

Soil Survey Report

**Atlanta Beltline Inc. (ABI) Northeast Trail (Task C)
MC² Project No. A051707.058
Atlanta, Fulton County, Georgia**

Prepared For: Mr. Sean Johnston, P.E.
Vice President
Kimley-Horn & Associates
817 W. Peachtree Street NW, The Biltmore Suite 601
Atlanta, GA 30308

Prepared By: MC Squared, Inc.
1275 Shiloh Road NW, Suite 2620
Kennesaw, GA 30144

Project No.: A051707.058
Prepared: March 2018





March 28, 2018

Mr. Sean Johnston, P.E.
Vice President
Kimley-Horn & Associates
817 W. Peachtree Street NW, The Biltmore Suite 601
Atlanta, GA 30308


Subject: Soil Survey Report
Atlanta Beltline Inc. (ABI) Northeast Trail (Task C)
MC² Project No. A051707.058
Atlanta, Fulton County, Georgia


Dear Mr. Johnston:

MC Squared, Inc. (MC²) is pleased to present this Soil Survey Report for the proposed ABI Northeast Trail (Task C) in Atlanta, Fulton County, Georgia. This soil survey was performed in general accordance with the latest GDOT guidance documents for soil survey. The report summarizes our findings, the subsurface conditions we encountered and our conclusions and recommendations as they relate to the project design and construction.


Thank you for giving us the opportunity to work with **Kimley-Horn & Associates** for ABI. Please let us know if you have any comments or require additional information.

Respectfully submitted,
MC²


Amir Moussly
Staff Engineer


Prashanth Vaddu, P.E.
Project Engineer
P.E. No. 039820


Nicholas Diorio, P.E.
Project Manager
P.E. No. 038370


Sam Moussly
CEO

Attachments:

Soil Survey Summary 4 Pages

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SOIL SURVEY SUMMARY
For
ABI Northeast Trail (Task C)
MC² Project No. A051707.058
Atlanta, Fulton County, Georgia

- 1. Location / Description** This project is for the construction of the ABI Northeast Trail (Task C), beginning at Westminster Drive Northeast (Station 93+19) and ending at approximately 250 feet north of the Clear Creek pedestrian bridge (Station 115+00). The project lies within the city limits of Atlanta in Fulton County. Refer to Project Location Map (Sheet 1) in **Figures** for approximate project limits and location.
- 2. Geology** This project will be geologically sited in a Biotitic Gneiss Undifferentiated rock type in the Georgia Piedmont Region.
- 3. Rock** None encountered above proposed cut elevations.
- 4. Removal / Waste** A test pit (3 ft. x 3 ft. x 10 ft.), performed at Station 110+60, 7' LT of the proposed trail, encountered debris. In addition to the test pit, two (2) auger borings were performed to delineate the areas where debris exists, as detailed in the Special Problems Section of this report. The potential that this debris extends into areas of the proposed trail alignment not explored by our borings is likely and shall be removed. Refer to pictorial documentation of the debris in **Appendix II**.

A summary of our findings is tabulated below.

Pond No.	Test Pit ID / Boring Type	Station / Offset	Depths of Encountered Debris (ft.)	Elevations of Encountered Debris (ft.)	Description of Debris
Task C Pond	Auger Boring	110+20, CL	0.0-9.0 (Boring terminated at 18.5)	824.0 to 833.0	Cinder blocks, brick, concrete, timber, rubber tires, trash, wires, plastic.
Task C Pond	Test Pit Pond C	110+60, 7' LT	0.0-10.0 (Test pit terminated at 10.0)	822.0 to 832.0	Cinder blocks, brick, concrete, timber, rubber tires, trash, wires, plastic.
Task C Pond	Auger Boring	112+20, 8' LT	- (Auger refusal at 7.5)	-	No debris encountered. Boring was terminated at 7.5 feet below ground surface due to auger refusal.

The project site is in a highly urbanized area, and miscellaneous debris may be encountered. A contingency budget is recommended to be set aside during construction to address potential unknown conditions.

Refer to Boring Location Plan (Sheet 5) in **Figures** for approximate locations of debris.

5. Subgrade Materials

The residual soils classified as SP-SM, SM and SC, encountered in a majority of our borings at the proposed finished grades generally appear suitable for the proposed construction; however, because of the micaceous properties of the soil they may require very tight moisture control to achieve proper compaction. We do not recommend placing excavated material consisting of CL, CH, or MH within three (3) feet of the bottom of the subgrade directly beneath the pavement section.

6. Site Preparation

The areas that require fill or construction at the existing grade should be proof-rolled with a fully loaded (20 ton) dump truck in the presence of a geotechnical engineer. The geotechnical engineer observing the proof-rolling should identify any areas that deflect or “pump” excessively and evaluate those areas further by probing, hand auger borings, and/or excavating test pits. Recommendations for subgrade improvement such as undercutting, stabilizing using crushed stone or other means should be provided by the geotechnical engineer who observes the proof-rolling. In addition, the subgrade and backfill is recommended to be compacted to 95% of the soil’s standard Proctor maximum dry density within +/-3% of the optimum moisture content as determined by ASTM D-698 and in equal lifts with a vibratory compactor in lifts not to exceed 8-inches (loose).

The subgrade soils should be firm and stable prior to placement of fill. It is recommended for soil backfill, at and above two (2) foot below bottom of base course material in pavement areas, be placed and compacted to 98% of the soil’s standard Proctor maximum dry density within +/-3% of the optimum moisture content as determined by ASTM D-698 and in equal 6-inch lifts with a vibratory compactor. Failure to compact the backfill will result in future settlement of the ground surface.

Surface water control may be necessary during construction to establish a stable foundation during installation of utility pipes and appurtenances.

7. Pavement Design Values

We recommend the following values for use in the pavement design calculations for this project:

Soil Support Value =	2.0
Regional Factor =	1.6
Subgrade Reaction, k =	110 pci

Graded aggregate base (GAB) is the only base material recommended for use on this project.

8. Ditch Lining We recommend the following values for use in the ditch lining calculations for this project:

Plasticity Index, PI = 17
D75 (mm) = 0.227
Unified Soils Classification System (USCS) = CL

9. Slopes Maximum 2:1 slopes will be safe for this project.

10. Ground-water Groundwater was encountered below grade at some locations of subsurface borings but is not expected to cause problems during construction. Groundwater table (GWT) observations within Task C are tabulated below.

Boring ID	Station / Offset	Exploration Depth (ft.)	GWT Depth (ft.)	GWT Elevation (ft.)
TC-B-01	95+03, CL	5	GNE	GNE
TC-B-02	96+40, 3' RT	25	16.0	824.7
TC-B-03	99+20, 3' RT	10	GNE	GNE
TC-B-04	100+70, 3' RT	5	GNE	GNE
TC-B-05	101+45, 3' RT	16 (Auger Refusal)	8.5 (cave-in)	829.1 (cave-in)
TC-B-06	104+43, 4' RT	5	GNE	GNE
TC-B-07	106+43, 7' RT	5	GNE	GNE
TC-B-08	109+25, 27' RT	20	GNE	GNE
TC-B-09	110+70, 25' RT	10	GNE	GNE
TC-B-10	112+90, 7' RT	10	GNE	GNE

Note: GNE – Groundwater Not Encountered (at time of drilling)

11. Shrinkage We recommend an average shrinkage factor of 25% for use in the earthwork calculations for this project.

12. Rock Swell We recommend the use of an average swell factor of 30% for material shown as hard rock.

13. Bench Detail Where new fills are to be placed on existing slopes steeper than 3:1, the existing slope should be benched in accordance with the attached detail in **Appendix III**.

14. Pavement Design We recommend the use of a minimum 8 inches of graded aggregate base in the pavement section for this project.

15. Serrated Slopes Serrated slopes will not be required on this project.

16. Special Problems

A. The creek and its tributaries may require siltation control during construction at the following locations:

<u>Station to Station</u>	<u>Location</u>
108+75± to 115+00±	Lt. & Rt.

B. Numerous residences are located very close to the construction limits of this project. Vibration monitoring will be required due to vibrations from the construction activities which may cause some concern with property owners. GDOT Special Provision (SP) 154 may be used as a guideline to determine location of seismographs, crack gauges, etc. Pre- and post-construction crack survey reports recording observations of structural distresses shall be completed.

C. Debris in the form of cinder blocks, brick, concrete, timber, rubber tires, trash, wires, plastic was encountered and will need to be removed under clearing and grubbing. These materials were encountered at the following locations:

<u>Station to Station</u>	<u>Location</u>
110+00± to 110+60±	Lt. & Rt.

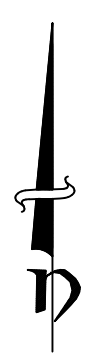
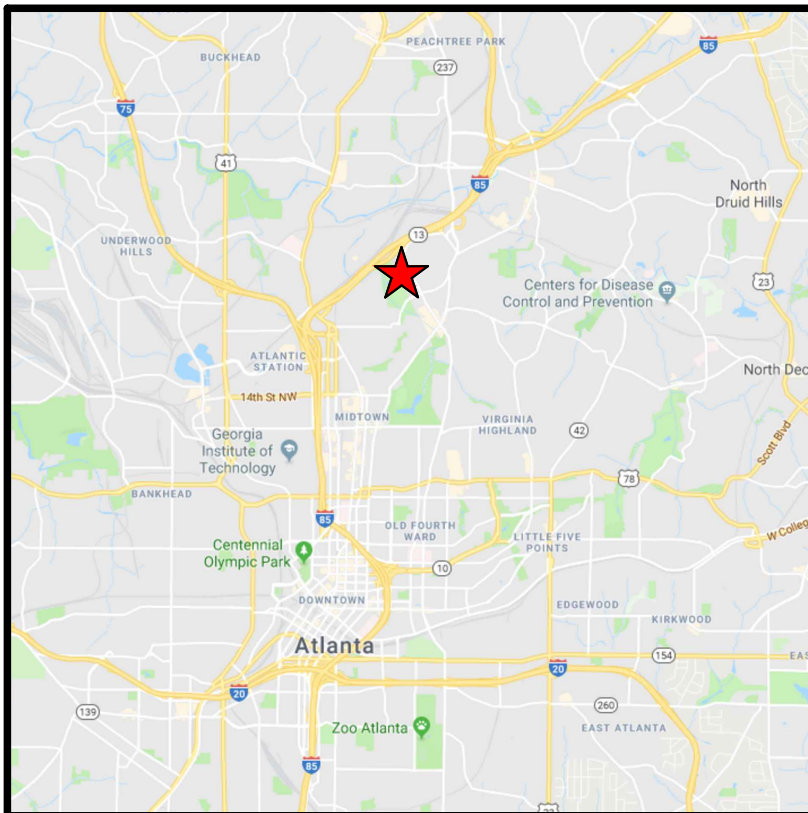
Reported By: Amir Moussly
Prashanth Vaddu, P.E.

Reviewed By: Nicholas Diorio, P.E.
Sameer Moussly

Soil Survey Report
ABI Northeast Trail (Task C)
MC Squared Project No. A051707.058
Atlanta, Fulton County, Georgia


FIGURES

- Project Location Map
- Boring Location Plan

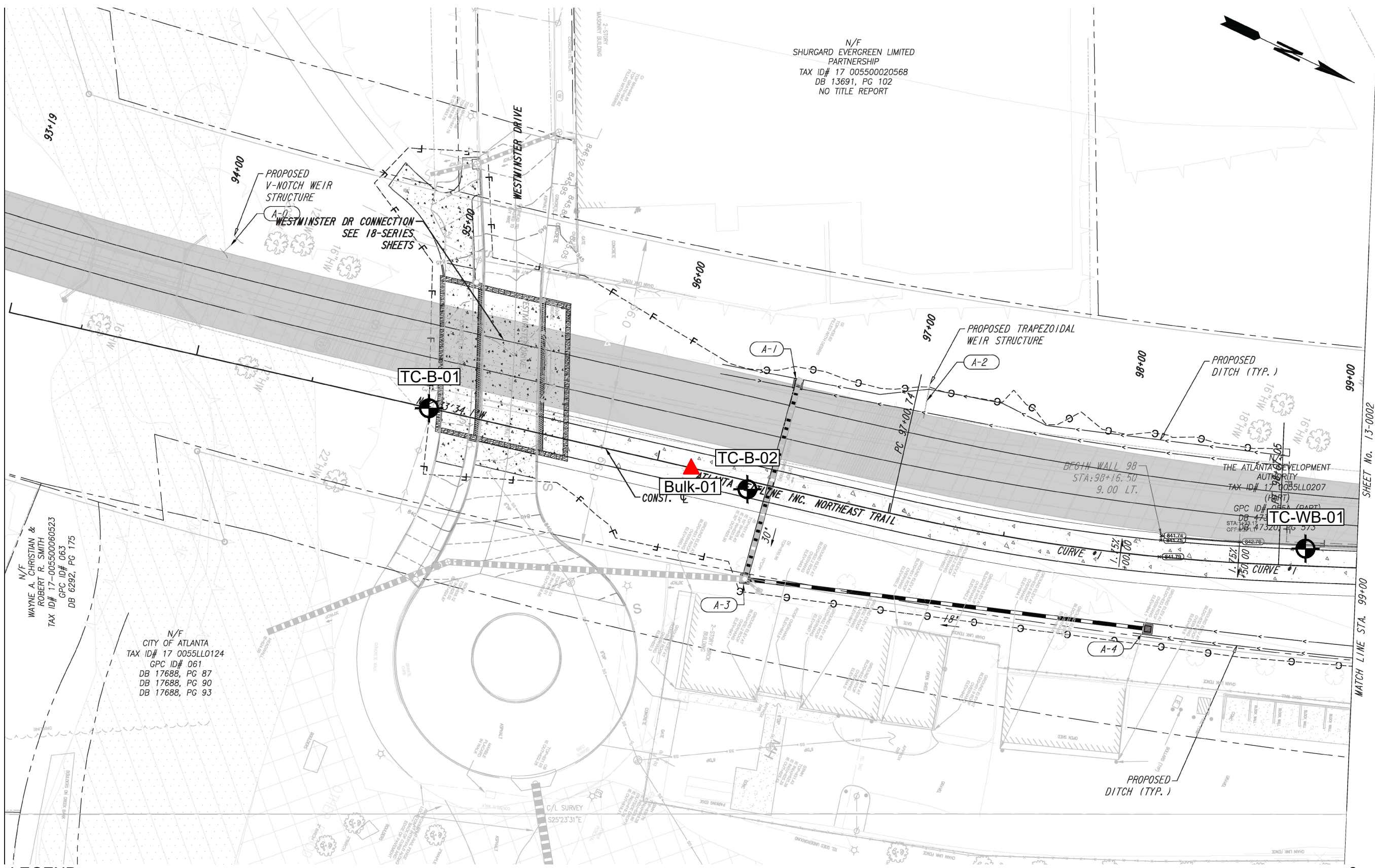


LEGEND:
 ★ Project Location



DATE	NAME	REVISION	APPROVED BY:		NAME	DATE	Project Location Map	MC ² PROJ. NO.	SHEET NO.	
				 <p>MC SQUARED, INC. Geotechnical Consultants 1275 Shiloh Road NW Suite 2620 Kennesaw, GA 30144 Ph: 770-650-0873 Fax: 770-650-7825</p>	DESIGNED BY:	TC	11/16/2017	ABI NE Trail Atlanta, Fulton County, Georgia	A051707.058	1
					DRAWN BY:	TC	12/12/2017			
					CHECKED BY:	JJ	12/15/2017			
					SUPERVISED BY:	PV				
				<small>GEORGIA ENGINEERING CERTIFICATE OF AUTHORIZATION No. PEF00482 Prashanth Vaddu, P.E. GEORGIA LICENSE No. PE039820</small>						

N/F
SHURGARD EVERGREEN LIMITED
PARTNERSHIP
TAX ID# 17 005500020568
DB 13691, PG 102
NO TITLE REPORT



N/F
WAYNE A. CHRISTIAN &
ROBERT R. SMITH
TAX ID# 17-005500060523
GPC ID# 063
DB 6292, PG 175

N/F
CITY OF ATLANTA
TAX ID# 17 0055LL0124
GPC ID# 061
DB 17688, PG 87
DB 17688, PG 90
DB 17688, PG 93

THE ATLANTA DEVELOPMENT
AUTHORITY
TAX ID# 17 0035LL0207
(PART)
GPC ID# 065A (PART)
DB 473
STA: 150+17
OFF: 177320, PG 573

SHEET No. 13-0002
MATCH LINE STA. 99+00

LEGEND:

- Approximate Boring Location
- Approximate Bulk Sample Retrieval Location
- Approximate Infiltration Test Location

Source: Kimley-Horn
& Associates
Date: 11/1/2017

DATE	NAME	REVISION	APPROVED BY:



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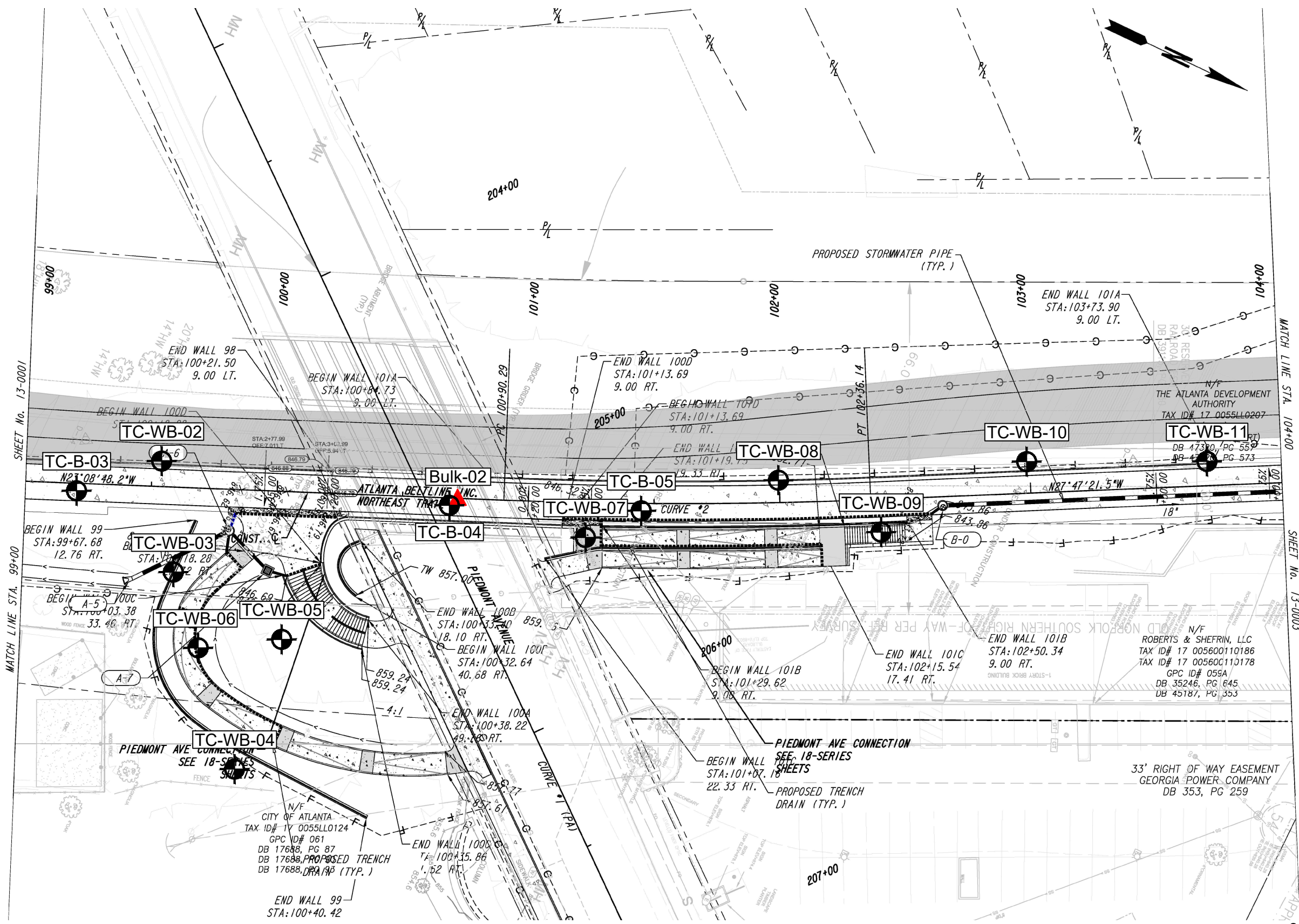
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AUTHORIZATION No. PE00482
Prashanth Vaddu, P.E.
GEORGIA LICENSE No. PE039820

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DRAWN BY: TC	12/12/2017
CHECKED BY: JJ	12/15/2017
SUPERVISED BY: PV	

Boring Location Plan

ABI NE Trail (Task C)
Atlanta, Fulton County, Georgia

MC ² PROJ. NO.	SHEET NO.
A051707.058	2



LEGEND:

-  Approximate Boring Location
-  Approximate Bulk Sample Retrieval Location
-  Approximate Infiltration Test Location

Source: Kimley-Horn & Associates
Date: 11/1/2017

DATE	NAME	REVISION	APPROVED BY:



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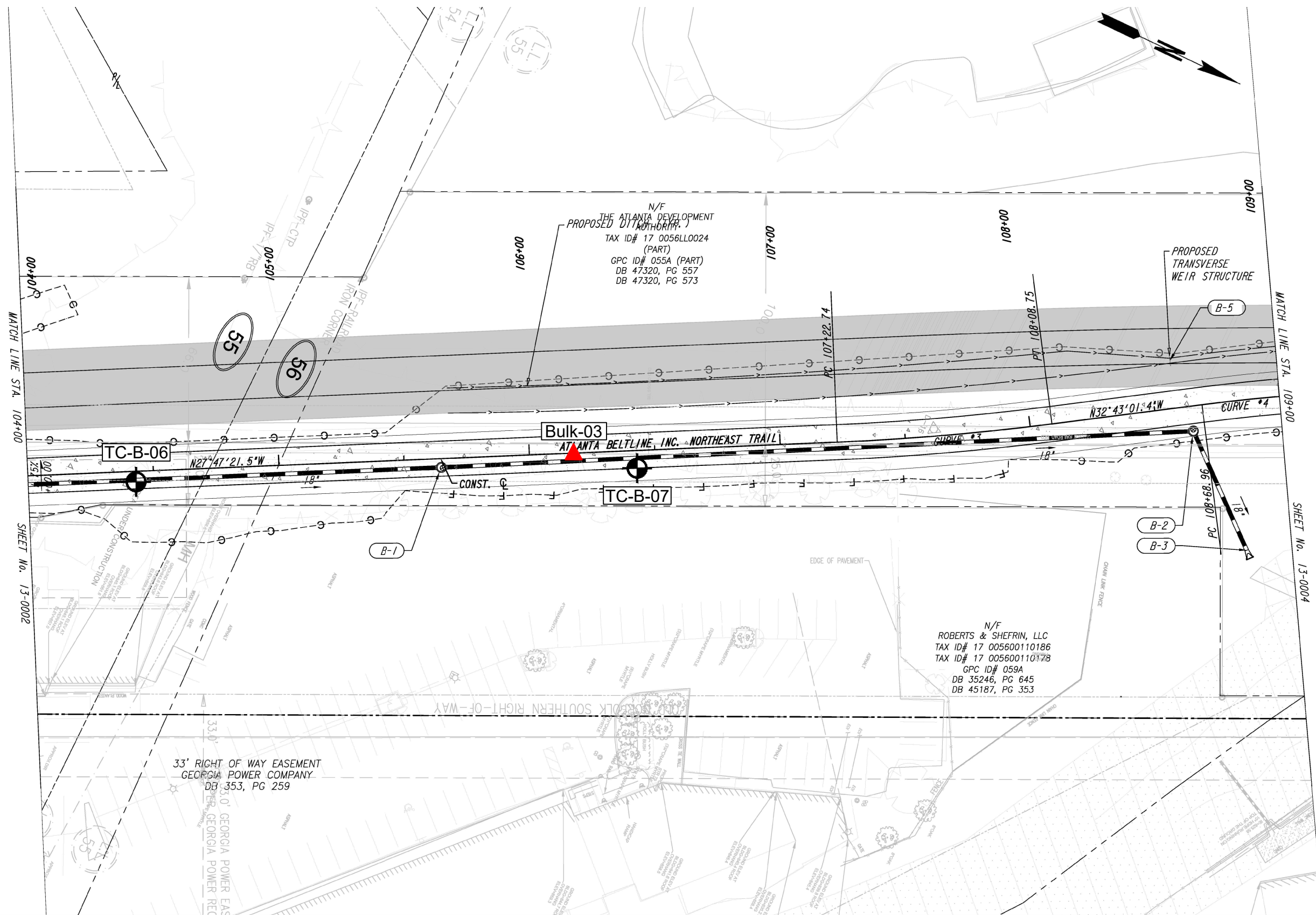
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SUPERVISED BY: PV	

Boring Location Plan

ABI NE Trail (Task C)
Atlanta, Fulton County, Georgia

MC² PROJ. NO.	SHEET NO.
A051707.058	3



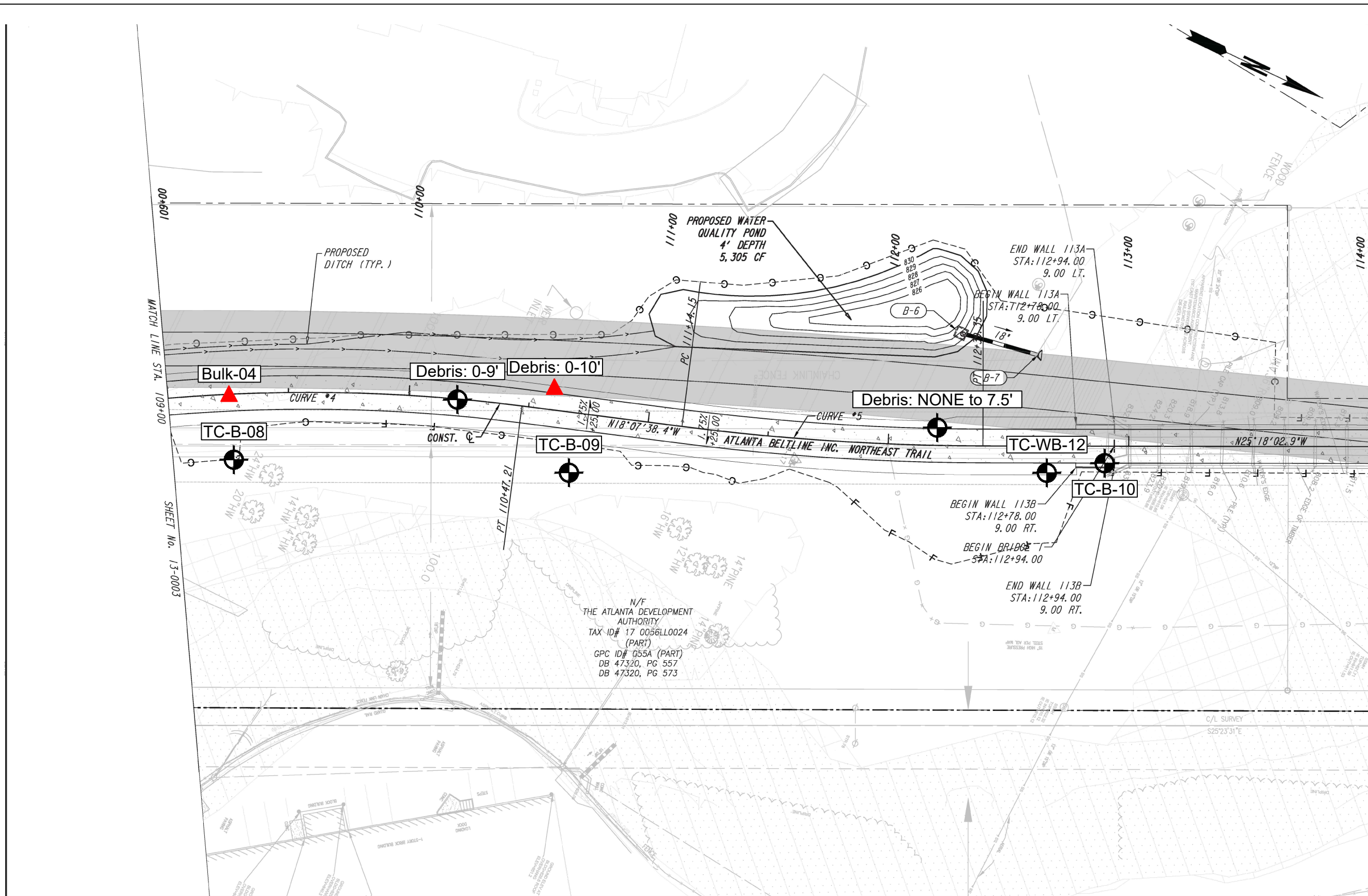
LEGEND:

- Approximate Boring Location
- Approximate Bulk Sample Retrieval Location
- Approximate Infiltration Test Location

Source: Kimley-Horn & Associates
Date: 11/1/2017

DATE	NAME	REVISION	APPROVED BY:				

 MC² <small>GEOTECHNICAL • ENVIRONMENTAL MATERIALS TESTING</small>	MC SQUARED, INC. Geotechnical Consultants 1275 Shiloh Road NW Suite 2620 Kennesaw, GA 30144 Ph: 770-650-0873 Fax: 770-650-7825	<small>GEORGIA ENGINEERING CERTIFICATE OF AUTHORIZATION No. PE00482 Prashanth Vaddu, P.E. GEORGIA LICENSE No. PE039820</small>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">NAME</th> <th style="width: 10%;">DATE</th> </tr> </thead> <tbody> <tr> <td>DESIGNED BY: TC</td> <td>11/16/2017</td> </tr> <tr> <td>DRAWN BY: TC</td> <td>12/12/2017</td> </tr> <tr> <td>CHECKED BY: JJ</td> <td>12/15/2017</td> </tr> <tr> <td>SUPERVISED BY: PV</td> <td> </td> </tr> </tbody> </table>	NAME	DATE	DESIGNED BY: TC	11/16/2017	DRAWN BY: TC	12/12/2017	CHECKED BY: JJ	12/15/2017	SUPERVISED BY: PV	
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DRAWN BY: TC	12/12/2017												
CHECKED BY: JJ	12/15/2017												
SUPERVISED BY: PV													
Boring Location Plan ABI NE Trail (Task C) Atlanta, Fulton County, Georgia													
MC ² PROJ. NO.	A051707.058	SHEET NO.	4										



MATCH LINE STA. 109+00

SHEET No. 13-0003

MATCH LINE STA. 114+00

SHEET No. 13-0005

LEGEND:

- Approximate Boring Location
- Approximate Bulk Sample Retrieval Location/Test Pit
- Approximate Infiltration Test Location

Source: Kimley-Horn & Associates
Date: 11/1/2017

DATE	NAME	REVISION	APPROVED BY:

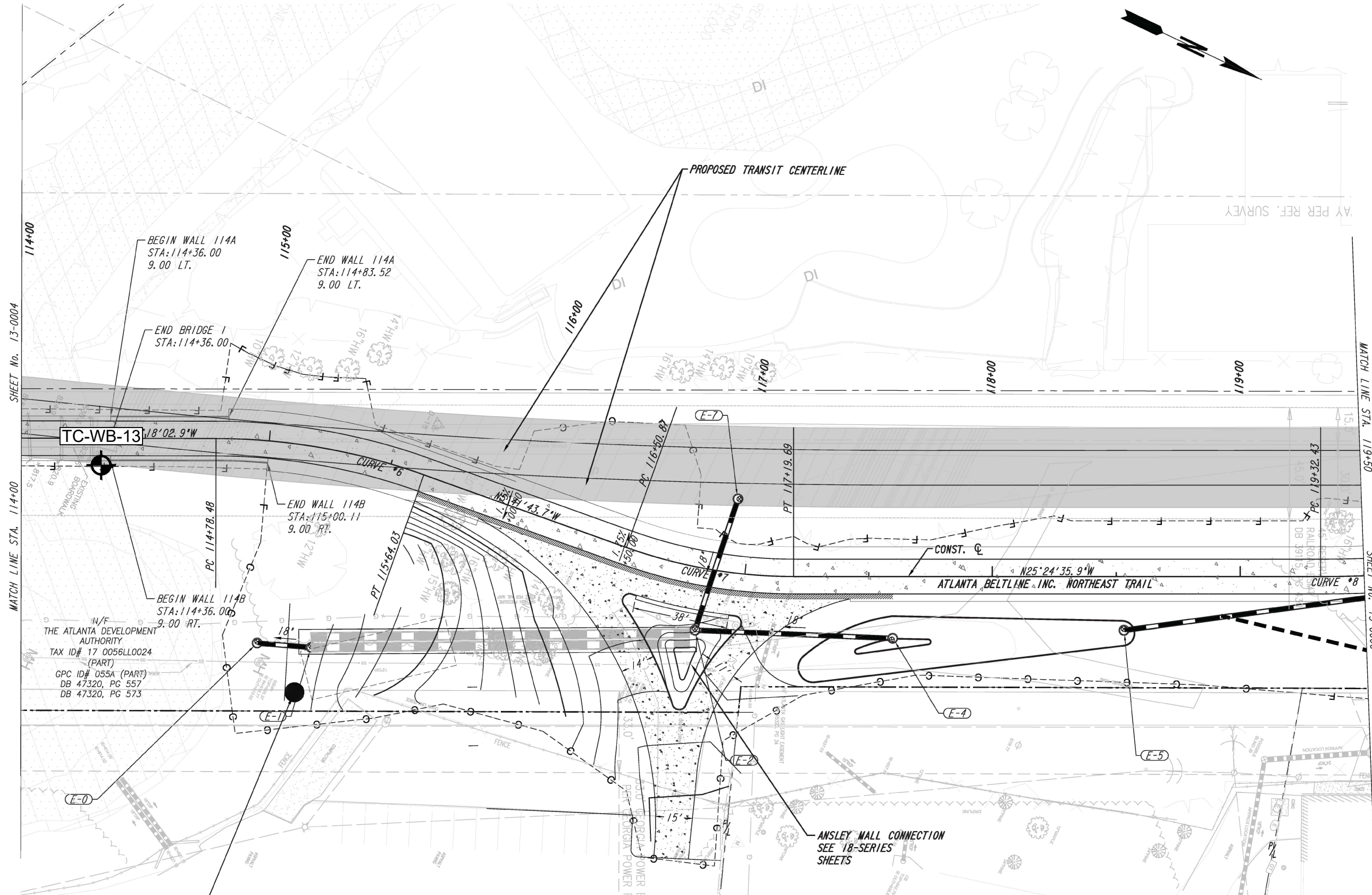


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GEORGIA LICENSE No. PE039820

NAME	DATE
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DRAWN BY: TC	12/12/2017
CHECKED BY: JJ	12/15/2017
SUPERVISED BY: PV	

Boring Location Plan	MC ² PROJ. NO.	SHEET NO.
ABI NE Trail (Task C) Atlanta, Fulton County, Georgia	A051707.058	5



SHEET No. 13-0004

MATCH LINE STA. 114+00

MATCH LINE STA. 119+50

SHEET No. 13-0006

TC-WB-13 18'02.9"W

BEGIN WALL 114B STA: 114+36.00 9.00 RT.

N/F THE ATLANTA DEVELOPMENT AUTHORITY TAX ID# 17 0056LLO024 (PART) GPC ID# 055A (PART) DB 47320, PG 557 DB 47320, PG 573

END WALL 114B STA: 115+00.11 9.00 RT.

PROPOSED TRANSIT CENTERLINE

ATLANTA BELTLINE INC. NORTHEAST TRAIL

ANSLEY MALL CONNECTION SEE 18-SERIES SHEETS

LEGEND:

-  Approximate Boring Location
-  Approximate Bulk Sample Retrieval Location
-  Approximate Infiltration Test Location

Source: Kimley-Horn & Associates
Date: 11/1/2017

DATE	NAME	REVISION	APPROVED BY:



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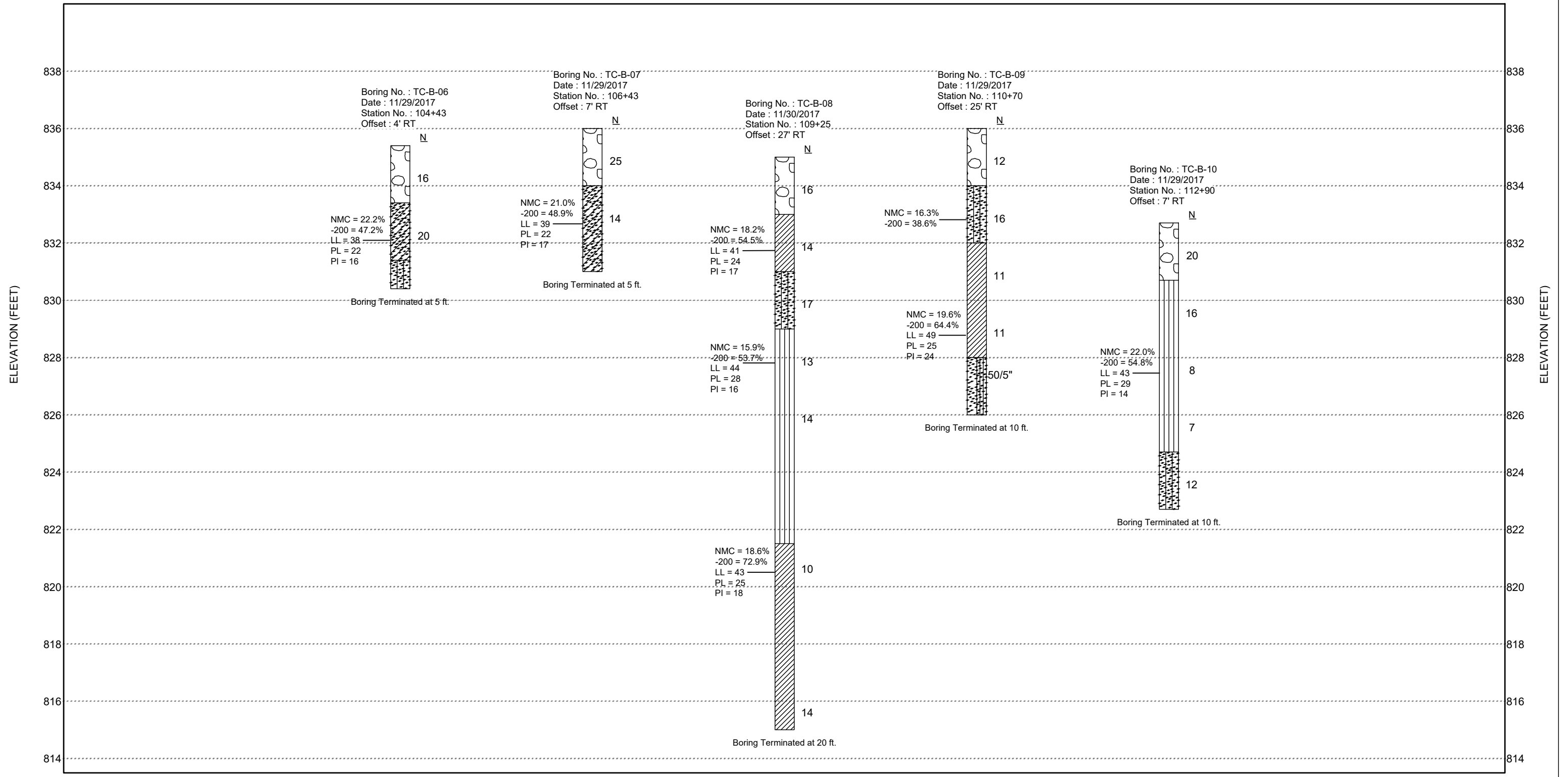
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Boring Location Plan	MC ² PROJ. NO.	SHEET NO.
ABI NE Trail (Task C) Atlanta, Fulton County, Georgia	A051707.058	6


Soil Survey Report
ABI Northeast Trail (Task C)
MC Squared Project No. A051707.058
Atlanta, Fulton County, Georgia

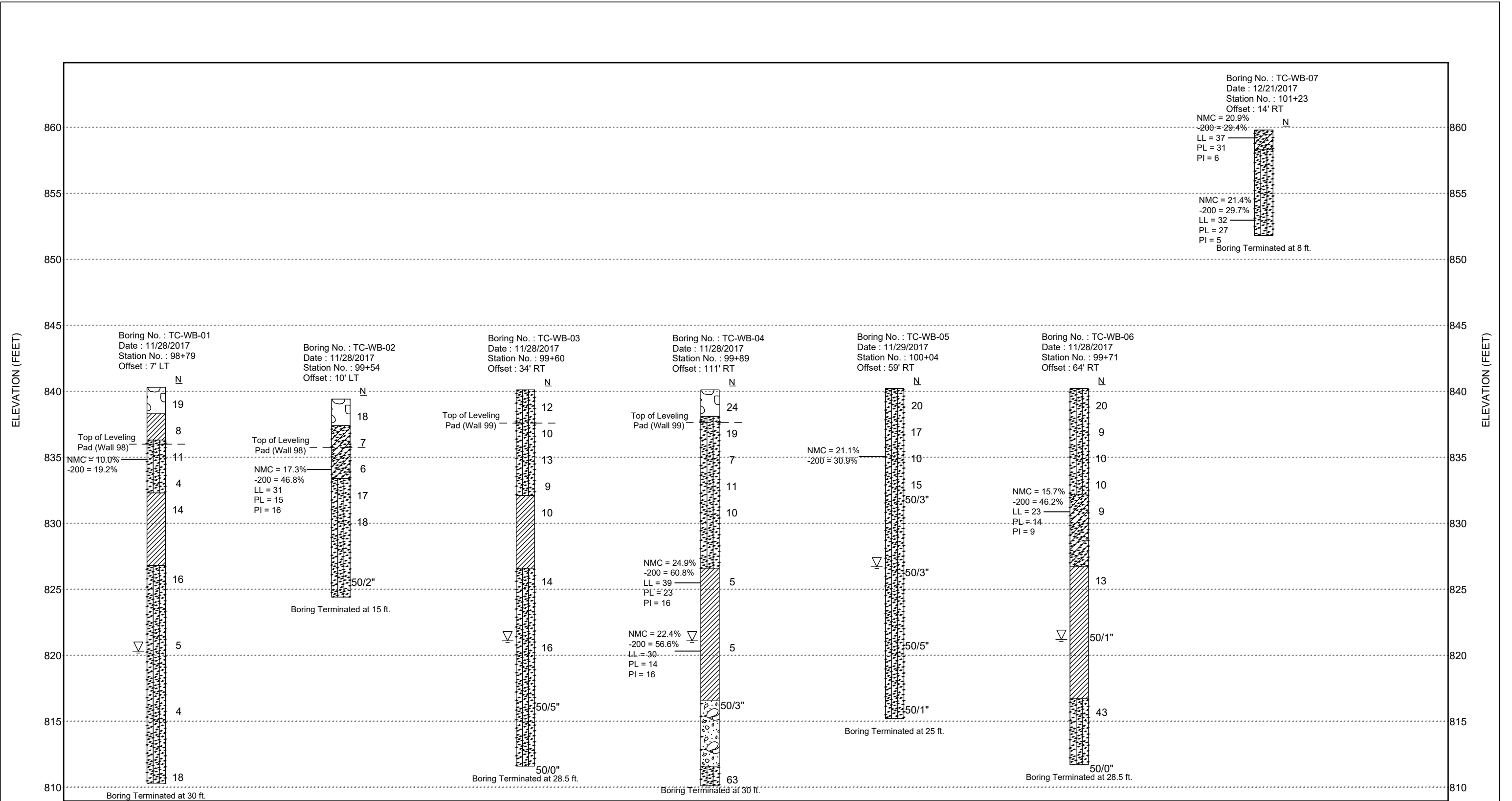
APPENDIX I

- Subsurface Boring Profiles
 - Legend
- Soil Profiles (gINT)




*N Values Drawn At Top Of Interval























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						DRAWN BY:	KH	12/13/17			
						CHECKED BY:	JJ	12/15/17			
						SUPERVISED BY:	PV				



*N Values Drawn At Top Of Interval

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					DRAWN BY:	KH	12/13/17						
					CHECKED BY:	AM	12/15/17						
				SUPERVISED BY:	PV								

LEGEND

 Top Soil	 (CL-ML) Silty Clay
 Asphalt	 (CH) Fat Clay
 Concrete	 (CL) Lean Clay
 (GAB) Graded Aggregate Base	 (OH) Organic Clay
 Limerock Base	 (OL) Organic Silt
 No. 57 Stone	 Peat
 Soil Cement	 Fill
 (SP) Poorly Graded Sand	 Bedrock
 (SP-SM) Poorly Graded Sand With Silt	 Limestone
 (SP-SC) Poorly Graded Sand With Clay	 (WLS) Weathered Limestone
 (SM) Silty Sand	 Track Ballast
 (SC) Clayey Sand	 Granite
 (MH) Elastic Silt	 Gneiss
 (ML) Silt	 Schist

NOTES:

- ∓ Water Table At Time Of Drilling
- ∓ Water Table After 24 Hours
- GNE Groundwater Not Encountered
- GNA Groundwater Not Apparent
- GNM Groundwater Not Measured
- CL Center Line
- RT Right Of Center Line
- LT Left of Center Line
- BGS Below Ground Surface
- HA Hand Auger
- PA Power Auger
- NMC Natural Moisture Content (%)
- 200 Fines Passing A No. 200 Sieve (%)
- PI Plasticity Index
- NP Non Plastic
- LL Liquid Limit
- OC Organic Content (%)
- N SPT N-Value
- WOH Weight-Of-Hammer
- WOR Weight-Of-Rod
- CPT Cone Penetrometer Test
- SPT Standard Penetration Test
- DT Dilatometer Test
- LOC Loss Of Circulation
- ROC Regain Of Circulation
- REC Rock Core Recovery(%)
- RQD Rock Quality Designation
- ST Shelby Tube Sample
- q_u Unconfined Compressive Strength From Pocket Penetrometer In tsf

GRANULAR MATERIALS- RELATIVE DENSITY	SPT (BLOWS/FT)
VERY LOOSE	≤ 4
LOOSE	5-10
MEDIUM	11-30
DENSE	31-50
VERY DENSE	GREATER THAN 50
SILTS AND CLAYS CONSISTENCY	SPT (BLOWS/FT)
VERY SOFT	≤ 2
SOFT	3-4
FIRM	5-8
STIFF	9-15
VERY STIFF	16-30
HARD	30-50
VERY HARD	GREATER THAN 50
SPT Spoon Inside Diameter 1 3/8"	ASTM Standard Drop Safety Hammer
SPT Spoon Outside Diameter 2"	Average Hammer Drop Height 30"
	Hammer Weight 140 lbs

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ABI Northeast Trail (Task C)
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APPENDIX II

- Summary of Laboratory Results
- Atterberg Limits' Results
- Grain Size Distribution



MC Squared, Inc.
1275 Shiloh Road, Suite 2620
Kennesaw, GA 30144

SUMMARY OF LABORATORY RESULTS

CLIENT Kimley-Horn & Associates

PROJECT NAME ABI NE Trail (Task C)

PROJECT NUMBER A051707.058

PROJECT LOCATION Atlanta, Fulton County, Georgia

Sample No.	Station/ Offset (C/L)	Soil Description	GDOT Class	% < Finer Sieve					D75 (mm)	Clay Count %	N M C (%)	Total Vol- ume Change %	Swell %	Shrink age %	M D D pcf	O M C %	LL %	PL %	PI %	Eros- ion In- dex	Soil sup- port Value
				1.5"	3/4"	#10	#40	#60													
Bulk-1 (0-1 ft)	96+15, CL	Brown silty C to F SAND (micaceous)	SM	100.0	84.5	65.3	54.1	32.7	0.797	10.5		18.3	16.4	1.9	113.1	13.6				6.11	
Bulk-2 (0-1 ft)	100+72, CL	Light brown M to F sandy CLAY (micaceous)	CL	100.0	99.6	93.8	86.8	66.3	0.122	39.0		26.1	22.0	4.1	101.2	18.9				1.97	
Bulk-3 (0-1 ft)	106+18, CL	Brown M to F sandy SILT (micaceous)	ML	100.0	97.5	85.4	74.7	50.7	0.254	19.4		32.0	26.9	5.1	88.6	27.4				3.90	
Bulk-4 (0-1 ft)	109+25, CL	Reddish brown silty C to F SAND (micaceous)	SM	100.0	87.8	68.8	58.6	34.8	0.625	13.8		12.2	10.1	2.0	98.9	20.3				5.85	
TC-B-02 (2-4 ft)	96+40, 3' RT	Brown M to F sandy SILT (micaceous)	ML	100.0	99.4	91.0	83.5	54.3	0.171		30.2									3.45	
TC-B-02 (8-10 ft)	96+40, 3' RT	Brown M to F sandy fat CLAY (micaceous)	CH	100.0	95.2	88.9	82.1	59.5	0.163		23.1						51	28	23	2.81	
TC-B-03 (2-4 ft)	99+20, 3' RT	Dark brown silty M to F SAND (micaceous)	SM	100.0	91.0	78.6	67.4	41.2	0.358		18.4									5.06	
TC-B-03 (6-8 ft)	99+20, 3' RT	Reddish brown fine sandy elastic SILT (micaceous)	MH	100.0	98.9	94.4	87.9	59.7	0.132		31.4						56	33	23	2.79	
TC-B-05 (2-4 ft)	101+45, 3' RT	Light gray silty M to F SAND	SM	100.0	96.1	67.8	52.0	18.9	0.572		6.5									7.80	
TC-B-06 (2-4 ft)	104+43, 4' RT	Reddish brown clayey M to F SAND (micaceous)	SC	100.0	95.3	80.4	69.2	47.2	0.329		22.2						38	22	16	4.33	
TC-B-07 (2-4 ft)	106+43, 7' RT	Brown clayey M to F SAND (micaceous)	SC	100.0	96.3	79.2	69.3	48.9	0.34		21.0						39	22	17	4.11	
TC-B-08 (2-4 ft)	109+25, 27' RT	Brown M to F sandy lean CLAY (micaceous)	CL	100.0	98.4	85.4	76.9	54.5	0.227		18.2						41	24	17	3.42	
TC-B-08 (6-8 ft)	109+25, 27' RT	Brown M to F sandy SILT (micaceous)	ML	100.0	98.9	91.8	83.3	53.7	0.174		15.9						44	28	16	3.53	
TC-B-08 (13.5-15 ft)	109+25, 27' RT	Brown lean CLAY with fine sand (micaceous)	CL	100.0	99.8	98.4	96.4	72.9	0.082		18.6						43	25	18	1.16	
TC-B-09 (2-4 ft)	110+70, 25' RT	Dark gray silty M to F SAND (micaceous)	SM	100.0	90.4	68.7	58.0	38.6	0.607		16.3									5.38	
TC-B-09 (6-8 ft)	110+70, 25' RT	Brown M to F sandy lean CLAY (micaceous)	CL	100.0	98.3	92.3	84.7	64.4	0.139		19.6						49	25	24	2.21	
TC-B-10 (4-6 ft)	112+90, 7' RT	Reddish brown fine sandy SILT (micaceous)	ML	100.0	93.5	88.8	81.8	54.8	0.178		22.0						43	29	14	3.39	
TC-WB-01 (4-6 ft)	98+79, 7' LT	Brown silty C to F SAND	SM	100.0	78.1	54.5	43.8	19.2	1.593		10.0									7.77	
TC-WB-02 (4-6 ft)	99+54, 10' LT	Light brown clayey M to F SAND	SC	100.0	99.2	86.6	73.8	46.8	0.263		17.3						31	15	16	4.37	
TC-WB-04 (13.5-15 ft)	99+60, 34' RT	Brown M to F sandy lean CLAY (micaceous)	CL	100.0	99.3	92.3	84.4	60.8	0.151		24.9						39	23	16	2.65	
TC-WB-04 (19-21 ft)	99+89, 111' RT	Brown, gray M to F sandy lean CLAY (slightly micaceous)	CL	100.0	99.7	91.4	82.2	56.6	0.18	31.0	22.4						30	14	16	3.17	
TC-WB-05 (4-6 ft)	100+04, 59' RT	Tan silty M to F SAND (micaceous)	SM	100.0	96.2	81.5	68.1	30.9	0.329		21.1									6.33	
TC-WB-06 (8-10 ft)	99+71, 64' RT	Brown clayey M to F SAND (micaceous)	SC	100.0	96.3	86.8	76.2	46.2	0.238		15.7						23	14	9	4.45	
TC-WB-07 (0-1.5 ft)	101+23, 14' RT	Reddish brown silty SAND (micaceous)	SM					29.4			20.9						37	31	6	6.52	
TC-WB-07 (7.5-8 ft)	101+23, 14' RT	Reddish brown silty SAND (micaceous)	SM					29.7			21.4						32	27	5	6.48	
TC-WB-09 (0-1 ft)	102+40, 13' RT	Gray silty SAND (micaceous)	SM								23.6										
TC-WB-09 (1-3.5 ft)	102+40, 13' RT	Gray silty SAND (micaceous)	SM								21.5										
TC-WB-09 (3.5-5 ft)	102+40, 13' RT	Reddish brown silty SAND (micaceous)	SM					37.2			23.9						40	27	13	5.56	
TC-WB-10 (2-4 ft)	102+99, 13' LT	Dark gray silty M to F SAND (micaceous)	SM	100.0	90.9	75.3	64.1	33.1	0.419		16.0									6.06	
TC-WB-11 (8-10 ft)	103+70, 10' LT	Dark gray clayey M to F SAND (micaceous)	SC	100.0	97.5	84.4	72.7	42.7	0.278		18.3						29	19	10	4.88	



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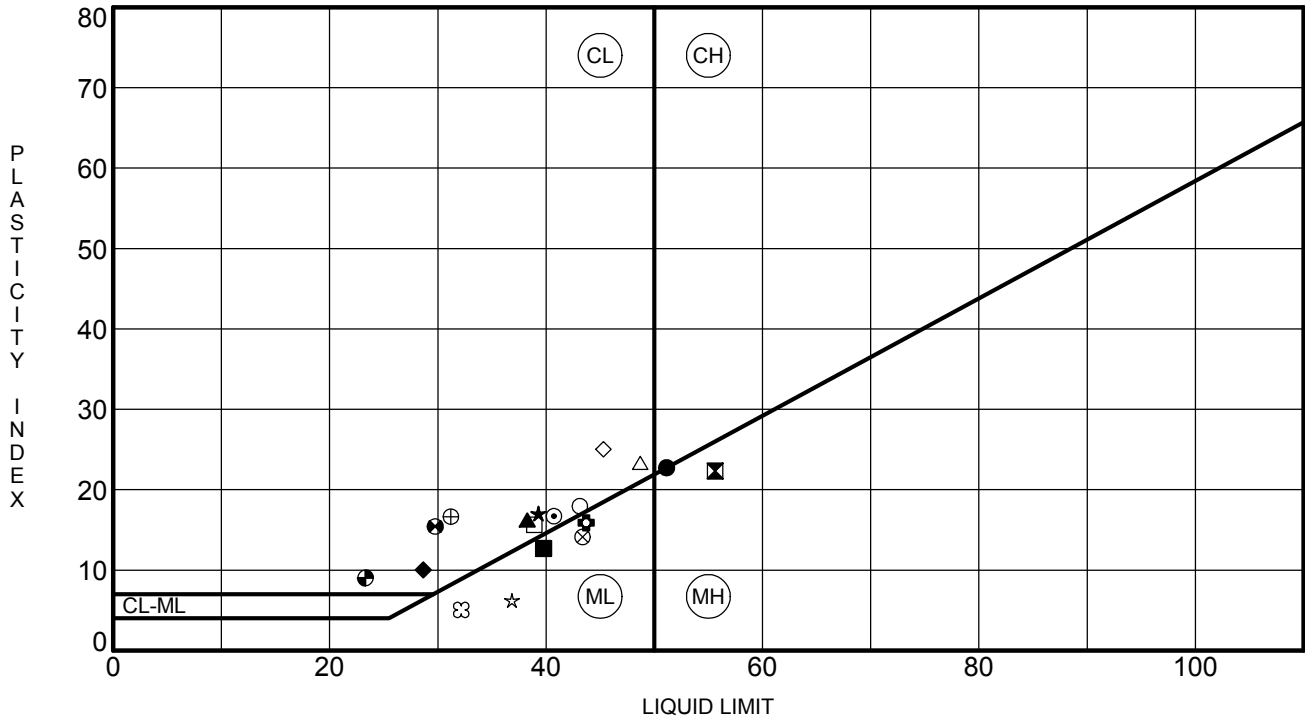
ATTERBERG LIMITS' RESULTS

CLIENT Kimley- Horn & Associates

PROJECT NAME ABI NE Trail (Task C)

PROJECT NUMBER A051707.058

PROJECT LOCATION Atlanta, Fulton County, Georgia



Specimen Identification	LL	PL	PI	%Fines	Classification
● TC-B-02 (8-10 ft)	51	28	23	60	Brown M to F sandy fat CLAY (micaceous)
⊠ TC-B-03 (6-8 ft)	56	33	23	60	Reddish brown fine sandy elastic SILT (micaceous)
▲ TC-B-06 (2-4 ft)	38	22	16	47	Reddish brown clayey M to F SAND (micaceous)
★ TC-B-07 (2-4 ft)	39	22	17	49	Brown clayey M to F SAND (micaceous)
⊙ TC-B-08 (2-4 ft)	41	24	17	54	Brown M to F sandy lean CLAY (micaceous)
⊕ TC-B-08 (6-8 ft)	44	28	16	54	Brown M to F sandy SILT (micaceous)
○ TC-B-08 (13.5-15 ft)	43	25	18	73	Brown lean CLAY with fine sand (micaceous)
△ TC-B-09 (6-8 ft)	49	25	24	64	Brown M to F sandy lean CLAY (micaceous)
⊗ TC-B-10 (4-6 ft)	43	29	14	55	Reddish brown fine sandy SILT (micaceous)
⊕ TC-WB-02 (4-6 ft)	31	15	16	47	Light brown clayey M to F SAND
□ TC-WB-04 (13.5-15 ft)	39	23	16	61	Brown M to F sandy lean CLAY (micaceous)
⊕ TC-WB-04 (19-21 ft)	30	14	16	57	Brown, gray M to F sandy lean CLAY (slightly micaceous)
● TC-WB-06 (8-10 ft)	23	14	9	46	Brown clayey M to F SAND (micaceous)
☆ TC-WB-07 (0-1.5 ft)	37	31	6	29	Reddish brown silty SAND (micaceous)
⊗ TC-WB-07 (7.5-8 ft)	32	27	5	30	Reddish brown silty SAND (micaceous)
■ TC-WB-09 (3.5-5 ft)	40	27	13	37	Reddish brown silty SAND (micaceous)
◆ TC-WB-11 (8-10 ft)	29	19	10	43	Dark gray clayey M to F SAND (micaceous)
◇ TC-WB-11 (13.5-15 ft)	45	20	25	58	Brown M to F sandy lean CLAY (micaceous)

%Fines- % of total soil (by weight) passing U.S. No. 200 sieve



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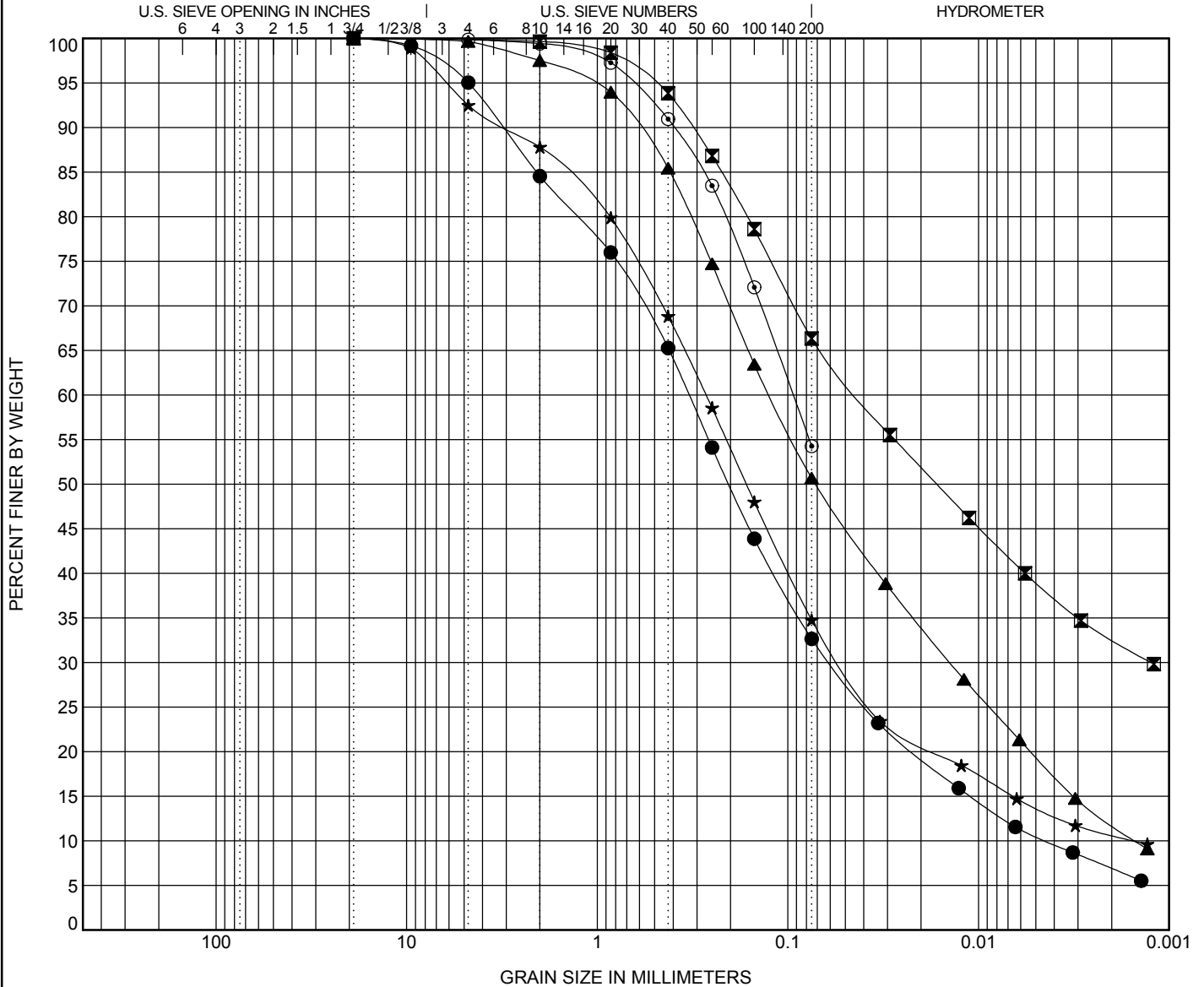
GRAIN SIZE DISTRIBUTION

CLIENT **Kimley-Horn & Associates**

PROJECT NAME **ABI NE Trail (Task C)**

PROJECT NUMBER **A051707.058**

PROJECT LOCATION **Atlanta, Fulton County, Georgia**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● Bulk-1 (0-1 ft)	Brown silty C to F SAND (micaceous)				2.46	75.26
☒ Bulk-2 (0-1 ft)	Light brown M to F sandy CLAY (micaceous)					
▲ Bulk-3 (0-1 ft)	Brown M to F sandy SILT (micaceous)				1.06	83.24
★ Bulk-4 (0-1 ft)	Reddish brown silty C to F SAND (micaceous)				6.92	177.94
⊙ TC-B-02 (2-4 ft)	Brown M to F sandy SILT (micaceous)					

Specimen Identification	D100	D60	D30	D10	NMC	%Gravel	%Sand	%Silt	%Clay
● Bulk-1 (0-1 ft)	19	0.331	0.06	0.004		5.0	62.4	22.1	10.5
☒ Bulk-2 (0-1 ft)	19	0.043	0.001			0.2	33.5	27.3	39.0
▲ Bulk-3 (0-1 ft)	19	0.124	0.014	0.001		0.3	49.0	31.3	19.4
★ Bulk-4 (0-1 ft)	19	0.269	0.053	0.002		7.5	57.7	21.0	13.8
⊙ TC-B-02 (2-4 ft)	19	0.094			30.2	0.1	45.6		54.3

Note-Sample soaked for 16 hrs (+/- 10 min)



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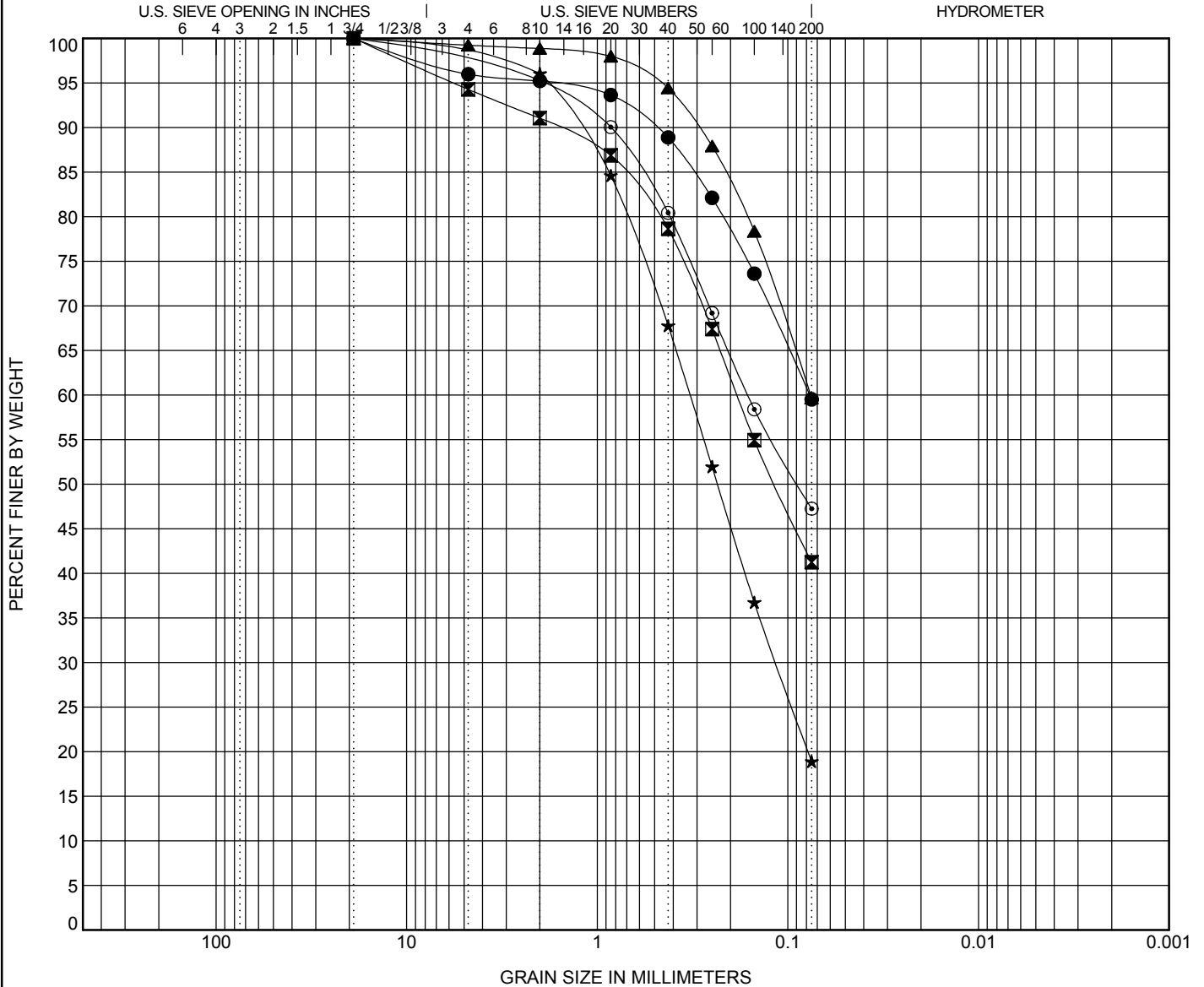
GRAIN SIZE DISTRIBUTION

CLIENT **Kimley-Horn & Associates**

PROJECT NAME **ABI NE Trail (Task C)**

PROJECT NUMBER **A051707.058**

PROJECT LOCATION **Atlanta, Fulton County, Georgia**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● TC-B-02 (8-10 ft)	Brown M to F sandy fat CLAY (micaceous)					51	28	23		
☒ TC-B-03 (2-4 ft)	Dark brown silty M to F SAND (micaceous)									
▲ TC-B-03 (6-8 ft)	Reddish brown fine sandy elastic SILT (micaceous)					56	33	23		
★ TC-B-05 (2-4 ft)	Light gray silty M to F SAND									
⊙ TC-B-06 (2-4 ft)	Reddish brown clayey M to F SAND (micaceous)					38	22	16		
Specimen Identification	D100	D60	D30	D10	NMC	%Gravel	%Sand	%Silt	%Clay	
● TC-B-02 (8-10 ft)	19	0.077			23.1	4.0	36.5	59.5		
☒ TC-B-03 (2-4 ft)	19	0.185			18.4	5.7	53.0	41.2		
▲ TC-B-03 (6-8 ft)	19	0.076			31.4	0.8	39.6	59.7		
★ TC-B-05 (2-4 ft)	19	0.327	0.115		6.5	2.4	78.7	18.9		
⊙ TC-B-06 (2-4 ft)	19	0.162			22.2	2.9	49.8	47.2		

Note-Sample soaked for 16 hrs (+/- 10 min)



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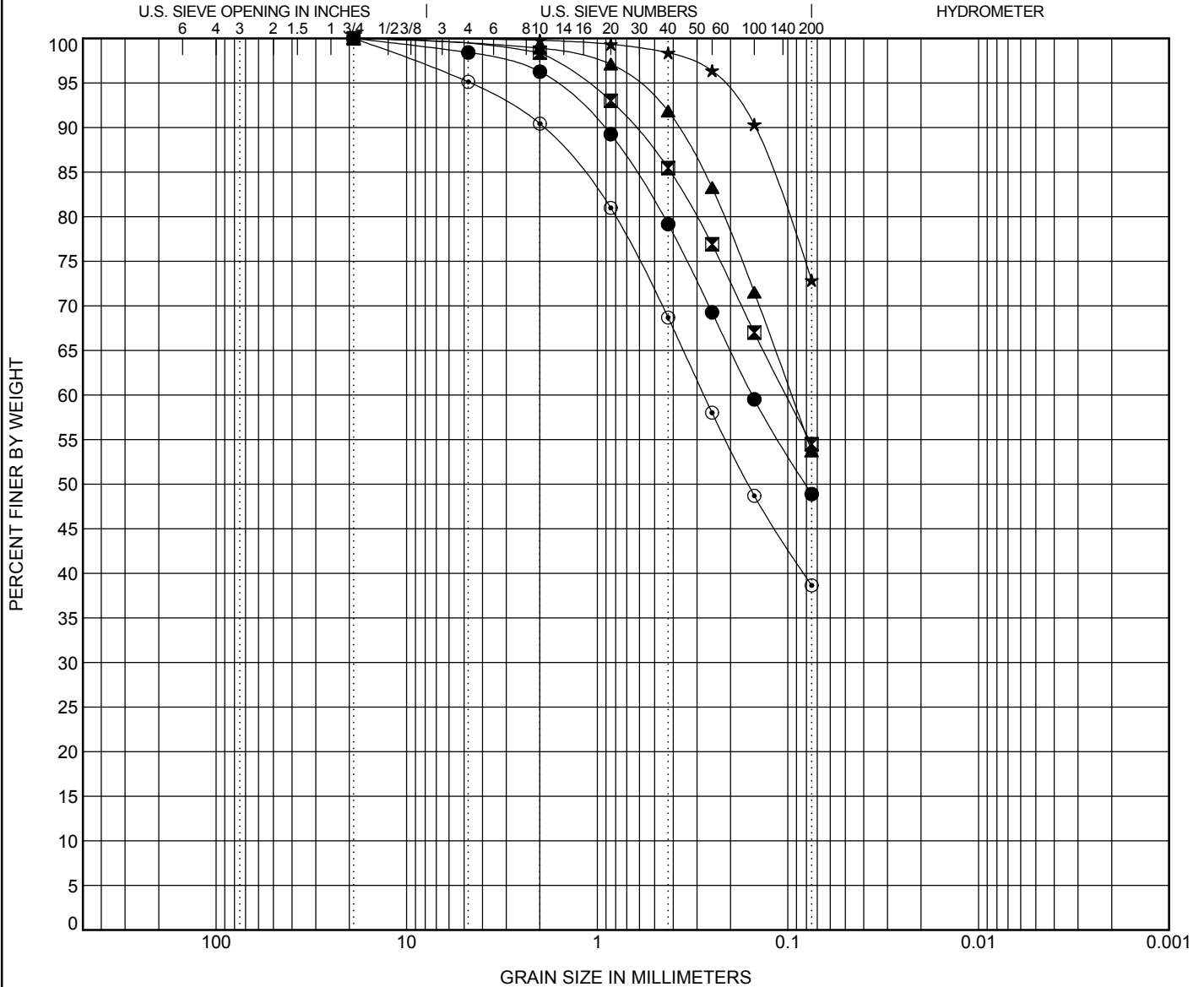
GRAIN SIZE DISTRIBUTION

CLIENT **Kimley-Horn & Associates**

PROJECT NAME **ABI NE Trail (Task C)**

PROJECT NUMBER **A051707.058**

PROJECT LOCATION **Atlanta, Fulton County, Georgia**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● TC-B-07 (2-4 ft)	Brown clayey M to F SAND (micaceous)	39	22	17		
☒ TC-B-08 (2-4 ft)	Brown M to F sandy lean CLAY (micaceous)	41	24	17		
▲ TC-B-08 (6-8 ft)	Brown M to F sandy SILT (micaceous)	44	28	16		
★ TC-B-08 (13.5-15 ft)	Brown lean CLAY with fine sand (micaceous)	43	25	18		
⊙ TC-B-09 (2-4 ft)	Dark gray silty M to F SAND (micaceous)					

Specimen Identification	D100	D60	D30	D10	NMC	%Gravel	%Sand	%Silt	%Clay
● TC-B-07 (2-4 ft)	19	0.154			21.0	1.6	49.5		48.9
☒ TC-B-08 (2-4 ft)	19	0.102			18.2	1.0	44.5		54.5
▲ TC-B-08 (6-8 ft)	19	0.096			15.9	0.7	45.6		53.7
★ TC-B-08 (13.5-15 ft)	19				18.6	0.1	27.0		72.9
⊙ TC-B-09 (2-4 ft)	19	0.276			16.3	4.9	56.5		38.6

Note-Sample soaked for 16 hrs (+/- 10 min)



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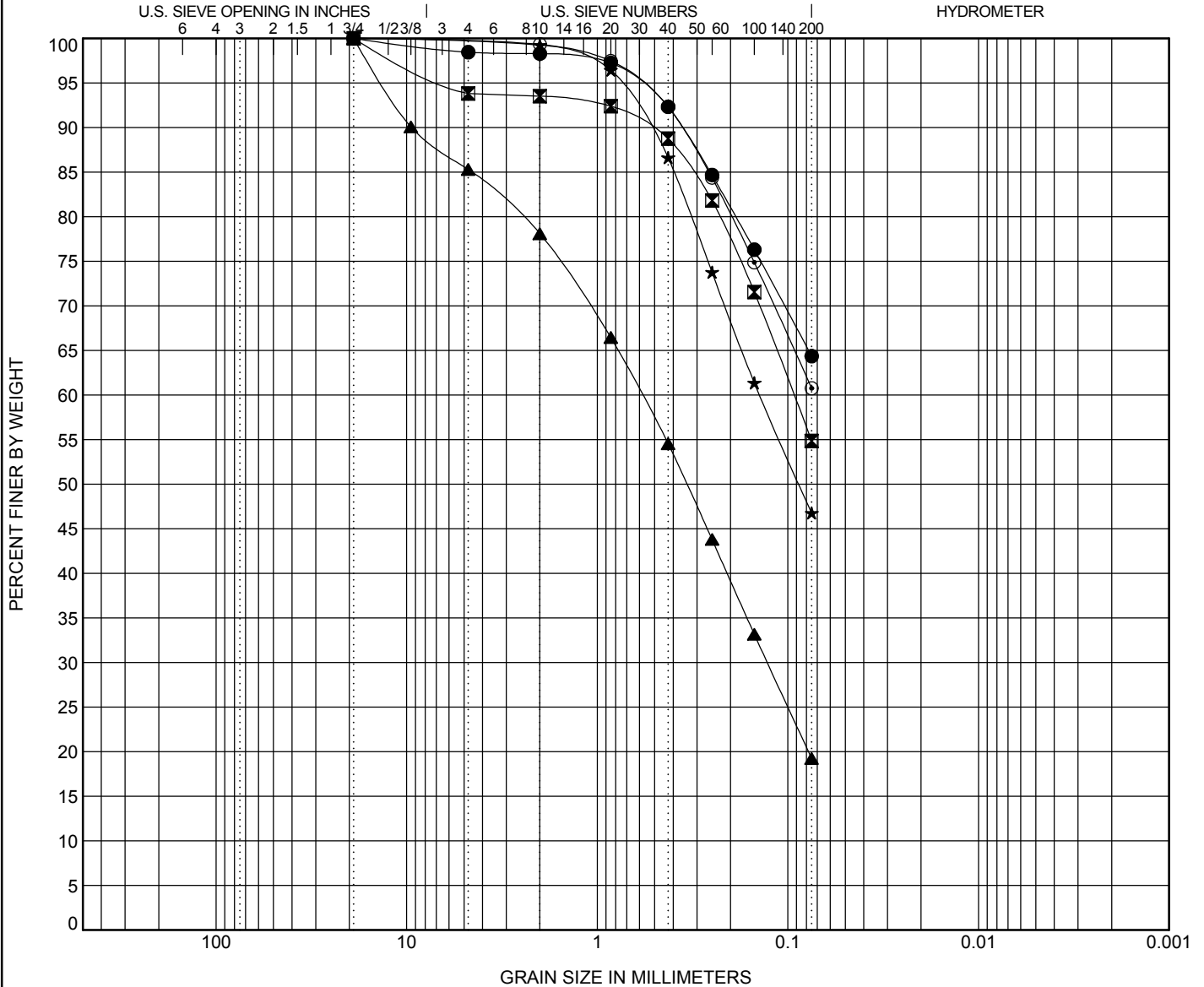
GRAIN SIZE DISTRIBUTION

CLIENT Kimley-Horn & Associates

PROJECT NAME ABI NE Trail (Task C)

PROJECT NUMBER A051707.058

PROJECT LOCATION Atlanta, Fulton County, Georgia



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● TC-B-09 (6-8 ft)	Brown M to F sandy lean CLAY (micaceous)					49	25	24		
☒ TC-B-10 (4-6 ft)	Reddish brown fine sandy SILT (micaceous)					43	29	14		
▲ TC-WB-01 (4-6 ft)	Brown silty C to F SAND									
★ TC-WB-02 (4-6 ft)	Light brown clayey M to F SAND					31	15	16		
⊙ TC-WB-04 (13.5-15 ft)	Brown M to F sandy lean CLAY (micaceous)					39	23	16		
Specimen Identification	D100	D60	D30	D10	NMC	%Gravel	%Sand	%Silt	%Clay	
● TC-B-09 (6-8 ft)	19				19.6	1.5	34.1	64.4		
☒ TC-B-10 (4-6 ft)	19	0.093			22.0	6.2	39.0	54.8		
▲ TC-WB-01 (4-6 ft)	19	0.584	0.128		10.0	14.7	66.1	19.2		
★ TC-WB-02 (4-6 ft)	19	0.141			17.3	0.5	52.8	46.8		
⊙ TC-WB-04 (13.5-15 ft)	19				24.9	0.4	38.8	60.8		

Note-Sample soaked for 16 hrs (+/- 10 min)



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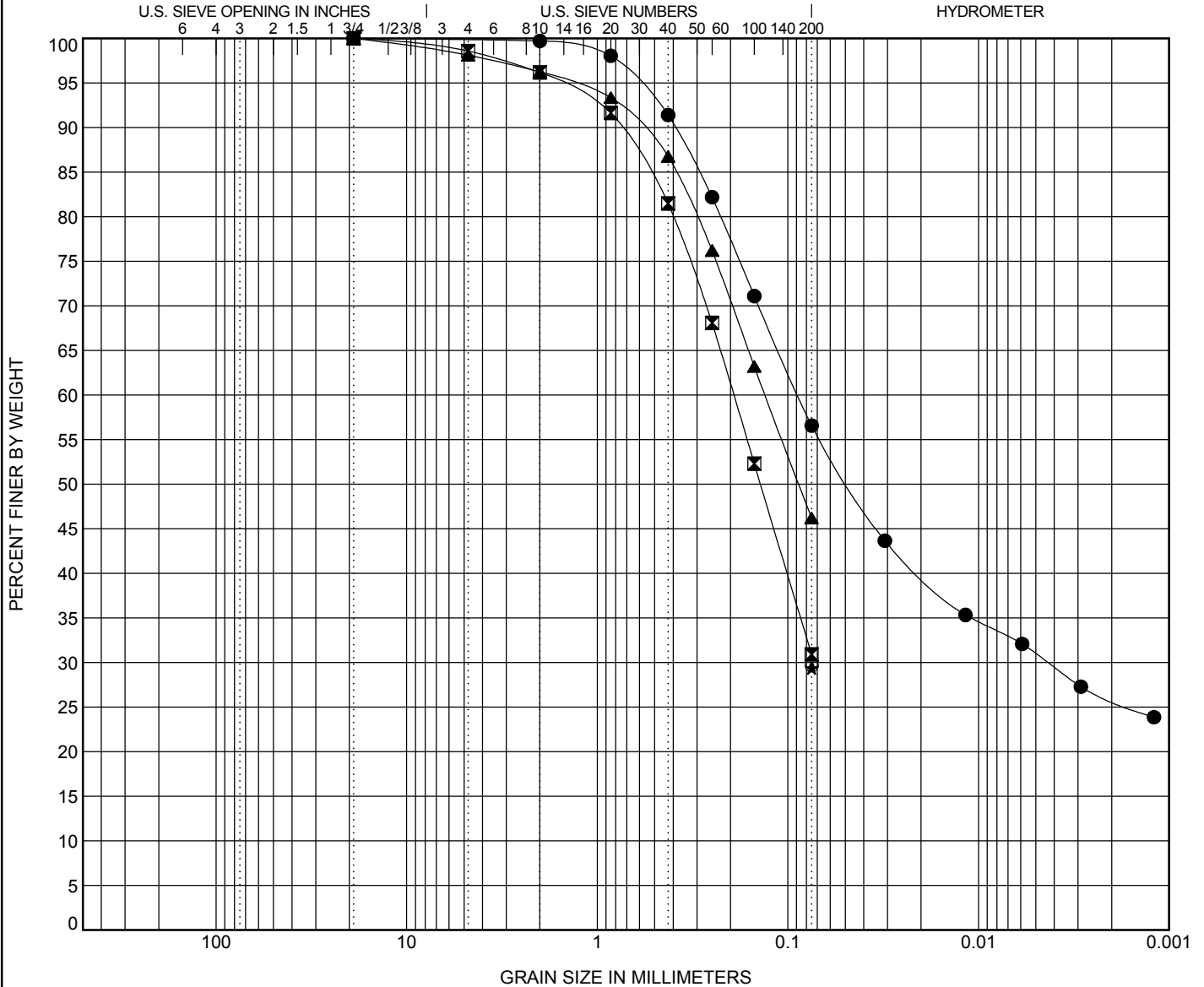
GRAIN SIZE DISTRIBUTION

CLIENT Kimley-Horn & Associates

PROJECT NAME ABI NE Trail (Task C)

PROJECT NUMBER A051707.058

PROJECT LOCATION Atlanta, Fulton County, Georgia



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● TC-WB-04 (19-21 ft)	Brown, gray M to F sandy lean CLAY (slightly micaceous)					30	14	16		
☒ TC-WB-05 (4-6 ft)	Tan silty M to F SAND (micaceous)									
▲ TC-WB-06 (8-10 ft)	Brown clayey M to F SAND (micaceous)					23	14	9		
★ TC-WB-07 (0-1.5 ft)	Reddish brown silty SAND (micaceous)					37	31	6		
◎ TC-WB-07 (7.5-8 ft)	Reddish brown silty SAND (micaceous)					32	27	5		
Specimen Identification	D100	D60	D30	D10	NMC	%Gravel	%Sand	%Silt	%Clay	
● TC-WB-04 (19-21 ft)	19	0.088	0.004		22.4	0.2	43.3	25.6	31.0	
☒ TC-WB-05 (4-6 ft)	19	0.193			21.1	1.4	67.7	30.9		
▲ TC-WB-06 (8-10 ft)	19	0.132			15.7	1.9	51.9	46.2		
★ TC-WB-07 (0-1.5 ft)	0.075				20.9			29.4		
◎ TC-WB-07 (7.5-8 ft)	0.075				21.4			29.7		

Note-Sample soaked for 16 hrs (+/- 10 min)



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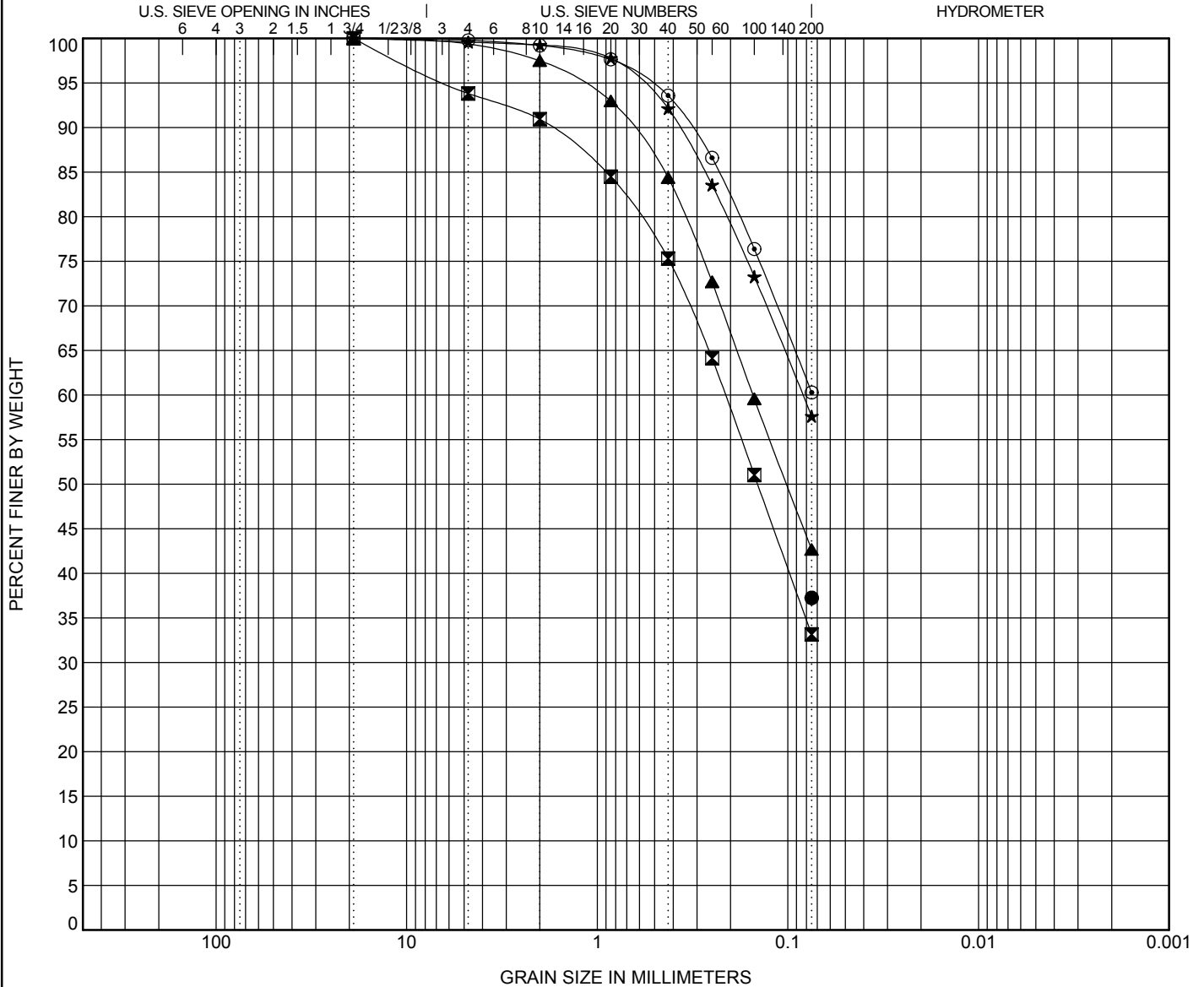
GRAIN SIZE DISTRIBUTION

CLIENT Kimley-Horn & Associates

PROJECT NAME ABI NE Trail (Task C)

PROJECT NUMBER A051707.058

PROJECT LOCATION Atlanta, Fulton County, Georgia



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● TC-WB-09 (3.5-5 ft)	Reddish brown silty SAND (micaceous)					40	27	13		
☒ TC-WB-10 (2-4 ft)	Dark gray silty M to F SAND (micaceous)									
▲ TC-WB-11 (8-10 ft)	Dark gray clayey M to F SAND (micaceous)					29	19	10		
★ TC-WB-11 (13.5-15 ft)	Brown M to F sandy lean CLAY (micaceous)					45	20	25		
⊙ TC-WB-12 (4-6 ft)	Reddish brown M to F sandy SILT (micaceous)									
Specimen Identification	D100	D60	D30	D10	NMC	%Gravel	%Sand	%Silt	%Clay	
● TC-WB-09 (3.5-5 ft)	0.075				23.9				37.2	
☒ TC-WB-10 (2-4 ft)	19	0.213			16.0	6.2	60.7		33.1	
▲ TC-WB-11 (8-10 ft)	19	0.153			18.3	1.5	55.8		42.7	
★ TC-WB-11 (13.5-15 ft)	19	0.083			22.4	0.4	42.0		57.6	
⊙ TC-WB-12 (4-6 ft)	19				23.7	0.2	39.5		60.3	

Note-Sample soaked for 16 hrs (+/- 10 min)


Soil Survey Report
ABI Northeast Trail (Task C)
MC Squared Project No. A051707.058
Atlanta, Fulton County, Georgia

APPENDIX III

- Pictorial Documentation of Debris at Task C Pond
 - Benching Detail




**Task C Pond Test Pit
Sta. 110+60, 7' LT**

	<p>SOIL SURVEY REPORT ABI Northeast Trail (Task C) Atlanta, Fulton County, Georgia</p>	<p>For: Kimley-Horn & Associates</p>
	<p>PICTORIAL DOCUMENTATION OF DEBRIS IN TASK C POND</p>	<p>MC² Project No. A051707.058 Date: March, 2018</p>




**Task C Pond Test Pit
Sta. 110+60, 7' LT**

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	<p>PICTORIAL DOCUMENTATION OF DEBRIS IN TASK C POND</p>	<p>MC² Project No. A051707.058</p>
	<p>Date: March, 2018</p>	




**Task C Pond Test Pit
Sta. 110+60, 7' LT**

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	<p>PICTORIAL DOCUMENTATION OF DEBRIS IN TASK C POND</p>	<p>MC² Project No. A051707.058 Date: March, 2018</p>




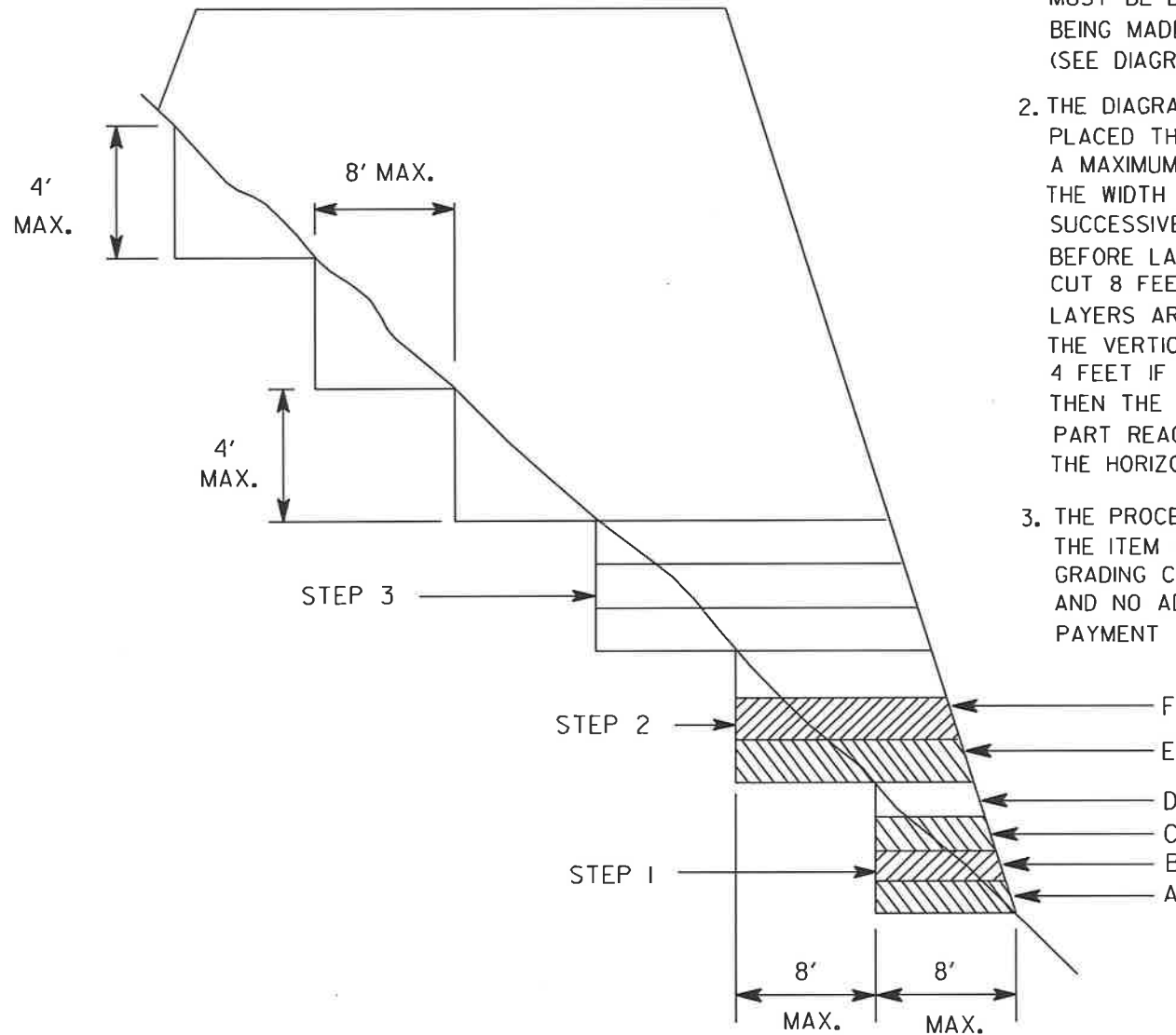
**Task C Pond Test Pit
Sta. 110+60, 7' LT**

	<p>SOIL SURVEY REPORT ABI Northeast Trail (Task C) Atlanta, Fulton County, Georgia</p>	<p>For: Kimley-Horn & Associates</p>
		<p>MC² Project No. A051707.058</p>
	<p>PICTORIAL DOCUMENTATION OF DEBRIS IN TASK C POND</p>	<p>Date: March, 2018</p>



**Task C Pond Test Pit
Sta. 110+60, 7' LT**

	<p>SOIL SURVEY REPORT ABI Northeast Trail (Task C) Atlanta, Fulton County, Georgia</p>	<p>For: Kimley-Horn & Associates</p>
	<p>PICTORIAL DOCUMENTATION OF DEBRIS IN TASK C POND</p>	<p>MC² Project No. A051707.058 Date: March, 2018</p>



1. WHERE THE EMBANKMENT IS TO BE PLACED ON A HILLSIDE OR ANOTHER EXISTING EMBANKMENT HAVING A SLOPE OF 3 TO 1 OR STEEPER, THE FOUNDATION MUST BE BENCHING WHILE THE EMBANKMENT IS BEING MADE.
(SEE DIAGRAM AT LEFT.)
2. THE DIAGRAM SHOWS THAT BEFORE LAYER 'A' IS PLACED THE FIRST STEP (1) IS CUT INTO THE SLOPE A MAXIMUM DISTANCE OF ABOUT 8 FEET (ABOUT $\frac{3}{4}$ THE WIDTH OF THE TYPICAL D-8 BULLDOZER BLADE). SUCCESSIVE LAYERS B, C, AND D ARE THEN PLACED BEFORE LAYER 'E' IS PLACED, THE SECOND STEP IS CUT 8 FEET INTO THE SLOPE AND SUCCESSIVE LAYERS ARE AGAIN PLACED. IF IT IS ANTICIPATED THAT THE VERTICAL PART OF THE STEP WILL EXCEED 4 FEET IF A 8 FEET HORIZONTAL CUT IS MADE, THEN THE ACTUAL CUT STOPS WHEN THE VERTICAL PART REACHES A MAXIMUM OF 4 FEET ALLOWING THE HORIZONTAL DISTANCE TO VARY.
3. THE PROCESS OF BENCHING IS CONSIDERED INCIDENTAL TO THE ITEM OF UNCLASSIFIED EXCAVATION AND BORROW OR GRADING COMPLETE IN CONSTRUCTION OF THE EMBANKMENT AND NO ADDITIONAL MEASUREMENT OF QUANTITY OR PAYMENT WILL BE MADE FOR BENCHING.

BENCHING DETAIL