CITY OF TAMPA

Bob Buckhorn, Mayor **CONTRACT ADMINISTRATION DEPARTMENT**

Michael W. Chucran, Director

ADDENDUM 3

DATE: February 15, 2019

Contract 18-C-00041; Stormwater Construction - Citywide FY 18 RE-BID

Bidders on the above referenced project are hereby notified that the following addendum is made to the Contract Documents. BIDS TO BE SUBMITTED SHALL CONFORM TO THIS NOTICE.

Item 1: Replace the Proposal pages P-1, P-2 and P-3 that were issued via Addendum 1 with the attached pages P-2RR, P-3RR and P-4RR.

Item 2: Contract Items, page C-3R: Replace Contract Item C1.20 – Excavation and Removal of Soil, with the Following:

C1.20 – DAVID E. WEST POND EXCAVATION, REMOVAL OF SOIL, GRADING, AND SOD RESTORATION
The Contractor shall furnish all materials, equipment, and labor for pond excavation shown on the Plans, specified, and directed by the Engineer.

Work in this Contract Item includes the excavation required as shown on the Plans. The work also includes all necessary grading, testing, backfilling, sheeting, shoring, bracing, temporary ramps, construction fencing, dewatering, regrading of excavated soil per grading plans, clean fill, over excavation of unsuitable (clayey) materials, disposal of surplus excavated material, and protection of adjacent facilities, sodding and all appurtenant work, complete and in place.

The work shall conform to the City of Tampa Standard Specifications – Workmanship and Materials Section 1 – Excavation – Earth and Rock and Section 108- Dewatering.

The Contractor shall refer to the latest version of FDOT Workmanship and Materials Section 120 – Excavation and Embankment.

Disposal of unsuitable materials shall conform to the requirements of the City Standard Specifications for Workmanship and Materials Section 113 – Disposal of Debris and Section 108- Dewatering.

Payment for excavation will be made at the Contract Item Unit Price per Lump Sum (LS).

Item 3: Insert the attached David E. West Pond Plan.

Item 4: A copy of the geotechnical report is provided for reference.

All other provisions of the Contract Documents and Specifications not in conflict with this Addendum shall remain in full force and effect. Questions are to be e-mailed to Contract Administration@tampagov.net.

Jim Greiner

Jim Greiner, P.E., Contract Management Supervisor

Item No.	Description	Unit	Est Qty	Unit Price in Words		Unit Price		Total Price
105.2B	TREE REMOVAL - 9"-18"	EA	22		$		$	
110.1	CLEARING & GRUBBING POND SITE	AC	1.6		$		$	
120	POND SUBSOIL EXCAVATION, REMOVAL OF SOIL, GRADING AND SOD RESTORATION	LS	1		$		$	
130	CLEAN FILL	CY	7,600		$		$	
135	GRADE DITCH	LF	85		$		$	
110.3	GROUT EX. STORMWATER PIPE LATERALS	CY	10		$		$	
425.1	INLETS, DT BOT, TYPE E, <10'	EA	15		$		$	
425.2	MANHOLES, P-7, <10' deep (3.5')	EA	12		$		$	
425.3	MANHOLES, J-7, <10' deep (4')	EA	3		$		$	
425.4	INLET, COT CURB TYPE 1, <10'	EA	1		$		$	
425.7	INLET, COT CURB TYPE BR-1, <10	EA	1		$		$	
425.8	INLET, COT GRATE TYPE T, <10'	EA	47		$		$	
430.15	15" ROUND STORMWATER PIPE (RCP)	LF	1,200		$		$	
430.1	18" ROUND STORMWATER PIPE (RCP)	LF	1,000		$		$	
430.11	19"x30" MITERED END SECTION	EA	3		$		$	
430.12A	CONNECT STORMWATER PIPE TO EXISTING STRUCTURE (0-24")	EA	18		$		$	
430.12B	CONNECT STORMWATER PIPE TO EXISTING STRUCTURE (30-60")	EA	1		$		$	
430.2	24" ROUND STORMWATER PIPE (RCP)	LF	500		$		$	
430.30A	30" ROUND STORMWATER PIPE (RCP)	LF	400		$		$	
430.60A	60" ROUND STORMWATER PIPE (RCP)	LF	100		$		$	
430.4	12"x18" ELLIPTICAL STORMWATER PIPE (CLASS IV) (RCP)	LF	1,093		$		$	
430.5	14"x23" ELLIPTICAL STORMWATER PIPE (ERCP)	LF	299		$		$	

Item No.	Description	Unit	Est Qty	Unit Price in Words		Unit Price		Total Price
430.6	19"x30" ELLIPTICAL STORMWATER PIPE (ERCP)	LF	1,298		$		$	
530	Rip Rap - (2' deep)	CY	89		$		$	
550.1	REMOVE AND RESET FENCE	LF	1,255		$		$	
8901	SOD - AUGUSTINE	SY	9,500		$		$	
8902	SOD - BAHIA	SY	8,056		$		$	
8903	Hydroseeding	SY	2,900		$		$	
285.2	BEDDING	TN	237		$		$	
334	SUPERPAVE ASPHALTIC CONC, SP12.5 (2")	TN	936		$		$	
520.6	F&I Type “D” concrete curb	LF	100		$		$	
520.8	F&I CURB, DROP	LF	130		$		$	
520.110	CONCRETE CURB AND GUTTER TYPE "F"	LF	785		$		$	
522.1	SIDEWALK CONCRETE, 6" THICK (3000 psi)	SY	573		$		$	
522.2	CONCRETE, 6" THICK (DRIVEWAYS) (3000psi)	SY	2,586		$		$	
9250	ADA Compliant Ramps	EA	25		$		$	
2103	F&I 8" ductile iron pipe offset - all inclusive with tap (<30' in length)	EA	1		$		$	
2103.12	F&I 12" ductile iron pipe offset - all inclusive with tap (<30' in length)	EA	2		$		$	
2106	F&I 10" DIP - polywrap w fittings and restraints - all inclusive	LF	3,040		$		$	
2200	F&I 2" HDPE tubing by HDD w/HDPE adapters and HDPE fittings at various depths - all inclusive with tap (20' in length)	EA	2		$		$	
6004	F&I 10" gate or tapping valve with box on DIP, CIP or PVCP	EA	6		$		$	
6005	F&I 10" air release valve	EA	2		$		$	
6104	F&I 8" Linestop on Existing Water Main	EA	1		$		$	
900.1	8" Dia. PVC Pipe (C-900, DR-18)	LF	25		$		$	

Item No.	Description	Unit	Est Qty	Unit Price in Words		Unit Price		Total Price
900.2	24" Dia. PVC Pipe (C-900, DR-18)	LF	20		$		$	
1706	6-Inch Diameter PVC Pipe House Lateral (SDR-35) (<30' in length)	EA	25		$		$	
1707	6" Dia. PVC Pipe (SDR-26)	LF	30		$		$	
1708	8" Dia. PVC Pipe (SDR-26)	LF	80		$		$	
1709	10" Dia. PVC Pipe (SDR-26)	LF	20		$		$	
4660	6-Inch Diameter, SDR-35, PVC Clean-out and cover	EA	25		$		$	
100	CONTINGENCY	LS	1	Two hundred thousand dollars and no cents	$	200,000.00	$	200,000.00
						SUBTOTAL	$	
101	MOBILIZATION - 8% of Subtotal	LS	1		$		$	
102	MAINTENANCE OF TRAFFIC - 10% of Subtotal	LS	1		$		$	
						TOTAL	$	

SW

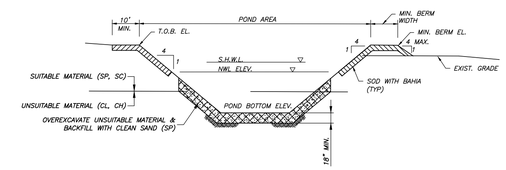
C-13
&
C-14

0 30
1"=30'

SEC. 19 & 20 T28S R19E

WET DETENTION POND DATA

	POND 10
MIN. BERM/T.O.B. ELEV.	25.5
SHWL ELEV.	23.0
NWL ELEV.	22.0
BOTTOM ELEV.	19.0
MIN. BERM WIDTH	10'



WET DETENTION POND DETAIL

N.T.S.

GENERAL NOTE:

1. ALL RCP PIPE SHALL BE CLASS IV, UNLESS OTHERWISE NOTED.

POND CONSTRUCTION NOTES:

1) GRADE AND PROVIDE 4:1 SLOPEOUTSIDE 10' MAINTENANCE BERM FROM ELV. 25.5 TO EX. GRADE.

2) SILT FENCE & HAY BALES MUST BE PROVIDED DURING CONSTRUCTIONPHASE PER FDOT INDEX 102.

3) PROVIDE TREE BARRICADES PER CITY CODE FOR ALL TREES WITHIN LIMITS OF CONSTRUCTION.

Diameter (in) Removed on Site	Number Removed on Site	Multiplier for Debit	Debit	Tree Removed Type / Inch	Tree Replacement Req'ed	Tree Replacement (inch)
5"-7"	2	0	0	Oak: 7", 7"	0	0
8"-12"	12	1	12	Oak:8",9",9",9",8",10", 10",9",8",12",11" Other: 8"	(1) 2" tree/tree	(12) 2" trees
13"-19"	3	2	6	Oak:17" Pine: 15", 17"	(2) 2" tree/tree	(6) 2" trees
20"-29"	4	4	16	Oak:22",22" Pine:23",23"	(4) 2" tree/tree	(16) 2" trees
over 30" Variance Board	0	in per in	0	N/A	in per in	(0) 2" trees
All Palms	1	1	1	Palm: 12"	(1) 2" tree/tree	(1) 2" trees
TOTAL:	22		35			(35) 2" trees

Tree Fund Calc (8 inches or larger trees):
(To Be Paid For By City of Tampa)
Removal Inch [Oak] $150/in X 164 in =$24,600
Removal Inch [Other,Pine] $150/in X 76 in =$11,400
Removal Inch [Palm] $300/tree X 1 tree =$ 300
TOTAL = $36,300

TREE LEGEND

- = BAY TREE
- = BOTTLE BRUSH TREE
- = CAMPHOR TREE
- = CEDAR
- = CHINABERRY TREE
- = CITRUS TREE
- = CYPRESS TREE
- = ELM TREE
- = EUCALYPTUS TREE
- = MAGNOLIA TREE
- = MAPLE TREE
- = MULBERRY TREE
- = OAK TREE
- = OTHER SPECIES
- = PALM TREE
- = PECAN TREE
- = PERSIMMON TREE
- = PINE TREE
- = SYCAMORE TREE
- = WAX MYRTLE TREE
- = WILLOW TREE
- = TO BE REMOVED

No.	DATE	REVISIONS	No.	DATE	REVISIONS
3			6		
2			5		
1			4		

DES:
DRN:
CKD:
DATE: 1/23/19

CITY of TAMPA
Department of Transportation and Stormwater Services
Stormwater Engineering Division

NTCB FLOODING RELIEF - DAVID E. WEST POND
POND PLAN

SHEET 7 OF 77

SW001

AREHNA | Engineering, Inc.

5012 W. Lemon Street
Tampa, Florida 33609
Ph 813.944.3464 | Fax 813.944.4959

August 22, 2014

Barbara Graves
City of Tampa DPW – Stormwater Engineering
306 E Jackson St 6N
Tampa, FL 33602
813-274-8963
barbara.graves@tampagov.net

Subject: Report of Geotechnical Engineering Services
Stormwater Improvements
David E. West Park
N. 22nd Street Tampa, FL
AREHNA Project No. B-14-111.01

AREHNA Engineering, Inc. is pleased to submit this report of our geotechnical services. The purpose of our geotechnical study was to obtain information on the general subsurface conditions for the proposed stormwater improvements.

PROJECT INFORMATION

We understand that additional stormwater management facilities are needed in the area. The western portion of the David E. West Park is under consideration for use as a stormwater management area.

SCOPE OF SERVICES

The following services were performed to achieve the above-outlined objectives:

- Requested utility location services from Sunshine State One-Call.
- Performed three Standard Penetration Test (SPT) borings to a depth of 15 feet at locations selected by the City. Samples were collected and Standard Penetration Test resistances were measured at intervals of two feet for the top ten feet and five feet thereafter.
- Performed a Double Ring Infiltration (DRI) test and determined the seasonal high groundwater level adjacent to each SPT boring.
- Visually classified and stratified the soil samples in the laboratory using the Unified Soil Classification System (USCS).
- Reported the results of the field exploration in this written report, signed and sealed by a professional engineer specializing in geotechnical engineering.

FIELD EXPLORATION

The SPT and DRI locations are indicated on the Field Exploration Location Map in the Appendix, Figure 2. Note that standing water resulted in our moving the boring and DRI test approximately 50 feet southwest of location B-2.

Representative portions of these soil samples were sealed in glass jars, labeled and transferred for classification.

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 (Figure 3 in the Appendix). Based on this review, the natural ground surface elevation at the project site is relatively flat at an elevation between +25 to +30 feet National Geodetic Vertical Datum of 1929 (NGVD).

USDA NATURAL RESOURCES CONSERVATION SERVICE DATA

A review of the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) survey for Hillsborough County, attached as Figure 4, indicates that the natural soils at the project site consist of Myakka fine sand (mapping unit 29) and Tavares-Millhopper fine sand (mapping unit 53). The NRCS published profiles typically reports soils extending to 80 inches below the ground surface. Excerpts from the published Soil Survey are provided below for reference:

Characteristic of Myakka fine sand [29]: This soil is nearly level and poorly drained. It is on broad plains on the flatwoods. The slope is 0 to 2 percent. Typically, this soil has a surface layer of very dark gray fine sand about 5 inches thick. The subsurface layer, to a depth of about 20 inches, is gray fine sand. The upper part of the subsoil, to a depth of about 25 inches, is black fine sand. The middle part, to a depth of 30 inches, is dark reddish brown fine sand. The lower part, to a depth of about 38 inches, is brownish yellow fine sand. The upper part of the substratum, to a depth of about 55 inches, is very pale brown fine sand. The lower part to a depth of about 80 inches is dark grayish brown fine sand

Characteristics of Tavares-Millhopper fine sand [53]: The soils in this map unit are nearly level to gently sloping and moderately well drained. They are in low-lying areas on the uplands and on low ridges on the flatwoods.

Typically, the surface layer of the Tavares soil is dark grayish brown fine sand about 6 inches thick. The upper part of the underlying material, to a depth of about 32 inches, is pale brown fine sand. The middle part, to a depth of about 40 inches, is very pale brown fine sand. The lower part to a depth of about 80 inches is light gray fine sand. Similar soils included in mapping, in some areas, have a brown or dark brown layer in the lower part of the underlying material. Other similar soils, in some of the lower parts of the landscape, are somewhat poorly drained.

Typically, the surface layer of the Millhopper soil is dark gray fine sand about 4 inches thick. The upper part of the subsurface layer, to a depth of about 9 inches, is brown fine sand. The next layer, to a depth of about 25 inches, is light yellowish brown fine sand. The next layer, to a depth of about 48 inches, is light gray, mottled fine sand. The lower part, to a depth of about 57 inches, is light gray fine sand. The upper part of the subsoil, to a depth of about 62 inches, is very pale brown, mottled sandy clay loam. The lower part to a depth of about 80 inches is gray, mottled sandy clay loam. Similar soils included in mapping, in some areas, have a dark surface layer more than 10 inches thick.

Based on the borings performed, the soils that underlie the site generally consist of natural soils similar to the Myakka and Millhopper units described above.

SUBSURFACE CONDITIONS

The Soil Test Boring Records in the Appendix should be consulted for a detailed description of the subsurface conditions encountered at the boring location. These records represent our interpretation of the subsurface conditions based on the field logs and visual examination of field samples by a geotechnical engineer. The profile illustrates the visual characteristics of the soil strata encountered using the Unified Soil Classification System. When reviewing the boring records, it should be understood that soil conditions may vary away from the boring locations.

Beneth a veneer of topsoil, the borings generally encountered fine sands to depths of 3 to 4 feet below grade. The clay content and plasticity of the soil then generally increased with depth to the 15 foot deep boring termination.

A page defining the terms and classification symbols used in the boring profiles is included in the Appendix of this report.

DOUBLE RING INFILTRATION (DRI) TEST RESULTS

The following table summarizes the DRI Test Results:

Test Location	Test Depth Below Ground Surface, feet	Seasonal High Ground Water Depth, ft	Final Vertical Infiltration Rate, in/hr
DRI-1	0.4	1.5	1
DRI-2	0.5	3	7
DRI-3	1.0	3	8

The above vertical infiltration rate is the actual value found in the upper find sands. No factor of safety has been applied. The underlying clayey sands and clays have a vertical infiltration rate less than 1% of the above tabulated values.

Based on the mapping performed by the USDA, soils information obtained from the site and our experience in the area, we estimate that the seasonal high ground water level will be as tabulated above.

A summary of the DRI test results is attached in the Appendix.

GROUNDWATER CONDITIONS

The groundwater level was encountered at a depth of approximately 4 feet in the SPT borings performed adjacent to the DRI locations. The actual groundwater level was likely higher due the the clayey soils encountered. Some standing water was found in the depressed area in northwest - central portion of the site

at the time our borings were made. Fluctuation in ground water levels should be expected due to seasonal climatic changes, construction activity, rainfall variations, surface water runoff, and other site-specific factors. Since ground water level variations are anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based on the assumption that variations will occur.

The borings were drilled during a period of moderate rainfall.

CLOSING

AREHNA appreciates the opportunity to have assisted you 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.

Respectfully Submitted,

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

Kristina LaCava 8/25/14
Kristina LaCava, P.E.
Geotechnical Engineer
Florida Registration 77594

8-22-14
Curtis J. Roos, P.E.
Senior Geotechnical Engineer
Florida Registration 27570

APPENDIX

Project Site Location Map – Figure 1
Field Exploration Location Plan – Figure 2
USGS Topographic Survey – Figure 3
USDA Soil Survey – Figure 4
Generalized Subsurface Profile – Figure 5
Soil Test Boring Records
Key to Soil Classification
Double Ring Infiltration Test Results
Field Test Procedures

APPENDIX

Project Site Location Map – Figure 1
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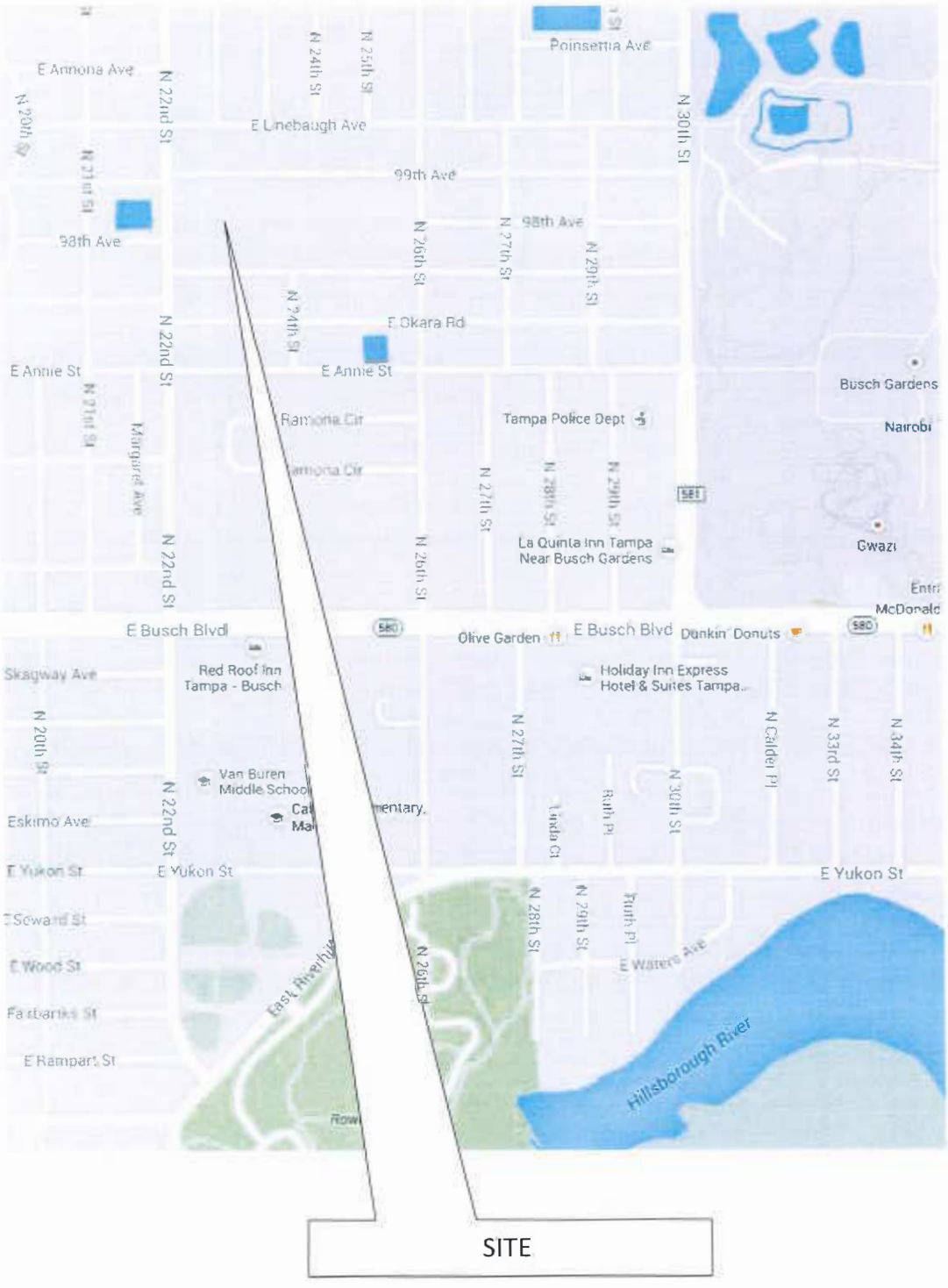
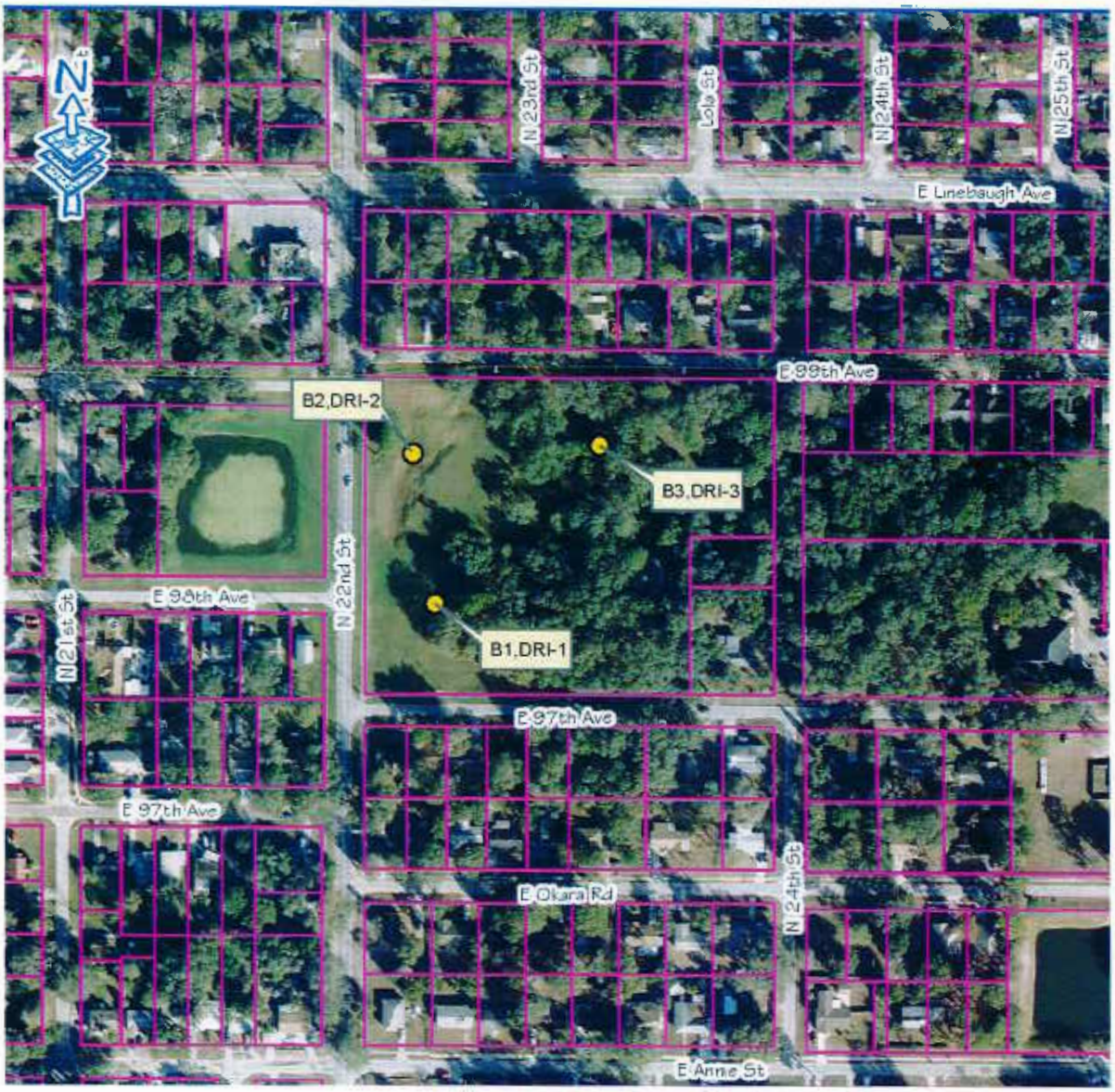
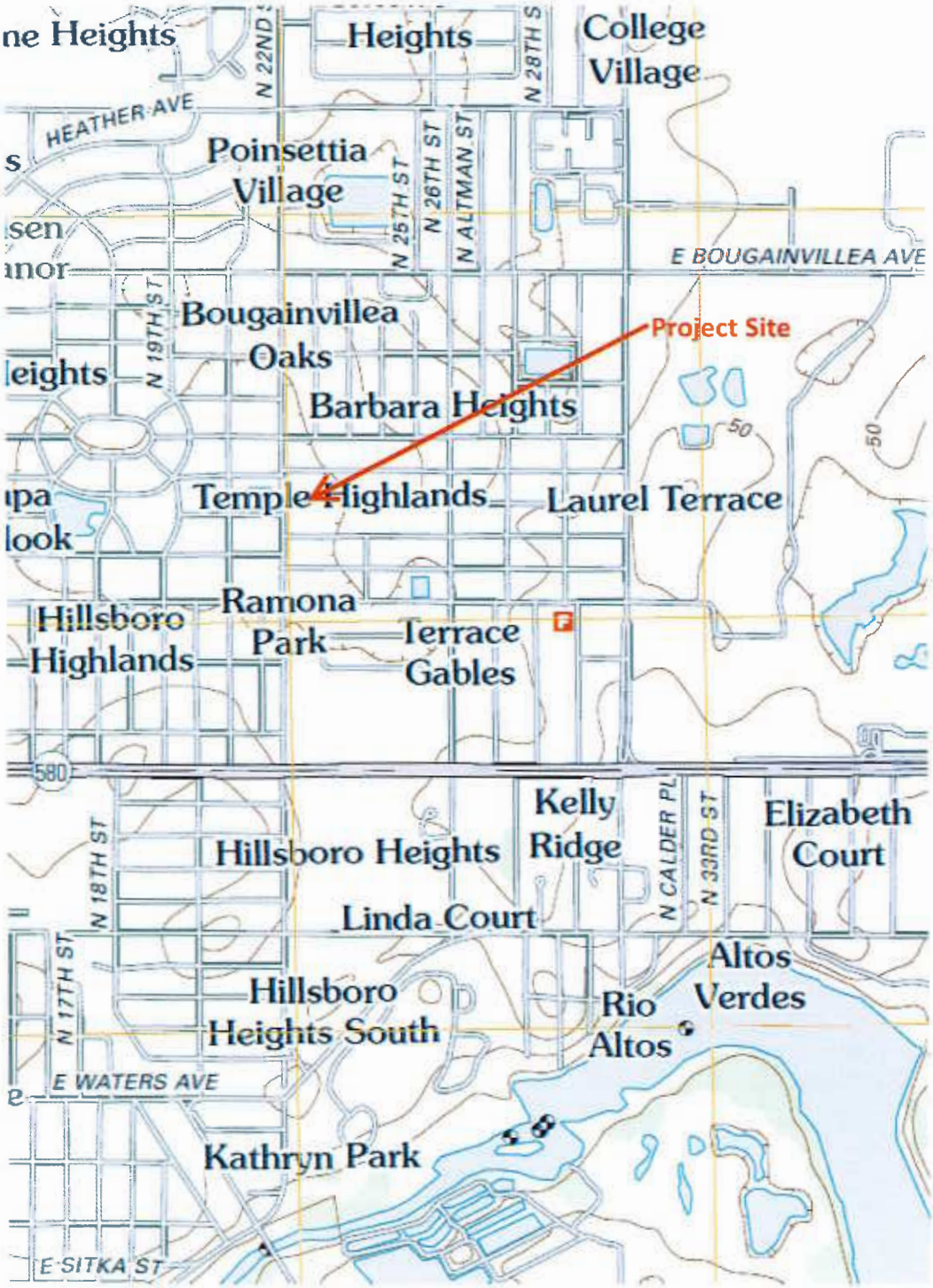


David E. West Park Tampa, FL	AREHNA Engineering, Inc. 5012 West Lemon Street, Tampa, Fl 33609 Phone 813.944.3464 • Fax 813.944.4959	PROJECT SITE LOCATION MAP	
Client: City of Tampa Project: B-14-111.01 Date: August 21, 2014		Designed By: KSL Checked By: JEP Drawn By: KCA	FIGURE 1



Note: Boring and Double Ring Infiltration test at B-2 moved approximately 50 feet southwest due to standing water.

David E. West Park Tampa, FL	AREHNA Engineering, Inc. 5012 West Lemon Street, Tampa, FL 33609 Phone 813.944.3464 ▪ Fax 813.944.4959	FIELD EXPLORATION LOCATION MAP	
Client: City of Tampa Project: B-14-11L.01 Date: August 21, 2014		Designed By: KSL Checked By: JEP Drawn By: KCA	FIGURE 2



David E. West Park Tampa, FL	AREHNA Engineering, Inc. 5012 West Lemon Street, Tampa, FL 33609 Phone 813.944.3464 ▪ Fax 813.944.4959	USGS TOPOGRAPHIC SURVEY	
Client: City of Tampa Project: B-14-111.01 Date: August 21, 2014		Designed By: KSL Checked By: JEP Drawn By: KCA	FIGURE 3

Soil Mapping Unit

29 – Myakka fine sand
53 – Tavares – Millhopper fine sand

N

David E. West Park
Tampa, FL

USDA SOIL SURVEY

Client: City of Tampa
Project: B-14-111.01
Date: August 21, 2014

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

Designed By: KSL
Checked By: JEP
Drawn By: KCA

FIGURE 4

DEPTH (ft)	SOIL DESCRIPTION AND REMARKS	WATER LEVEL	GRAPHIC LOG	SAMPLE TYPE	SPT BLOW COUNTS	N-VALUE	● SPT N VALUE ● 20 40 60 80 / PL MC LL 20 40 60 80 / ▲ FINES CONTENT (%) ▲ 20 40 60 80
0	Loose gray brown fine SAND (SP) with some small roots			SPT	1-2-3-2	5	
	Loose brown fine SAND (SP)	▽		SPT	2-3-2-2	5	
	Loose gray clayey fine SAND (SC)			SPT	1-3-3-3	6	
	Firm gray sandy CLAY (CL)			SPT	3-4-4-4	8	
10	Firm gray green high plasticity CLAY (CH)			SPT	2-2-3-4	5	
				SPT	1-2-2	4	

Bottom of borehole at 15.0 feet.

Date Drilled: 8/19/14
Drilled By: AREHNA
Method: ASTM D-1586, Standard Penetration Test Boring

Ground Water Level:

▽ At Time of Drilling: 4 ft below existing grade

Remarks:

DAVID E. WEST PARK
TAMPA, FL
AREHNA Project No.: B-14-111.01
City of Tampa

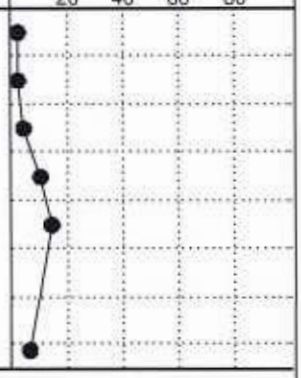
AREHNA | Engineering, Inc.

SOIL BORING LOG

Drawn By: LEF
Checked By: CJR
Date: 8/21/2014

Boring B-01

DEPTH (ft)	SOIL DESCRIPTION AND REMARKS	WATER LEVEL	GRAPHIC LOG	SAMPLE TYPE	SPT BLOW COUNTS	N-VALUE
0	Very loose gray brown fine SAND (SP) with some small roots			SPT	1-1-1-2	2
	Very loose gray fine SAND (SP)	▽		SPT	1-1-1-2	2
	Very loose gray clayey fine SAND (SC)			SPT	WOH-2-2-4	4
	Firm to stiff gray sandy CLAY (CL)			SPT	2-4-6-6	10
10				SPT	7-7-7-8	14
				SPT	2-2-4	6



Bottom of borehole at 15.0 feet.

Date Drilled: 8/19/14
Drilled By: AREHNA
Method: ASTM D-1586, Standard Penetration Test Boring

Ground Water Level:

▽ At Time of Drilling: 4 ft below existing grade

Remarks:

DAVID E. WEST PARK
TAMPA, FL
AREHNA Project No.: B-14-111.01
City of Tampa

AREHNA Engineering, Inc.

SOIL BORING LOG

Drawn By: LEF
Checked By: CJR
Date: 8/21/2014

Boring B-02

DEPTH (ft)	SOIL DESCRIPTION AND REMARKS	WATER LEVEL	GRAPHIC LOG	SAMPLE TYPE	SPT BLOW COUNTS	N-VALUE
0	Very loose gray brown fine SAND (SP)			SPT	WOH-2-1-2	3
	Loose orange tan clayey fine SAND (SC)	▽		SPT	1-1-1-2	2
				SPT	2-3-3-5	6
	Firm to stiff gray sandy CLAY (CL)			SPT	3-4-5-6	9
10				SPT	2-3-4-6	7
	Firm gray green high plasticity CLAY (CH)			SPT	2-2-3	5

● SPT N VALUE ●
20 40 60 80
PL MC LL
20 40 60 80
▲ FINES CONTENT (%) ▲
20 40 60 80

Bottom of borehole at 15.0 feet.

Date Drilled: 8/19/14
Drilled By: AREHNA
Method: ASTM D-1586, Standard Penetration Test Boring

Ground Water Level:
▽ At Time of Drilling: 4 ft below existing grade

Remarks:

DAVID E. WEST PARK
TAMPA, FL
AREHNA Project No.: B-14-111.01
City of Tampa

AREHNA | Engineering, Inc.

SOIL BORING LOG

Drawn By: LEF
Checked By: CJR
Date: 8/21/2014

Boring B-03

KEY TO SYMBOLS

AREHNA | Engineering, Inc.

CLIENT City of Tampa – DPW – Stormwater
PROJECT NAME Stormwater Improvements
PROJECT NUMBER B-14-111.01
PROJECT LOCATION Tampa, FL

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)

- SP: Poorly-graded Sand
- SC: Clayey Sand
- CL: Low Plasticity Clay
- CH: High Plasticity Clay

SAMPLER SYMBOLS

Standard Penetration Test

Standard Penetration Resistances

SAND & GRAVEL

No. of Blows	Relative Density
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
Greater than 50	Very Dense

SILT & CLAY

No. of Blows	Consistency
0 - 2	Very Soft
3 - 4	Soft
5 - 8	Firm
9 - 15	Stiff
16 - 30	Very Stiff
Greater than 30	Hard

LIMESTONE

No. of Blows	Consistency
10 - 20	Soft
21 - 50	Medium
51 - 50/3"	Hard
Greater than 50/3"	Very Hard

WOR = Weight of Rod
WOH = Weight of Hammer

Ground Water Level Measurements

- Water Level at Time Drilling, or as Shown
- Water Level After 24 Hours, or as Shown

ABBREVIATIONS

- LL - LIQUID LIMIT (%)
- PI - PLASTICITY INDEX (%)
- W - MOISTURE CONTENT (%)
- DD - DRY DENSITY (PCF)
- NP - NON PLASTIC
- -200 - PERCENT PASSING NO. 200 SIEVE
- PP - POCKET PENETROMETER (TSF)

SOIL BOUNDARY CLASSIFICATIONS

FINE GRAINED SOILS	COARSE GRAINED SOILS						
SILT or CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		
# 200 Sieve	#40 Sieve	#10 Sieve	#4 Sieve	3/4-inch	3-inch	12-inch	

SUMMARY OF DOUBLE RING INFILTRATION TEST RESULTS

Stormwater Improvements
David E. West Park
N. 22nd Street Tampa, FL
AREHNA Project No. B-14-111.01

Test: **DRI-01**

Date of Test: August 19, 2014

Test Depth: 0.4 feet below ground surface

Test Procedure: ASTM D-3385

Outer Ring Diameter: 24 inches

Inner Ring Diameter: 12 inches

Head: 12.0 inches

Test Duration: 4 hrs

Time Increments (Minutes)	Infiltration per Time Period (Inches)
15	0.25
15	0.25
15	0.25
15	0.25
30	0.5
30	0.5
30	0.5
30	0.5
30	0.5
30	0.5

Infiltration Rate: 1 inches per hour

Approximate Depth To Seasonal High Ground Water Level: 1.5 feet

SUMMARY OF DOUBLE RING INFILTRATION TEST RESULTS

Stormwater Improvements
David E. West Park
N. 22nd Street Tampa, FL
AREHNA Project No. B-14-111.01

Test: **DRI-02**

Date of Test: August 19, 2014

Test Depth: 0.5 feet below ground surface

Test Procedure: ASTM D-3385

Outer Ring Diameter: 24 inches

Inner Ring Diameter: 12 inches

Head: 12.0 inches

Test Duration: 4 hrs

Time Increments (Minutes)	Infiltration per Time Period (Inches)
15	2.5
15	2
15	2
15	2
30	4
30	4
30	3.5
30	3.5
30	3.5
30	3.5

Infiltration Rate: 7 inches per hour

Approximate Depth To Seasonal High Ground Water Level: 3 feet

SUMMARY OF DOUBLE RING INFILTRATION TEST RESULTS

Stormwater Improvements
David E. West Park
N. 22nd Street Tampa, FL
AREHNA Project No. B-14-111.01

Test: **DRI-03**

Date of Test: August 19, 2014

Test Depth: 1.0 feet below ground surface

Test Procedure: ASTM D-3385

Outer Ring Diameter: 24 inches

Inner Ring Diameter: 12 inches

Head: 12.0 inches

Test Duration: 4 hrs

Time Increments (Minutes)	Infiltration per Time Period (Inches)
15	4
15	4
15	4
15	3
30	6
30	6
30	6
30	5
30	4
30	4

Infiltration Rate: inches 8 per hour

Approximate Depth To Seasonal High Ground Water Level: 3 feet

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-feet 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 automatically tripped hammer falling 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.

Double Ring Infiltration (DRI) Testing

The DRI tests are performed in general accordance with ASTM D3385 "Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer". The 24-inch diameter outer ring is set on the prepared and roughened surface and is driven into the soil below the topsoil. Care is taken not to disturb the soil adjacent to ring walls. The ring is then checked visually for levelness. The 12-inch diameter inner ring is then set concentrically within the outer ring and pushed and/or driven into the soil. The inner ring is then checked visually for level and location within the outer ring. Water is poured into both rings using a splash guard to reduce scouring of the soil surface during the testing. The inner ring and annular space is then simultaneously filled with water to a depth of 12 inches. Water is added during the testing to maintain the 12-inch head. The total inches of water used to maintain the test level is recorded for a given time interval. This measured amount, divided by the corresponding time increment, is an infiltration velocity. The final hour of data represents the infiltration rate.

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Date: 8/21/2014
Drawn By: LEF
Checked By: CJR

Stormwater Improvements
Tampa, FL

Prepared for
City of Tampa – DPW – Stormwater
Project No.: B-14-111.01

GENERALIZED SUBSURFACE PROFILE
Figure 5

Poorly-graded Sand
Clayey Sand
Low Plasticity Clay
High Plasticity Clay

Soil Classification Key