

REFERENCE: B-5777

PROJECT: 45733

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY DAVIDSON

PROJECT DESCRIPTION REPLACE BRIDGE NO. 58
ON NC 109 OVER US 64

SITE DESCRIPTION -L- STA. 20+64

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5777	1	19

CAUTION NOTICE

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 - 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

A. SUTTLE, P.G.

C. OSBORNE

INVESTIGATED BY ECS SOUTHEAST, LLC

DRAWN BY A. SUTTLE, P.G.

CHECKED BY M. MULLA, P.E.

SUBMITTED BY ECS SOUTHEAST, LLC

DATE JUNE 2024

Prepared in the Office of:



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ENGINEERING
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DocuSigned by:
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399DBE42974A1604
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
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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										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										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.										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:										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - 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. ARTESIAN - 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. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - 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. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - 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. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - 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. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - 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. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)																			
GENERAL CLASS.										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										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.									
SILT-CLAY MATERIALS (> 35% PASSING #200)										MINERALOGICAL COMPOSITION										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.									
GROUP CLASS.										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										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.									
SYMBOL										COMPRESSIBILITY																													
%										SLIGHTLY COMPRESSIBLE																													
PASSING #10										MODERATELY COMPRESSIBLE																													
*40										HIGHLY COMPRESSIBLE																													
*200										PERCENTAGE OF MATERIAL																													
										ORGANIC MATERIAL																													
										GRANULAR SOILS																													
										SILT - CLAY SOILS																													
										OTHER MATERIAL																													
										TRACE OF ORGANIC MATTER																													
										LITTLE ORGANIC MATTER																													
										MODERATELY ORGANIC																													
										HIGHLY ORGANIC																													
										GROUND WATER																													
										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING																													
										STATIC WATER LEVEL AFTER 24 HOURS																													
										PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA																													
										SPRING OR SEEP																													
										MISCELLANEOUS SYMBOLS																													
										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION																													
										SOIL SYMBOL																													
										ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT																													
										INFERRED SOIL BOUNDARY																													
										INFERRED ROCK LINE																													
										ALLUVIAL SOIL BOUNDARY																													
										RECOMMENDATION SYMBOLS																													
										UNDERCUT																													
										UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE																													
										UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK																													
										ABBREVIATIONS																													
										AR - AUGER REFUSAL																													
										BT - BORING TERMINATED																													
										CL - CLAY																													
										CPT - CONE PENETRATION TEST																													
										CSE - COARSE																													
										DMT - DILATOMETER TEST																													
										DPT - DYNAMIC PENETRATION TEST																													
										e - VOID RATIO																													
										F - FINE																													
										FOSS. - FOSSILIFEROUS																													
										FRAC. - FRACTURED, FRACTURES																													
										FRAGS. - FRAGMENTS																													
										HL - HIGHLY																													
										EQUIPMENT USED ON SUBJECT PROJECT																													
										DRILL UNITS:																													
										CME-45C																													
										CME-55																													
										CME-750X																													
										VANE SHEAR TEST																													
										PORTABLE HOIST																													
										DIEDRICH D-70																													
										ADVANCING TOOLS:																													
										CLAY BITS																													
										6" CONTINUOUS FLIGHT AUGER																													
										8" HOLLOW AUGERS																													
										HARD FACED FINGER BITS																													
										TUNG-CARBIDE INSERTS																													
										CASING																													
										W/ ADVANCER																													
										TRICONE																													
										TRICONE																													
										CORE BIT																													
										HAMMER TYPE:																													
										AUTOMATIC																													
										MANUAL																													
										CORE SIZE:																													
										B																													
										H																													
										N Q2																													
										HAND TOOLS:																													
										POST HOLE DIGGER																													
										HAND AUGER																													
										SOUNDING ROD																													
										VANE SHEAR TEST																													
										PLASTICITY																													
										PLASTICITY INDEX (PI)																													
										DRY STRENGTH																													
										VERY LOW																													
										SLIGHT																													
										MEDIUM																													
										HIGH																													
										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.																													

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

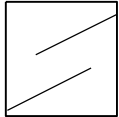
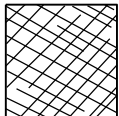
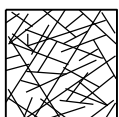

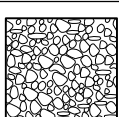
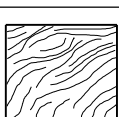
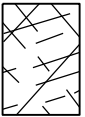


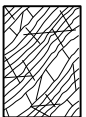
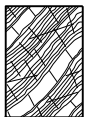



SUBSURFACE INVESTIGATION

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)


<div><div>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</div><div>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.</div></div>	<div><div>SURFACE CONDITIONS</div><div>VERY GOOD Very rough, fresh unweathered surfaces</div><div>GOOD Rough, slightly weathered, iron stained surfaces</div><div>FAIR Smooth, moderately weathered and altered surfaces</div><div>POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments</div><div>VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings</div></div>	<div><div>GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)</div><div>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.</div></div>	<div><div>SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)</div><div>VERY GOOD - Very Rough, fresh unweathered surfaces</div><div>GOOD - Rough, slightly weathered surfaces</div><div>FAIR - Smooth, moderately weathered and altered surfaces</div><div>POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments</div><div>VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings</div></div>
<div><div>STRUCTURE</div><div><div>INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities</div><div>BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</div><div>VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</div><div>BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</div><div>DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</div><div>LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes</div></div></div>	<div><div>DECREASING INTERLOCKING OF ROCK PIECES</div><div>90</div><div>80</div><div>70</div><div>60</div><div>50</div><div>40</div><div>30</div><div>20</div><div>10</div><div>N/A</div><div>N/A</div></div>	<div><div>COMPOSITION AND STRUCTURE</div><div><div>A. Thick bedded, very blocky sandstone The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.</div><div><div>B. Sandstone with thin inter-layers of siltstone</div><div><div>C. Sandstone and siltstone in similar amounts</div><div><div>D. Siltstone or silty shale with sandstone layers</div><div><div>E. Weak siltstone or clayey shale with sandstone layers</div></div></div><div><div>C, D, E, and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.</div><div><div>F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</div><div><div>G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</div><div><div>H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.</div></div></div></div></div></div></div></div></div>	<div><div>70</div><div>60</div><div>50</div><div>40</div><div>30</div><div>20</div><div>10</div></div>

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 45733.1.1			TIP B-5777			COUNTY DAVIDSON			GEOLOGIST A. Suttle						
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)			
BORING NO. EB1-A			STATION 19+81			OFFSET 19 ft LT			ALIGNMENT -L-			0 HR.	36.3		
COLLAR ELEV. 781.9 ft			TOTAL DEPTH 38.7 ft			NORTHING 737,481			EASTING 1,673,040			24 HR.	Caved		
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER C. Osborne			START DATE 04/24/24			COMP. DATE 04/24/24			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	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
785															
780	780.9	1.0	4	4	4									781.9	0.0
775	778.4	3.5	3	4	6							M		ROADWAY EMBANKMENT Medium Stiff to Very Stiff, Tan-Red-Orange-Gray, Silty CLAY (A-7-5/A-7-6), with trace gravel	
	775.9	6.0	9	8	9							M			
770	773.4	8.5	18	40	43							M		RESIDUAL Hard, Tan-Gray, Fine to Coarse Sandy SILT (A-4), with some rock fragments, clay seams	
	768.4	13.5	19	20	19							M			
765	763.4	18.5	18	82/0.3										WEATHERED ROCK Tan-Gray (META-ARGILLITE)	
	758.4	23.5	25	39	61/0.2										
755	753.4	28.5	17	45	39									RESIDUAL Hard, Tan-Gray, Fine to Coarse Sandy SILT (A-4), with some rock fragments	
	748.4	33.5	11	51	49/0.4										
745	743.3	38.6	60/0.1											WEATHERED ROCK Gray-Tan (META-ARGILLITE)	
														743.3	38.6
														743.2	38.7
														NON-CRYSTALLINE ROCK Gray (META-ARGILLITE) Boring Terminated with Standard Penetration Test Refusal at Elevation 743.2 ft In Non-Crystalline Rock (META-ARGILLITE) Surficial Organic Soil (0.0' to 0.3')	

NCDOT BORE DOUBLE B5777 GEO GTM.GPJ NC DOT.GDT 5/11/24

WBS 45733.1.1				TIP B-5777				COUNTY DAVIDSON				GEOLOGIST A. Suttle					
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)					
BORING NO. EB1-B				STATION 19+92				OFFSET 22 ft RT				ALIGNMENT -L-				0 HR. N/A	
COLLAR ELEV. 784.8 ft				TOTAL DEPTH 35.9 ft				NORTHING 737,470				EASTING 1,673,081				24 HR. Caved	
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024								DRILL METHOD SPT Core Boring				HAMMER TYPE Automatic					
DRILLER C. Osborne				START DATE 04/24/24				COMP. DATE 04/24/24				SURFACE WATER DEPTH N/A					
CORE SIZE N/A				TOTAL RUN 10.1 ft													
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %ROD (ft) %		SAMP. NO.	STRATA REC. (ft) %ROD (ft) %		LOG	DESCRIPTION AND REMARKS						
											ELEV. (ft)	DEPTH (ft)					
759	759.0	25.8	3.6	2:56/1.0 N=60/0.1	(3.3) 92%	(2.2) 61%		(9.8) 98%	(6.1) 61%		759.0	Begin Coring @ 25.8 ft					25.8
755	755.4	29.4	5.0	2:36/1.0	(5.0) 100%	(3.2) 64%					758.9	NON-CRYSTALLINE ROCK					25.9
				Slight to Very Slightly Weathered, Hard to Very Hard, Brown-Gray META-ARGILLITE, with Very Close to Close Fracture Spacing, Indurated to Extremely Indurated, with clay seams present between fractures													
			4:14/1.0			GSI = 65-70											
			2:42/1.0														
			3:08/1.0														
750	750.4	34.4	1.5	3:11/1.0	(1.5) 100%	(0.7) 47%					748.9	Boring Terminated at Elevation 748.9 ft In Non-Crystalline Rock (META-ARGILLITE) Surficial Organic Soil (0.0' to 0.3')					35.9
			2:32/1.0														
			2:52/1.0														
			1:39/0.5														

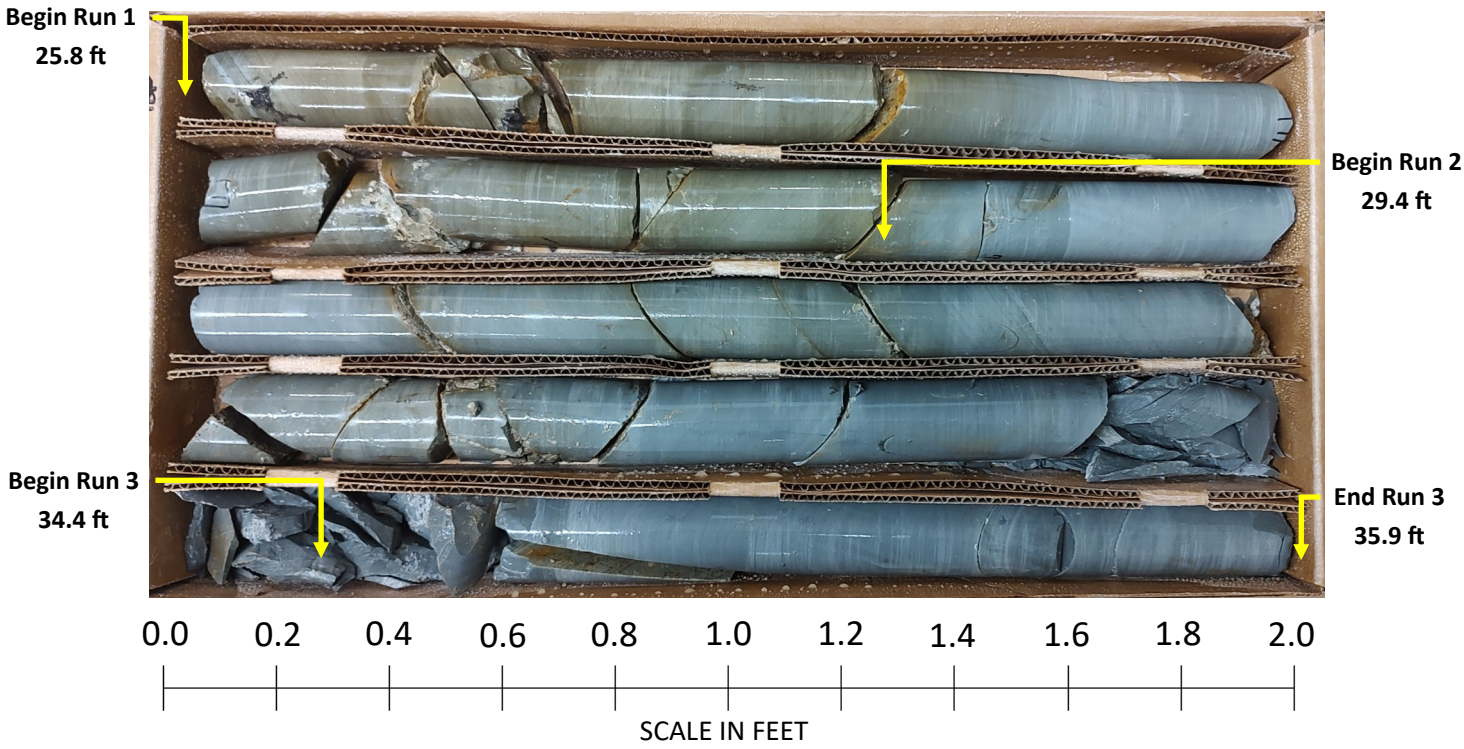


Replace Bridge No. 58 on NC 109 over US 64

WBS - 45733.1.1 TIP No. B-5777


Rock Core Photographs: Boring - EB1-B

Station: 19+92 Offset: 22' RT



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 45733.1.1				TIP B-5777				COUNTY DAVIDSON				GEOLOGIST A. Suttle					
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)					
BORING NO. B1-A				STATION 20+80				OFFSET 19 ft LT				ALIGNMENT -L-				0 HR. N/A	
COLLAR ELEV. 767.5 ft				TOTAL DEPTH 21.0 ft				NORTHING 737,567				EASTING 1,673,089				24 HR. FIAD	
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024								DRILL METHOD SPT Core Boring				HAMMER TYPE Automatic					
DRILLER C. Osborne				START DATE 05/01/24				COMP. DATE 05/01/24				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			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
770																	
765	766.5	1.0													767.5	GROUND SURFACE	0.0
																WEATHERED ROCK	
	764.0	3.5	20	57	43/0.3											Gray (META-ARGILLITE)	
760	762.8	4.7	14	86/0.5											762.8		4.7
															762.7	NON-CRYSTALLINE ROCK	4.8
			60/0.1													Gray (META-ARGILLITE)	
755																Moderate to Slightly Weathered, Medium Hard to Hard, Brown META-ARGILLITE, with Very Close to Close Fracture Spacing, Extremely Indurated, with clay seams present between fractures	
																REC = 95%, RQD = 7%, GSI = 20-25	
																Very Slightly Weathered, Very Hard, Gray META-ARGILLITE, with Very Close to Moderately Close Fracture Spacing, Extremely Indurated	
750																	
																RS-1	

WBS 45733.1.1				TIP B-5777				COUNTY DAVIDSON				GEOLOGIST A. Suttle											
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)											
BORING NO. B1-A				STATION 20+80				OFFSET 19 ft LT				ALIGNMENT -L-				0 HR. N/A							
COLLAR ELEV. 767.5 ft				TOTAL DEPTH 21.0 ft				NORTHING 737,567				EASTING 1,673,089				24 HR. FIAD							
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024								DRILL METHOD SPT Core Boring				HAMMER TYPE Automatic											
DRILLER C. Osborne				START DATE 05/01/24				COMP. DATE 05/01/24				SURFACE WATER DEPTH N/A											
CORE SIZE N/A				TOTAL RUN 16.2 ft																			
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %ROD (ft) %		SAMP. NO.	STRATA REC. (ft) %ROD (ft) %		L O G	DESCRIPTION AND REMARKS ELEV. (ft) DEPTH (ft)												
762.7											Begin Coring @ 4.8 ft												
760	762.7	4.8	4.1	4:24/1.0	(4.1)	(0.4)		(5.4)	(0.4)		762.7	Moderate to Slightly Weathered, Medium Hard to Hard, Brown META-ARGILLITE, with Very Close to Close Fracture Spacing, Extremely Indurated, with clay seams present between fractures									4.8		
	758.6	8.9		3:52/1.0																			
755			5.0	4:26/1.0	(4.7)	(1.9)						757.0	GSI = 20-25									10.5	
				0:52/0.1	94%	38%			(10.5)		(7.5)		Very Slightly Weathered, Very Hard, Gray META-ARGILLITE, with Very Close to Moderately Close Fracture Spacing, Extremely Indurated										
				5:32/1.0																			
750	753.6	13.9		6:42/1.0			RS-1					GSI = 60-65											
			5.0	5:32/1.0								RS-1: 14.1' - 14.5'											
				2:12/1.0	(5.0)	(3.8)						Unit Weight = 172.6 pcf											
	748.6	18.9		1:47/1.0	100%	76%						Unconfined Compressive Strength = 10,770 psi / 1,551 ksf											
	746.5	21.0	2.1	1:59/1.0	(2.1)	(1.8)					746.5	Boring Terminated at Elevation 746.5 ft In Non-Crystalline Rock (META-ARGILLITE)									21.0		
				1:43/1.0	100%	86%						Surficial Organic Soil (0.0' to 0.1')											
				1:37/1.0								NOTE: Unable to recover portion of rock core from Run 2 due to fractured rock, section recovered during Run 3.											

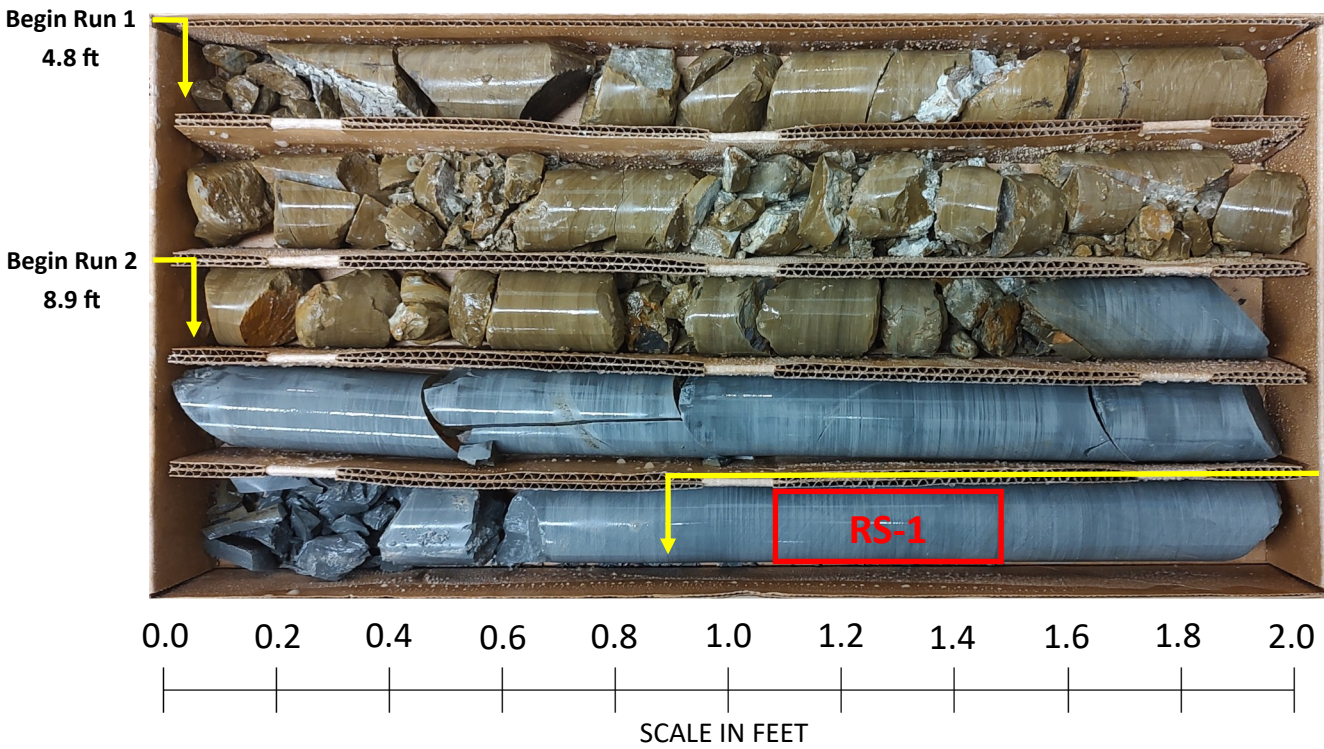


Replace Bridge No. 58 on NC 109 over US 64

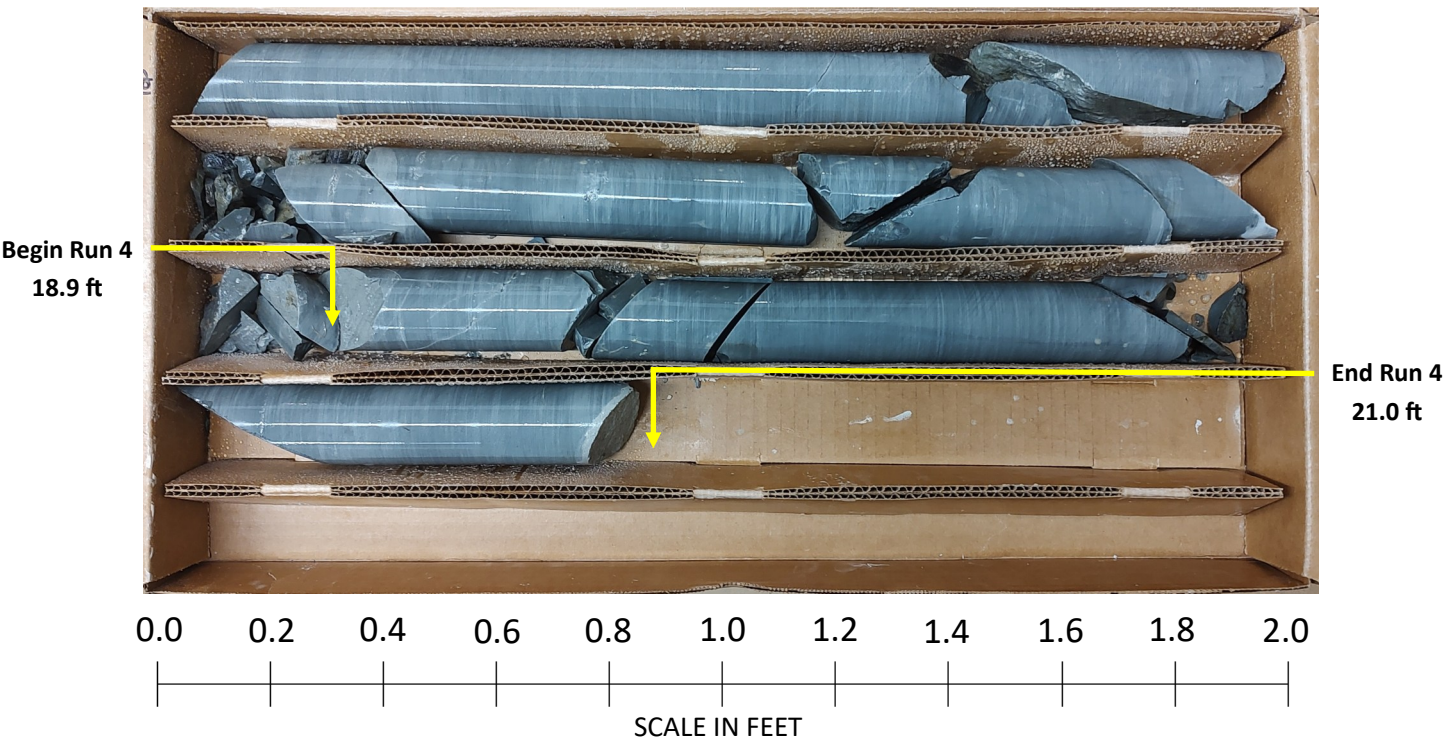
WBS - 45733.1.1 TIP No. B-5777

Rock Core Photographs: Boring - B1-A

Station: 20+80 Offset: 19' LT




*See log for note



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 45733.1.1				TIP B-5777				COUNTY DAVIDSON				GEOLOGIST A. Suttle					
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)					
BORING NO. B1-B				STATION 20+84				OFFSET 22 ft RT				ALIGNMENT -L-				0 HR. N/A	
COLLAR ELEV. 768.1 ft				TOTAL DEPTH 19.0 ft				NORTHING 737,550				EASTING 1,673,127				24 HR. Caved	
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024								DRILL METHOD SPT Core Boring				HAMMER TYPE Automatic					
DRILLER C. Osborne				START DATE 04/30/24				COMP. DATE 04/30/24				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					DEPTH (ft)		
770																	
	767.1	1.0											768.1 GROUND SURFACE 0.0				
765	764.7	3.4	100/0.2										WEATHERED ROCK Tan (META-ARGILLITE)				
			60/0.1										764.7 3.4				
760											RS-2		NON-CRYSTALLINE ROCK Tan-Gray (META-ARGILLITE)				
													Slight to Very Slightly Weathered, Hard to Very Hard, Gray META-ARGILLITE, with Very Close to Moderately Close Fracture Spacing, Extremely Indurated, with clay seams present between fractures				
755													REC = 100%, RQD = 75%, GSI = 65-70				
750													749.1 19.0				
													Boring Terminated at Elevation 749.1 ft In Non-Crystalline Rock (META-ARGILLITE)				
													Surficial Organic Soil (0.0' to 0.1')				

WBS 45733.1.1				TIP B-5777				COUNTY DAVIDSON				GEOLOGIST A. Suttle							
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)							
BORING NO. B1-B				STATION 20+84				OFFSET 22 ft RT				ALIGNMENT -L-				0 HR. N/A			
COLLAR ELEV. 768.1 ft				TOTAL DEPTH 19.0 ft				NORTHING 737,550				EASTING 1,673,127				24 HR. Caved			
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024								DRILL METHOD SPT Core Boring				HAMMER TYPE Automatic							
DRILLER C. Osborne				START DATE 04/30/24				COMP. DATE 04/30/24				SURFACE WATER DEPTH N/A							
CORE SIZE N/A				TOTAL RUN 15.5 ft															
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		ROD (ft) %	SAMP. NO.	STRATA REC. (ft) %		ROD (ft) %	L O G	DESCRIPTION AND REMARKS ELEV. (ft) DEPTH (ft)						
764.6	764.6	3.5	0.5	3:35/0.5	(0.5)	(0.4)			(15.5)	(11.6)			Begin Coring @ 3.5 ft						
	764.1	4.0	5.0	3:39/1.0 2:42/1.0 2:52/1.0 2:36/1.0 2:25/1.0	100% (5.0) 100%	80% (3.7) 74%			100%	75%	764.6 Slight to Very Slightly Weathered, Hard to Very Hard, Gray META-ARGILLITE, with Very Close to Moderately Close Fracture Spacing, Extremely Indurated, with clay seams present between fractures								
760	759.1	9.0					RS-2						GSI = 65-70						
			5.0	3:17/1.0 3:24/1.0 3:33/1.0 3:37/1.0 3:28/1.0	(5.0) 100%	(4.0) 80%							RS-2: 6.2' - 6.6' Unit Weight = 169.3 pcf Unconfined Compressive Strength = 4,590 psi / 661 ksf						
755	754.1	14.0		3:24/1.0 3:37/1.0 3:39/1.0 3:41/1.0 3:33/1.0	(5.0) 100%	(3.5) 70%													
			5.0																
750	749.1	19.0											749.1 Boring Terminated at Elevation 749.1 ft In Non-Crystalline Rock (META-ARGILLITE)						
													Surficial Organic Soil (0.0' to 0.1')						

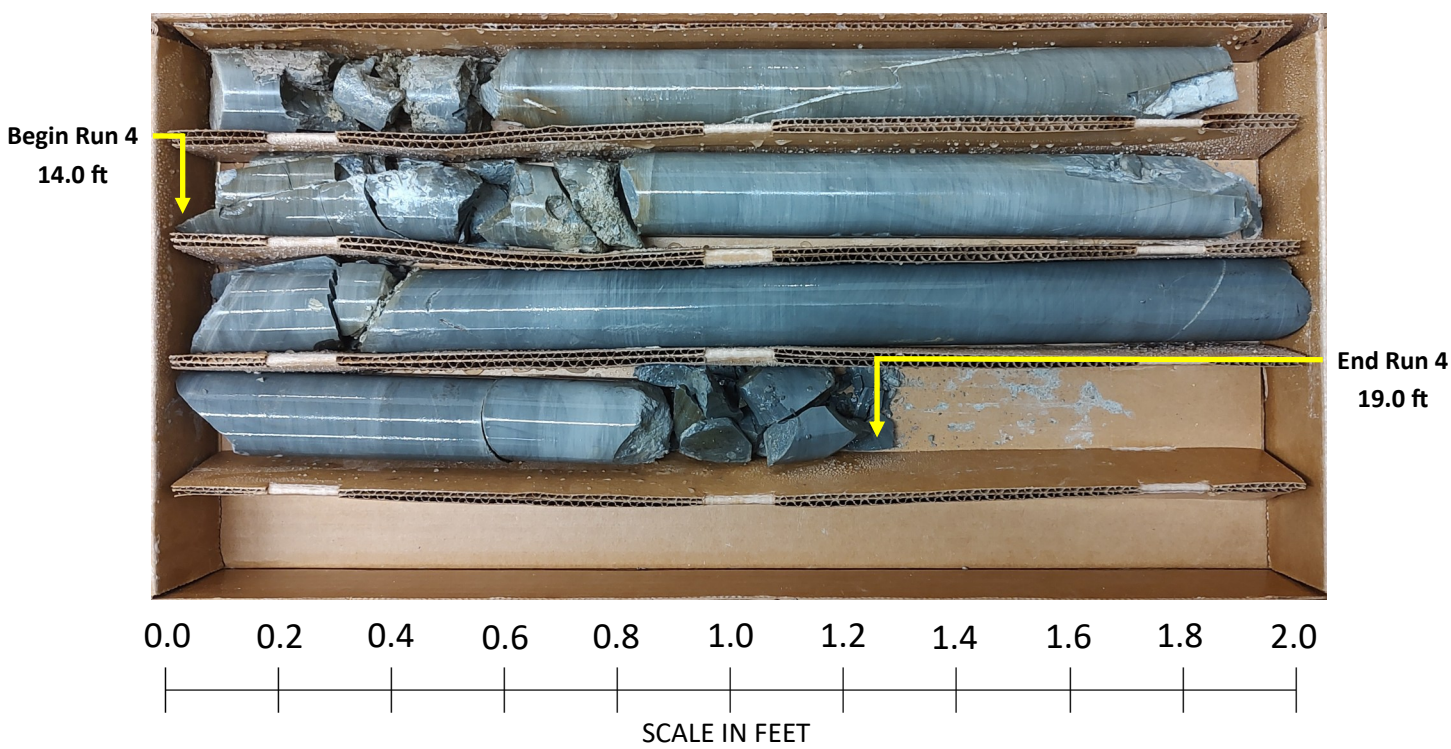
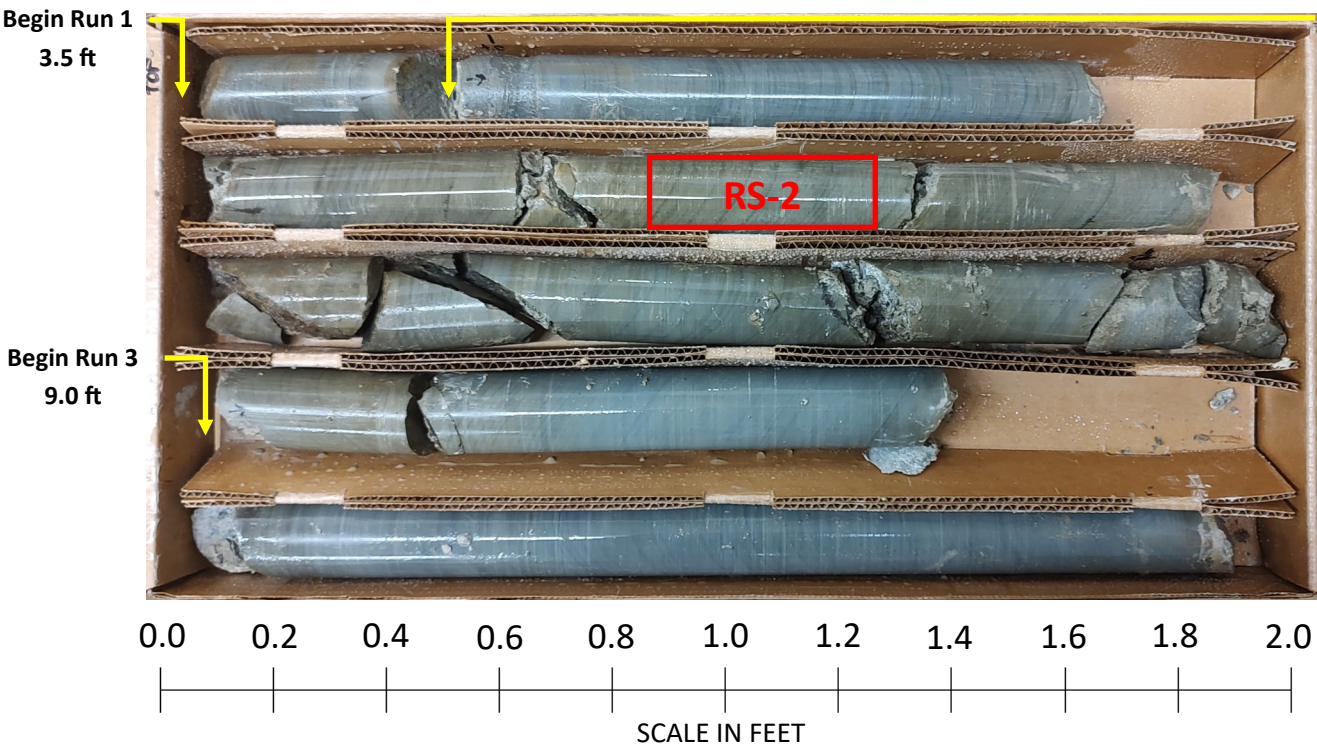


Replace Bridge No. 58 on NC 109 over US 64

WBS - 45733.1.1 TIP No. B-5777

Rock Core Photographs: Boring - B1-B

Station: 20+84 Offset: 22' RT



NCDOT BORE DOUBLE B5777 GEO GTM.GPJ NC DOT.GDT 5/11/24

WBS 45733.1.1				TIP B-5777				COUNTY DAVIDSON				GEOLOGIST A. Suttle							
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)							
BORING NO. EB2-A				STATION 21+66				OFFSET 30 ft LT				ALIGNMENT -L-				0 HR. Dry			
COLLAR ELEV. 775.2 ft				TOTAL DEPTH 19.8 ft				NORTHING 737,647				EASTING 1,673,122				24 HR. Dry			
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024								DRILL METHOD NW Casing w/ Advancer				HAMMER TYPE Automatic							
DRILLER C. Osborne				START DATE 04/18/24				COMP. DATE 04/22/24				SURFACE WATER DEPTH N/A							
CORE SIZE N/A				TOTAL RUN 5.0 ft															
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		ROD (ft) %	SAMP. NO.	STRATA REC. (ft) %		ROD (ft) %	L O G	DESCRIPTION AND REMARKS				DEPTH (ft)		
760.4	760.4	14.8	5.0	1:24/1.0 2:32/1.0 3:14/1.0 3:52/1.0 4:28/1.0	(2.7) 54%	(0.0) 0%			(2.7) 54%	(0.0) 0%			Begin Coring @ 14.8 ft NON-CRYSTALLINE ROCK				14.8		
	755.4	19.8											Moderate to Slightly Weathered, Hard, Gray META-ARGILLITE, with Very Close to Close Fracture Spacing, Extremely Indurated, with clays seams present between fractures				19.8		
													GSI = 20-25 Boring Terminated at Elevation 755.4 ft In Non-Crystalline Rock (META-ARGILLITE)						
													Surficial Organic Soil (0.0' to 0.3')						
													NOTE 1: Casing Advancer used from 14.1' to 14.8' due to auger refusal. Unable to confirm spoon refusal due to materials cored into casing.						
													NOTE 2: Boring terminated prematurely at a depth of 19.8' due to water circulation issue which caused core barrel to fuse with inner barrel. Unable to obtain Run 2 core sample from barrel.						

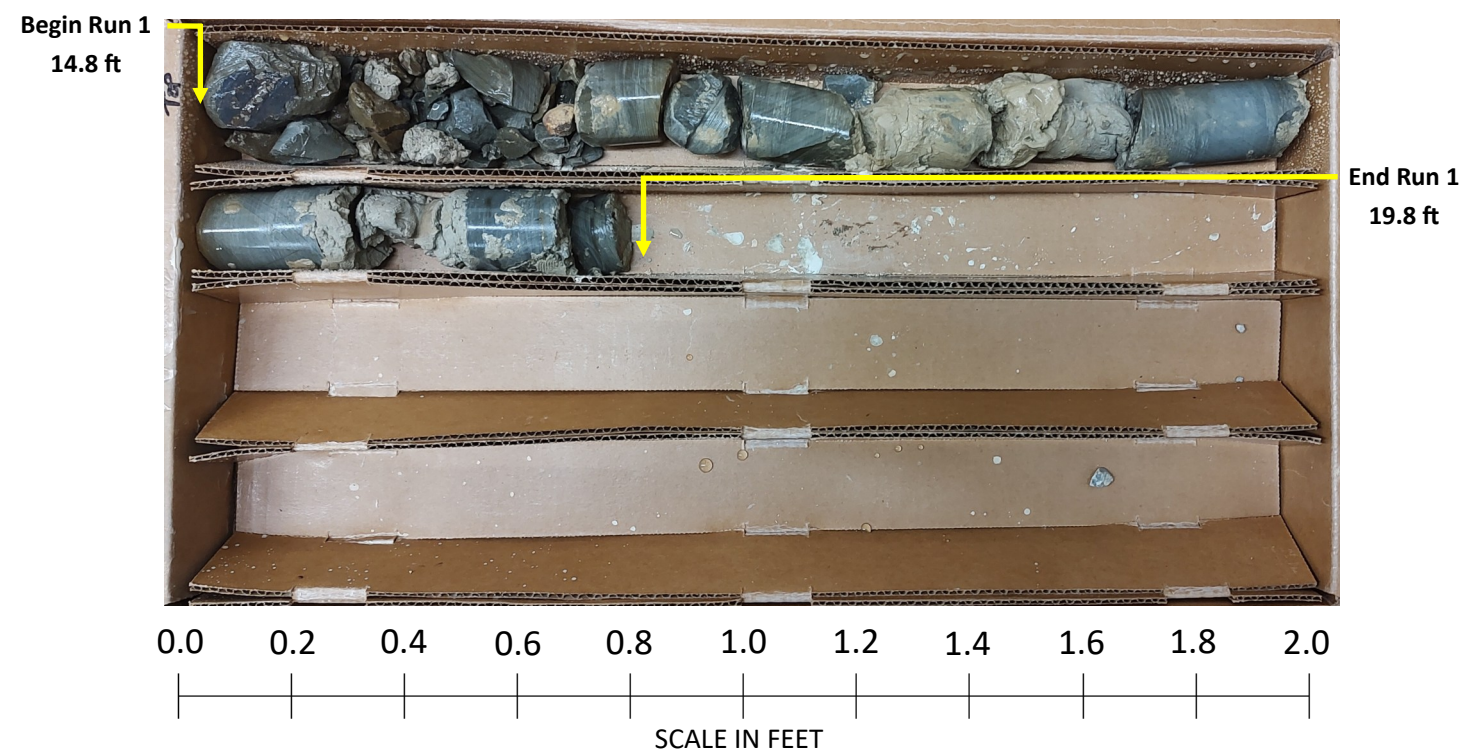


Replace Bridge No. 58 on NC 109 over US 64

WBS - 45733.1.1 TIP No. B-5777

Rock Core Photographs: Boring - EB2-A

Station: 21+66 Offset: 30' LT



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 45733.1.1				TIP B-5777		COUNTY DAVIDSON				GEOLOGIST A. Suttle														
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)												
BORING NO. EB2-A (2)				STATION 21+70				OFFSET 33 ft LT				ALIGNMENT -L-		0 HR.	N/A									
COLLAR ELEV. 774.7 ft				TOTAL DEPTH 22.7 ft				NORTHING 737,652				EASTING 1,673,122		24 HR.	N/A									
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024								DRILL METHOD NW Casing w/ Advancer				HAMMER TYPE Automatic												
DRILLER C. Osborne				START DATE 04/23/24				COMP. DATE 04/23/24				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										
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)									
775														774.7	GROUND SURFACE	0.0								
770	762.4	12.3				<div><div></div><div></div><div></div><div></div></div>								<div><div></div><div></div><div></div><div></div></div>	Auger Probe to 12.3'									
765																								
760						60/0.0																762.4	NON-CRYSTALLINE ROCK	12.3
																							Moderate to Very Slightly Weathered, Hard to Very Hard, Brown-Gray META-ARGILLITE, with Very Close to Close Fracture Spacing, Extremely Indurated, with clay seams present between fractures	
755																							REC = 96%, RQD = 40%, GSI = 55-60	
														752.0	Boring Terminated at Elevation 752.0 ft In Non-Crystalline Rock (META-ARGILLITE)	22.7								
															NOTE 1: Boring offset from original EB2-A location due to water circulation issue which caused core barrel to fuse with inner barrel.									
															NOTE 2: Top of rock elevation higher than previous location, confirmed with spoon refusal.									

NCDOT BORE DOUBLE B5777_GEO_GTM.GPJ NC_DOT.GDT 5/11/24

WBS 45733.1.1				TIP B-5777				COUNTY DAVIDSON				GEOLOGIST A. Suttle										
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)										
BORING NO. EB2-A (2)				STATION 21+70				OFFSET 33 ft LT				ALIGNMENT -L-				0 HR. N/A						
COLLAR ELEV. 774.7 ft				TOTAL DEPTH 22.7 ft				NORTHING 737,652				EASTING 1,673,122				24 HR. N/A						
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024								DRILL METHOD NW Casing w/ Advancer				HAMMER TYPE Automatic										
DRILLER C. Osborne				START DATE 04/23/24				COMP. DATE 04/23/24				SURFACE WATER DEPTH N/A										
CORE SIZE N/A				TOTAL RUN 10.4 ft																		
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) % ROD (ft) %		SAMP. NO.	STRATA REC. (ft) % ROD (ft) %		LOG	DESCRIPTION AND REMARKS											
											ELEV. (ft)	DEPTH (ft)										
762.4												Begin Coring @ 12.3 ft										
	762.4	12.3	2.4	N=60/0.0 0:45/0.4 4:44/1.0	(2.0) 83%	(0.5) 21%		(10.0) 96%	(4.2) 40%		762.4	12.3										
760	760.0	14.7		5:01/1.0 5:23/1.0 5:17/1.0 5:08/1.0 4:26/1.0 5:18/1.0	(5.0) 100%	(2.5) 50%						Moderate to Very Slightly Weathered, Hard to Very Hard, Brown-Gray META-ARGILLITE, with Very Close to Close Fracture Spacing, Extremely Indurated, with clay seams present between fractures										
			5.0									GSI = 55-60										
755	755.0	19.7																				
			3.0																			
	752.0	22.7		5:23/1.0 5:29/1.0 5:15/1.0	(3.0) 100%	(1.2) 40%					752.0	22.7										
												Boring Terminated at Elevation 752.0 ft In Non-Crystalline Rock (META-ARGILLITE)										
												NOTE 1: Boring offset from original EB2-A location due to water circulation issue which caused core barrel to fuse with inner barrel.										
												NOTE 2: Top of rock elevation higher than previous location, confirmed with spoon refusal.										

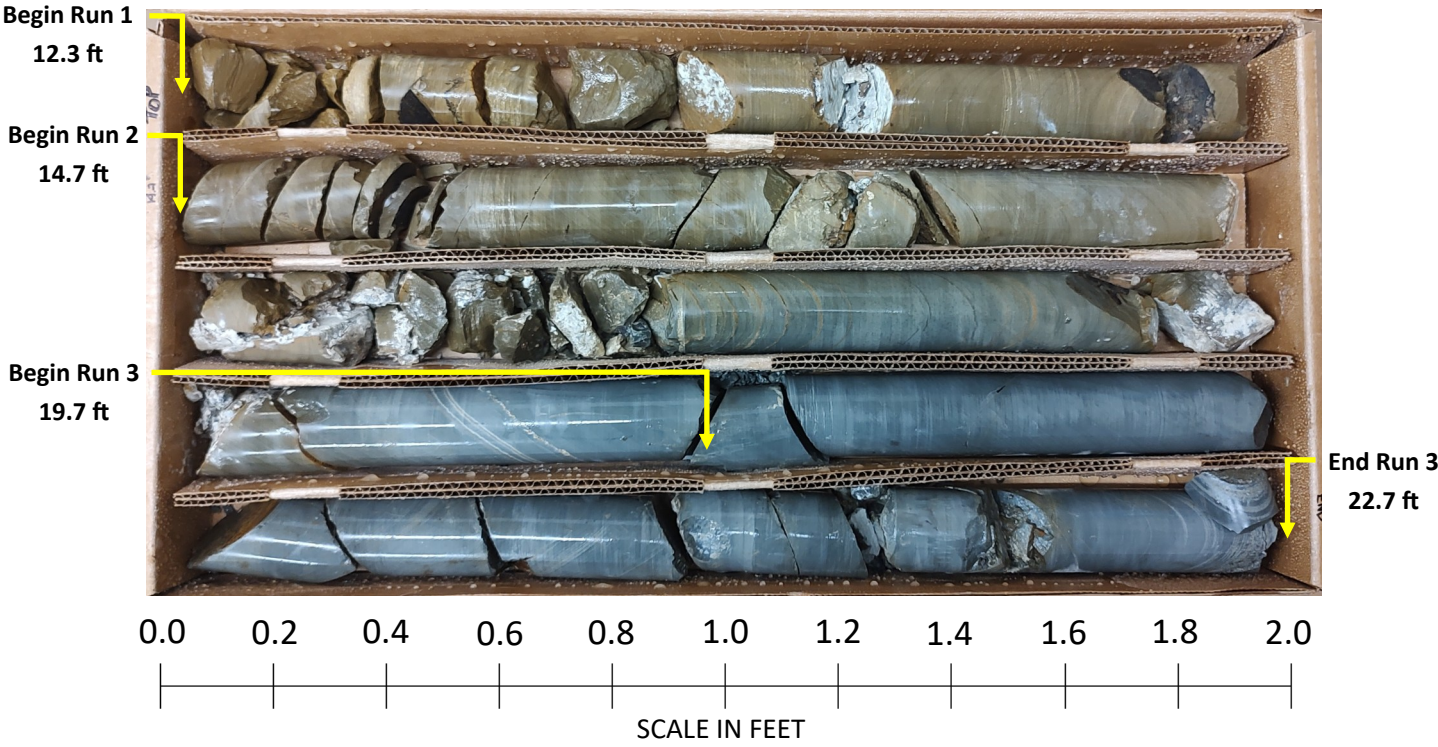


Replace Bridge No. 58 on NC 109 over US 64

WBS - 45733.1.1 TIP No. B-5777

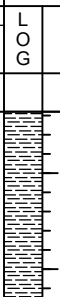
Rock Core Photographs: Boring - EB2-A (2)

Station: 21+70 Offset: 33' LT



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 45733.1.1				TIP B-5777		COUNTY DAVIDSON			GEOLOGIST A. Suttle				
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64										GROUND WTR (ft)			
BORING NO. EB2-B				STATION 21+24			OFFSET 19 ft RT			ALIGNMENT -L-		0 HR. N/A	
COLLAR ELEV. 768.7 ft				TOTAL DEPTH 15.5 ft			NORTHING 737,586			EASTING 1,673,144		24 HR. FIAD	
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024							DRILL METHOD SPT Core Boring				HAMMER TYPE Automatic		
DRILLER C. Osborne				START DATE 05/01/24			COMP. DATE 05/01/24			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	MOI		
770													
765	767.7	1.0		86	24/0.1								768.7 GROUND SURFACE 0.0
	765.2	3.5		20	80/0.2								WEATHERED ROCK Tan-Gray (META-ARGILLITE)
	763.3	5.4		60/0.1									763.3 5.4
760													NON-CRYSTALLINE ROCK Gray (META-ARGILLITE)
755													Moderate to Very Slightly Weathered, Hard to Very Hard, Brown-Gray META-ARGILLITE, with Very Close to Close Fracture Spacing, Extremely Indurated, with clay seams present between fractures
													763.2 5.5
													753.2 REC = 100%, RQD = 19%, GSI = 40-45 15.5
													Boring Terminated at Elevation 753.2 ft In Non-Crystalline Rock (META-ARGILLITE)
													Surficial Organic Soil (0.0' to 0.3')

WBS 45733.1.1				TIP B-5777				COUNTY DAVIDSON				GEOLOGIST A. Suttle					
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64												GROUND WTR (ft)					
BORING NO. EB2-B				STATION 21+24				OFFSET 19 ft RT				ALIGNMENT -L-				0 HR. N/A	
COLLAR ELEV. 768.7 ft				TOTAL DEPTH 15.5 ft				NORTHING 737,586				EASTING 1,673,144				24 HR. FIAD	
DRILL RIG/HAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024								DRILL METHOD SPT Core Boring				HAMMER TYPE Automatic					
DRILLER C. Osborne				START DATE 05/01/24				COMP. DATE 05/01/24				SURFACE WATER DEPTH N/A					
CORE SIZE N/A				TOTAL RUN 10.0 ft													
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %ROD (ft) %		SAMP. NO.	STRATA REC. (ft) %ROD (ft) %		L O G	DESCRIPTION AND REMARKS ELEV. (ft) DEPTH (ft)						
763.2											Begin Coring @ 5.5 ft						
760	763.2	5.5	4.0	3:24/1.0 3:44/1.0 3:17/1.0 2:48/1.0	(4.0) 100%	(0.6) 15%		(10.0) 100%	(2.9) 29%		763.2	Moderate to Very Slightly Weathered, Hard to Very Hard, Brown-Gray META-ARGILLITE, with Very Close to Close Fracture Spacing, Extremely Indurated, with clay seams present between fractures				5.5	
	759.2	9.5		2:17/1.0 2:12/1.0 2:22/1.0 2:42/1.0 2:36/1.0	(5.0) 100%	(1.9) 38%											
755			5.0														
	754.2	14.5															
	753.2	15.5	1.0	2:23/1.0	(1.0) 100%	(0.4) 40%					753.2	Boring Terminated at Elevation 753.2 ft In Non-Crystalline Rock (META-ARGILLITE)				15.5	
												Surficial Organic Soil (0.0' to 0.3')					

NCDOT BORE DOUBLE B5777_GEO_GTM.GPJ NC_DOT.GDT 5/11/24

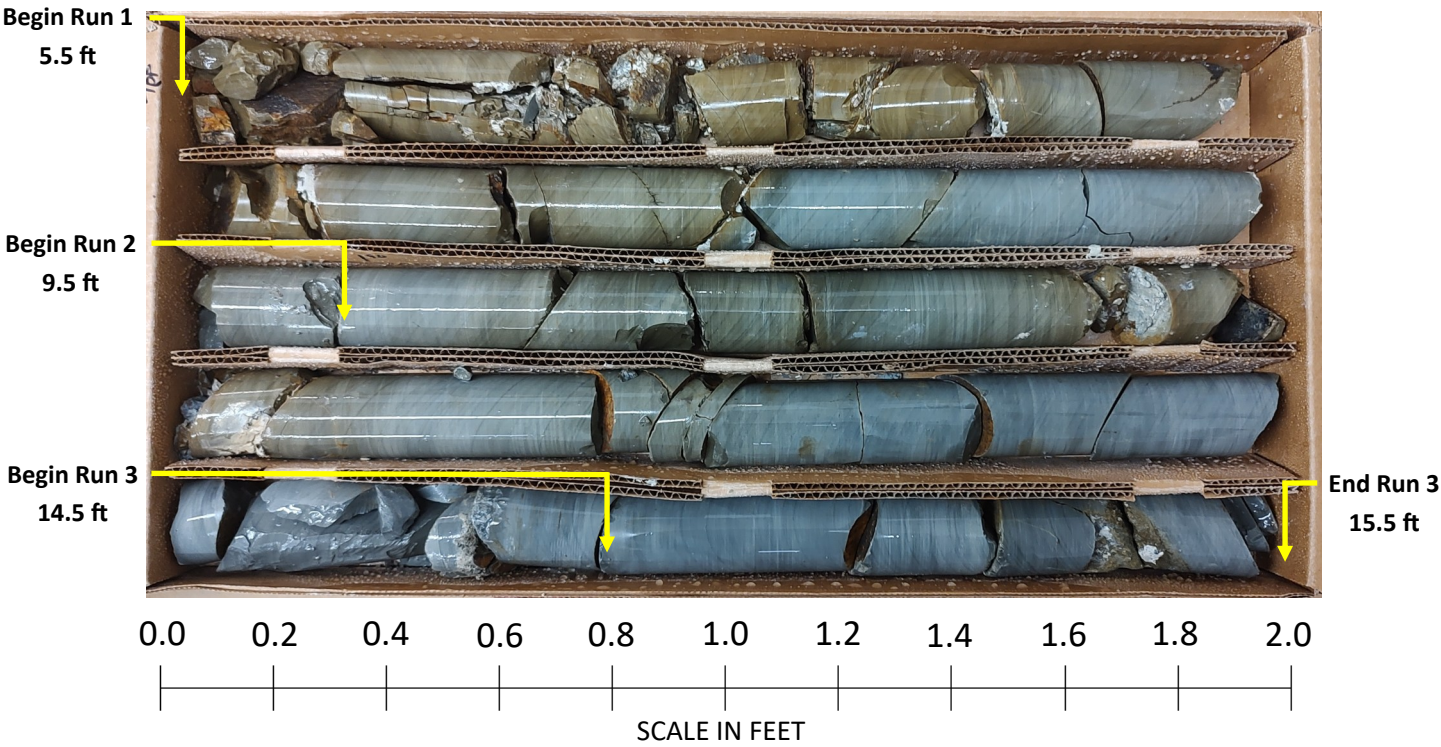


Replace Bridge No. 58 on NC 109 over US 64

WBS - 45733.1.1 TIP No. B-5777 Rock

Core Photographs: Boring - EB2-B

Station: 21+24 Offset: 19' RT



ROCK TEST RESULTS									
SAMPLE NO.	BORING	STATION -L-	OFFSET	DEPTH INTERVAL	RUN REC (%)	RUN RQD (%)	Rock Type	Unit Weight LB/FT ³	Unconfined Compressive Strength (PSI/KSF)
RS-1	B1-A	20+80	19' LT	14.1-14.5	100	76	Meta-Argillite	172.6	10,770 psi / 1,551 ksf
RS-2	B1-B	20+84	22' RT	6.2-6.6	100	74	Meta-Argillite	169.3	4,590 psi / 661 ksf
RS = NQ2 Rock Core Barrel Sample (ASTM D-2113)									



PHOTO 1: VIEW FROM -L- REALIGNMENT OF PROPOSED BRIDGE APPROACH AT END BENT 1, LOOKING UPSTATION.



PHOTO 2: VIEW FROM -L- REALIGNMENT OF PROPOSED BRIDGE APPROACH AT END BENT 2, LOOKING DOWNSTATION.

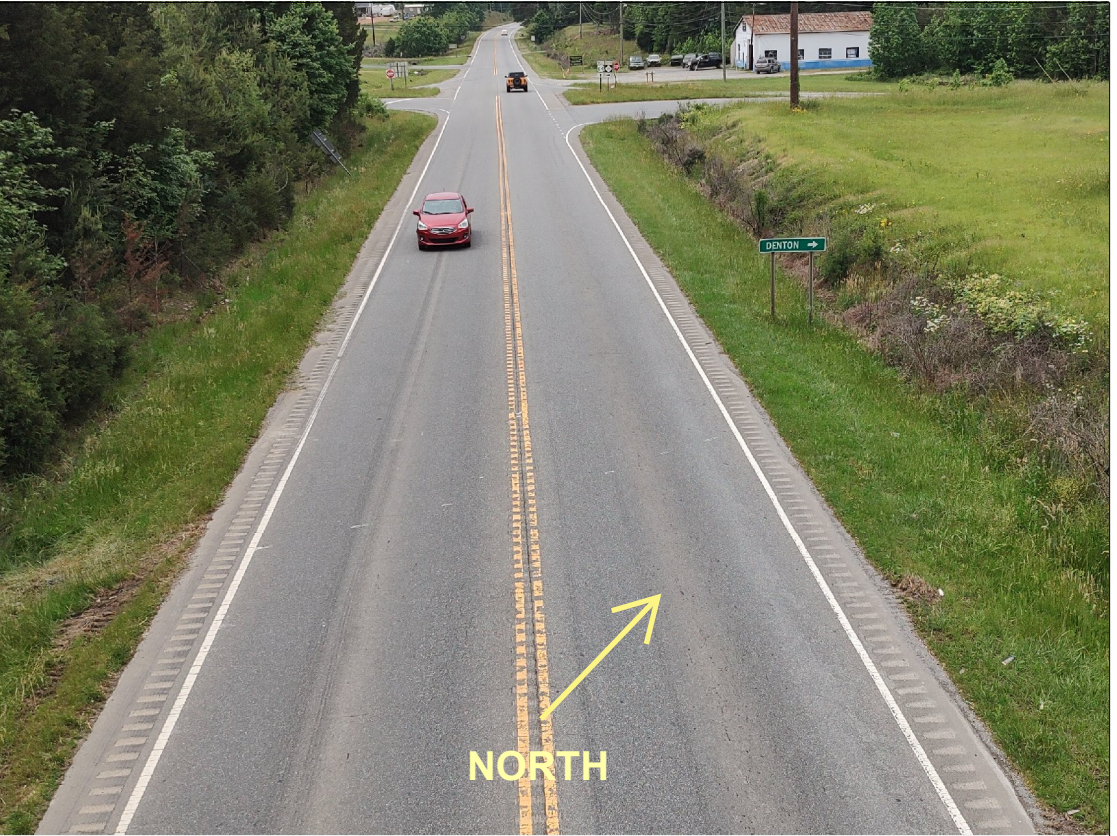


PHOTO 3: VIEW LOOKING NORTHWEST ALONG US 64 FROM EXISTING BRIDGE DECK.

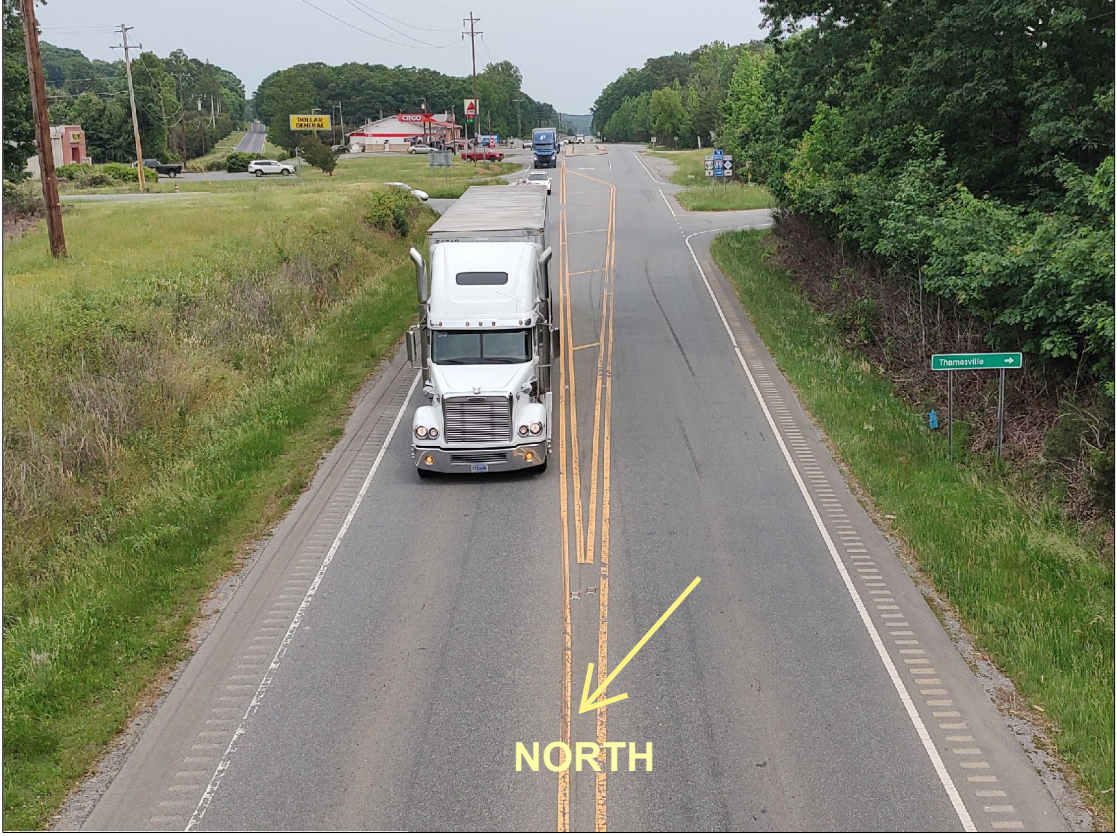


PHOTO 4: VIEW LOOKING SOUTHEAST ALONG US 64 FROM EXISTING BRIDGE DECK.