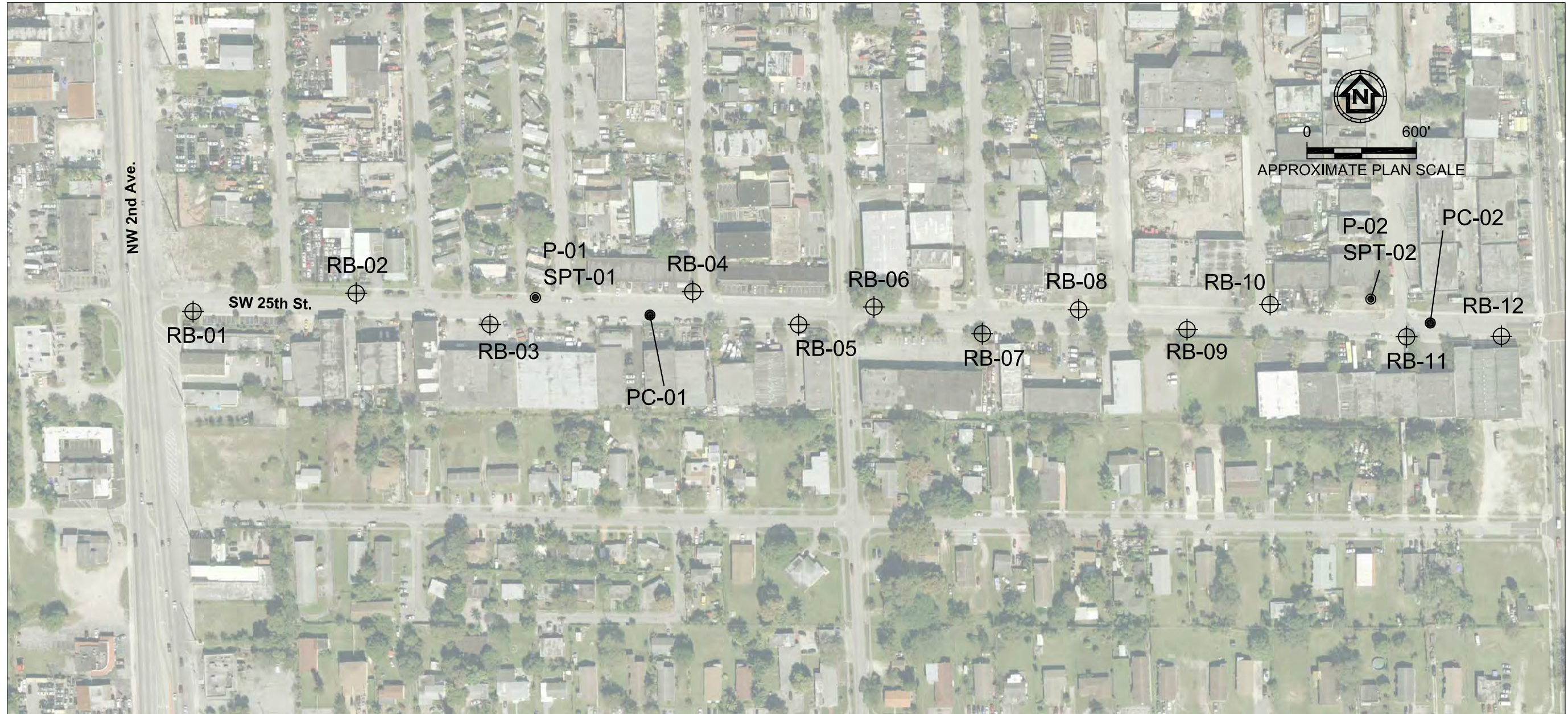


LEGEND




-  Approximate Location of Hand Auger Boring
-  Approximate Location of Percolation Test & Standard Penetration Test (SPT) Boring
-  Approximate Location of Pavement Core

Z:\Projects\B - Geotechnical\2017\B-17-052 SW 25th St\11 - CADD\B-17-052 25th Awdwg (Sht-01).Micava Jun 26, 2017 - 9:47am

REVISIONS			PREPARED BY:	NAME			REPORT OF CORE BORINGS	PROJECT NO.	SHEET NO.
NO.	DATE	DESCRIPTIONS		APPROVED	DESIGNED BY:	DATE			
				LMC	05/2017	SW 25th Street Complete Streetscape Improvements City of West Park, Florida	B-17-052		
				LMC	05/2017				
				KL	05/2017				
				Kristina S. LaCava, P.E.					
			AREHNA Engineering, Inc. 5012 West Lemon Street, Tampa, FL 33609 Phone 813.944.3464 Fax 813.944.4959 Certificate of Authorization No. 28410						



LEGEND

-  Approximate Location of Hand Auger Boring
-  Approximate Location of Percolation Test & Standard Penetration Test (SPT) Boring
-  Approximate Location of Pavement Core




Z:\Projects\B - Geotechnical\2017\B-17-052 SW 25th St\11 - CAD\DWG\B-17-052 25th Awrdwg (Sheet) (2) Micave Jun 26, 2017 - 9:50am

REVISIONS			PREPARED BY:	NAME DATE			REPORT OF CORE BORINGS	PROJECT NO.	SHEET NO.
NO.	DATE	DESCRIPTIONS		APPROVED	DESIGNED BY:	LMC			
							SW 25th Street Complete Streetscape Improvements City of West Park, Florida	B-17-052	
				DRAWN BY:	LMC	05/2017			
				CHECKED BY:	KL	05/2017			
				SUPERVISED BY:	Krstina S. LaCava, P.E.				

PREPARED BY:
AREHNA Engineering, Inc.
 5012 West Lemon Street, Tampa, FL 33609
 Phone 813.944.3464 | Fax 813.944.4959
 Certificate of Authorization No. 28410

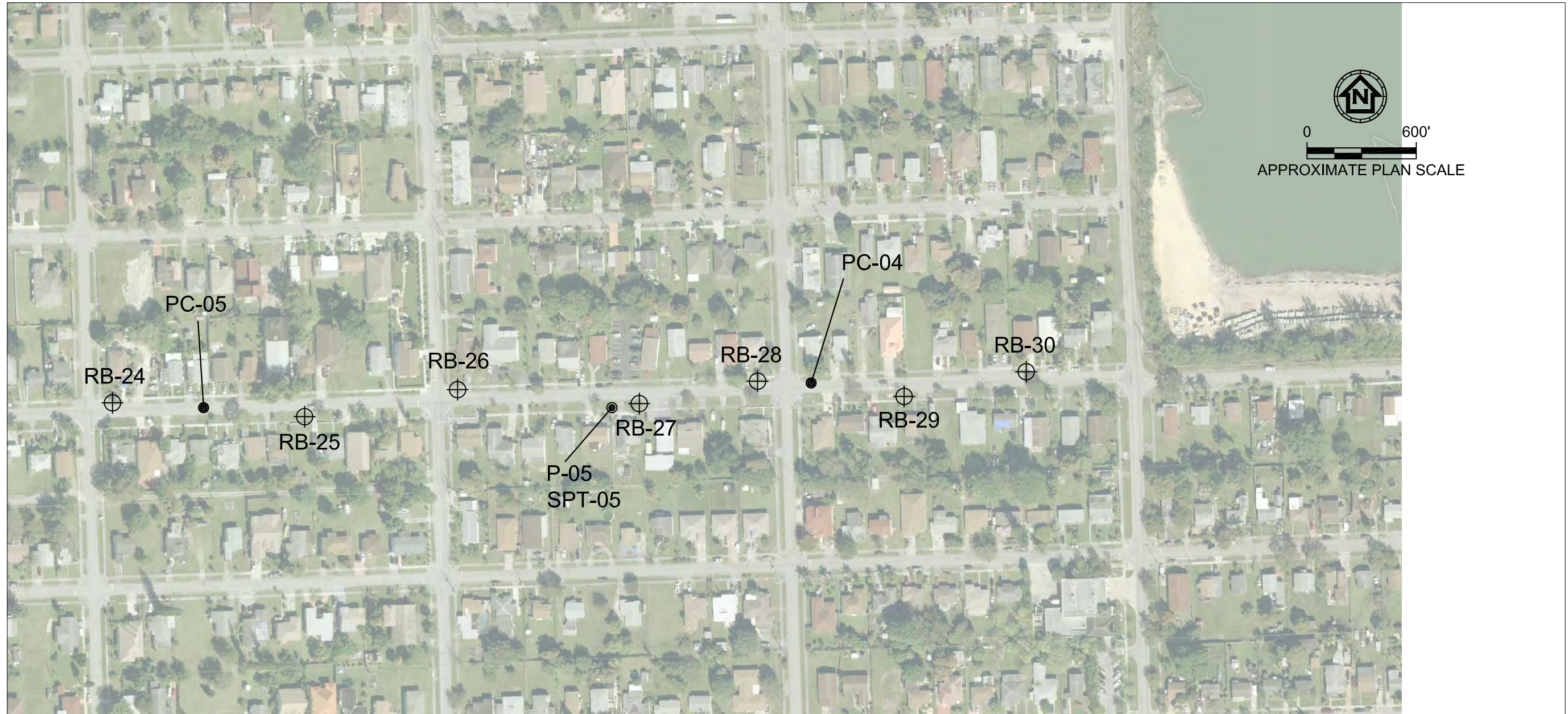


LEGEND




-  Approximate Location of Hand Auger Boring
-  Approximate Location of Percolation Test & Standard Penetration Test (SPT) Boring
-  Approximate Location of Pavement Core

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REVISIONS			PREPARED BY:	NAME DATE			REPORT OF CORE BORINGS	PROJECT NO.	SHEET NO.
NO.	DATE	DESCRIPTIONS		APPROVED	DESIGNED BY:	LMC			
							SW 25th Street Complete Streetscape Improvements City of West Park, Florida	B-17-052	
AREHNA Engineering, Inc. 5012 West Lemon Street, Tampa, FL 33609 Phone 813.944.3464 Fax 813.944.4959 Certificate of Authorization No. 28410				SUPERVISED BY: Kristina S. LaCava, P.E.					



LEGEND

-  Approximate Location of Hand Auger Boring
-  Approximate Location of Percolation Test & Standard Penetration Test (SPT) Boring
-  Approximate Location of Pavement Core

Z:\Projects\B - Geotechnical\2017\B-17-052 SW 25th St\11 - CAD\B-17-052 25th Awdwg (Sheet) (4) Micave Jun 26, 2017 - 9:57am

REVISIONS			PREPARED BY:	NAME			REPORT OF CORE BORINGS	PROJECT NO.	SHEET NO.
NO.	DATE	DESCRIPTIONS		DESIGNED BY:	LMC	05/2017			
			AREHNA Engineering, Inc. 5012 West Lemon Street, Tampa, FL 33609 Phone 813.944.3464 Fax 813.944.4959 Certificate of Authorization No. 28410	DRAWN BY:	LMC	05/2017	SW 25th Street Complete Streetscape Improvements City of West Park, Florida	B-17-052	
				CHECKED BY:	KL	05/2017			
				SUPERVISED BY:	Krstina S. LaCava, P.E.				
				APPROVED					

CITY OF WEST PARK

SW 25TH STREET COMPLETE STREETScape IMPROVEMENTS

DATE OF SURVEY : June 2017
 SURVEY MADE BY : AREHNA Engineering, Inc.
 SUBMITTED BY : Kristine LaCava, P.E.

CROSS SECTION SOIL SURVEY FOR THE DESIGN OF ROADS
 SURVEY BEGINS STREET. : SR 7 SURVEY ENDS STREET. : SW 40TH AVENUE

STRATUM NO.	ORGANIC CONTENT		MOISTURE CONTENT		SIEVE ANALYSIS RESULTS % PASS						ATTERBERG LIMITS (%)			DESCRIPTION	CORROSION TEST RESULTS					
	NO. OF TESTS	% ORGANIC	NO. OF TESTS	MOISTURE CONTENT	NO. OF TESTS	10 MESH	40 MESH	60 MESH	100 MESH	200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTIC INDEX		AASHTO GROUP	NO. OF TESTS	RESISTIVITY ohms cm	CHLORIDE ppm	SULFATES ppm	pH
1	--	--	2	5	2	99-100	90-92	63-69	20-22	4-5	--	--	--	A-3	BROWN-GRAY TO LIGHT GRAY TO LIGHT BROWN FINE SAND	--	--	--	--	--
2	--	--	3	5-8	3	64-72	66	50	20	6-10	--	--	--	A-3	GRAY TO GRAY-BROWN TO LIGHT BROWN TO LIGHT GRAY FINE SAND TO FINE SAND WITH SILT OCCASIONALLY WITH TRACE TO LITTLE LIMESTONE FRAGMENTS	4	5,300 - 8,500	30-60	<2	8.5-8.7
3	--	--	4	7-12	4	64-97	55-87	40-60	21-23	13-15	--	--	--	A-2-4	DARK GRAY TO GRAY SILTY FINE SAND OCCASIONALLY WITH TRACE TO FEW LIMESTONE FRAGMENTS	--	--	--	--	--
4	--	--	1	30	1	75	--	--	--	29	1	41	26	A-7-6	BROWN SANDY CLAY OCCASIONALLY WITH FEW LIMESTONE FRAGMENTS	--	--	--	--	--
5	--	--	1	3	1	48	--	--	--	7	--	--	--	A-1-a	LIGHT BROWN SANDY LIMESTONE	--	--	--	--	--

EMBANKMENT AND SUBGRADE MATERIAL
 STRATA BOUNDARIES ARE APPROXIMATE MAKE FINAL CHECK AFTER GRADING
 ☹ - WATER TABLE ENCOUNTERED
 GNE - GROUND WATER NOT ENCOUNTERED.

NOTES:

1. THE MATERIAL FROM STRATUM 1 & 2 (A-3) AND STRATUM 5 (A-1-a) APPEARS SATISFACTORY FOR USE IN THE EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH INDEX 505.
2. THE MATERIAL FROM STRATUM 3 (A-2-4) APPEARS SATISFACTORY FOR USE IN THE EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH INDEX 505. HOWEVER, THIS MATERIAL IS LIKELY TO RETAIN EXCESS MOISTURE AND MAY BE DIFFICULT TO DRY AND COMPACT. IT SHOULD BE USED IN THE EMBANKMENT ABOVE THE WATER LEVEL EXISTING AT THE TIME OF CONSTRUCTION.
3. THE MATERIAL FROM STRATUM 4 (A-7-5) IS PLASTIC (P) MATERIAL AND SHALL BE REMOVED IN ACCORDANCE WITH INDEX 500. IT MAY REMAIN IN PLACE ABOVE THE EXISTING WATER LEVEL (AT THE TIME OF CONSTRUCTION) TO WITHIN 2 FEET OF THE PROPOSED BASE. IT SHOULD BE PLACED UNIFORMLY IN THE LOWER PORTION OF THE EMBANKMENT FOR SOME DISTANCE ALONG THE PROJECCT RATHER THEN FULL DEPTH FOR SHORTER DISTANCES.

REVISIONS						AREHNA ENGINEERING, INC. 5012 W. LEMON STREET TAMPA FLORIDA 33609 813-944-3464 CERTIFICATE OF AUTHORIZATION #28410 ENGINEER OF RECORD: KRISTINA LACAVA, P.E. NO: 77594				ROADWAY SOILS SURVEY	SHEET NO.	
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION							
							ROAD NO.	COUNTY	PROJECT #		SW 25TH ST.	BROWARD

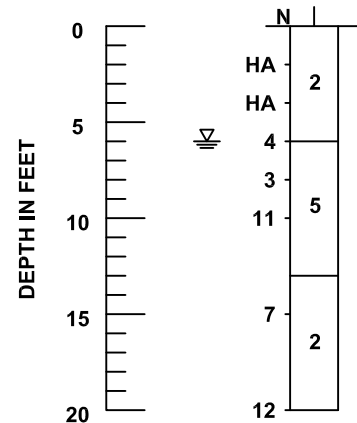
LEGEND

1. BROWN-GRAY TO LIGHT GRAY TO LIGHT BROWN FINE SAND (A-3)
 2. GRAY TO GRAY-BROWN TO LIGHT BROWN TO LIGHT GRAY FINE SAND TO FINE SAND WITH SILT OCCASIONALLY WITH TRACE TO LITTLE LIMESTONE FRAGMENTS (A-3)
 3. DARK GRAY TO GRAY SILTY FINE SAND OCCASIONALLY WITH TRACE TO FEW LIMESTONE FRAGMENTS (A-2-4)
 4. BROWN SANDY CLAY OCCASSIONALLY WITH FEW LIMESTONE FRAGMENTS (A-7-6)
 5. LIGHT BROWN SANDY LIMESTONE (A-1-a)
- A3 AASHTO Soil Classification Group Symbol
As Determined By Visual Review and laboratory testing on selected samples for confirmation of visual review
- N SPT N-Value In Blows/Foot For 12 Inches Of Penetration Utilizing Automatic Hammer (unless otherwise noted)
- ▽ Ground Water Table at the Time of Drilling
- HA Hand Augered To Avoid Utility Conflicts and Safety Reasons

SOIL PROFILE

SPT-1

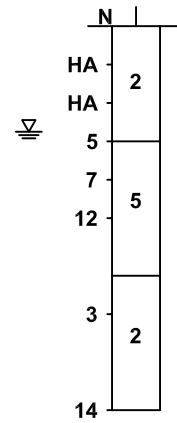
DATE: 5/31/2017
DRILLER: T. CHAPPEL
HAMMER: AUTOMATIC
RIG: BR-2500



LATITUDE: N 25.9880
LONGITUDE: W 80.2045

SPT-2

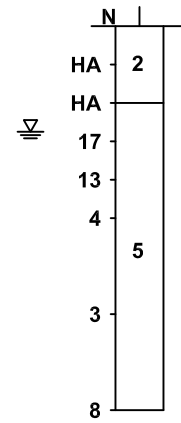
DATE: 5/31/2017
DRILLER: T. CHAPPEL
HAMMER: AUTOMATIC
RIG: BR-2500



LATITUDE: N 25.9879
LONGITUDE: W 80.1999

SPT-3

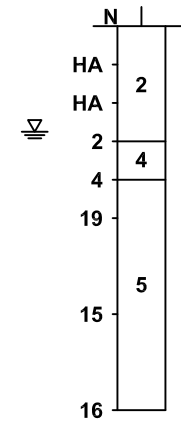
DATE: 5/31/2017
DRILLER: T. CHAPPEL
HAMMER: AUTOMATIC
RIG: BR-2500



LATITUDE: N 25.9879
LONGITUDE: W 80.1953

SPT-4

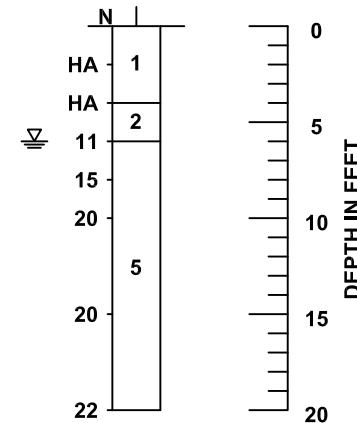
DATE: 5/31/2017
DRILLER: T. CHAPPEL
HAMMER: AUTOMATIC
RIG: BR-2500



LATITUDE: N 25.9880
LONGITUDE: W 80.1908

SPT-5

DATE: 5/31/2017
DRILLER: T. CHAPPEL
HAMMER: AUTOMATIC
RIG: BR-2500



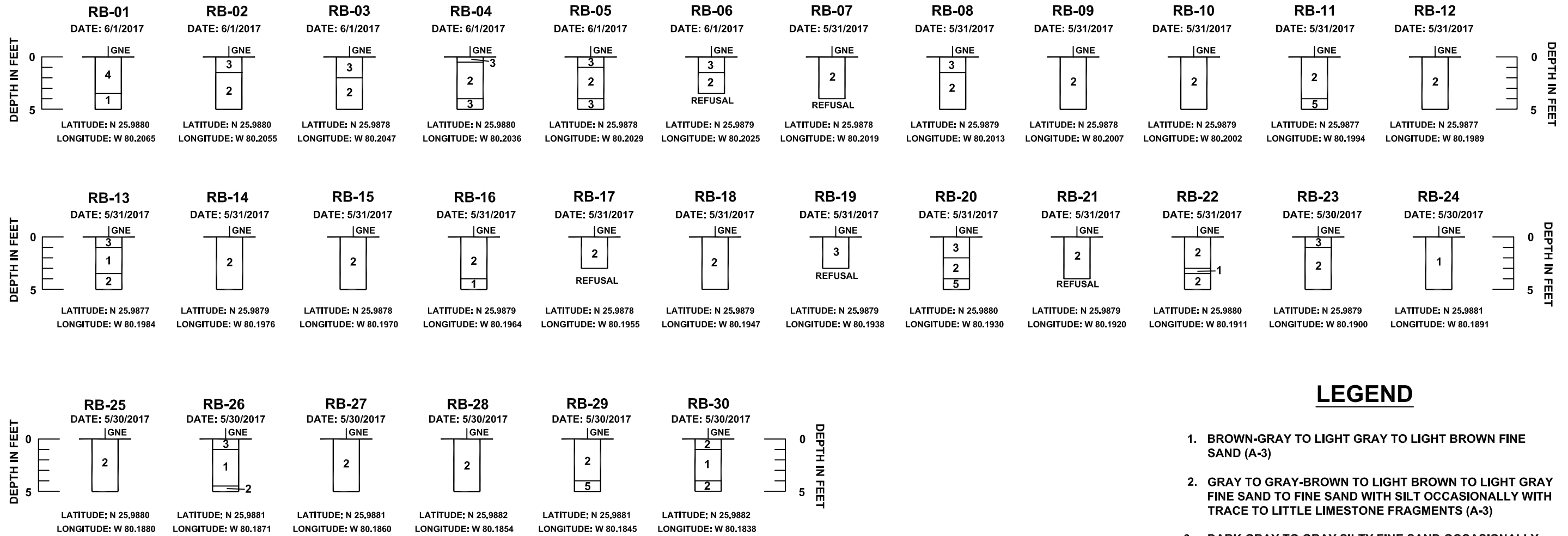
LATITUDE: N 25.9880
LONGITUDE: W 80.1862

SPT Boring N-Value (Blow/Foot)

Granular Materials			Silts and Clays		
Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)	Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 4	Less than 3	Very Soft	Less than 2	Less than 1
Loose	4 - 10	3 - 8	Soft	2 - 4	1 - 3
Medium Dense	10 - 30	8 - 24	Firm	4 - 8	3 - 6
Dense	30 - 50	24 - 40	Stiff	8 - 15	6 - 12
Very Dense	Greater than 50	Greater than 40	Very Stiff	15 - 30	12 - 24
			Hard	Greater than 30	Greater than 24

REVISIONS						AREHNA ENGINEERING, INC. 5012 W. LEMON STREET TAMPA FLORIDA 33609 813-944-3464 CERTIFICATE OF AUTHORIZATION #28410 ENGINEER OF RECORD: KRISTINA LACAVA, P.E. NO: 77594	ROADWAY BORING PROFILES			SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	PROJECT #	
							SW 25TH ST.	BROWARD	B-17-052	

SOIL PROFILES



LEGEND

1. BROWN-GRAY TO LIGHT GRAY TO LIGHT BROWN FINE SAND (A-3)
 2. GRAY TO GRAY-BROWN TO LIGHT BROWN TO LIGHT GRAY FINE SAND TO FINE SAND WITH SILT OCCASIONALLY WITH TRACE TO LITTLE LIMESTONE FRAGMENTS (A-3)
 3. DARK GRAY TO GRAY SILTY FINE SAND OCCASIONALLY WITH TRACE TO FEW LIMESTONE FRAGMENTS (A-2-4)
 4. BROWN SANDY CLAY OCCASIONALLY WITH FEW LIMESTONE FRAGMENTS (A-7-6)
 5. LIGHT BROWN SANDY LIMESTONE (A-1-a)
- A3 AASHTO Soil Classification Group Symbol
As Determined By Visual Review and laboratory testing on selected samples for confirmation of visual review
- N SPT N-Value In Blows/Foot For 12 Inches Of Penetration Utilizing Automatic Hammer (unless otherwise noted)
- GNE Groundwater Not Encountered

PAVEMENT CORE DATA

CORE ID	PAVEMENT THICKNESS (IN)	PAVEMENT MATERIAL TYPE	BASE THICKNESS (IN)	BASE MATERIAL TYPE
PC-1	2.1	ASPHALT	11.0	LIMEROCK
PC-2	2.4	ASPHALT	11.5	LIMEROCK
PC-3	2.1	ASPHALT	11.0	LIMEROCK
PC-4	2.1	ASPHALT	11.0	LIMEROCK
PC-5	2.0	ASPHALT	12.0	LIMEROCK

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

AREHNA ENGINEERING, INC.
5012 W. LEMON STREET
TAMPA FLORIDA 33609
813-944-3464
CERTIFICATE OF AUTHORIZATION #28410
ENGINEER OF RECORD: KRISTINA LACAVA, P.E. NO: 77594

ROAD NO.	COUNTY	PROJECT #
SW 25TH ST.	BROWARD	B-17-052

ROADWAY BORING PROFILES

SHEET NO.

TABLE 2
SUMMARY OF CORROSION TEST RESULTS
SW 25TH STREET COMPLETE STREETScape IMPROVEMENTS
CITY OF WEST PARK, FLORIDA
AREHNA PROJECT NO.: B-17-052

Boring Name	Sample Depth (feet)	AASHTO Classification	Stratum Number	pH	Resistivity (ohm-cm)	Chlorides (ppm)	Sulfates (ppm)	FDOT Substructure Environmental Classification - Concrete	FDOT Substructure Environmental Classification - Steel
SPT-1	0-6	A-3	2	8.7	6,500	45	<2	Slightly Aggressive	Slightly Aggressive
SPT-2	0-6	A-3	2	8.5	8,500	30	<2	Slightly Aggressive	Slightly Aggressive
SPT-4	0-6	A-3	2	8.5	5,300	45	<2	Slightly Aggressive	Slightly Aggressive
SPT-5	0-6	A-3	2	8.6	5,600	60	<2	Slightly Aggressive	Slightly Aggressive

**SUMMARY OF PERCOLATION TEST RESULTS
USUAL CONDITION TEST CONSTANT HEAD**

Project Name: SW 25TH STREET COMPLETE STREETScape IMPROVEMENTS

AREHNA PROJECT NO. B-17-052

Date Performed

June 17, 2017

Test No.	Depth to Grd. Water (ft)	Depth to Water during testing (ft)	(H2) (ft)	Borehole Depth (ft)	Casing/ Borehole Diameter (inches)	Stabilized Flow during Test (gallons)	Rate of Flow		k, Hydraulic Conductivity (cfs/ft ² -ft. Head):
							(gpm)	(cfs)	
P-01	4.8	0.0	4.8	15	4.0	3.0	3.0	0.00675	1.1E-04
P-02	4.7	0.0	4.7	15	4.0	3.7	3.8	0.00838	1.3E-04
P-03	4.8	0.0	4.8	15	4.0	3.0	3.1	0.00680	1.1E-04
P-04	5.0	0.0	5.0	15	4.0	3.5	3.6	0.00795	1.2E-04
P-05	4.7	0.0	4.7	15	4.0	3.0	3.2	0.00722	1.2E-04

Note: Screen depth -

from 0.0 ft
to 15.0 ft below existing ground surface.

SFWMD PERCOLATION TEST – CONSTANT HEAD

Percolation Test No. P-01

Date: 6/17/2017			Project Name: SW 25 Street Complete Streetscape Improvements		
Project No.: B-17-052			Project No.: B-17-052		
Driller: T. CHAPPEL			Prepared by/ Date: KSL / 6-20-2017 Checked by/ Date: ALG /		
BOREHOLE GEOMETRY					
Borehole Diameter: <u> 4 </u> (inches)			Solid Casing Depth: <u> - </u> (feet) to <u> - </u> (feet)		
Casing Diameter: <u> 2 </u> (inches)			Perforated Casing Depth: <u> 0 </u> (feet) to <u> 15 </u> (feet)		
Borehole Depth: <u> 15 </u> (feet)			Groundwater Depth: <u> 4.8 </u> (feet) (measured from ground surface)		
PERCOLATION TEST DATA					
Flushing Period: <u> 2 </u> minutes			Groundwater Depth during testing: <u> 0 </u> (feet) (measured from ground surface)		
TEST RESULTS					
Time (minutes)	Meter Reading		Time (minutes)	Meter Reading	
	Meter Reading (Gallons)	Gallons (Accumulated)		Meter Reading (Gallons)	Gallons (Accumulated)
Initial Reading	0	0	8	3.0	24.3
1	3.0	3.0	9	3.0	27.3
2	3.1	6.1	10	3.0	30.3
3	3.2	9.3	11		
4	3.0	12.3	12		
5	3.0	15.3	13		
6	3.0	18.3	14		
7	3.0	21.3	15		
BORING INFORMATION					
Sample No.	Depth (feet)		Soil/Rock Description		
	From	To			
1	0	6	Gray fine SAND with few limestone fragments (SP)		
2	6	13	Dark brown and light brown sandy LIMESTONE with few sand (LS)		
3	13	20	Light brown fine SAND with few limestone fragments (SP)		
4					

SFWMD PERCOLATION TEST – CONSTANT HEAD

Percolation Test No. P-02

Date: 6/17/2017			Project Name: SW 25 Street Complete Streetscape Improvements		
Project No.: B-17-052			Project No.: B-17-052		
Driller: T. CHAPPEL			Prepared by/ Date: KSL / 6-20-2017 Checked by/ Date: ALG /		
BOREHOLE GEOMETRY					
Borehole Diameter: <u> 4 </u> (inches)			Solid Casing Depth: <u> - </u> (feet) to <u> - </u> (feet)		
Casing Diameter: <u> 2 </u> (inches)			Perforated Casing Depth: <u> 0 </u> (feet) to <u> 15 </u> (feet)		
Borehole Depth: <u> 15 </u> (feet)			Groundwater Depth: <u> 4.7 </u> (feet) (measured from ground surface)		
PERCOLATION TEST DATA					
Flushing Period: <u> 2 </u> minutes			Groundwater Depth during testing: <u> 0 </u> (feet) (measured from ground surface)		
TEST RESULTS					
Time (minutes)	Meter Reading		Time (minutes)	Meter Reading	
	Meter Reading (Gallons)	Gallons (Accumulated)		Meter Reading (Gallons)	Gallons (Accumulated)
Initial Reading	0	0	8	3.8	30.2
1	4.0	4.0	9	3.7	33.9
2	3.6	7.6	10	3.7	37.6
3	3.7	11.3	11		
4	3.8	15.1	12		
5	3.7	18.8	13		
6	3.8	22.6	14		
7	3.8	26.4	15		
BORING INFORMATION					
Sample No.	Depth (feet)		Soil/Rock Description		
	From	To			
1	0	6	Gray fine SAND with few limestone fragments (SP)		
2	6	13	Light brown and gray sandy LIMESTONE with few sand (LS)		
3	13	20	Light brown fine SAND with few limestone fragments (SP)		
4					

SFWMD PERCOLATION TEST – CONSTANT HEAD

Percolation Test No. P-03

Date: 6/17/2017			Project Name: SW 25 Street Complete Streetscape Improvements		
Project No.: B-17-052			Project No.: B-17-052		
Driller: T. CHAPPEL			Prepared by/ Date: KSL / 6-20-2017 Checked by/ Date: ALG /		
BOREHOLE GEOMETRY					
Borehole Diameter: <u> 4 </u> (inches)			Solid Casing Depth: <u> - </u> (feet) to <u> - </u> (feet)		
Casing Diameter: <u> 2 </u> (inches)			Perforated Casing Depth: <u> 0 </u> (feet) to <u> 15 </u> (feet)		
Borehole Depth: <u> 15 </u> (feet)			Groundwater Depth: <u> 4.8 </u> (feet) (measured from ground surface)		
PERCOLATION TEST DATA					
Flushing Period: <u> 2 </u> minutes			Groundwater Depth during testing: <u> 0 </u> (feet) (measured from ground surface)		
TEST RESULTS					
Time (minutes)	Meter Reading		Time (minutes)	Meter Reading	
	Meter Reading (Gallons)	Gallons (Accumulated)		Meter Reading (Gallons)	Gallons (Accumulated)
Initial Reading	0	0	8	3.0	24.5
1	3.2	3.2	9	3.0	27.5
2	3.1	6.3	10	3.0	30.5
3	3.1	9.4	11		
4	3.1	12.5	12		
5	3.0	15.5	13		
6	3.0	18.5	14		
7	3.0	21.5	15		
BORING INFORMATION					
Sample No.	Depth (feet)		Soil/Rock Description		
	From	To			
1	0	4	Gray to brown fine SAND with trace to few limestone fragments (SP)		
2	4	20	Light brown and gray sandy LIMESTONE with few sand (LS)		
3					
4					

SFWMD PERCOLATION TEST – CONSTANT HEAD

Percolation Test No. P-04

Date: 6/17/2017			Project Name: SW 25 Street Complete Streetscape Improvements		
Project No.: B-17-052			Project No.: B-17-052		
Driller: T. CHAPPEL			Prepared by/ Date: KSL / 6-20-2017 Checked by/ Date: ALG /		
BOREHOLE GEOMETRY					
Borehole Diameter: <u> 4 </u> (inches)			Solid Casing Depth: <u> - </u> (feet) to <u> - </u> (feet)		
Casing Diameter: <u> 2 </u> (inches)			Perforated Casing Depth: <u> 0 </u> (feet) to <u> 15 </u> (feet)		
Borehole Depth: <u> 15 </u> (feet)			Groundwater Depth: <u> 5.0 </u> (feet) (measured from ground surface)		
PERCOLATION TEST DATA					
Flushing Period: <u> 2 </u> minutes			Groundwater Depth during testing: <u> 0 </u> (feet) (measured from ground surface)		
TEST RESULTS					
Time (minutes)	Meter Reading		Time (minutes)	Meter Reading	
	Meter Reading (Gallons)	Gallons (Accumulated)		Meter Reading (Gallons)	Gallons (Accumulated)
Initial Reading	0	0	8	3.5	28.7
1	3.7	3.7	9	3.5	32.2
2	3.7	7.4	10	3.5	35.7
3	3.6	11.0	11		
4	3.5	14.5	12		
5	3.6	18.1	13		
6	3.6	21.7	14		
7	3.5	25.2	15		
BORING INFORMATION					
Sample No.	Depth (feet)		Soil/Rock Description		
	From	To			
1	0	6	Gray to brown fine SAND with trace to few limestone fragments (SP)		
2	6	8	Brown sandy CLAY with few limestone fragments (CL)		
3	8	20	Light brown and gray sandy LIMESTONE with few sand (LS)		
4					

SFWMD PERCOLATION TEST – CONSTANT HEAD

Percolation Test No. P-05

Date: 6/17/2017			Project Name: SW 25 Street Complete Streetscape Improvements		
Project No.: B-17-052			Project No.: B-17-052		
Driller: T. CHAPPEL			Prepared by/ Date: KSL / 6-20-2017 Checked by/ Date: ALG /		
BOREHOLE GEOMETRY					
Borehole Diameter: <u> 4 </u> (inches)			Solid Casing Depth: <u> - </u> (feet) to <u> - </u> (feet)		
Casing Diameter: <u> 2 </u> (inches)			Perforated Casing Depth: <u> 0 </u> (feet) to <u> 15 </u> (feet)		
Borehole Depth: <u> 15 </u> (feet)			Groundwater Depth: <u> 4.7 </u> (feet) (measured from ground surface)		
PERCOLATION TEST DATA					
Flushing Period: <u> 2 </u> minutes			Groundwater Depth during testing: <u> 0 </u> (feet) (measured from ground surface)		
TEST RESULTS					
Time (minutes)	Meter Reading		Time (minutes)	Meter Reading	
	Meter Reading (Gallons)	Gallons (Accumulated)		Meter Reading (Gallons)	Gallons (Accumulated)
Initial Reading	0	0	8	3.0	26.4
1	3.7	3.7	9	3.0	29.4
2	3.7	7.4	10	3.0	32.4
3	3.5	10.9	11		
4	3.5	14.4	12		
5	3.0	17.4	13		
6	3.0	20.4	14		
7	3.0	23.4	15		
BORING INFORMATION					
Sample No.	Depth (feet)		Soil/Rock Description		
	From	To			
1	0	4	Gray to gray-brown fine SAND (SP)		
2	4	6	Brown fine SAND with trace to few limestone fragments (SP)		
3	6	20	Light brown and gray sandy LIMESTONE with few sand (LS)		
4					

FIELD PROCEDURES

Standard Penetration Test (SPT) Borings

The SPT borings are performed in general accordance with ASTM D-1586, "Penetration Test and Split-Barrel Sampling of Soils." A rotary drilling process is used and bentonite drilling fluid is circulated in the boreholes to stabilize the sides and flush the cuttings. At regular intervals, the drilling tools are removed and soil samples are obtained with a standard 2-foot long, 2-inch diameter split-tube sampler. The sampler is first seated 6 inches and then driven an additional foot with blows of a 140-pound hammer falling under its own weight a distance of 30 inches. The number of hammer blows required to drive the sampler the final foot is designated the "Penetration Resistance." The penetration resistance, when properly interpreted, is an index to the soil strength and density.

Auger Boring

The auger borings are performed in general accordance with ASTM D-1452, "Standard Practice for Soil Investigation and Sampling by Auger Borings". Auger borings are advanced manually using a bucket-type hand auger. The soils encountered are identified, in the field, from cuttings brought to the surface by the augering process. Representative soil samples from the auger borings are placed in glass jars and transported to our laboratory where they are examined by an engineer for classification.

SFWMD Constant Head "Usual Condition" Open Hole Test Method

The percolation tests were performed in order to estimate the hydraulic conductivity of the materials encountered. The Constant Head method was used. The general procedures outlined in the South Florida Water Management District Permit Information Manual (Volume IV) were followed. The tests were performed in a 2-inch diameter perforated PVC pipe installed in an approximately 4-inch diameter hole pre-drilled to a depth of 15 feet below the existing ground surface. The borehole was then filled with water and the water level maintained at the surface. Once the inflow stabilized or came to equilibrium with the outflow rate or seepage, the amount of water added for a period of 10 minutes was recorded and the percolation rate calculated and reported in units of CFS/FT²-FT of head.

