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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 _____ STA. 20+64

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

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 1999707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAIL

CENERAL SOL 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 BORNOS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-FLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DECREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLL 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 CALITONED THAT DETAILS SHOWN ON THE BUBSURFACE 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 OPNION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONSTITUNTS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF FOR ANN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONTENS ENCOUNTERED AT THE SUFE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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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					
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	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTE ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD					
ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN Ø. BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK					
IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK.					
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	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:					
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT ROCK (WR) 100 BLOWS PER FOOT IF TESTED.					
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE					
CLASS. (≤ 35%, PASSING *200) (> 35%, PASSING *200) (> 000 mm c + 100	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	RUCK (CR) GNEISS, GABBRO, SCHIST, ETC.					
CLASS. A-1-0 A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTA ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YELD SPT REFUSAL					
SYMBOL COCCORDENCE CONTRACTOR CONTRACTO	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT					
7 Passing	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SANDS SPT REFUSAL ROCK TYPE INCLUDES LIMESTONE, SANDS					
*10 50 MX *40 30 MX 50 MX 51 MN GRANULAR SILT- SOILS CLAY PEAT	PERCENTAGE OF MATERIAL						
*200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL <u>SOILS OTHER MATERIAL</u>	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK					
MATERIAL	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	HAMMER IF CRYSTALLINE.					
PASSING *40	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY C (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER H					
PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 11 MN 11 MN 11 MN 10 MX 11 MN 11 MN 11 MN MODERATE ORGANIC	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	OF A CRYSTALLINE NATURE.					
GRUUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX NU MX AMUUNIS UF SOILS	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO RO (SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL					
OF MAIOR CRAVEL AND FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER					
MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS	STATIC WATER LEVEL AFTER <u>24</u> HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS					
GEN. RATING EXCELLENT TO GOOD FAIR TO POOR UNSUITABLE	∇PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLA DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH					
AS SUBGRADE LACECULAR TO GOOD FRINT TO TOUL POOR FOUL ONOT TOUL PI OF A-7-5 SUBGRAUP IS ≤ LL - 30 + PI OF A-7-6 SUBGRAUP IS > LL - 30 PI OF A-7-6 SUBGRAUP IS > LL - 30 PI OF A-7-6 SUBGRAUP IS > LL - 30	SPRING OR SEEP	WITH FRESH ROCK.					
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL F SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE L					
COMPACTNESS OF RANGE OF STANDARD RANGE OF UNCONFINED		(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND					
PRIMARY SOIL TYPE CONFIGURESS ON PENETRATION RESISTENCE COMPRESSIVE STRENGTH CONSISTENCY (N-VALUE) (TONS/FT ²)	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION WITH SOIL DESCRIPTION OF ROCK STRUCTURES	IF TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND E					
VERY LODSE < 4		(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS 4					
GENERALLY LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A		TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF					
MATERIAL DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER OUGER BORING CONE PENETROMETER	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS AR					
VERT DENSE > 50		SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT					
VERY SOFT < 2 < 0.25 GENERALLY SOFT 2 TO 4 0.25 TO 0.5	INFERRED SOIL BOUNDARY	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N V</u>					
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0 MATERIAL STIFF 8 TO 15 1 TO 2	TIETTE INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY					
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4		SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS ALSO AN EXAMPLE.					
		ROCK HARDNESS					
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMEN					
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNDERCUT ZUNSUITABLE WASTE ACCEPTABLE, BUT NOT TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BI					
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.					
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DE					
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE D BY MODERATE BLOWS.					
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE O					
SOIL MOISTURE - CORRELATION OF TERMS	CLCLAY MODMODERATELY γ -UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC γ_{d} -DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD POINT OF A GEOLOGIST'S PICK.					
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN					
(ATTERBERG LIMITS) DESCRIPTION GOIDE FOR FILED MOISTONE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u> DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POIN PIECES CAN BE BROKEN BY FINGER PRESSURE.					
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT,) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO SD SAND, SANDY SS SPLIT SPOON F - FINE SL SILT, SILTY ST SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK.					
	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCH FINGERNAIL.					
PLASTIC SEMISOLID; REQUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING					
	HI HIGHLY V - VERY RATIO	TERM SPACING TERM					
- MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED WIDE 3 TO 10 FEET THICKLY BEDDED 1					
OM _ OPTIMUM MOISTURE - MOIST - KM/ SOLID; HT OK KEHK OFTIMUM MOISTORE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.1					
		CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.0 VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.00					
- DRY - (D) ATTAIN OPTIMUM MOISTURE	CME-55 CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED <					
PLASTICITY	■	INDURATION					
PLASTICITY INDEX (PI) DRY STRENGTH	CME-750X HARD FACED FINGER BITS X -N Q2	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HE					
NON PLASTIC Ø-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.					
MODERATELY PLASTIC 16-25 MEDIUM	CASING X W/ ADVANCER	CRAINS CAN BE SERADATED FROM SAMPLE WITH ST					
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST	MODERATELY INDURATED BREAKS EASILY WHEN HIT WITH HAMMER.					
COLOR		INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL DIFFICULT TO BREAK WITH HAMMER.					
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X CORE BIT VANE SHEAR TEST						
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE SAMPLE BREAKS ACROSS GRAINS.					

PROJECT REFERENCE NO.

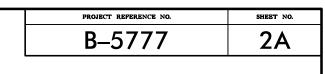
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ED. AN INFERRED	
D SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
1 FOOT PER 60 IS OFTEN	AQUIFER - A WATER BEARING FORMATION OR STRATA.
	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
T N VALUES >	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.
OCK THAT NCLUDES GRANITE,	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.
AL PLAIN IF TESTED. TC.	$\underline{\text{COLLUVIUM}}$ - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
MAY NOT YIELD STONE, CEMENTED	$\frac{\text{CORE}}{\text{BY TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED}{\text{BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.}$
	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
RINGS UNDER	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
COATINGS IF OPEN. HAMMER BLOWS IF	DIPLOTEL: DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
OCK UP TO AL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
R BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
IS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AY. ROCK HAS H AS COMPARED	PARENT MATERIAL.
IT HS COM HILD	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FELDSPARS DULL LOSS OF STRENGTH	F <u>ORMATION (FM.)</u> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
EVIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
ARE KAOLINIZED	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
RE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
of strong rock T only minor <i>Values < 100 BPF</i>	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
S. SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - 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.
NS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
BLOWS REQUIRED	<u>SILL</u> - 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 BEODING OR SCHISTOSITY OF THE INTRUDEO ROCKS.
DEEP CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
OR PICK POINT. D BLOWS OF THE	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.
N FRAGMENTS NT. SMALL, THIN	<u>STRATA CORE RECOVERY (SREC.)</u> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
. PIECES 1 INCH HED READILY BY	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.
	BENCH MARK:
THICKNESS	BM-I (N737693 EI673323)
4 FEET 1.5 - 4 FEET	STA. 23+07, 121' RT ELEVATION: 779.6 FEET
.16 - 1.5 FEET	NOTES:
03 - 0.16 FEET 108 - 0.03 FEET	ROADWAY DESIGN FILES, DTM FILE PROVIDED BY NCDOT.
< 0.008 FEET	
EAT, PRESSURE, ETC.	NORTHING AND EASTINGS OBTAINED USING A TRIMBLE GEO7X. ELEVATIONS FOR BRIDGE BORINGS OBTAINED USING BENCHMARK
2, I NESSONE, E I C.	BM-I (N737693 EI673323)
TEEL PROBE:	FIAD = FILLED IMMEDIATELY AFTER DRILLING
PROBE:	
E;	DATE: 8-15-14

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

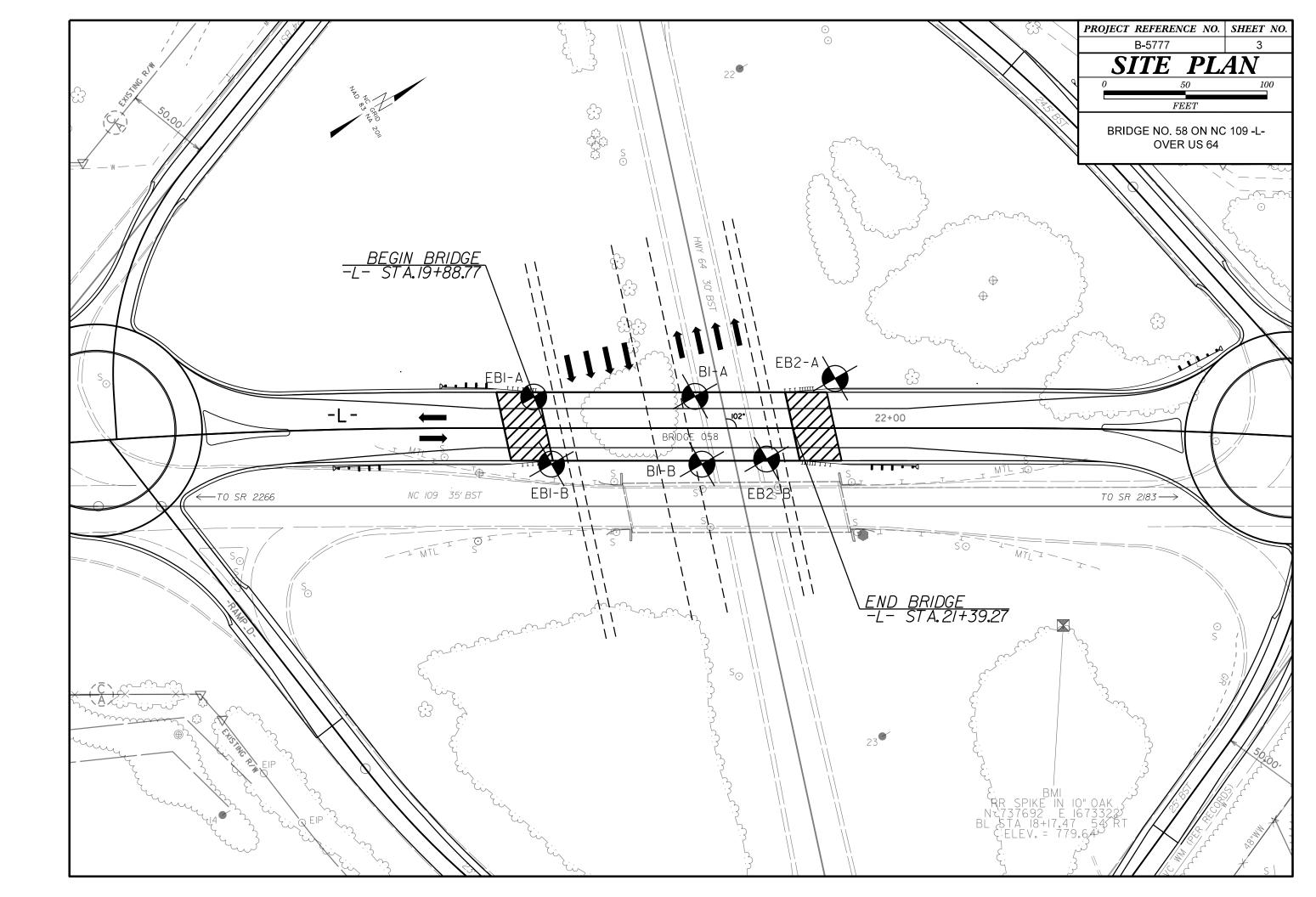
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

AASHTO LRFD Figure 10.4.6.4–1 — Determination of GSI for Jointed P	Rock Mass (Marı	nos and Hoek,2	2000)			AASHTO LRFD Figure 10.4.6.4-2 $-$ Determination of GSI for T
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed F GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) 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.	Very rough, fresh unweathered surfaces	GOOD Rough, slightly weathered, iron stained surfaces	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings	AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for T GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000) 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 fail poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.
STRUCTURE		REASING SU		ALITY	>0,3	COMPOSITION AND STRUCTURE
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90			N/A	N/A	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.
BLOCKY - well interlocked un- disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		70 60				B. Sand- stone with thin inter-
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets		5	0			layers of siltstone amounts stone layers
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity			40	30		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 .
discontinuity sets. Persistence of bedding planes or schistosity DISINTEGRATED - poorly inter- locked, heavily broken rock mass with mixture of angular and rounded rock pieces				20		G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	N/A	N/A			10	Into small rock pr



Tectonically Defo	ormed Heteroo	geneous Rock	Masses (Marır	nos and Hoek	, 2000)
SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)	VERY GOOD - Very Rough, fresh unweathered surfaces	GOOD - Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slicken- sided or highly weathered surfaces with soft clay coatings or fillings
E. Weak siltstone or clayey shale with sandstone layers	70 60	A 50 B 40	с г 30	D E	
the or sultstone deformed forming an tructure leformed sulty forming a e with pockets yers of ensformed oneces.			\$	F/ 20 	+ ¹⁰

DATE: 8-19-16



									JRE L	.00				
WBS	45733	.1.1			TI	P B-5777		COUNTY	DAVIDS	NC			GEOLOGIST A. Suttle	
SITE	DESCR	IPTION	Rep	lace Br	ridge N	o. 58 on NC	109 over l	JS 64						GROUND WTR (ft)
BORI	NG NO.	EB1-	A		S	TATION 19	+81		OFFSET	19 ft LT			ALIGNMENT -L-	0 HR. 36.3
	AR ELE					OTAL DEPT	-		NORTHING		81		EASTING 1,673,040	24 HR. Caved
				-						1				
				IF E		Diedrich D-						J H.S	, <u> </u>	ERTYPE Automatic
DRIL	LER C.	. Osbor	-			FART DATE			COMP. DA		24/24		SURFACE WATER DEPTH N//	4
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CO	-	0 2		PER FOOT	75 100 	SAMP NO.	MO	O I G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION DEPTH (f
785	-	-											- 781.9 GROUND SURF/	ACE 0.
780	780.9	1.0	4	4	4							FN	ROADWAY EMBAN	
	 778.4 [_]	3.5		1		- 1				11	M		_ Medium Stiff to Ver Tan-Red-Orange-Gray,	Silty CLAY
	_		3	4	6	10					м	EN	(A-7-5/A-7-6), with tra-	ce gravel
775	775.9 -	6.0	9	8	9									
	773.4	8.5				••••• <u>•</u> 17•			_ <u>-</u> · · ·		M		773.9	<u>8</u> .
	-773.4		18	40	43				83		м		RESIDUAL Hard, Tan-Gray, Fine to C	oarse Sandv
770	-	F							1				Hard, Tan-Gray, Fine to C SILT (A-4), with some rock f	ragments, clay
	768.4	13.5						1					_ seams	
	700.4	13.5	19	20	19		€39	 			м			
65	-	F												
00	700.4.7												- 763.4	18
	763.4	18.5	18	82/0.3	3		· · '	+	100/0.8	 		977A	WEATHERED RC	DCK
,	-	ţ								i I			Tan-Gray (META-ARC	GILLITE)
60	_	<u> </u>							· · · ·	!			_	
	758.4	23.5	25	39	61/0.2									
	-	Ł							100/0.7	•				
755	_	F								!				20
	753.4	28.5	17	45	39				· <u></u>	4				2
	-	F		45	39				• 84		M		Hard, Tan-Gray, Fine to C SILT (A-4), with some roo	oarse Sandy
750	_	t											– SILT (A-4), with some roo	ck tragments
	748.4	33.5											747.9	34
	-	ţ	11	51	49/0.4				- I				WEATHERED RC	DCK
745	-	ł							100/0.9	Į	$\mid \vee$		Gray-Tan (META-ARC	GILLITE)
	743 3	38.6											743.3	38
			60/0.1					I	60/0.1	▶			NON-CRYSTALLINE	
	-	ł										-	Gray (META-ARGIL Boring Terminated with	
	-												Penetration Test Refusal at I ft In Non-Crystalline (META-ARGILLI	Elevation 743.2 Rock
	-	t									1		Surficial Organic Soil (0).0' to 0.3')
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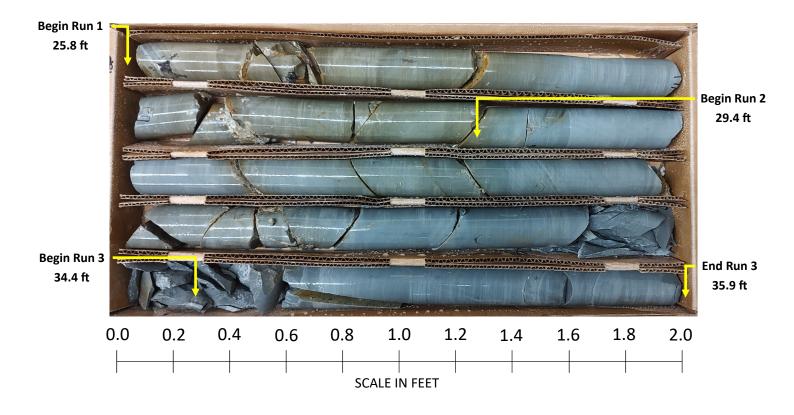
WDS 45700.4.4	TIP B-5777 COUNTY DAVIDSON				
WBS 45733.1.1		GEOLOGIST A. Suttle	WBS 45733.1.1		DUNTY DAVIDS
SITE DESCRIPTION Replace Bridge	-	GROUND WTR (ft)	SITE DESCRIPTION Replace Bridg	-	
	STATION 19+92 OFFSET 22 ft RT	ALIGNMENT -L- 0 HR. N/A	BORING NO. EB1-B	STATION 19+92	OFFSET
COLLAR ELEV. 784.8 ft	TOTAL DEPTH 35.9 ft NORTHING 737,470	EASTING 1,673,081 24 HR. Caved	COLLAR ELEV. 784.8 ft	TOTAL DEPTH 35.9 ft	NORTHIN
	S049 Diedrich D-70 94% 04/02/2024 DRILL METHOD Si		DRILL RIG/HAMMER EFF./DATE ECS		
DRILLER C. Osborne	START DATE 04/24/24 COMP. DATE 04/24/24 NT BLOW/S PER FOOT SAMP V L	SURFACE WATER DEPTH N/A	DRILLER C. Osborne	START DATE 04/24/24	COMP. DA
ELEV DRIVE DEPTH BLOW COUNT (ft) (ft) (ft) 0.5ft 0.5ft 0.5		SOIL AND ROCK DESCRIPTION		TOTAL RUN 10.1 ft	ATA
(II) (ft) (II) 0.5ft 0.5ft 0.8	0.5ft 0 25 50 75 100 NO. MOI G	ELEV. (ft) DEPTH (ft	ELEV RUN ELEV (ft) (ft) (ft) (Min/ft)	RUNSAMP.REC.RQD(ft)(ft)%%	(ff)
				(ft) (ft) NO. (ft) %	(ft) G ELEV.
785		_784.8 GROUND SURFACE 0.0 ROADWAY EMBANKMENT	759 759.0 25.8 3.6 2:56/1.0) (3.3) (2.2) (9.8) ((6.1) 759.0
	<u>З</u>	Medium Stiff to Stiff, Red-Brown-Tan-Gray, Silty CLAY (A-7-5), with trace to little gravel		$ \begin{array}{c} 0 \\ 1 \\ 92\% \\ 0 \end{array} \left(\begin{array}{c} (2.2) \\ 0 \\ 98\% \\ 0 \end{array} \right) $	(6.1) 759.0 61% 758.9
781.3 7 3.5 4 5 3	3 · · · · · · · · · · · · · · · · · · · · M		755 755.4 - 29.4 2:36/1.0 755 5.4 - 29.4 5.0 2:36/1.0 755 5.0 2:58/0.6	(5.0) (3.2)	
778.8 6.0 4 8 6		-			
776.3 85			750 750.4 34.4 $3:11/1.0$ $2:49/1.0$ $2:49/1.0$		
	18	 Very Stiff to Hard, Tan-Gray-Orange, Fine 	748.9 35.9 1.5 2:52/1.0	(1.5) (0.7) 100% 47%	748.9
		to Coarse Sandy SILT (A-4), with little to some rock fragments			
770 771.3 13.5 8 36 4	49 · · · · · · · · · · · · · · · ·				
		-			
766.3 18.5		766.3 18.5			
765 20 80/0.5		WEATHERED ROCK Tan-Gray (META-ARGILLITE)	1 ‡		
		· · · · · · · · · · · · · · · · · · ·			
761.3 23.5	100/0.5				
759.0 25.8 60/0.1		- 759.0 25.8 - 758.9_/ NON-CRYSTALLINE ROCK /- 25.9			
		Tan-Gray (META-ARGILLITE)	1 ±		
755		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			
		- _{748.9} REC = 97%, RQD = 60%, GSI = 65-70 35.9			
		Boring Terminated at Elevation 748.9 ft In Non-Crystalline Rock (META-ARGILLITE)			
		_ Surficial Organic Soil (0.0' to 0.3')			
					I F
					I F
		-			I F
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		-			
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SC	N	GEOLOGIST	A. Suttle				
					GROUN	ID WTR	(ft)
. ;	22 ft RT	ALIGNMENT	-L-		0 HR.		N/A
NG			-		24 HR.	Ca	
	,	Core Boring		HAMME	ER TYPE		
DA.	TE 04/24/24	SURFACE WA	TER DEP				
-	. — -			,/			
V. (ESCRIPTION AND	REMARK	S		DEPT	Ή (ft)
. (Begin Coring @	0.25.8 ft)
0 9		NON-CRYSTALI	INE ROCK		rou= 0	/	25.8 25.9
	Slight to Very Slig META-ARGILLITE, w to Extremely Indur	ith Very Close to (Close Fract	ure Space	cing, Indu	rated	
		GSI = 65	-70				
9	Boring Terminat	ed at Elevation 74	8.9 ft In Nor	n-Crvsta	lline Rock		35.9
	g . orninati	(META-ARG	ILLITE)				
	S	urficial Organic So	oil (0.0' to 0	.3')			

ECS

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



													1				ı											
WBS	3 4573	3.1.1			TI	P B-5777		COUNTY	/ DAVIDSO	N			GEOLO	GIST A. Suttle			WE	3S 457	33.1.1			TIP	B-577	7	C	OUNT	Y DA	VIDSON
SITE	DESC	RIPTION	Repl	ace B	ridge N	o. 58 on NC	: 109 over	US 64								WTR (ft)	SIT	E DESC	RIPTION	l Repl	ace Bridg	ge No.	58 on I	NC 109 o	over US	64		
BOR	ING NO	. B1-A			S	TATION 2	0+80		OFFSET 1				ALIGN	MENT -L-	0 HR.	N/A	BO	BORING NO. B1-A STATIO							OFF	SET 19 ft		
COL	LAR EL	. EV . 76	67.5 ft		Т	OTAL DEPT	TH 21.0 f	ť	NORTHING	737,5	67		EASTIN	IG 1,673,089	24 HR.	FIAD			LEV. 76					PTH 2 ⁻				RTHING 73
DRIL	L RIG/H	AMMER E	FF./DA	TE E	CS049	9 Diedrich D	-70 94%	04/02/202	4	DRILL M	IETHOD	D SP1	Core Borin	ig 🔤	IAMMER TYPE	lutomatic	DR	ILL RIG/H	AMMER E	FF./DA	TE ECS	S049 Diedrich D-70 94% 04/02/2024						DR
DRIL		C. Osbor	ne		S	TART DATE	05/01/2	24	COMP. DAT	FE 05/	01/24		SURFA	CE WATER DEPT	I N/A		DR	ILLER	C. Osbo	me		STA	RT DA	TE 05/	01/24		CON	IP. DATE
ELEV	DRIVE	DEPTH		w cc				PER FOOT		SAMP.	∇		SOIL AND ROCK DESCRIPTION			CO	RE SIZE	N/A			тот	AL RU	N 16.2					
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 :	25	50	75 100	NO.	моі		ELEV. (ft)			DEPTH (ft	ELE				DRILL RATE	REC.	RQD	SAMP.	ST REC.	RATA RQD (ft) %	L	
																	(ft)	(ft)	′ (ft)	(ft)	(Min/ft)	1 (#)	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (ft)
770		\downarrow											_				762											
		ŧ										ΙĿ	767.5	GROUND	SURFACE	0.0	76	762.1	4.8	4.1	4:24/1.0 4:17/1.0	(4.1) 100%	(0.4) 5 10%		(5.4) 95%	(0.4) 7%	圜	762.7 M
		1.0	20	57	43/0.3									WEATHER Gray (META	ED ROCK		/00		3 + 8.9		3:52/1.0						E	
765	764.0	1 3.5							100/0.8				-	Gray (META	ARGILLITE)				1	5.0	0:52/0.1 5:32/1.0 6:42/1.0 5:32/1.0 5:32/1.0 5:27/1.0	(4.7)	(1.9) 38%					757.0
	762.8	4.7	14 60/0.1	86/0.5	5				100/1.0				762.8	NON-CRYSTA		4.7			1		6:42/1.0				(10.5) (7.5) 5 71%	罿	
760		Ŧ										×		Gray (META	ARGILLITE)			753.6	<u>3 + 13.9</u>	5.0	5:42/1.0	(5.0)	(3.8)		_		罿	
		Ŧ												Moderate to Slightly Hard to Hard, Browr	META-ARGILLIT	E,			ł	0.0	2:42/1.0 2:12/1.0	100%	5 76%	RS-1	-1		霻-	
		ŧ											757.0 V	vith Very Close to Clo Extremely Indurate	se Fracture Spaci d. with clav seams	ng, <u>10.5</u>	750		$\frac{1}{18.9}$		1:47/1.0							-
755		‡											-	present betw	en fractures				+	2.1	1:59/1.0 1:43/1.0	(21)	(1.8)				Ē.	
		‡					· · · · ·			RS-1		霻	Ļ	REC = 95%, RQD				746.	5 <u>+ 21.0</u> +		1:37/1.0	100%	<u>86%</u>				-	746.5
		t								<u></u>	1	臝		Very Slightly Weathe META-ARGILLITE,	with Very Close to	, ,			‡									
750	-	ŧ					<u> </u>	· · · · ·					-	Moderately Close Extremely	Fracture Spacing, Indurated				ţ									
		ł					· · · ·					臺	746.5	REC = 100%, RQD		65 21.0			1									N
		Ŧ							1 1					Boring Terminated a	Elevation 746.5 ft	In			ł									
		ł											1	Non-Crystalline Rock Surficial Organic		L)			‡ ‡									_
		ł										Ŀ	_	NOTE: Unable to re					ţ									
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NCDOT BORE DOUBLE B5777_GEO_GTM.GPJ_NC_DOT.GDT_5/11/24		Ŧ			1							F							ł								F	
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N	GEOLOGIST	A. Suttle			
				GROUN	DWTR (ft)
19 ft LT	ALIGNMEN	Г -L-		0 HR.	N/A
7 37,567	EASTING	1,673,089		24 HR.	FIAD
DRILL METHOD SPT	Core Boring		HAMME	ER TYPE	Automatic
TE 05/01/24	SURFACE V	VATER DEP	TH N/A	4	
DI	ESCRIPTION A	ND REMARK	S		
(ft)					DEPTH (ft)
Moderate to Slig META-ARGILLITE, w Indurated, v	Begin Corin htly Weathered ith Very Close t vith clay seams	d, Medium Har o Close Fracti	ure Spac	ing, Extre	4.8 emely
		20-25			10.5
Very Slightly Weathe Close to Moderate	ered, Very Hard ely Close Fracti	, Gray META- ure Spacing, E		TE, with \ y Indurate	/ery d
	GSI =	60-65			
		.1' - 14.5'			
Unconfined Co	Unit Weight ompressive Str	t = 172.6 pcf ength = 10,770	0 psi / 1,	551 ksf	
					21.0
Boring Terminate		746.5 ft In Nor RGILLITE)	n-Crystal	lline Rock	
S	urficial Organic	: Soil (0.0' to 0	.1')		
NOTE: Unable to reco	over portion of r k, section recov			lue to frac	tured
TOCI	k, section recov	ered during R	un 5.		

Begin Run 1 4.8 ft Begin Run 4 Begin Run 2 18.9 ft 8.9 ft *Begin Run 3 13.9 ft RS-1 0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 0.0 0.2 0.4 0.6 0.8 1.0 SCALE IN FEET SCALE IN FEET

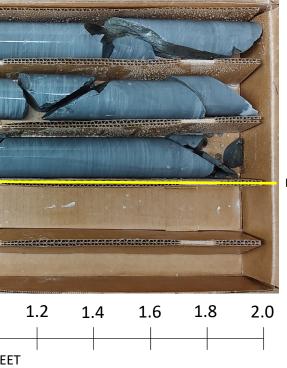
Replace Bridge No. 58 on NC 109 over US 64

WBS - 45733.1.1 TIP No. B-5777 Rock Core Photographs: Boring - B1-A Station: 20+80 Offset: 19' LT

*See log for note



SHEET 8



End Run 4 21.0 ft

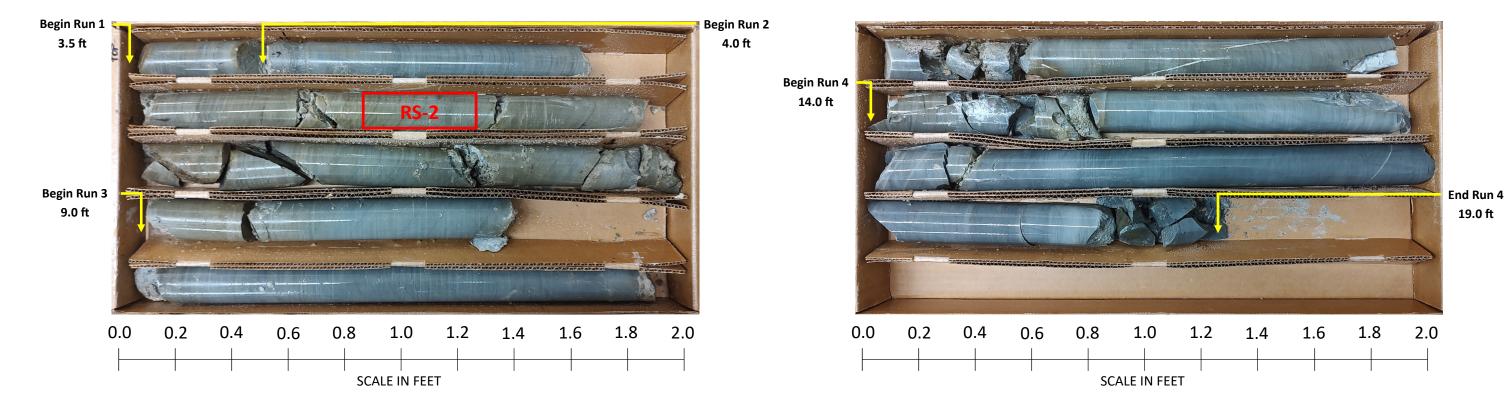
770 (ft) CH (ft)					ace Brida	Renl				-		1	DAVIDSO		109 over			DN Repla		WBS
BORING NO. B1-B STATION 20+84 OFFSET 22 ft RT ALIGNMENT -L- 0 HR. N/A COLLAR ELEV. 768.1 ft TOTAL DEPTH 19.0 ft NORTHING 737.550 EASTING 1,673,127 24 HR. Caved COLLAR ELEV. 768.1 ft TOTAL DEPTH TOTAL DEPTH DRILL RCIMAMMER EFF./DATE ECS049 Diedrich D-70 94% 04/02/2024 DRILL METHOD SPT Cree Boring HAMMER TYPE Automatic DRILLER C. Osborne START DATE 04/30/24 COMP. DATE 04/30/24 SURFACE WATER DEPTH N/A ELEV DRIV DepTH ELOW COUNT ELOW COUNT BLOWS PER FOOT SOIL AND ROCK DESCRIPTION CORE SIZE N/A TOTAL NOT 15 770 - </th <th></th> <th>IC 109 over</th> <th>58 on N</th> <th>e No. 5</th> <th>ace Brida</th> <th>Renla</th> <th></th> <th>CCCDI</th> <th>OTTE DE</th> <th></th> <th></th> <th></th> <th></th> <th>US 64</th> <th>109 over</th> <th>o 58 on NC</th> <th>ace Bridae N</th> <th>JN Repla</th> <th>DESCRIPTION</th> <th>A</th>		IC 109 over	58 on N	e No. 5	ace Brida	Renla		CCCDI	OTTE DE					US 64	109 over	o 58 on NC	ace Bridae N	JN Repla	DESCRIPTION	A
COLLAR ELEV. 766.1 ft TOTAL DEPTH 19.0 ft NORTHING 737.550 EASTING 1,673,127 24 HR Caved DRILL RIGHAMMER EFF, JAATE 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 MOI 0.sti						Тері														
DRILL RIGHAMMER EFF./DATE ECS:049 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 PRIVE DEPTH BLOW COUNT BLOWS PER FOOT SAMP L SOIL AND ROCK DESCRIPTION CORE SIZE N/A TOTAL RUN 15 770 - - - - - SOIL AND ROCK DESCRIPTION CORE SIZE N/A TOTAL RUN 15 770 - <	OFFSET																			
DRILLER C. Osborne START DATE 04/30/24 COMP. DATE 04/30/24 SURFACE WATER DEPTH N/A ELEV DRIVE Depth BLOW COUNT BLOW SPER FOOT SAMP SOIL AND ROCK DESCRIPTION CORE SIZE N/A TOTAL RUN 15 ELEV (ft) 6.5 ft 5.0 ft 5.0 ft 0.5 ft 5.0 ft 0.0 ft CORE SIZE N/A TOTAL RUN 15 770										┥┝──										
LEV (ft) DEVM (ft) DEVM (ft) BLOW COUNT (ft) BLOWS PER FOOT 0.5ft SAMP 0 SAMP (ft) Solid AND ROCK DESCRIPTION DEPTH (ft) CORE SIZE NA TOTAL RUN 15 770	1% 04/02/2024	<u>) 94% (</u>	edrich l	049 Die	E ECS	FF./DAT	IMER E	RIG/HAM	DRILL RI	DR	bre Boring HAMMER TYPE Automatic							R EFF./DA	RIG/HAMMER E	DRIL
(f) (30/24 COMP. D	iE 04/30/2	RT DAT	STAF		ne	Osbor	ER C.	DRILLE	DF	SURFACE WATER DEPTH N/A		COMP. DAT							DRIL
NO Der min Der min Der min ELEV DEP min RATE REC RO SAM 770							N/A			CC	SOIL AND ROCK DESCRIPTION		75 400							ELEV
770 764.7 3.4 760.1 768.1 GROUND SURFACE 0.0 764.7 3.4 760.1		SAMP.	JN RQD (ff)	REC.	RATE	RUN		ELEV	ELEV F		EV. (ft) DEPTH (ft)	NO. MOI G	15 100	50 7	25 ;		0.5π 0.5π	γ 0.5π	(ft) (ft)	(14)
765 764.7 3.4 60/0.1 769.1 9.0 5.0 3.32/1.0 100% 80%	(ft) (ft) G ELEV	- NO. (%	%	(Min/ft)	(11)	(11)	(ft)	(II)											
765 764.7 3.4 3.4 760 750.1 9.0 22:36/1.0 100% 74% 760 760 760 760.1	(15.5) (11.6) - 764.6	(1	(0,4)	(0.5)	3.35/0 5	0.5	35	764.6		764										770
765 764.7 3.4 60/0.1 60/0.1 760 764.7 3.4 760 764.7 3.4 760 764.7 3.4 760 764.7 3.4 760 764.7 3.4 760 764.7 3.4 760 764.7 764.7 760 764.7 764.7 760 764.7 764.7 760 764.7 764.7 760 764.7 764.7 760 764.7 764.7 760 764.7 764.7 760 764.7 764.7 760 764.7 764.7 760 764.7 764.7 765 764.7 764.7 755 754.1 14.0 750 764.7 3.33/1.0 750 764.7 3.4 750 764.7 3.4 750 764.7 3.4 750 764.7 3.33/1.0 750 7749.1 19.0 </td <td>100% 75%</td> <td></td> <td>80%</td> <td>100%</td> <td>3:39/1.0</td> <td>5.0</td> <td><u>4.0</u>/</td> <td>764.1 <u>/</u> L</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>++</td> <td></td> <td></td> <td>767 1 1 0</td> <td></td>	100% 75%		80%	100%	3:39/1.0	5.0	<u>4.0</u> /	764.1 <u>/</u> L								++			767 1 1 0	
760 760 750 751 9.0 225/1.0 (6.0) (4.0) 760 760 5.0 3:24/1.0 (5.0) 3:37/1.0 (5.0) 3:37/1.0 (5.0) 3:37/1.0 (5.0) 3:37/1.0 (5.0) 3:37/1.0 (5.0) 3:37/1.0 (5.0) 3:37/1.0 (5.0) 3:37/1.0 (5.0) 3:37/1.0 (5.0) 3:33/1.0 (5.0) 3:33/1.0		RS-2	(3.7) 74%	(5.0) 100%	2:36/1.0		-	+	760	76	Tan (META-ARGILLITE)		100/0.2					100/0.2	Ţ	765
760 Ian-Gray (META-ARGILLITE) 3:24/1.0 100% 80% 760 Slight to Very Slightly Weathered, Hard to Very Hard, Gray META-ARGILLITE, with Very Close Fracture Spacing, Extremely Indurated, with clay seams present between fractures 3:32/1.0 100% 80% 755 REC = 100%, RQD = 75%, GSI = 65-70 5.0 3:33/1.0 3:33/1.0 3:33/1.0 750 T49.1 Boring Terminated at Elevation 749.1 ft In Non-Crystalline Rock (META-ARGILLITE) 19.0 3:33/1.0 10.0			(4.0)	(5.0)	2:25/1.0		9.0	759.1	7				60/0.1					1 60/0.1	<u></u>	
760 -			80%	100%	3:24/1.0		-	Ŧ			Slight to Very Slightly Weathered, Hard to								‡	
755 750 5.0 3:24/1.0 (5.0) 3:37/1.0 750 750 749.1 749.1 19.0 3:33/1.0 750 749.1 19.0 3:33/1.0 100% 750 749.1 19.0 3:33/1.0 100% 750 749.1 19.0 3:33/1.0 100% 750 749.1 19.0 10.0 10.0 750 749.1 19.0 10.0 10.0 750 749.1 19.0 10.0 10.0 750 749.1 19.0 10.0 10.0 10.0					3:37/1.0 3·28/1.0		- 14.0	754.1	755 7	75	Very Hard, Gray META-ARGILLITE, with		+ • • • • • •						‡	760
755			(3.5) 70%	I (5 0) I	3.24/10	5.0	_	Ŧ			Spacing, Extremely Indurated, with clay		1 1						‡	
750 749.1 19.0 3:33/1.0 750 749.1 19.0 3:33/1.0 750 749.1 19.0 3:33/1.0 80ring Terminated at Elevation 749.1 ft In Non-Crystalline Rock (META-ARGILLITE) 19.0					3:39/1.0		-	Ŧ	750	75	·					11			‡	766
750 749.1 19.0 Boring Terminated at Elevation 749.1 ft In Non-Crystalline Rock (META-ARGILLITE) 19.0	749.1				3:33/1.0		19.0	749.1	7		REC = 100%, RQD = 75%, GSI = 65-70		· · · · ·						+	755
750 19.0 Boring Terminated at Elevation 749.1 ft In Non-Crystalline Rock (META-ARGILLITE)							-	‡					1 1						1	
Boring Terminated at Elevation 749.1 ft In Non-Crystalline Rock (META-ARGILLITE)							-	-			0.4		· · · ·						‡	750
							-	Ŧ			Boring Terminated at Elevation 749.1 ft In		I						<u>+</u>	ł
Surficial Organic Soil (0.0' to 0.1')							-	‡			· · · · · · · · · · · · · · · · · · ·								1	
							-	1			Surficial Organic Soil (0.0' to 0.1')								+	
							-	‡											1	
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osc	N	GEOLOGIST A. Suttle			
				GROUN	ND WTR (ft)
Г	22 ft RT	ALIGNMENT -L-		0 HR.	N/A
ING	737,550	EASTING 1,673,127		24 HR.	Caved
	DRILL METHOD SPT	Core Boring	HAMME	R TYPE	Automatic
DA	TE 04/30/24	SURFACE WATER DEP	TH N/A	4	
	DI	ESCRIPTION AND REMARK	S		
EV. (DEPTH (ft)
1.6	META-ARGILLIT	Begin Coring @ 3.5 ft Slightly Weathered, Hard to V E, with Very Close to Moderat idurated, with clay seams pre	tely Clos	e Fractur	
		GSI = 65-70			
	Unconfined (RS-2: 6.2' - 6.6' Unit Weight = 169.3 pcf Compressive Strength = 4,59	0 psi / 66	61 ksf	
1 1					19.0
9.1	Boring Terminate	ed at Elevation 749.1 ft In Nor (META-ARGILLITE)	n-Crystal	lline Rock	19.0
	S	urficial 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

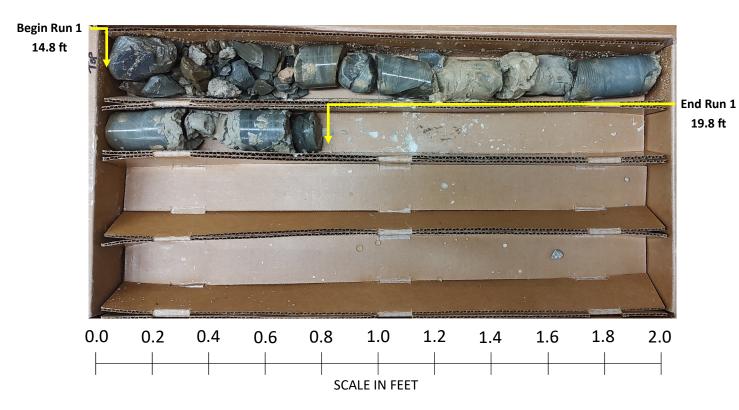


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WBS	45733	.1.1			TI	P B-577	7	COU	NTY DA	VIDSON	١			GEOLC	GIST A. Sut	tle	1		WBS	3 4573	3.1.1			TIP	B-577	7	C	OUNT	/ DAVID	SON
SITE	DESCRI	IPTION	Repla	ace Bri		o. 58 on N		ver US 64										NTR (ft)	SITE	DESCF	RIPTION	Repl	ace Bridę	ge No. t	58 on N	IC 109 o	ver US	64		
BOR	ing no.	EB2-A	4		S	TATION	21+66		OFF	SET 30) ft LT			ALIGN	MENT -L-		0 HR.	Dry	BOR	ING NO	EB2-	A		STA	TION	21+66			OFFSET	30
COL	LAR ELE	V . 77	5.2 ft		т	OTAL DE	PTH 19.	8 ft	NOR	THING	737,64	17		EASTIN	IG 1,673,122	2	24 HR.	Dry	COL	LAR EL	EV . 77	75.2 ft		тот	AL DEI	PTH 19	.8 ft		NORTHI	NG
DRIL	L RIG/HAM	MMER E	FF./DA1	E EC	CS049) Diedrich	D-70 94	% 04/02/2	024	1	DRILL M	ethod	NW	Casing w/ A	Advancer	НАММ	ER TYPE Aut	tomatic	DRIL	L RIG/HA	MMER E	FF./DAT	TE ECS	049 Di	edrich	D-70 949	% 04/0	2/2024	Ļ	
	LER C.				1	TART DA				IP. DATI	E 04/2	22/24		SURFA	CE WATER D	EPTH N/	A			LER C				1		TE 04/1			COMP. D	
ELEV	DRIVE	DEPTH	BLO	w cou	UNT		BLOV	VS PER FC	OT		SAMP.		L	1						E SIZE				_		N 5.0 ft				
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75	100	NO.		O G	ELEV. (ft)	SOIL AND I	ROCK DES		DEPTH (ft)	ELEV	DUN	DEPTH		DRILL RATE	R		SAMP.		ATA	L O	
								1	I										(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	(ft)	RQD (ft) %	NO.	(ft)	ATA RQD (ft) %	O G _{ELE}	-\/ (ft
780																			760-4					70	70		70	70		<u>v. (n</u>
100	-	-											F	-					76004	760.4 -	14.8	5.0	1:24/1.0	(2.7)	(0.0)		(2.7) 54%	(0.0) 0%	760.	.4
		È											Ę								Ŧ		2:32/1.0)	0%		54%	0%		
775		-											γŧ	775.2		JND SURF		0.0		755.4	- <u>19.8</u>		3:52/1.0 4:28/1.0						755.	.4
	774.2	1.0	3	3	3							M	N		N	AY EMBAN ledium Stiff	,			-	Ŧ								F	
	771.7	- 3.5	4	2	3				••			м	N		Orange-Tan-Re (A-7-5), wit	d-Brown-G n trace to so	ray, Silty CLAY ome gravel	(‡								Ę	
770	769.2	6.0	-	-		•5							S	-			Ū				‡								-	
]	E .	4	7	28							мL	5	767.2				8.0			‡								Ę	
765	766.7 -	- 8.5 -	12	49	51/0.3							м			— — — — — — *R Hard, Tan-Orar	OCKY FILL					ŧ								Ł	
105	╎╶┥	È.								100/0.8				-	SILT (A-4), wit						Ŧ								F	
	761.7	- - 13.5												761.7				13.5			Ŧ								F	
760		_	43	57/0.1					•••••	100/0.6		5		760.4		Thered R Ieta-Argi		14.8			Ŧ								F	
		L										11111	<u></u>		NON-CR	YSTALLINE	ROCK			-	Ŧ								F	
	-	-													loderate to Slig META-ARGIL	LITE, with \	/ery Close to				‡								Ę	
		-											=	- 755.4	Close Fractu Indurated, wi	th clays sea	ams present	19.8			‡								-	
]	F											F		betv	veen fractu	res				ŧ								E	
		F											F	L	REC = 54%,						ŧ								E	
		F											F	-	Boring Termina Non-Crystalline	Rock (MET	ALION 755.4 IT IN A-ARGILLITE	1 2)		-	ŧ								-	
	1	-											F		Surficial Or	ganic Soil (0.0' to 0.3')				Ŧ								Ł	
													E	- 1	NOTE 1: Casing	Advancer	used from 14.	1'			Ŧ								F	
													E		to 14.8' due to confirm spoor	auger refus	sal. Unable to			-	Ŧ								-	
		E											E			ed into casi					ŧ								Ę	
	-	-											┝	- 1	OTE 2: Boring					-	‡								È.	
		F											F	is	a depth of 19. sue which cau						ŧ								Ę	
	1	F											F		inner barrel. Ur		ain Run 2 core				ŧ								Ł	
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GEO_GTM.GPJ_NC_DOT.GDT_5/11/24		-											F								‡								Ę	
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NCDOT BORE DOUBLE B5777	4	F											F								‡								F	
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SO	N	GEOLOGIST	A. Suttle				
					GROUN	D WTR (f	t)
3	80 ft LT	ALIGNMENT	-L-		0 HR.	Dr	ry
١G			573,122		24 HR.	Dr	•
	- /-	Casing w/ Advance	-	Намме	ER TYPE	Automatic	,
		<u> </u>				Automatic	
A	FE 04/22/24	SURFACE WA	AIER DEP	TH N/A	٩		
	D	ESCRIPTION AN	D REMARK	S			
/. (f	t)					DEPTH	(ft)
		Begin Coring (@ 14.8 ft				4.0
1	Moderate to Slightly V		Gray META	-ARGILL		Very	4.8
	Close to Close Fract		emely Indura			ams	
1	١					<u>ا</u>	9.8
	Boring Terminat	GSI = 2 ed at Elevation 75	55.4 ft In Noi	n-Crystal	lline Rock	/	
	-	(META-ARC		-			
	S	urficial Organic S	oil (0.0' to 0	.3')			
	NOTE 1: Casing Adv Unable to confirm	ancer used from spoon refusal du	14.1' to 14.8 e to materia	3' due to Ils cored	auger ref into casi	usal. ng.	
	NOTE 2: Boring tern circulation issue w	hich caused core	barrel to fu	se with i	nner barr		
	Unable to	o obtain Run 2 co	re sample fr	om barre	el.		

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





WBS 45733.1.1 TIP B-5777 COUNT	Y DAVIDSON	GEOLOGIST A. Suttle	WBS 45733.1.1	TIP B-5777 COUNT	TY DAVIDSON	GEOLOGIST A. Suttle
SITE DESCRIPTION Replace Bridge No. 58 on NC 109 over US 64		GROUND WTR (ft)	SITE DESCRIPTION Replace Bridg	ge 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	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	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% 04/02/202	24 DRILL METHOD NV	V Casing w/ Advancer HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE ECS		24 DRILL METHOD NW	V Casing w/ Advancer HAMMER TYPE Automatic
DRILLER C. Osborne START DATE 04/23/24	COMP. DATE 04/23/24	SURFACE WATER DEPTH N/A	DRILLER C. Osborne	START DATE 04/23/24	COMP. DATE 04/23/24	SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW COUNT BLOWS PER FOOT	SAMP.	SOIL AND ROCK DESCRIPTION	CORE SIZE N/A	TOTAL RUN 10.4 ft		
(ft) (ft) (ft) 0.5ft 0.5ft 0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft) DEPTH (ft)	ELEV RUN DEPTH RUN DRILL	RUN STRATA REC. RQD SAMP. REC. RQD (ft) (ft) NO. (ft) (ft) (ft)		DESCRIPTION AND REMARKS
			(ft) ELEV (ft) (ft) (Min/ft)	(ft) (ft) NO. (ft) (ft)	G ELEV. (ft)	DEPTH (ft)
775		_774.7 GROUND SURFACE 0.0	762.4			Begin Coring @ 12.3 ft NON-CRYSTALLINE ROCK 12.3
		-	762.4 12.3 2.4 N=60/0.7 760 760.0 14.7 4:44/1.0 5.0 5:01/1.0 5:01/1.0	2 (2.0) (0.5) 83% 21% (10.0) (4.2) 96% 40%	Moderate to Very S	Slightly Weathered, Hard to Very Hard, Brown-Gray
770		-	5.0 \ <u>5:01/1.0</u> 5:2 <u>3/1.0</u>	1/ (5.0) (2.5) 100% 50%	Indurated,	with Very Close to Close Fracture Spacing, Extremely with clay seams present between fractures
		- Auger Probe to 12.3'	755 755.0 19.7 2.0 5.18/1.0 755 755.0 19.7 2.0 5.18/1.0 755 755.0 19.7 2.0 5.18/1.0			GSI = 55-60
	• • • • • •	-	755 755.0 19.7 4.20/10 5:18/1.0 3.0 5:23/1.0	(3.0) (1.2) 100% 40%		
765	-┼┧│ │ │ ┝	-	752.0 22.7 5:29/1.0 5:15/1.0	0 100% 40%	752.0	22.7
		- - <u>762.4</u>			Boring Termina	ated at Elevation 752.0 ft In Non-Crystalline Rock (META-ARGILLITE)
760 60/0.0		- NON-CRYSTALLINE ROCK Moderate to Very Slightly Weathered Hard			NOTE 1: Borinç	g offset from original EB2-A location due to water which caused core barrel to fuse with inner barrel.
		 to Very Hard, Brown-Gray META-ARGILLITE, with Very Close to 				
		Close Fracture Spacing, Extremely Indurated, with clay seams present			NOTE 2: Top of roc	ck elevation higher than previous location, confirmed with spoon refusal.
		between fractures				
		REC = 96%, RQD = 40%, GSI = 55-60 752.0 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.				
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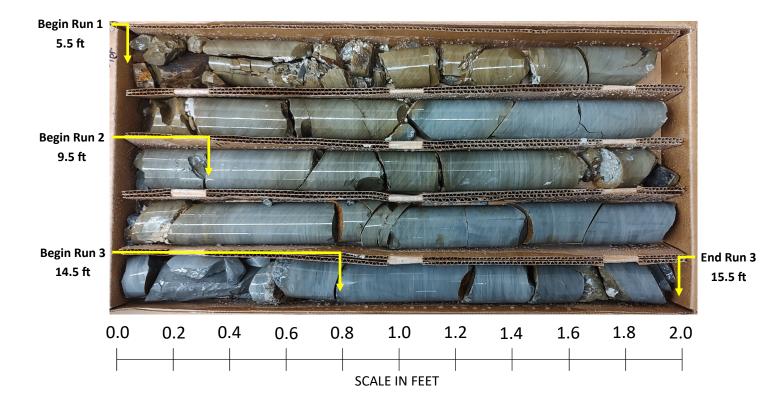
SCALE IN FEET

								-																					
WBS	4573	3.1.1			TI	I P B-5777	7	COUNT	Y DAVIDSC	N			GEOLOG	IST A. Sutt	le			WBS	4 5733	3.1.1			TIP	B-577	7	c	OUNTY	DAVID	SON
SITE	DESCR	RIPTION	Repl	ace Br	ridge N	o. 58 on N	C 109 over	US 64								GROUND	WTR (ft)	SITE	DESCR	RIPTION	Repl	lace Brido	ge No.	58 on N	IC 109 o	over US	64		
BORI	ing no	. EB2-	В		S	TATION 2	21+24		OFFSET '	19 ft RT			ALIGNM	ENT -L-		0 HR.	N/A	BOR	ING NO	. EB2-	В		STA	TION	21+24			OFFSET	19
COLI	LAR EL	. EV. 76	68.7 ft		т	OTAL DEP	TH 15.5	ft	NORTHING	737,5	86		EASTING	1,673,144	2	4 HR.	FIAD	COL	LAR EL	. EV. 76	68.7 ft		тот	AL DE	PTH 1:	5.5 ft	1	NORTHI	NG
DRILI	L RIG/HA	AMMER E	FF./DA	TE E	CS049	Diedrich [D-70 94%	04/02/202	24	DRILL N	NETHO) SP	T Core Boring		HAMMER	TYPE Au	utomatic	DRIL	L RIG/HA	MMER E	FF./DA	TE ECS	049 Di	edrich	D-70 94	1% 04/0)2/2024		[
		C. Osbor					E 05/01/2		COMP. DA	TE 05/	01/24		SURFAC	E WATER D	EPTH N/A				LER C				1		TE 05/			COMP. D	DATE
ELEV	DRIVE	DEPTH	BLC	w co	UNT		BLOWS	PER FOO	T	SAMP.			1						E SIZE						N 10.0				
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	Имо	O G	ELEV. (ft)	SUIL AND R	ROCK DESCF	RPTION	DEPTH (ft)	ELEV	RUN	DEPTH		DRILL	R	UN RQD	SAMP.		RATA RQD	L	
																		(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	(ft) %	(ft) %	NO.	(ft) %		Ö G _{ELE}	EV. (ft)
770																		763.2											
	707.7	T											768.7		JND SURFAC		0.0		763.2	5.5	4.0	3:24/1.0 3:44/1.0	(4.0)	(0.6)		(10.0)) (2.9) 29%	763.	.2
	767.7	<u>+ 1.0</u> +	86	24/0.1					100/0.6						(META-ARGI			760	759.2	9.5		3:17/1.0		1070		10070		<u>-</u>	
765	765.2	3.5	20	80/0.2	2					,			_						100.2	-	5.0	2:17/1.0	(5.0)	(1.9)					
	763.3	5.4	60/0.1	-									- 763.3 763.2	NON-CR	YSTALLINE R	OCK	5.4			‡		2:22/1.0		3070				3	
760		‡										霻			ETA-ARGILL	ITE)		755	754.2	14.5		2:36/1.0						- 7.9	2
700		‡												to Very H	Hard, Brown-C	Gray			755.2	- 15.5	1.0	2:23/1.0	100%	40%				753.:	
		‡												META-ARGÍLL Close Fractu	re Spacing, E	xtremely				Ŧ								Ł	
755		‡											_	Indurated, wi	ith clay seams veen fractures	s present				ŧ								F	
		<u>+</u>			4			•••		_		圍	753.2 F	EC = 100%, F	RQD = 19%. (SSI = 40-45	5 _ 15.5			Ŧ								Ē	
		ŧ											B	oring Terminat	ted at Elevatio	n 753.2 ft l	In		-	Ŧ								F	
		Ŧ													,		=)			Ŧ								F	
		ł												Surficial Org	ganic Soil (0.0	r to 0.3')				Ŧ								F	
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NCDOT BORE DOUBLE B5777_GEO_GTM.GPJ_NC_DOT.GDT_5/11/24		‡																	-	‡								Ł	
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SON	GEOLOGIST A. Suttle			
			GROUN	D WTR (ft)
19 ft RT	ALIGNMENT -L-		0 HR.	N/A
IG 737,586	EASTING 1,673,144		24 HR.	FIAD
DRILL METHOD SPT	Core Boring	HAMME	R TYPE	Automatic
ATE 05/01/24	SURFACE WATER DEPT	TH N/A	Ą	
D	ESCRIPTION AND REMARKS	S		
/. (ft)				DEPTH (ft)
META-ARGILLITE, w	Begin Coring @ 5.5 ft lightly Weathered, Hard to Ve ith Very Close to Close Fractu with clay seams present betwee GSI = 40-45	ure Spac	ing, Extre	ray 5.5 mely
		0	line D. 1	15.5
Boring Terminat	ed at Elevation 753.2 ft In Nor (META-ARGILLITE)	i-Crystal	iine Kock	
S	urficial Organic Soil (0.0' to 0	.3')		

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	
RS-1	B1-A	20+80	19' LT	14.1-14.5	100	76	Meta-Argillite	
RS-2	B1-B	20+84	22' RT	6.2-6.6	100	74	Meta-Argillite	
RS = NQ2 Rock	Core Barrel Samp	le (ASTM D-211	.3)					

	PROJECT REFERENCE NO.	SHEET NO.
	B-5777	17
Unit Weight	Unconfined Compressive	Strength
	Unconfined Compressive (PSI/KSF)	Strength
LB/FT ³	(PSI/KSF)	
LB/FT ³ 172.6	(PSI/KSF) 10,770 psi / 1,551 k	sf
LB/FT ³	(PSI/KSF)	sf
LB/FT ³ 172.6	(PSI/KSF) 10,770 psi / 1,551 k	sf



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

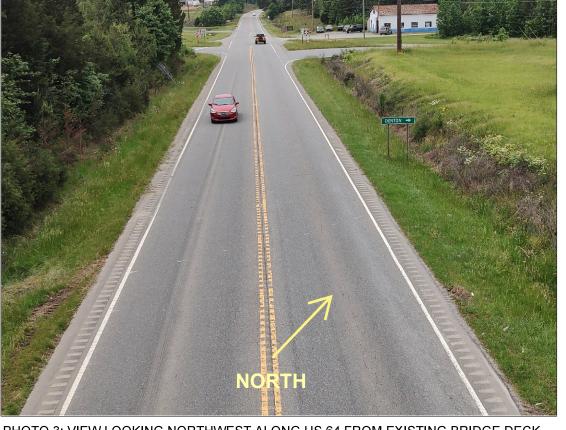
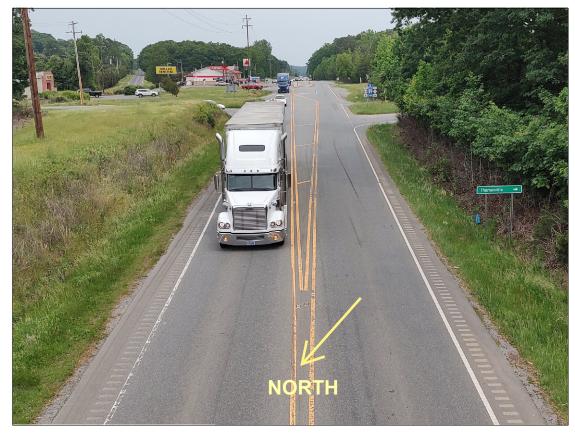


PHOTO 3: VIEW LOOKING NORTHWEST ALONG US 64 FROM EXISTING BRIDGE DECK.



END BENT 2, LOOKING DOWNSTATION.



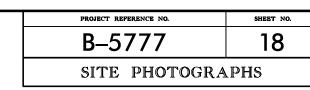


PHOTO 2: VIEW FROM -L- REALIGNMENT OF PROPOSED BRIDGE APPROACH AT

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