

REFERENCE: B-5833

PROJECT: 45786

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5833	1	7

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

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**STRUCTURE**

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**SUBSURFACE INVESTIGATION**

COUNTY YADKIN  
PROJECT DESCRIPTION REPLACE CULVERT NO. 2099 ON  
US 21 BUSINESS OVER UT TO SANDYBERRY CREEK

SITE DESCRIPTION \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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2, 2A	LEGEND (SOIL & ROCK)
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7	SITE PHOTOS

PERSONNEL

<u>J.K. STICKNEY</u>
<u>C.L. SMITH</u>
<u>B.E. FOSTER</u>
_____
_____

DS  
JEB INVESTIGATED BY J.E. BEVERLY  
DRAWN BY J.E. BEVERLY  
CHECKED BY C.R. LAVENDER III  
SUBMITTED BY K.B. MILLER  
DATE AUGUST 2020


**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.

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- 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.



DocuSigned by:  
 8/18/2020  
SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL  
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  
 (PAGE 1 OF 2)

SOIL DESCRIPTION										GRADATION									
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 (AASHTO T 206, 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										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.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS									
GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										MINERALOGICAL COMPOSITION									
GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.									
SYMBOL										COMPRESSIBILITY									
% PASSING #10, #40, #200										SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50									
MATERIAL PASSING #40 LL, PI										PERCENTAGE OF MATERIAL									
GROUP INDEX										ORGANIC MATERIAL GRANULAR SOILS SILT - CLAY SOILS OTHER MATERIAL									
USUAL TYPES OF MAJOR MATERIALS										TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE									
GEN. RATING AS SUBGRADE										GROUND WATER									
EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR POOR UNSUITABLE										▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ▼ STATIC WATER LEVEL AFTER 24 HOURS ▽PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○ SPRING OR SEEP									
CONSISTENCY OR DENSENESS										MISCELLANEOUS SYMBOLS									
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION 25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES SOIL SYMBOL SPT DMT VST PMT TEST BORING ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CORE BORING INFERRED SOIL BOUNDARY MONITORING WELL INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE PIEZOMETER INSTALLATION SPT N-VALUE									
TEXTURE OR GRAIN SIZE										RECOMMENDATION SYMBOLS									
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053										UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK									
GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005 IN. 12 3										ABBREVIATIONS									
SOIL MOISTURE - CORRELATION OF TERMS										AR - AUGER REFUSAL MED. - MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA - MICACEOUS WEA. - WEATHERED CL. - CLAY CPT - CONE PENETRATION TEST MOD. - MODERATELY ? - UNIT WEIGHT CSE. - COARSE NP - NON PLASTIC 7/2 - DRY UNIT WEIGHT DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS DPT - DYNAMIC PENETRATION TEST SAP. - SAPROLITIC S - BULK e - VOID RATIO SD. - SAND, SANDY SL. - SILT, SILTY SSI - SPLIT SPOON F - FINE FOSS. - FOSSILIFEROUS SLS. - SLIGHTLY ST - SHELBY TUBE FRAC. - FRACTURED, FRACTURES TCR - TRICONE REFUSAL RS - ROCK FRAGS. - FRAGMENTS w - MOISTURE CONTENT RT - RECOMPACTED TRIAXIAL HI. - HIGHLY CBR - CALIFORNIA BEARING RATIO									
PLASTICITY										EQUIPMENT USED ON SUBJECT PROJECT									
NON PLASTIC SLIGHTLY PLASTIC MODERATELY PLASTIC HIGHLY PLASTIC										DRILL UNITS: CME-45C CME-55 CME-550 VANE SHEAR TEST PORTABLE HOIST									
PLASTICITY INDEX (PI) DRY STRENGTH VERY LOW SLIGHT MEDIUM HIGH										ADVANCING TOOLS: CLAY BITS 6' CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING W/ ADVANCER TRICONE STEEL TEETH TRICONE TUNG-CARB. CORE BIT									
COLOR										HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B H N HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST									
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.																			

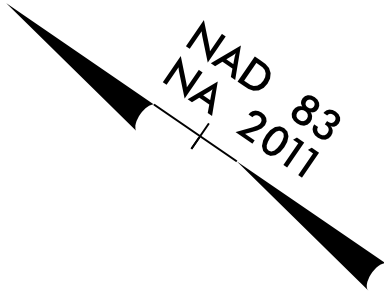
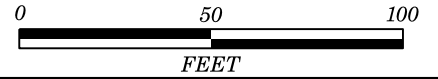
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
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# SUBSURFACE INVESTIGATION

## SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 2 OF 2)

ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>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:</p>		<p><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.  <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.  <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.  <b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.  <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.  <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.  <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.  <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.  <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.  <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.  <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.  <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.  <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.  <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.  <b>FORMATION (FM.)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.  <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.  <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.  <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.  <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.  <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.  <b>ROCK QUALITY DESIGNATION (ROD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.  <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.  <b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  <b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.  <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
WEATHERED ROCK (WR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	
CRYSTALLINE ROCK (CR)		FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	
NON-CRYSTALLINE ROCK (NCR)		FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	
COASTAL PLAIN SEDIMENTARY ROCK (CP)		COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	
WEATHERING			
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.		
VERY SLIGHT (V SL.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.		
SLIGHT (SL.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.		
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.		
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u>		
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &gt; 100 BPF</u>		
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</u>		
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.		
ROCK HARDNESS			
VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.		
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.		
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		
SOFT	CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.		
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.		
FRACTURE SPACING		BEDDING	
TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET
		THINLY LAMINATED	< 0.008 FEET
INDURATION			
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.			
FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.		
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.		
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.		
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.		
BENCH MARK: ELEVATIONS TAKEN FROM TIN FILE "B5833 LS TIN.TIN"		DATED 10-17-19	
ELEVATION:		FEET	
<b>NOTES:</b>			

# SITE PLAN



15

14

13

BL-3

PROP. BOX  
CULVERT

B-1

AT-1  
WELL

ISBK BUS

+45  
38'LT

+45  
20'LT

8"X18" CURB

8"X18" CURB

8-1

16' 16" HDPE

5' FDPS

S 41° 09' 54.1" E

US HWY 21

GREU, TL-3

ALLUVIAL

B-2

GREU, TL-3

GREU, TL-3

ISF BUS

GR

48" WD RAIL

48" WD RAIL

48" WD RAIL

36" CMP

40'R

40'R

20'

5' FDPS

EU, TL-3

BMI

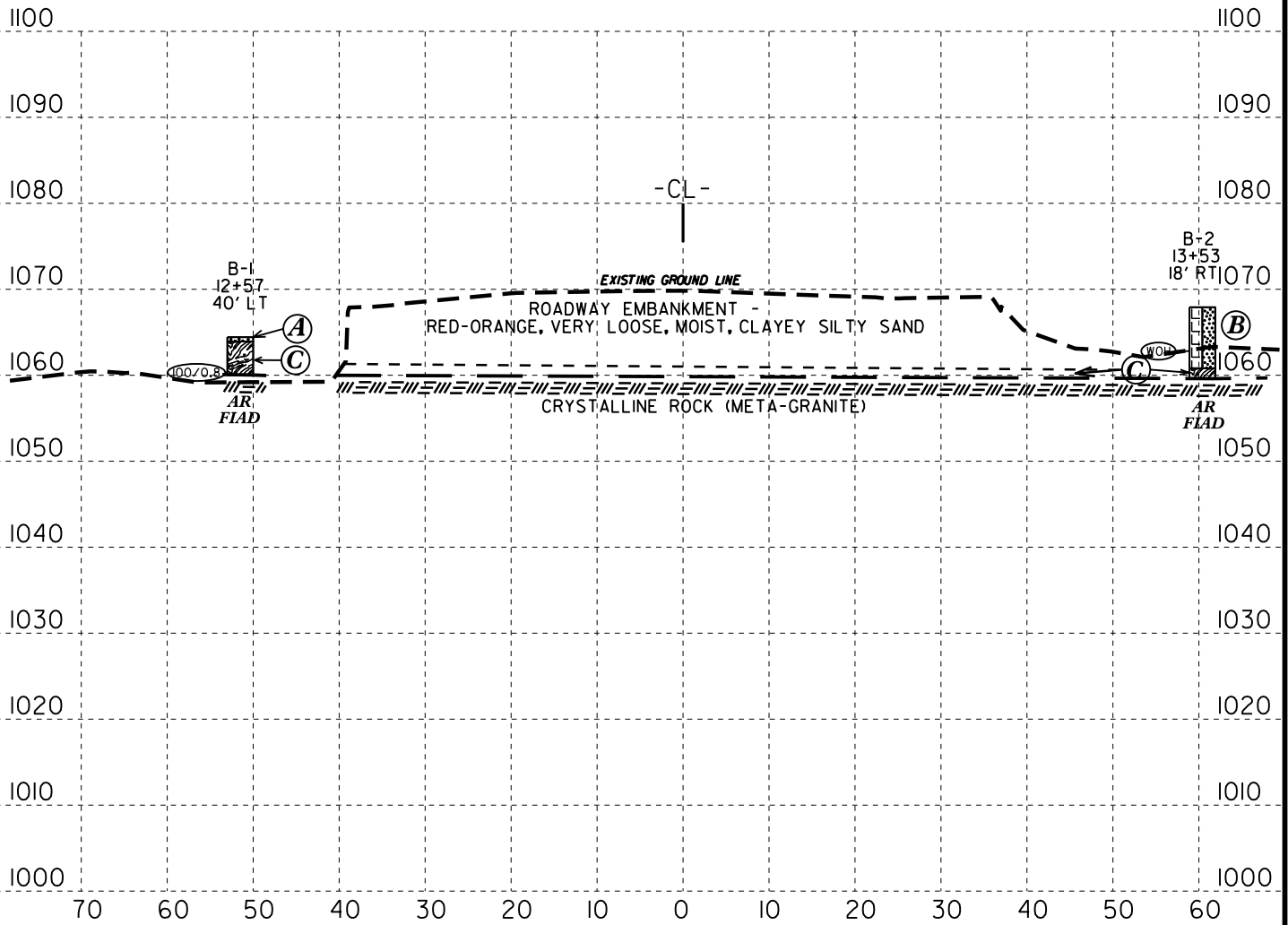
+00.00

12' 12"

12' 12"

12' 12"





- Ⓐ ALLUVIAL - TAN-BROWN, LOOSE, SILTY SAND
- Ⓑ ROADWAY EMBANKMENT - RED-ORANGE, VERY LOOSE, MOIST, CLAYEY SILTY SAND
- Ⓒ WEATHERED ROCK (META-GRANITE)

SKEW = 30 Degrees



VE = 1:1

**PROFILE ALONG CULVERT**  
**-CL- STA 12+93.03 -L-**

# GEOTECHNICAL BORING REPORT BORE LOG

WBS 45786.1.1			TIP B-5833			COUNTY YADKIN			GEOLOGIST Stickney, J. K.							
SITE DESCRIPTION REPLACE CULVERT NO. 2099 ON US 21 BUSINESS OVER UT TO SANDYBERRY CREEK									GROUND WTR (ft)							
BORING NO. B-1			STATION 12+57			OFFSET 40 ft LT			ALIGNMENT -L-							
COLLAR ELEV. 1,064.4 ft			TOTAL DEPTH 4.4 ft			NORTHING 896,966			EASTING 1,464,579							
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER Smith, C. L.			START DATE 08/03/20			COMP. DATE 08/03/20			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		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
1065															GROUND SURFACE	0.0
															ALLUVIAL TAN-BROWN, LOOSE, SILTY SAND	0.9
1060	1,061.1	3.3	46	54/0.3											WEATHERED ROCK WEATHERED META-GRANITE	4.4
															Boring Terminated at Elevation 1,060.0 ft ON CRYSTALLINE ROCK (META-GRANITE)	

NCDOT BORE SINGLE B5833 GEO\_RDWY.GPJ NC\_DOT.GDT 8/18/20

# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 45786.1.1		<b>TIP</b> B-5833		<b>COUNTY</b> YADKIN		<b>GEOLOGIST</b> Stickney, J. K.									
<b>SITE DESCRIPTION</b> REPLACE CULVERT NO. 2099 ON US 21 BUSINESS OVER UT TO SANDYBERRY CREEK							<b>GROUND WTR (ft)</b>								
<b>BORING NO.</b> B-2		<b>STATION</b> 13+53		<b>OFFSET</b> 18 ft RT		<b>ALIGNMENT</b> -L-									
<b>COLLAR ELEV.</b> 1,067.9 ft		<b>TOTAL DEPTH</b> 8.3 ft		<b>NORTHING</b> 896,856		<b>EASTING</b> 1,464,599									
<b>DRILL RIG/HAMMER EFF./DATE</b> HFC0072 CME-550X 89% 12/16/2019				<b>DRILL METHOD</b> H.S. Augers		<b>HAMMER TYPE</b> Automatic									
<b>DRILLER</b> Smith, C. L.		<b>START DATE</b> 08/03/20		<b>COMP. DATE</b> 08/03/20		<b>SURFACE WATER DEPTH</b> 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					
1070															
1065	1,063.8	4.1	WOH	WOH	WOH									1,067.9	0.0
1060														1,060.8	7.1
														1,059.6	8.3

NCDOT BORE SINGLE B5833 GEO\_RDWY.GPJ NC\_DOT.GDT 8/18/20

### Culvert at -L- Sta. 12+93.03 SITE PHOTOGRAPHS



**Photograph No. 1:** View looking down line



**Photograph No. 2:** Culvert outlet

REFERENCE: B-5833

PROJECT: 45786

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY YADKIN  
PROJECT DESCRIPTION REPLACE BRIDGE NO. 29 ON  
US 21 BUS OVER I-77

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5-7	CROSS SECTIONS
8-10	BORE LOGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5833	1	10

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 (IN-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

C.L. SMITH

J.K. STICKNEY

B.E. FOSTER

INVESTIGATED BY C. R. LAVENDER, III  
CAROLINAS

DRAWN BY GEOTECHNICAL GROUP

CHECKED BY J.E. BEVERLY

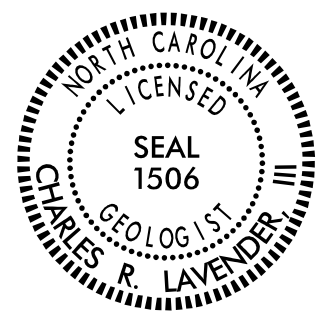
SUBMITTED BY K. B. MILLER

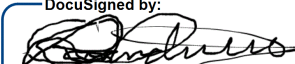
DATE NOVEMBER 2021

CADD Work Prepared in the Office of:



**CAROLINAS  
GEOTECHNICAL  
GROUP**  
2400 CROWNPOINT EXECUTIVE DRIVE  
SUITE 800  
CHARLOTTE, NC 28227  
(980) 339-8684



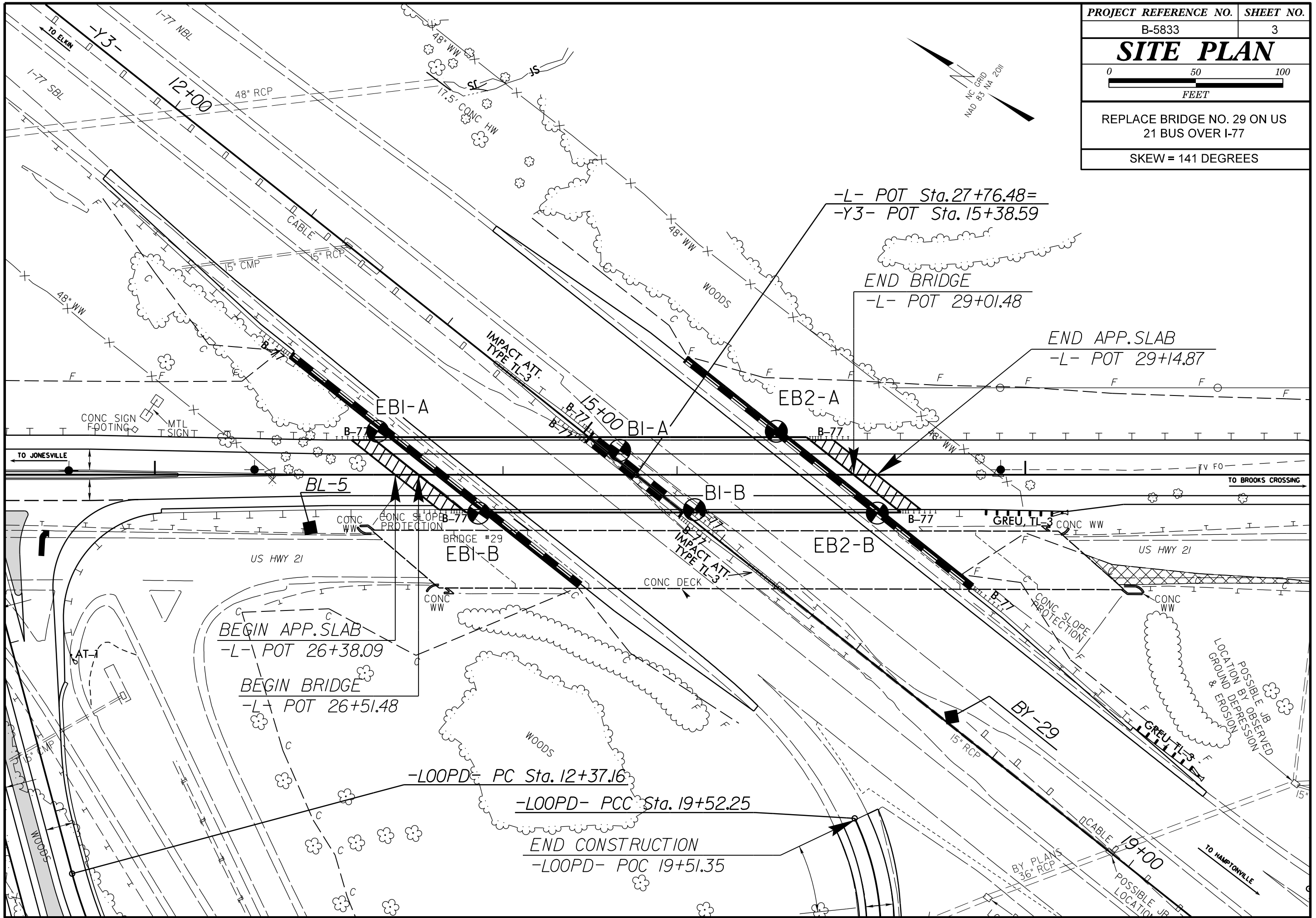
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 8EEA8D1B8A8E438 SIGNATURE DATE 11/9/2021

**DOCUMENT NOT CONSIDERED FINAL  
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

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																													
<p>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 (AASHTO T 208, 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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p><b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORMLY GRADED</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>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:</p>										<p><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. <b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (ROD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																													
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<p>▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p>▽ STATIC WATER LEVEL AFTER 24 HOURS</p> <p>▽ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p>○ SPRING OR SEEP</p>										<b>WEATHERING</b>										<b>FRESH</b>										<b>ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</b>																																																																																																																																																													
<b>CONSISTENCY OR DENSENESS</b>										<b>MISCELLANEOUS SYMBOLS</b>										<b>VERY SLIGHT (IV SLI.)</b>										<b>ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</b>																																																																																																																																																													
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<p>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.</p>										<p>CLAY BITS</p> <p>6" CONTINUOUS FLIGHT AUGER</p> <p><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</p> <p><input type="checkbox"/> HARD FACED FINGER BITS</p> <p><input type="checkbox"/> TUNG-CARBIDE INSERTS</p> <p><input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</p> <p><input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> STEEL TEETH</p> <p><input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB.</p> <p><input type="checkbox"/> CORE BIT</p> <p><input checked="" type="checkbox"/> PDC BIT</p>										<b>HARD</b>										<b>HARD</b>										<b>MODERATELY HARD</b>										<b>MODERATELY HARD</b>										<b>MODERATELY HARD</b>										<b>MODERATELY HARD</b>																																																																																																																					
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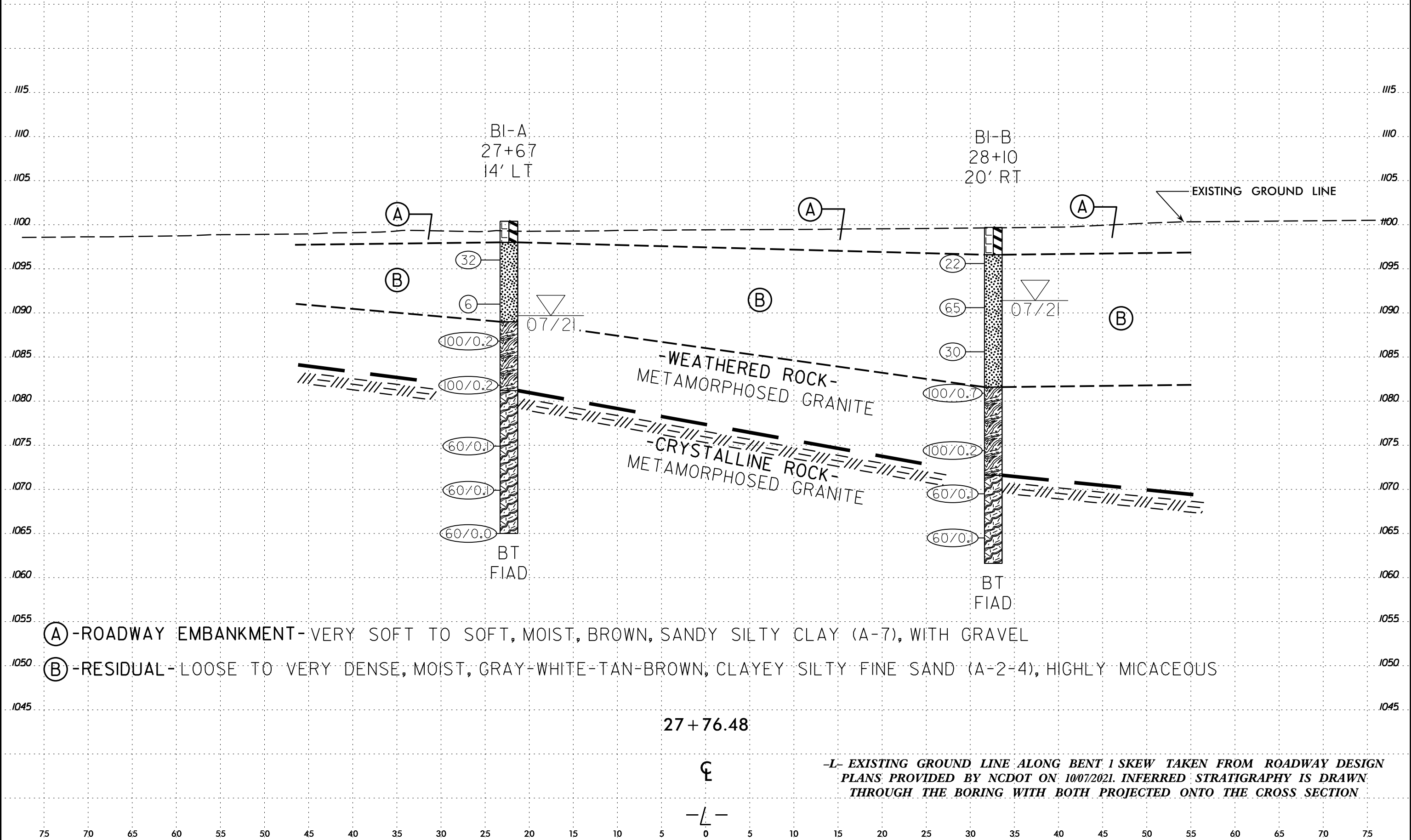
PROJECT REFERENCE NO.	SHEET NO.
B-5833	3
<b>SITE PLAN</b>	
 0 50 100 FEET	
REPLACE BRIDGE NO. 29 ON US 21 BUS OVER I-77	
SKEW = 141 DEGREES	





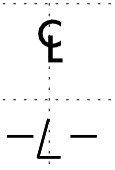


6/23/16  
07-NOV-2021 09:40  
C:\Users\jmcghee\OneDrive - Carolinas Geotechnical Group, PLLC\Projects\0112 - Drilling and Drafting On-Cell\NCDDT GEU\01-B-5833 Drafting Only\CAD\GEO\TECH\Site&Sub\B-5833.GEO.BRG00029\_XSI.dgn



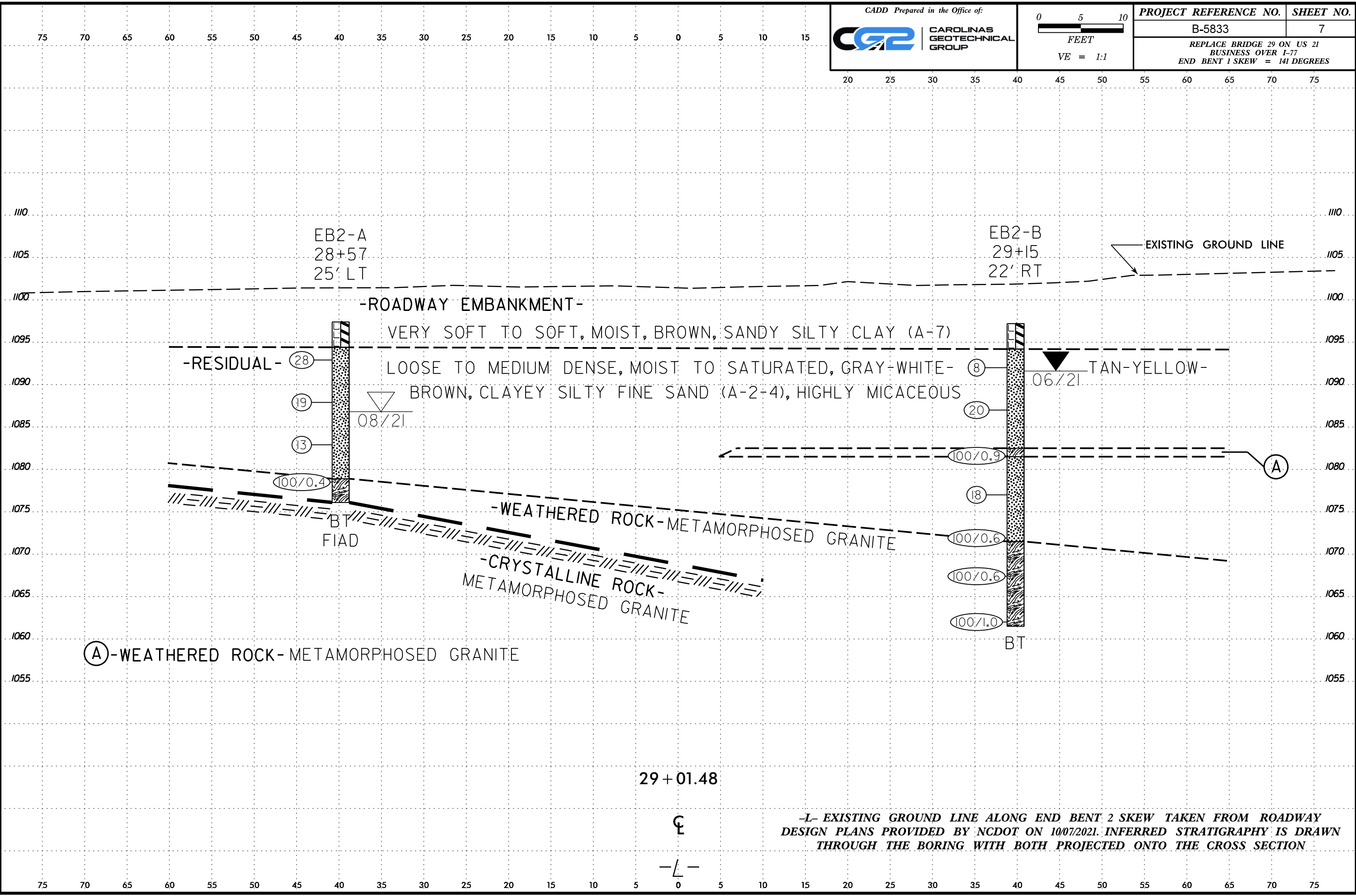
- (A) -ROADWAY EMBANKMENT-VERY SOFT TO SOFT, MOIST, BROWN, SANDY SILTY CLAY (A-7), WITH GRAVEL
- (B) -RESIDUAL- LOOSE TO VERY DENSE, MOIST, GRAY-WHITE-TAN-BROWN, CLAYEY SILTY FINE SAND (A-2-4), HIGHLY MICACEOUS

27 + 76.48



-L- EXISTING GROUND LINE ALONG BENT 1 SKEW TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY NCDOT ON 10/07/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16  
07-NOV-2021 09:40  
C:\Users\jmcghee\OneDrive - Carolines Geotechnical Group, PLLC\Projects\0112 - Drilling and Drafting On-Cell\NCDDOT\_GEU\01-B-5833 Drafting On-Cell\NCDDOT\_GEU\01-B-5833 Site&Sub\B-5833.GEO.BRGG0029\_XSI.dgn



29 + 01.48

⊕  
—L—

-L- EXISTING GROUND LINE ALONG END BENT 2 SKEW TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY NCDOT ON 10/07/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 26+28		OFFSET 25 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 1,100.9 ft		TOTAL DEPTH 18.4 ft		NORTHING 895,925		EASTING 1,465,471									
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 06/08/21		COMP. DATE 06/08/21		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					
1105															
1100															
1095	1,096.9	4.0	10	40	60/0.4										
1090	1,091.9	9.0	5	7	8										
1085	1,086.9	14.0	40	15	25										

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 26+86		OFFSET 22 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 1,099.6 ft		TOTAL DEPTH 20.0 ft		NORTHING 895,851		EASTING 1,465,465									
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 06/08/21		COMP. DATE 06/08/21		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					
1100															
1095	1,095.8	3.8	12	30	58										
1090	1,090.8	8.8	15	30	38										
1085	1,085.8	13.8	56	44/0.1											
1080															

NCDOT BORE DOUBLE B5833\_GEO\_BRDG0029\_YADKIN.GPJ NC\_DOT.GDT 11/7/21

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77							GROUND WTR (ft)								
BORING NO. B1-A		STATION 27+67		OFFSET 14 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 1,100.4 ft		TOTAL DEPTH 35.4 ft		NORTHING 895,805		EASTING 1,465,540									
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 07/07/21		COMP. DATE 07/07/21		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					
1105															
1100															
1095	1,097.0	3.4	12	10	22										
1090	1,092.0	8.4	4	2	4										
1085	1,087.0	13.4	100/0.2												
1080	1,082.0	18.4	100/0.2												
1075	1,075.0	25.4	60/0.1												
1070	1,070.0	30.4	60/0.1												
	1,065.0	35.4	60/0.0												

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77							GROUND WTR (ft)								
BORING NO. B1-B		STATION 28+10		OFFSET 20 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 1,099.7 ft		TOTAL DEPTH 38.1 ft		NORTHING 895,750		EASTING 1,465,537									
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 07/07/21		COMP. DATE 07/07/21		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					
1100															
1095	1,096.6	3.1	6	3	19										
1090	1,091.6	8.1	21	31	34										
1085	1,086.6	13.1	7	10	20										
1080	1,081.6	18.1	53	47/0.2											
1075	1,074.6	25.1	100/0.2												
1070	1,069.6	30.1	60/0.1												
1065	1,064.6	35.1	60/0.1												

NCDOT BORE DOUBLE B5833\_GEO\_BRDG0029\_YADKIN.GPJ NC\_DOT.GDT 11/7/21

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 28+57		OFFSET 25 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 1,097.4 ft		TOTAL DEPTH 21.3 ft		NORTHING 895,737		EASTING 1,465,600										
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 08/31/21		COMP. DATE 08/31/21		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						
1100																
1095	1,093.9	3.5	8	16	12								M	1,097.4 GROUND SURFACE 1,094.4 ROADWAY EMBANKMENT Brown, Sandy Silty CLAY	0.0 3.0	
1090	1,088.9	8.5	8	8	11								M	RESIDUAL Gray, White, Tan and Brown, Medium Dense, Clayey Silty Fine SAND, highly micaceous		
1085	1,083.9	13.5	6	6	7								M			
1080	1,078.9	18.5	100/0.4										W			
														W	1,078.9 WEATHERED ROCK (Metamorphosed Granite)	18.5
															1,076.1 Boring Terminated by Auger Refusal at Elevation 1,076.1 ft on CRYSTALLINE ROCK (Metamorphosed Granite)	21.3

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 29+15		OFFSET 22 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 1,097.2 ft		TOTAL DEPTH 35.7 ft		NORTHING 895,662		EASTING 1,465,594										
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 06/09/21		COMP. DATE 06/09/21		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						
1100																
1095	1,093.0	4.2	3	4	4								M	1,097.2 GROUND SURFACE 1,094.2 ROADWAY EMBANKMENT Brown, Sandy Silty CLAY	0.0 3.0	
1090	1,088.0	9.2	7	8	12								M	RESIDUAL Brown, Gray, White, Tan and Yellow, Loose to Medium Dense, Clayey Silty Fine SAND, highly micaceous		
1085	1,083.0	14.2	18	43	57/0.4								W			
1080	1,078.0	19.2	7	6	12										1,082.5 WEATHERED ROCK (Metamorphosed Granite) 1,081.5 RESIDUAL	14.7 15.7
														W	RESIDUAL Brown, Gray, White and Tan, Medium Dense, Clayey Silty Fine SAND, highly micaceous	
1075	1,073.0	24.2	2	16	84/0.1									Sat.		
1070	1,068.0	29.2	75	25/0.1											1,071.5 WEATHERED ROCK (Metamorphosed Granite)	25.7
1065	1,063.0	34.2	8	25	75/0.5										1,061.5 Boring Terminated at Elevation 1,061.5 ft in WEATHERED ROCK (Metamorphosed Granite)	35.7

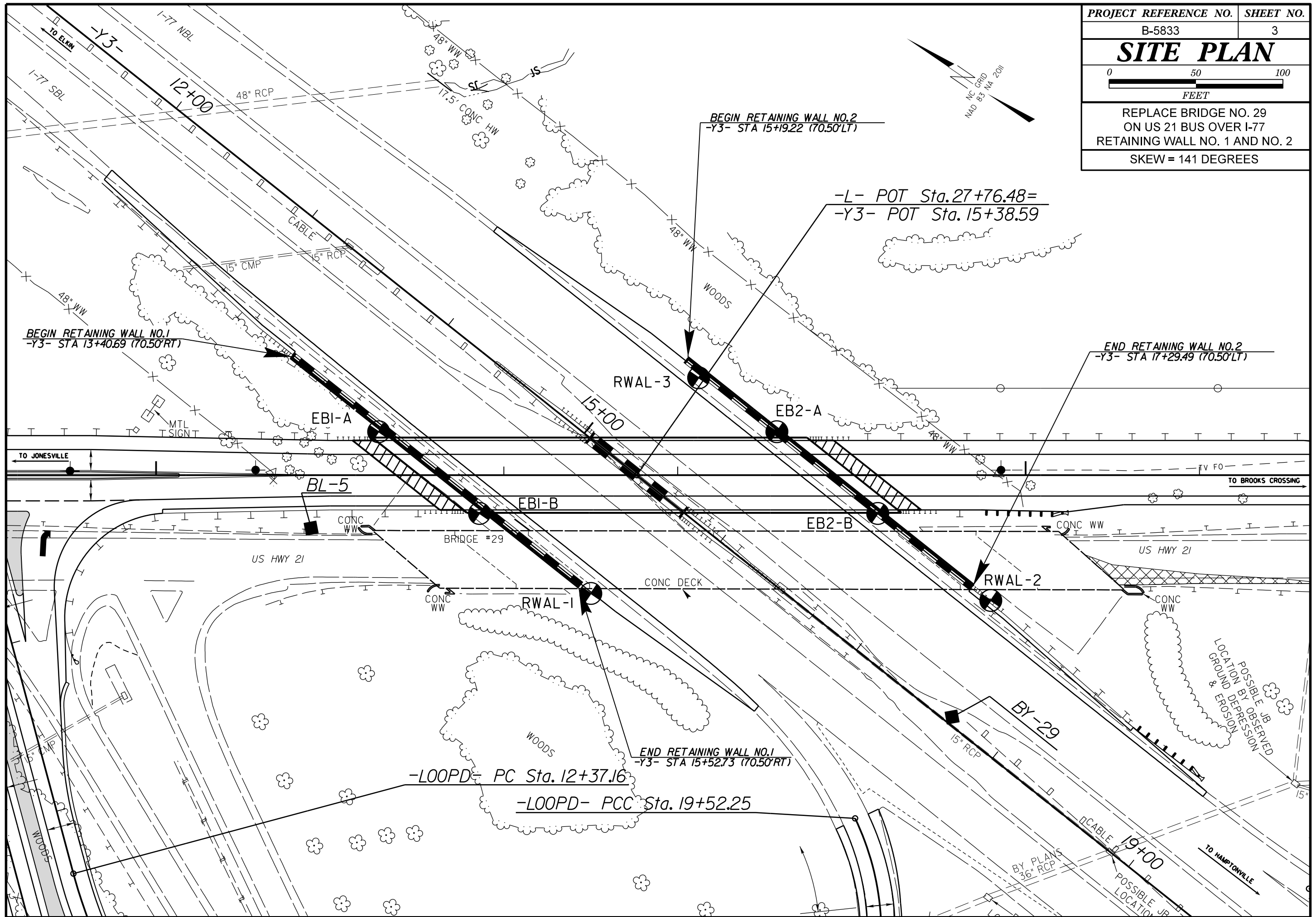
NCDOT BORE DOUBLE B5833\_GEO\_BRDG0029\_YADKIN.GPJ NC\_DOT.GDT 11/7/21



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

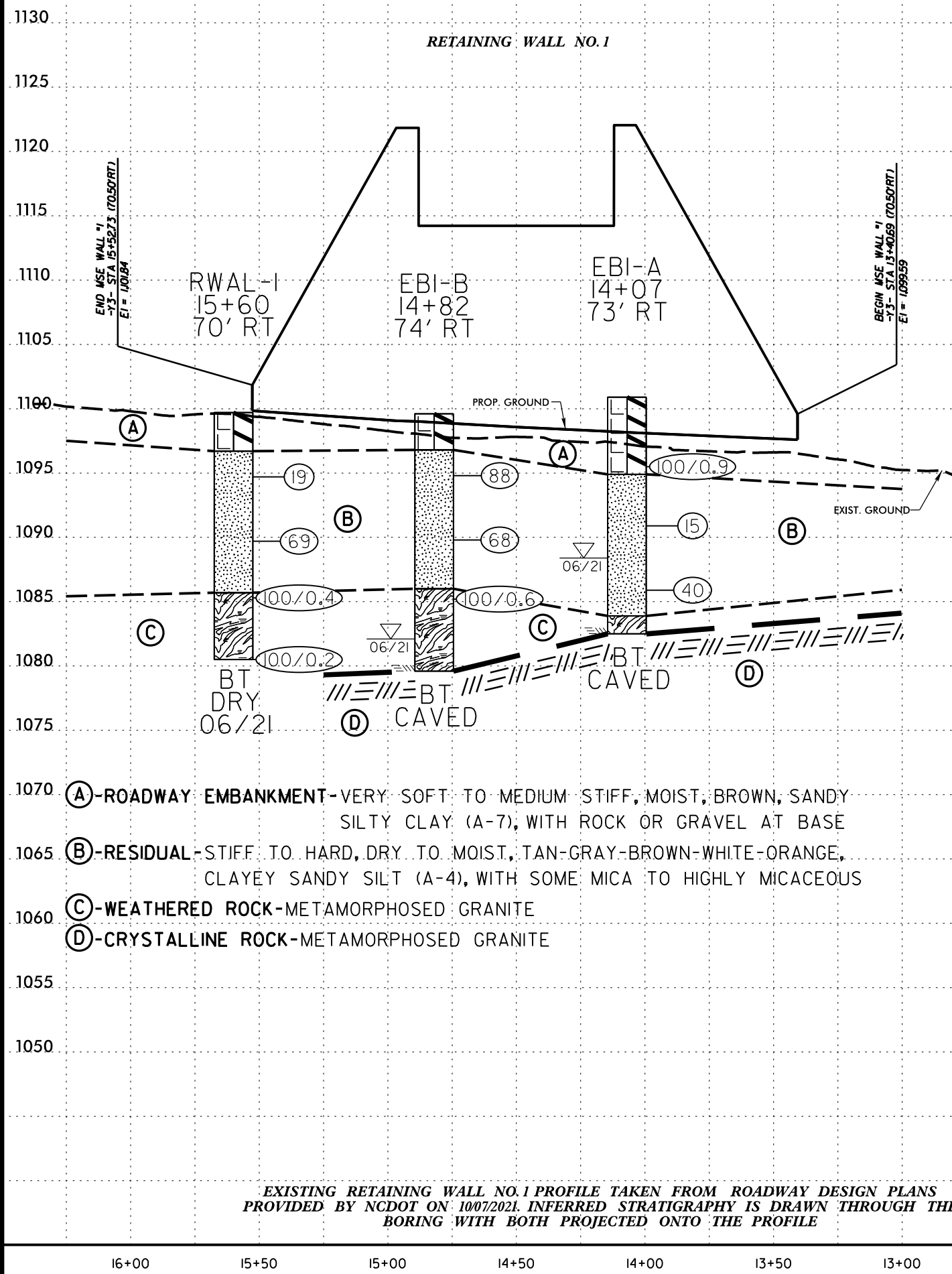
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																				
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR 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 (AASHTO T 208, 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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p><b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORMLY GRADED</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>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:</p>										<p><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. <b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. <b>TOPSOIL (TS)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																				
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HIGHLY PLASTIC	26 OR MORE	HIGH																																																																																																																																																																																
COLOR										ELEVATION: 1103.48 FEET										BORINGS: RWAL-1, RWAL-2, AND RWAL-3 COLLAR ELEVATIONS OBTAINED USING PROVIDED .TIN FILE																																																																																																																																																														
<p>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.</p>										<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p>										<p>NOTE: SURVEY FILES AND ROADWAY DESIGN FILES PROVIDED BY NCDOT ON 10/07/2021</p>																																																																																																																																																														

PROJECT REFERENCE NO.	SHEET NO.
B-5833	3
<b>SITE PLAN</b>	
REPLACE BRIDGE NO. 29 ON US 21 BUS OVER I-77 RETAINING WALL NO. 1 AND NO. 2 SKEW = 141 DEGREES	



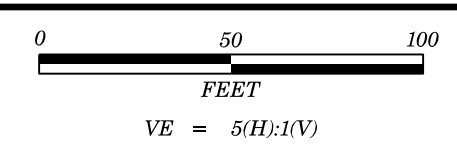
5/14/99  
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**-Y3-**



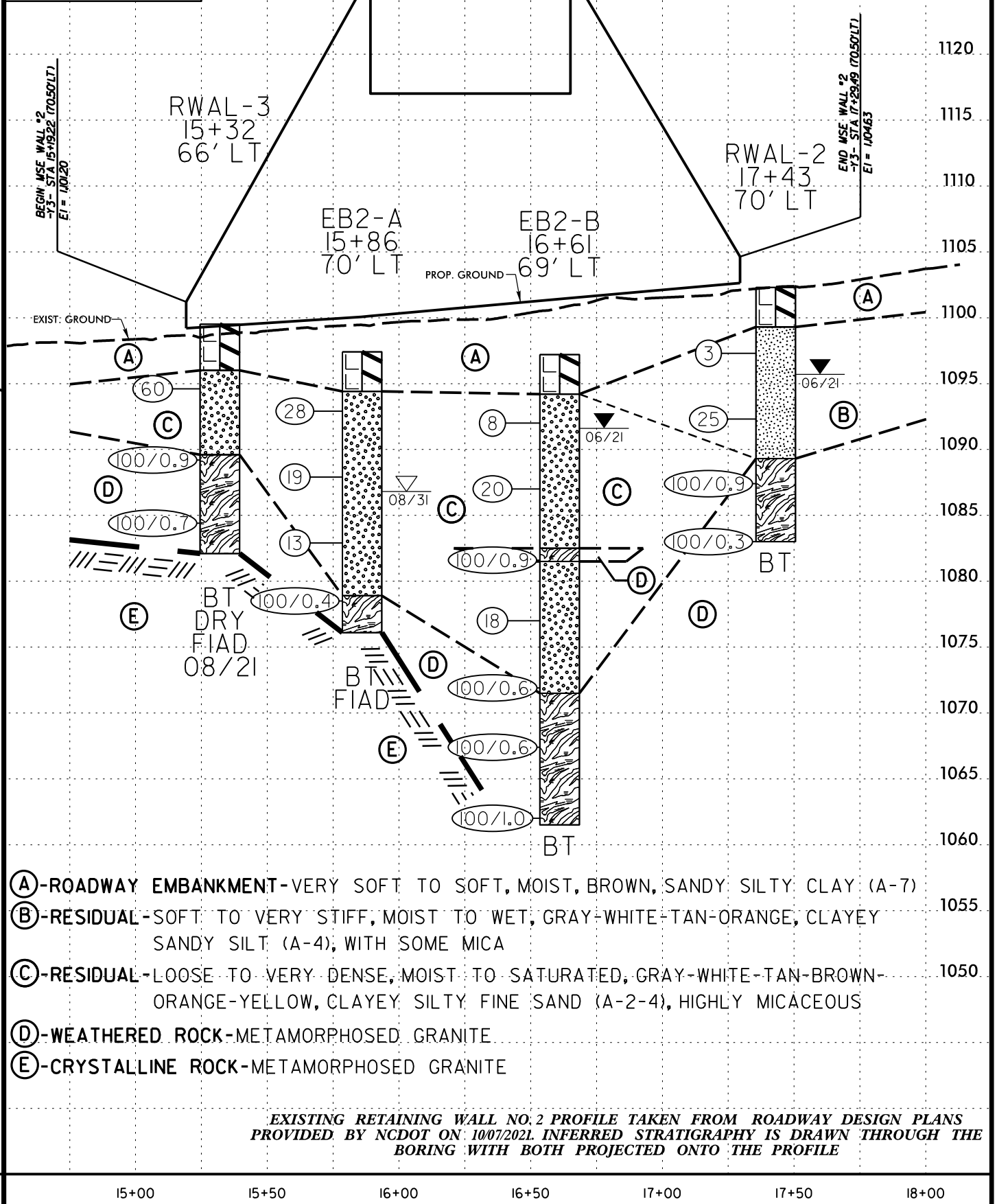
- (A) - ROADWAY EMBANKMENT - VERY SOFT TO MEDIUM STIFF, MOIST, BROWN, SANDY SILTY CLAY (A-7), WITH ROCK OR GRAVEL AT BASE
- (B) - RESIDUAL - STIFF TO HARD, DRY TO MOIST, TAN-GRAY-BROWN-WHITE-ORANGE, CLAYEY SANDY SILT (A-4), WITH SOME MICA TO HIGHLY MICACEOUS
- (C) - WEATHERED ROCK - METAMORPHOSED GRANITE
- (D) - CRYSTALLINE ROCK - METAMORPHOSED GRANITE

EXISTING RETAINING WALL NO.1 PROFILE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY NCDOT ON 10/07/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE PROFILE



PROJECT REFERENCE NO.	SHEET NO.
B-5833	4
REPLACE BRIDGE NO. 29 ON US 21 BUS OVER I-77	
RETAINING WALL NO. 1 AND NO. 2	

**-Y3-**



- (A) - ROADWAY EMBANKMENT - VERY SOFT TO SOFT, MOIST, BROWN, SANDY SILTY CLAY (A-7)
- (B) - RESIDUAL - SOFT TO VERY STIFF, MOIST TO WET, GRAY-WHITE-TAN-ORANGE, CLAYEY SANDY SILT (A-4), WITH SOME MICA
- (C) - RESIDUAL - LOOSE TO VERY DENSE, MOIST TO SATURATED, GRAY-WHITE-TAN-BROWN-ORANGE-YELLOW, CLAYEY SILTY FINE SAND (A-2-4), HIGHLY MICACEOUS
- (D) - WEATHERED ROCK - METAMORPHOSED GRANITE
- (E) - CRYSTALLINE ROCK - METAMORPHOSED GRANITE

EXISTING RETAINING WALL NO.2 PROFILE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY NCDOT ON 10/07/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE PROFILE

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77: Retaining Wall No. 1							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 14+07		OFFSET 73 ft RT		ALIGNMENT -Y3-									
COLLAR ELEV. 1,100.9 ft		TOTAL DEPTH 18.4 ft		NORTHING 895,925		EASTING 1,465,471									
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 06/08/21		COMP. DATE 06/08/21		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					
1105															
1100														1,100.9	0.0
1095	1,096.9	4.0	10	40	60/0.4									1,094.9	8.0
1090	1,091.9	9.0	5	7	8										
1085	1,086.9	14.0	40	15	25									1,083.9	17.0
														1,082.5	18.4

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77: Retaining Wall No. 1							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 14+82		OFFSET 74 ft RT		ALIGNMENT -Y3-									
COLLAR ELEV. 1,099.6 ft		TOTAL DEPTH 20.0 ft		NORTHING 895,851		EASTING 1,465,465									
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 06/08/21		COMP. DATE 06/08/21		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					
1100															
														1,099.6	0.0
														1,096.8	2.8
1095	1,095.8	3.8	12	30	58										
1090	1,090.8	8.8	15	30	38										
1085	1,085.8	13.8	56	44/0.1										1,086.0	13.6
1080														1,079.6	20.0

NCDOT BORE DOUBLE B5833\_GEO\_BRDG0029\_RWAL\_YADKIN.GPJ\_NC\_DOT.GDT 11/7/21

# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 45786.1.2		<b>TIP</b> B-5833		<b>COUNTY</b> YADKIN		<b>GEOLOGIST</b> Stickney, J. K.										
<b>SITE DESCRIPTION</b> Replace Bridge 29 on US 21 BUS over I-77: Retaining Wall No. 1							<b>GROUND WTR (ft)</b>									
<b>BORING NO.</b> RWAL-1		<b>STATION</b> 15+60		<b>OFFSET</b> 70 ft RT		<b>ALIGNMENT</b> -Y3-										
<b>COLLAR ELEV.</b> 1,099.7 ft		<b>TOTAL DEPTH</b> 19.2 ft		<b>NORTHING</b> 895,772		<b>EASTING</b> 1,465,463										
<b>DRILL RIGHAMMER EFF./DATE</b> HFC0070 CME-550X 80% 02/23/2021				<b>DRILL METHOD</b> H.S. Augers		<b>HAMMER TYPE</b> Automatic										
<b>DRILLER</b> Smith, C. L.		<b>START DATE</b> 06/08/21		<b>COMP. DATE</b> 06/08/21		<b>SURFACE WATER DEPTH</b> 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)		
1100														1,099.7	0.0	GROUND SURFACE
														1,096.7	3.0	ROADWAY EMBANKMENT Brown, Sandy Silty CLAY
1095	1,095.7	4.0	4	5	14											RESIDUAL Tan, Gray, Brown and White, Very Stiff to Hard, Clayey Sandy SILT, highly micaceous
1090	1,090.7	9.0	12	36	33											
1085	1,085.7	14.0	100/0.4											1,085.7	14.0	WEATHERED ROCK (Metamorphosed Granite)
	1,080.7	19.0	100/0.2											1,080.5	19.2	Boring Terminated at Elevation 1,080.5 ft in WEATHERED ROCK (Metamorphosed Granite)

NCDOT BORE DOUBLE B5833\_GEO\_BRDG0029\_RWAL\_YADKIN.GPJ\_NC\_DOT.GDT 11/7/21

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77: Retaining Wall No. 2							GROUND WTR (ft)									
BORING NO. RWAL-3		STATION 15+32		OFFSET 66 ft LT		ALIGNMENT -Y3-										
COLLAR ELEV. 1,099.5 ft		TOTAL DEPTH 17.4 ft		NORTHING 895,791		EASTING 1,465,600										
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 08/31/21		COMP. DATE 08/31/21		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						
1100														1,099.5	0.0	GROUND SURFACE
														1,096.0	3.5	ROADWAY EMBANKMENT Brown, Sandy Silty CLAY
1095	1,095.6	3.9	8	25	35											RESIDUAL Tan, Brown, Orange, Very Dense, Clayey Silty Fine SAND, highly micaceous
1090	1,090.6	8.9	12	30	70/0.4									1,089.6	9.9	WEATHERED ROCK (Metamorphosed Granite)
1085	1,085.6	13.9	12	58	42/0.2									1,082.1	17.4	CRYSTALLINE ROCK (Metamorphosed Granite) Boring Terminated by Auger Refusal at Elevation 1,082.1 ft on CRYSTALLINE ROCK (Metamorphosed Granite)

WBS 45786.1.2		TIP B-5833		COUNTY YADKIN		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Replace Bridge 29 on US 21 BUS over I-77: Retaining Wall No. 2							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 15+86		OFFSET 70 ft LT		ALIGNMENT -Y3-										
COLLAR ELEV. 1,097.4 ft		TOTAL DEPTH 21.3 ft		NORTHING 895,737		EASTING 1,465,600										
DRILL RIGHAMMER EFF./DATE HFC0070 CME-550X 80% 02/23/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 08/31/21		COMP. DATE 08/31/21		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						
1100														1,097.4	0.0	GROUND SURFACE
														1,094.4	3.0	ROADWAY EMBANKMENT Brown, Sandy Silty CLAY
1095	1,093.9	3.5	8	16	12											RESIDUAL Gray, White, Tan and Brown, Medium Dense, Clayey Silty Fine SAND, highly micaceous
1090	1,088.9	8.5	8	8	11											WEATHERED ROCK (Metamorphosed Granite)
1085	1,083.9	13.5	6	6	7											WEATHERED ROCK (Metamorphosed Granite)
1080	1,078.9	18.5	100/0.4											1,076.1	21.3	Boring Terminated by Auger Refusal at Elevation 1,076.1 ft on CRYSTALLINE ROCK (Metamorphosed Granite)

NCDOT BORE DOUBLE B5833\_GEO\_BRDG0029\_RWAL\_YADKIN.GPJ\_NC\_DOT.GDT 11/7/21

