

REFERENCE: R-2577A

PROJECT: 37405

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2577A	1	

STRUCTURE
SUBSURFACE INVESTIGATION

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COUNTY FORSYTH
PROJECT DESCRIPTION US 158 (REIDSVILLE RD) FROM
NORTH OF US 421/1-40 BUS. TO SR 1965 (BELEWS
CREEK RD)
SITE DESCRIPTION DUAL BRIDGES ON US 158
(REIDSVILLE RD) OVER LOWERY MILL CREEK
BETWEEN SR 2405 (OLD BELLOWS CREEK RD)
AND SR 2405 (WILLIAM TUCKER ROAD)

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (ON-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 - BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

B. FARMER

J. MIZE (2019)

S&ME PERSONELL (2019)

SUMMIT PERSONELL

INVESTIGATED BY RK&K, LLP

DRAWN BY B. FARMER

CHECKED BY G. GOINS

SUBMITTED BY RK&K, LLP

DATE DECEMBER 2022

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

Table with columns for General Class, Granular Materials, Silty-Clay Materials, Organic Materials, Group Class, Symbol, % Passing, Material Passing #40, Group Index, Usual Types of Major Materials, and Gen. Rating as Subgrade.

PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

Table mapping Primary Soil Type to Compactness or Consistency, Range of Standard Penetration Resistance, and Range of Unconfined Compressive Strength.

TEXTURE OR GRAIN SIZE

Table showing U.S. Std. Sieve Size, Boulder, Cobble, Gravel, Coarse Sand, Fine Sand, Silt, and Clay content.

SOIL MOISTURE - CORRELATION OF TERMS

Table correlating Soil Moisture Scale (Atterberg Limits) with Field Moisture Description and Guide for Field Moisture Description.

PLASTICITY

Table showing Plasticity Index (PI) and Dry Strength for Non-Plastic, Slightly Plastic, Moderately Plastic, and Highly Plastic soils.

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

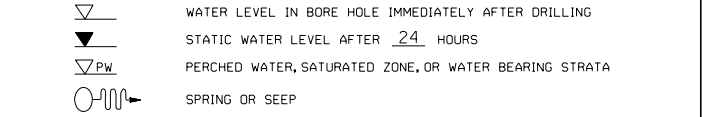
COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE LL < 31
MODERATELY COMPRESSIBLE LL = 31 - 50
HIGHLY COMPRESSIBLE LL > 50

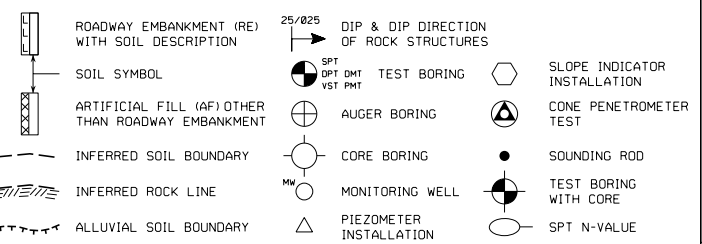
PERCENTAGE OF MATERIAL

Table showing percentages for Organic Material, Granular Soils, Silty-Clay Soils, and Other Material.

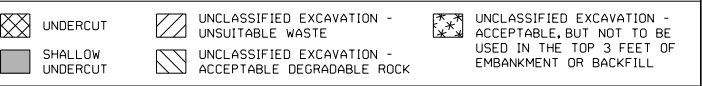
GROUND WATER



MISCELLANEOUS SYMBOLS



RECOMMENDATION SYMBOLS



ABBREVIATIONS

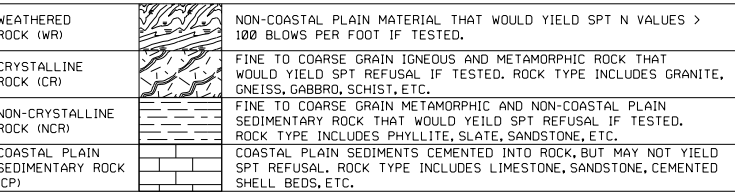
Table of abbreviations for Auger Refusal, Boring Terminated, Clay, Cone Penetration Test, Coarse, Dilatometer Test, Dynamic Penetration Test, Void Ratio, Fossils, Fractured Frags, High, Mica, Micaceous, Moderately, Non-Plastic, Organic, Pressuremeter Test, Sand, Silty, Slightly, TCR, Moisture Content, Very, Vane Shear Test, Weathered, Unit Weight, Dry Unit Weight, Bulk, Split Spoon, Shelby Tube, Rock, Recompected Triaxial, California Bearing Ratio.

EQUIPMENT USED ON SUBJECT PROJECT

Form for recording equipment used: Drill Units (CME-45C, CME-55, CME-550, Vane Shear Test, Portable Hoist, CME 550X), Advancing Tools (Clay Bits, Continuous Flight Auger, Hollow Augers, Hard Faced Finger Bits, Tung-Carbide Inserts, Casings, Tricone, Core Bit), Hammer Type (Automatic, Manual), Core Size (B, H, N-Q), and Hand Tools (Post Hole Digger, Hand Auger, Sounding Rod, Vane Shear Test).

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:



WEATHERING

Table describing weathering levels: Fresh, Very Slight, Slight, Moderate, Moderately Severe, Severe, Very Severe, and Complete.

ROCK HARDNESS

Table describing rock hardness levels: Very Hard, Hard, Moderately Hard, Medium Hard, Soft, Very Soft, and Very Very Soft.

FRACTURE SPACING

Table describing fracture spacing: Very Wide, Wide, Moderately Close, Close, Very Close.

BEDDING

Table describing bedding: Very Thickly Bedded, Thickly Bedded, Thinly Bedded, Very Thinly Bedded, Thickly Laminated, Thinly Laminated.

TERMS AND DEFINITIONS

Table of definitions for terms: Alluvium, Aquifer, Arenaceous, Argillaceous, Artesian, Calcareous, Colluvium, Core Recovery, Dike, Dip, Dip Direction, Fault, Float, Flood Plain, Formation, Joint, Ledge, Lens, Mottled, Perched Water, Residual Soil, Rock Quality Designation, Saprolite, Sill, Slickenside, Standard Penetration Test, Strata Core Recovery, Strata Rock Quality Designation, Topsoil, Bench Mark, Elevation, Notes, and Abbreviations.

BENCH MARK: N/A

ELEVATION: N/A FEET

NOTES: BORING ELEVATIONS FOR BORINGS L 139+00 AND L 141+00 WERE DETERMINED FROM THE PROVIDED TIN DATED 12/18/2020. ALL REMAINING BORING ELEVATIONS WERE DETERMINED USING A SURVEY GRADE GPS. TIN FILE: R2577A_ddc.tin.tin. ABBREVIATIONS: FIAD - FILLED IMMEDIATELY AFTER DRILLING, CT - CORING TERMINATED, AR - AUGER AND STANDARD PENETRATION TEST REFUSAL, BORINGS AT EBI-B NBL, BI-B NBL, AND BI-A NBL WERE DRILLED IN OFFSET LOCATIONS DUE TO DRILLING COMPLICATIONS (SEE BORING LOGS).

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

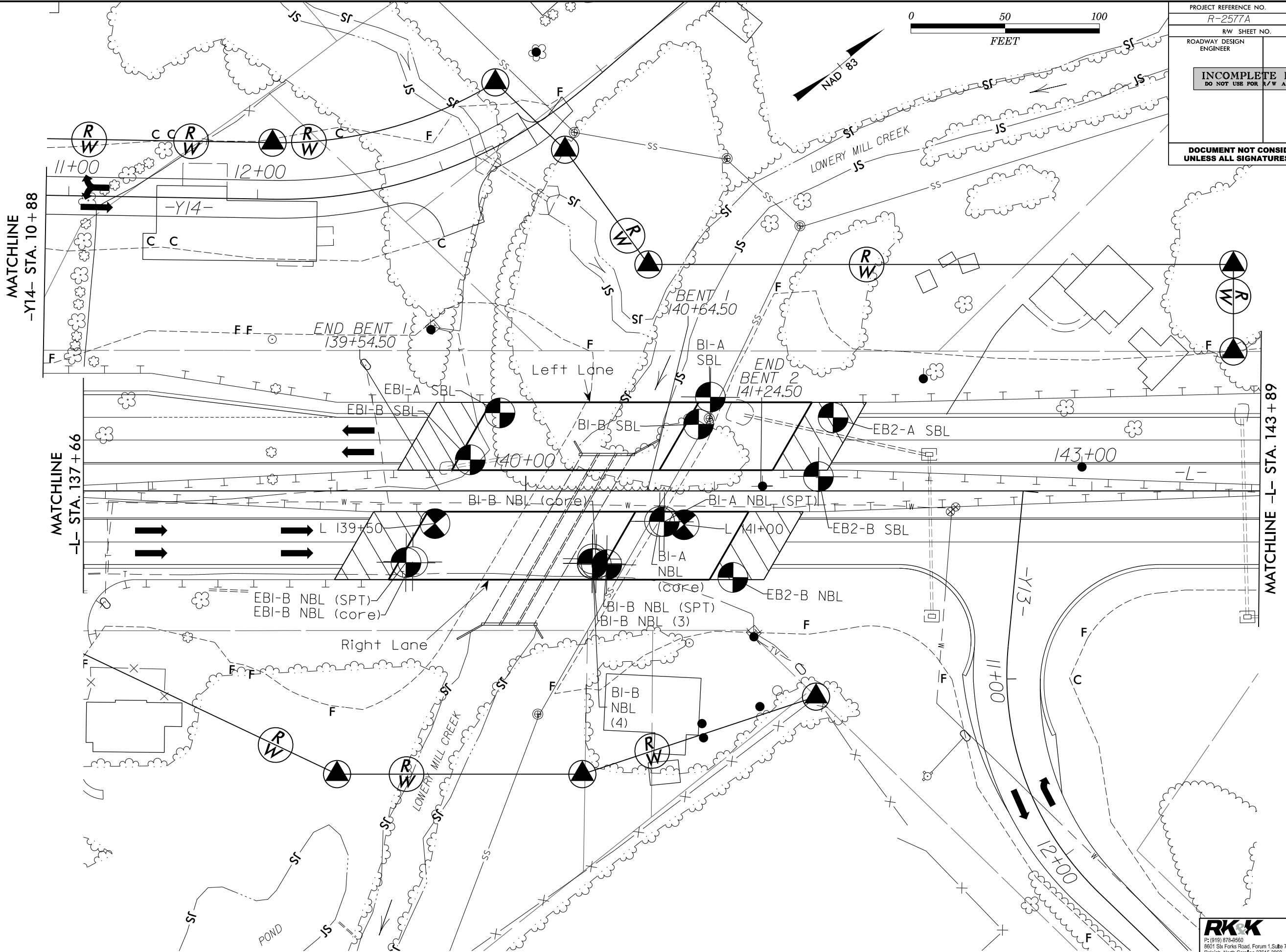
**SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS**

AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)		SURFACE CONDITIONS					GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)		SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)					
<p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.</p>		VERY GOOD	GOOD	FAIR	POOR	VERY POOR	<p>From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.</p>	VERY GOOD	GOOD	FAIR	POOR	VERY POOR		
		Very rough, fresh unweathered surfaces	Rough, slightly weathered, iron stained surfaces	Smooth, moderately weathered and altered surfaces	Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	Slickensided, highly weathered surfaces with soft clay coatings or fillings		Very Rough, fresh unweathered surfaces	Rough, slightly weathered surfaces	Smooth, moderately weathered and altered surfaces	Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings		
STRUCTURE		DECREASING SURFACE QUALITY →					COMPOSITION AND STRUCTURE							
	INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90			N/A	N/A		70						
	BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	80						60	A					
	VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets		70						50	B	C	D	E	
	BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity			60						40				
	DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces				50						30			
	LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes					40						20		
													10	
														10

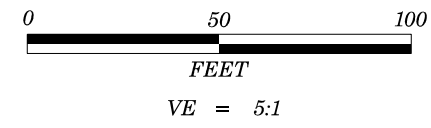
PROJECT REFERENCE NO. R-2577A	SHEET NO. 3
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



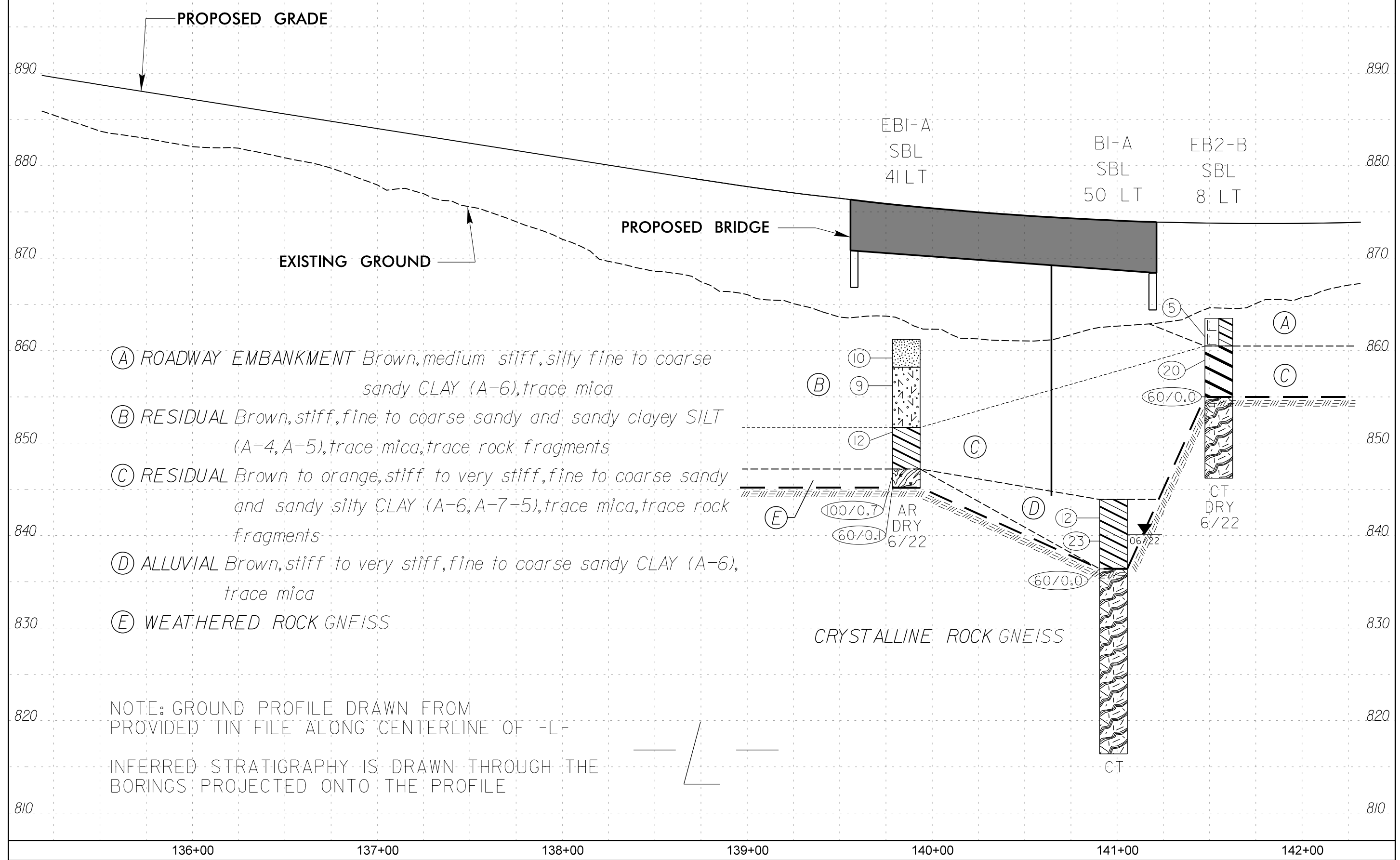
LEFT LANE SKEW = 60°
RIGHT LANE SKEW = 60°

L 139+50 AND L 141+00 WERE DRILLED IN 2019

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PROJECT REFERENCE NO.	SHEET NO.
R-2577A	4
PROFILE THROUGH LEFT LANE BORINGS PROJECTED ALONG -L-	



- Ⓐ ROADWAY EMBANKMENT Brown, medium stiff, silty fine to coarse sandy CLAY (A-6), trace mica
- Ⓑ RESIDUAL Brown, stiff, fine to coarse sandy and sandy clayey SILT (A-4, A-5), trace mica, trace rock fragments
- Ⓒ RESIDUAL Brown to orange, stiff to very stiff, fine to coarse sandy and sandy silty CLAY (A-6, A-7-5), trace mica, trace rock fragments
- Ⓓ ALLUVIAL Brown, stiff to very stiff, fine to coarse sandy CLAY (A-6), trace mica
- Ⓔ WEATHERED ROCK GNEISS

NOTE: GROUND PROFILE DRAWN FROM PROVIDED TIN FILE ALONG CENTERLINE OF -L-
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS PROJECTED ONTO THE PROFILE

CRYSTALLINE ROCK GNEISS

EBI-A
SBL
41 LT

BI-A
SBL
50 LT

EB2-B
SBL
8 LT

5

Ⓑ

10

9

12

Ⓒ

Ⓐ

20

60/0.0

Ⓒ

CT
DRY
6/22

Ⓔ

AR
DRY
6/22

100/0.7
60/0.1

Ⓓ

12

23

60/0.0
06/22

CT

136+00

137+00

138+00

139+00

140+00

141+00

142+00

890

880

870

860

850

840

830

820

810

890

880

870

860

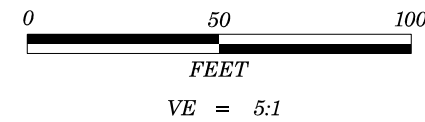
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840

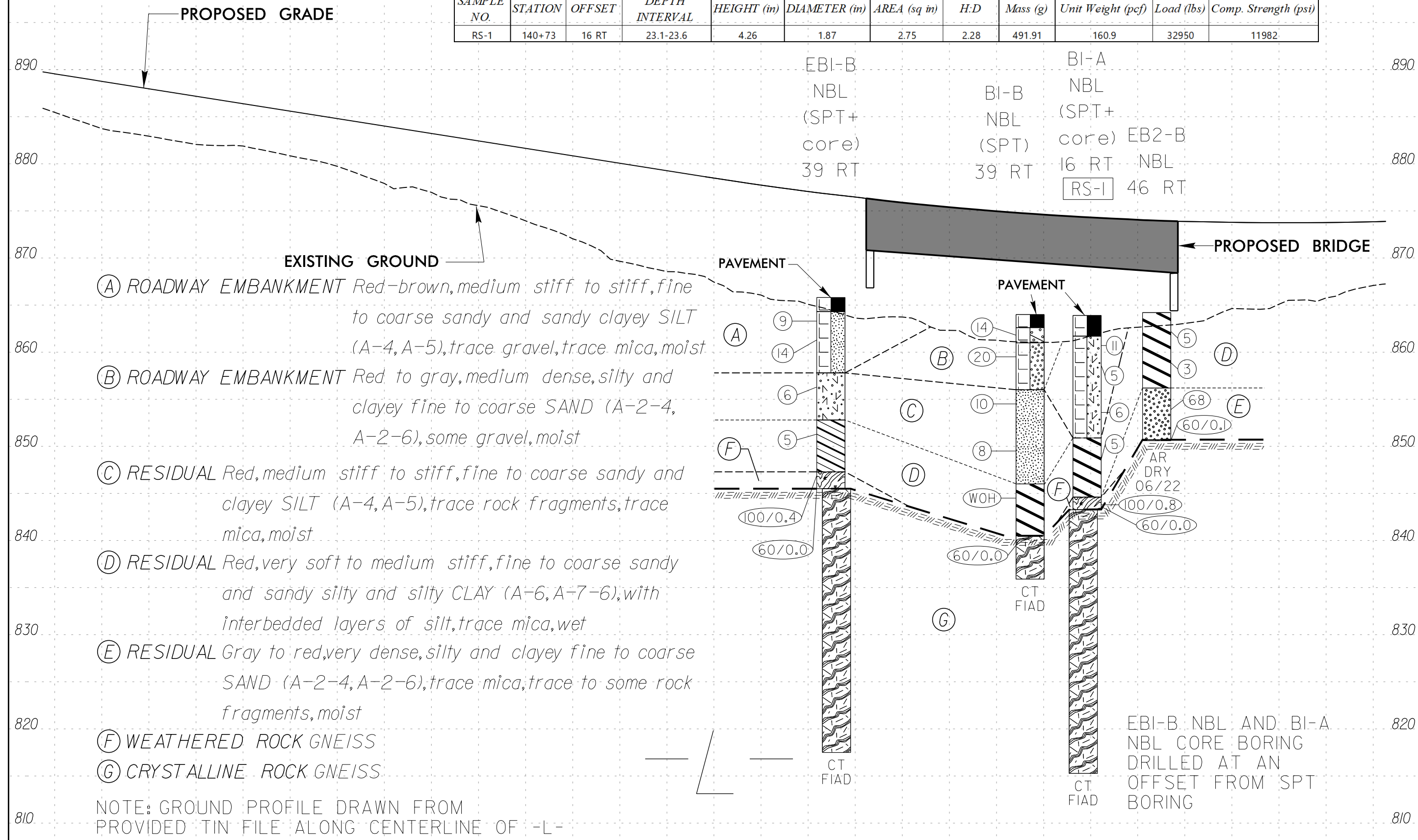
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820

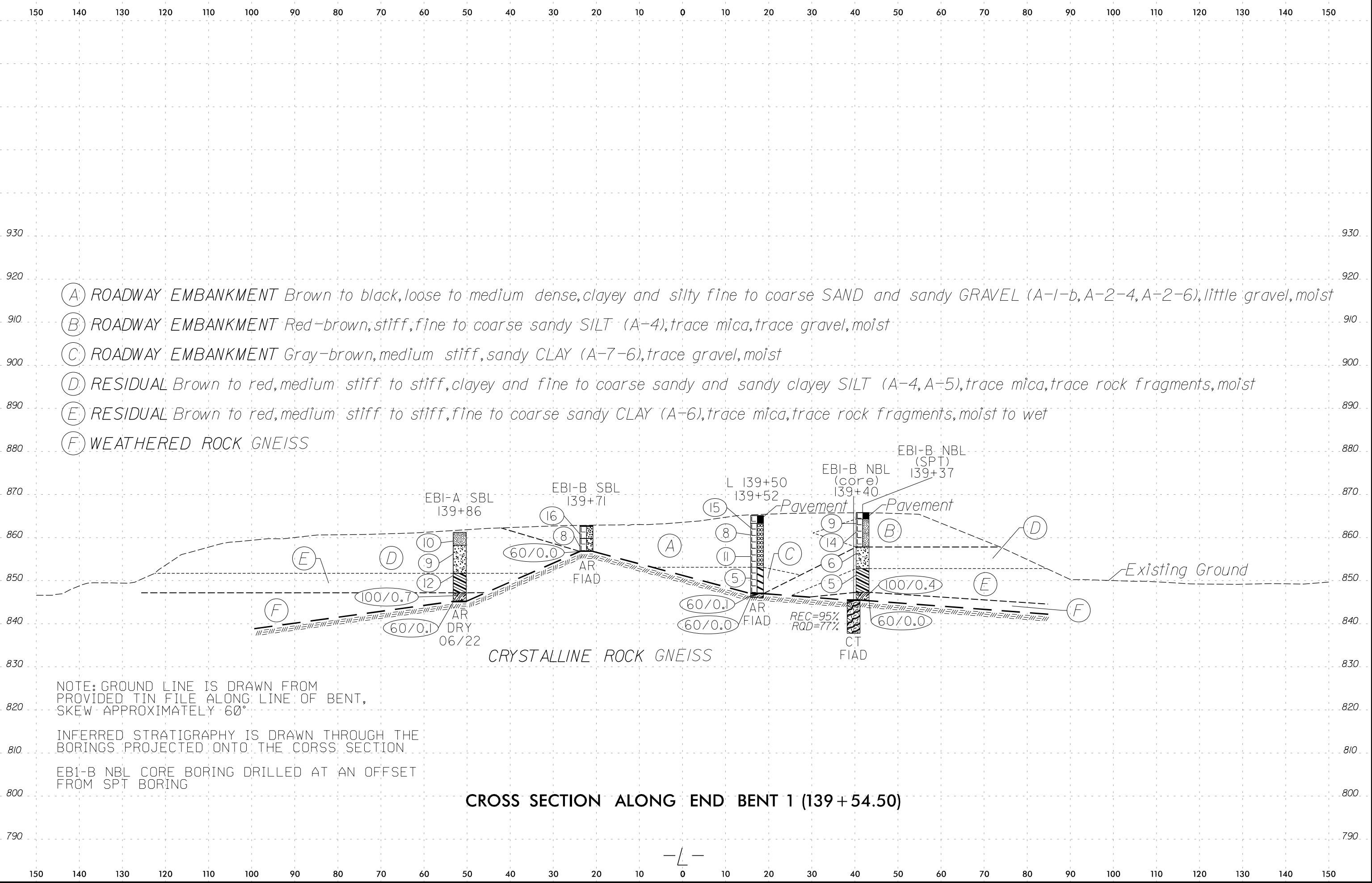
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ROCK TEST RESULTS											
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-1	140+73	16 RT	23.1-23.6	4.26	1.87	2.75	2.28	491.91	160.9	32950	11982



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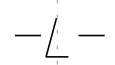
- (A) ROADWAY EMBANKMENT Brown to black, loose to medium dense, clayey and silty fine to coarse SAND and sandy GRAVEL (A-1-b, A-2-4, A-2-6), little gravel, moist
- (B) ROADWAY EMBANKMENT Red-brown, stiff, fine to coarse sandy SILT (A-4), trace mica, trace gravel, moist
- (C) ROADWAY EMBANKMENT Gray-brown, medium stiff, sandy CLAY (A-7-6), trace gravel, moist
- (D) RESIDUAL Brown to red, medium stiff to stiff, clayey and fine to coarse sandy and sandy clayey SILT (A-4, A-5), trace mica, trace rock fragments, moist
- (E) RESIDUAL Brown to red, medium stiff to stiff, fine to coarse sandy CLAY (A-6), trace mica, trace rock fragments, moist to wet
- (F) WEATHERED ROCK GNEISS

NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT, SKEW APPROXIMATELY 60°

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS PROJECTED ONTO THE CROSS SECTION

EBI-B NBL CORE BORING DRILLED AT AN OFFSET FROM SPT BORING

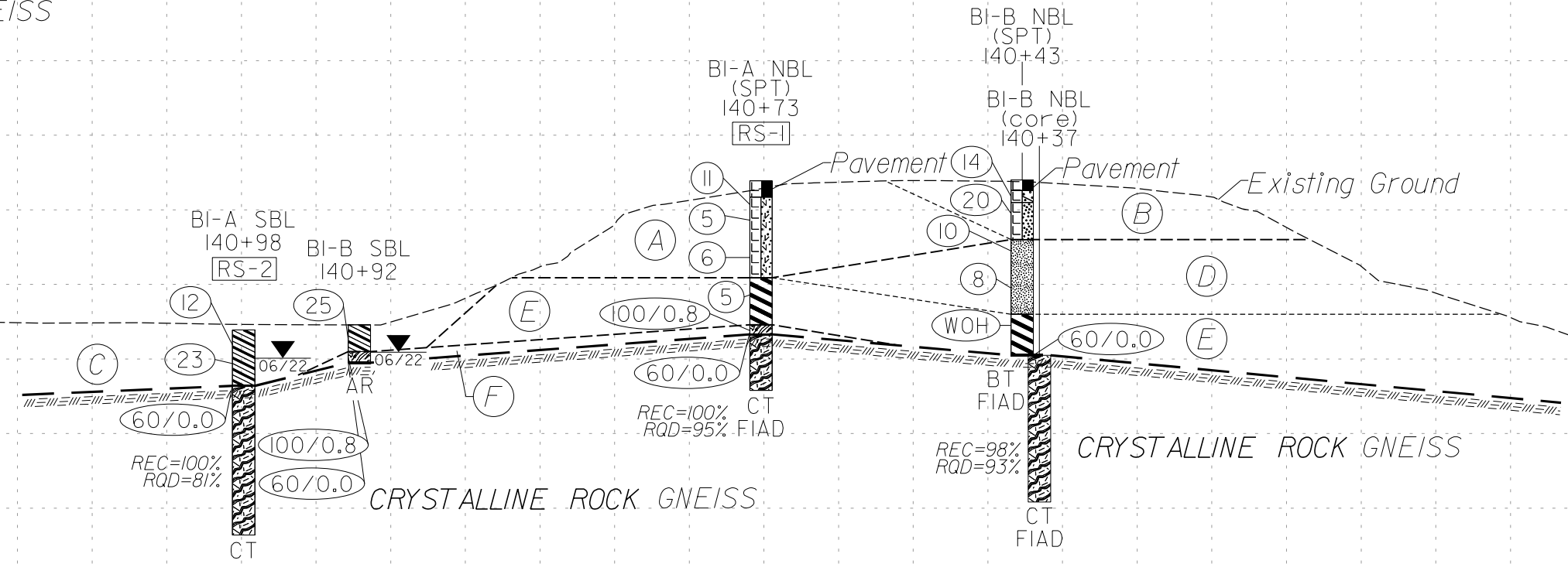
CROSS SECTION ALONG END BENT 1 (139 + 54.50)



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ROCK TEST RESULTS											
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-1	140+73	16 RT	23.1-23.6	4.26	1.87	2.75	2.28	491.91	160.9	32950	11982
RS-2	140+98	50 LT	12.5-12.9	3.94	1.85	2.69	2.13	472.28	169.8	14600	5428

- (A) ROADWAY EMBANKMENT Red-brown, medium stiff to stiff, sandy and fine to coarse sandy clayey SILT (A-4, A-5), trace gravel, trace to little mica, moist to wet
- (B) ROADWAY EMBANKMENT Red to gray, medium dense, silty and clayey fine to coarse SAND (A-2-4, A-2-6), some gravel, moist
- (C) ALLUVIAL Brown, stiff to very stiff, fine to coarse sandy CLAY (A-6), trace mica, little gravel, wet to saturated
- (D) RESIDUAL Red, medium stiff to stiff, fine to coarse sandy SILT (A-4), trace mica, trace rock fragments, moist
- (E) RESIDUAL Red, very soft to medium stiff, sandy and silty CLAY (A-7-5), trace mica, wet
- (F) WEATHERED ROCK GNEISS

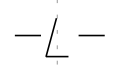


NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT, SKEW APPROXIMATELY 60°

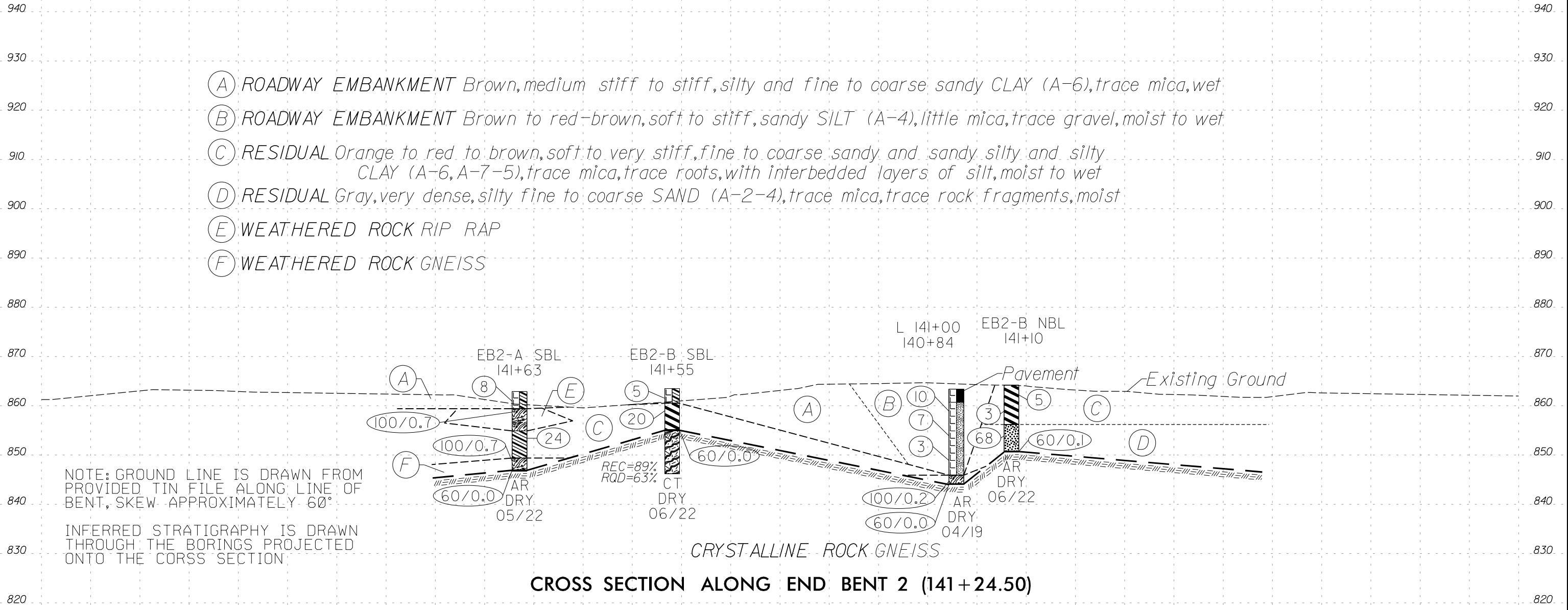
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS PROJECTED ONTO THE CROSS SECTION

B1-B NBL CORE BORING DRILLED AT AN OFFSET FROM SPT BORING

CROSS SECTION ALONG BENT 1 (140+64.50)



150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



CROSS SECTION ALONG END BENT 2 (141+24.50)

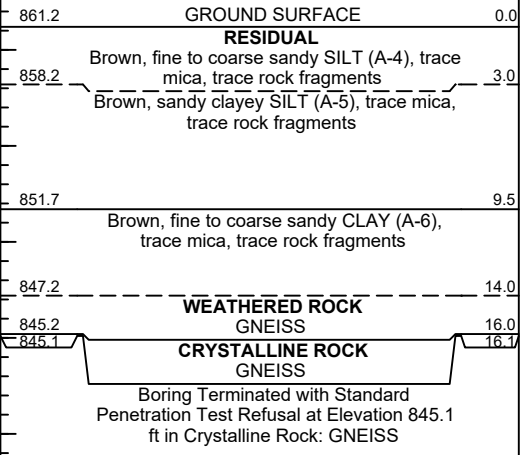


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GEOTECHNICAL BORING REPORT

BORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer									
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)								
BORING NO. EB1-A SBL		STATION 139+86		OFFSET 41 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 861.2 ft		TOTAL DEPTH 16.1 ft		NORTHING 872,446		EASTING 1,657,159									
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER M. Moseley		START DATE 06/07/22		COMP. DATE 06/07/22		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)	
865															
860	860.2	1.0	6	6	4							M		861.2	0.0
	857.2	4.0	11	5	4							M		858.2	3.0
855															
	852.2	9.0	13	7	5							M		851.7	9.5
850															
	847.2	14.0	11	89/0.2										847.2	14.0
	845.2	16.0												845.2	16.0
		60/0.1												845.1	16.1



NCDOT BORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 7/21/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer										
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)									
BORING NO. EB1-B NBL (SPT)		STATION 139+37		OFFSET 38 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 865.8 ft		TOTAL DEPTH 22.9 ft		NORTHING 872,357		EASTING 1,657,188										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021		DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic												
DRILLER M. Moseley		START DATE 06/16/22		COMP. DATE 06/16/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
870																
865	864.3	1.5	6	4	5								M		865.8 GROUND SURFACE 0.0	
	862.3	3.5	6	8	6								M		864.3 ROADWAY EMBANKMENT 1.1' Asphalt 0.4' ABC 1.5	
860															Red-brown, fine to coarse sandy SILT (A-4), trace mica, trace gravel	
	857.3	8.5	2	3	3								M		857.8 RESIDUAL 8.0	
855															Red, clayey SILT (A-5), trace mica	
	852.3	13.5	2	3	2								W		852.8 13.0	
850															Red, fine to coarse sandy CLAY (A-6), trace mica	
	847.3	18.5	100/0.4												847.3 WEATHERED ROCK 18.5	
845															845.5 GNEISS 20.3	
	845.5	20.3	60/0.0												842.9 CRYSTALLINE ROCK 22.9	
															Boring Terminated with Standard Penetration Test Refusal at Elevation 842.9 ft on Crystalline Rock: GNEISS	
															Core boring offset from SPT boring due to hydraulic hose leak and traffic control time restrictions.	

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer										
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)									
BORING NO. EB1-B NBL (core)		STATION 139+40		OFFSET 38 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 865.7 ft		TOTAL DEPTH 28.0 ft		NORTHING 872,360		EASTING 1,657,190										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021		DRILL METHOD Core Boring		HAMMER TYPE Automatic												
DRILLER M. Moseley		START DATE 06/17/22		COMP. DATE 06/17/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
870																
865															865.7 GROUND SURFACE 0.0	
															SPT completed in boring EB1-B NBL (SPT)	
860																
855																
850																
845															845.4 CRYSTALLINE ROCK 20.3	
															837.7 28.0	
840															Boring Terminated at Elevation 837.7 ft in Crystalline Rock: GNEISS	
															Core boring offset from SPT boring due to hydraulic hose leak and traffic control time restrictions.	

NCDOT BORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 7/25/22

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer					
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)				
BORING NO. EB1-B NBL (SPT)		STATION 139+37		OFFSET 38 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 865.8 ft		TOTAL DEPTH 20.3 ft		NORTHING 872,357		EASTING 1,657,188					
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER M. Moseley		START DATE 06/16/22		COMP. DATE 06/16/22		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 2.5 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
845.4	845.4	20.4	2.5		(2.5)	(2.5)	(2.5)	(2.5)		Begin Coring @ 20.4 ft	
	842.9	22.9			100%	100%	100%	100%		CRYSTALLINE ROCK	20.3
										Black, white, slight weathering, hard, moderately close fracture spacing, GNEISS	
										GSI=60 to 70	
										Boring Terminated with Standard Penetration Test Refusal at Elevation 845.5 ft on Crystalline Rock: GNEISS	
										Core boring offset from SPT boring due to hydraulic hose leak and traffic control time restrictions.	

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer					
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)				
BORING NO. EB1-B NBL (core)		STATION 139+40		OFFSET 38 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 865.7 ft		TOTAL DEPTH 28.0 ft		NORTHING 872,360		EASTING 1,657,190					
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021				DRILL METHOD Core Boring		HAMMER TYPE Automatic					
DRILLER M. Moseley		START DATE 06/17/22		COMP. DATE 06/17/22		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 7.7 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
845	845.4	20.3	2.7	01:01/0.7	(2.3)	(1.2)	(7.3)	(5.9)		Begin Coring @ 20.3 ft	
	842.7	23.0		01:35/1.0	85%	44%				CRYSTALLINE ROCK	20.3
				02:58/1.0						Black, white, slight to moderate weathering, hard, close fracture spacing, BIOTITE GNEISS	
				01:14/1.0	(5.0)	(4.7)				GSI=60 to 70	
				01:54/1.0	100%	94%				Boring Terminated at Elevation 837.7 ft in Crystalline Rock: GNEISS	
				02:39/1.0						Core boring offset from SPT boring due to hydraulic hose leak and traffic control time restrictions.	
				02:47/1.0							
	837.7	28.0		04:43/1.0							28.0

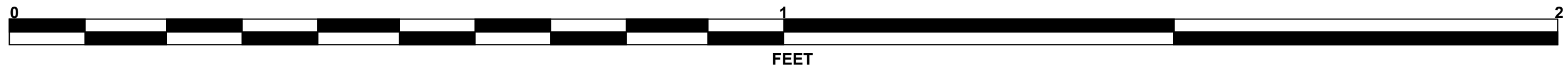
NCDOT CORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 7/21/22

CORE PHOTOGRAPHS

EB1-B NBL (SPT)

-L- 139+37 38 RT

BOX 1: 20.4-22.9 FEET



CORE PHOTOGRAPHS

EB1-B NBL (core)

-L- 139+40 38 RT

BOX 1: 20.3-28.0 FEET



FEET

GEOTECHNICAL BORING REPORT BORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer									
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)								
BORING NO. EB1-B SBL		STATION 139+71		OFFSET 17 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 862.8 ft		TOTAL DEPTH 6.0 ft		NORTHING 872,418		EASTING 1,657,168									
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER M. Moseley		START DATE 06/06/22		COMP. DATE 06/06/22		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
865															
	861.8	1.0	15	7	9									862.8	GROUND SURFACE
	858.9	3.9	8	4	4									859.8	ROADWAY EMBANKMENT 0.2' Gravel Driveway
	856.8	6.0	60/0.0											856.8	Brown, silty fine to coarse SAND (A-2-4), little gravel
															Brown-red, clayey fine to coarse SAND (A-2-6), little gravel
															Boring Terminated with Standard Penetration Test Refusal at Elevation 856.8 ft on Crystalline Rock: GNEISS

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST J Mize									
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)								
BORING NO. L 139+50		STATION 139+52		OFFSET 17 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 865.1 ft		TOTAL DEPTH 19.0 ft		NORTHING 872,382		EASTING 1,657,182									
DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH D-50 90% 11/08/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER T Williams		START DATE 04/23/19		COMP. DATE 04/23/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
870															
														865.1	GROUND SURFACE
	863.3	1.8	12	8	7									863.3	0.6' Asphalt, 1.2' ABC
	861.6	3.5	5	4	4										ROADWAY EMBANKMENT Brown-black, loose to medium dense, sandy GRAVEL (A-1-b)
	856.6	8.5	8	5	6										
	851.6	13.5	2	3	2									853.1	Gray-brown, medium stiff, sandy CLAY (A-7-6), trace gravel
	846.6	18.5	60/0.1											847.0	CRYSTALLINE ROCK GRANITE
	846.1	19.0	60/0.0											846.1	Boring Terminated at Elevation 846.1 ft in Crystalline Rock: GRANITE
															Boring elevation determined from existing TIN dated 12/18/2020

NCDOT BORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 7/21/22

GEOTECHNICAL BORING REPORT BORE LOG

WBS 37405.1.1	TIP R-2577A	COUNTY FORSYTH	GEOLOGIST B. Farmer	
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek				GROUND WTR (ft)
BORING NO. B1-A NBL (SPT)	STATION 140+73	OFFSET 16 ft RT	ALIGNMENT -L-	0 HR. Dry
COLLAR ELEV. 863.9 ft	TOTAL DEPTH 28.1 ft	NORTHING 872,476	EASTING 1,657,259	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021		DRILL METHOD SPT Core Boring	HAMMER TYPE Automatic	
DRILLER M. Moseley	START DATE 06/06/22	COMP. DATE 06/06/22	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
865														GROUND SURFACE	0.0
	861.7	2.2												ROADWAY EMBANKMENT	2.2
860	859.6	4.3	6	6	5									1.4' Asphalt, 0.8' ABC	
			2	2	3									Red-brown, fine to coarse sandy clayey SILT (A-5), trace gravel, trace mica	
855	854.6	9.3	2	3	3										
850	849.6	14.3	2	2	3									RESIDUAL	13.0
														Red, silty CLAY (A-7-5), trace mica	
845	844.6	19.3													
	843.6	20.3	46	54/0.3										WEATHERED ROCK	19.3
														GNEISS	20.6
840														CRYSTALLINE ROCK	
														GNEISS	

Boring Terminated at Elevation 835.8 ft in Crystalline Rock: GNEISS

Core boring offset from SPT boring due to damaged (loose diamonds) core bit.

WBS 37405.1.1	TIP R-2577A	COUNTY FORSYTH	GEOLOGIST B. Farmer	
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek				GROUND WTR (ft)
BORING NO. B1-A NBL (core)	STATION 140+71	OFFSET 16 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 863.9 ft	TOTAL DEPTH 31.0 ft	NORTHING 872,474	EASTING 1,657,257	24 HR. N/A
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021		DRILL METHOD Core Boring	HAMMER TYPE Automatic	
DRILLER M. Moseley	START DATE 06/07/22	COMP. DATE 06/07/22	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
865														GROUND SURFACE	0.0
														SPT completed in boring B1-A NBL (SPT)	
860															
855															
850															
845															
840														CRYSTALLINE ROCK	20.7
														GNEISS	
835															

Boring Terminated at Elevation 832.9 ft in Crystalline Rock: GNEISS

Metal object lodged in coring equipment, could not continue rock coring.

NCDOT BORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 7/21/22

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer					
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)				
BORING NO. B1-A NBL (SPT)		STATION 140+73		OFFSET 16 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 863.9 ft		TOTAL DEPTH 28.1 ft		NORTHING 872,476		EASTING 1,657,259					
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER M. Moseley		START DATE 06/06/22		COMP. DATE 06/06/22		SURFACE WATER DEPTH N/A					
CORE SIZE NQ		TOTAL RUN 7.5 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
843.3	843.3	20.6	2.5	04:07/1.0	(2.5)	(2.5)	(7.5)	(7.1)		843.3	20.6
	840.8	23.1		04:56/1.0	100%	100%	100%	95%		Begin Coring @ 20.6 ft CRYSTALLINE ROCK Gray, black, fresh to very slight weathering, hard, close to moderately close fracture spacing, GNEISS GSI=80 to 90	
840		5.0		02:40/0.5 03:53/1.0 05:07/1.0 02:57/1.0 04:36/1.0 07:33/1.0	(5.0)	(4.6)				RS-1	835.8
										Boring Terminated at Elevation 835.8 ft in Crystalline Rock: GNEISS Core boring offset from SPT boring due to damaged (loose diamonds) core bit.	

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer					
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)				
BORING NO. B1-A NBL (core)		STATION 140+71		OFFSET 16 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 863.9 ft		TOTAL DEPTH 31.0 ft		NORTHING 872,474		EASTING 1,657,257					
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021				DRILL METHOD Core Boring		HAMMER TYPE Automatic					
DRILLER M. Moseley		START DATE 06/07/22		COMP. DATE 06/07/22		SURFACE WATER DEPTH N/A					
CORE SIZE NQ		TOTAL RUN 10.3 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
843.2	843.2	20.7	2.5	08:55/1.0	(2.5)	(1.9)	(7.3)	(6.6)		843.2	20.7
	840.7	23.2		10:40/1.0 03:48/0.5 06:22/1.0 06:06/1.0 06:18/1.0 04:15/1.0 04:51/1.0	100%	76%	100%	90%		Begin Coring @ 20.7 ft CRYSTALLINE ROCK Black, gray, fresh to very slight weathering, hard, close to moderately close fracture spacing, GNEISS GSI=60 to 70 Lost Circulation ~27'	
840		4.8			(4.8)	(4.7)					835.9
										Metal object lodged in coring equipment	
835		28.0	3.0	10:10/1.0	(0.0)	(0.0)				832.9	31.0
				09:21/1.0 04:22/1.0	0%	0%				Boring Terminated at Elevation 832.9 ft in Crystalline Rock: GNEISS Metal object lodged in coring equipment, could not continue rock coring.	

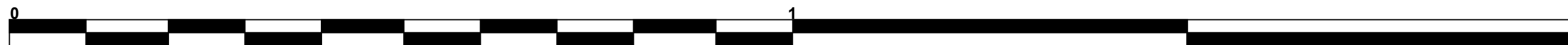
NCDOT CORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 7/21/22

CORE PHOTOGRAPHS

B1-A NBL (SPT)

-L- 140+73 16 RT

BOX 1: 20.6-31.0 FEET



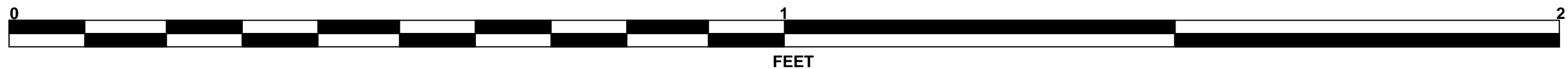
FEET

CORE PHOTOGRAPHS

B1-A NBL (core)

-L- 140+71 16 RT

BOX 1: 20.7-28.2 FEET



GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer										
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)									
BORING NO. B1-A SBL		STATION 140+98		OFFSET 50 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 843.9 ft		TOTAL DEPTH 27.5 ft		NORTHING 872,537		EASTING 1,657,224										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic										
DRILLER M. Moseley		START DATE 05/31/22		COMP. DATE 05/31/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
845														843.9	GROUND SURFACE	0.0
	842.9	1.0													ALLUVIAL Brown, fine to coarse sandy CLAY (A-6), trace mica	
840	840.4	3.5	4	7	5											
	836.4	7.5	5	4	19											
835			60/0.0											836.4	CRYSTALLINE ROCK GNEISS	7.5
830																
825																
820																
														816.4	Boring Terminated at Elevation 816.4 ft in Crystalline Rock: GNEISS	27.5

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer					
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)				
BORING NO. B1-A SBL		STATION 140+98		OFFSET 50 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 843.9 ft		TOTAL DEPTH 27.5 ft		NORTHING 872,537		EASTING 1,657,224					
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic					
DRILLER M. Moseley		START DATE 05/31/22		COMP. DATE 05/31/22		SURFACE WATER DEPTH N/A					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
836.4											
835	836.4	7.5	5.0	03:22/1.0 03:20/1.0 05:16/1.0 06:01/1.0 10:19/1.0	(5.0) 100%	(2.5) 50%	(20.0) 100%	(16.1) 81%		Begin Coring @ 7.5 ft CRYSTALLINE ROCK Black, white, fresh to very slight weathering, hard, close to moderately close fracture spacing, GNEISS GSI=60 to 70	7.5
830	831.4	12.5	5.0	16:37/1.0 02:40/1.0 02:48/1.0 02:47/1.0 03:20/1.0	(5.0) 100%	(4.6) 92%					
825	826.4	17.5	5.0	04:16/1.0 03:38/1.0 03:29/1.0 01:43/1.0 04:16/1.0	(5.0) 100%	(4.3) 86%					
820	821.4	22.5	5.0	03:11/1.0 02:37/1.0 03:55/1.0 04:27/1.0 05:39/1.0	(5.0) 100%	(4.7) 94%					
	816.4	27.5									
											816.4
											Boring Terminated at Elevation 816.4 ft in Crystalline Rock: GNEISS

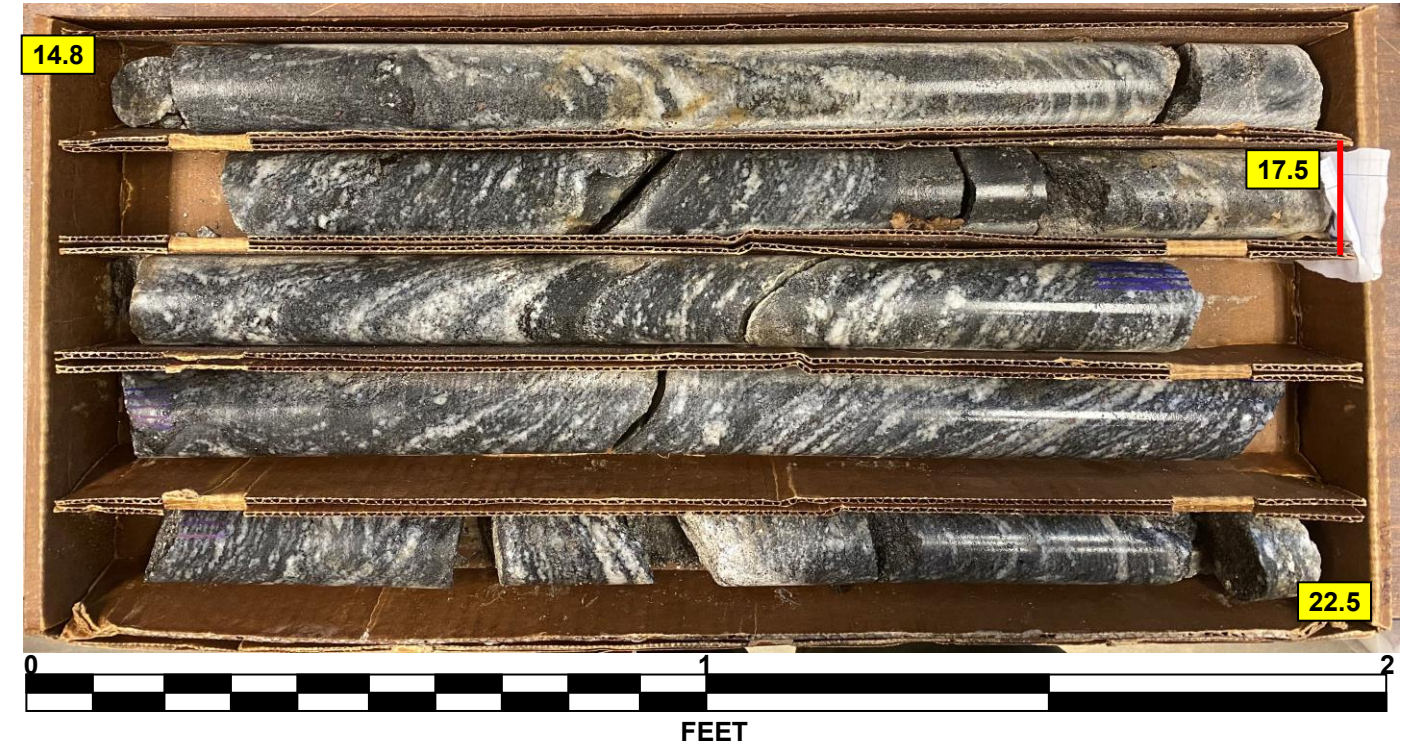
CORE PHOTOGRAPHS B1-A SBL

-L- 140+98 50 LT

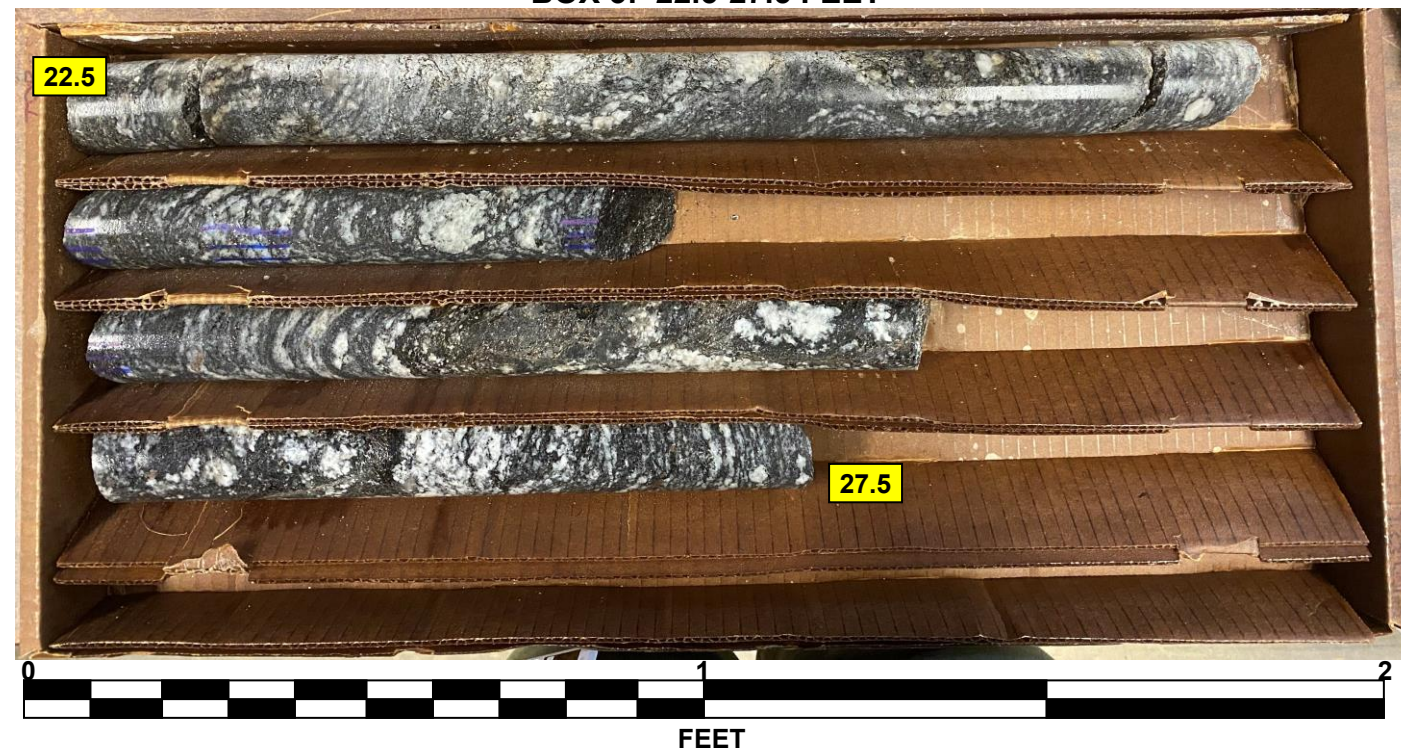
BOX 1: 7.5-14.8 FEET



BOX 2: 14.8-22.5 FEET



BOX 3: 22.5-27.5 FEET



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer											
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)										
BORING NO. B1-B NBL (SPT)		STATION 140+43		OFFSET 39 ft RT		ALIGNMENT -L-											
COLLAR ELEV. 864.0 ft		TOTAL DEPTH 28.1 ft		NORTHING 872,438		EASTING 1,657,257											
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 06/13/22		COMP. DATE 06/13/22		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
865															864.0	GROUND SURFACE	0.0
	862.8	1.2	17	9	5										862.6	ROADWAY EMBANKMENT 1.2' Asphalt 0.3' ABC	1.4
860	860.5	3.5	15	8	12										861.0	Red, clayey fine to coarse SAND (A-2-6) Gray, silty fine to coarse SAND (A-2-4), some gravel	3.0
															856.0	RESIDUAL	8.0
855	855.5	8.5	4	5	5											Red, fine to coarse sandy SILT (A-4), trace mica, trace rock fragments	
850	850.5	13.5	1	4	4												
845	845.5	18.5	WOH	WOH	WOH										846.0	Red, sandy silty CLAY (A-7-5), trace mica	18.0
840	839.5	24.5	60/0.0												840.5	CRYSTALLINE ROCK	23.5
																Issues during drilling. See boring B1-B NBL (core)	
															835.9	Boring Terminated at Elevation 835.9 ft in Crystalline Rock: GNEISS	28.1
																Core boring offset from SPT boring due to lost outer core barrel.	

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer											
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)										
BORING NO. B1-B NBL (core)		STATION 140+37		OFFSET 39 ft RT		ALIGNMENT -L-											
COLLAR ELEV. 863.8 ft		TOTAL DEPTH 42.8 ft		NORTHING 872,434		EASTING 1,657,253											
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021				DRILL METHOD Core Boring		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 06/17/22		COMP. DATE 06/17/22		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
865															863.8	GROUND SURFACE	0.0
																SPT completed in B1-B-NBL (SPT)	
860																	
855																	
850																	
845																	
840															840.7	CRYSTALLINE ROCK	23.1
																GNEISS	
835																	
830																	
825																	
															821.0	Boring Terminated at Elevation 821.0 ft in Crystalline Rock: GNEISS	42.8
																Core boring offset from SPT boring due to lost outer core barrel.	

NCDOT BORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 7/27/22

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer					
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)				
BORING NO. B1-B NBL (SPT)		STATION 140+43		OFFSET 39 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 864.0 ft		TOTAL DEPTH 28.1 ft		NORTHING 872,438		EASTING 1,657,257					
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER M. Moseley		START DATE 06/13/22		COMP. DATE 06/13/22		SURFACE WATER DEPTH N/A					
CORE SIZE NQ		TOTAL RUN 4.6 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
840	840.5	23.5	4.6		(4.5) 98%	(2.3) 49%	(4.5) 98%	(2.3) 49%		Begin Coring @ 23.5 ft CRYSTALLINE ROCK Black, white, slight to moderate weathering, hard, close fracture spacing, GNEISS GSI=40 to 50	23.5
	835.9	28.1								Boring Terminated at Elevation 835.9 ft in Crystalline Rock: GNEISS Core boring offset from SPT boring due to lost outer core barrel.	28.1

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer					
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)				
BORING NO. B1-B NBL (core)		STATION 140+37		OFFSET 39 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 863.8 ft		TOTAL DEPTH 42.8 ft		NORTHING 872,434		EASTING 1,657,253					
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021				DRILL METHOD Core Boring		HAMMER TYPE Automatic					
DRILLER M. Moseley		START DATE 06/17/22		COMP. DATE 06/17/22		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 19.7 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
840	840.7	23.1	4.7	01:15/0.7 02:15/1.0 01:45/1.0 01:54/1.0 02:14/1.0	(4.7) 100%	(3.9) 83%	(19.7) 100%	(18.3) 93%		Begin Coring @ 23.1 ft CRYSTALLINE ROCK Black, white, slight weathering, hard, close to moderately close fracture spacing, BIOTITE GNEISS GSI=50 to 60	23.1
835	836.0	27.8	5.0	02:11/1.0 01:49/1.0 01:46/1.0 01:29/1.0 01:17/1.0	(5.0) 100%	(4.5) 90%					
830	831.0	32.8	5.0	01:44/1.0 01:32/1.0 01:55/1.0 02:36/1.0 02:32/1.0	(5.0) 100%	(5.0) 100%					
825	826.0	37.8	5.0	02:50/1.0 02:34/1.0 03:30/1.0 03:52/1.0 03:15/1.0	(5.0) 100%	(4.9) 98%					
	821.0	42.8								Boring Terminated at Elevation 821.0 ft in Crystalline Rock: GNEISS Core boring offset from SPT boring due to lost outer core barrel.	42.8

NCDOT CORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 7/21/22

CORE PHOTOGRAPHS

B1-B NBL (SPT)

-L- 140+43 39 RT

BOX 1: 23.5-28.1 FEET

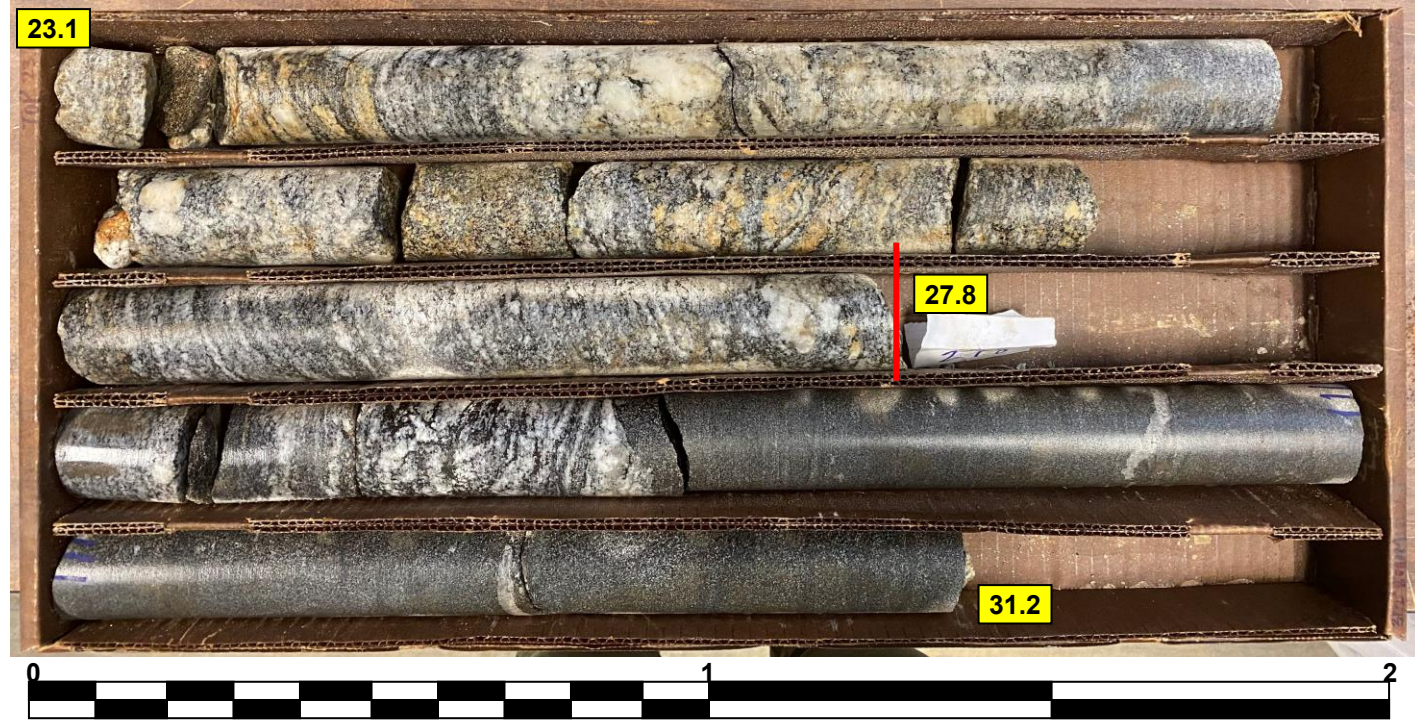


CORE PHOTOGRAPHS

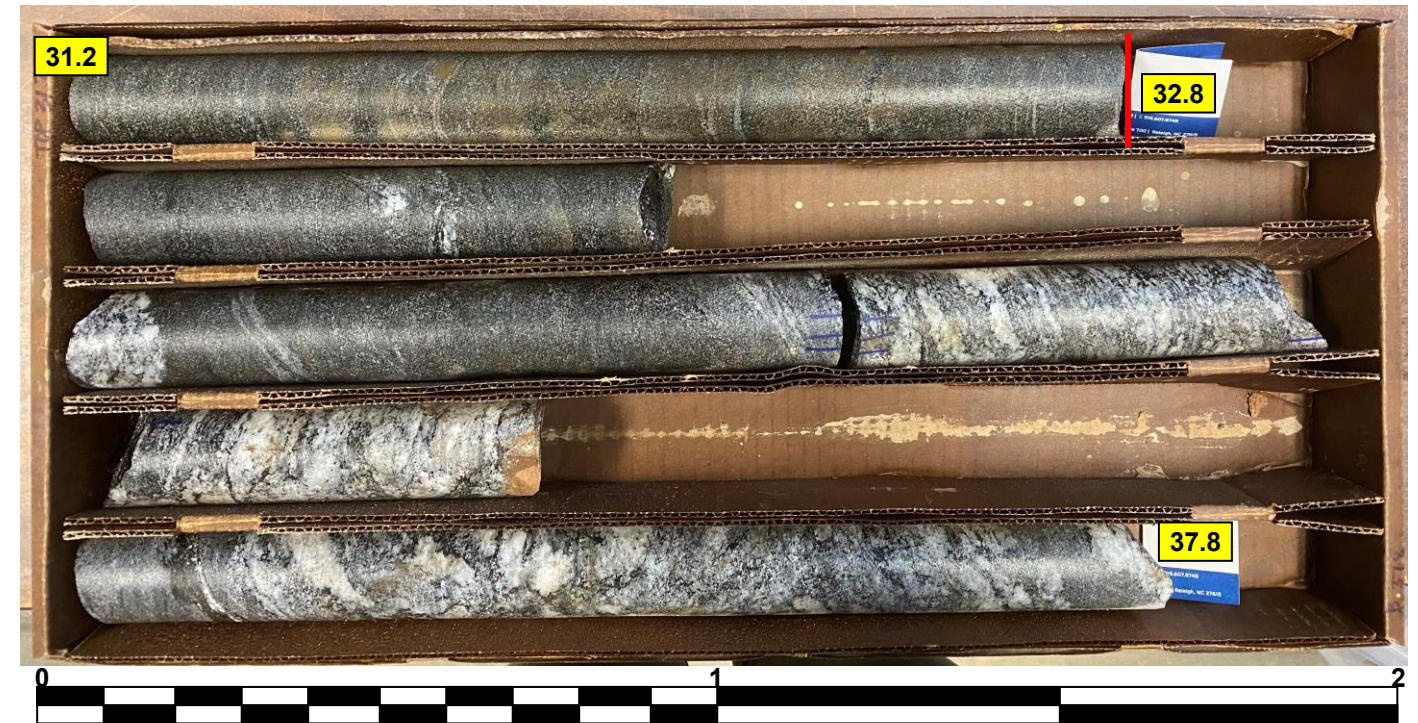
B1-B NBL (core)

-L- 140+37 39 RT

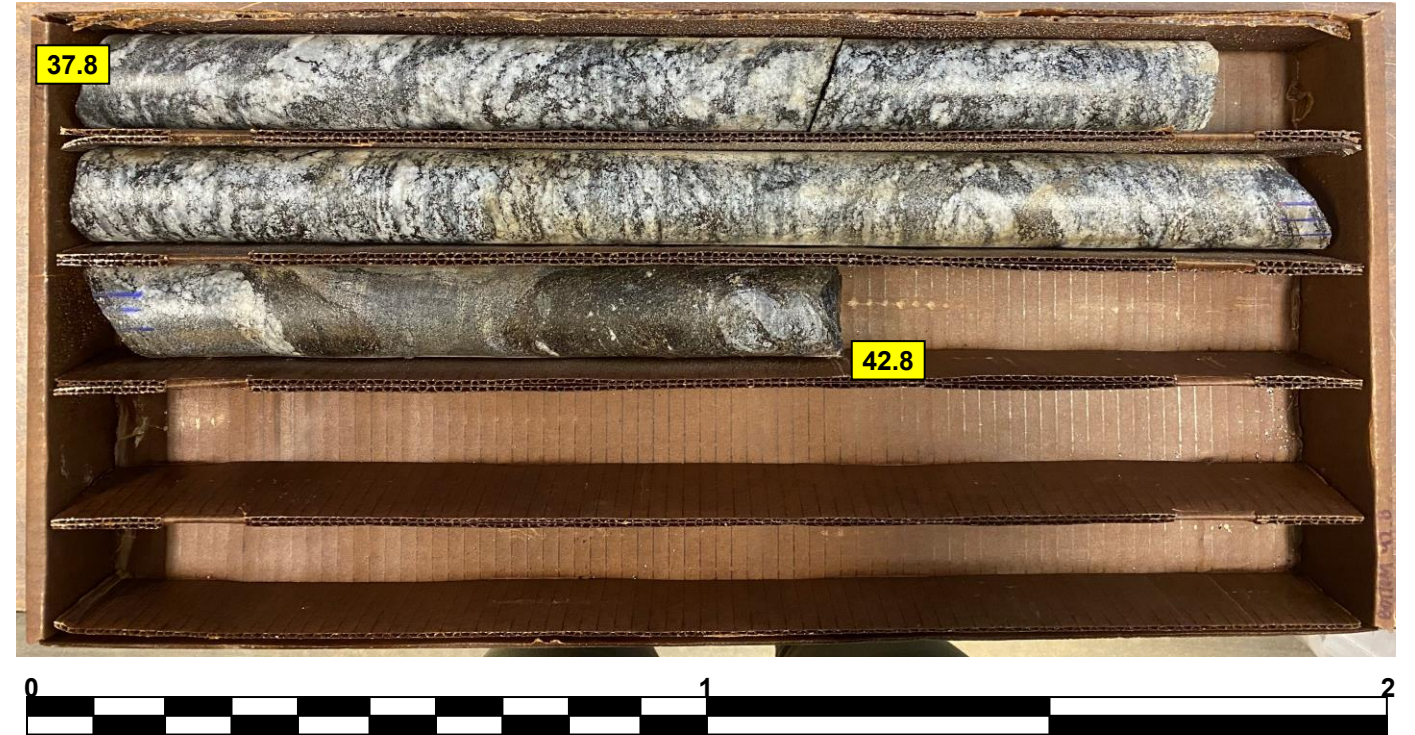
BOX 1: 23.1-31.2 FEET



BOX 2: 31.2-37.8 FEET



BOX 3: 37.8-42.8 FEET



GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer										
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)									
BORING NO. B1-B NBL (3)		STATION 140+35		OFFSET 39 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 863.8 ft		TOTAL DEPTH 23.1 ft		NORTHING 872,432		EASTING 1,657,252										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021			DRILL METHOD Core Boring		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 06/16/22		COMP. DATE 06/16/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
865															863.8	0.0
860																
855																
850																
845																
															843.2	20.6
															842.8	21.0
															840.7	23.1

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer					
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)				
BORING NO. B1-B NBL (3)		STATION 140+35		OFFSET 39 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 863.8 ft		TOTAL DEPTH 23.1 ft		NORTHING 872,432		EASTING 1,657,252					
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021			DRILL METHOD Core Boring		HAMMER TYPE Automatic						
DRILLER M. Moseley		START DATE 06/16/22		COMP. DATE 06/16/22		SURFACE WATER DEPTH N/A					
CORE SIZE N/A		TOTAL RUN 2.5 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
843.2											
	843.2	20.6	2.5		(0.8)	(0.0)				843.2	20.6
	840.7	23.1			32%	0%				842.8	21.0
										840.7	23.1

NCDOT BORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 11/11/22

843.2
842.8
840.7

CONCRETE 20.6
21.0

CRYSTALLINE ROCK GNEISS 23.1

Boring Terminated at Elevation 840.7 ft in Crystalline Rock: GNEISS

Stopped coring early due to encountering unexpected concrete between soil and rock.

843.2
842.8
840.7

Begin Coring @ 20.6 ft

CONCRETE 20.6
21.0

CRYSTALLINE ROCK 23.1

Black, white, moderate weathering, hard, close fracture spacing, GNEISS
GIS=30 to 40

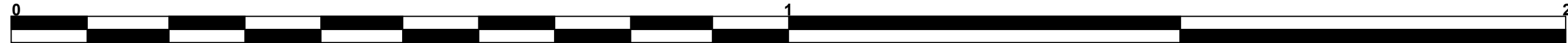
Boring Terminated at Elevation 840.7 ft in Crystalline Rock: GNEISS

CORE PHOTOGRAPHS

B1-B NBL (3)

-L- 140+35 39 RT

BOX 1: 20.6-23.1 FEET



FEET

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 37405.1.1			TIP R-2577A			COUNTY FORSYTH			GEOLOGIST B. Farmer							
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek								GROUND WTR (ft)								
BORING NO. B1-B NBL (4)		STATION 140+35		OFFSET 36 ft RT		ALIGNMENT -L-		0 HR. N/A								
COLLAR ELEV. 863.9 ft		TOTAL DEPTH 1.2 ft		NORTHING 872,434		EASTING 1,657,250		24 HR. FIAD								
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021					DRILL METHOD H.S. Augers			HAMMER TYPE Automatic								
DRILLER M. Moseley			START DATE 06/16/22		COMP. DATE 06/16/22		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
865																
															863.9	GROUND SURFACE 0.0
															862.7	ROADWAY EMBANKMENT 1.2
																Boring Terminated at Elevation 862.7 ft on Concrete Stopped drilling because this was the only boring location where concrete was found directly under asphalt.

WBS 37405.1.1			TIP R-2577A			COUNTY FORSYTH			GEOLOGIST B. Farmer							
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek								GROUND WTR (ft)								
BORING NO. B1-B SBL		STATION 140+92		OFFSET 35 ft LT		ALIGNMENT -L-		0 HR. N/A								
COLLAR ELEV. 844.6 ft		TOTAL DEPTH 5.1 ft		NORTHING 872,523		EASTING 1,657,231		24 HR. 3.7								
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021					DRILL METHOD H.S. Augers			HAMMER TYPE Automatic								
DRILLER M. Moseley			START DATE 06/01/22		COMP. DATE 06/01/22		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
845																
															844.6	GROUND SURFACE 0.0
				1.0	3	17	8								841.0	ALLUVIAL Brown, fine to coarse sandy CLAY (A-6), trace mica, little gravel 3.6
				3.6											839.5	WEATHERED ROCK GNEISS 5.1
				5.1	55	45/0.3										Boring Terminated with Standard Penetration Test Refusal at Elevation 839.5 ft on Crystalline Rock: GNEISS

NCDOT BORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 11/11/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer										
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)									
BORING NO. EB2-A SBL		STATION 141+63		OFFSET 39 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 862.9 ft		TOTAL DEPTH 16.0 ft		NORTHING 872,580		EASTING 1,657,274										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 05/31/22		COMP. DATE 05/31/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
865																
	861.9	1.0	2	1	7									862.9	GROUND SURFACE	0.0
860	859.4	3.5	62	38/0.2										859.4	ROADWAY EMBANKMENT Brown, fine to coarse sandy CLAY (A-6), trace mica	3.5
															WEATHERED ROCK RIPRAP	
855	854.4	8.5	2	7	17									854.9	RESIDUAL Brown, fine to coarse sandy CLAY (A-6), trace mica, trace roots	8.0
															WEATHERED ROCK GNEISS	
850	849.4	13.5	32	68/0.2										849.4		13.5
	846.9	16.0												846.9		16.0
			60/0.0												Boring Terminated with Standard Penetration Test Refusal at Elevation 846.9 ft on Crystalline Rock: GNEISS	

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST B. Farmer										
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)									
BORING NO. EB2-B NBL		STATION 141+10		OFFSET 46 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 864.2 ft		TOTAL DEPTH 13.6 ft		NORTHING 872,485		EASTING 1,657,305										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 06/07/22		COMP. DATE 06/07/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
865																
	863.2	1.0	5	3	2									864.2	GROUND SURFACE	0.0
860	859.9	4.3	3	1	2										RESIDUAL Red, silty CLAY (A-7-5), trace mica, with interbedded layers of silt	
															WEATHERED ROCK RIPRAP	
855	854.9	9.3	6	12	56									856.2	RESIDUAL Gray, silty fine to coarse SAND (A-2-4), trace mica, trace rock fragments	8.0
															WEATHERED ROCK GNEISS	
	850.7	13.5	60/0.1											850.7		13.5
														850.6	CRYSTALLINE ROCK GNEISS	13.6
															Boring Terminated with Standard Penetration Test Refusal at Elevation 850.6 ft in Crystalline Rock: GNEISS	

NCDOT BORE DOUBLE R-2577A_GEO_BRDG.GPJ NC_DOT.GDT 7/21/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST J Mize								
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek							GROUND WTR (ft)							
BORING NO. L 141+00		STATION 140+84		OFFSET 18 ft RT		ALIGNMENT -L-								
COLLAR ELEV. 863.4 ft		TOTAL DEPTH 19.4 ft		NORTHING 872,483		EASTING 1,657,267								
DRILL RIG/HAMMER EFF./DATE SME275 DIETRICH D-50 90% 11/08/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER T Williams		START DATE 04/23/19		COMP. DATE 04/23/19		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
865														GROUND SURFACE 0.0
														863.4 0.8' Asphalt, 1.9' ABC
860	859.9	3.5	4	5	5	10						M		860.7 2.7
														ROADWAY EMBANKMENT Brown to red-brown, soft to stiff, sandy SILT (A-4), little mica, trace gravel
855	854.9	8.5	6	3	4	7						M		
850	849.9	13.5	2	2	1	3						W		
845	844.9	18.5												845.9 17.5
	844.0	19.4	100/0.2							100/0.2				844.0 19.4
			60/0.0							60/0.0				WEATHERED ROCK GRANITE
														Boring Terminated at Elevation 844.0 ft on Crystalline Rock: GRANITE
														Boring elevation determined from existing TIN dated 12/18/2020

NCDOT BORE DOUBLE R-2577A_GEO_RDWY.GPJ NC_DOT.GDT 7/27/22

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 37405.1.1					TIP R-2577A		COUNTY FORSYTH			GEOLOGIST B. Farmer					
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek										GROUND WTR (ft)					
BORING NO. EB2-B SBL			STATION 141+55		OFFSET 8 ft LT		ALIGNMENT -L-			0 HR. N/A					
COLLAR ELEV. 863.5 ft			TOTAL DEPTH 17.3 ft		NORTHING 872,554		EASTING 1,657,293			24 HR. Dry					
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021						DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic						
DRILLER M. Moseley			START DATE 06/01/22		COMP. DATE 06/01/22		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
865															863.5 GROUND SURFACE 0.0
	862.5	1.0	2	3	2								W		860.5 ROADWAY EMBANKMENT Brown, silty fine to coarse sandy CLAY (A-6), trace mica 3.0
	860.0	3.5	4	2	18								W		860.5 RESIDUAL Orange, fine to coarse sandy silty CLAY (A-7-5), trace mica 3.0
	855.0	8.5													855.0 CRYSTALLINE ROCK GNEISS 8.5
850															846.2 Boring Terminated at Elevation 846.2 ft in Crystalline Rock: GNEISS 17.3

WBS 37405.1.1					TIP R-2577A		COUNTY FORSYTH			GEOLOGIST B. Farmer			
SITE DESCRIPTION US 158 (Reidsville Rd.) Dual Bridges over Lowery Mill Creek										GROUND WTR (ft)			
BORING NO. EB2-B SBL			STATION 141+55		OFFSET 8 ft LT		ALIGNMENT -L-			0 HR. N/A			
COLLAR ELEV. 863.5 ft			TOTAL DEPTH 17.3 ft		NORTHING 872,554		EASTING 1,657,293			24 HR. Dry			
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 83% 11/12/2021						DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic				
DRILLER M. Moseley			START DATE 06/01/22		COMP. DATE 06/01/22		SURFACE WATER DEPTH N/A						
CORE SIZE NQ						TOTAL RUN 8.8 ft							
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS ELEV. (ft) DEPTH (ft)		
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %				
855	855.0	8.5	3.8	01:06/0.8 00:51/1.0 01:01/1.0 01:07/1.0	(3.0) 79%	(1.5) 39%		(7.8) 89%	(5.5) 63%		855.0 Begin Coring @ 8.5 ft CRYSTALLINE ROCK Black, white, fresh to slight weathering, hard to moderately hard, close to moderately close fracture spacing, GNEISS GSI=40 to 50 8.5		
	851.2	12.3	5.0	01:38/1.0 02:33/1.0 03:12/1.0 02:59/1.0	(4.8) 96%	(4.0) 80%					846.2 Boring Terminated at Elevation 846.2 ft in Crystalline Rock: GNEISS 17.3		

CORE PHOTOGRAPHS

EB2-B SBL

-L- 141+55 8 LT

BOX 1: 8.5-17.3 FEET





ASTM D7012 - Method C

Unconfined Compression Test

Client: RK&K
 Report Date: 7/6/2022
 Project: Forsyth County R-2577A
 Project No.: R-2577A

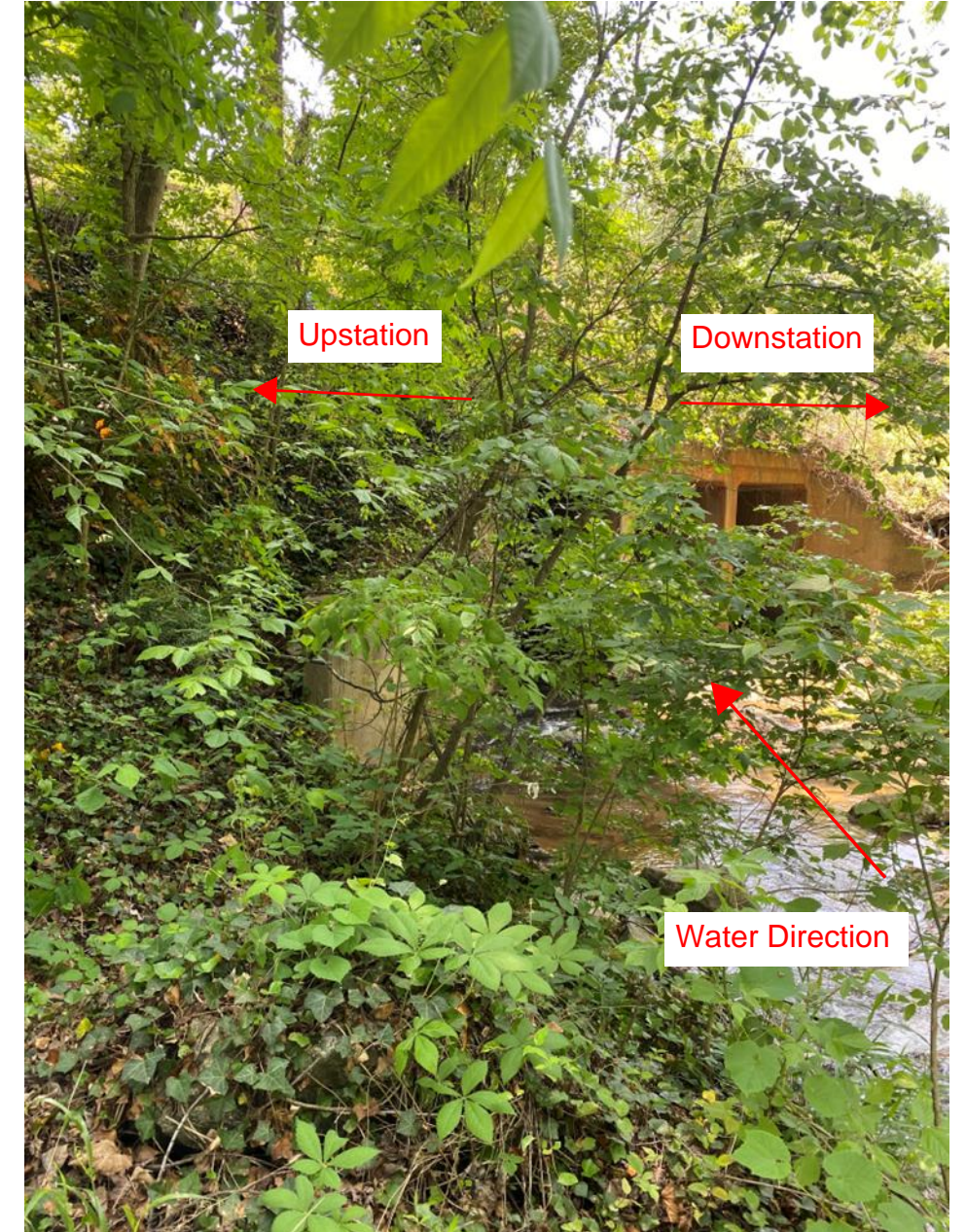
<i>SAMPLE NO.</i>	<i>STATION</i>	<i>OFFSET</i>	<i>DEPTH INTERVAL</i>	<i>HEIGHT (in)</i>	<i>DIAMETER (in)</i>	<i>AREA (sq in)</i>	<i>H:D</i>	<i>Mass (g)</i>	<i>Unit Weight (pcf)</i>	<i>Moisture (%)</i>	<i>Load (lbs)</i>	<i>Comp. Strength (psi)</i>
RS-1	140+73	16 RT	23.1-23.6	4.26	1.87	2.75	2.28	491.91	160.9	0.2	32950	11982
RS-2	140+98	50 LT	12.5-12.9	3.94	1.85	2.69	2.13	472.28	169.8	0.1	14600	5428



Drill Rig Photo on Bridge (-L-)



Lowery Mill Creek Downstream



Lowery Mill Creek Upstream

REFERENCE: R-2577A

PROJECT: 37405

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2577A	1	6

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN & WALL PROFILE
4 - 6	BORING LOGS

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
PROJECT DESCRIPTION US 158 (REIDSVILLE RD.) FROM NORTH OF US 421 / I 40 BUS. TO SR 1965 (BELEWS CREEK RD.)
SITE DESCRIPTION RETAINING WALL NO.1 FROM -L- STA 28+40 (LT) TO -L- STA 32+07 (LT)

INVENTORY

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (ON-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL
J. MIZE
A. BOZORGI
S&ME PERSONNEL
S&ME PERSONNEL

INVESTIGATED BY RK&K, LLP
DRAWN BY J. MIZE
CHECKED BY G. TAYLOR
SUBMITTED BY RK&K, LLP
DATE JUNE 2019

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UNLESS ALL SIGNATURES COMPLETED**

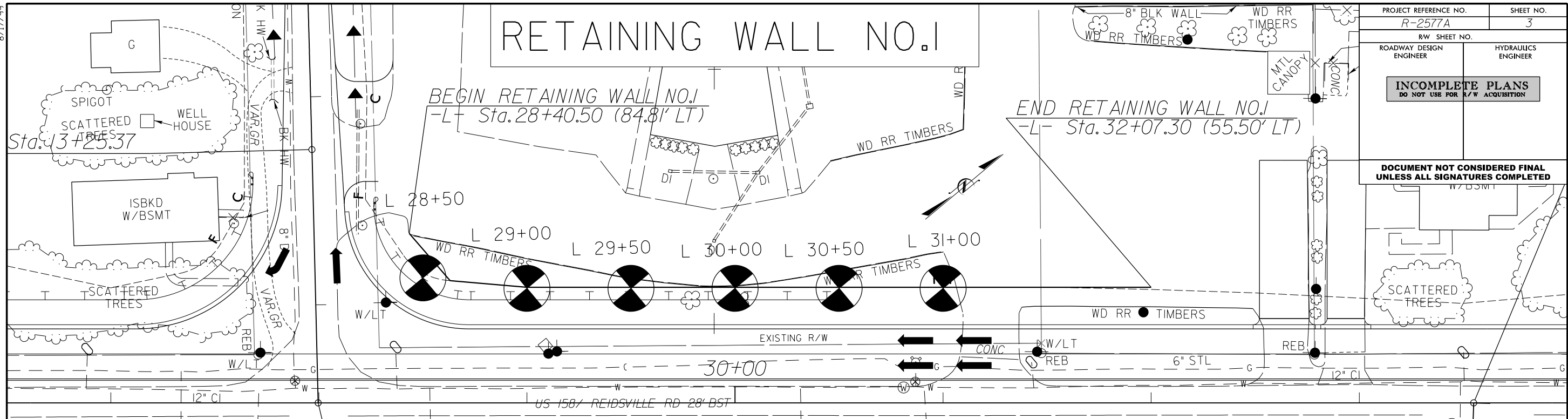
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. It includes detailed classification schemes, symbols for soil types and rock conditions, and definitions for various geotechnical terms.

8/17/99

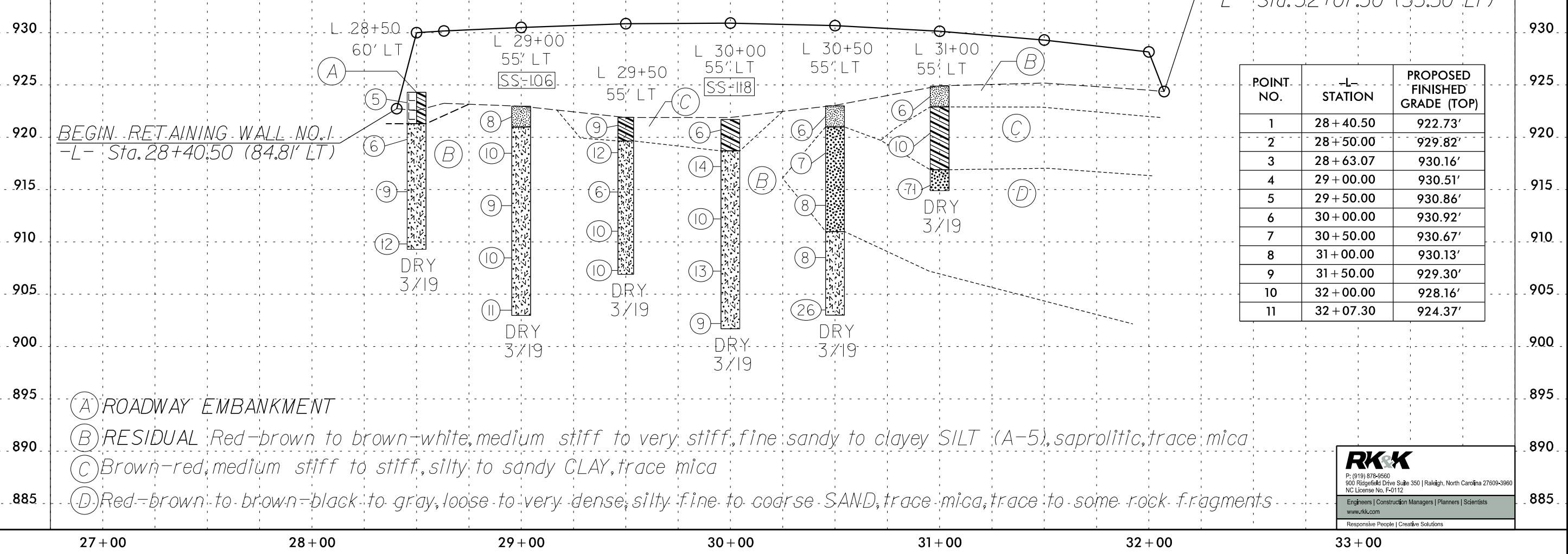
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PROJECT REFERENCE NO. R-2577A	SHEET NO. 3
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SOIL TEST RESULTS

SAMPLE NO.	LINE	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.T.	% BY WEIGHT				% PASSING SIEVE				% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
SS-106	-L-	29+00	0.0 - 1.5	A-4 (0)	40	4	21	40	18	21	89	78	70	42.3	26.2	N/A
SS-118	-L-	30+00	8.5 - 10	A-5 (1)	52	4	7	59	18	16	100	98	93	43.5	30.5	N/A



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 NC License No. P-0112
 Engineers | Construction Managers | Planners | Scientists
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 Responsive People | Creative Solutions

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST A Bozorgi										
SITE DESCRIPTION US 158 From North of US 421/I-40 Bus. To SR 1965 (Belews Creek Rd.)							GROUND WTR (ft)									
BORING NO. L 28+50		STATION 28+50		OFFSET 60 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 924.3 ft		TOTAL DEPTH 15.0 ft		NORTHING 863,897		EASTING 1,650,023										
DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH D-50 90% 11/08/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER T Williams		START DATE 03/20/19		COMP. DATE 03/20/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
925	924.3	0.0												924.3	0.0	GROUND SURFACE
			2	2	3											ROADWAY EMBANKMENT
																Red-brown, medium stiff, silty CLAY (A-6), trace mica
920	920.8	3.5	2	3	3									921.3	3.0	RESIDUAL
																Brown-orange, medium stiff to stiff, clayey to fine sandy SILT (A-5)
915	915.8	8.5	3	4	5											
910	910.8	13.5	4	5	7											
																Boring Terminated at Elevation 909.3 ft in Residual: clayey SILT (A-5)

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST A Bozorgi										
SITE DESCRIPTION US 158 From North of US 421/I-40 Bus. To SR 1965 (Belews Creek Rd.)							GROUND WTR (ft)									
BORING NO. L 29+00		STATION 29+00		OFFSET 55 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 923.0 ft		TOTAL DEPTH 20.0 ft		NORTHING 863,932		EASTING 1,650,059										
DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH D-50 90% 11/08/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER T Williams		START DATE 03/20/19		COMP. DATE 03/20/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
925														923.0	0.0	GROUND SURFACE
			2	4	4											RESIDUAL
																Red-brown, stiff, fine sandy SILT (A-4)
920	919.5	3.5	3	5	5									921.0	2.0	Brown-red, stiff, clayey SILT (A-5)
915	914.5	8.5	4	4	5											
910	909.5	13.5	4	4	6											
905	904.5	18.5	3	5	6											
																Boring Terminated at Elevation 903.0 ft in Residual: clayey SILT (A-5)

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST A Bozorgi	
SITE DESCRIPTION US 158 From North of US 421/I-40 Bus. To SR 1965 (Belews Creek Rd.)							GROUND WTR (ft)
BORING NO. L 29+50		STATION 29+50		OFFSET 55 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 921.9 ft		TOTAL DEPTH 20.0 ft		NORTHING 863,970		EASTING 1,650,091	
DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH D-50 90% 11/08/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER T Williams		START DATE 03/21/19		COMP. DATE 03/21/19		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
925														
920	921.9	0.0	2	3	6							W	921.9 GROUND SURFACE 0.0	
915	918.4	3.5	3	5	7							W	918.9 RESIDUAL Brown-red, stiff, silty CLAY (A-6) 3.0	
910	913.4	8.5	2	3	3							W	Brown to brown-white, medium stiff to stiff, clayey fine sandy SILT (A-5), saprolitic, trace mica	
905	908.4	13.5	3	4	6							W		
	903.4	18.5	4	4	6							W	901.9 Boring Terminated at Elevation 901.9 ft in Residual: clayey SILT (A-5) 20.0	

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST A Bozorgi	
SITE DESCRIPTION US 158 From North of US 421/I-40 Bus. To SR 1965 (Belews Creek Rd.)							GROUND WTR (ft)
BORING NO. L 30+00		STATION 30+00		OFFSET 55 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 921.7 ft		TOTAL DEPTH 20.0 ft		NORTHING 864,009		EASTING 1,650,123	
DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH D-50 90% 11/08/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER T Williams		START DATE 03/21/19		COMP. DATE 03/21/19		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
925														
920	921.7	0.0	2	3	3							W	921.7 GROUND SURFACE 0.0	
915	918.2	3.5	3	5	9							W	918.7 RESIDUAL Red-brown, medium stiff, fine to coarse sandy CLAY (A-6), trace mica 3.0	
910	913.2	8.5	3	5	5							W	Red-brown to brown-gray, stiff, fine sandy SILT (A-5), trace mica	
905	908.2	13.5	4	6	7							W		
	903.2	18.5	3	4	5							W	901.7 Boring Terminated at Elevation 901.7 ft in Residual: sandy SILT (A-5) 20.0	

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST A Bozorgi										
SITE DESCRIPTION US 158 From North of US 421/I-40 Bus. To SR 1965 (Belews Creek Rd.)							GROUND WTR (ft)									
BORING NO. L 30+50		STATION 30+50		OFFSET 55 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 923.0 ft		TOTAL DEPTH 20.0 ft		NORTHING 864,047		EASTING 1,650,155										
DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH D-50 90% 11/08/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER T Williams		START DATE 03/21/19		COMP. DATE 03/21/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
925																
	923.0	0.0	1	3	3	6							W	923.0	GROUND SURFACE	0.0
920	919.5	3.5	3	3	4	7							W	921.0	RESIDUAL Red-brown, medium stiff, fine sandy SILT (A-4)	2.0
													W		Red-brown to brown-black, loose, silty SAND (A-2-4), trace mica	
915	914.5	8.5	4	5	3	8							W			
910	909.5	13.5	2	3	5	9							W	911.0	Red-brown, stiff to very stiff, fine sandy SILT (A-5), saprolitic, trace mica	12.0
905	904.5	18.5	2	5	21	26							W	903.0	Boring Terminated at Elevation 903.0 ft in Residual: sandy SILT (A-5)	20.0

WBS 37405.1.1		TIP R-2577A		COUNTY FORSYTH		GEOLOGIST A Bozorgi										
SITE DESCRIPTION US 158 From North of US 421/I-40 Bus. To SR 1965 (Belews Creek Rd.)							GROUND WTR (ft)									
BORING NO. L 31+00		STATION 31+00		OFFSET 55 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 924.9 ft		TOTAL DEPTH 10.0 ft		NORTHING 864,086		EASTING 1,650,187										
DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH D-50 90% 11/08/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER T Williams		START DATE 03/21/19		COMP. DATE 03/21/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
925																
	924.9	0.0	2	3	3	6							W	924.9	GROUND SURFACE	0.0
920	921.4	3.5	3	4	6	10							W	922.9	RESIDUAL Red-brown, medium stiff, fine sandy SILT (A-4)	2.0
													W		Brown-red, stiff, fine to coarse sandy CLAY (A-6)	
915	916.4	8.5	5	14	57	7							W	916.9	Gray, very dense, silty fine to coarse SAND (A-2-4), trace to some rock fragments	8.0
													W	914.9	Boring Terminated at Elevation 914.9 ft in Residual: silty SAND (A-2-4)	10.0

NCDOT BORE DOUBLE R-2577A_GEO_RDWY.GPJ NC_DOT.GDT 6/5/19