Revised Wall Foundation Investigation (WFI) Report

Windy Hill Road-Terrell Mill Road Connector
GDOT P.I. No. 0013967
Cobb County Project No. X2401
HNTB Project No. 64327
MC² Project No. A121503.122
Marietta, Cobb County, Georgia

Prepared For: Anthony Prevost, P.E.
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Project No.: A121503.122
Prepared: February 2019 (Revised April 2019)

MC²
GEOTECHNICAL • ENVIRONMENTAL
MATERIALS TESTING

February 8, 2019
(Revised April 25, 2019)

Anthony Prevost, P.E.
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Subject: **Revised Wall Foundation Investigation (WFI) Report**
Windy Hill Road-Terrell Mill Road Connector
GDOT P.I. No. 0013967
Cobb County Project No. X2401
HNTB Project No. 64327
MC² Project No. A121503.122
Marietta, Cobb County, Georgia

Dear Mr. Prevost:

MC Squared, Inc. (MC²) is pleased to present this Revised Wall Foundation Investigation (WFI) Report for the proposed Windy Hill Road-Terrell Mill Road Connector in Marietta, Cobb County, Georgia. The original WFI (submitted February 8, 2019) was performed in general accordance with the latest GDOT guidance document for wall foundation investigation. The report summarizes our findings, the subsurface conditions we encountered and our conclusions and recommendations as they relate to the project design and construction. Per your direction, we revised the WFI to reflect updates for Walls 3, 5 and 8 in accordance with your e-mail, dated April 19, 2019.

Thank you for giving us the opportunity to work with HNTB for Cobb County. Please let us know if you have any comments or require additional information.

Respectfully submitted,
MC²

Amir Moussly
Staff Engineer

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Project Manager
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Attachments:

RETAINING WALL FOUNDATION REPORT
Windy Hill Road-Terrell Mill Road Connector
MC² Project No. A121503.122
Marietta, Cobb County, Georgia

1. Location

This project is for the construction of the Windy Hill Road-Terrell Mill Road Connector, connecting Windy Hill Road with Terrell Mill Road. The project begins at Sta. 103+00 and continues east to Sta. 155+00. The project lies within the city limits of Marietta in Cobb County. This report is to assist in the design of two Soil Nail walls (Wall Nos. 6 and 7) and four Mechanically Stabilized Earth (MSE) walls (Wall Nos. 1, 4, 5 and 8) as tabulated below:

Table 1: Summary of Walls

Wall ID	Approx. Location	Approx. Length (ft.)	Assumed Max Height* (ft.)	Wall Type(s)
Wall 1	112+80, 60' LT to 121+06, 48' LT	826	30	MSE and GDOT Standard
Wall 3	121+78, 55' RT to 123+82, 72' RT	234	15	GDOT Standard
Wall 4	122+55, 48' LT to 125+00, 48' LT	245	35	MSE
Wall 5	124+54, 96' RT to 141+58, 37' RT	1704	30	MSE and GDOT Standard
Wall 6	126+06, 48' LT to 132+90, 42' LT	684	20	Soil Nail and GDOT Standard
Wall 7	134+25, 42' LT to 137+75, 42' LT	350	17	Soil Nail and GDOT Standard
Wall 8	138+25, 42' LT to 142+10, 42' LT	385	20	MSE

*Note: Wall cross-sections provided by **HNTB** in an e-mail dated December 22, 2018. Based on information provided by **HNTB**, Wall 2 (Sta. 112+88, 43' RT to Sta. 115+20, 55' RT) is a GDOT standard wall; hence, it was not evaluated in this report. Similarly, Wall 3 is a type 6S concrete side barrier wall (per e-mail dated Apr 19, 2019).

2. Geology

This project will be geologically sited in a Biotitic Gneiss / Mica Schist / Amphibolite rock type in the Georgia Piedmont Region.

3. Subsurface and Groundwater Information

Subsurface information for the walls were obtained from thirty (30) Standard Penetration Test (SPT) Borings, as generally summarized in the table below.

Table 2: General Subsurface Conditions Summary

Wall ID	Location	Borings	General Soils Description
Wall 1	112+80, 60' LT to 121+06, 48' LT	B-03, B-04, B-06, WB3-02, WB3-03, WB3-04	Predominantly loose to very dense SM with pockets of stiff MH. AR*/Top of Rock Elevation Range: 946 feet to 891 feet (Mica Schist)
Wall 3	121+78, 55' RT to 123+82, 72' RT	B-10, WB4-02, WB4-03, WB5-06	Alternating layers of predominantly medium dense to very dense SP-SM and loose to very dense SM. AR*/Top of Rock Elevation Range: 914 feet to 899 feet (Mica Schist)
Wall 4	122+55, 48' LT to 125+00, 48' LT	WB3-05, WB3-06	Predominantly medium dense to very dense SM with pockets of very dense SP-SM, firm to stiff CL and MH. AR*/Top of Rock Elevation Range: 894 feet to 893 feet (Mica Schist)
Wall 5	124+54, 96' RT to 141+58, 37' RT	WB5-06, B-12, WB5-01, WB5-03, B-21, WB5-04	Predominantly very loose to very dense SM with pockets of medium dense to very dense SP-SM. AR*/Top of Rock Elevation Range: 930 feet to 895 feet (Mica Schist)
Wall 6	126+06, 48' LT to 132+90, 42' LT	WB-01, B-13, B-12, WB3-08, B-15, WB-02	Predominantly very loose to very dense SM with pockets of very loose SC and dense SP-SM. Very stiff to very hard ML layer (6'-15.2') present around Sta. 128+00, 40' L. AR*/Top of Rock Elevation Range: 930 feet to 914 feet (Mica Schist)
Wall 7	134+25, 42' LT to 137+75, 42' LT	B-17, WB3-10, B-18, B-19, WB3-12	Alternating layers of predominantly loose to very dense SM with pockets of dense to very dense SP-SM/SP, loose SC and stiff ML. AR*/Top of Rock Elevation Range: 924 feet to 913 feet (Mica Schist)
Wall 8	138+25, 42' LT to 142+10, 48' LT	WB3-16, WB3-13, WB3-14	Predominantly very loose to very dense SM with pockets of very loose to loose SC and firm CH. AR*/Top of Rock Elevation Range: 929 feet to 922 feet (Mica Schist)

* AR – Auger refusal to hollow stem auger advancement with drill rig in the vicinity of wall.

Refer to individual soil profiles (**Appendix I**) for details.

Groundwater table (GWT) was encountered in only five of the borings listed in the table above (WB5-03, WB5-04, WB3-10, WB3-13 and WB3-16). Within those five borings, GWT measurements ranged from 7 feet below ground surface (BGS) to 23.5 feet BGS. GWT elevations are summarized in the table below.

Table 2a: Subsurface GWT Elevations Summary

Boring	Location	GWT Elevation (ft.)
WB3-10	Sta. 134+65, 45'L	906.5
WB5-03	Sta. 136+70, 65'R	903.0
WB3-16	Sta. 139+00, 39'L	933.0
WB3-13	Sta. 140+47, 43'L	943.5
WB5-04	Sta. 140+50, 38'R	937.8

Weathered rock, may be encountered at the stations noted below at or above cut elevations. It may be removed by using heavy equipment and/or light blasting. Rock qualities, types and elevations vary across the project site. Accordingly, contingency for removal of good quality hard rock must be accounted for during construction. Rock was encountered near the bottom of the proposed cut wall elevations at the following locations:

Station to Station	***Location***
122+00± to 123+82±	Rt.
128+50± to 131+00±	Lt.

If competent rock is encountered, the attached detail for rock cut should be used (see Detail of Rock Cut in **Appendix III**). Refer to the Soil Survey report, there are some minor discrepancies of proposed cut elevations between the approved Soil Survey report and this WFI report, as cross-sections have been updated since the approval of the former.

All surface waters should be properly drained away from walls during and post construction.

Test boring WB3-06 completed in the vicinity of Wall 4 (Sta. 124+94, 73’ L) encountered CL and MH layers in the top 4 feet below ground surface (BGS). If similar soils are encountered within the MSE Wall (Wall 4 – 122+55, 48' LT to 125+00, 48' LT) footprint, they must be over-excavated and replaced with suitable soils (SM, SC, SP and SP-SM).

4. Soil Parameters

The following soil (granular engineered fill material) design parameters are recommended for use for the proposed MSE walls:

Cohesion	C= 0 psf
Soil Unit Weight,	γ= 120 pcf
Angle of Internal Friction	ϕ= 32 °
Coefficient of Sliding Friction	μ= 0.4

5. Slopes

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

6. Standup Tests

In order to evaluate the standup time of the in-situ soil for the construction of Soil Nail walls, a total of three (3) excavations, each measuring approximately 2 feet wide, 6 feet long and 6 feet deep, were performed. Excavations remained stable for approximately 9 days (Refer to Standup Test Photographs in **Appendix III** for details). A summary of the Standup Test locations is tabulated below.

Table 3: Standup Test Locations

Standup Test ID	Station/Offset
ST-01	129+00, 40' L
ST-02	129+45, 45' L
ST-03	134+00, 60' L

7. Evaluations

MSE Walls

The maximum allowable soil bearing pressure is 3000 psf. If the MSE wall design pressure exceeds the maximum allowable pressure, then the wall should be constructed to a height equivalent to the allowable bearing pressure, and after a 30-day waiting period, the wall may be constructed to its final height. Most of the settlement is estimated to occur during construction. Refer to the table summarizing our estimates in the Analyses and Assumptions section of this report.

All surface waters should be properly drained away from walls during and post construction.

Soil Nail Walls

Critical sections for each wall identified by HNTB were evaluated as indicated in **Appendix V**. We estimate that soil nail lengths equal to the height of the wall would be sufficient from a global stability standpoint.

• At locations where strict wall movement criteria exist, additional measures to limit deflections (such as closer spacing of nails and/or variable nail patterns) may be required.

• The existence of utilities and communication lines behind the wall must be evaluated for potential conflicts with the location, inclination, and length of soil nails, particularly in the upper rows. Additionally, the locations of the utilities must be accurately delineated.

The contractor must evaluate internal stability of the walls.

8. Analyses and Assumptions

Analyses – MSE Walls

External stability analyses against possible failure by bearing, sliding and overturning, as well as overall stability analyses were assessed for the proposed MSE Walls 1, 4, 5 and 8 using the latest cross-sections provided to us via e-mail by **HNTB** on December 22, 2018. If the configuration of walls were to change, our analyses would require reassessment. Global stability was completed using GeoStudio Slope/W software, 2012. Potential failure surfaces were computed using limiting equilibrium method of analysis developed by Spencer. Stability analyses against bearing, sliding and overturning were completed in accordance with AASHTO Standard Specifications for Highway Bridges, 17th edition, 2002. Walls were analyzed using ASD methodology.

For MSE walls, strap lengths were assumed to be equal to 100% of the wall height, where failure slip surface initiation points are assumed to start past the end of the strap's length, away from the wall.

Fill soil design parameters used in analysis can be found in Section 4 of this report. Where applicable, a live load of 250 psf was used to account for future roadway traffic. Based on our analysis, the minimum required (per AASHTO 2002) factors of safety, 1.5 (sliding and global stability), 2.0 (overturning in soil) and 3.0 (bearing capacity in soil) are achieved, as summarized in the table below.

Table 4: MSE Wall Analyses Summary

Wall ID	Assumed Max Height (ft.)	Wall Type	Global Stability (FS>1.5)	Estimated Total Settlement (in.)	Sliding (FS>=1.5)	Overturning (FS>=2)	Bearing Capacity (FS>=3)
Wall 1 (B-09)	30	MSE	1.60	7.0	2.2	9.0	8.1
Wall 1 (WB3-03)	30	MSE	1.59	10.0	2.2	9.0	8.1
Wall 4	35	MSE	1.51	1.7	2.2	9.0	14.2
Wall 5	30	MSE	1.68	3.0	2.2	9.0	8.1
Wall 8	20	MSE	1.62	1.4	2.2	9.0	5.3

Analyses – Soil Nail Walls

Global stability analyses were assessed for the proposed soil nail walls using the latest cross-sections provided by **HNTB** via an e-mail dated December 22, 2018. Global stability was completed using GeoStudio Slope/W software, 2018. Potential failure surfaces are computed using limiting equilibrium method of analysis developed by Spencer.

Soft soils were not encountered at the base of each proposed wall. As such, lateral sliding, basal heave and lateral squeeze analyses were not assessed for the proposed soil nail walls.

Where applicable, a live load of 250 psf was applied to the top of the wall to account for future roadway traffic. Additionally, at the critical section analyzed at Wall 6 (Sta. 130+00, L), a dead load of 2500 psf was applied near the top of the wall to account for an existing structure to remain in place. Based on our analysis, the minimum required (per FHWA GEC 007 "Soil Nail Walls Reference Manual", 2015) factor of safety of 1.5 for global stability is achieved. Walls were analyzed using ASD methodology.

Assumptions

The following table summarizes the assumed strap lengths (for MSE walls) and nail vertical spacing (for Soil Nail walls) used for analyses:

Table 5: Summary of Assumptions

Wall ID	Wall Type	Wall Height (ft.)	Section Analyzed	Strap Length/ Nail Vertical Spacing (ft.)
1	MSE	30	119+00	30
4	MSE	35	123+00	35
5	MSE	30	138+00	30
6	Soil Nail	20	130+00	5
7	Soil Nail	17	136+00	5
8	MSE	20	139+50	20

References:

MSE Walls: Applicable Design Standard/Guidance: AASHTO Standard Specifications for Highway Bridges, 17th edition, 2002.

Soil Nail Walls: Soil Nail Wall Reference Manual, FHWA GEC 007, Publication no. FHWA-NHI-14-007, February 2015.

Géotechnique,."A Method of Analysis of the Stability of Embankments Assuming Parallel Inter-Slice Forces". Spencer, E., 1967.

9. Corrosion

Soil Conditions (Soil Nail Walls)

Selected samples from borings nearby the proposed soil nail walls were tested for corrosivity series, including chlorides (AASHTO T-291-13), sulfates (AASHTO T-290-16), pH (ASTM D1293) and resistivity (ASTM G57). Laboratory results of the samples indicate non-aggressive soil conditions. Refer to **Appendix II** for Corrosion Test Results.

10. Special Conditions

A. Numerous structures are located very close to the construction limits of this project. The evaluations in this report assume that existing structures and utilities are not very sensitive to deflections. Vibration monitoring of existing facilities will likely be required due to construction activities which may cause some concern with property owners and damage to existing utilities. 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.

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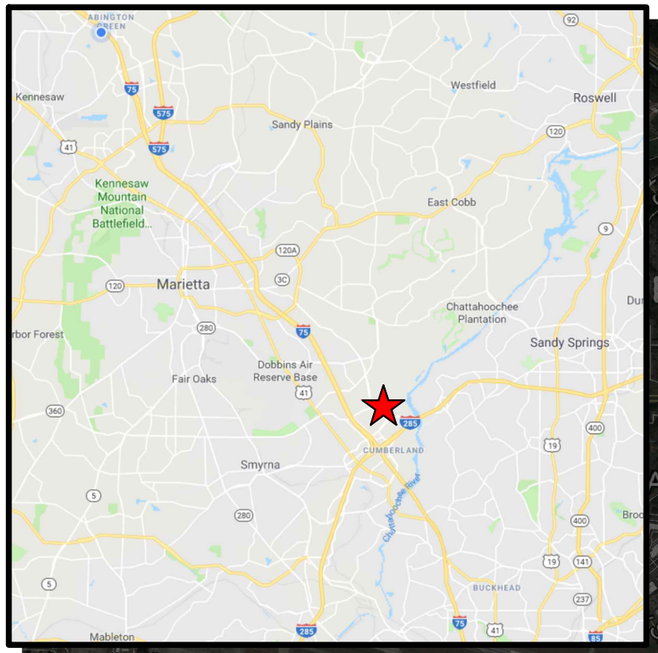
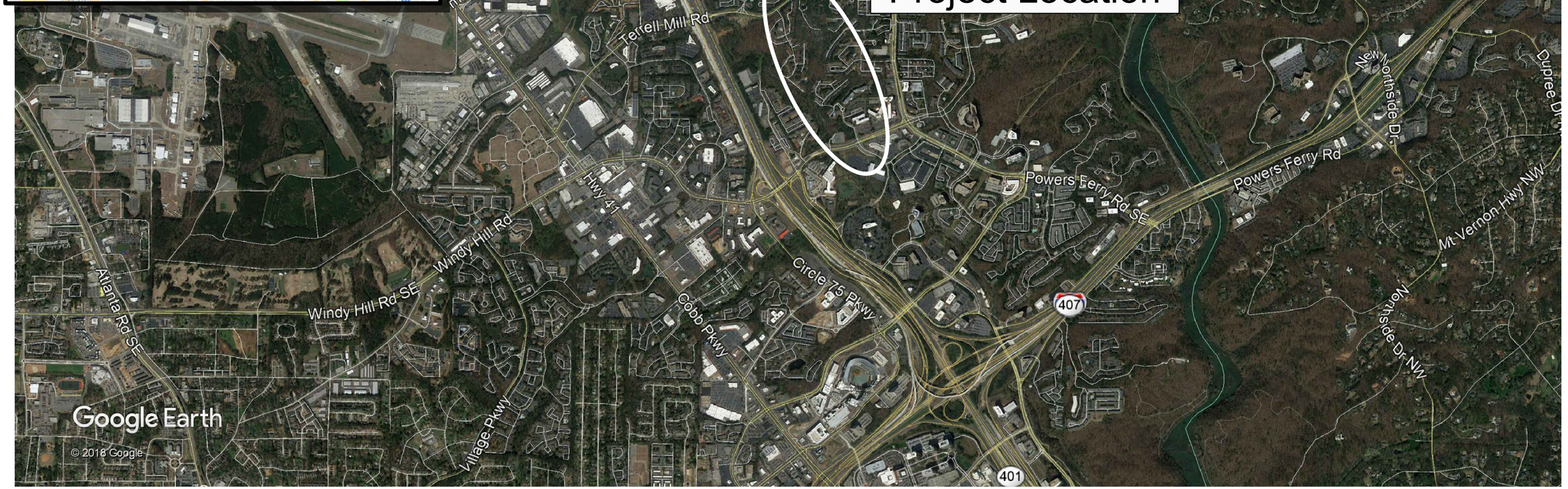
Reviewed By: Prashanth Vaddu, P.E.
Winston Stewart, P.E.

FIGURES

- Project Location Map – Sheet 1
- Boring Location Map – Sheets 2 through 11





LEGEND:

★ Project Location

Source: Google Earth
Image Date: 3/14/2018

0mi 0.5mi 1mi

Graphic Scale (miles)

DATE	NAME	REVISION	APPROVED BY:

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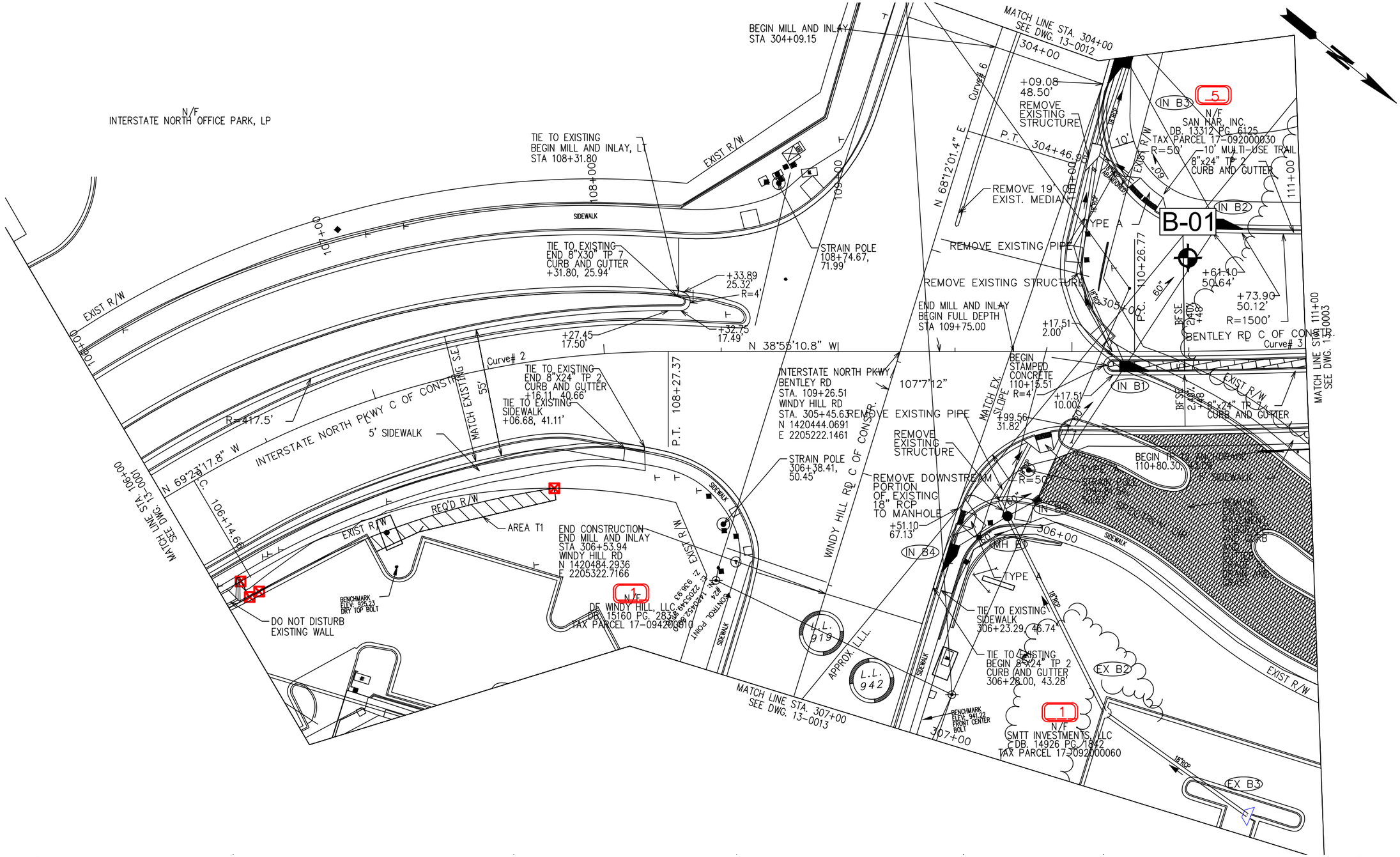
CHECKED BY:	AM	1/3/2019
SUPERVISED BY:	PV	

Project Location Map	MC² PROJ. NO.	SHEET NO.
Windy Hill Road - Terrell Mill Road Connector Marietta, Cobb County, Georgia	A121503.122	1



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0002

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Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

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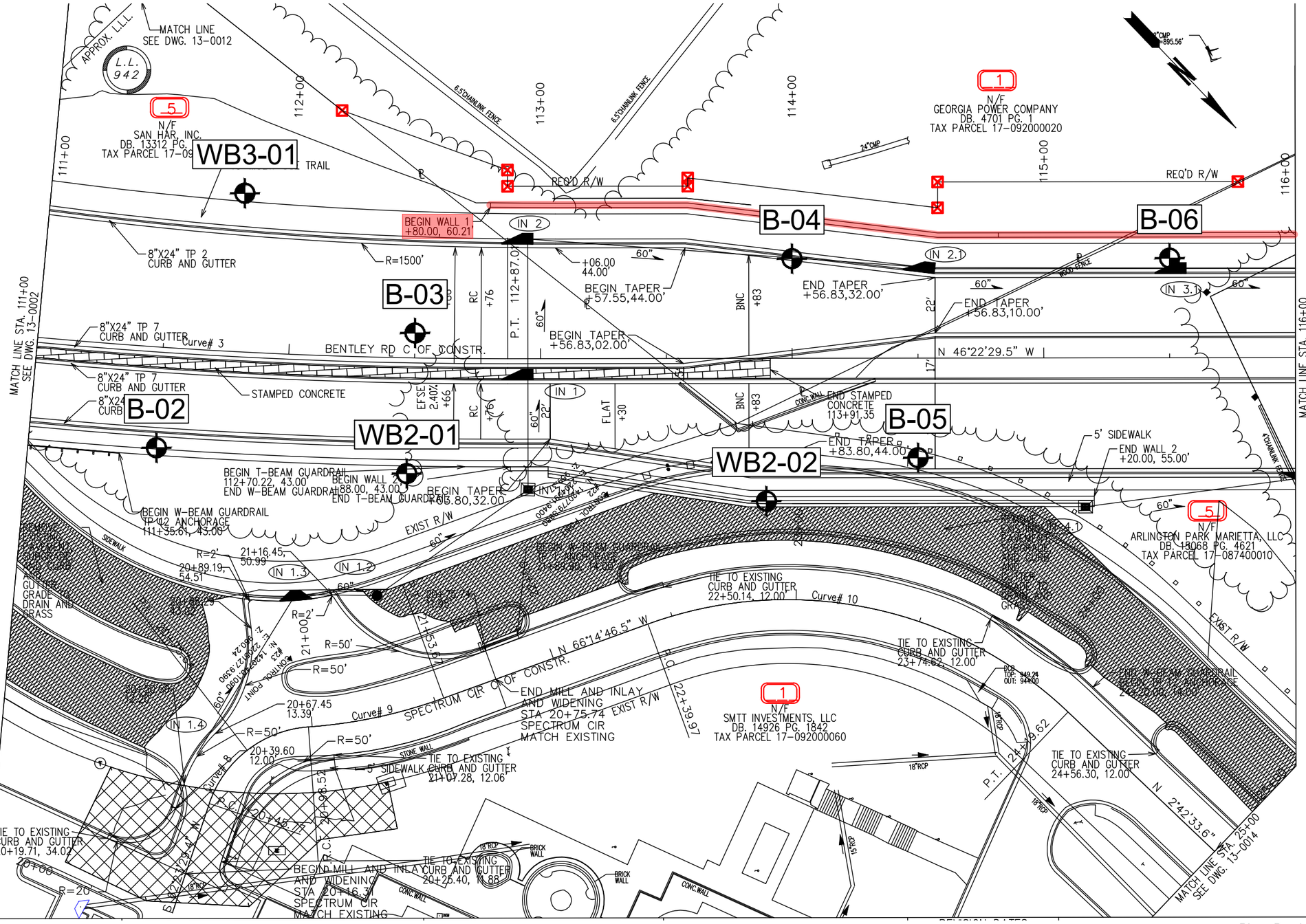

LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0003

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Windy Hill Road - Terrell Mill Road Connector
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MC² PROJ. NO.: A121503.122

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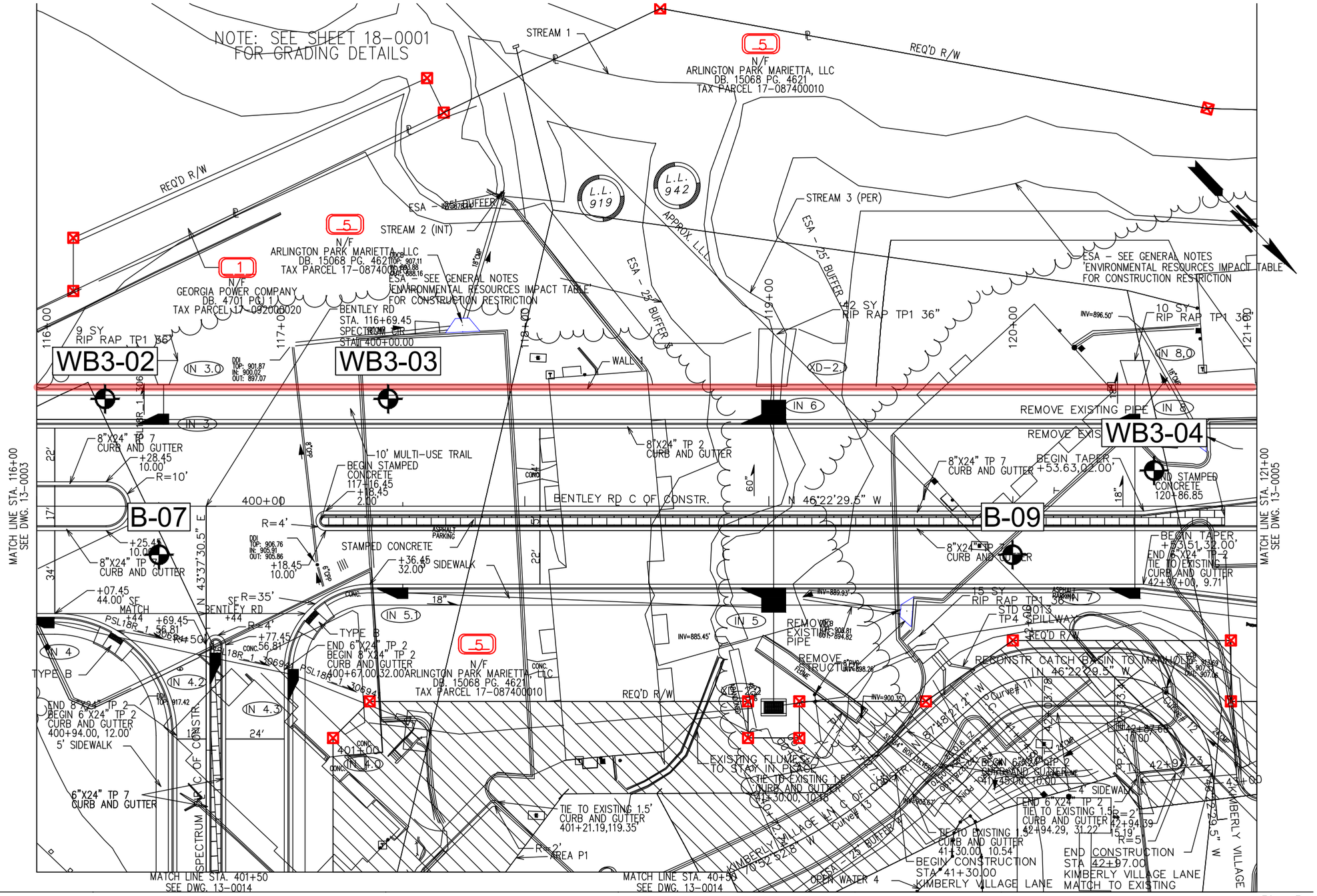

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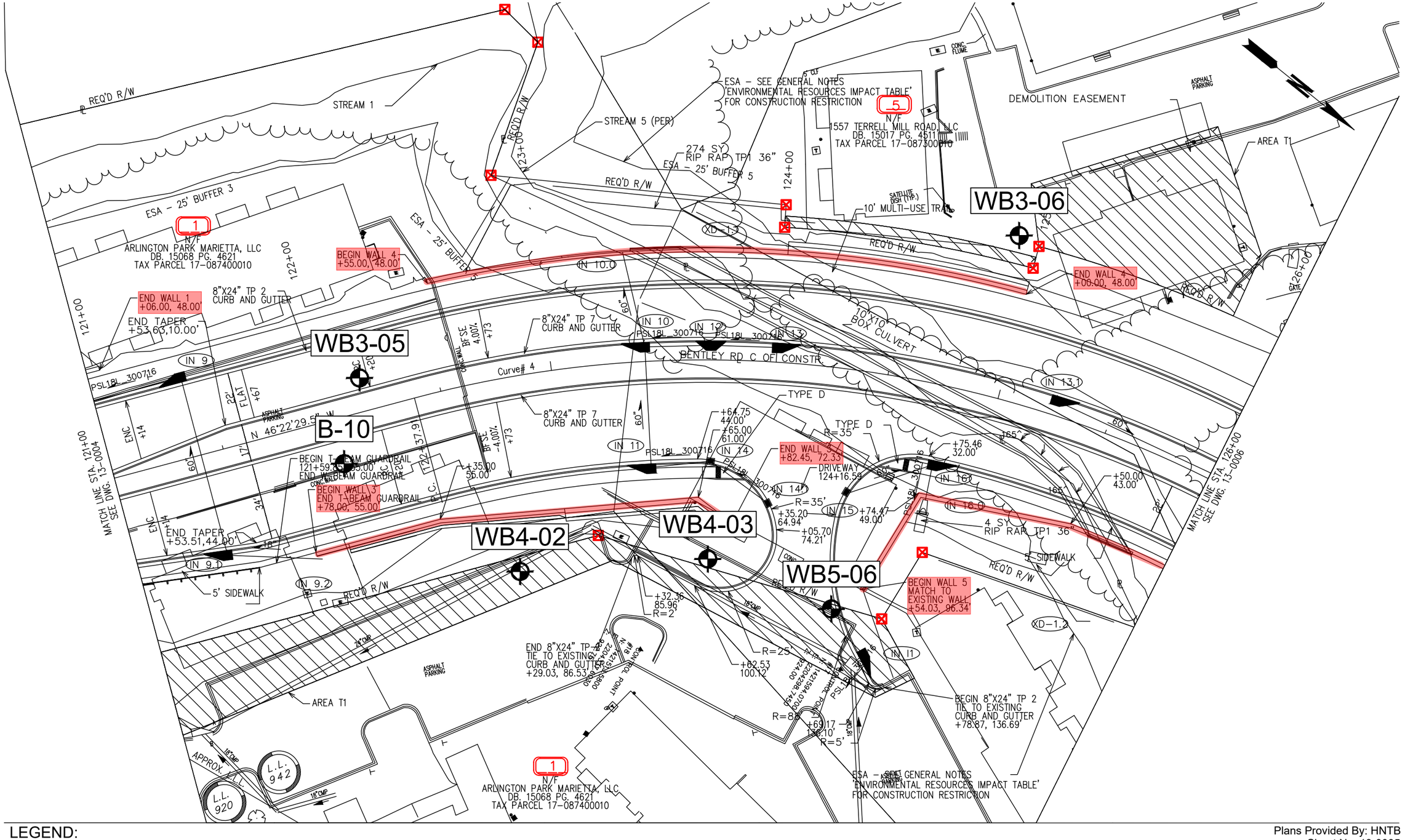
A121503.122	4



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Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

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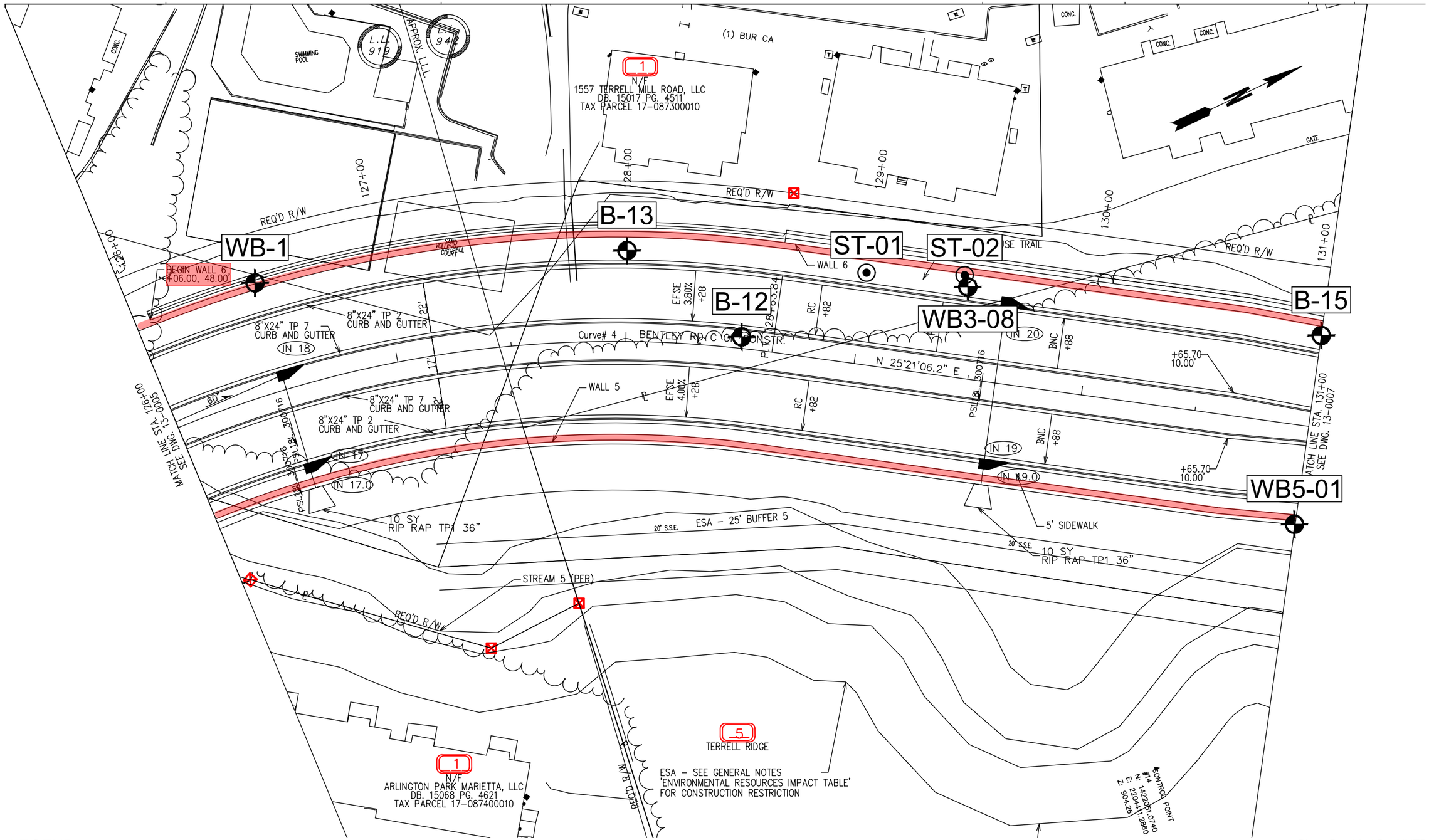

LEGEND:

- Approximate SPT Boring Location
- Approximate Stand Up Test Location

Plans Provided By: HNTB
Sheet No. 13-0006

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Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

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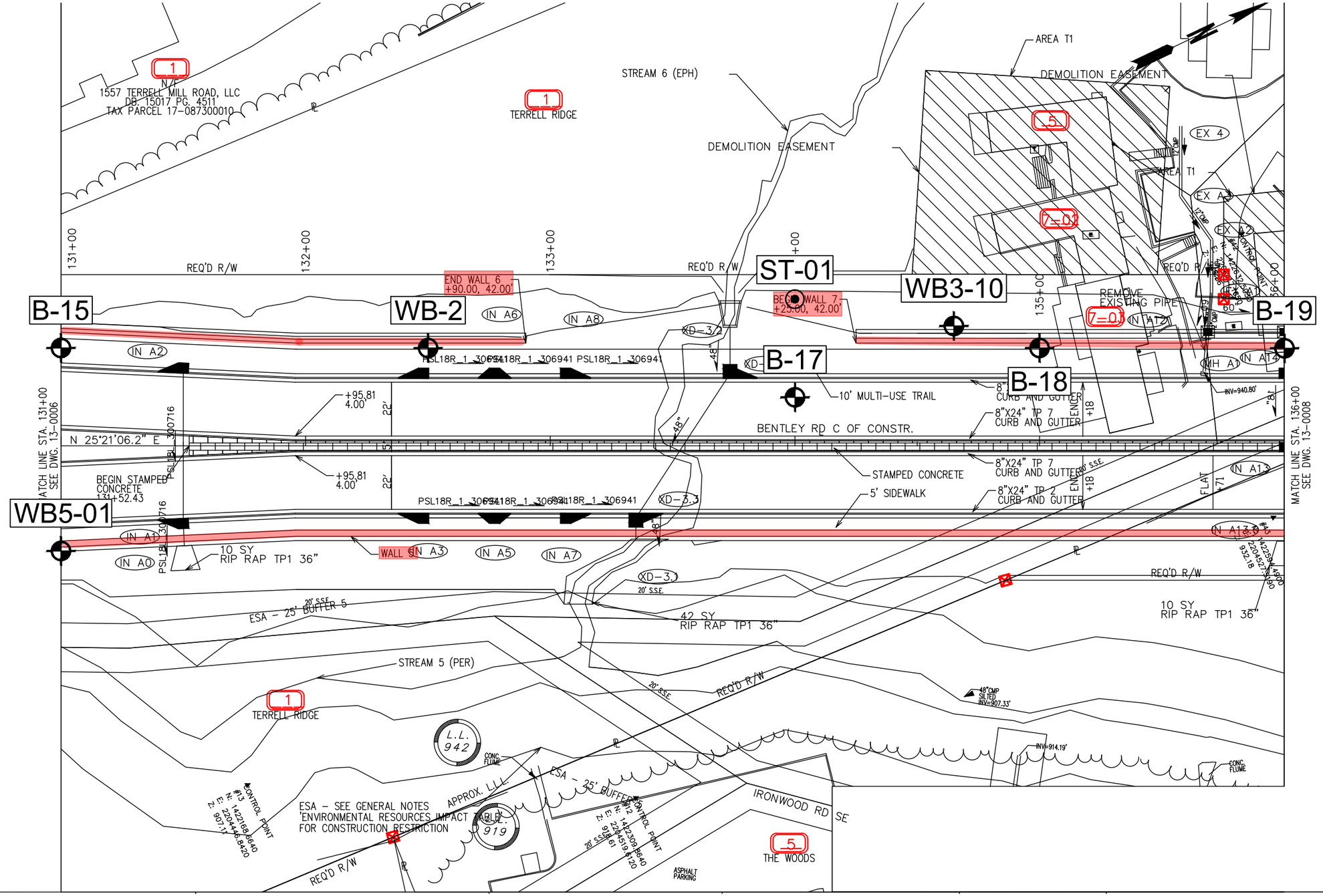

LEGEND:

- Approximate SPT Boring Location
- Approximate Stand Up Test Location

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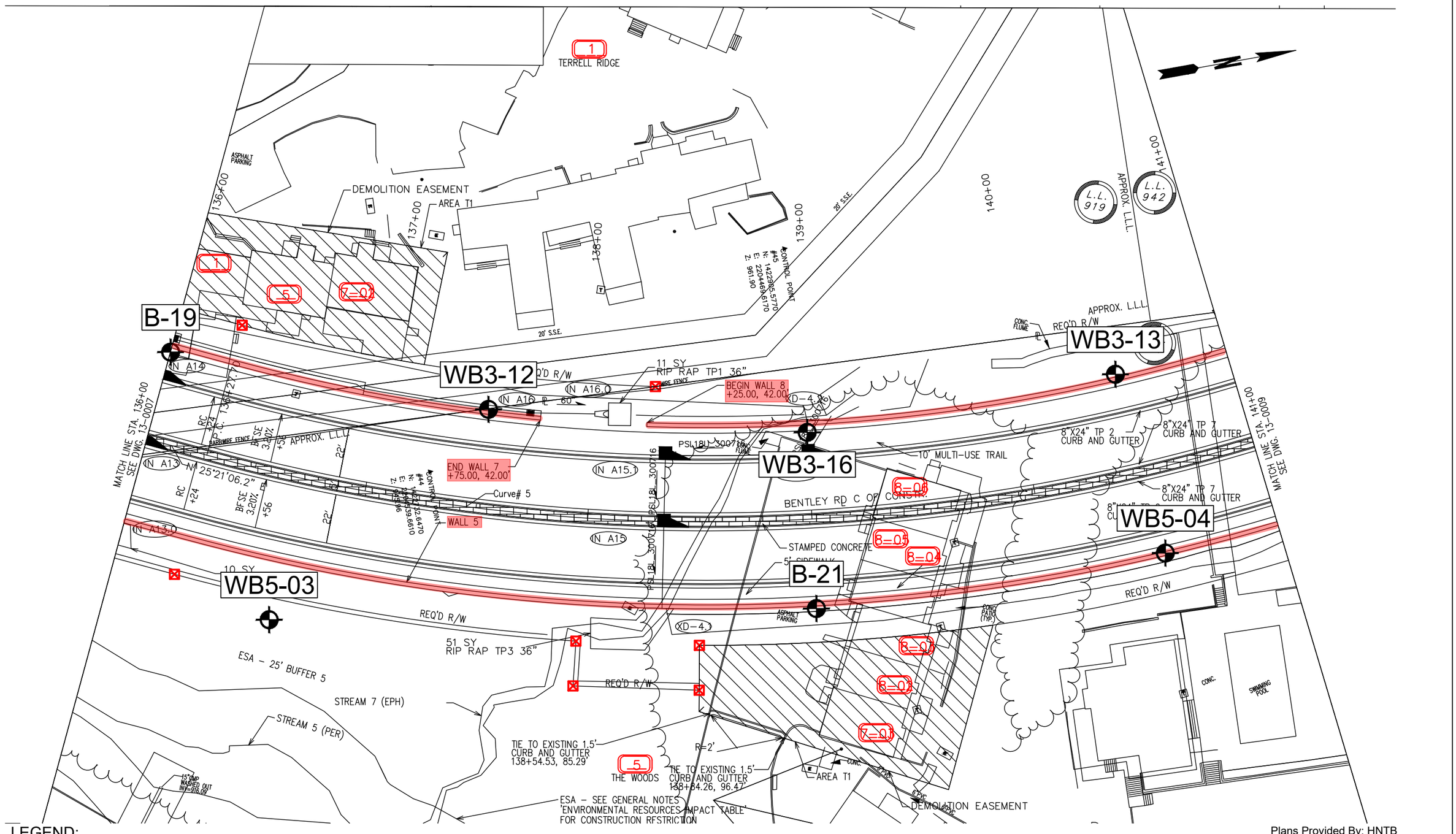

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Approximate SPT Boring Location

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MC² PROJ. NO.: A121503.122

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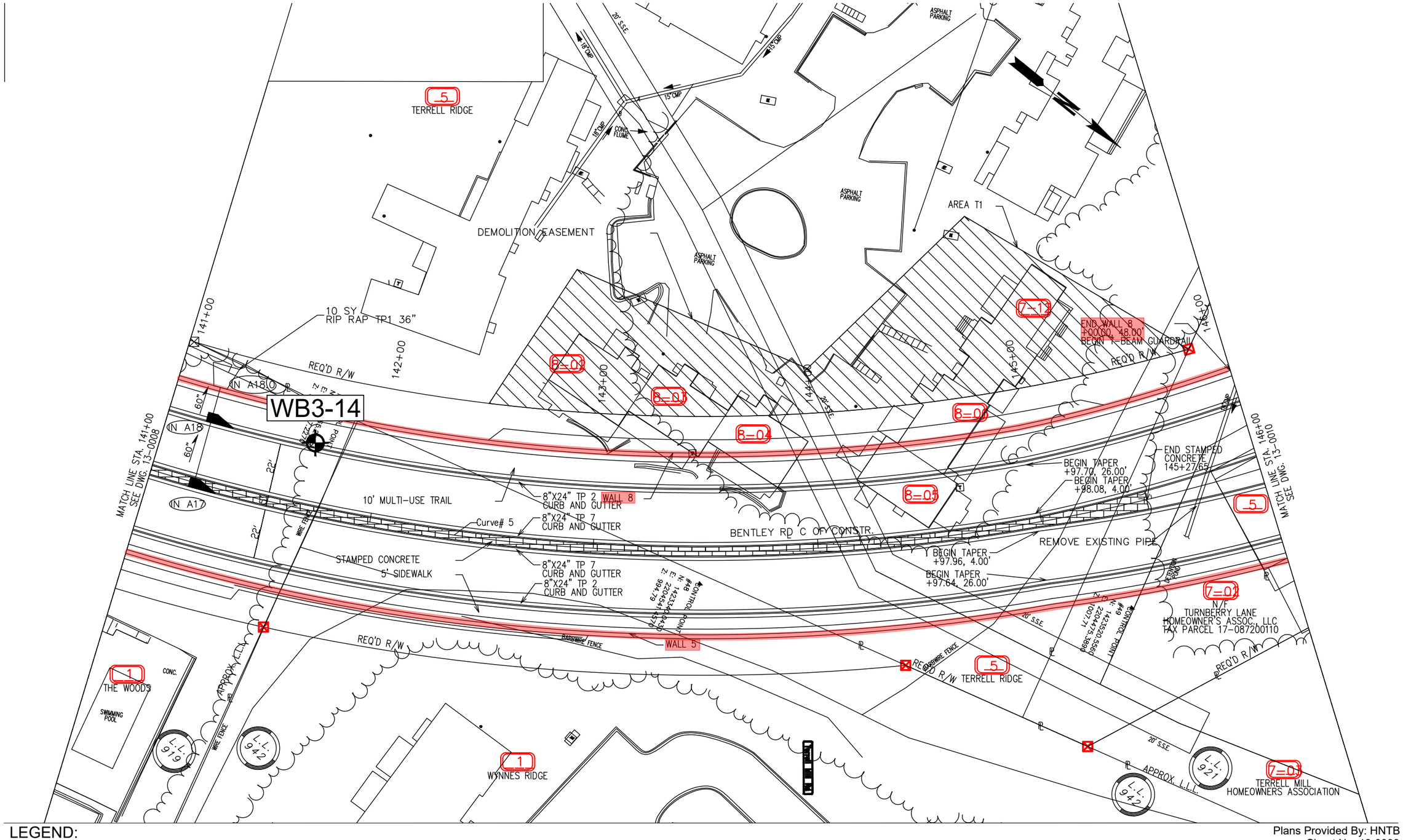

LEGEND:

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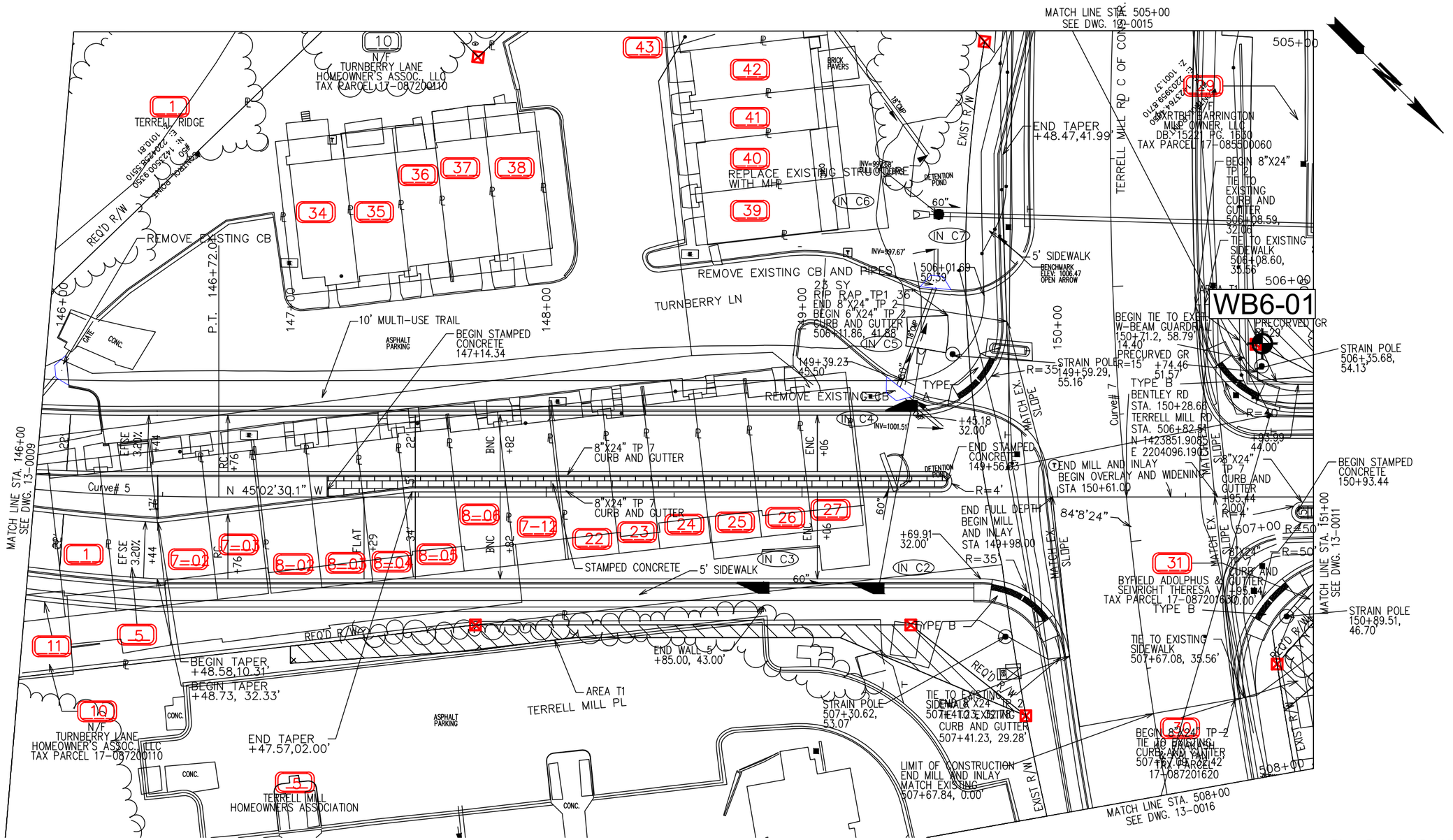
MC² PROJ. NO.: A121503.122

SHEET NO.: 9



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0010

DATE	NAME	REVISION	APPROVED BY:

MC² Geotechnical • Environmental Materials Testing

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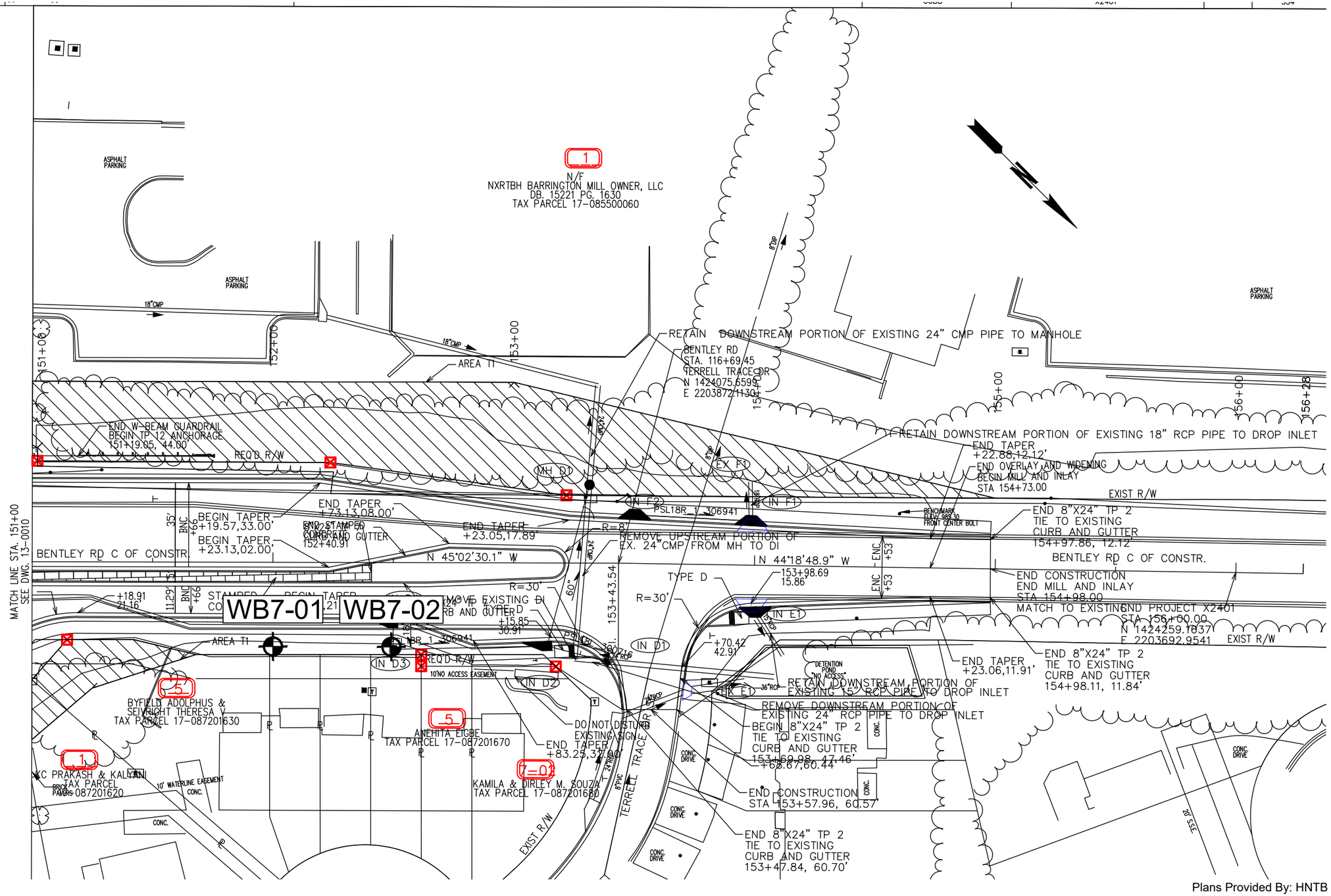
GEORGIA ENGINEERING CERTIFICATE OF AUTHORIZATION No. PEF004822
Prashanth Vaddu, P.E.
GEORGIA LICENSE No. PE039820

	NAME	DATE
DESIGNED BY:	TC	12/27/2018
DRAWN BY:	TC	12/28/2018
CHECKED BY:	AM	1/3/2019
SUPERVISED BY:	PV	

Boring Location Map	MC² PROJ. NO.	SHEET NO.
Windy Hill Road - Terrell Mill Road Connector Marietta, Cobb County, Georgia	A121503.122	10



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0011

DATE	NAME	REVISION	APPROVED BY:

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Boring Location Map

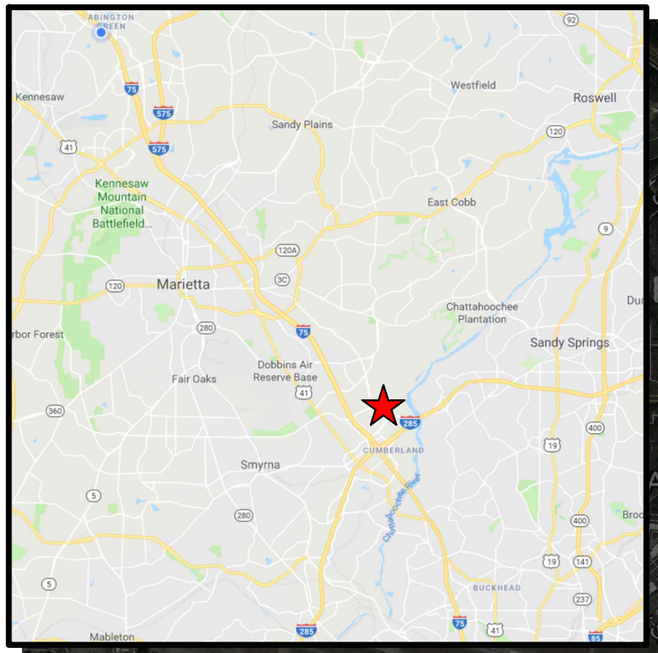
Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

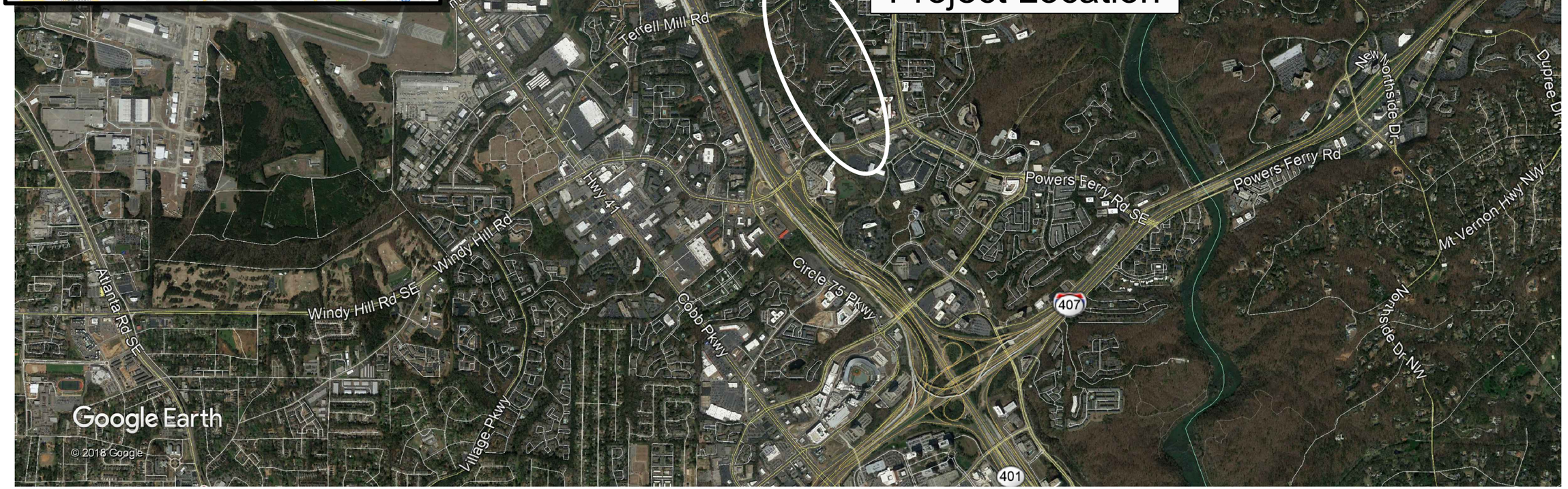
MC² PROJ. NO.: A121503.122

SHEET NO.: 11

APPENDIX I

- Subsurface Boring Profiles – Sheets 12 through 21
- Legend – Sheet 22
- Soil Profiles (gINT) – 40 Pages





LEGEND:

★ Project Location

Source: Google Earth
Image Date: 3/14/2018

0mi 0.5mi 1mi

Graphic Scale (miles)

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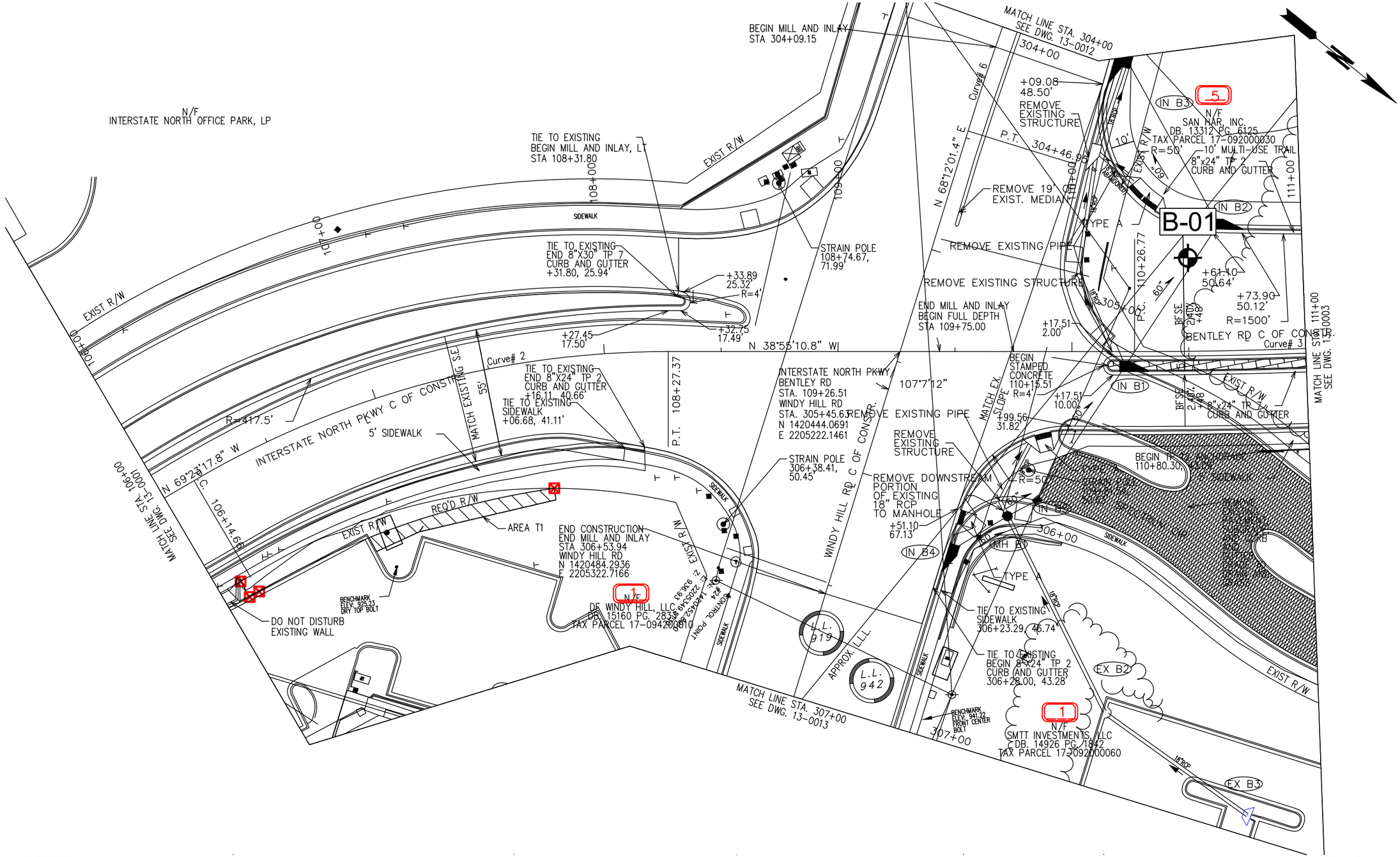
Project Location Map	MC² PROJ. NO.	SHEET NO.
Windy Hill Road - Terrell Mill Road Connector Marietta, Cobb County, Georgia	A121503.122	1



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0002

DATE	NAME	REVISION	APPROVED BY:

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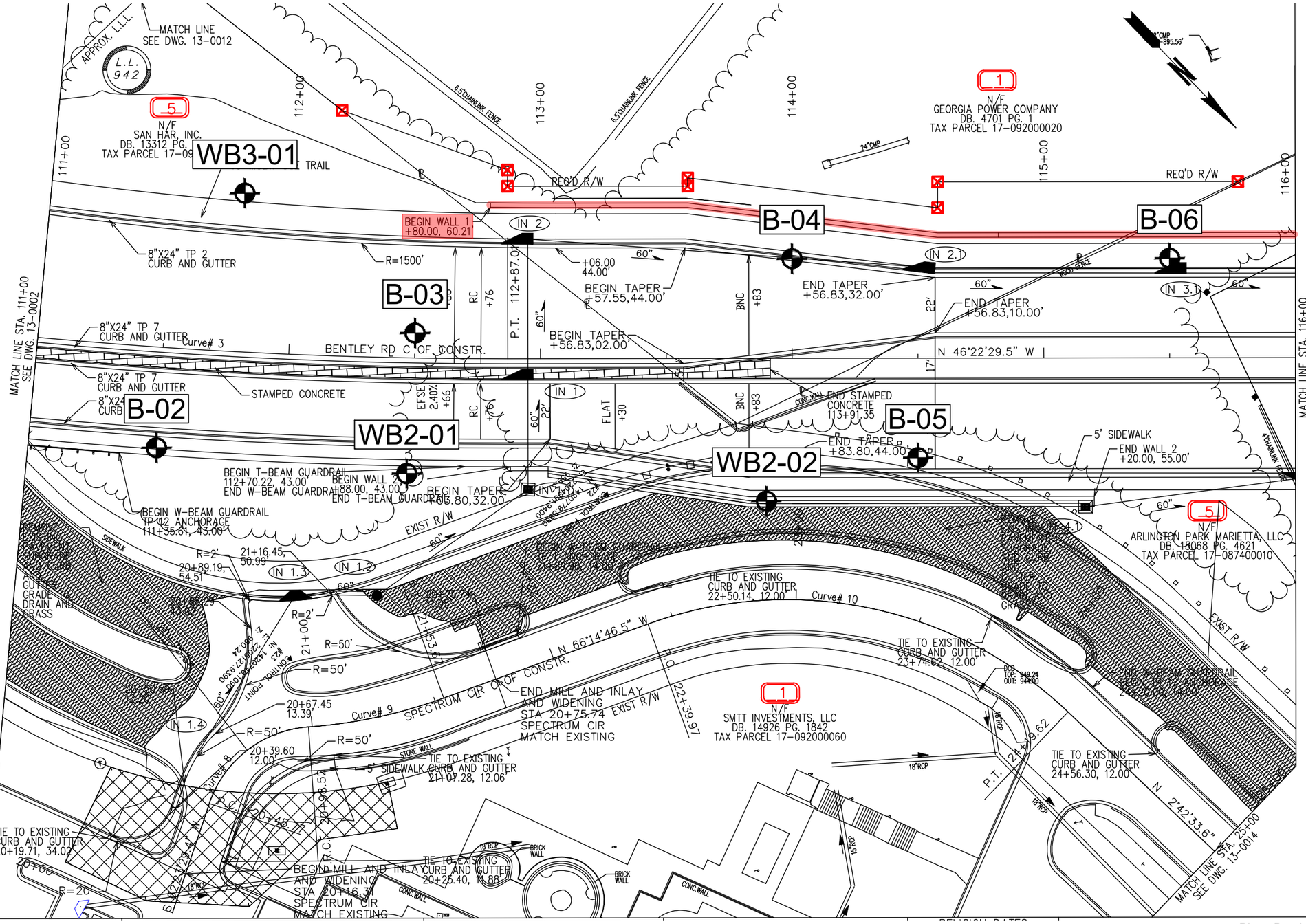
SUPERVISED BY:	PV	

Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 2



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0003

DATE	NAME	REVISION	APPROVED BY:

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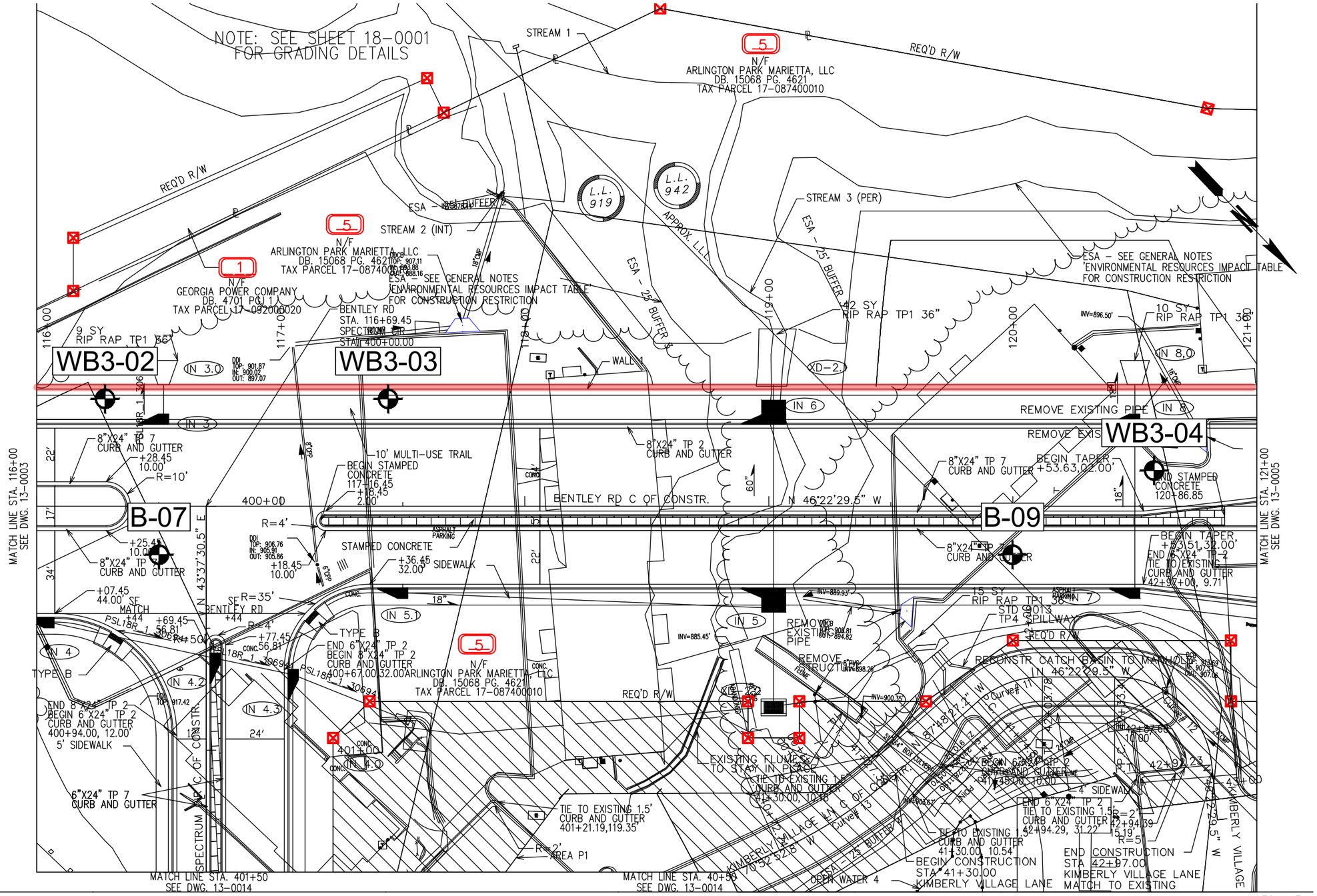
SUPERVISED BY:	PV	

Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 3



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0004

DATE	NAME	REVISION	APPROVED BY:

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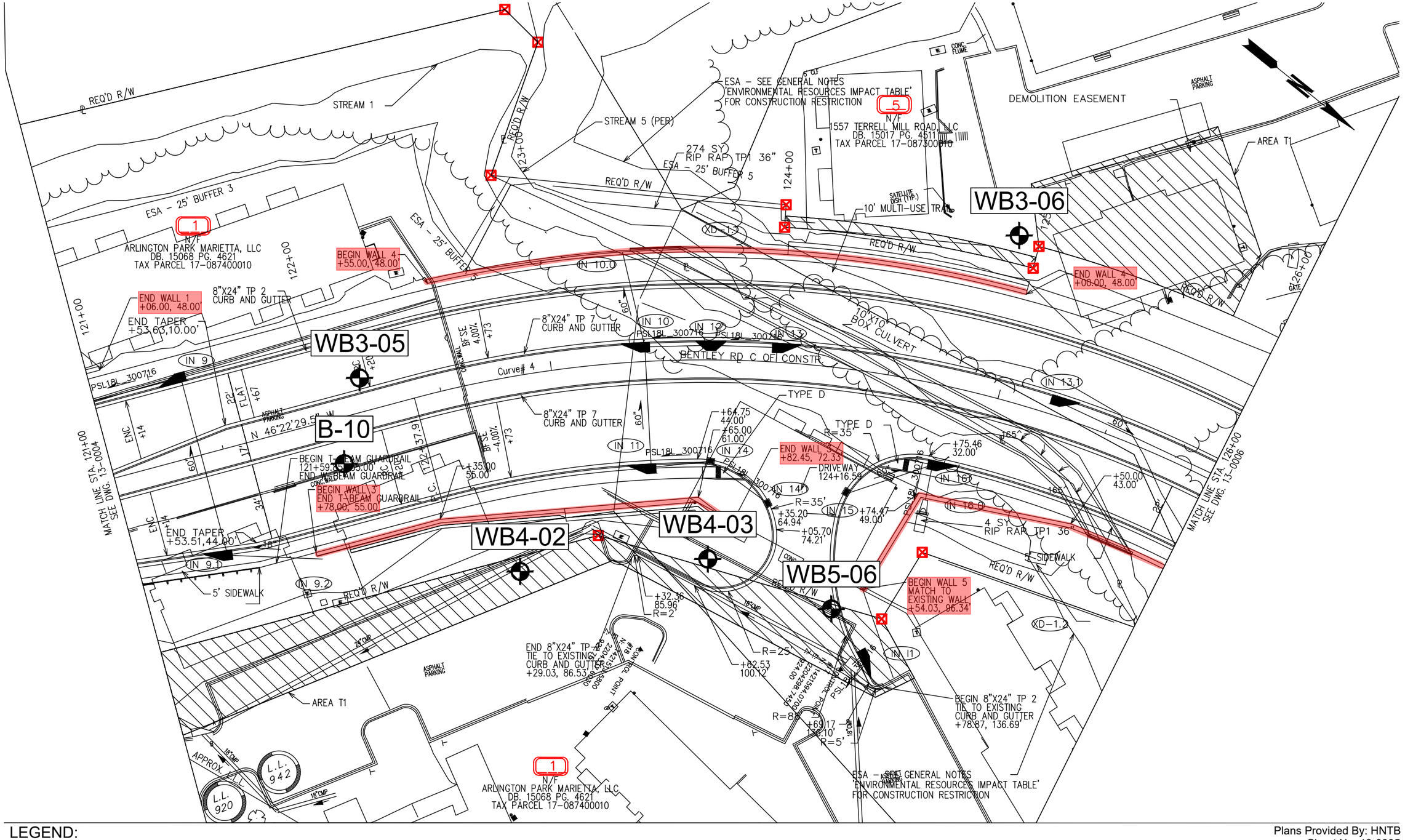
SUPERVISED BY:	PV	

Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.	SHEET NO.
A121503.122	4



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0005

DATE	NAME	REVISION	APPROVED BY:

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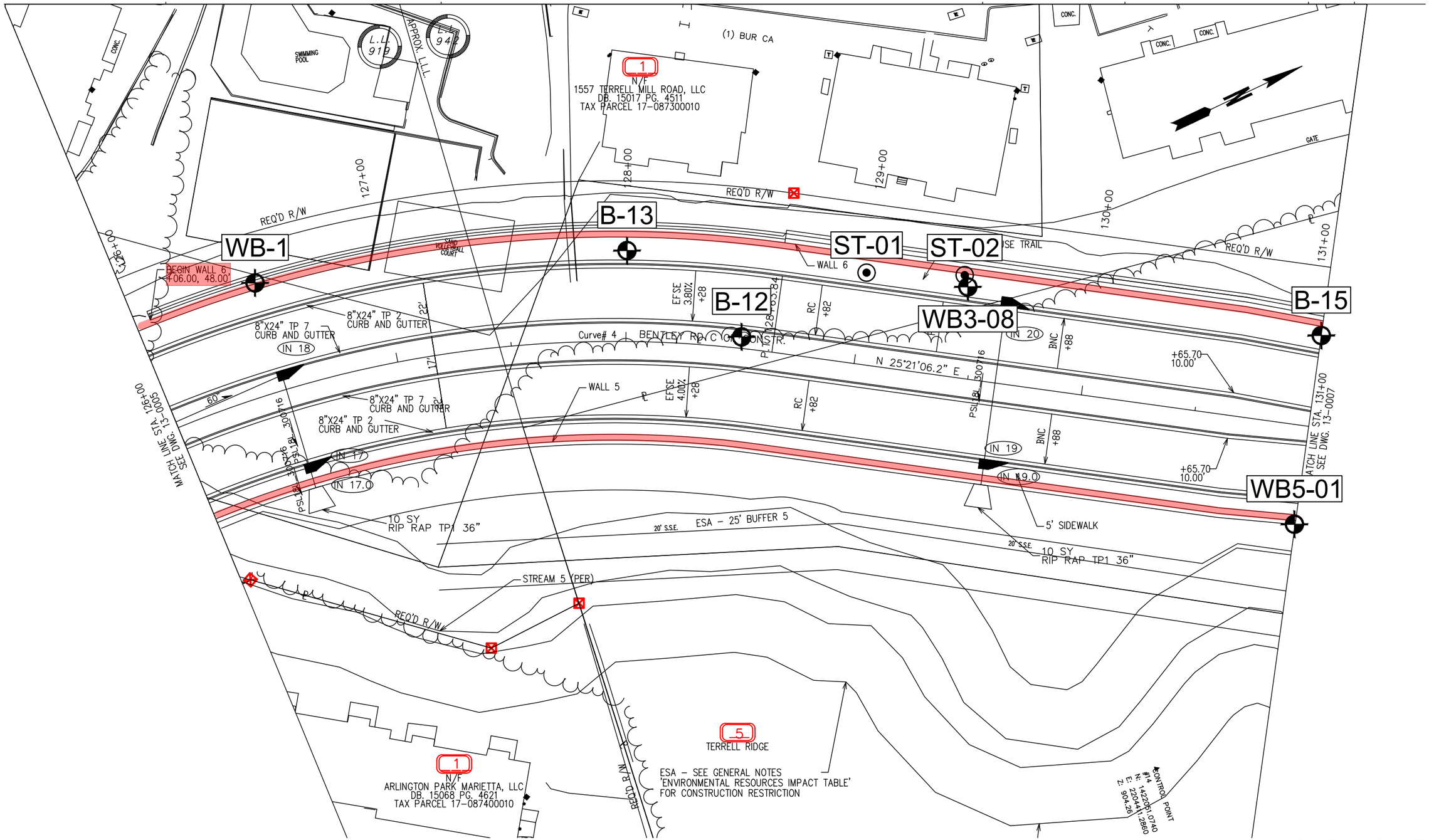
DRAWN BY:	TC	12/28/2018
CHECKED BY:	AM	1/3/2019
SUPERVISED BY:	PV	

Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 5



LEGEND:

- Approximate SPT Boring Location
- Approximate Stand Up Test Location

Plans Provided By: HNTB
Sheet No. 13-0006

DATE	NAME	REVISION	APPROVED BY:

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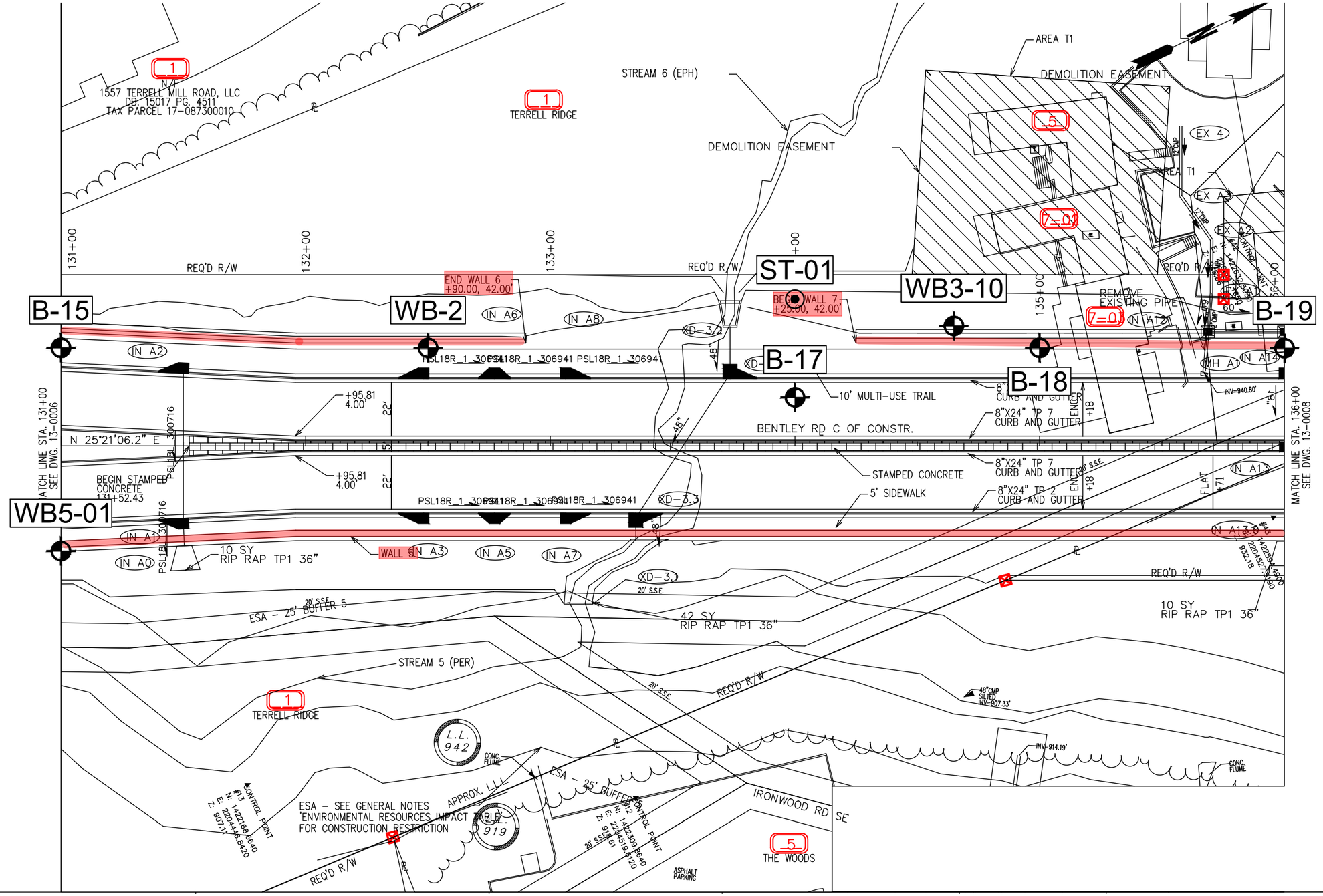
SUPERVISED BY:	PV	

Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 6



LEGEND:

- Approximate SPT Boring Location
- Approximate Stand Up Test Location

Plans Provided By: HNTB
Sheet No. 13-0007

DATE	NAME	REVISION	APPROVED BY:

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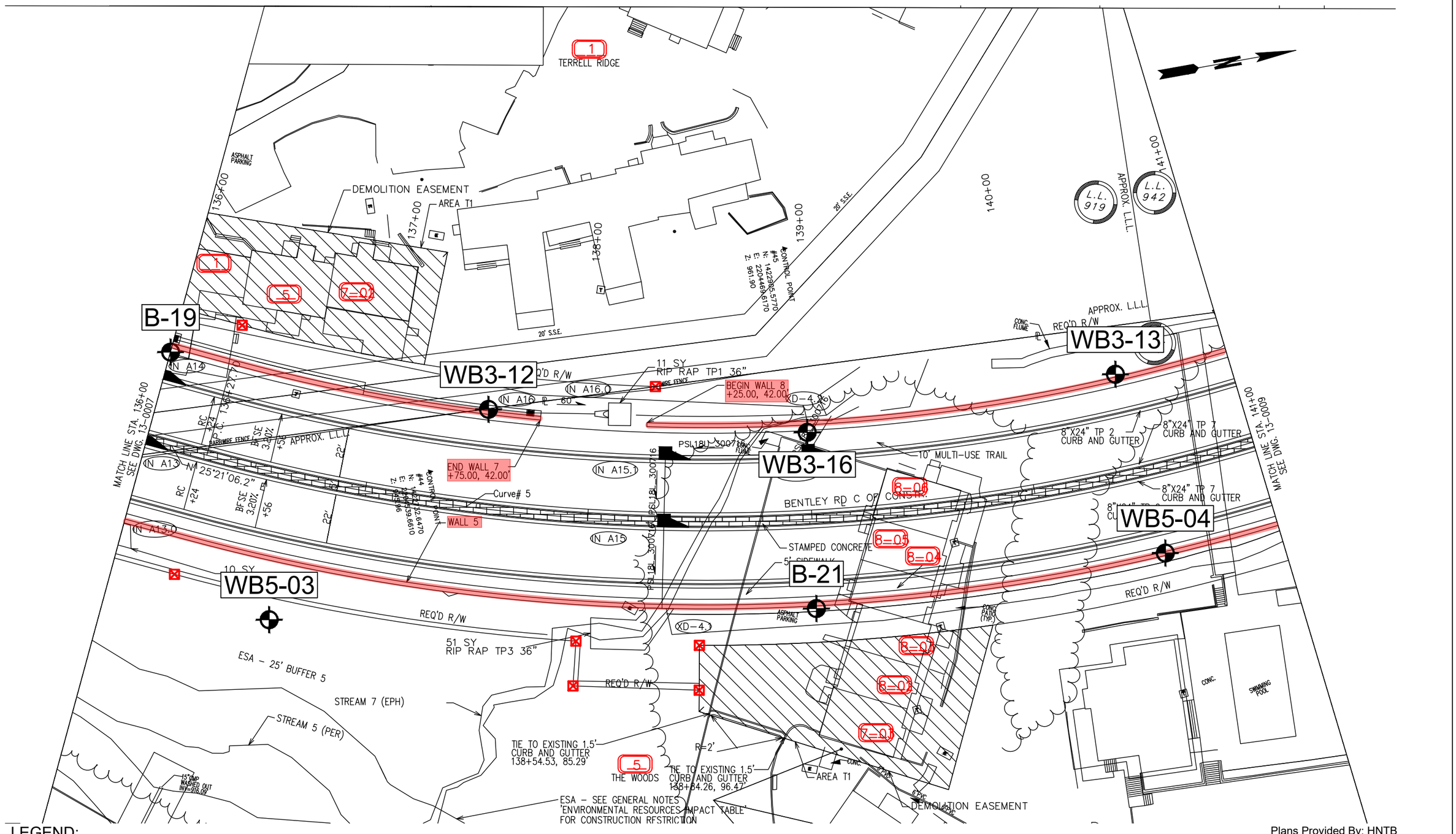
CHECKED BY:	AM	1/3/2019
SUPERVISED BY:	PV	

Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 7



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0008

DATE	NAME	REVISION	APPROVED BY:

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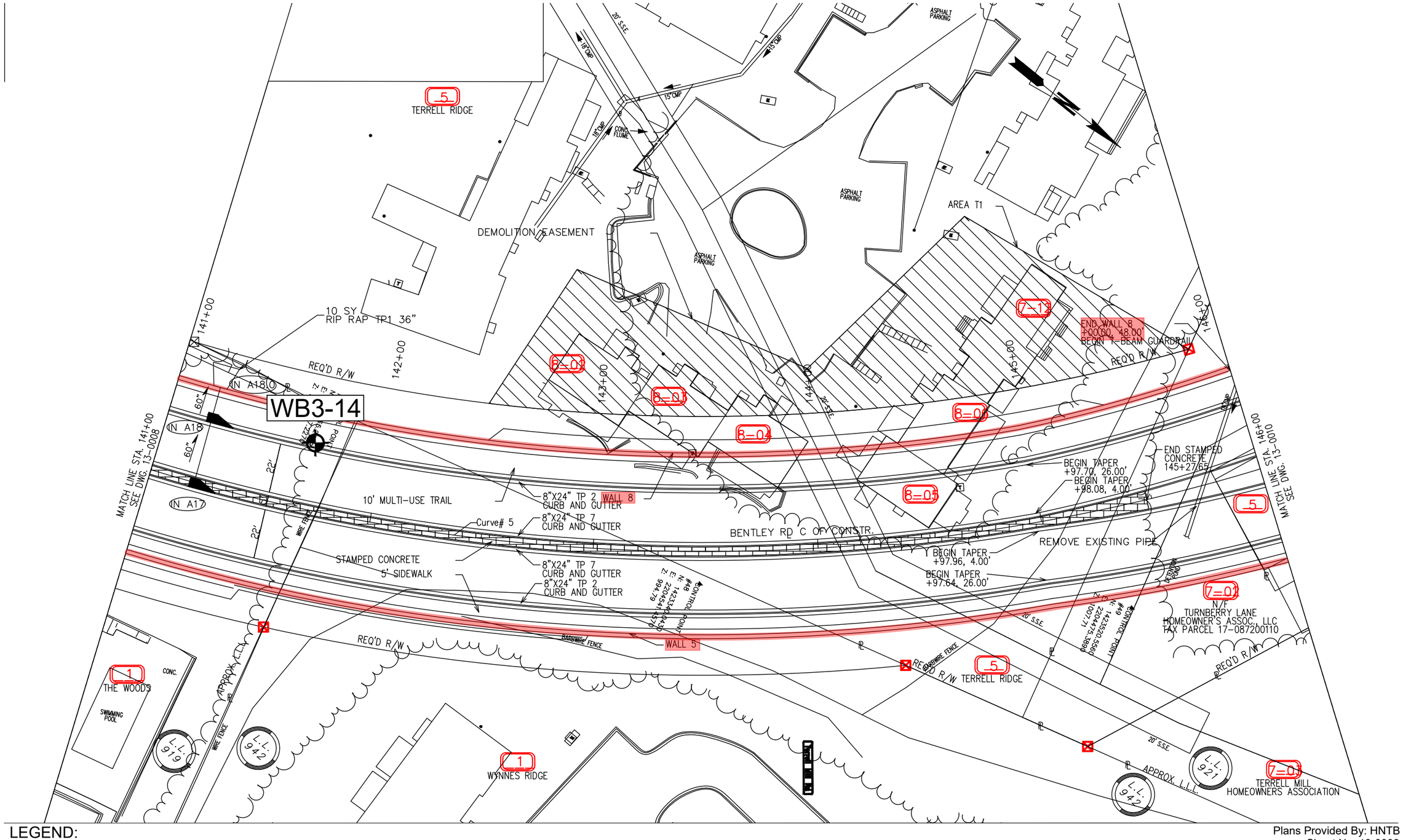
Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 8



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0009

DATE	NAME	REVISION	APPROVED BY:

MC SQUARED, INC.
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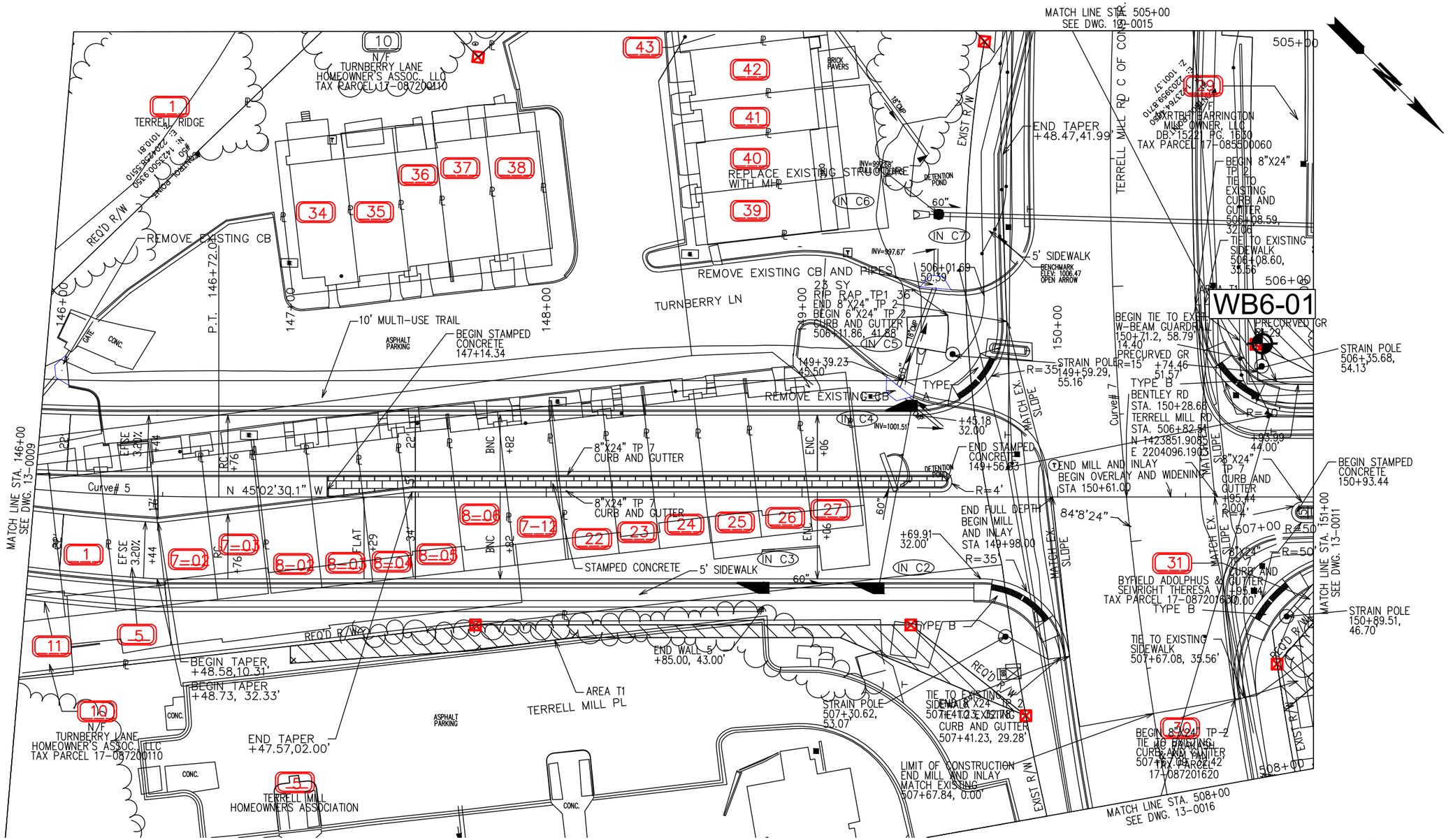
CHECKED BY:	AM	1/3/2019
SUPERVISED BY:	PV	

Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 9



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0010

DATE	NAME	REVISION	APPROVED BY:

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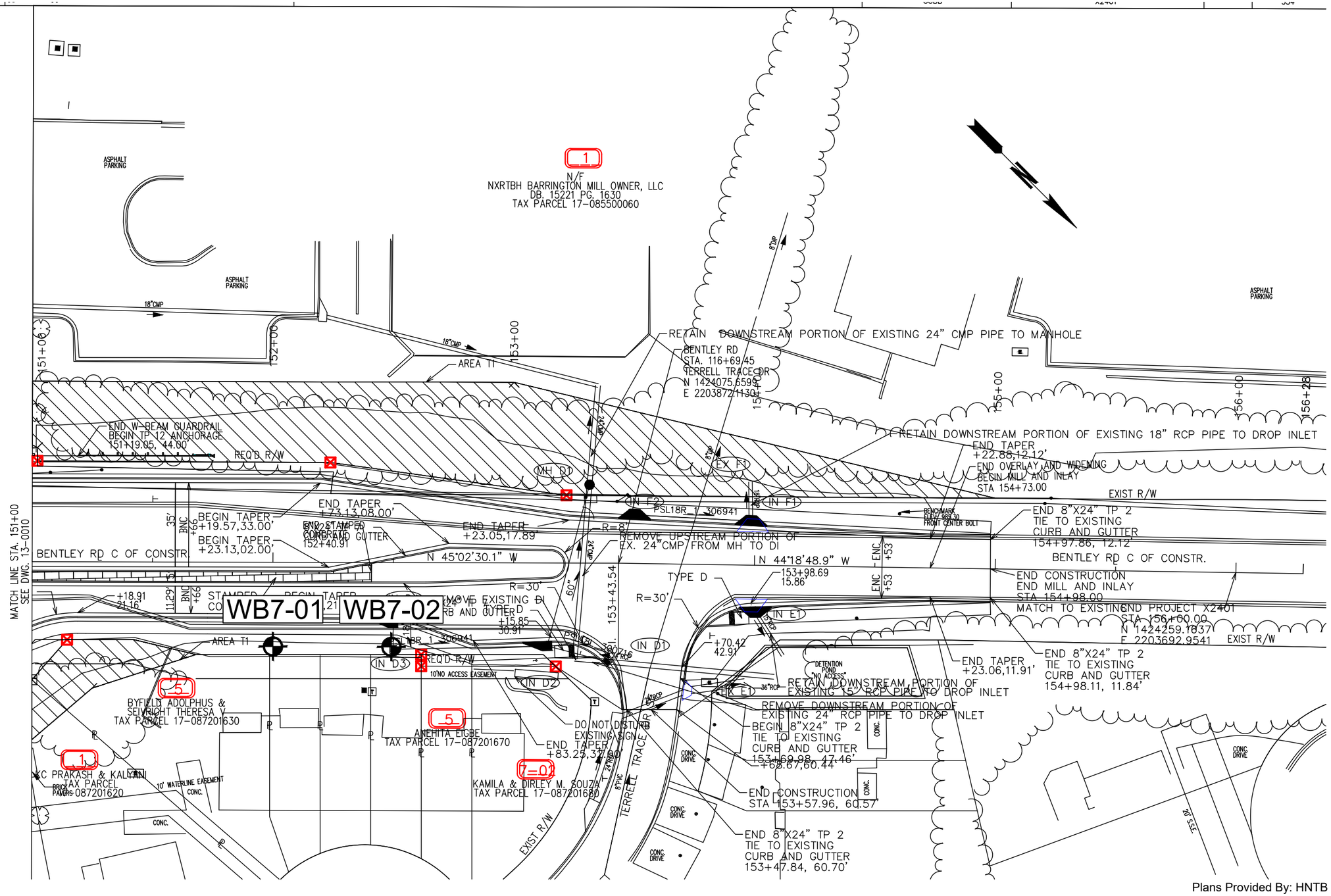
Boring Location Map	MC² PROJ. NO.	SHEET NO.
Windy Hill Road - Terrell Mill Road Connector Marietta, Cobb County, Georgia	A121503.122	10



LEGEND:

Approximate SPT Boring Location

Plans Provided By: HNTB
Sheet No. 13-0011

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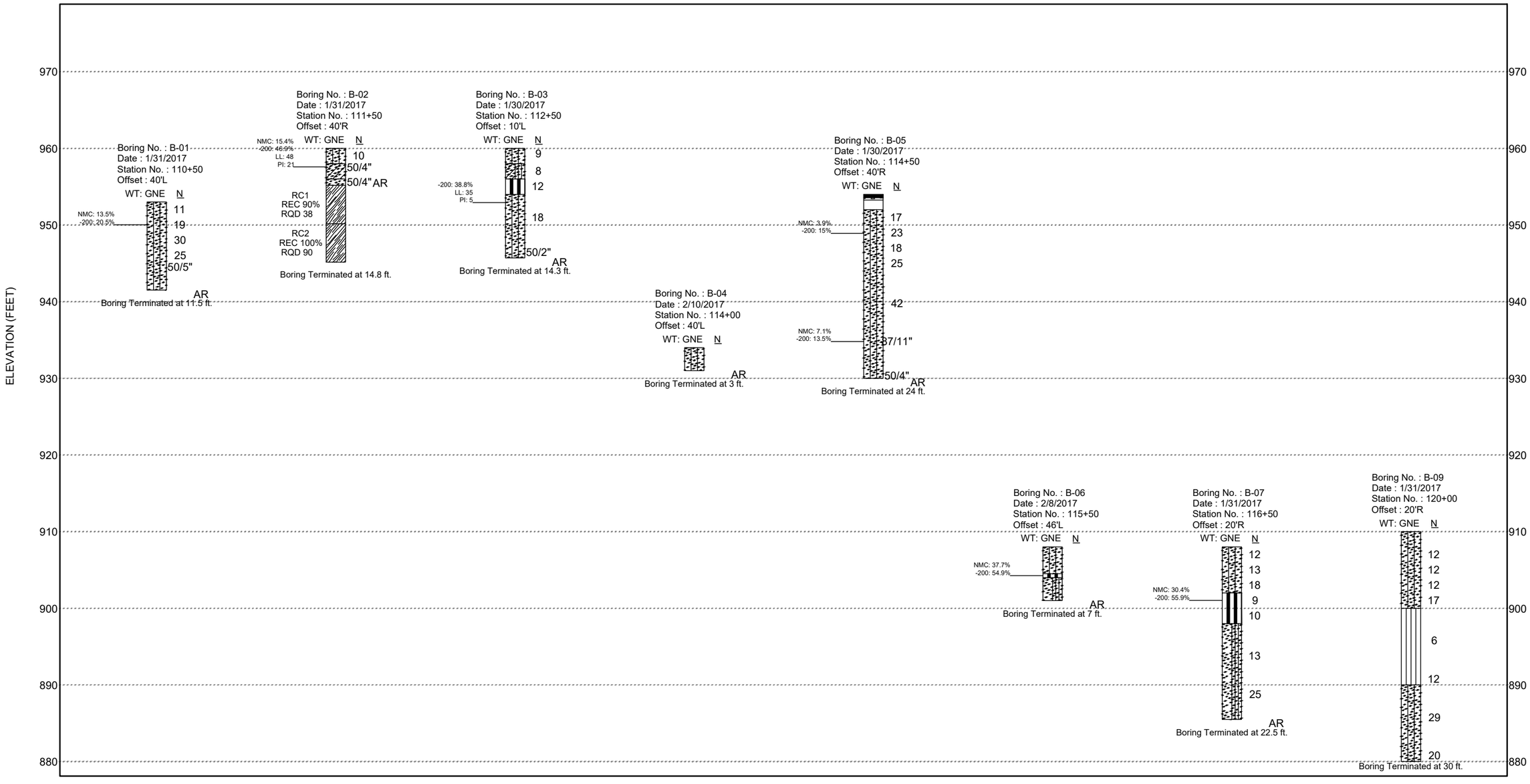
Boring Location Map

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 11

Soil Survey Borings



*N Values Drawn At Middle Of Interval

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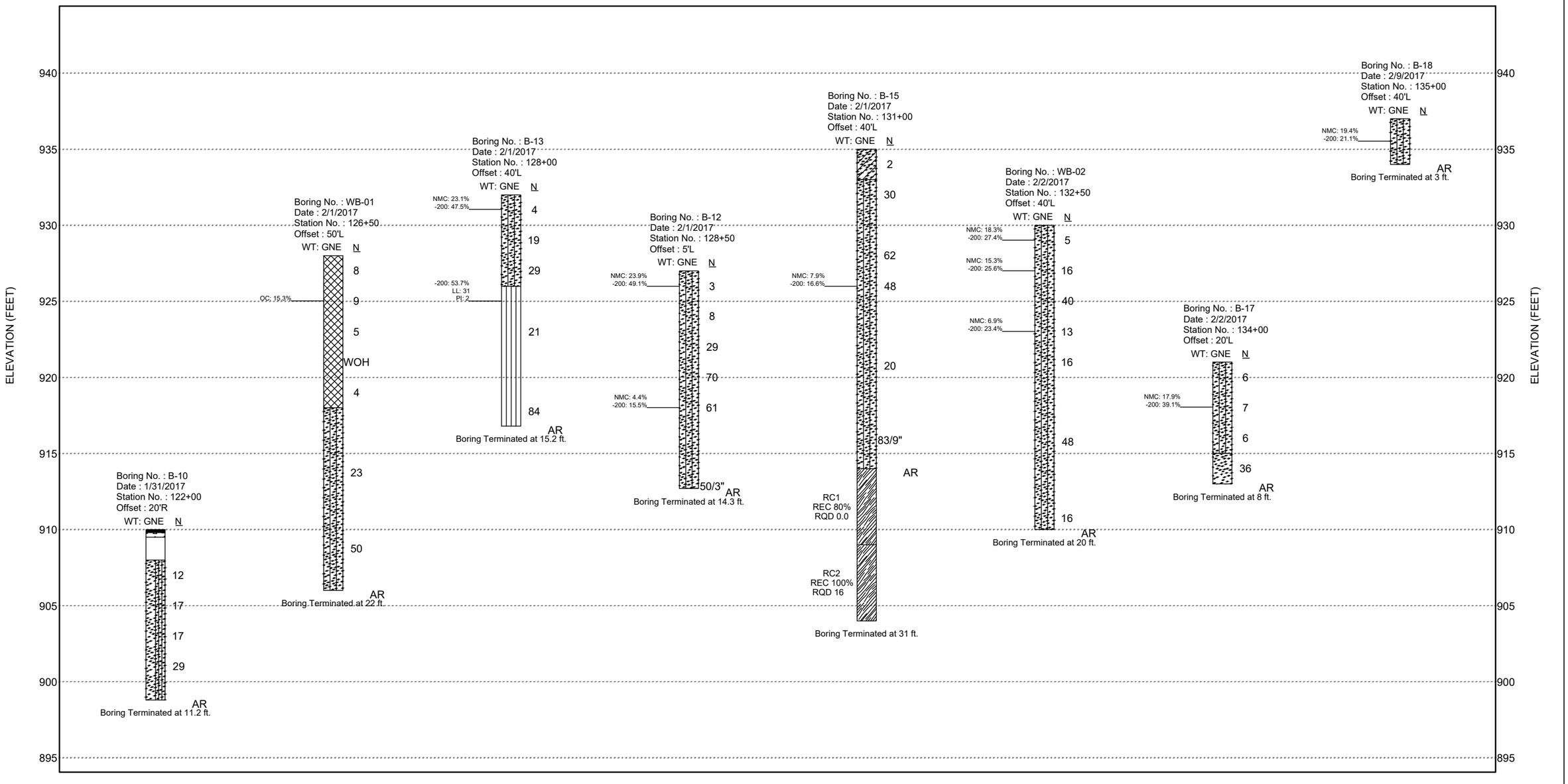
Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 12

Soil Survey Borings



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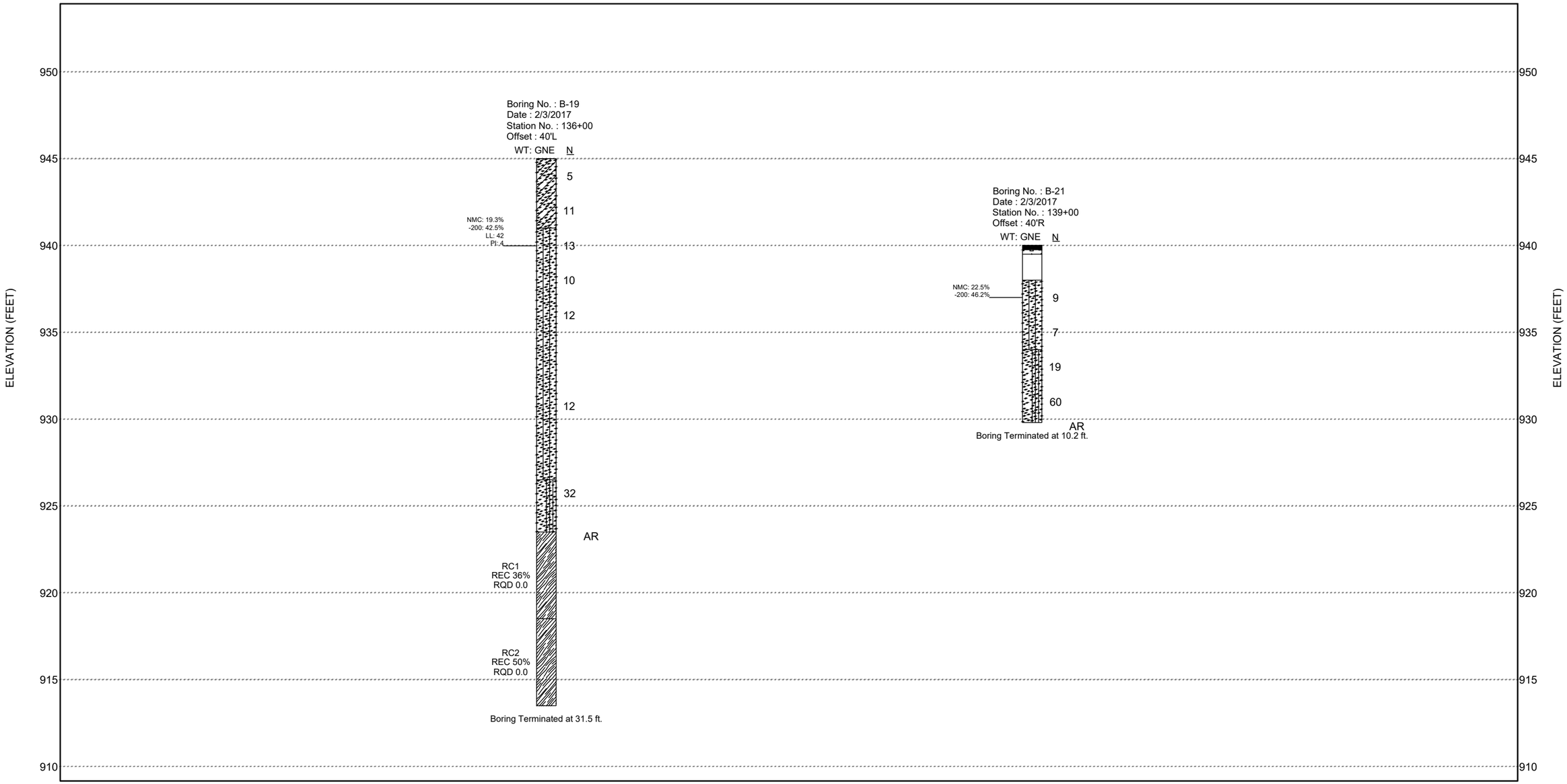
Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 13

Soil Survey Borings



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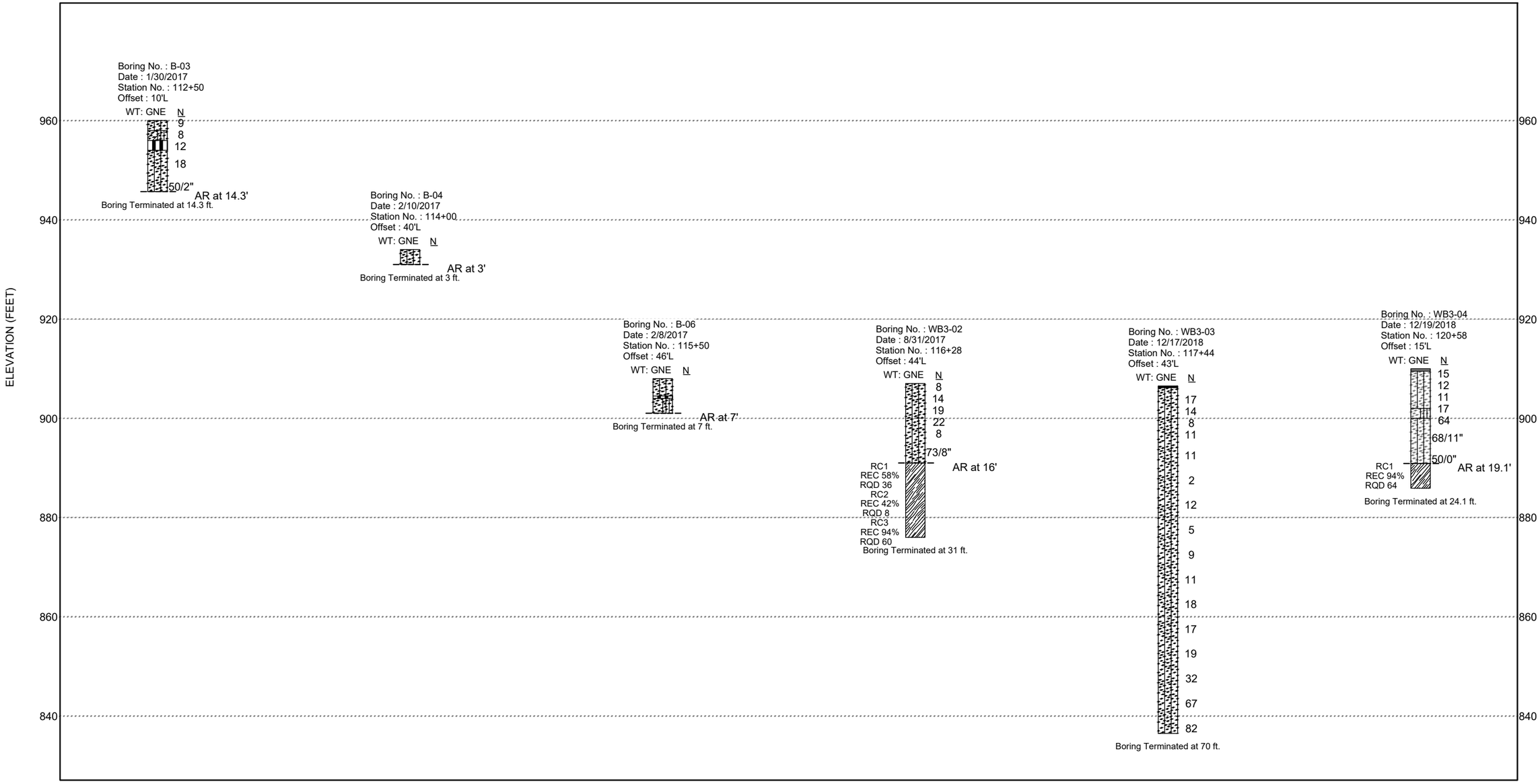
Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 14

Wall 1



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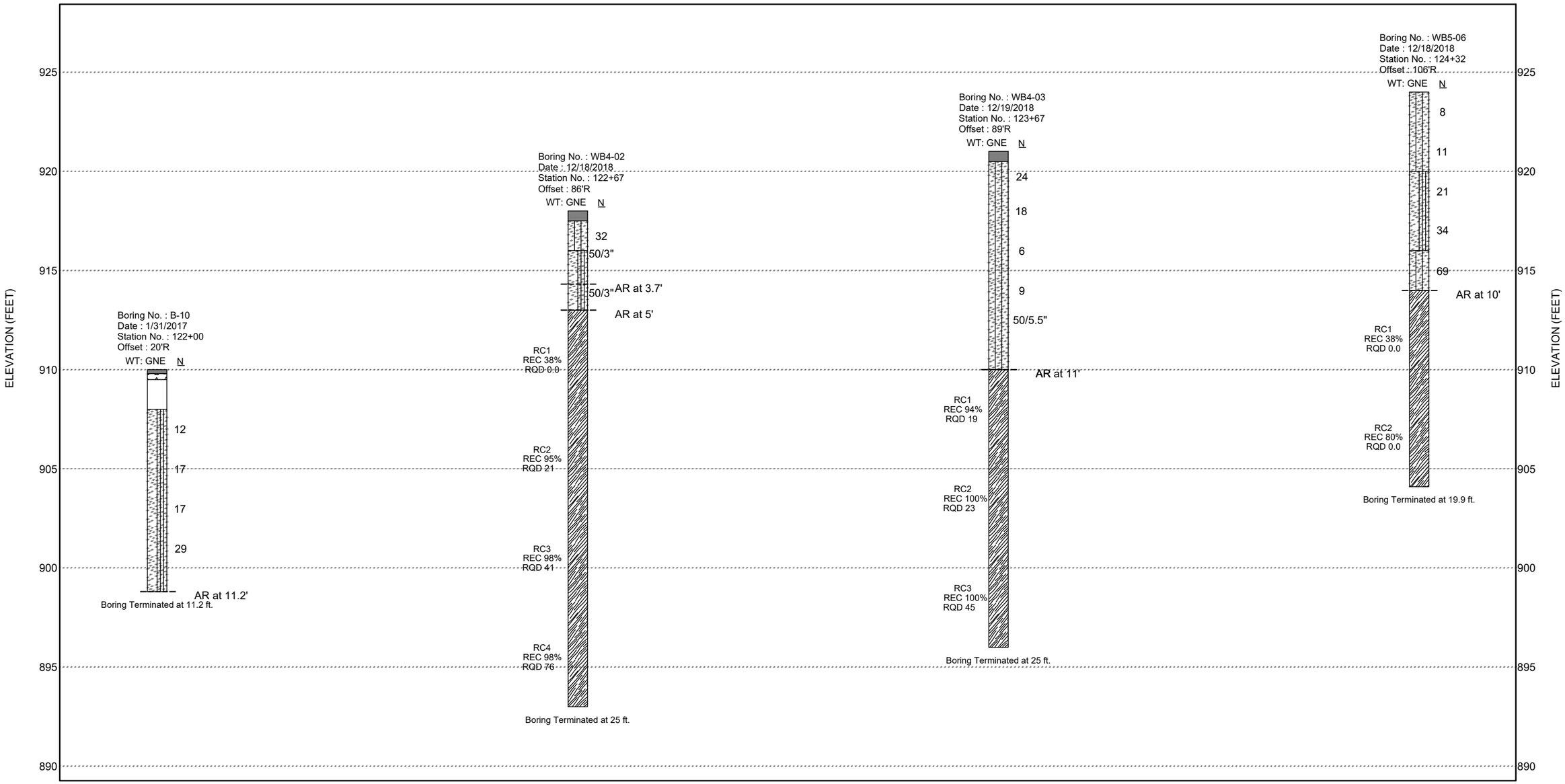
Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 15

Wall 3



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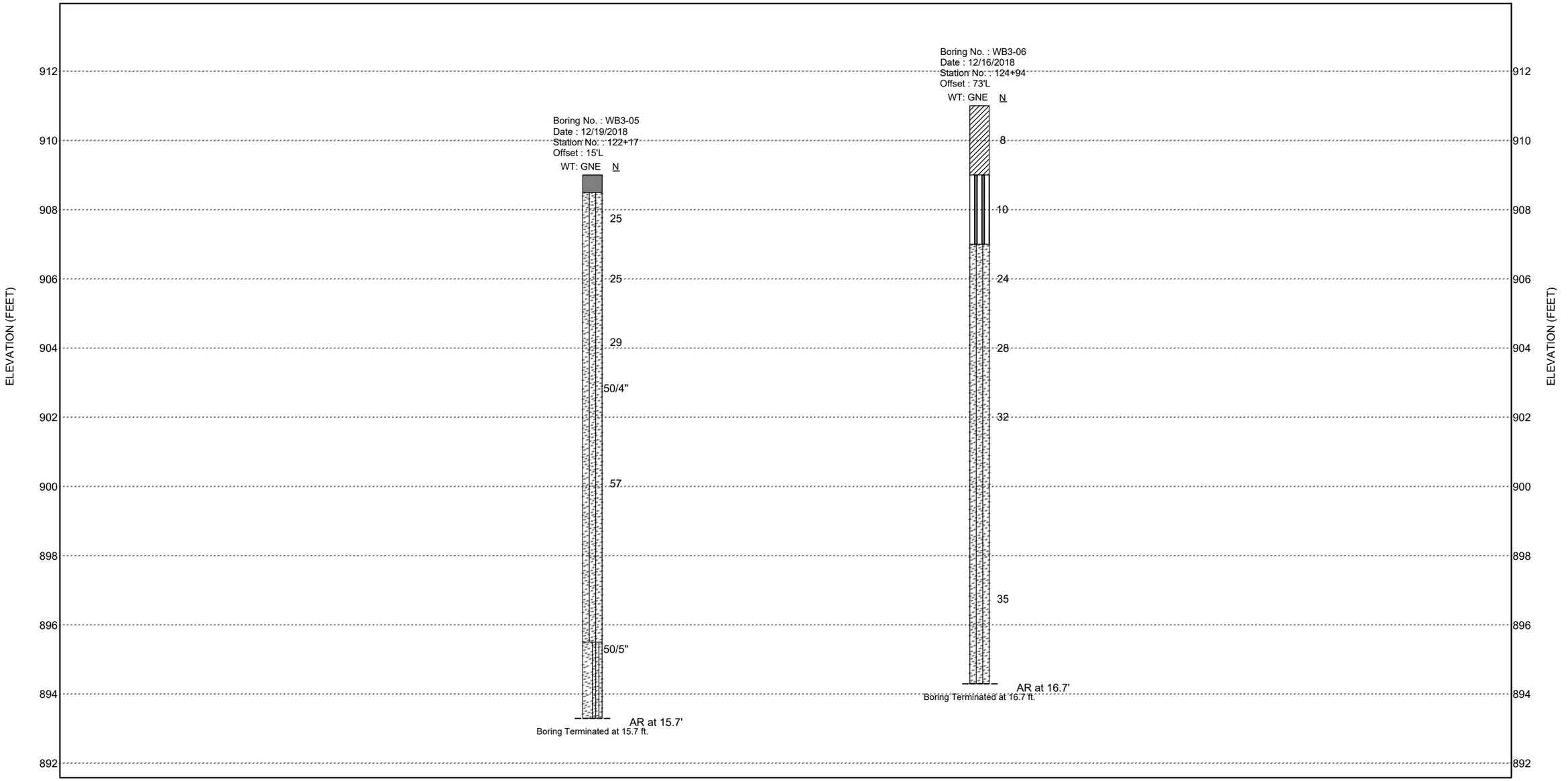
Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 16

Wall 4



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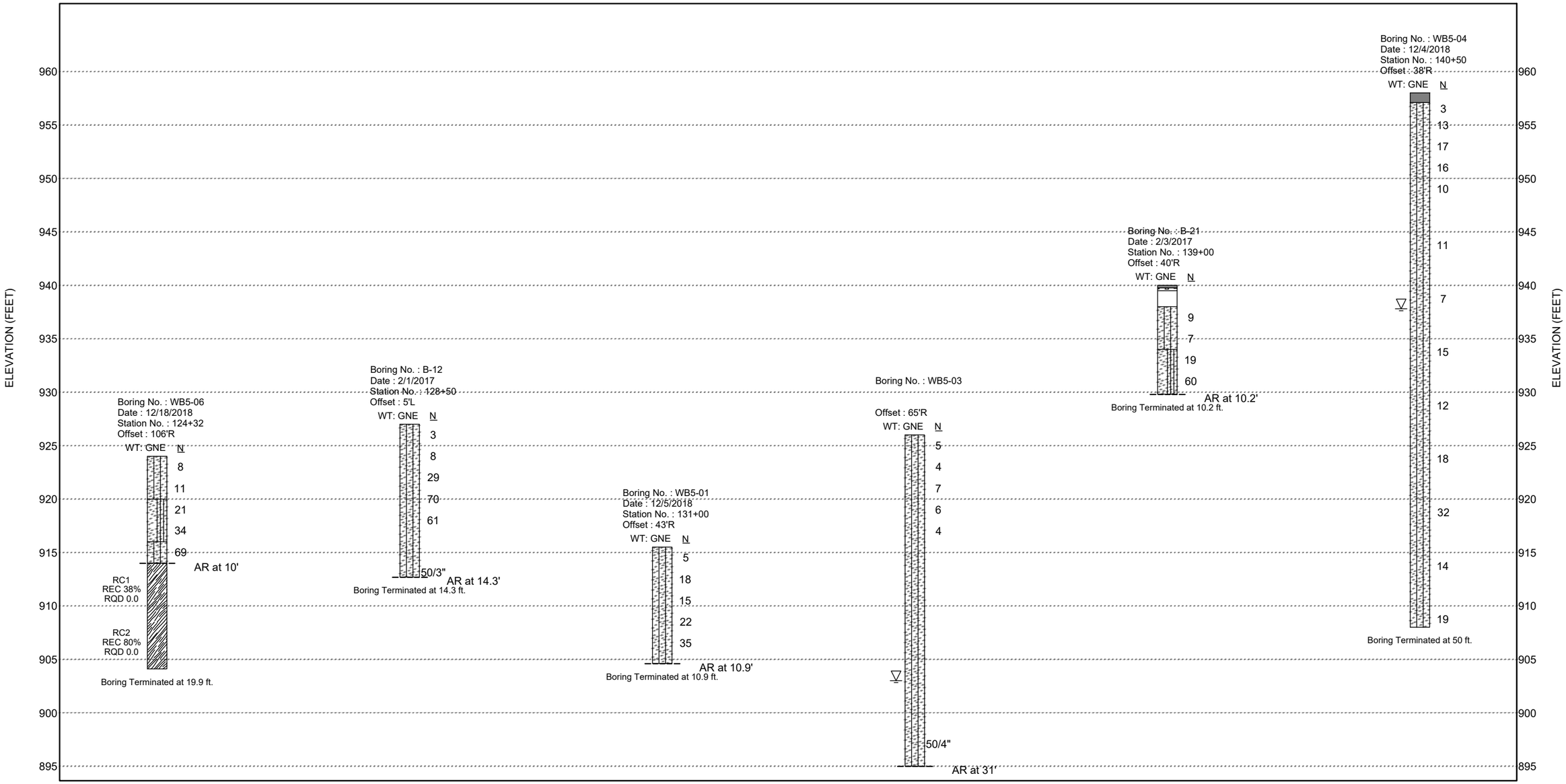
Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 17

Wall 5



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Suite 2620
Kennesaw, GA 30144
Ph:770-650-0873 Fax:770-650-7825

GEORGIA ENGINEERING CERTIFICATE OF AUTHORIZATION No. PEF004822
Prashanth Vaddu, P.E.
GEORGIA LICENSE No. PE039820

	NAME	DATE
DESIGNED BY:	TC	12/27/2018
DRAWN BY:	TC	12/28/2018
CHECKED BY:	AM	1/3/2019
SUPERVISED BY:	PV	

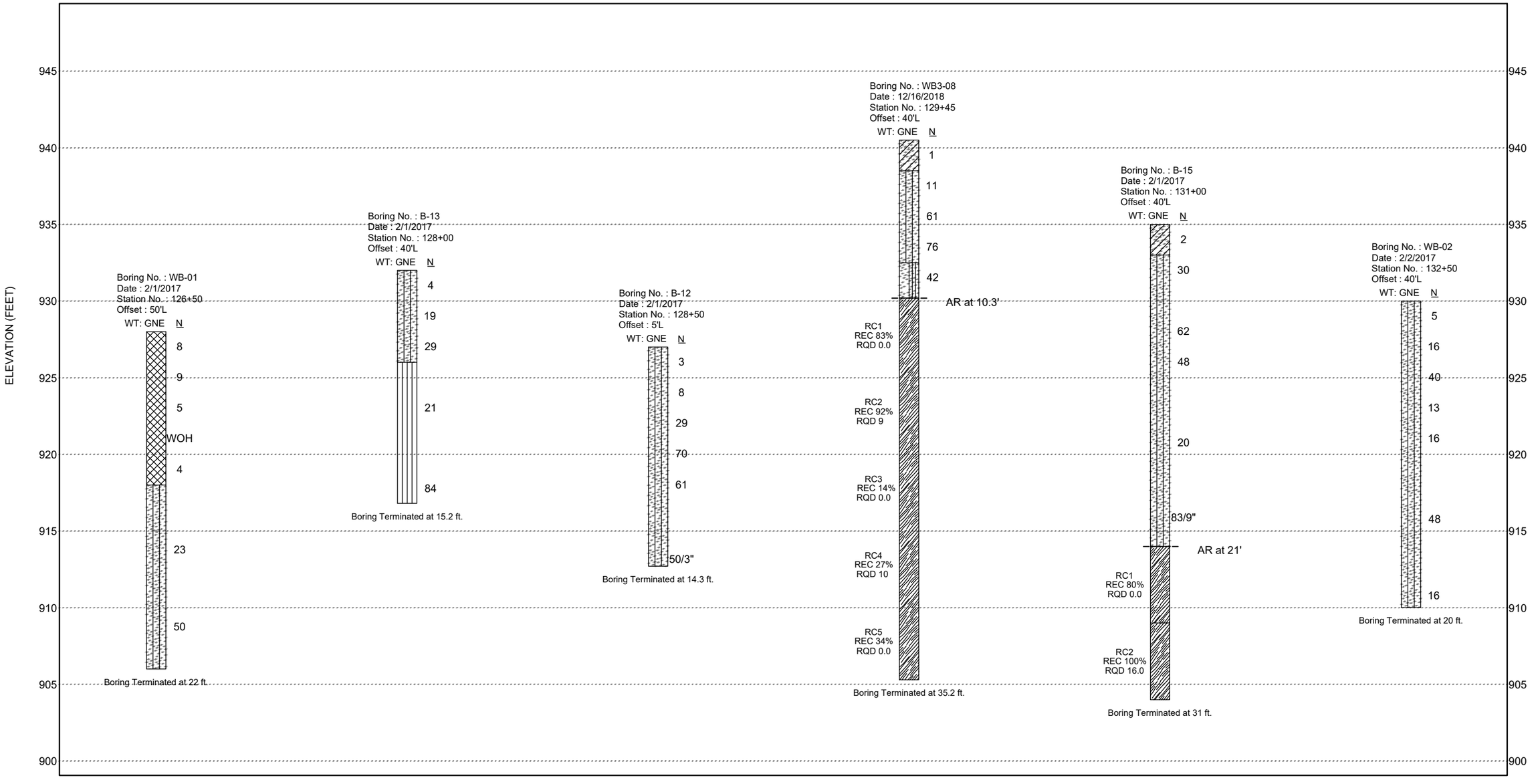
Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 18

Wall 6



*N Values Drawn At Middle Of Interval

DATE	NAME	REVISION	APPROVED BY:

MC² Geotechnical • Environmental Materials Testing

MC SQUARED, INC.
Geotechnical Consultants
1275 Shiloh Road NW
Suite 2620
Kennesaw, GA 30144
Ph:770-650-0873 Fax:770-650-7825

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SUPERVISED BY:	PV	

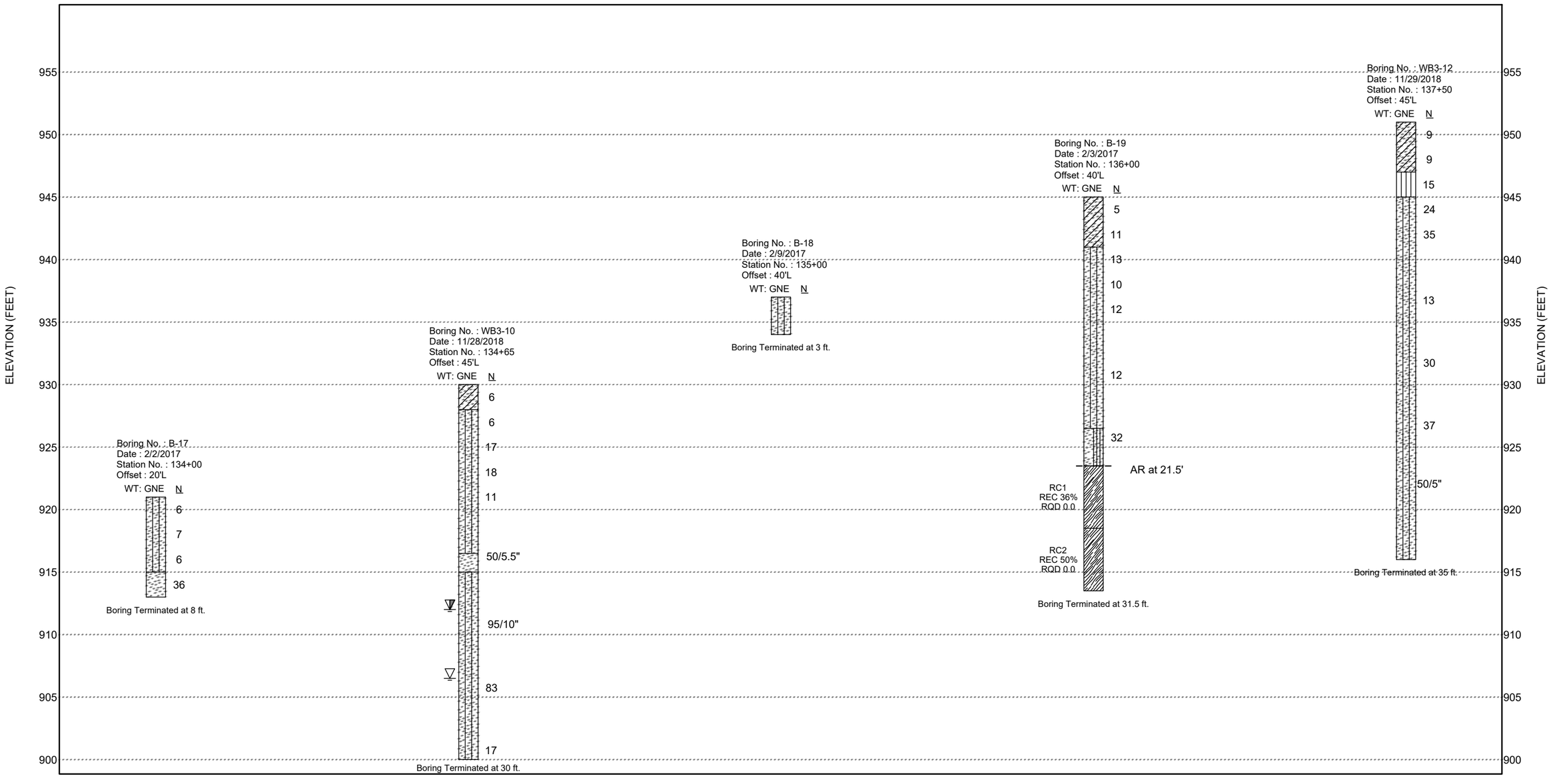
Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 19

Wall 7



*N Values Drawn At Middle Of Interval

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

	NAME	DATE
DESIGNED BY:	TC	12/27/2018
DRAWN BY:	TC	12/28/2018
CHECKED BY:	AM	1/3/2019
SUPERVISED BY:	PV	

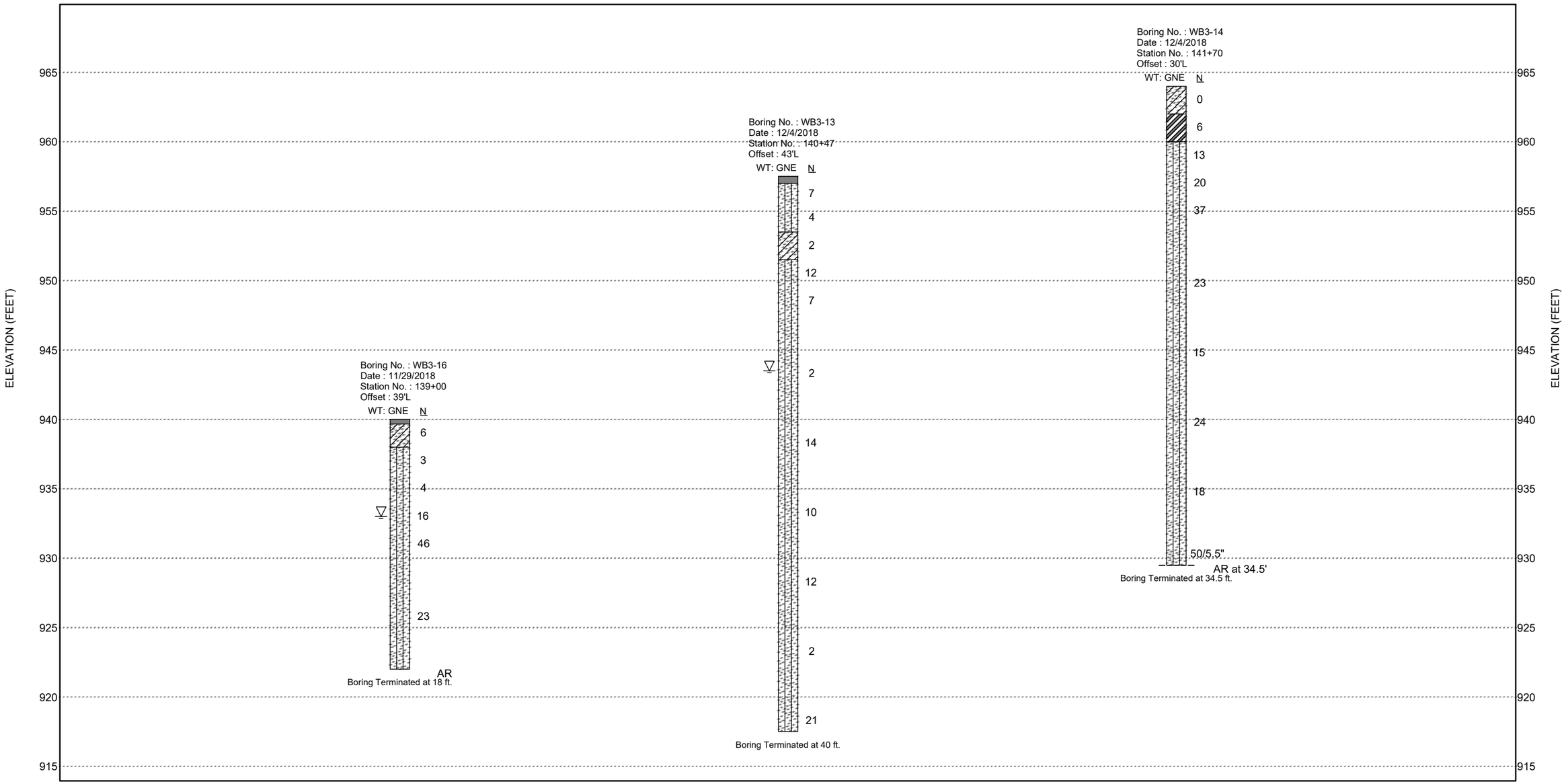
Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 20

Wall 8



*N Values Drawn At Middle Of Interval

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

	NAME	DATE
DESIGNED BY:	TC	12/27/2018
DRAWN BY:	TC	12/28/2018
CHECKED BY:	AM	1/3/2019
SUPERVISED BY:	PV	

Subsurface Boring Profiles

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 21

LEGEND

- Top Soil
- Asphalt
- Concrete
- (GAB) Graded Aggregate Base
- Limerock Base
- No. 57 Stone
- Soil Cement
- (SP) Poorly Graded Sand
- (SP-SM) Poorly Graded Sand With Silt
- (SP-SC) Poorly Graded Sand With Clay
- (SM) Silty Sand
- (SC) Clayey Sand
- (MH) Elastic Silt
- (ML) Silt
- (CL-ML) Silty Clay
- (CH) Fat Clay
- (CL) Lean Clay
- (OH) Organic Clay
- (OL) Organic Silt
- Peat
- Fill
- Bedrock
- Limestone
- (WLS) Weathered Limestone
- (PWR) Partially Weathered Rock
- Granite
- Gneiss
- Mica 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"
SPT Spoon Outside Diameter 2"

ASTM Standard Drop Safety Hammer
Average Hammer Drop Height 30"
Hammer Weight 140 lbs

DATE	NAME	REVISION	APPROVED BY:

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

	NAME	DATE
DESIGNED BY:	TC	12/27/2018
DRAWN BY:	TC	12/28/2018
CHECKED BY:	AM	1/3/2019
SUPERVISED BY:	PV	

Legend

Windy Hill Road - Terrell Mill Road Connector
Marietta, Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 22

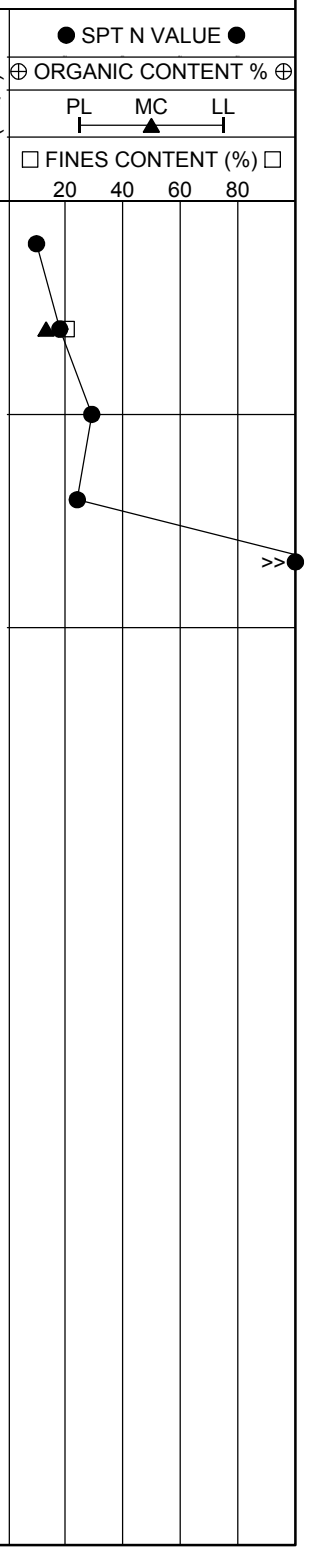
Soil Profile

BORING ID: B-01

MC² Geotechnical • Environmental Materials Testing

CLIENT	HNTB	**PROJECT NAME**	Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER	A121503.122	**PROJECT LOCATION**	Marietta, Cobb County, Georgia
DATE STARTED	1/31/17 **COMPLETED** 1/31/17	**GROUND ELEVATION**	953 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR	Tri-State Drilling, LLC	**GROUND WATER LEVELS:**	
DRILLING METHOD	Hollow Stem Auger	**AT TIME OF DRILLING**	GNA
LOGGED BY	Basanta Dhakal **CHECKED BY** P. Vaddu	**AT END OF DRILLING**	---
NOTES	Sta. 110+50, 40'L	**AFTER DRILLING**	---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	952	SM	Medium dense to very dense, brown, gray, micaceous, silty SAND	SS 1	3-6-5-6 (11)	
	950			SS 2	5-9-10-12 (19)	
5	948			SS 3	7-15-15-12 (30)	
	946			SS 4	12-11-14-17 (25)	
	944			SS 5	10-50/5"	
10	942		Auger Refusal at 11.5'			
	940		Bottom of hole at 11.5 feet.			
	938					
	936		Bottom of Cut			
	934					
	932					
	930					
	928					
	926					
	924					
	922					



Soil Profile

BORING ID: B-02

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 1/31/17 **COMPLETED** 1/31/17
GROUND ELEVATION 960 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 111+50, 40'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	958	SM	Loose, dark brown, micaceous, silty SAND	SS 1	2-4-6-20 (10)	
	956	SC	Very dense, brown, gray, clayey SAND	SS 2	25-50/4"	
5		SP	Very dense, brownish gray, SAND Auger refusal at 4.83'	SS 3	20-50/4"	
	954		Mica Schist (muscovite, quartz, feldspar, biotite) gray, white, black, hard to very hard, fresh to slightly weathered, 30 degree foliation, medium to coarse grained, some iron oxide staining present (4.83' - 9.83') Intensely fractured, 30 degree, planar, smooth, slightly to moderately weathered, iron oxide staining throughout	RC 1		90 (38)
	952					
10	950		Mica Schist (muscovite, quartz, feldspar, biotite) gray, white, black, hard to very hard, fresh to slightly weathered, 30 degree foliation, medium to coarse grained, some iron oxide staining present (9.83' - 14.83') Moderately fractured, 30 degree, planar, smooth, fresh to slightly weathered, some iron oxide staining present	RC 2		100 (90)
	948					
	946					
	944		Bottom of hole at 14.8 feet.			
	942		Bottom of Cut			
	940					
	938					
	936					
	934					
	932					
	930					

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

Soil Profile

BORING ID: WB3-01

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 8/29/17 **COMPLETED** 8/29/17
GROUND ELEVATION 960 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Big Dog
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 111+80, 63'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	960						
	958			Medium dense to very dense, brown to grayish brown, dark brown, silty SAND, micaceous, with rock fragments	SS 1	4-8-18-32 (26)	
					SS 2	33-50/5"	
5	956		SM		SS 3	50/6"	
	954				SS 4	16-26-50/4"	
	952				SS 5	2-50/3"	
10	950			Auger Refusal at 10 feet.			
	948			(10' - 30') MICA SCHIST (quartz, feldspar, biotite, muscovite) gray, black, white, moderately soft to moderately hard, slightly to highly weathered, medium to coarse grained, intensely fractured	RC 1		88 (56)
15	946						
	944				RC 2		100 (73)
	942						
20	940		MICA SCHIST				
	938				RC 3		100 (73)
	936						
25	934				RC 4		100 (85)
	932						
30	930						
				Bottom of hole at 30.0 feet.			
	928						
	926						
	924						
	922						
	920						

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

Soil Profile

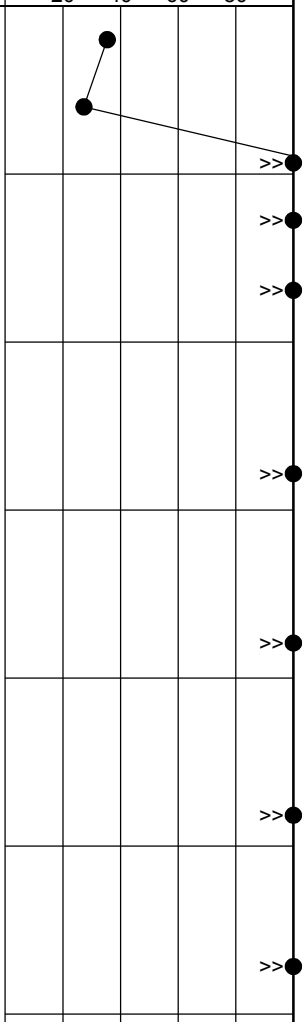
BORING ID: WB2-01

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 8/29/17 **COMPLETED** 8/29/17
GROUND ELEVATION 961 ft **HOLE SIZE** 6'
DRILLING CONTRACTOR Big Dog
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 112+40, 46'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	960		SM	Medium dense to very dense, reddish brown to brown, grayish brown, silty SAND, micaceous, with rock fragments	SS 1	4-14-22-23 (36)	
	958				SS 2	9-13-15-17 (28)	
5	956				SS 3	33-31-50/4"	
	954				SS 4	28-50/3"	
	952		SP-SM	Very dense, tan, poorly-graded fine SAND with silt, micaceous, with rock fragments	SS 5	10-50/5"	
10	950		SM	Very dense, dark brown to brown, silty SAND, micaceous, with rock fragments			
	948						
	946				SS 6	8-50/4"	
15	944						
	942				SS 7	10-50/5"	
20	940						
	938						
	936				SS 8	6-42-50/2"	
25	934						
	932				SS 9	50/2"	
30	930			Bottom of hole at 30.0 feet.			
	928						
	926						
	924						
	922						

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



Soil Profile

BORING ID: B-03

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 1/30/17 **COMPLETED** 1/30/17
GROUND ELEVATION 960 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 112+50, 10'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	958		SM	Loose, dark brown, micaceous, silty SAND	SS 1	3-4-5 (9)	
	956		SC-SM	Loose, brown, silty clayey SAND	SS 2	3-5-3-5 (8)	
5	954		MH	Stiff, reddish brown, sandy elastic SILT	SS 3	3-5-7-8 (12)	
	952		SM	Medium dense to very dense, grayish brown, brown, silty SAND Shelby Tube (6' - 8') Micaceous (6' - 8')	ST 4		
10	950				SS 5	6-8-10-9 (18)	
	948						
	946			Auger refusal at 14.3'	SS 6	50/2"	
				Bottom of hole at 14.3 feet.			
	944						
	942			Bottom of Cut			
	940						
	938						
	936						
	934						
	932						
	930						

● SPT N VALUE ●
⊕ ORGANIC CONTENT % ⊕
PL MC LL
☐ FINES CONTENT (%) ☐
20 40 60 80
>>

Soil Profile

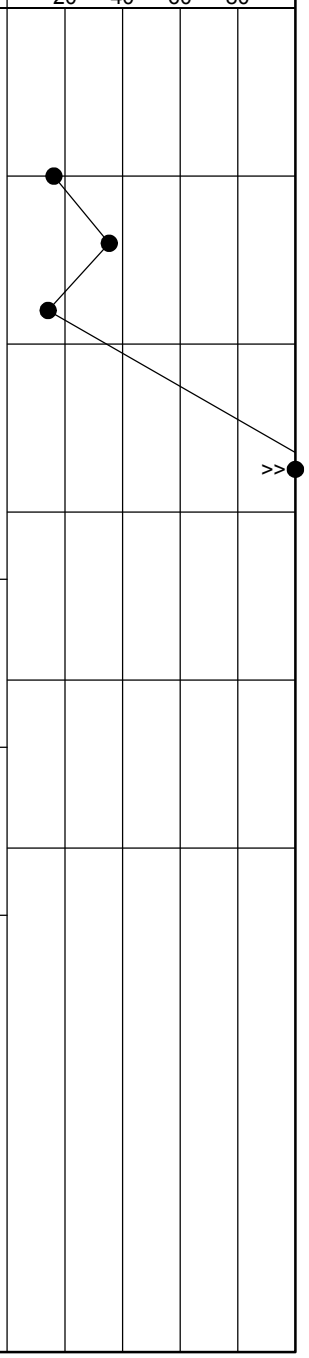
BORING ID: WB2-02

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 8/29/17 **COMPLETED** 8/29/17
GROUND ELEVATION 956 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Big Dog
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 113+90, 57'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	954		SM	Medium dense to very dense, dark brown to brown, reddish brown, grayish brown, silty SAND, micaceous	HA		
5	952				SS 1	9-9-8-6 (17)	
	950				SS 2	6-15-21-23 (36)	
	948				SS 3	3-6-9-13 (15)	
10	946						
	944						
	942				SS 4	50/6"	
15	940			Auger Refusal at 17 feet.			
	938		MICA SCHIST	(17' - 27') MICA SCHIST (quartz, feldspar, biotite, muscovite) gray, black, white, moderately soft to moderately hard, severely weathered to moderately weathered, medium to coarse grained, FeOx staining present, intensely fractured	RC 1		82 (0)
20	936						
	934				RC 2		95 (50)
	932						
25	930						
	928			Bottom of hole at 27.0 feet.			
	926						
	924						
	922						
	920						
	918						
	916						

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



Soil Profile

BORING ID: B-04

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/10/17 **COMPLETED** 2/10/17
GROUND ELEVATION 934 ft **HOLE SIZE** 4"
DRILLING CONTRACTOR MC Squared, Inc.
GROUND WATER LEVELS:
DRILLING METHOD Hand/Power Auger
AT TIME OF DRILLING GNA
LOGGED BY Amir Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 114+00, 40'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	● SPT N VALUE ● / ⊕ ORGANIC CONTENT % ⊕ / PL MC LL / ☐ FINES CONTENT (%) ☐ (20 40 60 80)
0	932		SM	Dark brown, brown, micaceous, silty SAND with organics and rock fragments	HA			
				Auger refusal at 3'				
	930			Bottom of hole at 3.0 feet.				
	928							
	926							
	924							
	922							
	920							
	918							
	916							
	914							
	912							
	910							
	908							
	906							
	904							

Soil Profile

BORING ID: B-05

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 1/30/17 **COMPLETED** 1/30/17
GROUND ELEVATION 954 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 114+50, 40'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	952		Asphalt Graded aggregate base No sample retrieved (0' - 2')			
		SM	Medium dense to very dense, brown, gray, micaceous, silty SAND	SS 1	5-8-9-10 (17)	
5	950		Rock fragments (2' - 8')	SS 2	3-11-12-12 (23)	
	948			SS 3	6-11-7-11 (18)	
	946			SS 4	4-12-13-10 (25)	
10	944					
	942					
	940			SS 5	4-12-30 (42)	
15	938					
	936					
				SS 6	11-37-50/5"	
20	934		Rock fragments (18.5' - 24') Bottom of Cut			
	932					
	930		Auger Refusal at 24'	SS 7	50/4"	
			Bottom of hole at 24.0 feet.			
	928					
	926					
	924					

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

Soil Profile

BORING ID: B-06

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/8/17 **COMPLETED** 2/8/17
GROUND ELEVATION 908 ft **HOLE SIZE** 4"
DRILLING CONTRACTOR MC Squared, Inc.
GROUND WATER LEVELS:
DRILLING METHOD Hand/Power Auger
AT TIME OF DRILLING GNA
LOGGED BY Amir Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 115+50, 46'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	906		SM	Dark brown, brown, silty SAND Organics (0' - 2')	HA		
	904		MH	Rock fragments (2' - 3.5') Brown, sandy elastic SILT with some organics			
5	902		SP-SM	Dark brown, SAND with silt			
	900			Auger refusal at 7' Bottom of hole at 7.0 feet.			
	898						
	896						
	894						
	892						
	890						
	888						
	886						
	884						
	882						
	880						
	878						

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

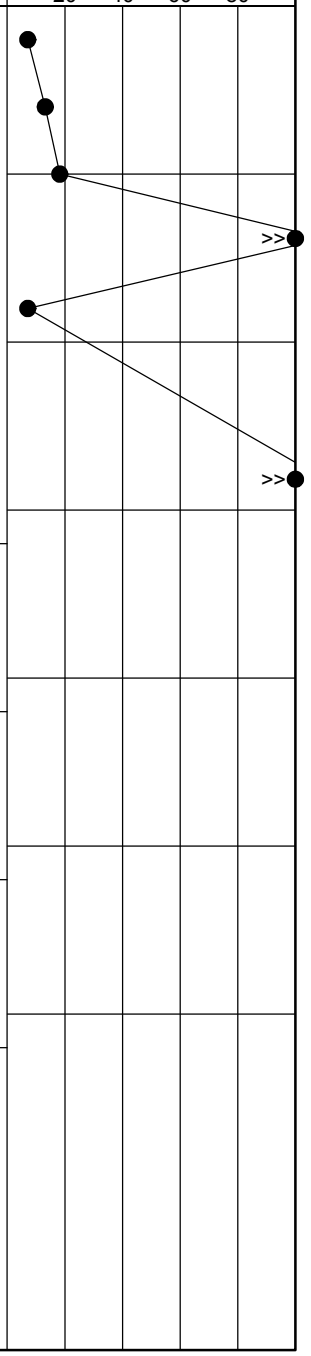
Soil Profile

BORING ID: WB3-02

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 8/31/17 **COMPLETED** 8/31/17
GROUND ELEVATION 907 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Big Dog
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 116+28, 44'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	906		SM	Loose to very dense, reddish brown to brown, gray to grayish brown, silty SAND, micaceous	SS 1	1-3-5-9 (8)	
	904				SS 2	5-7-7-7 (14)	
5	902				SS 3	4-9-10-10 (19)	
	900				SS 4	21-18-4-50/4"	
	898				SS 5	21-4-4-4 (8)	
10	896						
	894						
15	892			Auger Refusal at 16 feet.	SS 6	8-23-50/2"	
	890		MICA SCHIST	(16' - 31') MICA SCHIST (quartz, biotite, muscovite, feldspar) gray, black white, moderately soft to moderately hard, moderately to highly weathered, 25 to 30 degree foliation, medium to coarse grained, FeOx staining present, intensely fractured, planar	RC 1		58 (36)
20	888						
	886						
	884				RC 2		42 (8)
25	882						
	880						
	878				RC 3		94 (60)
30	876			Bottom of hole at 31.0 feet.			
	874						
	872						
	870						
	868						



Soil Profile

BORING ID: B-07

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 1/31/17 **COMPLETED** 1/31/17
GROUND ELEVATION 908 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 116+50, 20'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	906	SM	Medium dense, dark brown, gray, silty SAND with rock	SS 1	4-7-5-4 (12)	
	904			SS 2	4-6-7-7 (13)	
5	902			SS 3	4-9-9-7 (18)	
	900	MH	Stiff, brown, reddish brown, light brown, sandy elastic SILT Micaceous (6' - 8')	SS 4	3-3-6-7 (9)	
10	898			SS 5	3-5-5-6 (10)	
	896	SP-SM	Medium dense, dark gray, micaceous, SAND with silt			
	894			SS 6	6-7-6 (13)	
15	892		Rock fragments (15' - 22.5')			
	890					
				SS 7	4-11-14 (25)	
20	888					
	886		Auger Refusal at 22.5'			
	884		Bottom of hole at 22.5 feet.			
	882					
	880					
	878					

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

Soil Profile

BORING ID: WB3-03

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/17/18 **COMPLETED** 12/17/18
GROUND ELEVATION 906.5 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 117+44, 43'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	906			2 inches of ASPHALT, 2 inches of GRAVEL			
				Very loose to very dense, reddish brown to brown, grayish brown to gray, white, silty SAND, micaceous			
	904				SS 1	8-8-9-9 (17)	
5	902				SS 2	5-6-8-9 (14)	
	900				SS 3	5-4-4-6 (8)	
	898				SS 4	5-4-7-10 (11)	
10	896						
	894						
	892				SS 5	5-6-5 (11)	
15	890						
	888						
					SS 6	3-1-1 (2)	
20	886		SM				
	884						
	882				SS 7	3-7-5 (12)	
25	880						
	878						
					SS 8	2-2-3 (5)	
30	876						
	874						
	872				SS 9	4-4-5 (9)	
35	870						
	868						
					SS 10	3-5-6 (11)	
40							

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

(Continued Next Page)

Soil Profile

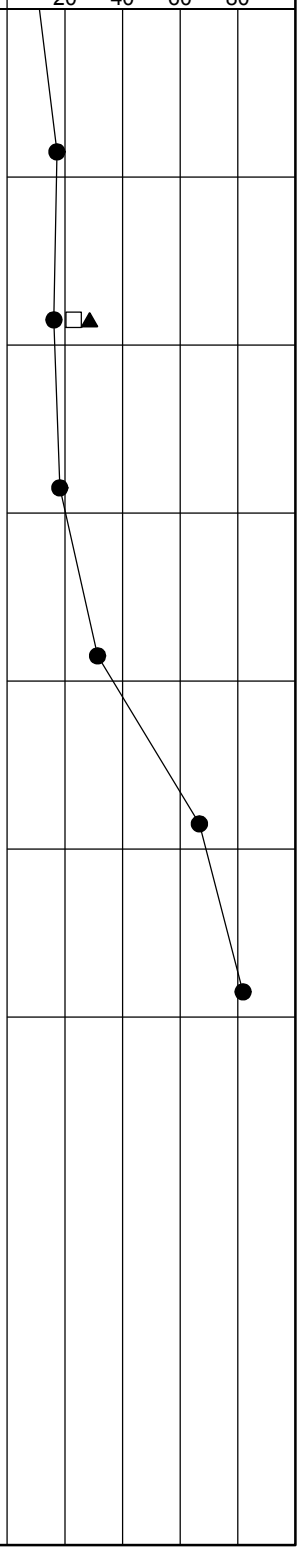
BORING ID: WB3-03

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB **PROJECT NAME** Windy Hill Road - Terrell Mill Road Connector

PROJECT NUMBER A121503.122 **PROJECT LOCATION** Marietta, Cobb County, Georgia

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
40	866			Very loose to very dense, reddish brown to brown, grayish brown to gray, white, silty SAND, micaceous			
	864						
45	862				SS 11	6-7-11 (18)	
	860						
	858						
50	856				SS 12	7-7-10 (17)	
	854						
	852				SS 13	5-7-12 (19)	
55	850		SM				
	848						
60	846				SS 14	9-13-19 (32)	
	844						
	842				SS 15	19-27-40 (67)	
65	840						
	838						
70	836			Bottom of hole at 70.0 feet.	SS 16	22-32-50 (82)	
	834						
	832						
	830						
	828						
	826						
	824						
	822						



Soil Profile

BORING ID: B-09

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 1/31/17 **COMPLETED** 1/31/17
GROUND ELEVATION 910 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 120+00, 20'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	910			Medium dense, grayish brown, reddish brown, dark brown, micaceous, silty SAND			
	908				SS 1	3-5-7-8 (12)	
	906						
5			SM		SS 2	5-6-6-8 (12)	
	904						
					SS 3	3-3-9-9 (12)	
	902						
					SS 4	4-9-8-6 (17)	
10	900						
	898			Firm to stiff, reddish brown, dark brown, micaceous, sandy SILT			
	896				SS 5	3-3-3 (6)	
15			ML				
	894						
	892						
					SS 6	5-6-6 (12)	
20	890						
	888			Medium dense, dark brown, gray, micaceous, silty SAND			
	886				SS 7	5-18-11 (29)	
25			SM	Rock fragments (20' - 25')			
	884						
	882						
					SS 8	5-7-13 (20)	
30	880						
				Bottom of hole at 30.0 feet.			

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

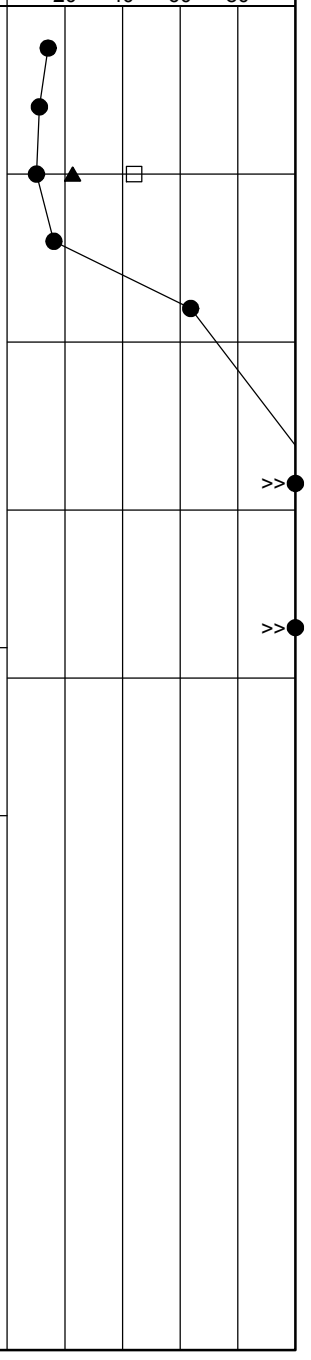
Soil Profile

BORING ID: WB3-04

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/19/18 **COMPLETED** 12/19/18
GROUND ELEVATION 910 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 120+58, 15'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0				0.2 feet of ASPHALT, 0.3 feet of GRAVEL			
	908		SM	Medium dense, brown to dark reddish to orange brown, silty SAND with rocks	SS 1	6-9-6 (15)	
					SS 2	6-5-7-10 (12)	
5	906				SS 3	6-6-5-7 (11)	
	904				SS 4	5-7-10-14 (17)	
	902		SP-SM	Very dense, brownish gray, SAND with silt	SS 5	17-24-40-43 (64)	
10	900						
	898		SM	Very dense, grayish brown, silty SAND, micaceous			
	896				SS 6	31-18-50/5"	
15	894						
	892			Auger Refusal at 19.1 feet.	SS 7	50/0"	
20	890		MICA SCHIST	(19.1' - 24.1') MICA SCHIST with Granite (muscovite, quartz, feldspar, biotite) gray, white, black, orange, soft to hard, slightly to highly weathered, 30 to 40 degree foliation, medium to coarse grained, iron-oxite staining throughout, moderately to intensely fractured, planar, smooth.	RC 1		94 (64)
	888						
	886						
	884			Bottom of hole at 24.1 feet.			
	882						
	880						
	878						
	876						
	874						
	872						
	870						



Soil Profile

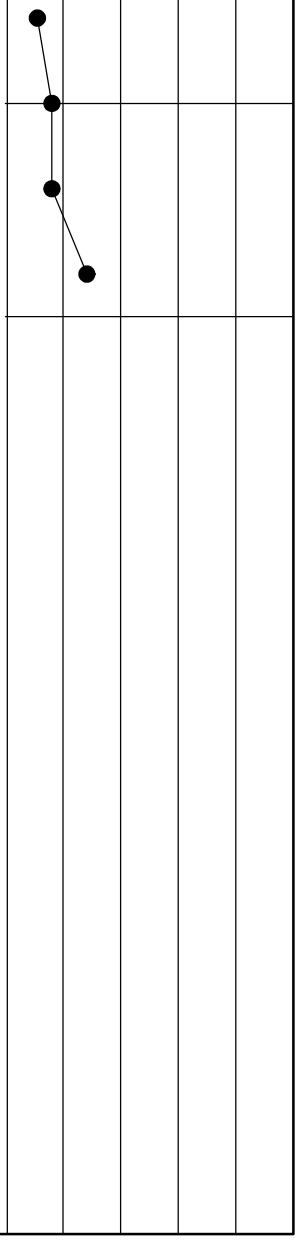
BORING ID: B-10

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 1/31/17 **COMPLETED** 1/31/17
GROUND ELEVATION 910 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 122+00, 20'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	910			Asphalt			
				Graded aggregate base			
	908			No sample retrieved (0' - 2')			
				Medium dense, light brown, brown, gray, white, SAND with silt Micaceous (2' - 8')	SS 1	4-5-7-10 (12)	
	906						
5					SS 2	5-8-9-8 (17)	
	904		SP-SM				
					SS 3	5-7-10-15 (17)	
	902						
					SS 4	5-17-12-19 (29)	
10	900						
				Auger Refusal at 11.2'			
	898			Bottom of hole at 11.2 feet.			
	896						
	894						
	892						
	890						
	888						
	886						
	884						
	882						
	880						

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



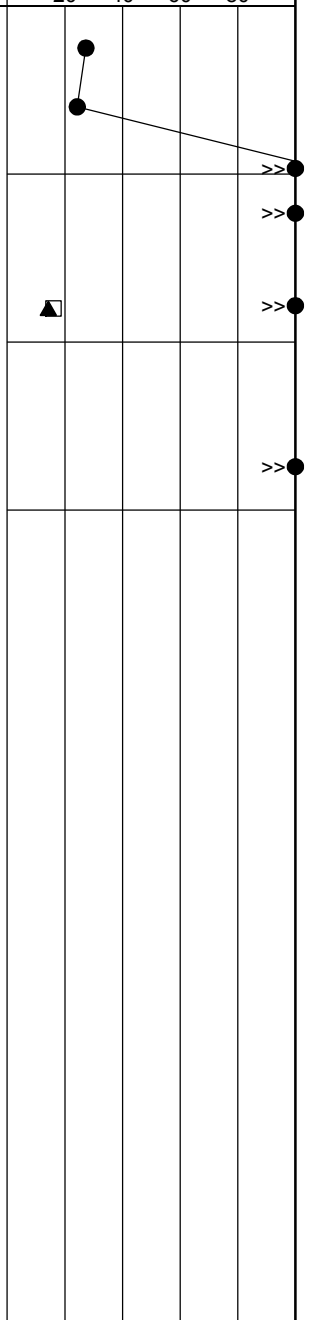
Soil Profile

BORING ID: WB3-05

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/19/18 **COMPLETED** 12/19/18
GROUND ELEVATION 909 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 122+17, 15'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	908			0.2 feet of ASPHALT, 0.3 feet of GRAVEL			
			SM	Medium dense to very dense, brown to grayish brown, orange brown, silty SAND, micaceous	SS 1	12-13-15 (28)	
	906				SS 2	12-12-13-15 (25)	
5	904				SS 3	8-7-22-50/2"	
	902				SS 4	50/4"	
	900				SS 5	24-15-42-50/4"	
10	898						
	896						
			SP-SM	Very dense, brownish gray, SAND with silt	SS 6	50/5"	
15	894			Auger Refusal at 15.7 feet.			
	892			Bottom of hole at 15.7 feet.			
	890						
	888						
	886						
	884						
	882						
	880						
	878						
	876						
	874						
	872						
	870						



Soil Profile

BORING ID: WB4-02

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/18/18 **COMPLETED** 12/18/18
GROUND ELEVATION 918 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 122+67, 86'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0			0.1 feet of ASPHALT, 0.4 feet of GRAVEL			
	916	SM	Very dense, brown to grayish brown, white, orange, silty fine SAND, with rock fragments	SS 1	13-19-50 (69)	
				SS 2	50/3"	
	914	SP-SM	Very dense, brown to grayish brown, white, orange, SAND with silt, with rock fragments Auger Refusal at 3.7 feet. Boring offset 8 feet right.	SS 3	50/3"	
5			Auger Refusal at 5 feet.			
	912	MICA SCHIST	(5' - 25') MICA SCHIST (muscovite, quartz, feldspar, biotite) gray, white, black, orange, soft to hard, slightly to highly weathered, 30 to 35 degree foliation, medium to coarse grained, some iron-oxite staining, intensely to moderately fractured, planar, smooth.	RC 1		38 (0)
	910					
10	908			RC 2		95 (21)
	906					
	904					
15				RC 3		98 (41)
	902					
	900					
20	898			RC 4		98 (76)
	896					
	894					
25			Bottom of hole at 25.0 feet.			
	892					
	890					
	888					
	886					
	884					
	882					
	880					
	878					

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

Soil Profile

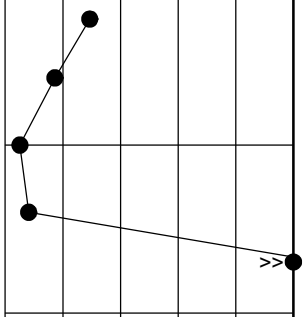
BORING ID: WB4-03

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/19/18 **COMPLETED** 12/19/18
GROUND ELEVATION 921 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 123+67, 89'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	920			0.1 feet of ASPHALT, 0.4 feet of GRAVEL			
			SM	Loose to very dense, brown to grayish brown, reddish brown, silty SAND, micaceous, with rock fragments	SS 1	11-13-17 (30)	
	918				SS 2	7-10-8-14 (18)	
5	916				SS 3	2-3-3-3 (6)	
	914				SS 4	5-4-5-4 (9)	
	912				SS 5	17-50/6"	
10	910			Auger Refusal at 11 feet.			
	908		MICA SCHIST	(11' - 15') MICA SCHIST (muscovite, quartz, feldspar, biotite) gray, white, black, orange, soft to moderately hard, moderately to highly weathered, 20 to 30 degree foliation, medium to coarse grained, iron-oxite staining throughout, intensely fractured, planar, smooth.	RC 1		94 (19)
15	906						
	904				RC 2		100 (23)
	902						
20	900				RC 3		100 (45)
	898						
25	896			Bottom of hole at 25.0 feet.			
	894						
	892						
	890						
	888						
	886						
	884						
	882						

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



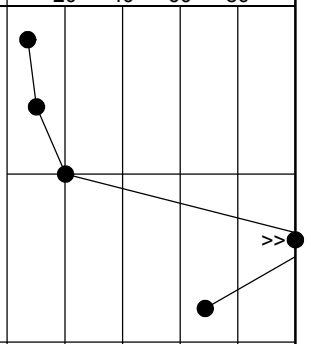
Soil Profile

BORING ID: WB5-06

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/18/18 **COMPLETED** 12/18/18
GROUND ELEVATION 924 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 124+32, 106'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	924						
	922		SM	Loose to medium dense, brown, silty SAND, micaceous, rock fragments	SS 1	3-2-6-6 (8)	
	920				SS 2	6-5-6-16 (11)	
5			SP-SM	Medium dense to dense, brown to reddish brown, gray, black, SAND with silt, with rock fragments	SS 3	8-10-11-11 (21)	
	918				SS 4	7-19-15-50/5"	
	916						
			SM	Very dense, brown to pale brown, silty SAND, micaceous	SS 5	40-44-25-25 (69)	
10	914			Auger Refusal at 10 feet.			
	912		MICA SCHIST	(10' - 19.9') MICA SCHIST (muscovite, quartz, feldspar, biotite) gray, white, black, orange, soft to moderately hard, moderately to highly weathered, 30 to 35 degree foliation, medium to coarse grained, iron-oxite staining throughout, intensely fractured, planar, smooth.	RC 1		38 (0)
	910						
15							
	908				RC 2		80 (0)
	906						
	904						
	902			Bottom of hole at 19.9 feet.			
	900						
	898						
	896						
	894						
	892						
	890						
	888						
	886						
	884						



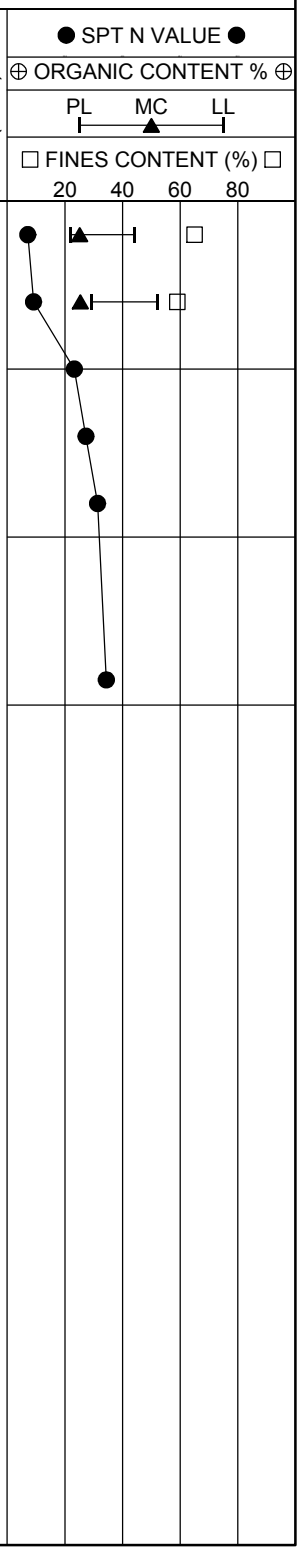
Soil Profile

BORING ID: WB3-06

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/16/18 **COMPLETED** 12/16/18
GROUND ELEVATION 911 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 124+94, 73'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	910		CL	Firm, reddish brown, sandy lean CLAY, micaceous	SS 1	2-4-4-6 (8)	
	908		MH	Stiff, reddish brown, sandy elastic SILT, micaceous	SS 2	5-5-5-6 (10)	
5	906		SM	Medium dense to dense, brown to reddish brown, grayish brown, silty SAND, micaceous	SS 3	7-11-13-15 (24)	
	904				SS 4	10-13-15-15 (28)	
	902				SS 5	9-15-17-17 (32)	
10	900						
	898						
15	896				SS 6	7-14-21 (35)	
	894			Auger Refusal at 16.7 feet.			
	892			Bottom of hole at 16.7 feet.			
	890						
	888						
	886						
	884						
	882						
	880						
	878						
	876						
	874						
	872						



Soil Profile

BORING ID: WB-01

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/1/17 **COMPLETED** 2/1/17
GROUND ELEVATION 928 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 126+50, 50'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	926		Possible Fill, Brown to dark brown to dark gray	SS 1	2-3-5-5 (8)	
			Heavy organics (2' - 4')	SS 2	3-4-5-22 (9)	
5	924			SS 3	3-2-3-2 (5)	
	922		Weight of hammer (6' - 7.5')	SS 4	0-0-0-2 (0)	
	920			SS 5	2-2-2-4 (4)	
10	918		Medium dense to dense, brown, reddish brown, silty SAND			
	916		Bottom of Cut			
	914			SS 6	11-11-12 (23)	
15	912	SM				
	910					
				SS 7	8-21-29 (50)	
20	908					
	906		Auger refusal at 22'			
			Bottom of hole at 22.0 feet.			
	904					
	902					
	900					
	898					

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

Soil Profile

BORING ID: B-13

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/1/17 **COMPLETED** 2/1/17
GROUND ELEVATION 932 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 128+00, 40'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	930	SM	Very loose to medium dense, reddish brown, brown, grayish brown, gray, SAND with silt	SS 1	1-2-2-3 (4)	
				SS 2	5-8-11-10 (19)	
5	928			SS 3	4-11-18-13 (29)	
	926		Very stiff to very hard, brown, micaceous, sandy SILT	ST 4		
	924		Shelby Tube (6' - 8')			
				SS 5	9-11-10-9 (21)	
10	922	ML	Bottom of Cut			
	920					
	918		Rock fragments (13.5' - 15')	SS 6	8-35-49 (84)	
15			Auger Refusal at 15.2'			
	916		Bottom of hole at 15.2 feet.			
	914					
	912					
	910					
	908					
	906					
	904					
	902					

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

Soil Profile

BORING ID: B-12

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/1/17 **COMPLETED** 2/1/17
GROUND ELEVATION 927 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Tate Cozort **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 128+50, 5'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	926		Very loose, reddish brown, brown, gray, micaceous, silty SAND	SS 1	1-1-2-2 (3)	
	924			SS 2	4-4-4-9 (8)	
5	922		Bottom of Cut	SS 3	7-13-16-18 (29)	
	920	SM	Micaceous (6' - 8')	SS 4	22-35-35-47 (70)	
	918			SS 5	26-36-25-20 (61)	
10	916					
	914					
			Auger Refusal at 14.3'	SS 6	32-50/3"	
	912		Bottom of hole at 14.3 feet.			
	910					
	908					
	906					
	904					
	902					
	900					
	898					
	896					

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

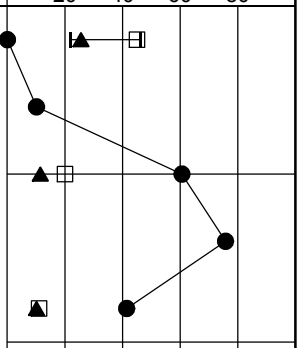
Soil Profile

BORING ID: WB3-08

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/16/18 **COMPLETED** 12/16/18
GROUND ELEVATION 940.5 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 129+45, 40'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	940		SC	Very loose, reddish brown, clayey SAND, micaceous	SS 1	0-0-1-2 (1)	
	938			Medium dense to very dense, brown to orange brown, white, black, gray, silty SAND, micaceous	SS 2	2-4-7-10 (11)	
5	936		SM		SS 3	8-32-29-20 (61)	
	934				SS 4	15-33-43-50 (76)	
	932		SP-SM	Dense, yellowish brown to dark brown, SAND with silt, micaceous	SS 5	25-15-27-34 (42)	
10	930			Auger Refusal at 10.3 feet.			
	928		MICA SCHIST	(10.3' - 35.2') MICA SCHIST (muscovite, quartz, feldspar, biotite) gray, white, black, orange, soft to moderately hard, moderately to highly weathered, 40 to 55 degree foliation, medium to coarse grained, iron-oxite staining throughout, intensely fractured, planar, smooth.	RC 1		83 (0)
15	926						
	924				RC 2		92 (9)
20	922						
	920				RC 3		14 (0)
	918						
25	916				RC 4		27 (10)
	914						
	912						
30	910				RC 5		34 (0)
	908						
35	906						
	904			Bottom of hole at 35.2 feet.			
	902						



Soil Profile

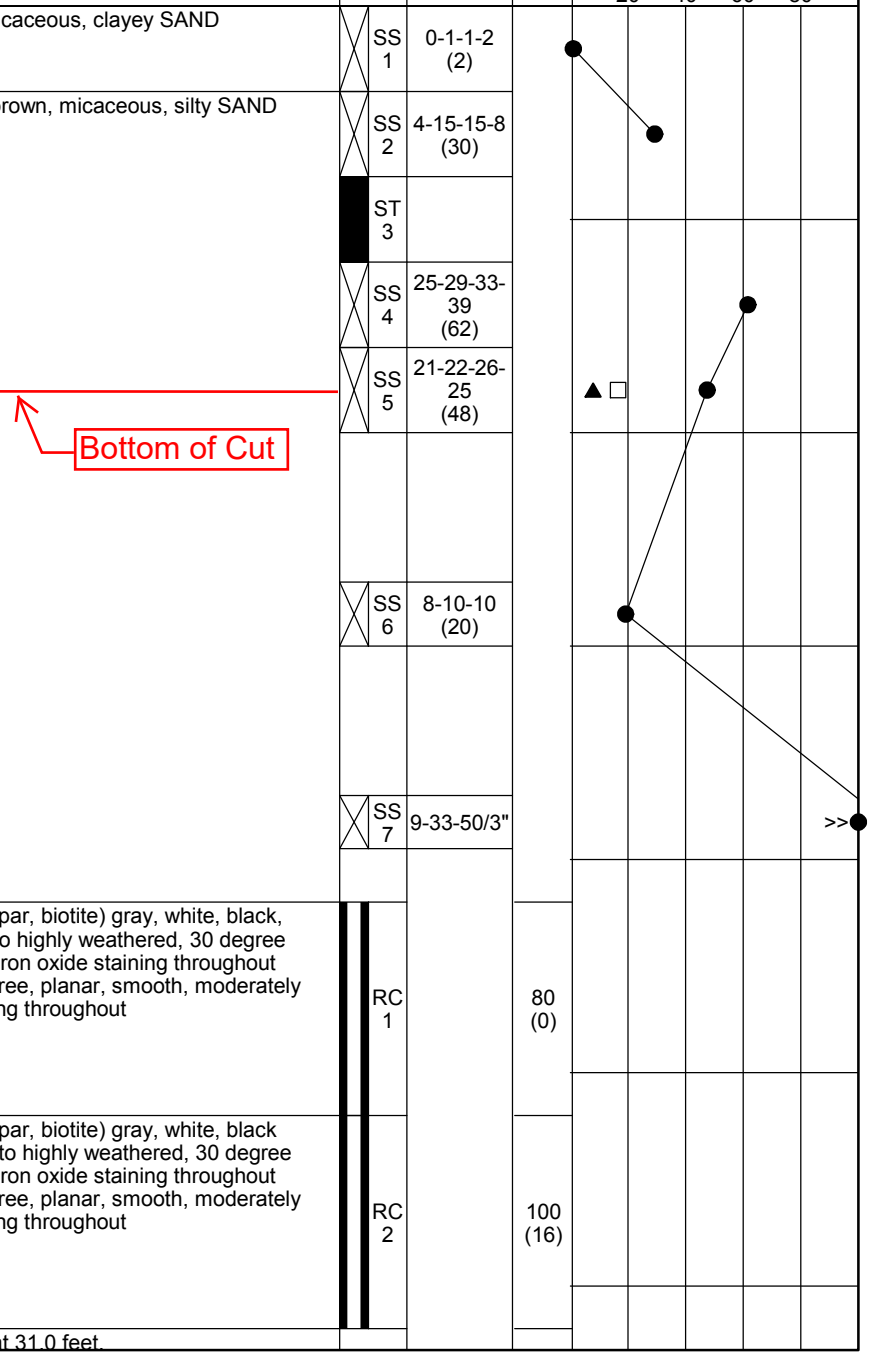
BORING ID: B-15

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/1/17 **COMPLETED** 2/1/17
GROUND ELEVATION 935 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Tate Cozort **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 131+00, 40'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	934	SC	Very loose, reddish brown, brown, micaceous, clayey SAND Weight of hammer (0' - 0.5')	SS 1	0-1-1-2 (2)	
	932		Medium dense to very dense, gray, brown, micaceous, silty SAND Rock fragments (2' - 4')	SS 2	4-15-15-8 (30)	
5	930		Shelby Tube (4' - 6')	ST 3		
	928			SS 4	25-29-33-39 (62)	
	926		Rock fragments (8' - 21')	SS 5	21-22-26-25 (48)	
10	924	SM	Bottom of Cut			
	922					
15	920			SS 6	8-10-10 (20)	
	918					
	916			SS 7	9-33-50/3"	
20	914		Auger refusal at 21'			
	912		Mica Schist (muscovite, quartz, feldspar, biotite) gray, white, black, moderately soft to hard, moderately to highly weathered, 30 degree foliation, medium to coarse grained, iron oxide staining throughout (21' - 26') Intensely fractured, 30 degree, planar, smooth, moderately to highly weathered, iron oxide staining throughout	RC 1		80 (0)
25	910					
	908		Mica Schist (muscovite, quartz, feldspar, biotite) gray, white, black moderately soft to very hard, slightly to highly weathered, 30 degree foliation, medium to coarse grained, iron oxide staining throughout (26' - 31') Intensely fractured, 30 degree, planar, smooth, moderately to highly weathered, iron oxide staining throughout	RC 2		100 (16)
30	906					
	904		Bottom of hole at 31.0 feet.			

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



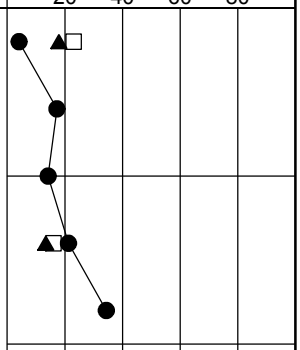
Soil Profile

BORING ID: WB5-01

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/5/18 **COMPLETED** 12/5/18
GROUND ELEVATION 915.5 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 131+00, 43'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	914		SM	Loose to dense, brown to grayish brown, reddish brown, orange brown, silty SAND, micaceous	SS 1	0-2-3-4 (5)	
	912				SS 2	5-9-9-9 (18)	
5	910				SS 3	3-8-7-9 (15)	
	908				SS 4	4-7-15-13 (22)	
	906				SS 5	9-18-17-20 (35)	
10	904			Auger Refusal at 10.9 feet.			
	902			Bottom of hole at 10.9 feet.			
	900						
	898						
	896						
	894						
	892						
	890						
	888						
	886						
	884						
	882						
	880						
	878						
	876						



Soil Profile

BORING ID: WB-02

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/2/17 **COMPLETED** 2/2/17
GROUND ELEVATION 930 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Amir Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 132+50, 40'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	928		SM	Loose to medium dense to dense, gray, reddish brown, brown, white, micaceous, silty SAND	SS 1	2-2-3-4 (5)	
					SS 2	7-7-9-11 (16)	
5	926				SS 3	9-23-17-19 (40)	
	924			Bottom of Cut	SS 4	10-7-6-5 (13)	
	922				SS 5	4-5-11-19 (16)	
10	920						
	918						
	916				SS 6	16-28-20 (48)	
15	914			Rock fragments (15' - 20')			
	912						
					SS 7	9-9-7 (16)	
20	910			Auger refusal at 20'			
				Bottom of hole at 20.0 feet.			
	908						
	906						
	904						
	902						
	900						

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

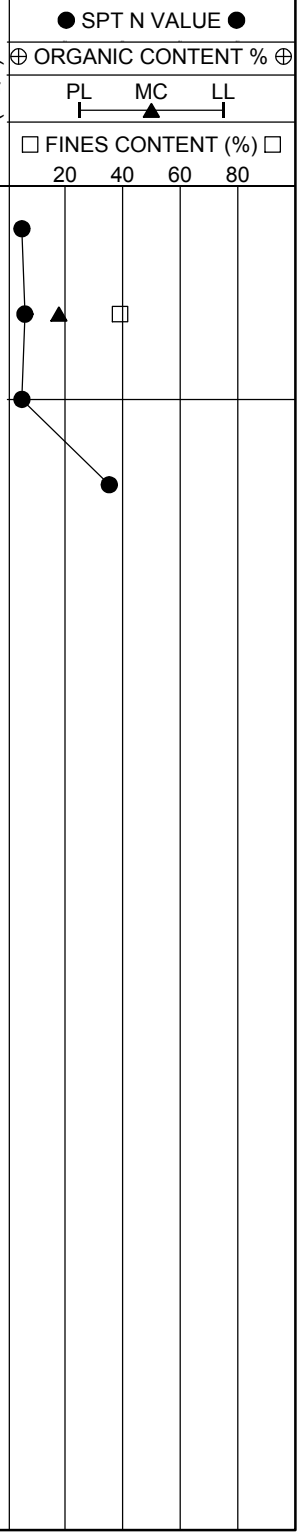
Soil Profile

BORING ID: B-17

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/2/17 **COMPLETED** 2/2/17
GROUND ELEVATION 921 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Amir Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 134+00, 20'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	920		SM	Firm, brown, reddish brown, micaceous, silty SAND	SS 1	2-3-3-3 (6)	
	918				SS 2	3-3-4-4 (7)	
5	916				SS 3	3-3-3-3 (6)	
	914		SP	Dense, brown, gray, SAND with rock fragments	SS 4	6-16-20-20 (36)	
				Auger Refusal at 8'			
	912			Bottom of hole at 8.0 feet.			
	910						
	908						
	906						
	904						
	902						
	900						
	898						
	896						
	894						
	892						
	890						



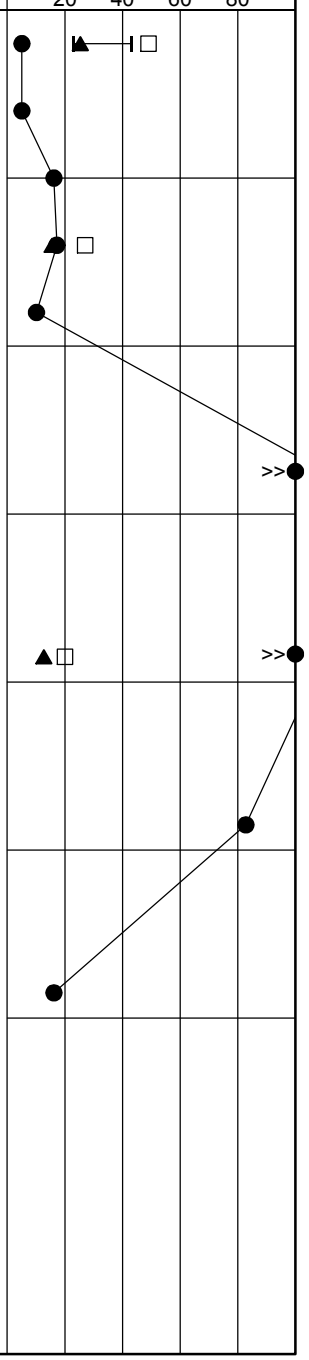
Soil Profile

BORING ID: WB3-10

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 11/28/18 **COMPLETED** 11/28/18
GROUND ELEVATION 930 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Betts Environmental
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING 23.5 ft / Elev 906.5 ft
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 134+65, 45'L
20hrs AFTER DRILLING 18.0 ft / Elev 912.0 ft

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	928	SC	Loose, reddish brown, clayey SAND	SS 1	1-3-3-5 (6)	
			Loose to medium dense, brown to reddish brown, grayish brown, silty SAND, micaceous	SS 2	2-3-3-5 (6)	
5	926			SS 3	5-8-9-10 (17)	
	924			SS 4	3-7-11-8 (18)	
	922	SM		SS 5	5-6-5-5 (11)	
10	920					
	918					
	916	SP	Very dense, brownish gray, poorly-graded SAND, with rock fragments	SS 6	50/6"	
15	914		Medium dense to very dense, brown to light brown, grayish brown, white, silty SAND, micaceous, with rock fragments			
	912					
20	910			SS 7	39-45-50/4"	
	908	SM				
	906			SS 8	15-34-49 (83)	
25	904					
	902					
30	900			SS 9	8-6-11 (17)	
	898		Bottom of hole at 30.0 feet.			
	896					
	894					
	892					
	890					



Soil Profile

BORING ID: B-18

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/9/17 **COMPLETED** 2/9/17
GROUND ELEVATION 937 ft **HOLE SIZE** 4"
DRILLING CONTRACTOR MC Squared, Inc.
GROUND WATER LEVELS:
DRILLING METHOD Hand/Power Auger
AT TIME OF DRILLING GNA
LOGGED BY Amir Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 135+00, 40'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	936		SM	Brown, brownish orange, micaceous, silty SAND and rock fragments	HA		
	934			Auger refusal at 3'			
				Bottom of hole at 3.0 feet.			
	932						
	930						
	928						
	926						
	924						
	922						
	920						
	918						
	916						
	914						
	912						
	910						
	908						
	906						

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

Bottom of Cut

Soil Profile

BORING ID: B-19

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/3/17 **COMPLETED** 2/3/17
GROUND ELEVATION 945 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 136+00, 40'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	944		SC	Loose to medium dense, reddish brown, black, brown, micaceous, clayey SAND	SS 1	2-2-3-3 (5)	
	942				SS 2	5-5-6-7 (11)	
5	940			Medium dense to loose, reddish brown, gray, micaceous, silty SAND	SS 3	4-6-7-7 (13)	
	938				SS 4	5-5-5-6 (10)	
	936				SS 5	4-6-6-7 (12)	
10	934		SM	Bottom of Cut			
	932				SS 6	3-5-7 (12)	
15	930						
	928						
	926		SP-SM	Dense, gray, white, black, micaceous, SAND with silt	SS 7	9-17-15 (32)	
20	924			Auger refusal at 21.5'			
	922			Mica Shist (muscovite, quartz, feldspar, biotite) brown, gray, moderately hard to very soft, moderately weathered to completely weathered, 30 degree foliation, medium to coarse grained, iron oxide staining present throughout (21.5' - 26.5') Intensely fractured, 30 degree, planar to non-planar, smooth, moderately to completely weathered, iron oxide staining present throughout	RC 1		36 (0)
25	920						
	918			Mica Shist (muscovite, quartz, feldspar, biotite) gray, white, moderately hard to very hard, silghtly to highly weathered, 30 degree foliation, medium to coarse grained, iron oxide staining throughout (21.5' - 26.5') Intensely fractured, 30 degree, planar, smooth, slightly to highly weathered, iron oxide staining present throughout	RC 2		50 (0)
	916						
30	914						

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

Bottom of hole at 31.5 feet.

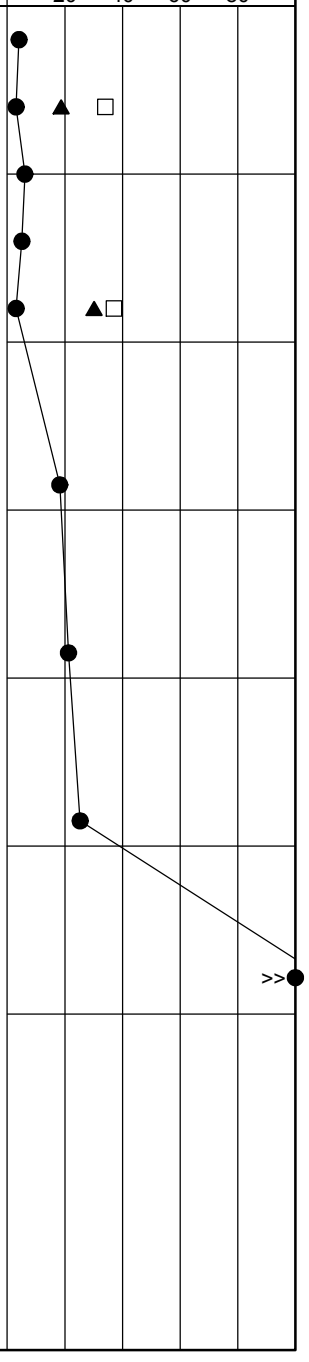
Soil Profile

BORING ID: WB5-03

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/6/18 **COMPLETED** 12/8/18
GROUND ELEVATION 926 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 23.0 ft / Elev 903.0 ft
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 136+70, 65'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	926			Very loose to very dense, brown to dark brown, orange brown, pale brown, grayish brown, silty SAND, micaceous	SS 1	1-3-2-2 (5)	
	924				SS 2	1-2-2-5 (4)	
	922				SS 3	4-3-4-5 (7)	
5	920				SS 4	1-3-3-5 (6)	
	918				SS 5	2-2-2-3 (4)	
10	916						
	914						
	912				SS 6	3-7-12 (19)	
15	910		SM				
	908						
	906				SS 7	2-9-13 (22)	
20	904						
	902			▽	SS 8	9-12-14 (26)	
25	900						
	898						
	896				SS 9	7-50/4"	
30	894			Auger Refusal at 31 feet.			
	892			Bottom of hole at 31.0 feet.			
	890						
	888						
	886						



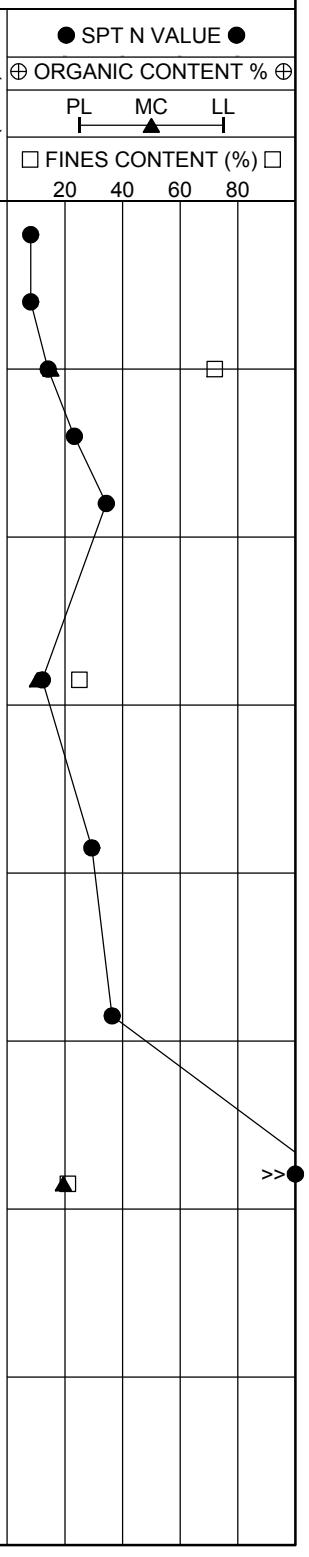
Soil Profile

BORING ID: WB3-12

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 11/29/18 **COMPLETED** 11/29/18
GROUND ELEVATION 951 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Betts Environmental
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 137+50, 45'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	950		SC	Loose, brown to reddish brown, clayey SAND, micaceous	SS 1	3-4-5-8 (9)	
	948				SS 2	3-3-6-7 (9)	
5	946		ML	Stiff, reddish brown, sandy SILT, micaceous	SS 3	3-8-7-8 (15)	
	944		SM	Medium dense to very dense, brown to light brown, grayish brown, dark brown, silty SAND, micaceous	SS 4	7-10-14-19 (24)	
	942				SS 5	6-16-19-20 (35)	
10	940						
	938				SS 6	7-7-6 (13)	
15	936						
	934						
	932				SS 7	7-14-16 (30)	
20	930						
	928						
	926				SS 8	13-16-21 (37)	
25	924						
	922				SS 9	12-50/5"	
30	920			Augered an additional 5 feet. No sample taken, assumed same as above.			
	918						
35	916						
	914			Bottom of hole at 35.0 feet.			
	912						



Soil Profile

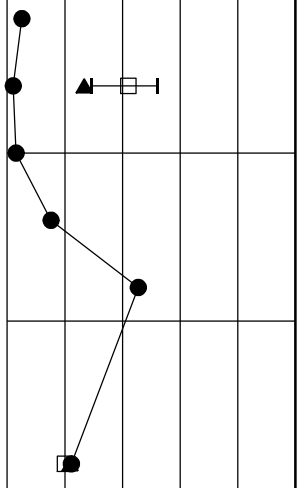
BORING ID: WB3-16

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 11/29/18 **COMPLETED** 11/29/18
GROUND ELEVATION 940 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Betts Environmental
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 7.0 ft / Elev 933.0 ft
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 139+00, 39'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	938	SC	4 inches of ASPHALT Loose, brown, clayey SAND, micaceous	SS 1	3-3-3-4 (6)	
	936		Very loose to dense, brown to grayish brown, dark brown, silty SAND, micaceous, rock fragments	SS 2	2-1-2-3 (3)	
5	934			SS 3	1-2-2-1 (4)	
	932		▽	SS 4	7-7-9-4 (16)	
10	930	SM		SS 5	8-21-25-14 (46)	
	928					
	926			SS 6	6-10-13 (23)	
15	924					
	922		Auger Refusal at 18 feet. Bottom of hole at 18.0 feet.			
	920					
	918					
	916					
	914					
	912					
	910					
	908					
	906					
	904					
	902					
	900					

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



Soil Profile

BORING ID: B-21

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 2/3/17 **COMPLETED** 2/3/17
GROUND ELEVATION 940 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR Tri-State Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNA
LOGGED BY Basanta Dhakal **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 139+00, 40'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	940			Asphalt			
				Graded aggregate base			
	938			No sample retrieved (0' - 2')			
				Loose, reddish brown, gray, micaceous, silty SAND	SS 1	3-4-5-6 (9)	
	936		SM				
5					SS 2	3-3-4-5 (7)	
	934						
				Medium dense to very dense, gray, brown, SAND with silt and rock fragments	SS 3	3-7-12-34 (19)	
	932		SP-SM				
					SS 4	26-17-43-37 (60)	
10	930			Auger refusal at 10.2'			
				Bottom of hole at 10.2 feet.			
	928						
	926						
	924						
	922						
	920						
	918						
	916						
	914						
	912						
	910						

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

Soil Profile

BORING ID: WB3-13

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/4/18 **COMPLETED** 12/4/18
GROUND ELEVATION 957.5 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 14.0 ft / Elev 943.5 ft
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 140+47, 43'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0			0.1 feet of ASPHALT, 0.4 feet of GRAVEL			
	956	SM	Very loose to loose, brown to reddish brown, silty SAND, micaceous	SS 1	3-4-3 (7)	
	954			SS 2	2-2-2-3 (4)	
5	952	SC	Very loose, reddish brown, clayey SAND, micaceous	SS 3	0-1-1-1 (2)	
	950	SM	Very loose to medium dense, brown to reddish brown, orange brown, grayish brown, dark brown, white, black, silty SAND, micaceous	SS 4	3-4-8-6 (12)	
10	948			SS 5	2-2-5-4 (7)	
	946					
	944		▽	SS 6	0-1-1 (2)	
15	942					
	940					
20	938			SS 7	2-4-10 (14)	
	936					
	934			SS 8	3-3-7 (10)	
25	932					
	930					
30	928			SS 9	3-3-9 (12)	
	926					
	924			SS 10	0-1-1 (2)	
35	922					
	920					
40	918			SS 11	5-8-13 (21)	

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

Bottom of hole at 40.0 feet.

Soil Profile

BORING ID: WB5-04

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/4/18 **COMPLETED** 12/4/18
GROUND ELEVATION 958 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 20.2 ft / Elev 937.8 ft
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 140+50, 38'R
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0				0.9 feet of ASPHALT and GRAVEL			
	956			Very loose to dense, brown to reddish brown, light brown, orange brown, grayish brown, dark brown, white, silty SAND, micaceous	SS 1	3-6	
					SS 2	4-7-6-9 (13)	
	954						
5					SS 3	4-7-10-17 (17)	
	952						
					SS 4	9-7-9-10 (16)	
	950						
					SS 5	4-4-6-12 (10)	
10	948						
	946						
	944				SS 6	3-4-7 (11)	
15							
	942						
	940						
					SS 7	3-3-4 (7)	
20	938			▽			
			SM				
	936						
	934				SS 8	5-7-8 (15)	
25							
	932						
	930						
					SS 9	2-4-8 (12)	
30	928						
	926						
	924				SS 10	0-7-11 (18)	
35							
	922						
	920						
					SS 11	9-17-15 (32)	
40	918						

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

(Continued Next Page)

Soil Profile

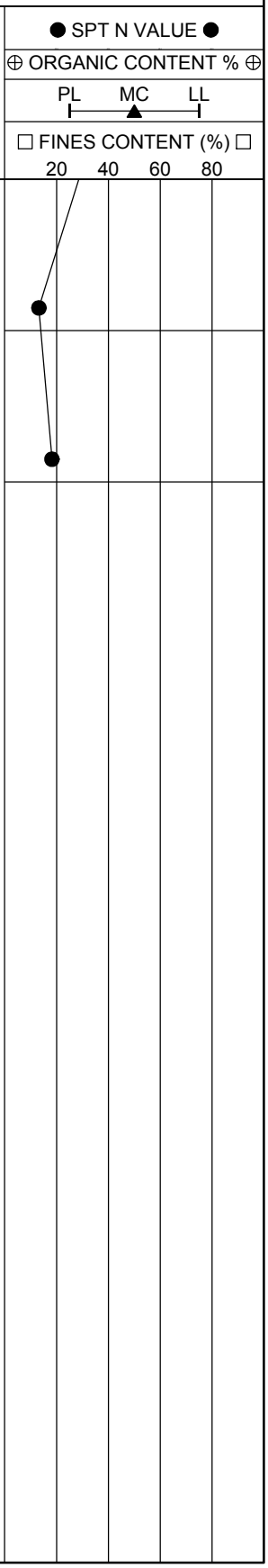
BORING ID: WB5-04

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB **PROJECT NAME** Windy Hill Road - Terrell Mill Road Connector

PROJECT NUMBER A121503.122 **PROJECT LOCATION** Marietta, Cobb County, Georgia

DEPTH (ft)	ELEV. (ft)	GRAPHIC LOG	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
40							
	916		SM	Very loose to dense, brown to reddish brown, light brown, orange brown, grayish brown, dark brown, white, silty SAND, micaceous			
	914				SS 12	3-6-8 (14)	
45							
	912						
	910						
					SS 13	4-8-11 (19)	
50	908						
				Bottom of hole at 50.0 feet.			
	906						
	904						
	902						
	900						
	898						
	896						
	894						
	892						
	890						
	888						
	886						
	884						
	882						
	880						
	878						
	876						
	874						



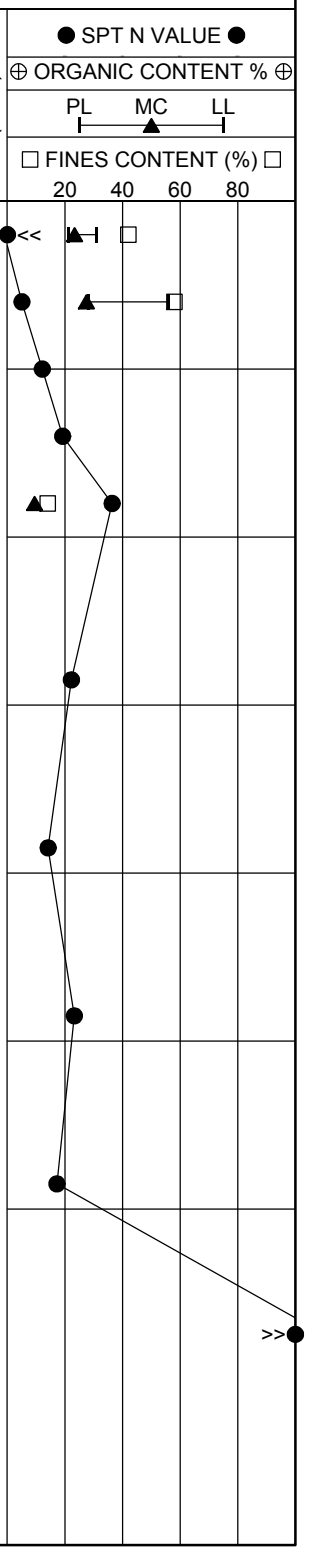
Soil Profile

BORING ID: WB3-14

MC² Geotechnical • Environmental Materials Testing

CLIENT HNTB
PROJECT NAME Windy Hill Road - Terrell Mill Road Connector
PROJECT NUMBER A121503.122
PROJECT LOCATION Marietta, Cobb County, Georgia
DATE STARTED 12/4/18 **COMPLETED** 12/4/18
GROUND ELEVATION 964 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR M&W Drilling
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING GNE
LOGGED BY A. Moussly **CHECKED BY** P. Vaddu
AT END OF DRILLING ---
NOTES Sta. 141+70, 30'L
AFTER DRILLING ---

DEPTH (ft)	ELEV. (ft)	USCS Group Symbol	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)
0	962	SC	Very loose, brown, clayey SAND, micaceous, traces of roots WOH from 0 to 2 feet.	SS 1	0-0-0-0 (0)	
	960	CH	Firm, reddish brown, sandy FAT CLAY, micaceous	SS 2	2-2-4-5 (6)	
5	958	SM	Medium dense to very dense, light to dark brown, pale brown, silty SAND, micaceous	SS 3	2-6-7-11 (13)	
	956			SS 4	6-8-12-13 (20)	
10	954			SS 5	13-21-16-16 (37)	
	952					
	950			SS 6	6-14-9 (23)	
15	948					
	946					
20	944			SS 7	4-8-7 (15)	
	942					
	940			SS 8	6-7-17 (24)	
25	938					
	936					
30	934			SS 9	7-7-11 (18)	
	932					
	930		Auger Refusal at 34.5 feet. Low Recovery (33.5' - 34.5')	SS 10	50/6"	
	928		Bottom of hole at 34.5 feet.			
	926					
	924					



APPENDIX II

- Summary of Laboratory Results – 2 Pages
  - Atterberg Limits' Results – 1 Page
  - Grain Size Distribution – 1 Page
  - Corrosion Test Results – 1 Page

SUMMARY OF LABORATORY RESULTS

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

CLIENT HNTB

PROJECT NAME Windy Hill Road - Terrell Mill Road Connector

PROJECT NUMBER A121503.122 GDOT P.I. 0013967

PROJECT LOCATION Marietta, Cobb County, Georgia

Sample No.	Station/ Offset (C/L)	Soil Description	USCS Class.	%< Finer Sieve								NMC (%)	pH	Resistivity (ohm-cm)	LL %	PL %	PI %
				3/4"	#4	#10	#20	#40	#60	#100	#200						
WB3-03 (48.5-50 ft)	Sta. 117+44, 43'L	Whitish, Grayish Silty SAND with Mica	SM								23	28.6			NP	NP	NP
WB3-04 (4-6 ft)	Sta. 120+58, 15'L	Dark Reddish Brown Silty SAND Micaceous	SM								44	22.7			NP	NP	NP
WB3-05 (8-10 ft)	Sta. 122+17, 15'L	Mottled Brown Gray Silty SAND Micaceous	SM								16	14.2			NP	NP	NP
WB4-02 (0-2 ft)	Sta. 122+67, 86'R	Reddish Brown Silty SAND Micaceous	SM		96	89	81	72	59	45	35	17.8			NP	NP	NP
WB4-02 (2-4 ft)	Sta. 122+67, 86'R	Orange, Brown SAND with Silt and Mica	SP-SM										5.3	31,000			
WB4-03 (2-4 ft)	Sta. 123+67, 89'R	Dark Reddish Brown Silty SAND Micaceous	SM		85	81	73	66	54	41	30	15.1			NP	NP	NP
WB4-03 (4-6 ft)	Sta. 123+67, 89'R	Reddish Brown Silty SAND with Mica	SM		82	76	68	60	48	35	25	15.3			NP	NP	NP
WB4-03 (6-8 ft)	Sta. 123+67, 89'R	Reddish Brown Silty SAND Micaceous	SM										5.4	24,000			
WB5-06 (2-4 ft)	Sta. 124+32, 106'R	Reddish Brown Silty SAND Micaceous	SM								36	16.1			NP	NP	NP
WB3-06 (0-2 ft)	Sta. 124+94, 73'L	Reddish Brown Sandy Lean CLAY Micaceous	CL								65	25.1			44	22	22
WB3-06 (2-4 ft)	Sta. 124+94, 73'L	Reddish Brown Sandy Elastic SILT Micaceous	MH								59	25.3			52	29	23
WB3-08 (0-2 ft)	Sta. 129+45, 40'L	Reddish Brown Clayey SAND with Mica	SC								45	25.6			46	22	24
WB3-08 (2-4 ft)	Sta. 129+45, 40'L	Orangish Brown SIlty SAND Micaceous	SM										5.2	32,000			
WB3-08 (4-6 ft)	Sta. 129+45, 40'L	Brown Silty SAND with Gravel with Mica	SM	95	76	70	59	51	41	31	20	11.5			NP	NP	NP
WB3-08 (8-10 ft)	Sta. 129+45, 40'L	Mottled Yellowish Brown, Dark Brown SAND with Silt and Mica	SP-SM								11	10.1			NP	NP	NP
WB5-01 (0-2 ft)	Sta. 131+00, 43'R	Reddish Brown Silty SAND with Mica	SM								23	17.9			NP	NP	NP
WB5-01 (6-8 ft)	Sta. 131+00, 43'R	Brown Silty SAND Micaceous	SM								16	13.3			NP	NP	NP
WB3-10 (0-2 ft)	Sta. 134+65, 45'L	Reddish Brown Clayey SAND	SC								49	25.3			43	23	20
WB3-10 (2-4 ft)	Sta. 134+65, 45'L	Reddish Brown Silty SAND Micaceous	SM										5.0	30,000			
WB3-10 (4-6 ft)	Sta. 134+65, 45'L	Grayish Brown Silty SAND Micaceous	SM										5.6	100,000			
WB3-10 (6-8 ft)	Sta. 134+65, 45'L	Brown Silty SAND Micaceous	SM	100	100	98	89	77	61	45	27	15.6	5.0	70,000	NP	NP	NP
WB3-10 (18.5-20 ft)	Sta. 134+65, 45'L	Light Brown Silty SAND Micaceous	SM								20	12.7			NP	NP	NP
WB5-03 (2-4 ft)	Sta. 136+70, 65'R	Brown Silty SAND with Roots Micaceous	SM								34	18.7			NP	NP	NP
WB5-03 (8-10 ft)	Sta. 136+70, 65'R	Dark Brown Silty SAND Micaceous	SM								37	30.1			NP	NP	NP
WB3-12 (2-4 ft)	Sta. 137+50, 45'L	Reddish Brown Clayey SAND Micaceous	SC										5.2	23,000			
WB3-12 (4-6 ft)	Sta. 137+50, 45'L	Reddish Brown Sandy SILT Micaceous	ML								72	15.1			NP	NP	NP
WB3-12 (6-8 ft)	Sta. 137+50, 45'L	Light Brown Silty SAND Micaceous	SM										5.8	140,000			
WB3-12 (8-10 ft)	Sta. 137+50, 45'L	Light Brown Silty SAND Micaceous	SM										5.9	110,000			
WB3-12 (13.5-15 ft)	Sta. 137+50, 45'L	Light Brown Silty SAND Micaceous	SM								25	10.4			NP	NP	NP
WB3-12 (28.5-30 ft)	Sta. 137+50, 45'L	Brown Silty SAND Micaceous	SM								21	19.5			NP	NP	NP

SUMMARY OF LABORATORY RESULTS

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

CLIENT HNTB

PROJECT NAME Windy Hill Road - Terrell Mill Road Connector

PROJECT NUMBER A121503.122 GDOT P.I. 0013967

PROJECT LOCATION Marietta, Cobb County, Georgia

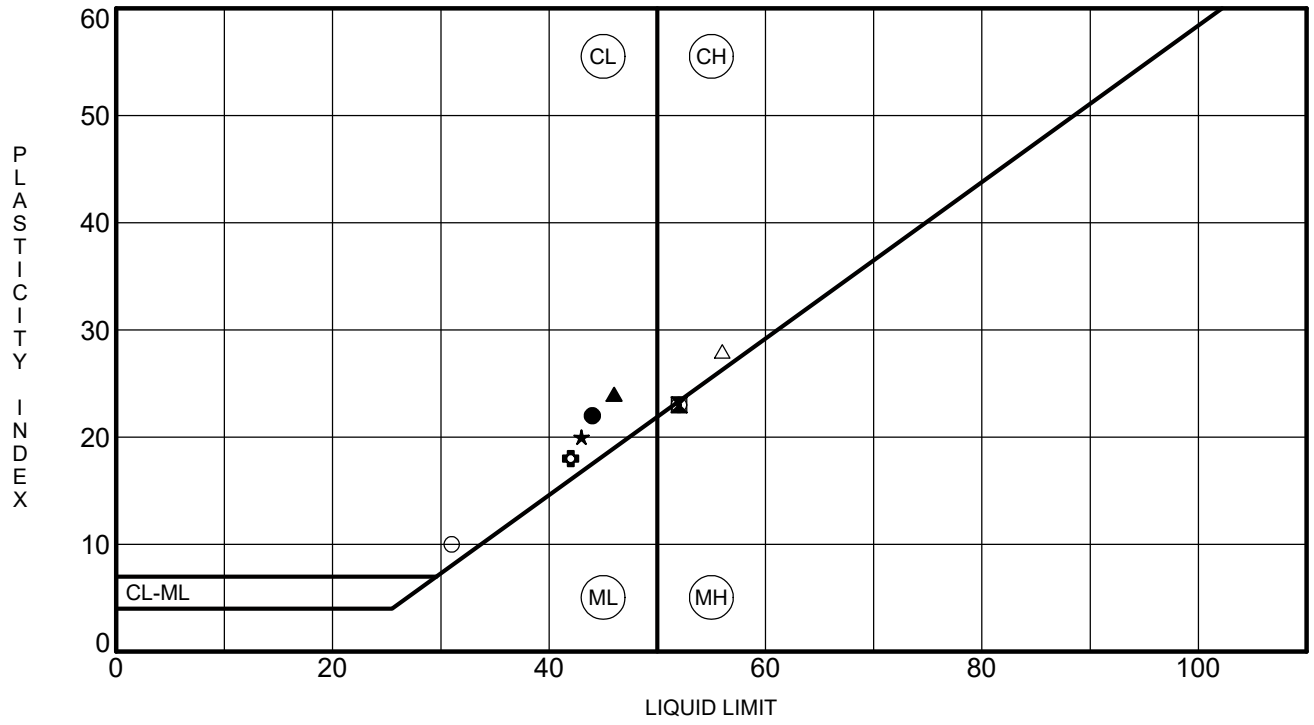
Sample No.	Station/ Offset (C/L)	Soil Description	USCS Class.	%< Finer Sieve								NMC (%)	pH	Resistivity (ohm-cm)	LL %	PL %	PI %
				3/4"	#4	#10	#20	#40	#60	#100	#200						
WB3-16 (2-4 ft)	Sta. 139+00, 39'L	Reddish Brown Silty SAND Micaceous	SM								42	26.7			52	29	23
WB3-16 (13.5-15 ft)	Sta. 139+00, 39'L	Light Brown Silty SAND Micaceous	SM								20	21.8			NP	NP	NP
WB3-13 (4-6 ft)	Sta. 140+47, 43'L	Reddish Brown Clayey SAND Micaceous	SC								43	23.9			42	24	18
WB3-13 (13.5-15 ft)	Sta. 140+47, 43'L	Gray White Silty SAND Micaceous	SM								29	39.2			NP	NP	NP
WB3-13 (33.5-35 ft)	Sta. 140+47, 43'L	Light Gray, White Silty SAND Micaceous	SM								23	39.4			NP	NP	NP
WB5-04 (0-2 ft)	Sta. 140+50, 38'R	Reddish Brown Silty SAND Micaceous	SM								39	21.3			NP	NP	NP
WB5-04 (18.5-20 ft)	Sta. 140+50, 38'R	Brown Silty SAND Micaceous	SM								33	34.2			NP	NP	NP
WB3-14 (0-2 ft)	Sta. 141+70, 30'L	Brown Clayey SAND with Traces of Roots Micaceous	SC								42	23.3			31	21	10
WB3-14 (2-4 ft)	Sta. 141+70, 30'L	Reddish Brown Sandy FAT CLAY Micaceous	CH								58	27.5			56	28	28
WB3-14 (8-10 ft)	Sta. 141+70, 30'L	Brown Silty SAND Micaceous	SM								14	9.5			NP	NP	NP
WB3-14 (18.5-20 ft)	Sta. 141+70, 30'L	Light Brown Silty SAND Micaceous	SM								20	17.5			NP	NP	NP

ATTERBERG LIMITS' RESULTS

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

CLIENT HNTB **PROJECT NAME** Windy Hill Road - Terrell Mill Road Connector

PROJECT NUMBER A121503.122 GDOT P.I. 0013967 **PROJECT LOCATION** Marietta, Cobb County, Georgia



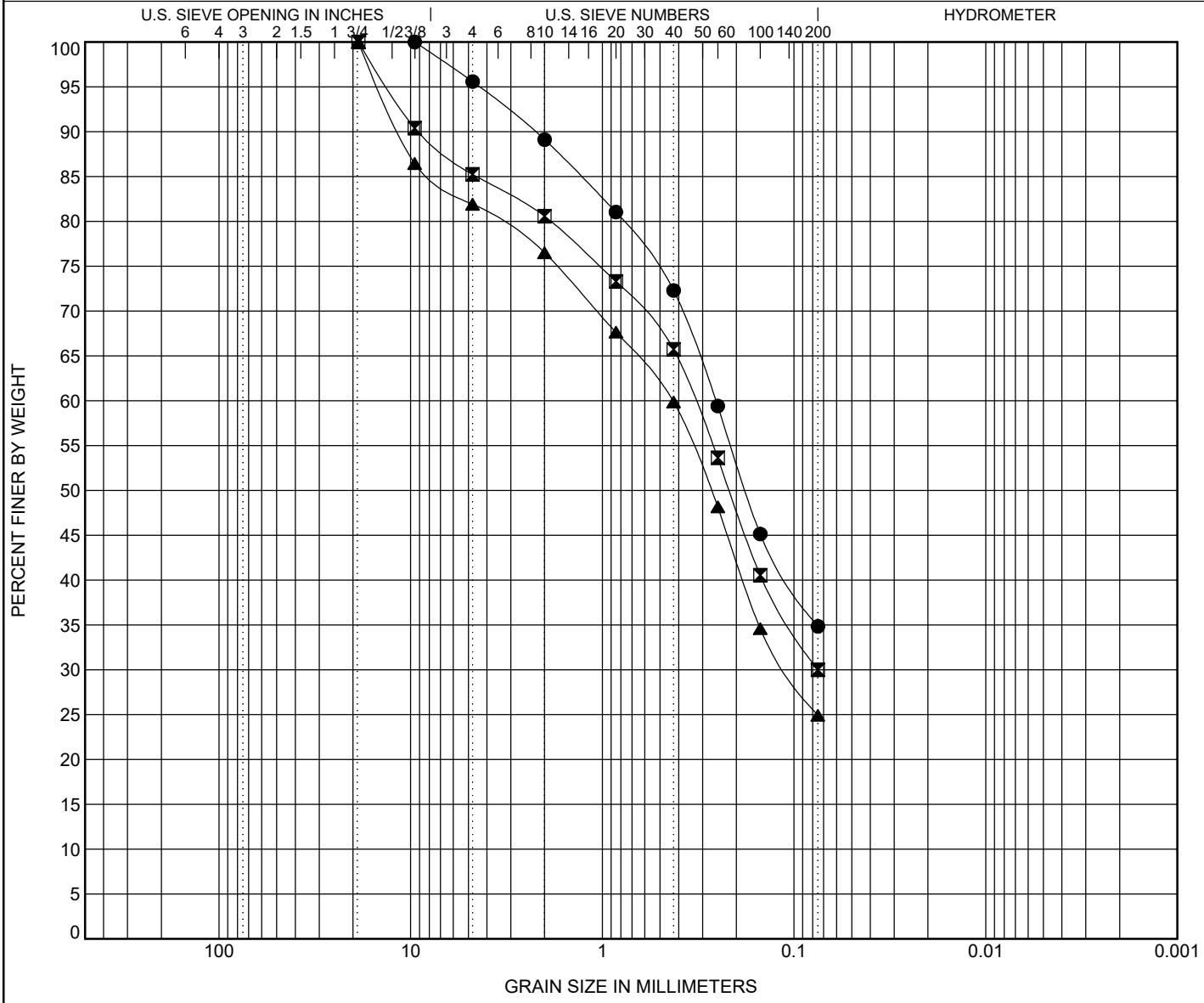
	Specimen Identification	LL	PL	PI	Fines	Classification
●	**WB3-06 (0-2 ft)**	**44**	**22**	**22**	**65**	**Reddish Brown Sandy Lean CLAY Micaceous**
⊠	**WB3-06 (2-4 ft)**	**52**	**29**	**23**	**59**	**Reddish Brown Sandy Elastic SILT Micaceous**
▲	**WB3-08 (0-2 ft)**	**46**	**22**	**24**	**45**	**Reddish Brown Clayey SAND with Mica**
★	**WB3-10 (0-2 ft)**	**43**	**23**	**20**	**49**	**Reddish Brown Clayey SAND**
⊙	**WB3-16 (2-4 ft)**	**52**	**29**	**23**	**42**	**Reddish Brown Silty SAND Micaceous**
✿	**WB3-13 (4-6 ft)**	**42**	**24**	**18**	**43**	**Reddish Brown Clayey SAND Micaceous**
○	**WB3-14 (0-2 ft)**	**31**	**21**	**10**	**42**	**Brown Clayey SAND with Traces of Roots Micaceous**
△	**WB3-14 (2-4 ft)**	**56**	**28**	**28**	**58**	**Reddish Brown Sandy FAT CLAY Micaceous**

GRAIN SIZE DISTRIBUTION

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

CLIENT HNTB **PROJECT NAME** Windy Hill Road - Terrell Mill Road Connector

PROJECT NUMBER A121503.122 GDOT P.I. 0013967 **PROJECT LOCATION** Marietta, Cobb County, Georgia



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● WB4-02 (0-2 ft)	**Reddish Brown Silty SAND Micaceous**	**NP**	**NP**	**NP**		
⊠ WB4-03 (2-4 ft)	**Dark Reddish Brown Silty SAND Micaceous**	**NP**	**NP**	**NP**		
▲ WB4-03 (4-6 ft)	**Reddish Brown Silty SAND with Mica**	**NP**	**NP**	**NP**		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● WB4-02 (0-2 ft)	**9.525**	**0.256**			**4.4**	**60.7**	**34.8**	
⊠ WB4-03 (2-4 ft)	**18.75**	**0.331**	**0.075**		**14.8**	**55.2**	**30.0**	
▲ WB4-03 (4-6 ft)	**18.75**	**0.43**	**0.108**		**18.1**	**57.0**	**24.9**	

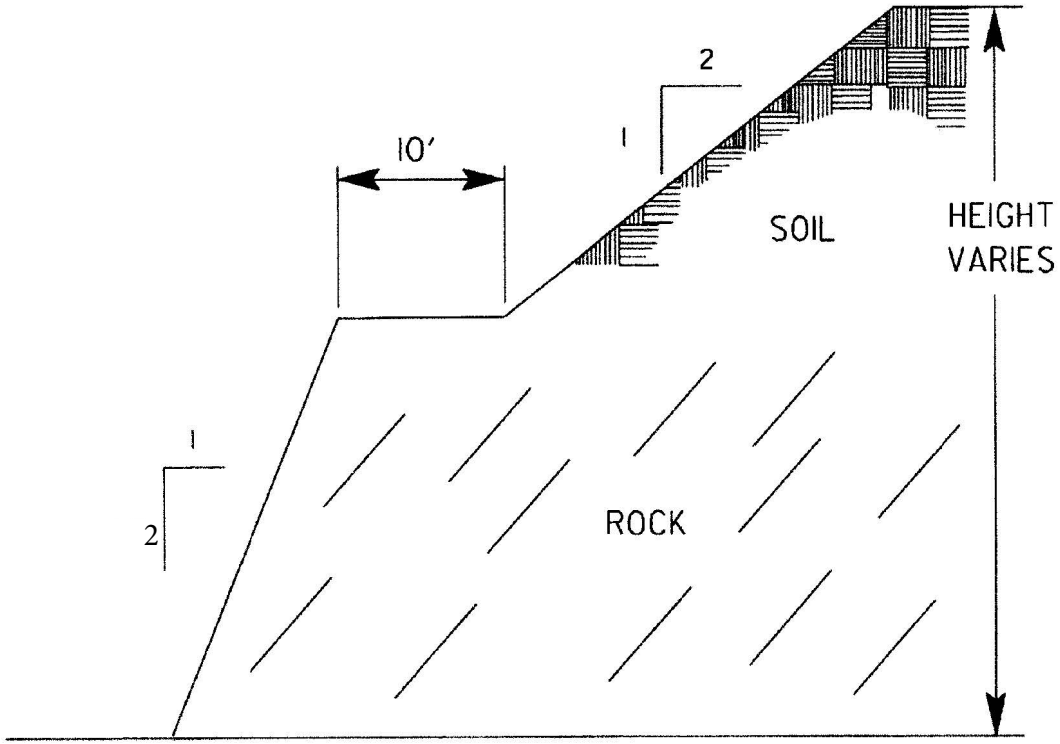
Note-Sample soaked for 16 hrs (+/- 10 min)

Corrosion Test Results

Summary of Environmental Corrosion Test Results							
Boring No. / Depth (ft)	**USCS**	**pH**	**Resistivity (ohm-cm)**	**Chlorides (ppm)**	**Sulfates (ppm)**	**Env. Classification * (Soil)**	
						Steel	**Concrete**
WB3-08 (2 – 4)	SM	5.2	32,000	<11	29	Non-Corrosive	Non-Corrosive
WB4-02 (2 – 4)	SP-SM	5.3	31,000	<11	27	Non-Corrosive	Non-Corrosive
WB4-03 (6 – 8)	SM	5.4	24,000	11	12	Non-Corrosive	Non-Corrosive
WB3-10 (2 – 4)	SM	5.0	30,000	<10	<10	Non-Corrosive	Non-Corrosive
WB3-10 (4 – 6)	SM	5.6	100,000	<10	<10	Non-Corrosive	Non-Corrosive
WB3-12 (2 – 4)	SC	5.2	23,000	<10	<10	Non-Corrosive	Non-Corrosive
WB3-12 (6 – 8)	SM	5.8	140,000	<10	<10	Non-Corrosive	Non-Corrosive
Notes:							
*As per Soil Nail Wall Reference Manual, FHWA GEC 007, Publication no. FHWA-NHI-14-007, February 2015 (Section 7.5)							
pH – tested in accordance with ASTM D4972							
Resistivity – tested in accordance with ASTM G57							
Chlorides – content determined by EPA SW9056A test method							
Sulfates – content determined by EPA SW9056A test method							

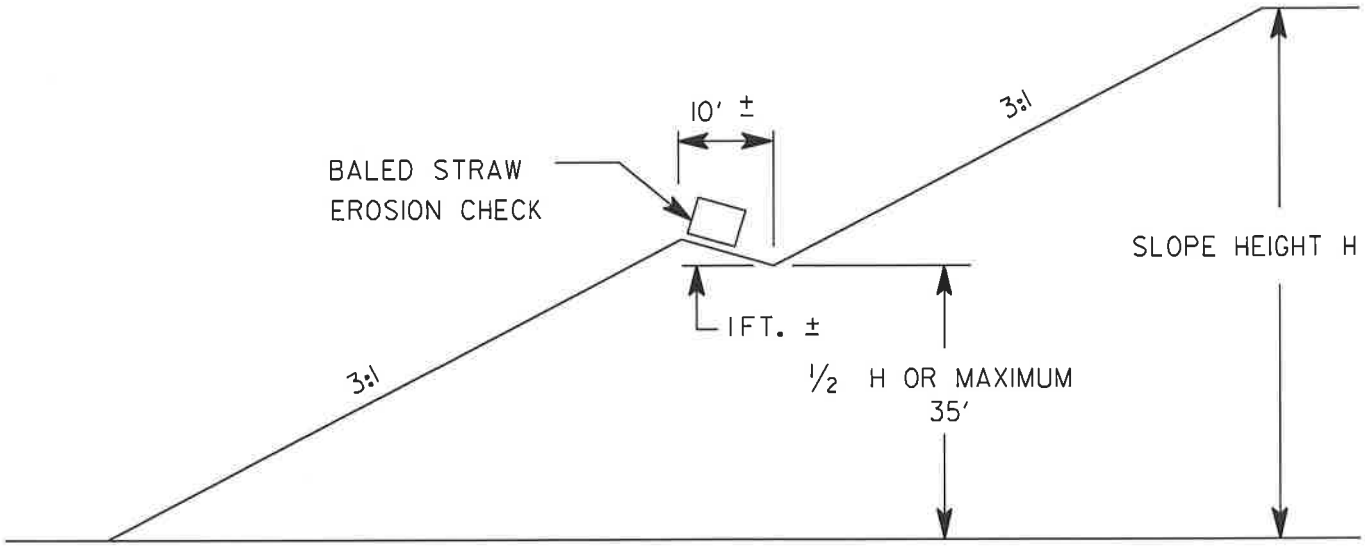
APPENDIX III

- Detail of Rock Cut – 1 Page
- Berm Detail for Cuts or Fills over 35 Feet – 1 Page
- Benching Detail – 1 Page
- Standup Test Photographs – 4 Pages
- Seismic Refraction Survey Report – 18 Pages



APPLIES TO STATION TO STATION	LOCATION	RANGE OF ROCK DEPTHS FROM EXISTING TOP OF GROUND ELEVATION.
122+00± to 123+82± 128+50± to 131+00±	Rt. Lt.	13 to 24 ft. 16 ft.

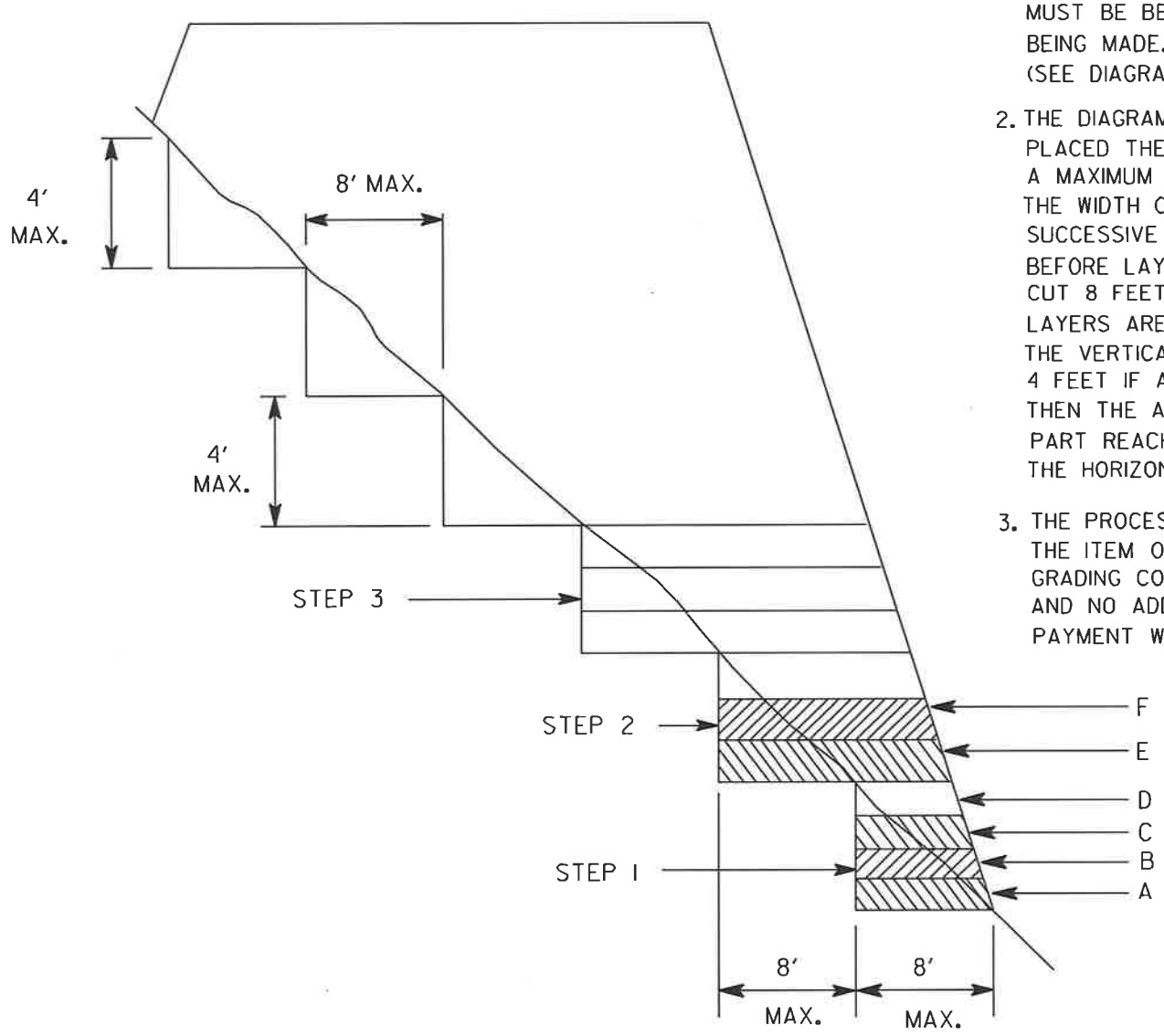
DETAIL FOR ROCK CUT



NOTES:

1. FOR SLOPE HEIGHTS LESS THAN 70 FT. BUT GREATER THAN 35 FT., A BERM SHOULD BE CONSTRUCTED AT APPROX. ½ THE SLOPE HEIGHT. FOR SLOPE HEIGHTS GREATER THAN 70 FT., CONSTRUCT A BERM EVERY 35 FT.
2. THE BERM SHOULD BE SLOPED TO DRAIN AND SHOULD BE CONNECTED TO CONCRETE FLUMES TO REMOVE WATER FROM SLOPE.
3. A DRAINAGE DITCH SHOULD BE CONSTRUCTED AT THE TOP OF CUT SLOPES WHERE WATER DRAINS TOWARDS SLOPE.

BERM DETAIL FOR CUTS OR FILLS OVER 35 FEET



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 BENCHED 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 ¾ 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

Standup Test Photographs

Windy Hill Road-Terrell Mill Road Connector

GDOT P.I. No. 0013967

Cobb County Project No. X2401

HNTB Project No. 64327

MC^2 Project No. A121503.122

Marietta, Cobb County, Georgia

Standup Test Photographs
Windy Hill Road-Terrell Mill Road Connector
HNTB
ST-01 (129+00, 40’ L)

Approximate dimensions:
2 feet wide, 6 feet long and 6 feet deep

Elapsed Time: 2 hours

Elapsed Time: 23 hours

Elapsed Time: 9 days

Standup Test Photographs
Windy Hill Road-Terrell Mill Road Connector
HNTB
ST-02 (129+45, 45’ L)

Approximate dimensions:
2 feet wide, 6 feet long and 6 feet deep

Elapsed Time: 1.5 hours

Elapsed Time: 24 hours

Elapsed Time: 9 days

Standup Test Photographs
Windy Hill Road-Terrell Mill Road Connector
HNTB
ST-03 (134+00, 60’ L)

Approximate dimensions:
2 feet wide, 6 feet long and 6 feet deep

Elapsed Time: 3 hours

Elapsed Time: 22 hours

Elapsed Time: 9 days

SEISMIC REFRACTION SURVEY REPORT

Windy Hill-Terrell Mill Connector
Cobb County, Georgia

Prepared For: **Chris Seckinger, P.E.**
Project Manager/Lead Roadway
HNTB
191 Peachtree Street, NE, Suite 3300
Atlanta, GA 30303

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

Project No.: A**121503.122**
Prepared: **December** 2016

MC²
GEOTECHNICAL • ENVIRONMENTAL
MATERIALS TESTING

December 22, 2016

Mr. Chris Seckinger, P.E.
Project Manager/Lead Roadway
HNTB
191 Peachtree Street, NE, Suite 3300
Atlanta, GA 30303

Subject: **Seismic Refraction Survey Report**
Windy Hill-Terrell Mill Connector
Cobb County, Georgia
MC Squared, Inc. (MC^2) Project Number A121503.122

Dear Mr. Seckinger:

MC^2 is pleased to submit this Seismic Refraction Survey Report for the Windy Hill-Terrell Mill Connector in Cobb County, Georgia. Refer to **Sheet** 1 for an approximate Project Location Map. These services were authorized through a subcontract agreement between **MC^2** and **HNTB** dated July 1, 2016.

Project Information

The planned improvements at the subject project consist of a new roadway alignment approximately 4,600 lineal feet. The planned roadway will consist of a four-lane divided roadway connecting Windy Hill Road and Terrell Mill Road with turn lanes and divided median. The proposed alignment transverses through areas with significant elevation changes. A preliminary evaluation of the roadway profile and cross sectional drawings provided by HNTB indicates several areas of cut and fill. Accordingly, HNTB has requested MC^2 to evaluate the subsurface conditions, specifically the presence of rock and its quality.

Scope of Work

Evaluation of the presence and depth to PWR and/or rock is a two-phase process. Phase I includes performing a non-invasive geophysical survey to estimate the depth, quality and extents of rock over a large footprint. Phase II includes performing test borings also called truth borings at strategically placed locations along the geophysical survey alignment to confirm and evaluate the quality of rock. This letter report addresses Phase I of the evaluation. Phase I of the evaluation consisted of performing a non-invasive geophysical method known as seismic refraction. Seismic refraction survey was performed along the proposed roadway alignment where cut is anticipated.

Field Investigation

A total length of approximately 1,320 lineal feet of roadway was evaluated over a period of four days. **Sheets 2 thru 4** depict the various proposed alignments and the approximate location of the various seismic refraction traverses, as located in the field by **MC^2** personnel.

The station numbering and location of the seismic refraction traverses as indicated on **Sheets 2 thru 4** should be considered approximate. Locations were identified in the field utilizing hand held GPS devices. Locations should be considered accurate to approximately 15 feet.

Seismic Refraction

The seismic refraction method is based on the measurement of the travel time of seismic waves refracted at the interfaces between subsurface layers of different velocity. Seismic energy (compression p-wave) is created by a source (shot) located on the surface. Energy radiates out from the shot point, either traveling directly through the upper layer (direct arrivals), or traveling down to and then laterally (refracting) along higher velocity layers (refracted arrivals) before returning to the surface. This energy is detected on the surface using a linear array (or spread) of geophones spaced at regular intervals. Beyond a certain distance from the shot point, known as the crossover distance, the refracted signal is observed as a first arrival signal at the geophones (arriving before the direct arrivals). Wave velocities increase as they are refracted off of harder layers. The field data establishes time versus distance graphs, which are used to calculate velocities and corresponding depths of the subsurface materials.

Field Methodology

A total of 8 seismic refraction traverses were deployed along various stations along the proposed alignment. At each traverse, twenty-four (24) 11.5 Hz geophones were deployed. The geophones were spaced 5 feet apart. Two sources were used, based on accessibility and ground surface conditions; one was a 20-lb sledge hammer striking a steel plate and the other was a GISCO Electronic Seismic Source which consists of a 50-lb hammer which utilizes elastomer acceleration. The source generates 208 Joules per strike at an impact velocity of 14 ft/sec. Several off-end shots, and intermediate center shots, were taken along each traverse alignment in the course of this survey.

The gathered data was analyzed using the SeisImager software suite, produced by Geometrics, Inc. Depth Profiles were produced by an analytical procedure based on consideration of shot and receiver geometry, the measured travel times and calculated velocities. The final output comprises of a depth profile of the refractor layers and a velocity model of the subsurface. Refer to **Sheets 5 thru 12** for P-wave profiles.

Findings

Inherent in this process is the assumption that the subsurface material gets denser with depth. Therefore, this technique cannot predict hidden layers (or weaker zones that may be present under rock layers). Refer to the limitations section of this report for additional limitations related to the seismic survey. In reading the attached profiles, the following typical range of velocities could be used as a reference. References to excavate-ability are in the context of an open cut.

P-Wave Velocity (ft/sec)	Interpretation of Material Composition
0 – 2000	Softer materials generally consisting of soils and Saprolites which typically can be excavated using backhoes and scrapers.
2000 – 5000	Partially Weathered and Fractured Rock which can usually be ripped using large earth moving equipment in mass excavations. Trench excavation may require blasting for removal.
>5000	Competent Rock normally requiring blasting in trench or mass excavations

The seismic refraction profiles showed a velocity range between 1,405 ft/sec and 1,986 ft/sec for the overburden material that ranged in thickness from approximately 2 feet to over 20 feet thick. The overburden is underlain by what appears to be more competent material, ranging in velocity from 3,033 ft/sec to over 11,000 ft/sec, which could connote layers of dense PWR and/or competent rock material.

The following table summarizes the seismic refraction line locations and our findings:

Seismic Traverse Line No.	Stations Covered	Ground Cover	Overburden Velocity (Average Thickness)	Refractory Layer Velocity
1	**110+75 to 112+95**	Grass, Leaf Litter & Ivy	**1,405 ft/sec (10 ft)**	**11,302 ft/sec**
2	**112+90 to 115+05**	Grass, Leaf Litter & Ivy	**1,587 ft/sec (25 ft)**	**8,202 ft/sec**
3	**120+65 to 122+85**	Asphalt	**1,939 ft/sec (20 ft)**	**8,374 ft/sec**
4	**126+45 to 128+70**	Grass, Asphalt (Tennis Court), Play Sand (Volleyball Court)	**1,623 ft/sec (15 ft)**	**5,312 ft/sec**
5	**127+85 to 130+05**	Grass & Leaf Litter	**1,487 ft/sec (10 ft)**	**6,538 ft/sec**
6	**130+40 to 132+55**	Grass & Leaf Litter	**1,247 ft/sec (8 ft)**	**6,211 ft/sec**
7	**134+00 to 136+15**	Grass & Leaf Litter	**1,986 ft/sec (15 ft)**	**4,581 ft/sec**
8	**135+60 to 137+70**	Grass & Leaf Litter	**1,438 ft/sec (5 ft)**	**3,033 ft/sec**

Conclusions

1. Our conclusions are based upon our review of the seismic traverse lines in conjunction with the proposed depth to cut along the proposed roadway alignment.

2. Our review of the seismic traverse lines 1, 4, 5, 6 and 8 indicates that portions of the proposed cut may encounter dense material such as PWR and/or rock during construction.

3. A closer look at the P-wave velocities indicates that a majority of the dense material may be PWR which may be excavatable/rippable using large earth moving equipment in mass excavations.

4. Phase II consisting of truth borings (Standard Penetration Test Borings) shall help determine the actual quality of rock and will be performed at a future time by **MC²** as approved by HNTB.

Limitations

The profiles presented show layers as having sharp boundaries. Actual field conditions, however, will likely grade from one horizon to the next, producing a thin zone of intermediate velocities which are not visible in the produced cross sections.

Geophysical techniques are highly interpretative. Accordingly, ground-truthing efforts are recommended to be undertaken in order to confirm findings from Phase I. The presence of a well-established groundwater table in a soil or partially weathered rock (PWR) regime will often produce a characteristic seismic velocity of 5,000 ft/sec which can be mistaken for competent rock. Where field conditions indicate a high probability for this occurrence, secondary geophysical or mechanical methods are recommended to verify the seismic refraction findings. These efforts may include using Shear Wave Velocity testing (such MASW), a series of drilled (Standard Penetration Test) borings, including rock coring and/or the use of test pits using rated excavating equipment.

We trust that the information provided in this report will assist you in the planning of the proposed project. We appreciate the opportunity to be of service to you and Cobb County. Should you have any questions, please do not hesitate to contact us.

Amir Moussly
Staff Engineer

Prashanth Vaddu, P.E.
Project Manager

Sameer Moussly
CEO

Attachments:

Sheet 1 – Project Location Map
Sheets 2 thru 4 – Approximate Seismic Traverse Locations
Sheet 5 – P-Wave Profile: Line 1
Sheet 6 – P-Wave Profile: Line 2
Sheet 7 – P-Wave Profile: Line 3
Sheet 8 – P-Wave Profile: Line 4
Sheet 9 – P-Wave Profile: Line 5
Sheet 10 – P-Wave Profile: Line 6
Sheet 11 – P-Wave Profile: Line 7
Sheet 12 – P-Wave Profile: Line 8

PI NO. 0013967

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GEORGIA LICENSE No. PE039820

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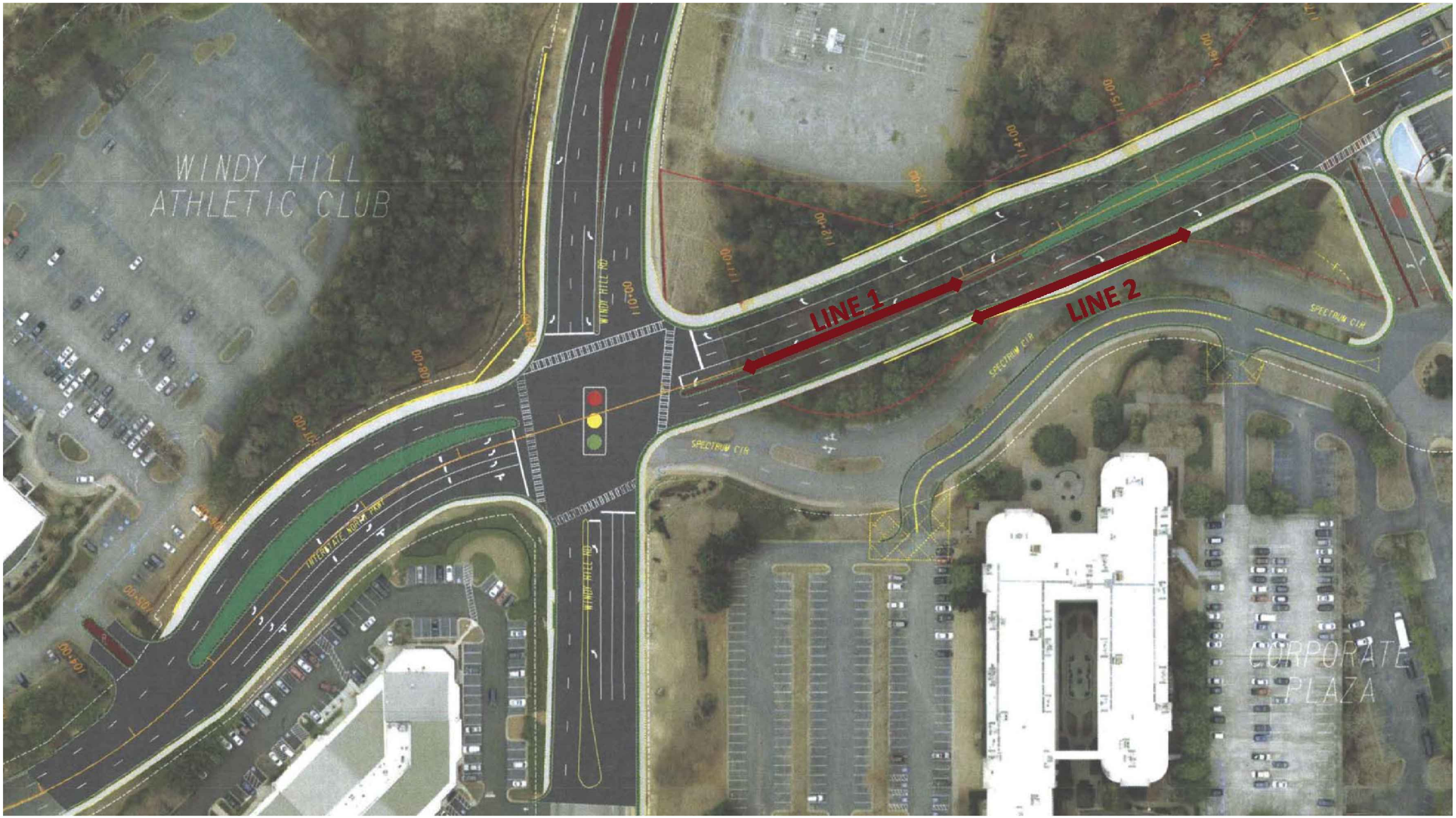
DESIGNED BY:	CW	12/20/16
DRAWN BY:	CW	12/20/16
CHECKED BY:	AM	12/20/16
SUPERVISED BY:	PV	

PROJECT LOCATION MAP	MC² PROJ. NO.	SHEET NO.
Windy Hill - Terrell Mill Connector Cobb County, Georgia	A121503.122	1



SEISMIC REFRACTION MAP : MATRIX

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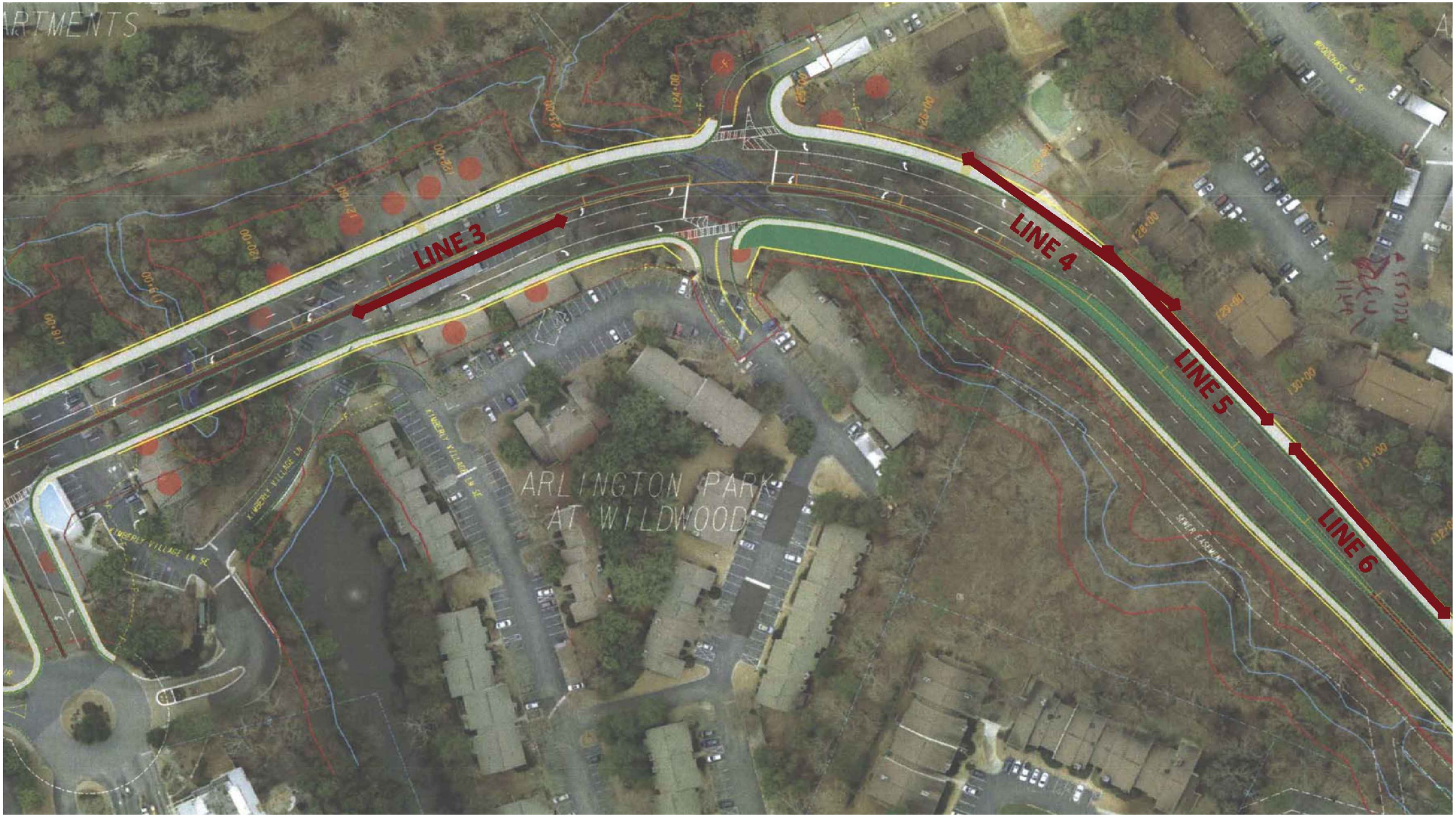
APPROXIMATE SEISMIC TRAVERSE LOCATIONS	MC² PROJ. NO.	SHEET NO.
Windy Hill - Terrell Mill Connector Cobb County, Georgia	A121503.122	2



SEISMIC REFRACTION MAP : MATRIX

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APPROXIMATE SEISMIC TRAVERSE LOCATIONS

Windy Hill - Terrell Mill Connector
Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 3

SEISMIC REFRACTION MAP : MATRIX

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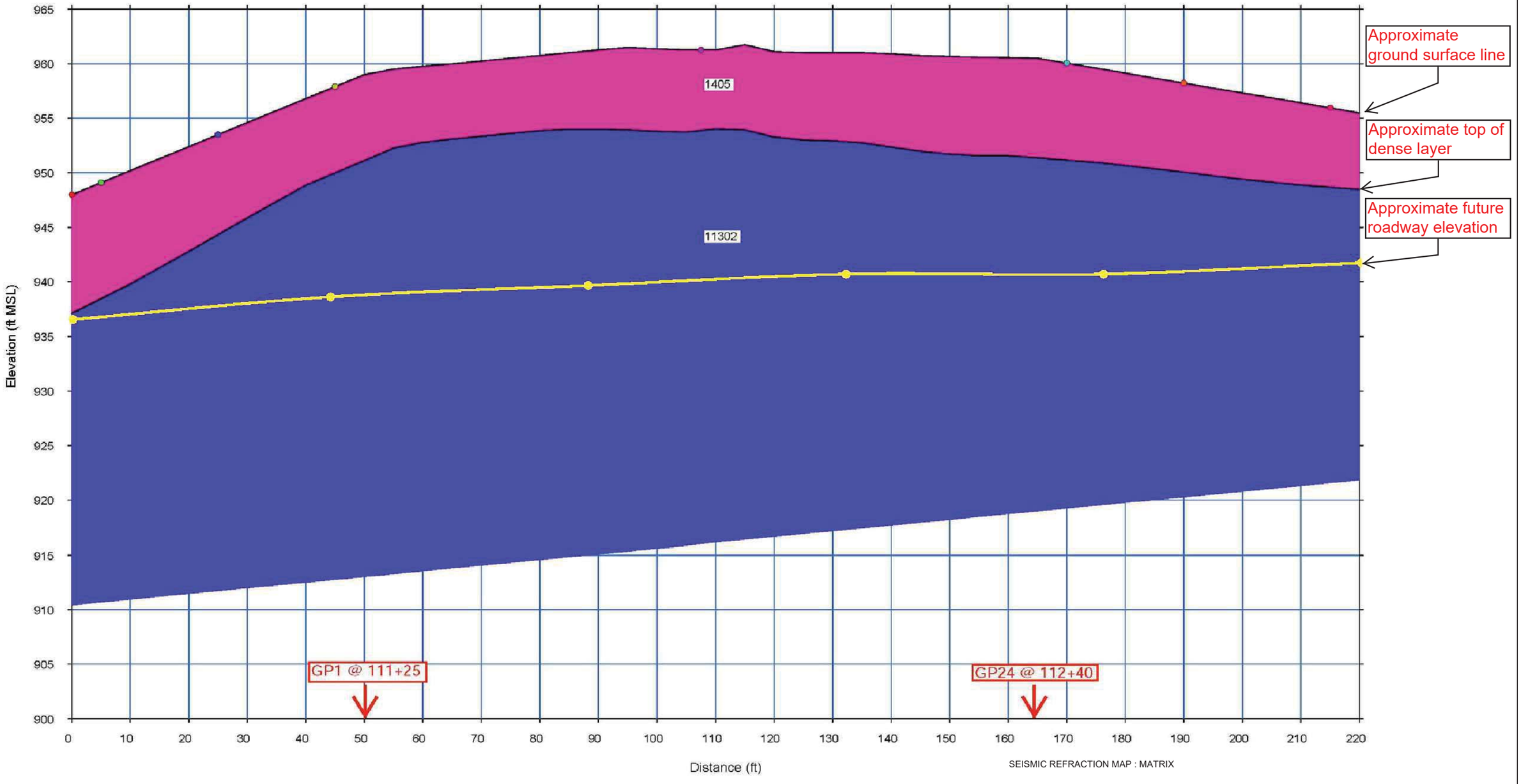
Windy Hill - Terrell Mill Connector Cobb County, Georgia	A121503.122	4



SEISMIC REFRACTION MAP : MATRIX

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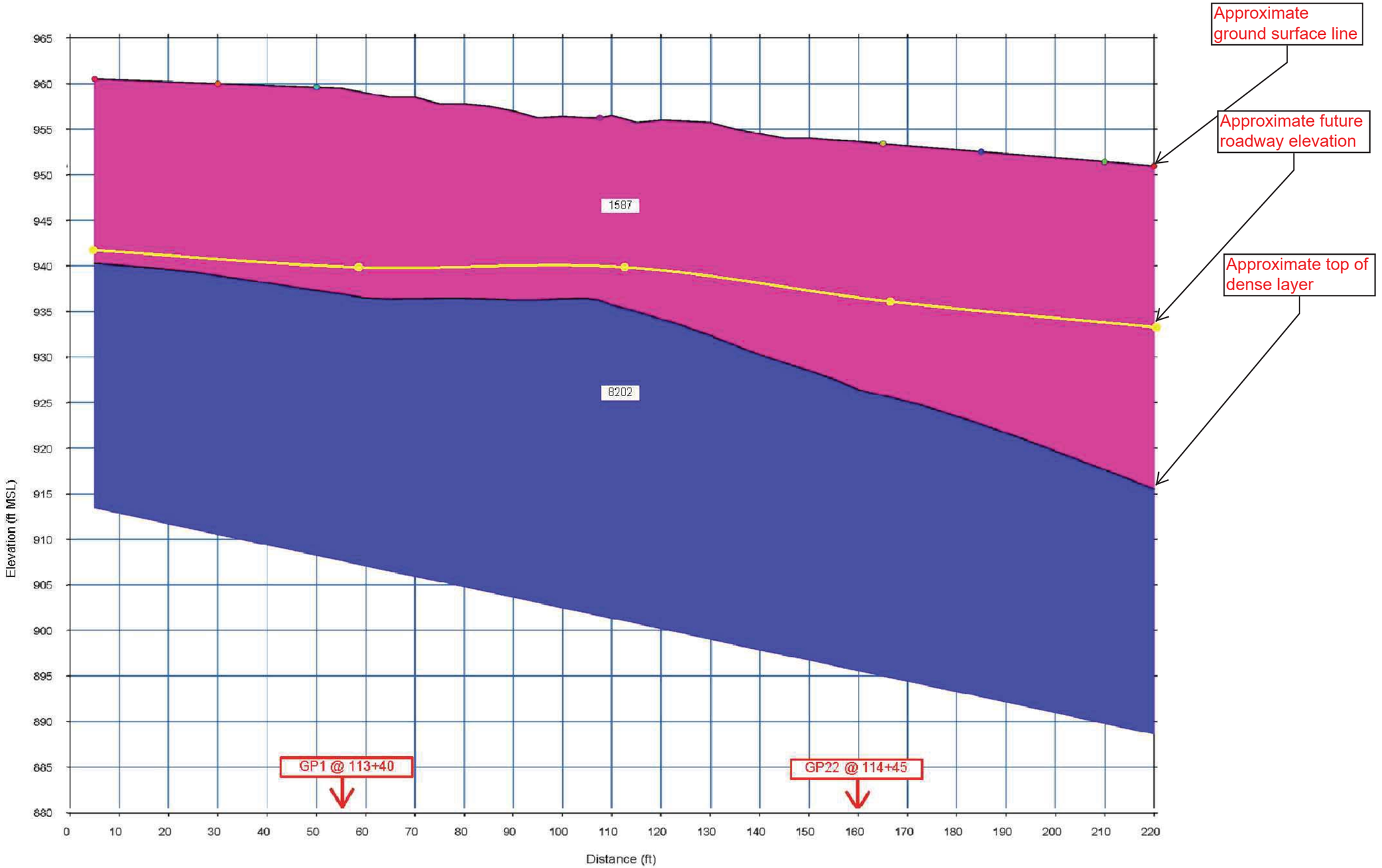
P-WAVE PROFILE: LINE 1

Windy Hill - Terrell Mill Connector
Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 5



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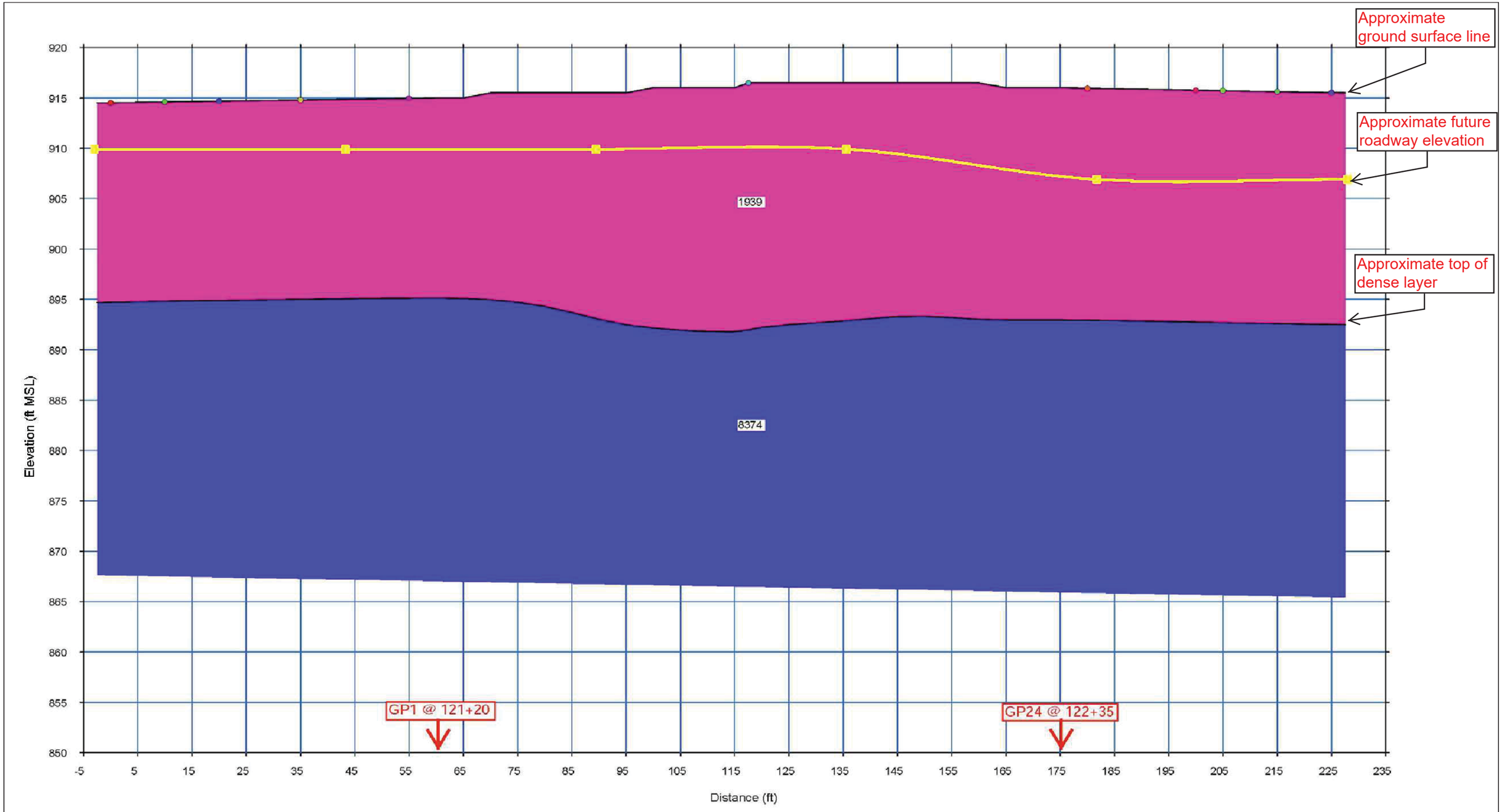
P-WAVE PROFILE: LINE 2	MC² PROJ. NO.	SHEET NO.
Windy Hill - Terrell Mill Connector Cobb County, Georgia	A121503.122	6



SEISMIC REFRACTION MAP : MATRIX

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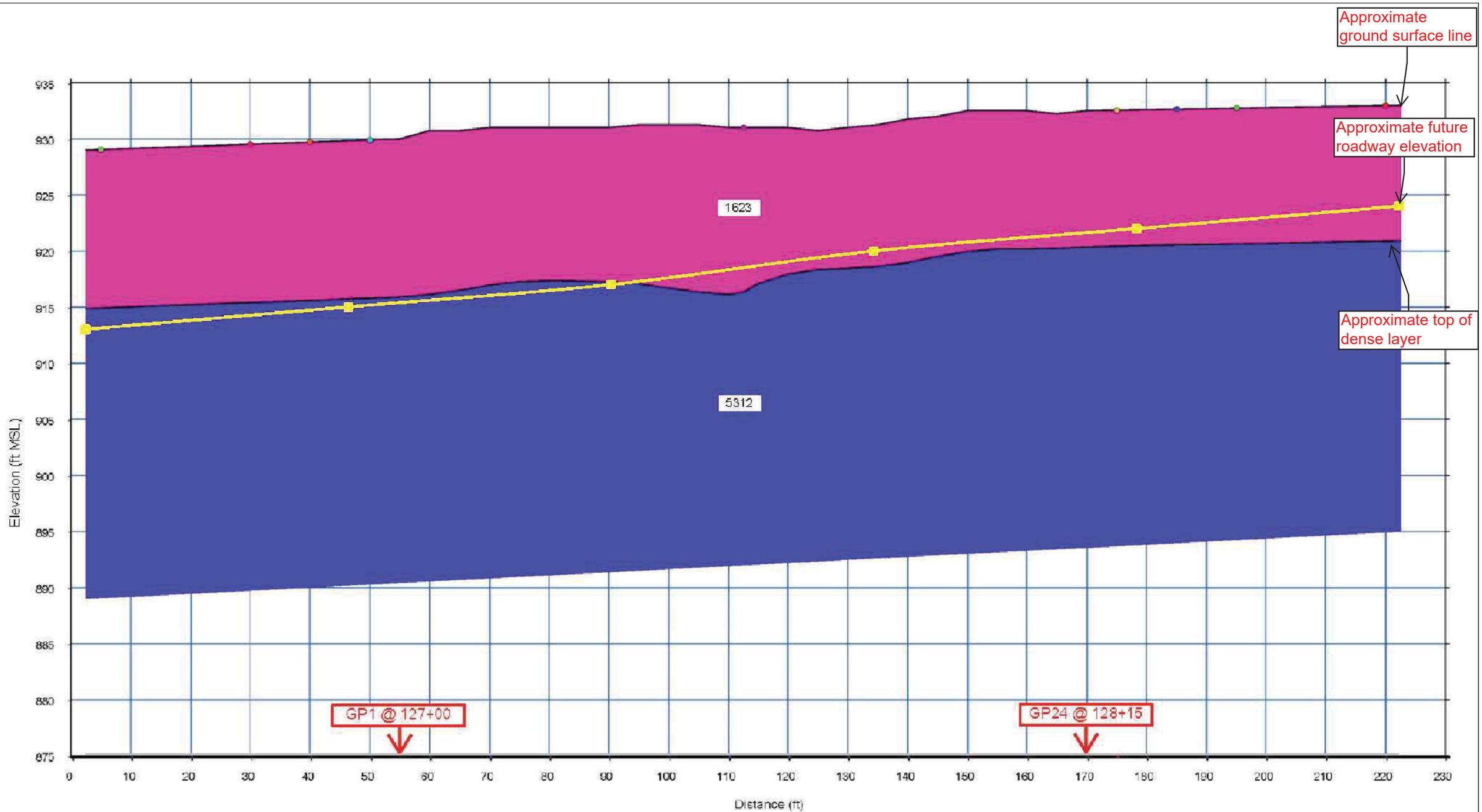
P-WAVE PROFILE: LINE 3	MC² PROJ. NO.	SHEET NO.
Windy Hill - Terrell Mill Connector Cobb County, Georgia	A121503.122	7



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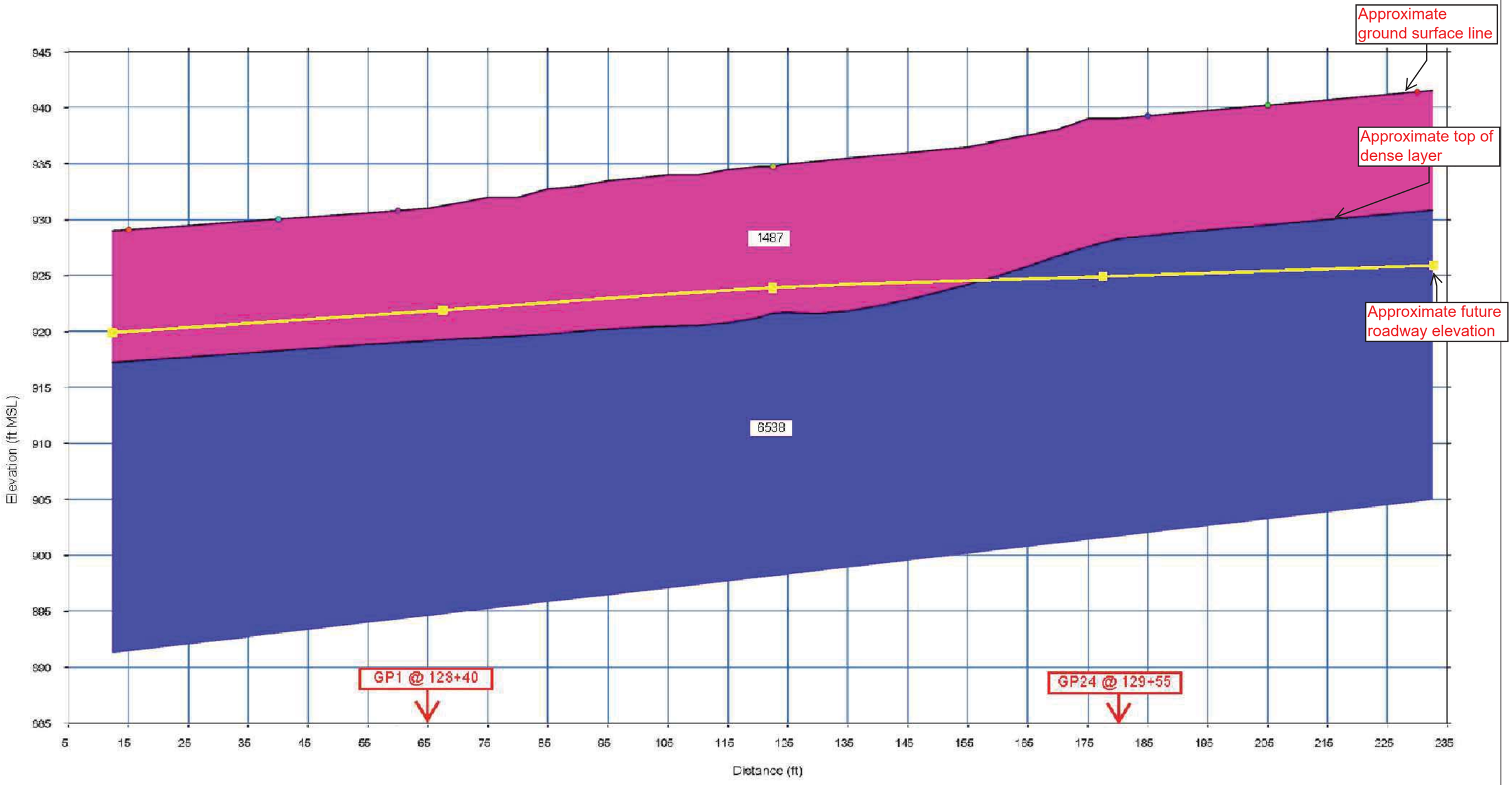
P-WAVE PROFILE: LINE 4

Windy Hill - Terrell Mill Connector
Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 8



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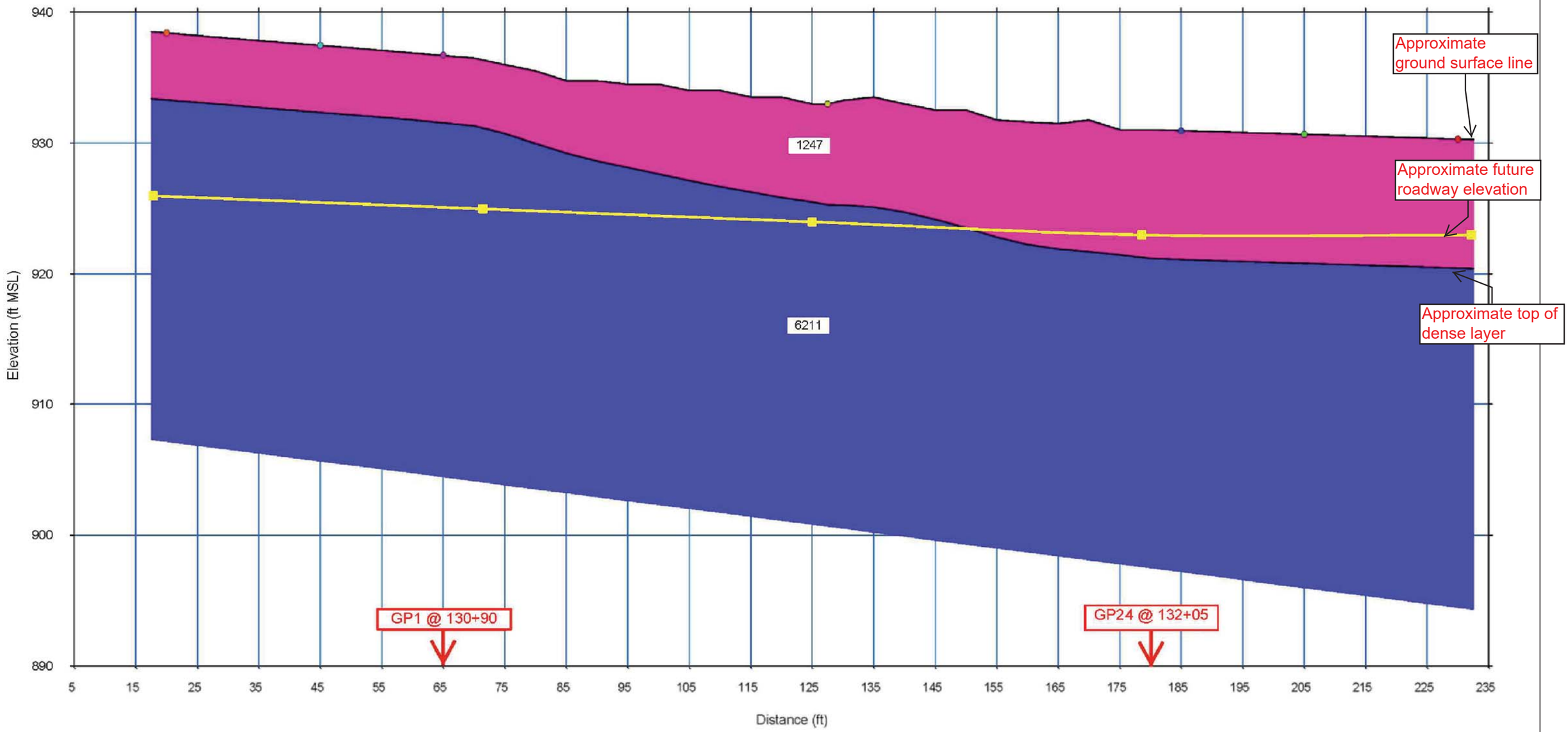
P-WAVE PROFILE: LINE 5	MC² PROJ. NO.	SHEET NO.
Windy Hill - Terrell Mill Connector Cobb County, Georgia	A121503.122	9



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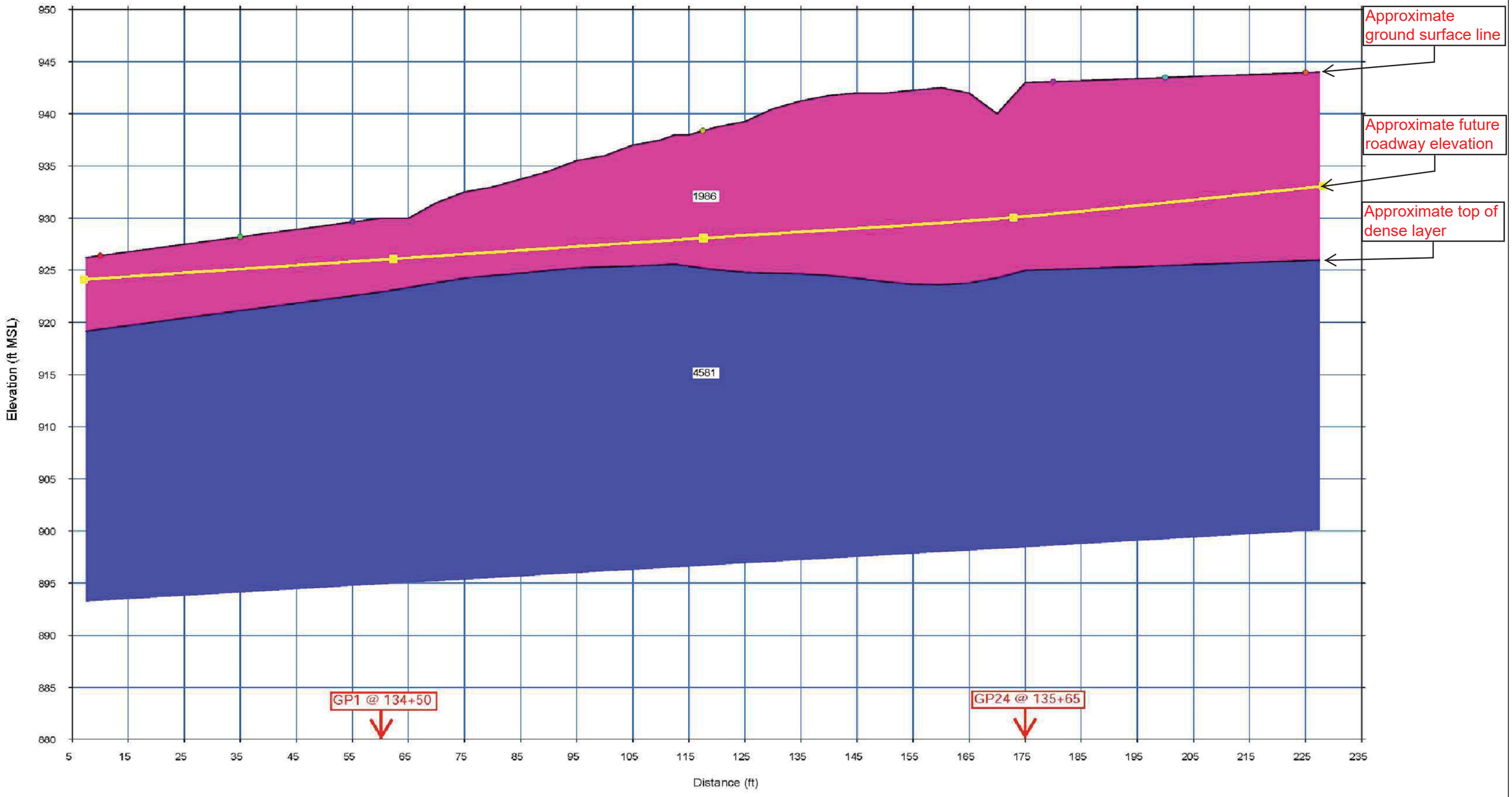
P-WAVE PROFILE: LINE 6

Windy Hill - Terrell Mill Connector
Cobb County, Georgia

MC² PROJ. NO.: A121503.122

SHEET NO.: 10



SEISMIC REFRACTION MAP : MATRIX

PI NO. 0013967

DATE	NAME	REVISION	APPROVED BY:

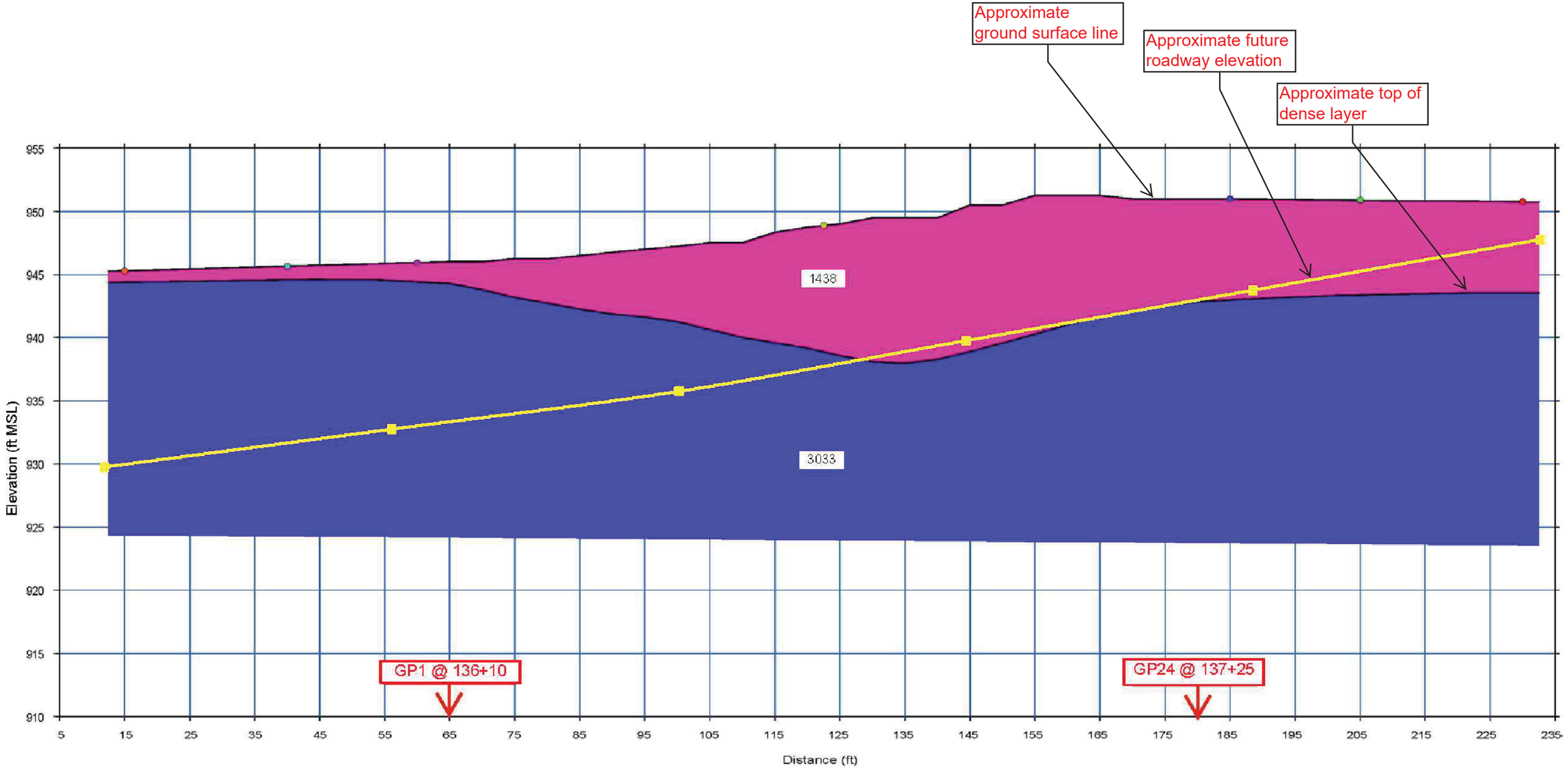
MC SQUARED, INC.
Geotechnical Consultants
1275 Shiloh Road NW
Suite 2620
Kennesaw, GA 30144
Ph:770-650-0873 Fax:770-650-7825

GEOTECHNICAL • ENVIRONMENTAL MATERIALS TESTING

GEORGIA ENGINEERING CERTIFICATE OF AUTHORIZATION No. PEF004822
Prashanth Vaddu, P.E.
GEORGIA LICENSE No. PE039820

	NAME	DATE
DESIGNED BY:	CW	12/20/16
DRAWN BY:	CW	12/20/16
CHECKED BY:	AM	12/20/16
SUPERVISED BY:	PV	

P-WAVE PROFILE: LINE 7	MC² PROJ. NO.	SHEET NO.
Windy Hill - Terrell Mill Connector Cobb County, Georgia	A121503.122	11



SEISMIC REFRACTION MAP : MATRIX

PI NO. 0013967

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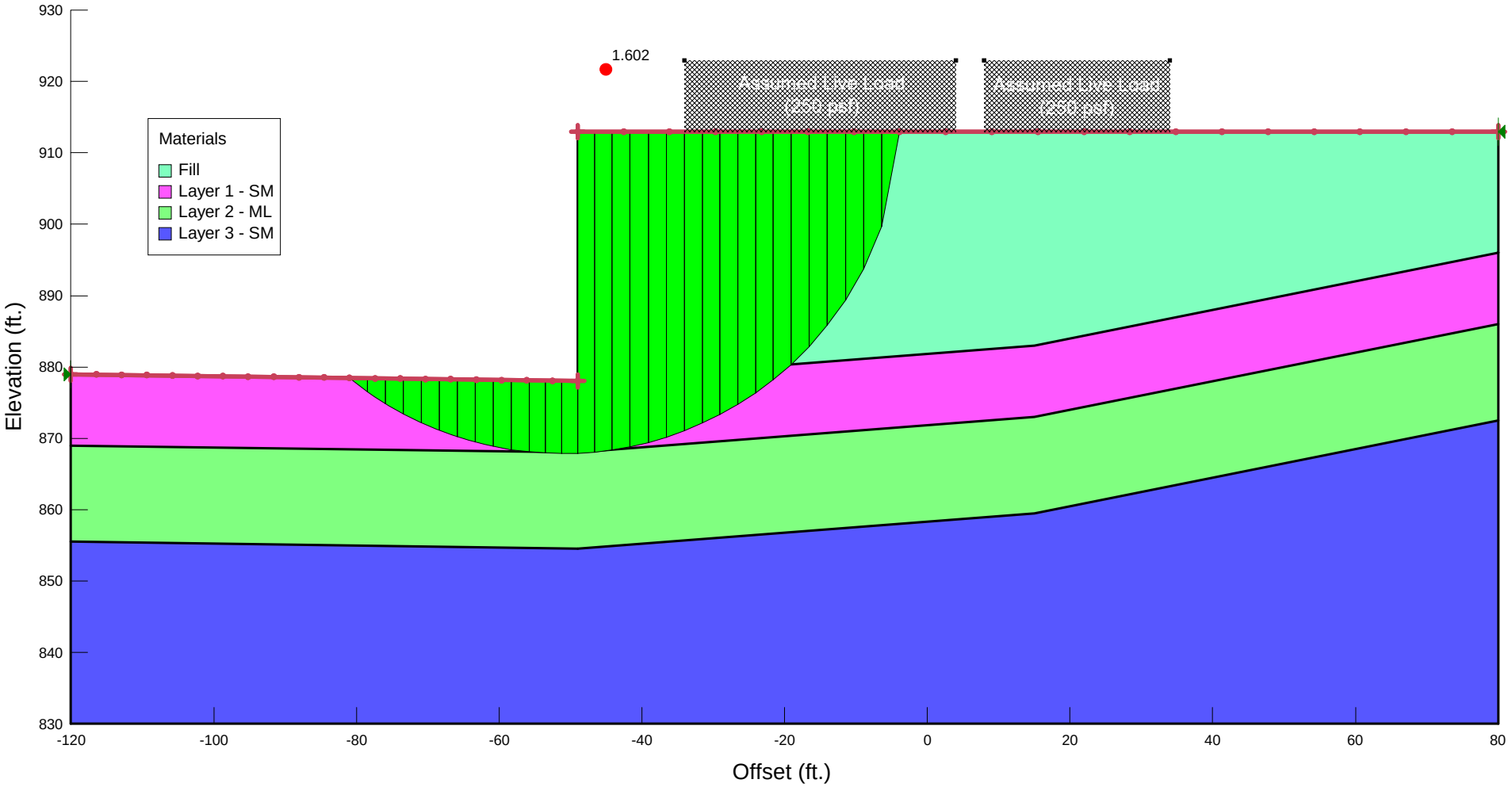
P-WAVE PROFILE: LINE 8	MC² PROJ. NO.	SHEET NO.
Windy Hill - Terrell Mill Connector Cobb County, Georgia	A121503.122	12

APPENDIX IV (MSE Walls)

- Global Stability Analysis – Wall 1 – 2 Pages
- Global Stability Analysis – Wall 4 – 1 Page
- Global Stability Analysis – Wall 5 – 2 Pages
- Global Stability Analysis – Wall 8 - 1 Page

Windy Hill Road-Terrell Mill Road Connector
GDOT P.I. No. 0013967
Cobb County Project No. X2401
HNTB Project No. 64327
MC Squared Project No. A121503.122
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 1 (B-09)
Sta. 119+00, L



Windy Hill Road-Terrell Mill Road Connector
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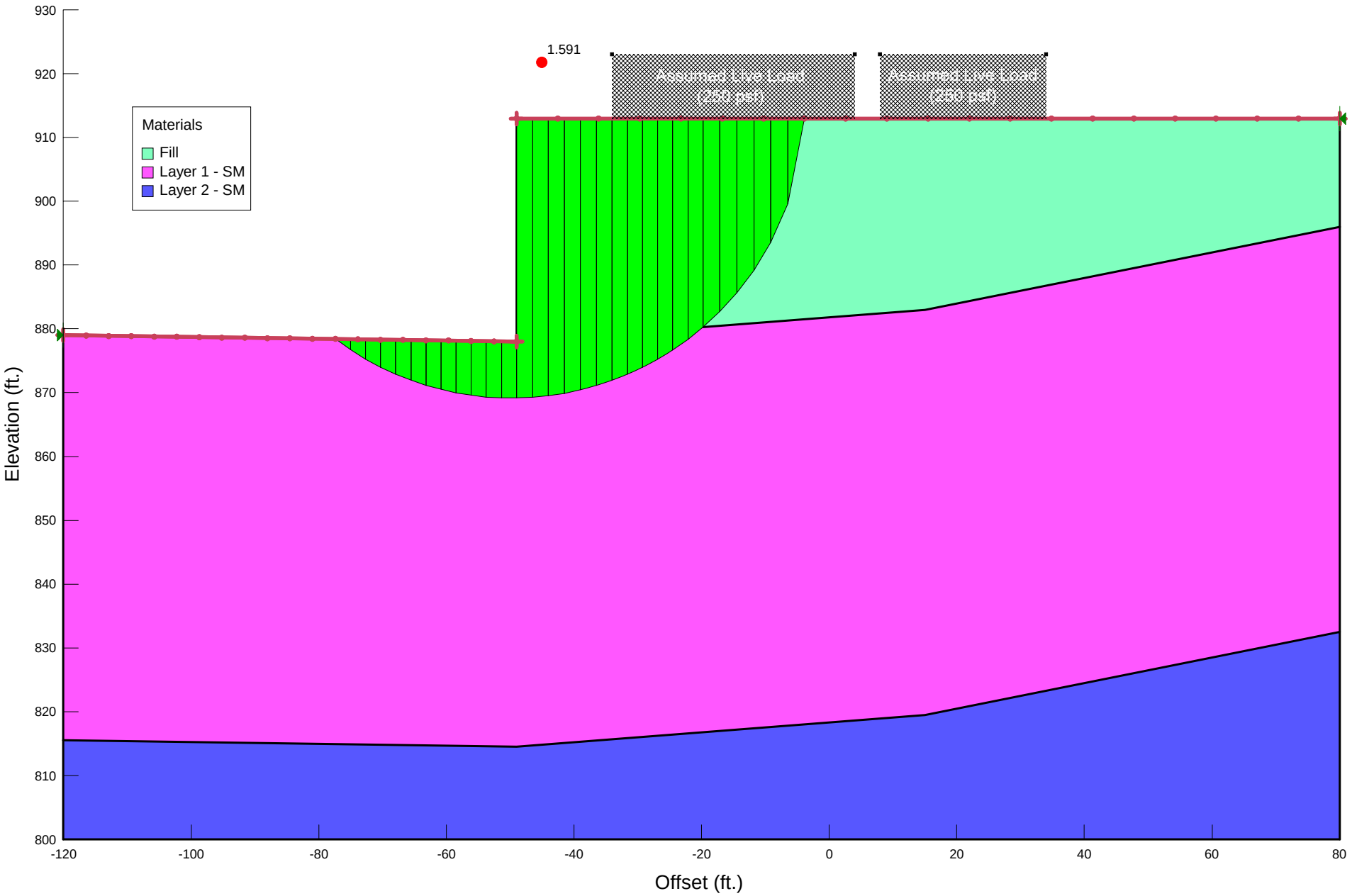
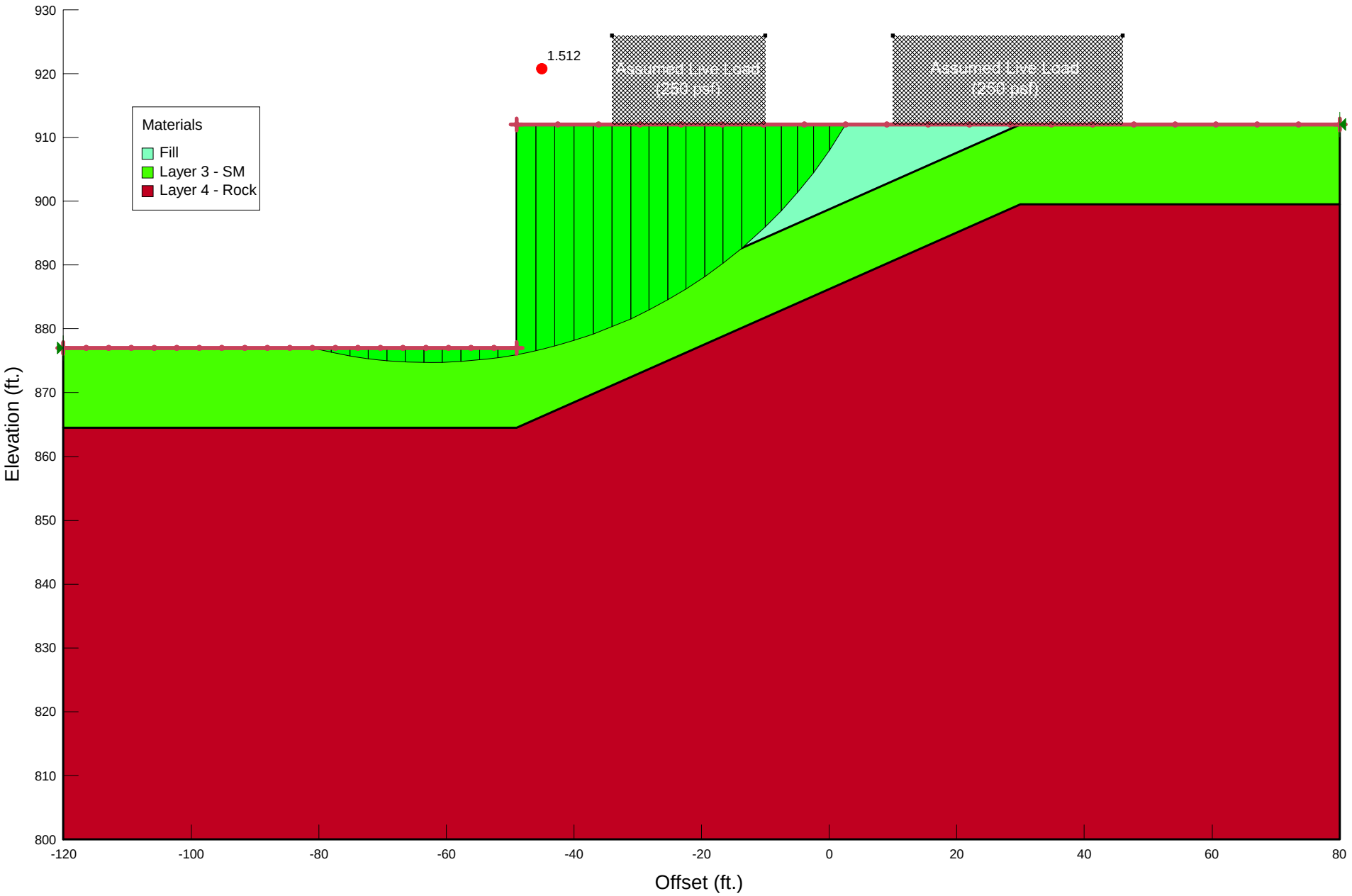
Cobb County Project No. X2401
HNTB Project No. 64327
MC Squared Project No. A121503.122
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 1 (WB3-03)
Sta. 119+00, L



Windy Hill Road-Terrell Mill Road Connector
GDOT P.I. No. 0013967
Cobb County Project No. X2401
HNTB Project No. 64327
MC Squared Project No. A121503.122
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 4 (WB3-06)
Sta. 123+00, L



Windy Hill Road-Terrell Mill Road Connector
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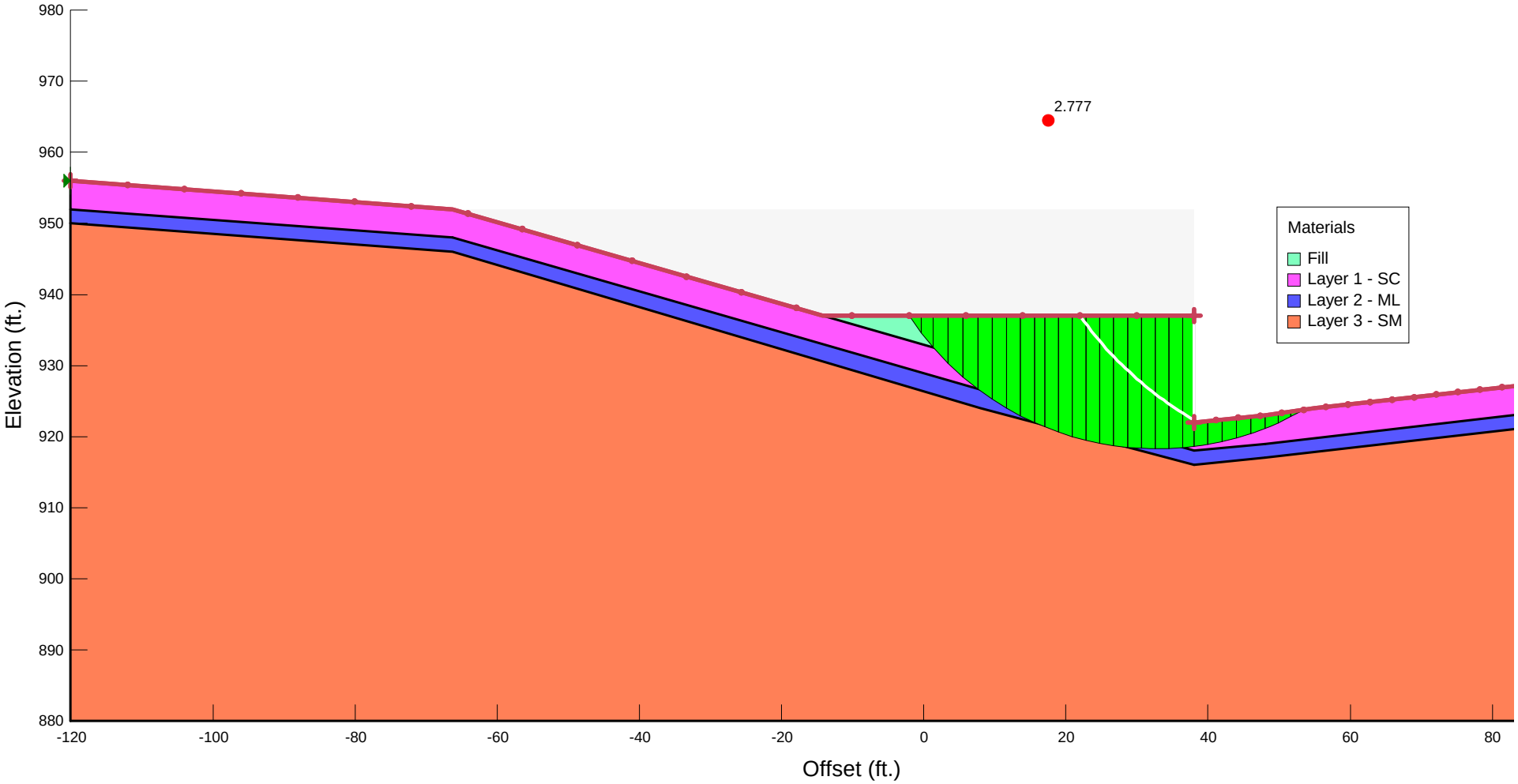
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 5 (Stage 1) (WB3-12)
Sta. 138+00, R



Windy Hill Road-Terrell Mill Road Connector
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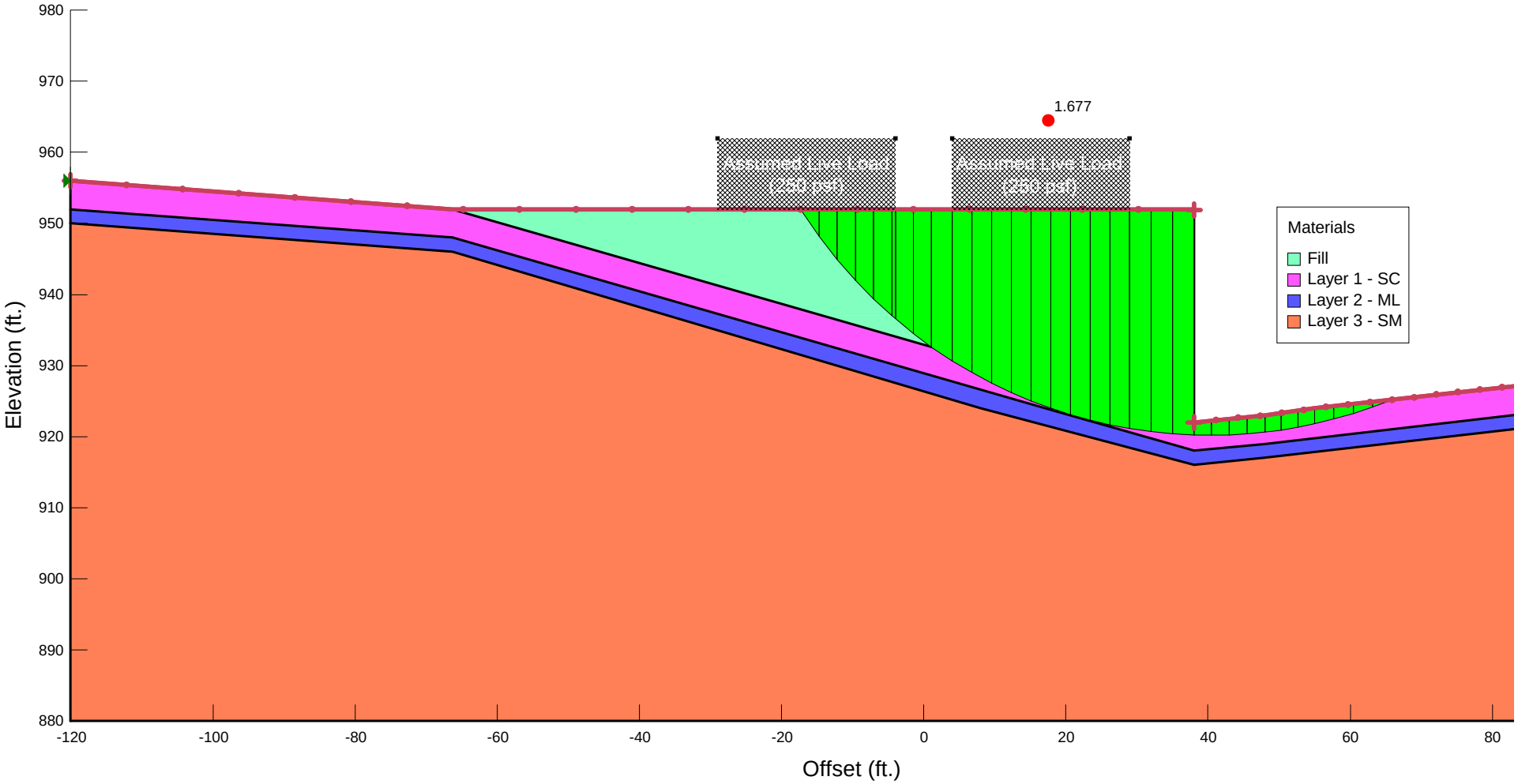
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 5 (Stage 2) (WB3-12)
Sta. 138+00, R



Windy Hill Road-Terrell Mill Road Connector
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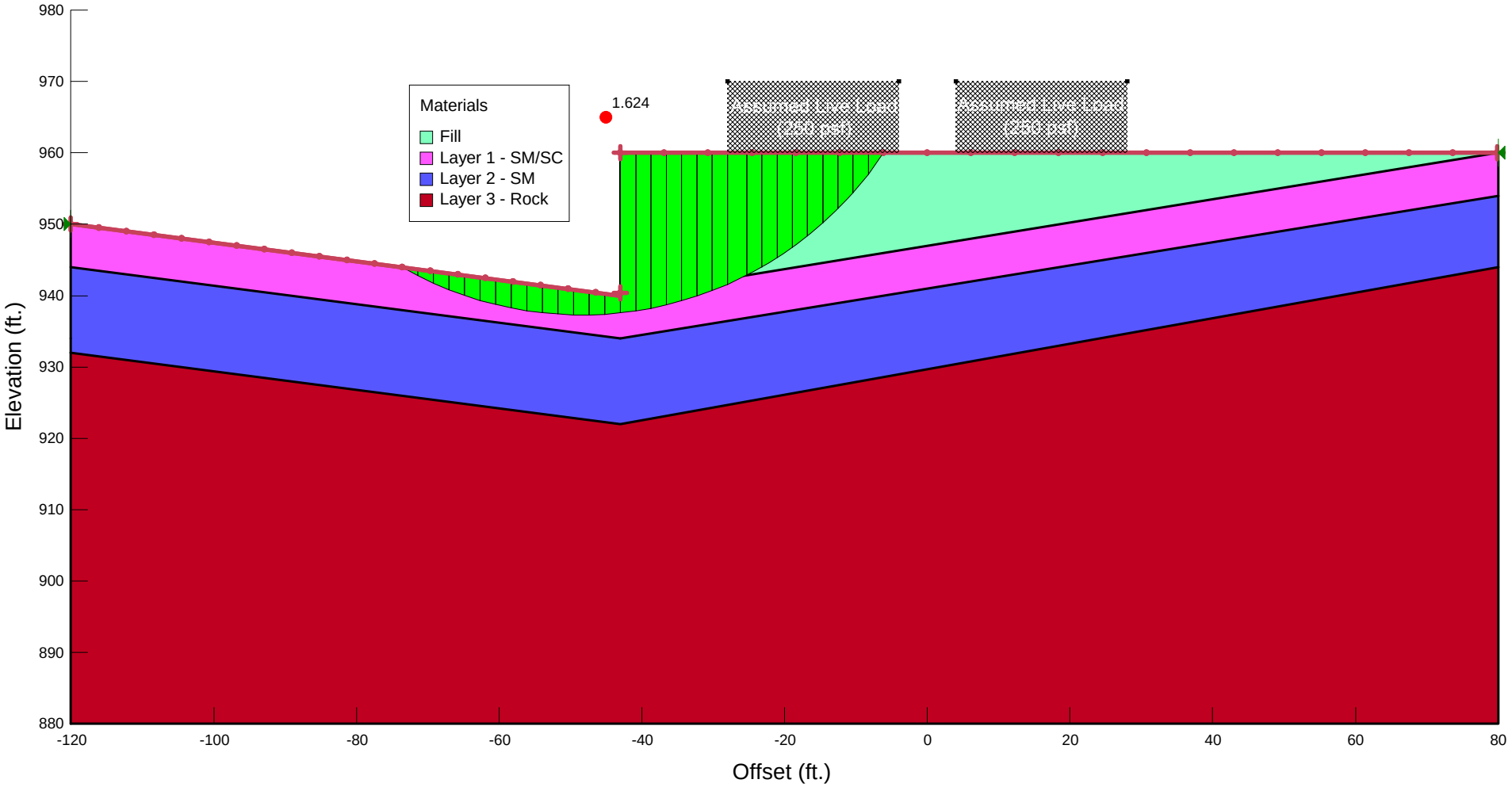
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 8 (WB3-16)
Sta. 139+50, L

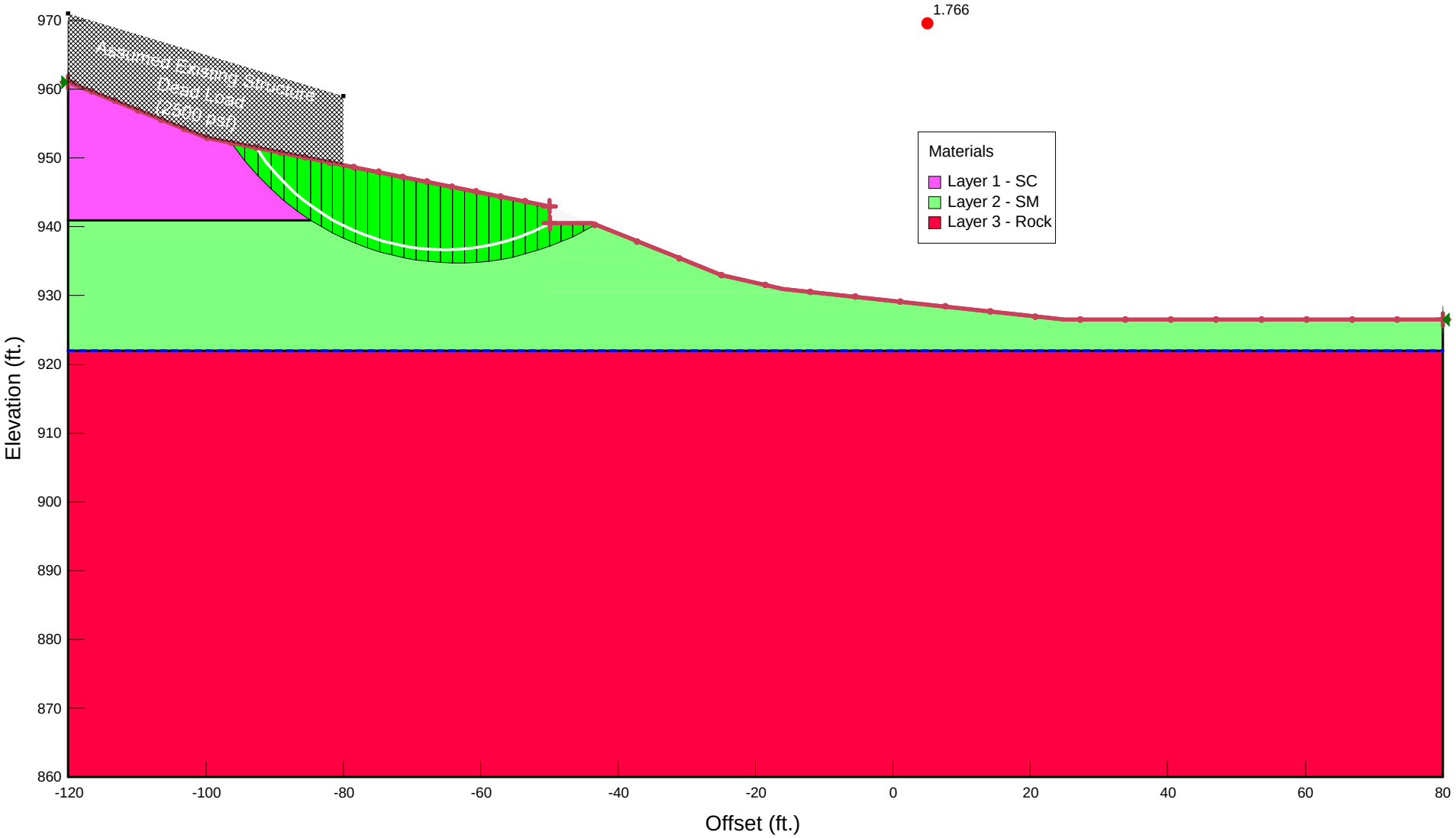


APPENDIX V (Soil Nail Walls)

- Global Stability Analysis – Wall 6 – 3 Pages
- Global Stability Analysis – Wall 7 – 4 Pages

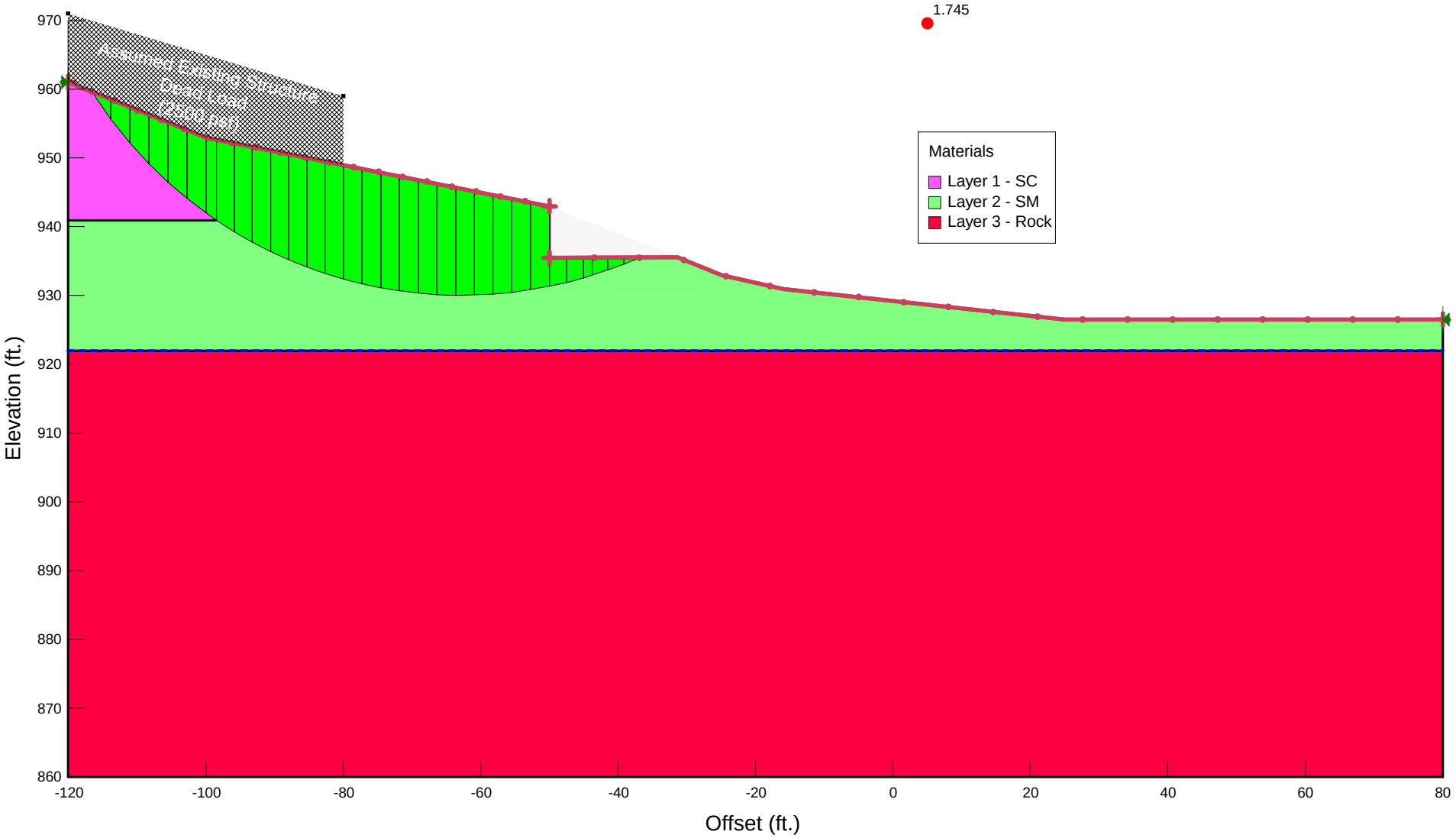
Windy Hill Road-Terrell Mill Road Connector
GDOT P.I. No. 0013967
Cobb County Project No. X2401
HNTB Project No. 64327
MC Squared Project No. A121503.122
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 6 (Stage 1) (B-15)
Sta. 130+00, L



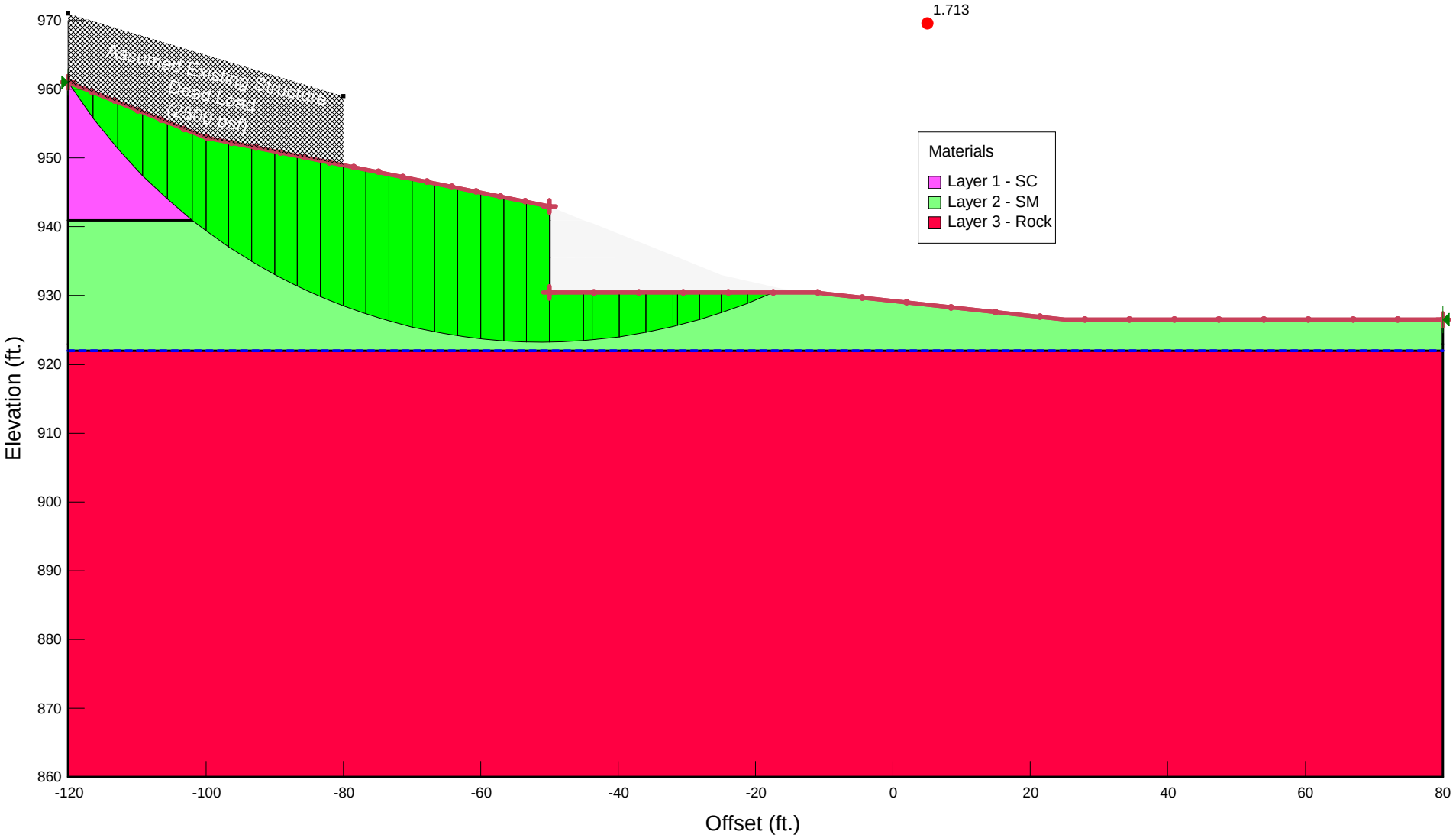
Windy Hill Road-Terrell Mill Road Connector
GDOT P.I. No. 0013967
Cobb County Project No. X2401
HNTB Project No. 64327
MC Squared Project No. A121503.122
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 6 (Stage 2) (B-15)
Sta. 130+00, L



Windy Hill Road-Terrell Mill Road Connector
GDOT P.I. No. 0013967
Cobb County Project No. X2401
HNTB Project No. 64327
MC Squared Project No. A121503.122
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 6 (Stage 3) (B-15)
Sta. 130+00, L



Windy Hill Road-Terrell Mill Road Connector
GDOT P.I. No. 0013967
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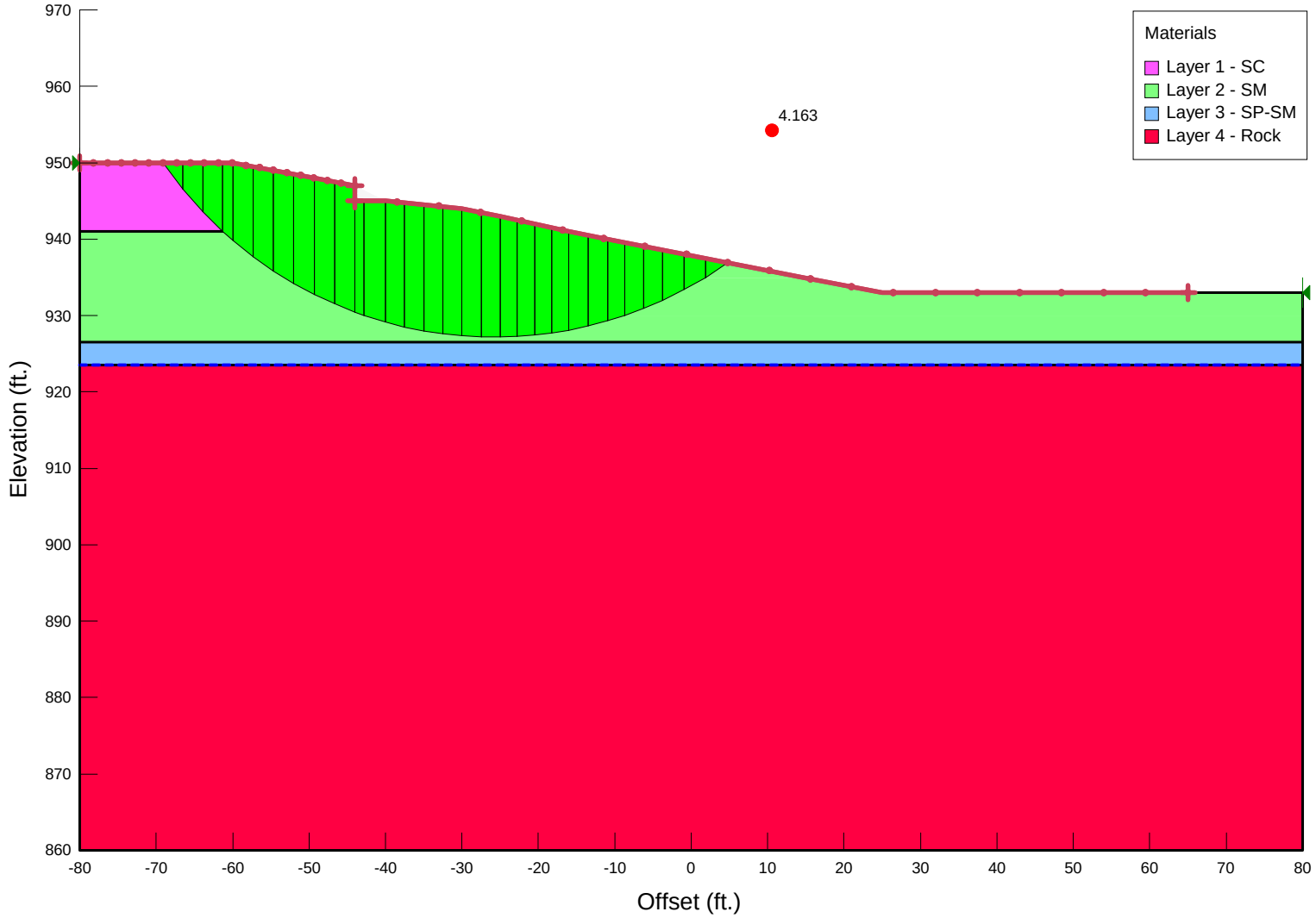
HNTB Project No. 64327
MC Squared Project No. A121503.122
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 7 (Stage 1) (B-19)
Sta. 136+00, L



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GDOT P.I. No. 0013967
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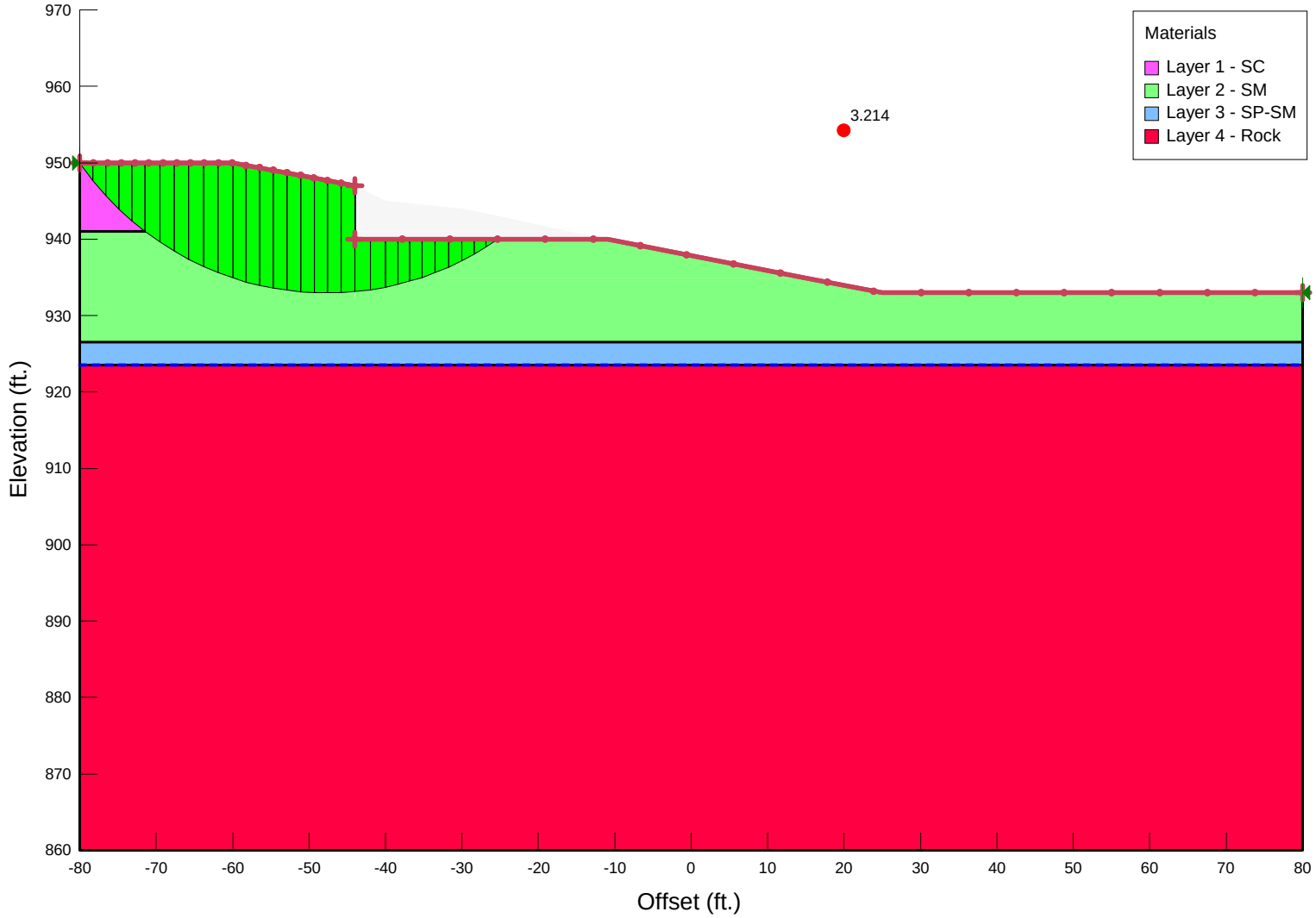
MC Squared Project No. A121503.122
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 7 (Stage 2) (B-19)
Sta. 136+00, L



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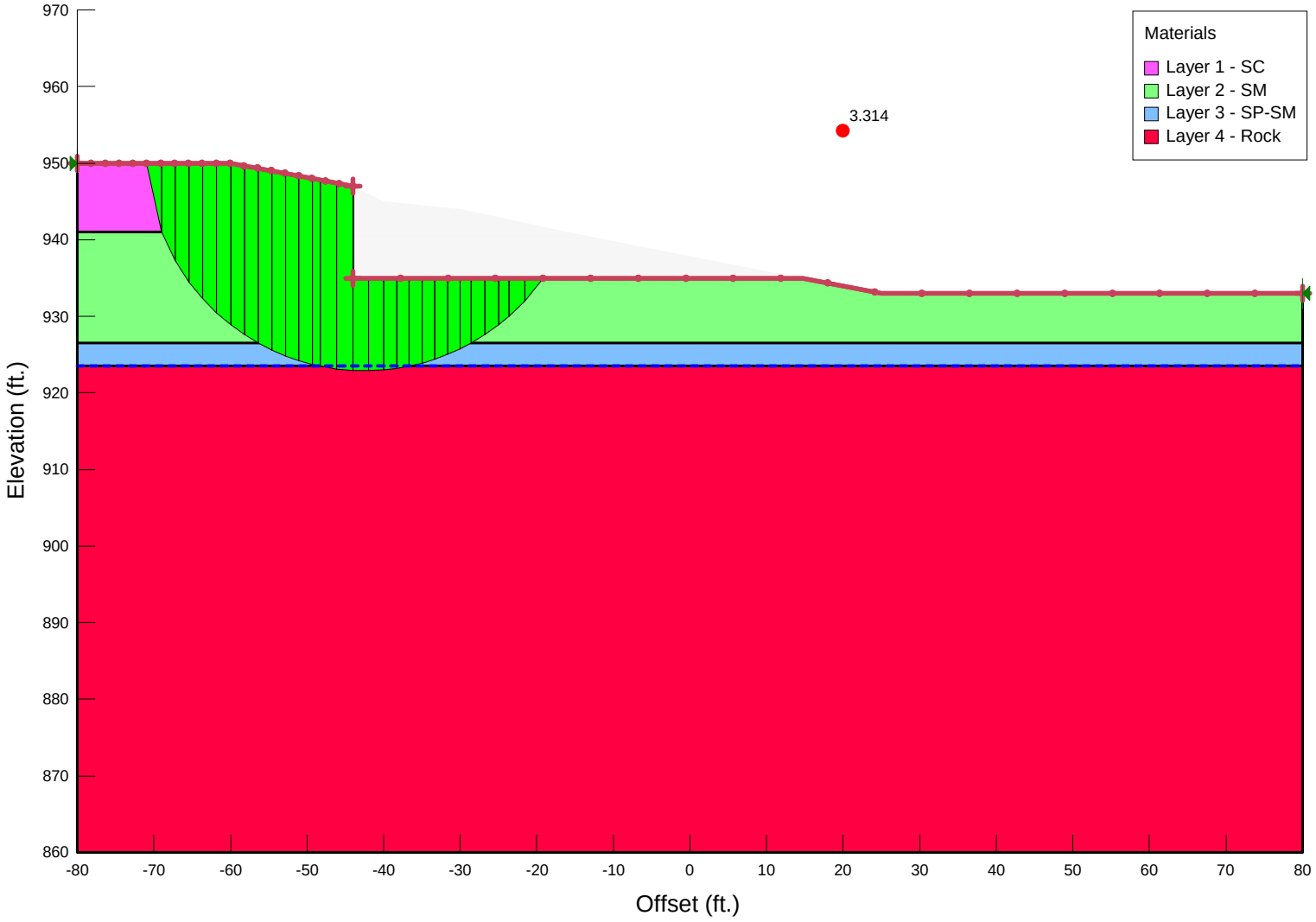
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 7 (Stage 3) (B-19)
Sta. 136+00, L



Windy Hill Road-Terrell Mill Road Connector
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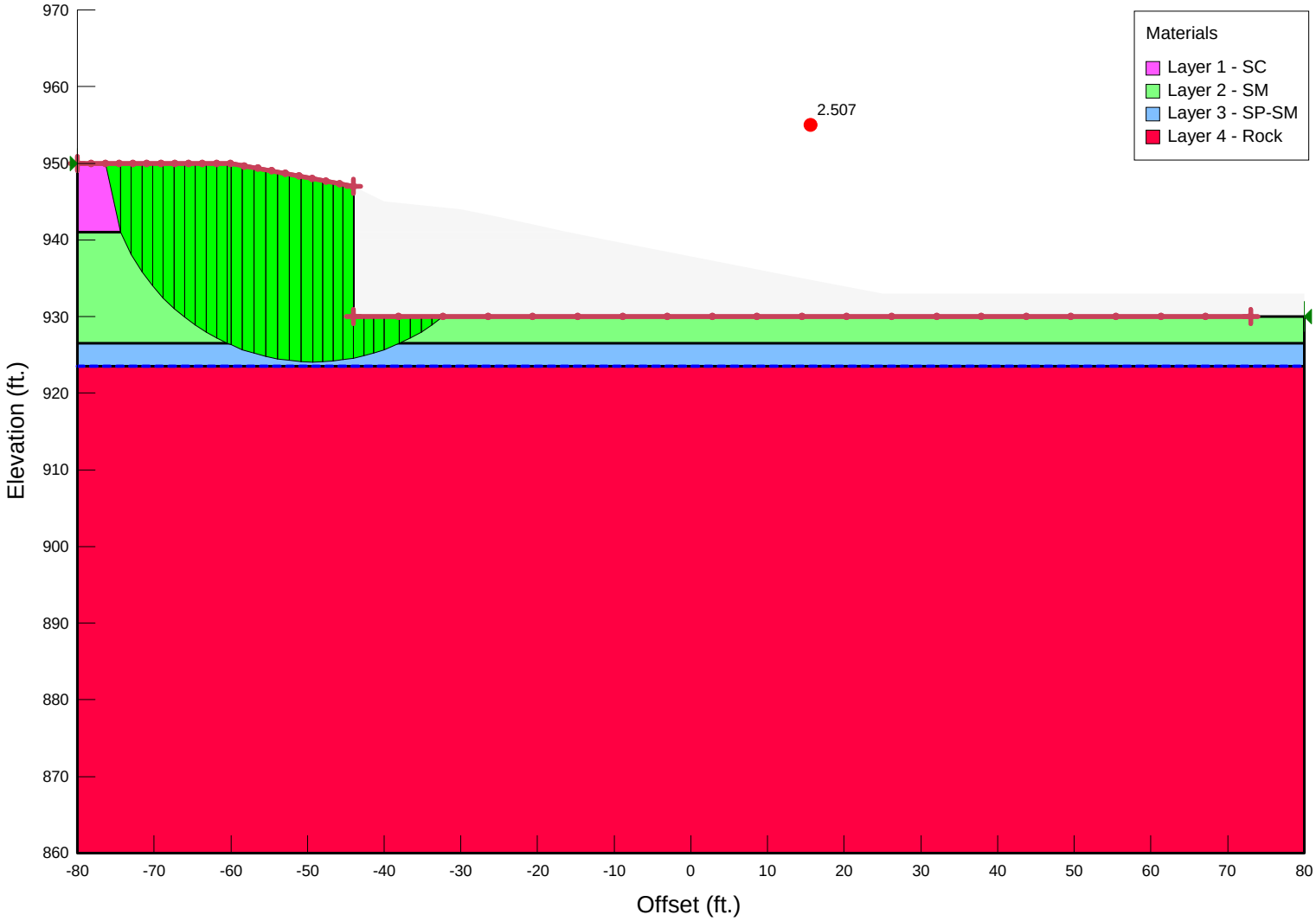
Marietta, Cobb County, Georgia

Global Stability Analysis - Wall 7 (Stage 5) (B-19)
Sta. 136+00, L



APPENDIX VI

- Rock Core Photographs – 18 Pages

DRY
Boring No. WB3-04 (Sta. 120+58, 15' L) Run 1
Run 1: 19.1 ft. – 24.1 ft., REC = 94%, RQD = 64%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
		MC² Project No. A121503.122
	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19

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Boring No. WB3-04 (Sta. 120+58, 15' L) Run 1
Run 1: 19.1 ft. – 24.1 ft., REC = 94%, RQD = 64%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
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DRY
Boring No. WB4-02 (Sta. 122+67, 86' R) Runs 1 and 2
Run 1: 5ft. – 10 ft., REC = 38%, RQD = 0%
Run 2: 10 ft. – 15 ft., REC = 95%, RQD = 21%

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	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19

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Boring No. WB4-02 (Sta. 122+67, 86' R) Runs 1 and 2
Run 1: 5ft. – 10 ft., REC = 38%, RQD = 0%
Run 2: 10 ft. – 15 ft., REC = 95%, RQD = 21%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
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	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19

DRY
Boring No. WB4-02 (Sta. 122+67, 86' R) Runs 3 and 4
Run 3: 15ft. – 20 ft., REC = 98%, RQD = 41%
Run 4: 20 ft. – 25 ft., REC = 98%, RQD = 76%

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	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19

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Boring No. WB4-02 (Sta. 122+67, 86' R) Runs 3 and 4
Run 3: 15ft. – 20 ft., REC = 98%, RQD = 41%
Run 4: 20 ft. – 25 ft., REC = 98%, RQD = 76%

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DRY
Boring No. WB4-03 (Sta. 123+67, 89' R) Runs 1 and 2
Run 1: 10 ft. – 15 ft., REC = 94%, RQD = 19%
Run 2: 15 ft. – 20 ft., REC = 100%, RQD = 23%

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WET
Boring No. WB4-03 (Sta. 123+67, 89' R) Runs 1 and 2
Run 1: 10 ft. – 15 ft., REC = 94%, RQD = 19%
Run 2: 15 ft. – 20 ft., REC = 100%, RQD = 23%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
		MC² Project No. A121503.122
	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19

DRY
Boring No. WB4-03 (Sta. 123+67, 89' R) Run 3
Run 3: 20 ft. – 25 ft., REC = 100%, RQD = 45%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
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	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19

WET
Boring No. WB4-03 (Sta. 123+67, 89' R) Run 3
Run 3: 20 ft. – 25 ft., REC = 100%, RQD = 45%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
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	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19

DRY
Boring No. WB5-06 (Sta. 124+32, 106' R) Runs 1 and 2
Run 1: 10 ft. – 14.9 ft., REC = 38%, RQD = 0%
Run 2: 14.9 ft. – 19.9 ft., REC = 80%, RQD = 0%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
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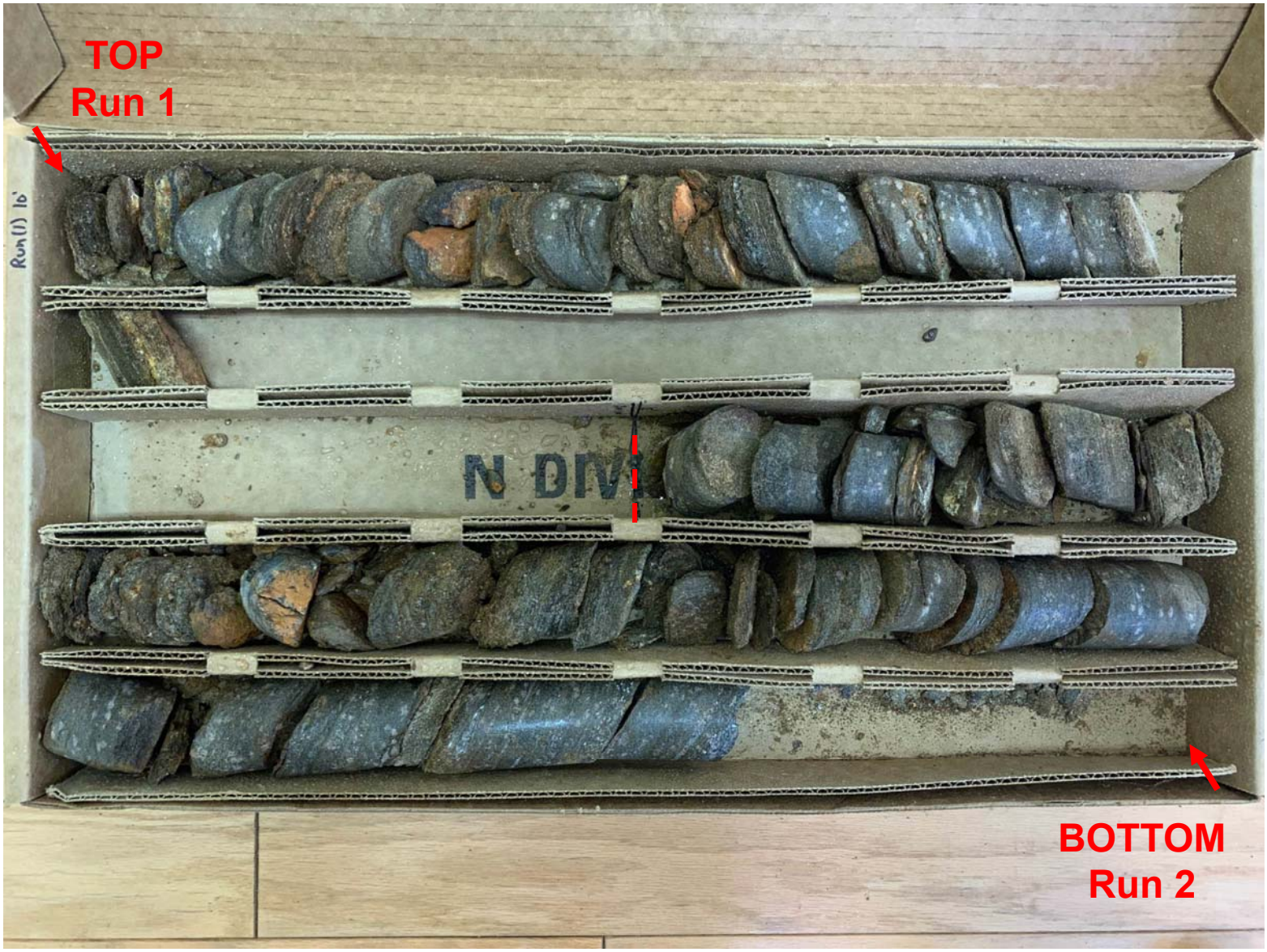

WET
Boring No. WB5-06 (Sta. 124+32, 106' R) Runs 1 and 2
Run 1: 10 ft. – 14.9 ft., REC = 38%, RQD = 0%
Run 2: 14.9 ft. – 19.9 ft., REC = 80%, RQD = 0%

DRY
Boring No. WB3-08 (Sta. 129+45, 40' L) Runs 1 and 2
Run 1: 10.3 ft. – 15.2 ft., REC = 83%, RQD = 0%
Run 2: 15.2 ft. – 20.2 ft., REC = 92%, RQD = 9%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
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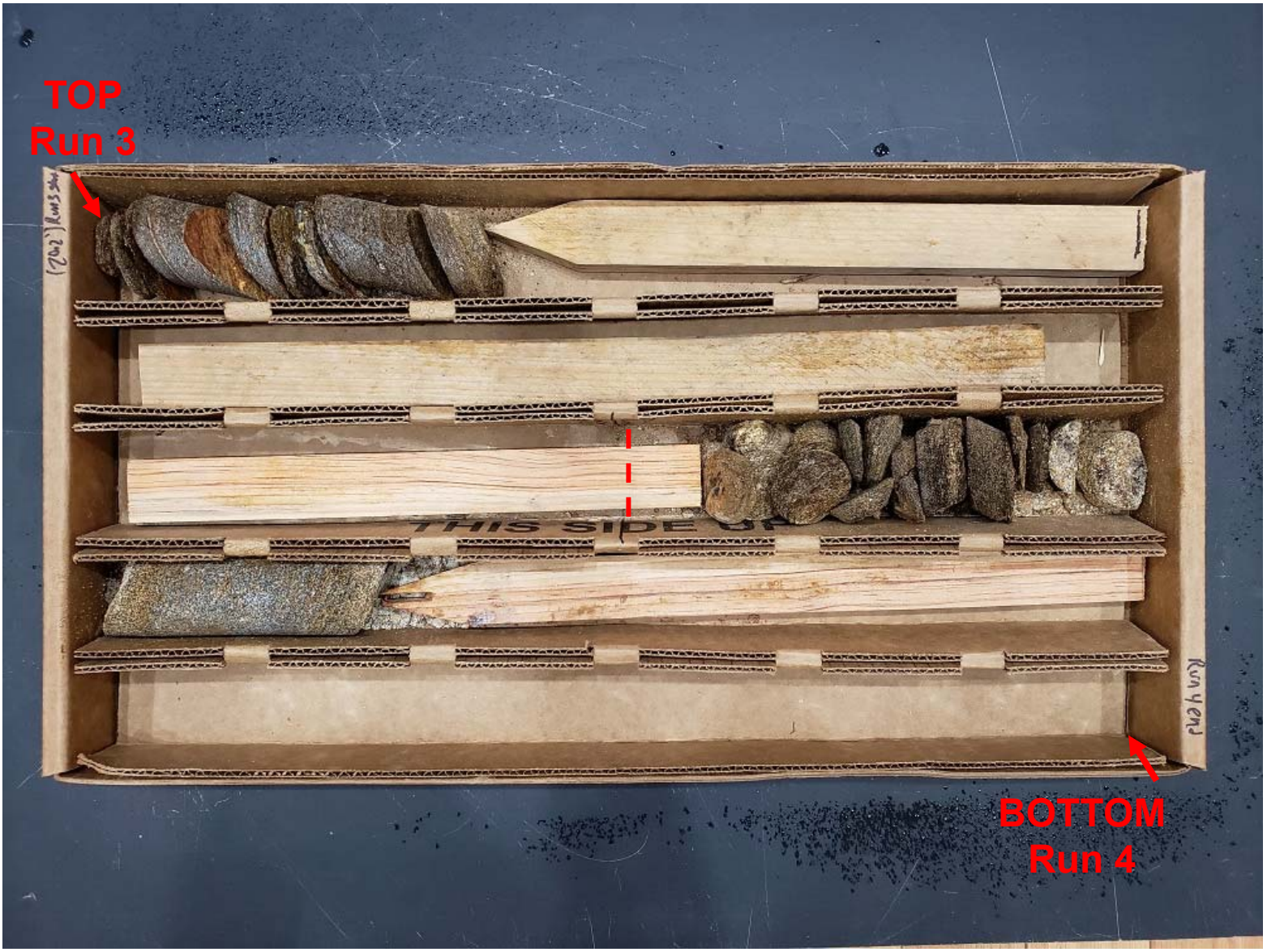
	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19

WET
Boring No. WB3-08 (Sta. 129+45, 40' L) Runs 1 and 2
Run 1: 10.3 ft. – 15.2 ft., REC = 83%, RQD = 0%
Run 2: 15.2 ft. – 20.2 ft., REC = 92%, RQD = 9%

DRY
Boring No. WB3-08 (Sta. 129+45, 40' L) Runs 3 and 4
Run 3: 20.2 ft. – 25.2 ft., REC = 14%, RQD = 0%
Run 4: 25.2 ft. – 30.2 ft., REC = 27%, RQD = 10%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
		MC² Project No. A121503.122
	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19



WET
Boring No. WB3-08 (Sta. 129+45, 40' L) Runs 3 and 4
Run 3: 20.2 ft. – 25.2 ft., REC = 14%, RQD = 0%
Run 4: 25.2 ft. – 30.2 ft., REC = 27%, RQD = 10%

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DRY
Boring No. WB3-08 (Sta. 129+45, 40' L) Run 5
Run 5: 30.2 ft. – 35.2 ft., REC = 34%, RQD = 0%

WET
Boring No. WB3-08 (Sta. 129+45, 40' L) Run 5
Run 5: 30.2 ft. – 35.2 ft., REC = 34%, RQD = 0%

MC² Geotechnical • Environmental Materials Testing	**Wall Foundation Investigation (WFI) Report** **Windy Hill Terrell Mill Connector** **Marietta, Cobb County Georgia**	**Prepared For:** HNTB Corporation
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	ROCK CORE PHOTOGRAPHS	**Date:** 4/19/19