March 24, 2017

Mr. Rusty Pruitt
City of Roswell
Recreation, Parks, Historic, and Cultural Affairs Dept.
Roswell, GA 30075

RE: Report of Geotechnical Exploration
Riverwalk Phase IV – WDCP Testing
Willeo Road
Roswell, Georgia

ECS Project No. 10:9440

Dear Mr. Pruitt:

ECS Southeast, LLP (ECS) is pleased to submit our report of geotechnical review for the above referenced project. This letter report presents an introduction to the proposed project, results of our exploration, subsurface conditions, and our recommendations. The work was completed in general accordance with ECS Proposal No. 10:12380r1 and as authorized under City of Roswell purchase order No.: 201713311-00 on February 21, 2017.

PROJECT INFORMATION

The information presented in this section is based on information provided by the City of Roswell and our site reconnaissance. The site is located along Willeo Road and the Chattahoochee River in Roswell, Georgia. A Site Location Diagram (Figure 1) is attached to this report. The proposed project consists of the construction of the Roswell Riverwalk Trail along the Chattahoochee River. Portions of the nature trail include a boardwalk supported by helical piers. We understand that helical piers installed to-date along various sections of the boardwalk have gone deeper than anticipated. The purpose of this field exploration was to identify depths at which helical piles can be anchored to provide necessary capacity along the next (Phase IV) section of the trail. The Phase IV trail alignment begins near the Chattahoochee Nature Center (to the north) and ends near Willeo Park (to the south).

FIELD EXPLORATION AND LABORATORY TESTING

Subsurface Exploration

To explore the subsurface conditions, a total of 11 Wildcat Dynamic Cone Penetrometer (WDCP) tests were performed along the proposed Phase IV boardwalk alignment areas. The WDCP testing logs have been included with this report.

The WDCP testing locations were determined in the field by our representative using hand-held GPS devices. The WDCP locations shown on the attached WDCP Location Plans (Figures 2 through 6) should be considered approximate.

WDCP testing was conducted to provide relative bearing values at regular intervals throughout the soil profile. In WDCP testing, a cone with a diameter of 1.47 inches is driven into the soil by a 34.94-pound hammer falling 15 inches. The number of blows required to drive the cone through 10 centimeter intervals is recorded. The blows obtained from WDCP can be correlated to Standard Penetration Test (SPT) N-values. Soil samples were not collected during WDCP testing.

FINDINGS AND RECOMMENDATIONS

WDCP Results

The WDCP testing typically encountered a very loose / very soft layer of soil to depths ranging from approximately 2' to 12' below the existing ground surface. Moderately dense/stiff soils were encountered below the upper very soft soils at WDCP-3, WDCP-4 and WDCP-5. The WDCP testing encountered refusal in all WDCP tests performed at depths ranging from approximately 2'-4" to 18'-8" below existing grade. Refusal is a designation applied to any material which cannot be further penetrated by the WDCP cone and is normally indicative of a dense material, such as rock fragments, dense soil, partially weathered rock, bedrock, etc. Please note that the WDCP testing utilizes hand operated equipment. Mechanically operated equipment will likely penetrate past WDCP refusal depths.

Generalized Table of Subsurface Conditions

The following table describes the general subsurface conditions reported in the WDCP tests. Please refer to the individual WDCP logs in the Appendix for more detailed information.

WDCP No.	Approximate WDCP Station	Approximate WDCP Refusal Depth (ft.)
WDCP-1	2+05.00	13'-5"
WDCP-2	3+85.00	3'-11"
WDCP-3	5+50.00	14'-1"
WDCP-4	7+90.00	18'-8"
WDCP-5	10+15.00	16'-9"
WDCP-6	12+00.00	12'-2"
WDCP-7	14+25.00	10'-6"
WDCP-8	16+30.00	2'-4"
WDCP-9	17+70.00	2'-7"
WDCP-10	20+20.00	13'-1"
WDCP-11	23+25.00	7'-10"

Helical Piles

A helical pile system generally consists of one or more helix plates, attached to a shaft. The helix anchor is installed by applying torque to the shaft and screwing it into the soil. The amount of torque required to screw the plate into place can be loosely correlated to the allowable load for the pile system. Due to variable soil conditions, field adjustment of pile locations under foundations may be needed.

From the WDCP testing performed, we estimate that helical piles will be installed to depth ranging from 5 to 19 along most section of the Phase IV alignment generally corresponding to the WDCP refusal depths provided in the previous table. Actual pile lengths may vary, with some piles possibly going a few feet deeper than the WDCP refusal depths. Similarly, we note that some piles may achieve capacity at depths several feet above the WDCP refusal depths, particularly near Stations 5+50.00 (WDCP-3), 7+90.00 (WDCP-4) and 10+15.00 (WDCP-5) where the moderately dense soils were encountered above the refusal depths.

In general, helical piles should typically be installed to minimum depths of 5 feet below the ground surface. However, we note that refusal was encountered at depths less than 6 feet deep at Stations 2+05.00, 3+85.00, 5+50.00 and 17+70.00. Adequate helical pier lengths may not be available along these sections of the boardwalk alignment. Alternate foundation types, possibly shallow foundations may likely be required in these areas.

CLOSING

This letter has been prepared in accordance with generally accepted geotechnical engineering practice. No warranty is expressed or implied. This letter is provided for the exclusive use of City of Roswell and their project specific design team. This report is not intended to be used or relied upon in connection with other projects or by other third parties. ECS disclaims liability for any such third party use or reliance without express written permission.

We appreciate the opportunity of working with you on this project and look forward to our continued association. Should you have questions regarding our findings or need additional consultations, please do not hesitate to contact our office at (770) 590-1971.

Respectfully,

ECS SOUTHEAST, LLP represented by:

Dana Causby, P.E.
Senior Geotechnical Engineer
GA Registration No. 27858

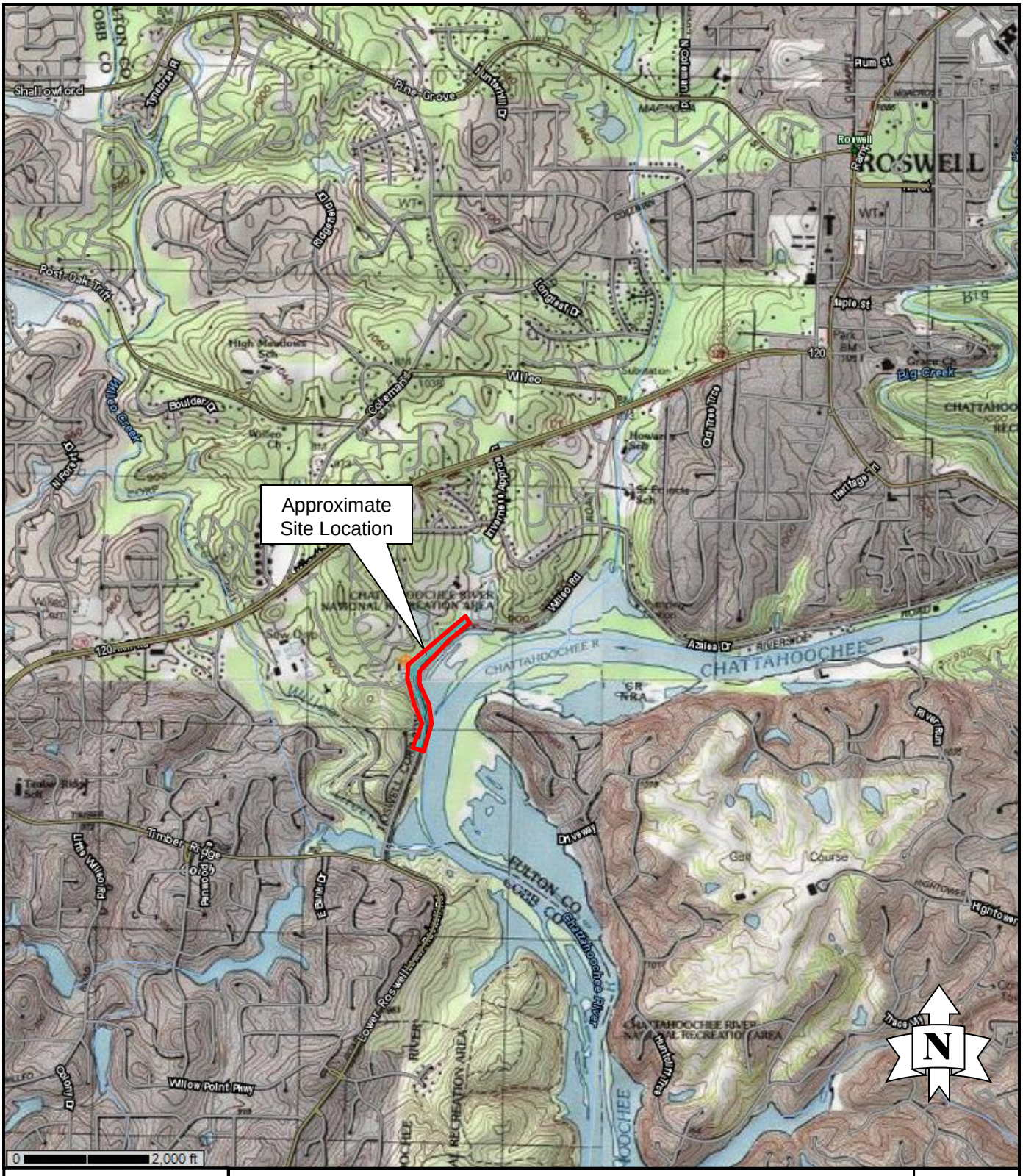
GEORGIA REGISTERED 3/24/2017 No. 27858 PROFESSIONAL ENGINEER DANA R. CAUSBY

Jay Hornsby, P.G.
Geotechnical Department Manager
GA Registration No. 1978

Attachments:

Figure 1 – Site Location Diagram
Figure 2 through 6 – WDCP Location Plans
Reference Notes for Boring Logs
WDCP Logs (11)
ASFE Information about Geotechnical Reports

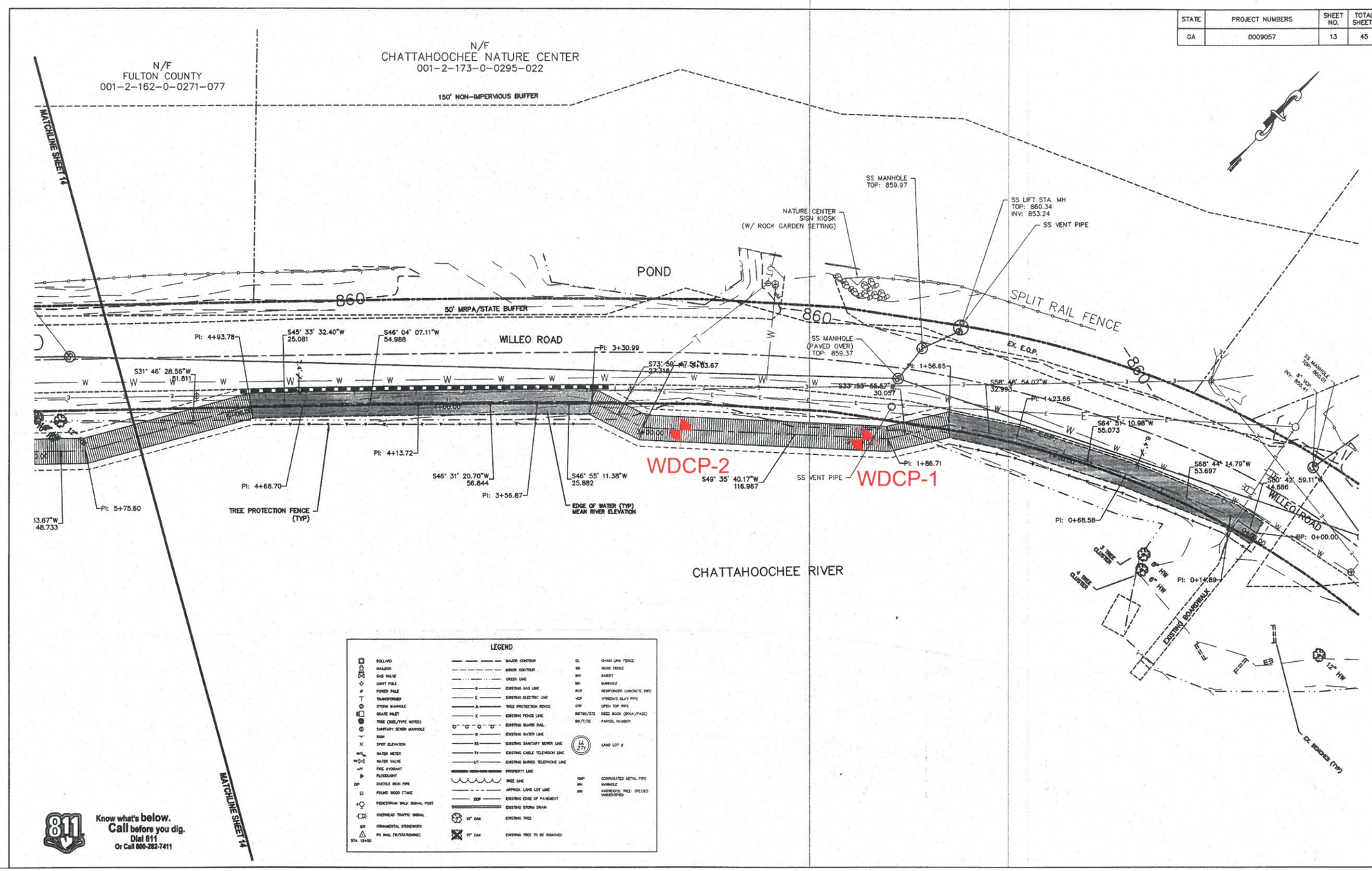
Attachments



SITE LOCATION DIAGRAM

REPORT OF GEOTECHNICAL EXPLORATION	**Project No.: 10:9440**	**Figure No.: 1**
Riverwalk Phase IV – WDCP Testing Roswell, Georgia	**Scale: As Shown**	
Reference: USGS Quadrangle	**Date: 3/2017**	

STATE	PROJECT NUMBERS	SHEET NO.	TOTAL SHEETS
GA	0009057	13	45



LEGEND

BOLLARD	MAJOR CONTOUR	CL	CHAIN LINK FENCE
MAILBOX	MINOR CONTOUR	WD	WOOD FENCE
GAS VALVE	CREEK LINE	INV	INVERT
LIGHT POLE	EXISTING GAS LINE	MH	MANHOLE
POWER POLE	EXISTING ELECTRIC LINE	RCP	REINFORCED CONCRETE PIPE
TRANSFORMER	TREE PROTECTION FENCE	VCP	VITREOUS CLAY PIPE
STORM MANHOLE	EXISTING FENCE LINE	OTP	OPEN TOP PIPE
GRATE INLET	EXISTING GUARD RAIL	88730/372	DEED BOOK (BOOK/PAGE)
TREE (SIZE/TYPE NOTED)	EXISTING WATER LINE	88/7/3E	PARCEL NUMBER
SANITARY SEWER MANHOLE	EXISTING SANITARY SEWER LINE	LL 277	LAND LOT #
SIGN	EXISTING CABLE TELEVISION LINE		
SPOT ELEVATION	EXISTING BURIED TELEPHONE LINE		
WATER METER	PROPERTY LINE		
WATER VALVE	TREE LINE	CMP	CORRUGATED METAL PIPE
FIRE HYDRANT	APPROX. LAND LOT LINE	MH	MANHOLE
FLOODLIGHT	EXISTING EDGE OF PAVEMENT	HW	HARDWOOD TREE: SPECIES UNIDENTIFIED
DUCTILE IRON PIPE	EXISTING STORM DRAIN		
FOUND WOOD STAKE	15" OAK EXISTING TREE		
PEDESTRIAN WALK SIGNAL POST	15" OAK EXISTING TREE TO BE REMOVED		
OVERHEAD TRAFFIC SIGNAL			
ORNAMENTAL STONEWORK			
PK NAIL (N/S/STACKING) STA. 12+50			

811 Know what's below. Call before you dig. Dial 811 Or Call 800-282-7411

LEGEND

Approximate WDCP Location

WDCP-X WDCP Designation

Graphic Scale 1"=50'

50 25 0 10 20 30 40 50

PROJECT: Riverwalk Phase IV, Roswell, GA

PREPARED FOR: City of Roswell

FIGURE NAME: WDCP LOCATION PLAN

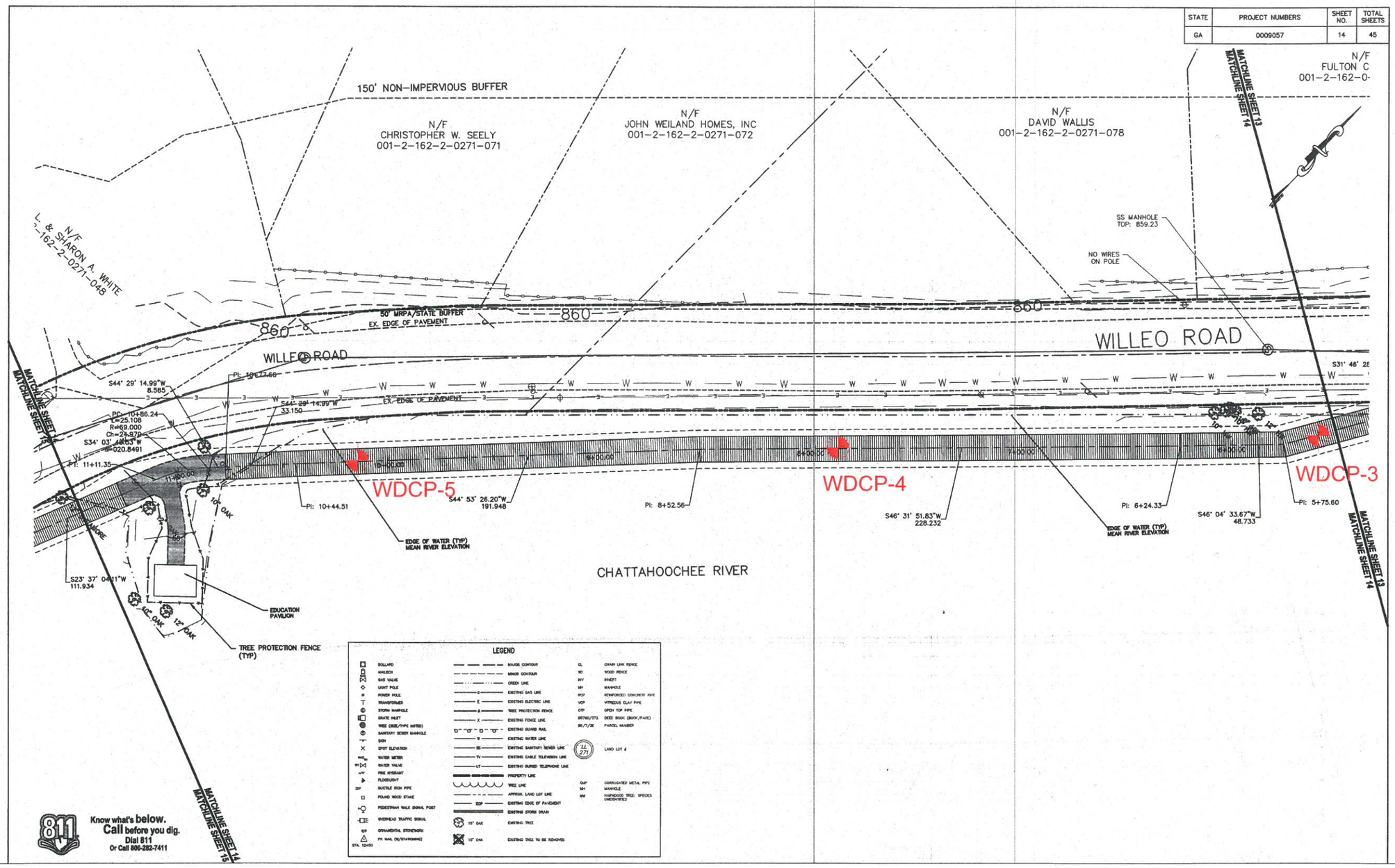
REFERENCE: Roswell Riverwalk Trail Connection Phase IV Layout, Grading & Drainage Plan

REVISIONS

JOB NO.	10:9440
SCALE	1"=50'
DRAWN	FGM 3/2017
APPR.	KJH 3/2017

Figure No.: 2

STATE	PROJECT NUMBERS	SHEET NO.	TOTAL SHEETS
GA	0009057	14	45



LEGEND

Approximate WDCP Location

WDCP-X WDCP Designation

Graphic Scale 1"=50'

50 25 0 10 20 30 40 50

ECS

PROJECT: Riverwalk Phase IV
Roswell, GA

PREPARED FOR: City of Roswell

FIGURE NAME: WDCP LOCATION PLAN

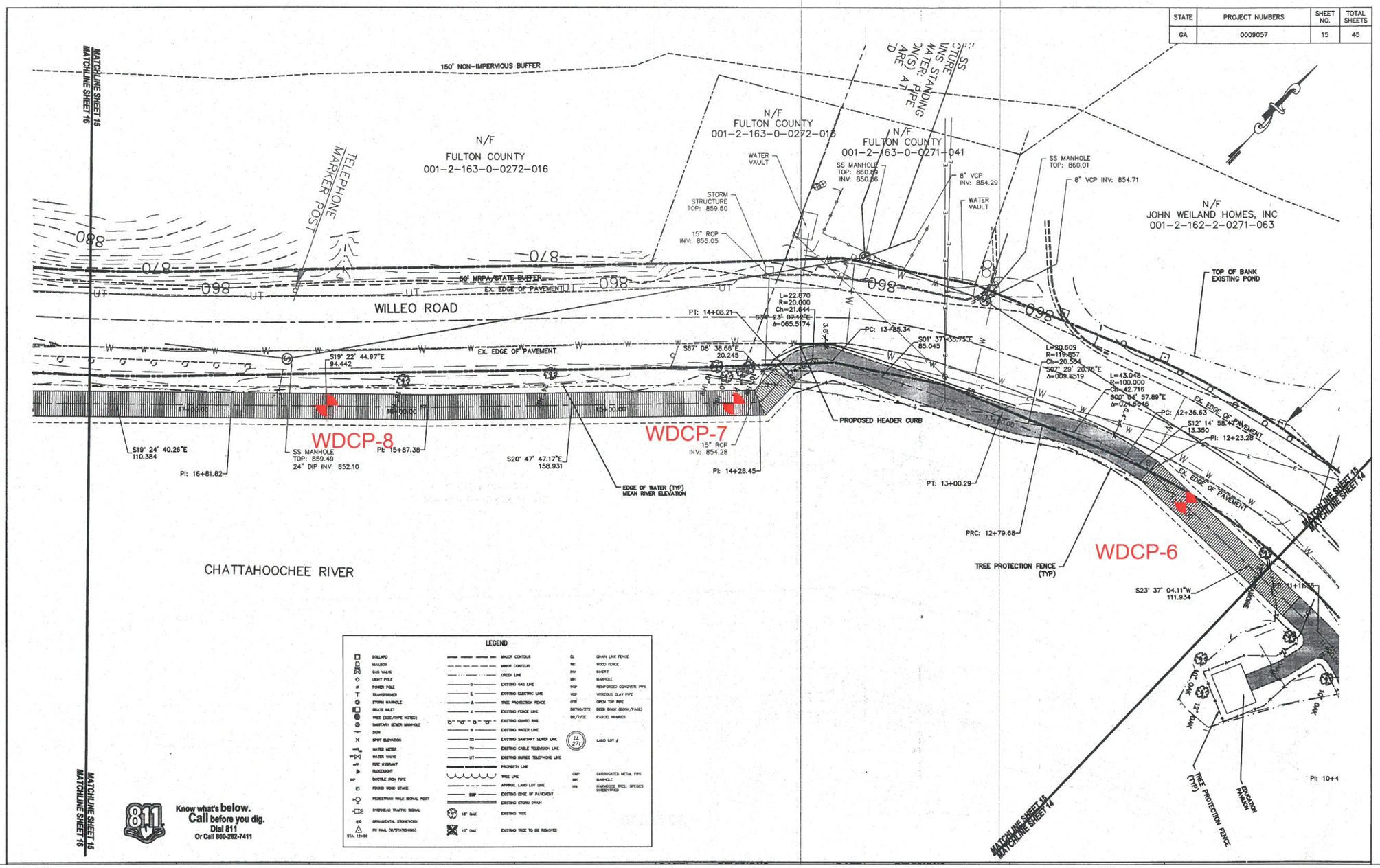
REFERENCE: Roswell Riverwalk Trail
Connection Phase IV
Layout, Grading & Drainage Plan

REVISIONS

JOB NO.	10:9440
SCALE	1"=50'
DRAWN	FGM 3/2017
APPR.	KJH 3/2017

Figure No.: 3

STATE	PROJECT NUMBERS	SHEET NO.	TOTAL SHEETS
GA	0009057	15	45



LEGEND

BOLLARD	MAJOR CONTOUR	CL CHAIN LINK FENCE
MAILBOX	MINOR CONTOUR	WD WOOD FENCE
GAS VALVE	CREEK LINE	INV INVERT
LIGHT POLE	EXISTING GAS LINE	MH MANHOLE
POWER POLE	EXISTING ELECTRIC LINE	RCP REINFORCED CONCRETE PIPE
TRANSFORMER	TREE PROTECTION FENCE	VCP VITREOUS CLAY PIPE
STORM MANHOLE	EXISTING FENCE LINE	OTP OPEN TOP PIPE
GRATE INLET	EXISTING GUARD RAIL	DB/PG/ST2 DEED BOOK (BOOK/PAGE)
TREE DBSE/TYPE NOTED)	EXISTING WATER LINE	BB/T/2E PARCEL NUMBER
SANITARY SEWER MANHOLE	EXISTING SANITARY SEWER LINE	LAND LOT #
SIGN	EXISTING CABLE TELEVISION LINE	
SPOT ELEVATION	EXISTING BURIED TELEPHONE LINE	
WATER METER	PROPERTY LINE	CMP CORRUGATED METAL PIPE
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FIRE HYDRANT	APPROX. LAND LOT LINE	HW HARDWOOD TREE: SPECIES UNIDENTIFIED
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DUCTILE IRON PIPE	EXISTING STORM DRAIN	
FOUND WOOD STAKE	18" OAK EXISTING TREE	
PEDESTRIAN WALK SIGNAL POST	18" OAK EXISTING TREE TO BE REMOVED	
OVERHEAD TRAFFIC SIGNAL		
ORNAMENTAL STONEWORK		
PK NAIL (W/STATIONING) STA. 12+00		

Know what's below. Call before you dig. Dial 811 Or Call 800-282-7411

LEGEND

Approximate WDCP Location

WDCP-X WDCP Designation

Graphic Scale 1"=50'

50 25 0 10 20 30 40 50

PROJECT: Riverwalk Phase IV Roswell, GA

PREPARED FOR: City of Roswell

FIGURE NAME: WDCP LOCATION PLAN

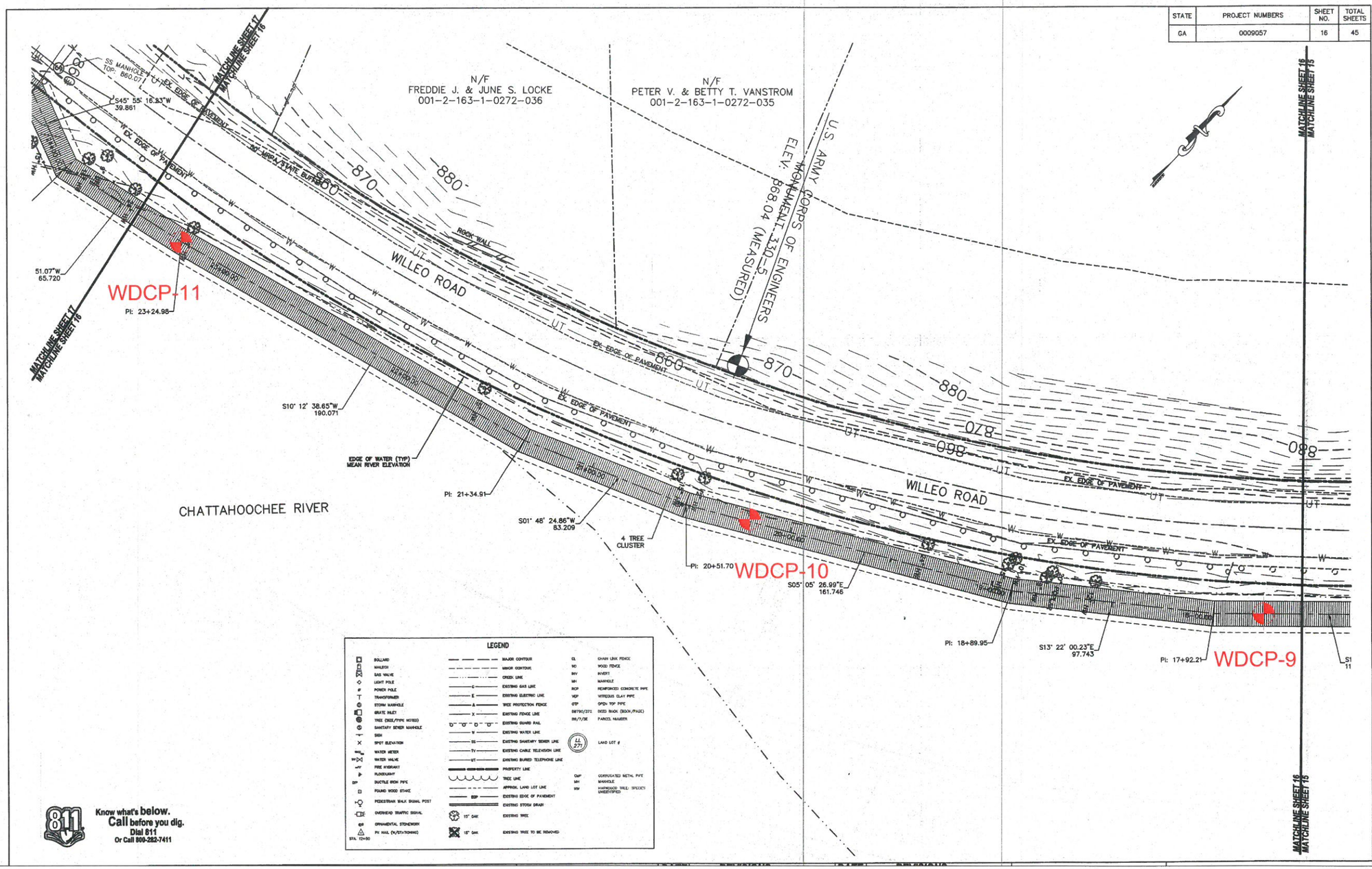
REFERENCE: Roswell Riverwalk Trail Connection Phase IV Layout, Grading & Drainage Plan

REVISIONS

JOB NO.	10:9440
SCALE	1"=50'
DRAWN	FGM 3/2017
APPR.	KJH 3/2017

Figure No.: 4

STATE	PROJECT NUMBERS	SHEET NO.	TOTAL SHEETS
GA	0009057	16	45



LEGEND

Approximate WDCP Location

WDCP-X WDCP Designation

Graphic Scale 1"=50'

50 25 0 10 20 30 40 50

PROJECT: Riverwalk Phase IV
Roswell, GA

PREPARED FOR: City of Roswell

FIGURE NAME: WDCP LOCATION PLAN

REFERENCE: Roswell Riverwalk Trail
Connection Phase IV
Layout, Grading & Drainage Plan

REVISIONS

JOB NO.	10:9440
SCALE	1"=50'
DRAWN	FGM 3/2017
APPR.	KJH 3/2017

Figure No.: 5

REFERENCE NOTES FOR BORING LOGS

MATERIAL[1,2]	
	ASPHALT
	CONCRETE
	GRAVEL
	TOPSOIL
	VOID
	BRICK
	AGGREGATE BASE COURSE
	FILL[3] MAN-PLACED SOILS
GW	**WELL-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GP	**POORLY-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GM	**SILTY GRAVEL** gravel-sand-silt mixtures
GC	**CLAYEY GRAVEL** gravel-sand-clay mixtures
SW	**WELL-GRADED SAND** gravelly sand, little or no fines
SP	**POORLY-GRADED SAND** gravelly sand, little or no fines
SM	**SILTY SAND** sand-silt mixtures
SC	**CLAYEY SAND** sand-clay mixtures
ML	**SILT** non-plastic to medium plasticity
MH	**ELASTIC SILT** high plasticity
CL	**LEAN CLAY** low to medium plasticity
CH	**FAT CLAY** high plasticity
OL	**ORGANIC SILT or CLAY** non-plastic to low plasticity
OH	**ORGANIC SILT or CLAY** high plasticity
PT	**PEAT** highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION		
DESIGNATION		**PARTICLE SIZES**
Boulders		12 inches (300 mm) or larger
Cobbles		3 inches to 12 inches (75 mm to 300 mm)
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")		<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, Q_P[4]	**SPT[5] (BPF)**	**CONSISTENCY[7] (COHESIVE)**
<0.25	<3	Very Soft
0.25 - <0.50	3 - 4	Soft
0.50 - <1.00	5 - 8	Medium Stiff
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT[5]	**DENSITY**
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

RELATIVE AMOUNT[7]	COARSE GRAINED (%)[8]	FINE GRAINED (%)[8]
Trace	≤5	≤5
Dual Symbol *(ex: SW-SM)*	10	10
With	15 - 20	15 - 25
Adjective *(ex: "Silty")*	≥25	≥30

WATER LEVELS[6]		
	WL	Water Level (WS)(WD)
		(WS) While Sampling
		(WD) While Drilling
	SHW	Seasonal High WT
	ACR	After Casing Removal
	SWT	Stabilized Water Table
	DCI	Dry Cave-In
	WCI	Wet Cave-In

[1] *Classifications and symbols per ASTM D 2488-09 (Visual-Manual Procedure) unless noted otherwise.*

[2] *To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.*

[3] *Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-**FILL**)].*

[4] *Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).*

[5] *Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf).*

[6] *The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.*

[7] *Minor deviation from ASTM D 2488-09 Note 16.*

[8] *Percentages are estimated to the nearest 5% per ASTM D 2488-09.*

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-06-2017
DATE COMPLETED: 03-06-2017

HOLE #: WDCP-1
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 3 ft	2	8.9	••	2	VERY LOOSE	SOFT
- 1 m	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 4 ft	2	7.7	••	2	VERY LOOSE	SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 5 ft	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 6 ft	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 2 m	2	7.7	••	2	VERY LOOSE	SOFT
- 7 ft	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
- 8 ft	4	13.7	•••	3	VERY LOOSE	SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
- 9 ft	5	17.1	••••	4	VERY LOOSE	SOFT
-	6	20.5	•••••	5	LOOSE	MEDIUM STIFF
-	6	20.5	•••••	5	LOOSE	MEDIUM STIFF
- 3 m 10 ft	10	34.2	•••••••••	9	LOOSE	STIFF
-	8	24.5	•••••••	6	LOOSE	MEDIUM STIFF
-	8	24.5	•••••••	6	LOOSE	MEDIUM STIFF
-	6	18.4	•••••	5	LOOSE	MEDIUM STIFF
- 11 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	7	21.4	••••••	6	LOOSE	MEDIUM STIFF
-	16	49.0	••••••••••••••	13	MEDIUM DENSE	STIFF
- 12 ft	11	33.7	•••••••••	9	LOOSE	STIFF
-	11	33.7	•••••••••	9	LOOSE	STIFF
-	11	33.7	•••••••••	9	LOOSE	STIFF
- 4 m 13 ft	22	67.3	••••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF

HOLE #: WDCP-1 **WILDCAT DYNAMIC CONE LOG**

PROJECT: Riverwalk Phase IV- WDCP PROJECT NUMBER: 10:9440

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	30/3	200.0	••	25+	VERY DENSE	HARD
-			Equipment Refusal @ 13'-5"			
- 14 ft						
-						
-						
- 15 ft						
-						
-						
- 16 ft						
- 5 m						
-						
- 17 ft						
-						
-						
- 18 ft						
-						
-						
- 19 ft						
-						
- 6 m						
- 20 ft						
-						
-						
- 21 ft						
-						
-						
- 22 ft						
-						
-						
- 7 m 23 ft						
-						
-						
- 24 ft						
-						
-						
- 25 ft						
-						
-						
- 26 ft						
- 8 m						
-						
- 27 ft						
-						
-						
- 28 ft						
-						
-						
- 29 ft						
-						
- 9 m						

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-06-2017
DATE COMPLETED: 03-06-2017

HOLE #: WDCP-2
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
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-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 3 ft	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 m	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 4 ft	25/0	200.0	••	25+	VERY DENSE	HARD
-			Equipment Refusal @ 3'-11"			
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-06-2017
DATE COMPLETED: 03-06-2017

HOLE #: WDCP-3
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
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-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 3 ft	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 m	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 4 ft	2	7.7	••	2	VERY LOOSE	SOFT
-	4	15.4	••••	4	VERY LOOSE	SOFT
-	3	11.6	•••	3	VERY LOOSE	SOFT
- 5 ft	2	7.7	••	2	VERY LOOSE	SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 6 ft	2	7.7	••	2	VERY LOOSE	SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
- 2 m	3	11.6	•••	3	VERY LOOSE	SOFT
- 7 ft	4	13.7	•••	3	VERY LOOSE	SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
- 8 ft	5	17.1	••••	4	VERY LOOSE	SOFT
-	8	27.4	•••••••	7	LOOSE	MEDIUM STIFF
-	4	13.7	•••	3	VERY LOOSE	SOFT
- 9 ft	4	13.7	•••	3	VERY LOOSE	SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
- 3 m 10 ft	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	6	18.4	•••••	5	LOOSE	MEDIUM STIFF
-	7	21.4	••••••	6	LOOSE	MEDIUM STIFF
-	7	21.4	••••••	6	LOOSE	MEDIUM STIFF
- 11 ft	6	18.4	•••••	5	LOOSE	MEDIUM STIFF
-	9	27.5	•••••••	7	LOOSE	MEDIUM STIFF
-	15	45.9	••••••••••••••	13	MEDIUM DENSE	STIFF
- 12 ft	15	45.9	••••••••••••••	13	MEDIUM DENSE	STIFF
-	21	64.3	••••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	16	49.0	••••••••••••••	13	MEDIUM DENSE	STIFF
- 4 m 13 ft	17	52.0	•••••••••••••••	14	MEDIUM DENSE	STIFF

PROJECT: Riverwalk Phase IV- WDCP PROJECT NUMBER: 10:9440

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	16	200.0	••	25+	VERY DENSE	HARD
-	25	69.3	••••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
- 14 ft	25	69.3	••••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
-			Equipment Refusal @ 14'-1"			
-						
- 15 ft						
-						
-						
- 16 ft						
- 5 m						
-						
- 17 ft						
-						
-						
- 18 ft						
-						
-						
- 19 ft						
-						
- 6 m						
- 20 ft						
-						
-						
- 21 ft						
-						
-						
- 22 ft						
-						
-						
- 7 m 23 ft						
-						
-						
- 24 ft						
-						
-						
- 25 ft						
-						
-						
- 26 ft						
- 8 m						
-						
- 27 ft						
-						
-						
- 28 ft						
-						
-						
- 29 ft						
-						
- 9 m						

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-06-2017
DATE COMPLETED: 03-06-2017

HOLE #: WDCP-4
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
- 3 ft	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 m	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 4 ft	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
- 5 ft	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
- 6 ft	2	7.7	••	2	VERY LOOSE	SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
- 2 m	2	7.7	••	2	VERY LOOSE	SOFT
- 7 ft	3	10.3	••	2	VERY LOOSE	SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
-	5	17.1	••••	4	VERY LOOSE	SOFT
- 8 ft	8	27.4	•••••••	7	LOOSE	MEDIUM STIFF
-	10	34.2	•••••••••	9	LOOSE	STIFF
-	10	34.2	•••••••••	9	LOOSE	STIFF
- 9 ft	10	34.2	•••••••••	9	LOOSE	STIFF
-	25	85.5	••••••••••••••••••••••••	24	MEDIUM DENSE	VERY STIFF
-	10	34.2	•••••••••	9	LOOSE	STIFF
- 3 m 10 ft	8	27.4	•••••••	7	LOOSE	MEDIUM STIFF
-	11	33.7	•••••••••	9	LOOSE	STIFF
-	11	33.7	•••••••••	9	LOOSE	STIFF
-	10	30.6	••••••••	8	LOOSE	MEDIUM STIFF
- 11 ft	11	33.7	•••••••••	9	LOOSE	STIFF
-	12	36.7	••••••••••	10	LOOSE	STIFF
-	18	55.1	••••••••••••••••	15	MEDIUM DENSE	STIFF
- 12 ft	14	42.8	••••••••••••	12	MEDIUM DENSE	STIFF
-	15	45.9	••••••••••••••	13	MEDIUM DENSE	STIFF
-	12	36.7	••••••••••	10	LOOSE	STIFF
- 4 m 13 ft	11	33.7	•••••••••	9	LOOSE	STIFF

HOLE #: WDCP-4 **WILDCAT DYNAMIC CONE LOG**

PROJECT: Riverwalk Phase IV- WDCP PROJECT NUMBER: 10:9440

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	13				VERY DENSE	HARD
-	12	33.2	••••••••••	9	LOOSE	STIFF
- 14 ft	10	27.7	••••••••	7	LOOSE	MEDIUM STIFF
-	13	36.0	••••••••••	10	LOOSE	STIFF
-	14	38.8	••••••••••••	11	MEDIUM DENSE	STIFF
- 15 ft	15	41.6	••••••••••••	11	MEDIUM DENSE	STIFF
-	14	38.8	••••••••••••	11	MEDIUM DENSE	STIFF
-	15	41.6	••••••••••••	11	MEDIUM DENSE	STIFF
- 16 ft	18	49.9	••••••••••••••	14	MEDIUM DENSE	STIFF
- 5 m	15	41.6	••••••••••••	11	MEDIUM DENSE	STIFF
-	16	40.6	••••••••••••	11	MEDIUM DENSE	STIFF
- 17 ft	17	43.2	••••••••••••	12	MEDIUM DENSE	STIFF
-	15	38.1	••••••••••••	10	LOOSE	STIFF
-	18	45.7	••••••••••••••	13	MEDIUM DENSE	STIFF
- 18 ft	20	50.8	••••••••••••••	14	MEDIUM DENSE	STIFF
-	25	63.5	••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	32	81.3	••••••••••••••••••••••••	23	MEDIUM DENSE	VERY STIFF
- 19 ft			Equipment Refusal @ 18'-8"			
-						
- 6 m						
- 20 ft						
-						
-						
- 21 ft						
-						
-						
- 22 ft						
-						
-						
- 7 m 23 ft						
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-						
- 24 ft						
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- 25 ft						
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-						
- 26 ft						
- 8 m						
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- 27 ft						
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-						
- 28 ft						
-						
-						
- 29 ft						
-						
- 9 m						

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-03-2017
DATE COMPLETED: 03-03-2017

HOLE #: WDCP-5
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 3 ft	1	4.4	•	1	VERY LOOSE	VERY SOFT
- 1 m	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 4 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 5 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 6 ft	3	11.6	•••	3	VERY LOOSE	SOFT
-	6	23.2	••••••	6	LOOSE	MEDIUM STIFF
- 2 m	7	27.0	•••••••	7	LOOSE	MEDIUM STIFF
- 7 ft	7	23.9	••••••	6	LOOSE	MEDIUM STIFF
-	11	37.6	••••••••••	10	LOOSE	STIFF
-	10	34.2	•••••••••	9	LOOSE	STIFF
- 8 ft	10	34.2	•••••••••	9	LOOSE	STIFF
-	8	27.4	•••••••	7	LOOSE	MEDIUM STIFF
-	8	27.4	•••••••	7	LOOSE	MEDIUM STIFF
- 9 ft	9	30.8	••••••••	8	LOOSE	MEDIUM STIFF
-	6	20.5	•••••	5	LOOSE	MEDIUM STIFF
-	8	27.4	•••••••	7	LOOSE	MEDIUM STIFF
- 3 m 10 ft	11	37.6	••••••••••	10	LOOSE	STIFF
-	12	36.7	••••••••••	10	LOOSE	STIFF
-	10	30.6	••••••••	8	LOOSE	MEDIUM STIFF
-	11	33.7	•••••••••	9	LOOSE	STIFF
- 11 ft	10	30.6	••••••••	8	LOOSE	MEDIUM STIFF
-	15	45.9	••••••••••••••	13	MEDIUM DENSE	STIFF
-	17	52.0	•••••••••••••••••	14	MEDIUM DENSE	STIFF
- 12 ft	14	42.8	••••••••••••	12	MEDIUM DENSE	STIFF
-	13	39.8	•••••••••••	11	MEDIUM DENSE	STIFF
-	16	49.0	••••••••••••••	13	MEDIUM DENSE	STIFF
- 4 m 13 ft	18	55.1	•••••••••••••••••	15	MEDIUM DENSE	STIFF

PROJECT: Riverwalk Phase IV- WDCP PROJECT NUMBER: 10:9440

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	17	47.1	••••••••••••••	25+	VERY DENSE	HARD
-	14	38.8	••••••••••••	11	MEDIUM DENSE	STIFF
- 14 ft	13	36.0	••••••••••	10	LOOSE	STIFF
-	33	91.4		25+	MEDIUM DENSE	VERY STIFF
-	19	52.6	••••••••••••••••	15	MEDIUM DENSE	STIFF
- 15 ft	17	47.1	••••••••••••••	13	MEDIUM DENSE	STIFF
-	23	63.7	••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	21	58.2	•••••••••••••••••	16	MEDIUM DENSE	VERY STIFF
- 16 ft	24	66.5	••••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
- 5 m	28	77.6	••••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
-	25/2	200.0	••	25+	VERY DENSE	HARD
- 17 ft			Equipment Refusal @ 16'-9"			
-						
-						
- 18 ft						
-						
-						
- 19 ft						
-						
- 6 m						
- 20 ft						
-						
-						
- 21 ft						
-						
-						
- 22 ft						
-						
-						
- 7 m 23 ft						
-						
-						
- 24 ft						
-						
-						
- 25 ft						
-						
-						
- 26 ft						
- 8 m						
-						
- 27 ft						
-						
-						
- 28 ft						
-						
-						
- 29 ft						
-						
- 9 m						

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-03-2017
DATE COMPLETED: 03-03-2017

HOLE #: WDCP-6
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	2	8.9	••	2	VERY LOOSE	SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
- 3 ft	2	8.9	••	2	VERY LOOSE	SOFT
- 1 m	2	8.9	••	2	VERY LOOSE	SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
- 4 ft	3	11.6	•••	3	VERY LOOSE	SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 5 ft	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 6 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 m	0	0.0		0	VERY LOOSE	VERY SOFT
- 7 ft	1	3.4		0	VERY LOOSE	VERY SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
- 8 ft	3	10.3	••	2	VERY LOOSE	SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
- 9 ft	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
-	4	13.7	•••	3	VERY LOOSE	SOFT
- 3 m 10 ft	6	20.5	•••••	5	LOOSE	MEDIUM STIFF
-	5	15.3	••••	4	VERY LOOSE	SOFT
-	5	15.3	••••	4	VERY LOOSE	SOFT
-	7	21.4	••••••	6	LOOSE	MEDIUM STIFF
- 11 ft	7	21.4	••••••	6	LOOSE	MEDIUM STIFF
-	12	36.7	••••••••••	10	LOOSE	STIFF
-	12	36.7	••••••••••	10	LOOSE	STIFF
- 12 ft	35/2	200.0	••	25+	VERY DENSE	HARD
-			Equipment Refusal @ 12'-2"			
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-03-2017
DATE COMPLETED: 03-03-2017

HOLE #: WDCP-3
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
- 2 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
- 3 ft	3	13.3	•••	3	VERY LOOSE	SOFT
- 1 m	2	8.9	••	2	VERY LOOSE	SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
- 4 ft	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 5 ft	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 6 ft	2	7.7	••	2	VERY LOOSE	SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
- 2 m	2	7.7	••	2	VERY LOOSE	SOFT
- 7 ft	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
- 8 ft	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
- 9 ft	3	10.3	••	2	VERY LOOSE	SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
- 3 m 10 ft	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	7	21.4	••••••	6	LOOSE	MEDIUM STIFF
-	40/1	200.0	••	25+	VERY DENSE	HARD
-			Equipment Refusal @ 10'-6"			
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-03-2017
DATE COMPLETED: 03-03-2017

HOLE #: WDCP-8
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	25/0	200.0	••	25+	VERY DENSE	HARD
-			Equipment Refusal @ 2'-4"			
- 3 ft			2 Offsets within 10' had similar results			
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-03-2017
DATE COMPLETED: 03-03-2017

HOLE #: WDCP-9
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	3	13.3	•••	3	VERY LOOSE	SOFT
-	3	13.3	•••	3	VERY LOOSE	SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	3	13.3	•••	3	VERY LOOSE	SOFT
-	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
- 2 ft	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
-	32/0	200.0	••	25+	VERY DENSE	HARD
- 3 ft			Equipment Refusal @ 2'-7"			
- 1 m			1 offset within 5' had similar results			
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-03-2017
DATE COMPLETED: 03-03-2017

HOLE #: WDCP-10
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	3	13.3	•••	3	VERY LOOSE	SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 3 ft	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 m	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 4 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 5 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 6 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 2 m	0	0.0		0	VERY LOOSE	VERY SOFT
- 7 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 8 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 9 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	4	13.7	•••	3	VERY LOOSE	SOFT
-	5	17.1	••••	4	VERY LOOSE	SOFT
- 3 m 10 ft	6	20.5	•••••	5	LOOSE	MEDIUM STIFF
-	7	21.4	••••••	6	LOOSE	MEDIUM STIFF
-	8	24.5	•••••••	6	LOOSE	MEDIUM STIFF
-	9	27.5	•••••••	7	LOOSE	MEDIUM STIFF
- 11 ft	7	21.4	••••••	6	LOOSE	MEDIUM STIFF
-	6	18.4	•••••	5	LOOSE	MEDIUM STIFF
-	5	15.3	••••	4	VERY LOOSE	SOFT
- 12 ft	5	15.3	••••	4	VERY LOOSE	SOFT
-	9	27.5	•••••••	7	LOOSE	MEDIUM STIFF
-	14	42.8	••••••••••••	12	MEDIUM DENSE	STIFF
- 4 m 13 ft	40/2	200.0	•• Equipment Refusal @ 13'-1"	25+	VERY DENSE	HARD

WILDCAT DYNAMIC CONE LOG

ECS Southeast, LLC
1281 Kennestone Circle, Suite 200
Marietta, GA 30066

PROJECT NUMBER: 10:9440
DATE STARTED: 03-03-2017
DATE COMPLETED: 03-03-2017

HOLE #: WDCP-11
CREW: FM/AR/MM
PROJECT: Riverwalk Phase IV- WDCP
ADDRESS: Willeo Road
LOCATION: Roswell, GA

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	2	8.9	••	2	VERY LOOSE	SOFT
-	2	8.9	••	2	VERY LOOSE	SOFT
-	3	13.3	•••	3	VERY LOOSE	SOFT
- 3 ft	2	8.9	••	2	VERY LOOSE	SOFT
- 1 m	2	8.9	••	2	VERY LOOSE	SOFT
-	3	11.6	•••	3	VERY LOOSE	SOFT
- 4 ft	3	11.6	•••	3	VERY LOOSE	SOFT
-	3	11.6	•••	3	VERY LOOSE	SOFT
-	2	7.7	••	2	VERY LOOSE	SOFT
- 5 ft	3	11.6	•••	3	VERY LOOSE	SOFT
-	3	11.6	•••	3	VERY LOOSE	SOFT
-	3	11.6	•••	3	VERY LOOSE	SOFT
- 6 ft	3	11.6	•••	3	VERY LOOSE	SOFT
-	5	19.3	•••••	5	LOOSE	MEDIUM STIFF
- 2 m	5	19.3	•••••	5	LOOSE	MEDIUM STIFF
- 7 ft	3	10.3	••	2	VERY LOOSE	SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
-	5	17.1	••••	4	VERY LOOSE	SOFT
- 8 ft	40/2	200.0	••	25+	VERY DENSE	HARD
-			Equipment refusal @ 7'-10"			
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

Important Information About Your

Geotechnical Engineering Report

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

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

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

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

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

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ-sometimes significantly from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the express purpose of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in-this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer For Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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