	CONTENTS	DESCRIPTION	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT
REFERENCE: BR-0115	<u>SHEET NO.</u> 2 2A 3 4 5-8 9-15 16	DESCRIPTION TITLE SHEET LEGEND (SOL & ROCK) SUPPLEMENTAL LEGEND (GSI) SITE PLAN PROFILE(S) CROSS SECTION(S) BORE LOG(S), CORE REPORT(S), & CORE PHOTOGRAPH(S) SITE PHOTOGRAPH(S)	STRUCTURE SUBSURFACE INVESTIGATION COUNTY Iredell SITE DESCRIPTION Bridge No. 166 on SR 1595 (Coolbrook Rd.) over Rocky Creek

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STATE N.C

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CAUTION NOTICE

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

GENERAL 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 BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLED DATA AND THE IN STUY (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION, THESS WATER LEVELS OR SOL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH THE 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 VIDUCTION THEORY OF CLEAR THE FIDE THE BIDDER OR CONTRACTOR IS CALITONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTWENT DOES NOT WARANT OR CLARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONSTRUCTIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HED DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FOM THE ACTUAL CONDENSIONS OF CONTANT THE SUBFRING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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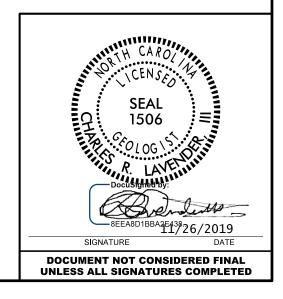
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DATE <u>November 2019</u>



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

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOI	L DESCRIPTION			GRADATION		T		ROCK DESCRIPTION
SOIL IS CONSIDERED UNCONSOLIDATED, SEM	-CONSOLIDATED, OR WEATHERED			TES A GOOD REPRESENTATION OF PARTICL			IS NON-COASTAL PLAIN MATE	ERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED.
BE PENETRATED WITH A CONTINUOUS FLIGH ACCORDING TO THE STANDARD PENETRATIC				NDICATES THAT SOIL PARTICLES ARE ALL S A MIXTURE OF UNIFORM PARTICLE SIZ		SPT REFUSA	AL IS PENETRATION BY A SPI	HICH NON-COASTAL PLAIN MATERIAL WOULD YIELD S PLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 F
IS BASED ON THE AASHTO SYSTEM. BA CONSISTENCY, COLOR, TEXTURE, MOISTURE, AA			OHF-ORHDED - INDICHTE	ANGULARITY OF GRAIN			NON-COASTAL PLAIN MATERI ED BY A ZONE OF WEATHEREI	IAL, THE TRANSITION BETWEEN SOIL AND ROCK IS D ROCK.
AS MINERALOGICAL COMPOSITION, AN	GULARITY, STRUCTURE, PLASTICIT	Y, ETC. FOR EXAMPLE,		Y OR ROUNDNESS OF SOIL GRAINS IS DE			RIALS ARE TYPICALLY DIVIDE	
VERY STIFF.GRAY.SILTY CLAY.MOIST WIT				NGULAR, SUBROUNDED, OR ROUNDED.	STORATED DT THE TENNS.	WEATHERED		COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT P
	ND AASHTO CLASSIFI	CATION	-	MINERALOGICAL COMPOSI	TION	ROCK (WR)	6 60	BLOWS PER FOOT IF TESTED.
GENERAL GRANULAR MATERIALS CLASS. (≤ 35% PASSING ■200)	SILT-CLAY MATERIALS (> 35% PASSING #200)	ORGANIC MATERIALS	MINERAL NA	MES SUCH AS QUARTZ, FELDSPAR, MICA, TA		CRYSTALLINE	E WOUL	TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK D YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCL
GROUP A-1 A-3 A-2	A-4 A-5 A-6 A-7	A-1, A-2 A-4, A-5	ARE USED IN	N DESCRIPTIONS WHEN THEY ARE CONSIDE	RED OF SIGNIFICANCE.	ROCK (CR)		SS, GABBRO, SCHIST, ETC. TO COARSE GRAIN METAMORPHIC AND NON-COASTAL
CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-4		A-3 A-6, A-7		COMPRESSIBILITY		NON-CRYSTAL ROCK (NCR)		MENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF
SYMBOL 0000000000				HTLY COMPRESSIBLE RATELY COMPRESSIBLE	LL < 31 LL = 31 - 50	COASTAL PL		TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. STAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT M
2 PASSING				LY COMPRESSIBLE	LL > 50	SEDIMENTAR	RY ROCK SPT I	REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTO
*10 50 MX		GRANULAR SILT- MUCK,		PERCENTAGE OF MATER	IAL	(CP)	SHELI	L BEDS, ETC. WEATHERING
■40 30 MX 50 MX 51 MN ■200 15 MX 25 MX 10 MX 35 MX 35 MX 35 M	(35 MX 36 MN 36 MN 36 MN 36 MN	SOILS SOILS PEAT	ORGANIC MATERIAL	GRANULAR SILT - CLAY SOILS SOILS	OTHER MATERIAL	FRESH		GHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK R
MATERIAL			TRACE OF ORGANIC M	ATTER 2 - 3% 3 - 5%	TRACE 1 - 10%	FRESH	HAMMER IF CRYSTALLINE.	GHT, FEW JUINTS MAT SHOW SLIGHT STAINING. ROCK RI
PASSING #40		SOILS WITH	LITTLE ORGANIC MAT MODERATELY ORGANIC		LITTLE 10 - 20% SOME 20 - 35%	VERY SLIGHT	A ROCK GENERALLY FRESH, JO	DINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COA
	41 MN 40 MX 41 MN 40 MX 41 MN 11 MN 10 MX 10 MX 11 MN 11 MN		HIGHLY ORGANIC	5 - 10% 12 - 20% > 10% > 20%	HIGHLY 35% AND ABOVE	(V SLI.)		ECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAM
	MX 8 MX 12 MX 16 MX NO MX	MODERATE ORGANIC		GROUND WATER		SLIGHT	OF A CRYSTALLINE NATURE.	
USUAL TYPES STONE FRAGS. SWE		ORGANIC	∇	WATER LEVEL IN BORE HOLE IMMEDIAT		(SLI.)		DINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL
OF MAJOR GRAVEL, AND SAND GRAVEL AND SAND GRAV		MATTER					CRYSTALS ARE DULL AND D	DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER I
MATERIALS SAND SHIND GRAVEL AND SH	NU 50115 50115			STATIC WATER LEVEL AFTER 24 H		MODERATE		ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS.
GEN. RATING EXCELLENT TO GOOD	FAIR TO POOR	FAIR TO POOR UNSUITABL	E VPW	PERCHED WATER, SATURATED ZONE, OR	WATER BEARING STRATA	(MOD.)		LDSPARS ARE DULL AND DISCOLORED,SOME SHOW CLAY. R BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH A
AS SUBURADE		POOR		SPRING OR SEEP			WITH FRESH ROCK.	
	LL - 30; PI OF A-7-6 SUBGROUP IS	> LL - 30	0.11	MISCELLANEOUS SYMBO	1.5	MODERATELY		DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FEL
		RANGE OF UNCONFINED		MISCELLANEOUS STABU	L3	SEVERE (MOD. SEV.)		JORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOS TH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WH
PRIMARY SOIL TYPE COMPACTNESS OF CONSISTENCY	PENETRATION RESISTENCE	COMPRESSIVE STRENGTH		ANKMENT (RE) 25/025 DIP & DIP DIRE			<u>IF TESTED, WOULD YIELD SF</u>	
	(N-VALUE)	(TONS/FT ²)		SCRIPTION - OF ROCK STRUC		SEVERE		DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVI
GENERALLY VERY LOOSE	< 4 4 TO 10		SOIL SYMBOL	DET DAT TEST BORI	ING SLOPE INDICATOR INSTALLATION	(SEV.)		STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE AGMENTS OF STRONG ROCK USUALLY REMAIN.
MATERIAL MEDIUM DENSE	10 TO 30	N/A		- 131 FM			IF TESTED. WOULD YIELD SP	PT N VALUES > 100 BPF
(NON-COHESIVE) DENSE VERY DENSE	30 TO 50 > 50		THAN ROADWA	ILL (AF) UTHER AUGER BORING	TEST	VERY SEVERE		DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF
VERY SOFT	< 2	< 0.25	INFERRED SOL		SOUNDING ROD	(V SEV.)		AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT O
GENERALLY SOFT	2 TO 4	Ø.25 TO Ø.5		MW -			VESTIGES OF ORIGINAL ROCH	K FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VAL</u>
SILT-CLAY MEDIUM STIFF MATERIAL STIFF	4 TO 8 8 TO 15	0.5 TO 1.0 1 TO 2	INFERRED ROOM	CK LINE MONITORING WEL	WITH CORE	COMPLETE		OCK FABRIC NOT DISCERNIBLE.OR DISCERNIBLE ONLY IN S. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS.
(COHESIVE) VERY STIFF	15 TO 30	2 TO 4	ALLUVIAL SOI	IL BOUNDARY A PIEZOMETER	SPT N-VALUE		ALSO AN EXAMPLE.	S. QUARIZ MAT BE PRESENT AS DIKES OR STRINGERS.
HARD	> 30	> 4			<u> </u>			ROCK HARDNESS
IEXIU	RE OR GRAIN SIZE			RECOMMENDATION SYMBO	JLS	VERY HARD	CANNOT BE SCRATCHED BY	KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS
U.S. STD. SIEVE SIZE 4	10 40 60 200			UNCLASSIFIED EXCAVATION -	ACCEPTABLE, BUT NOT TO BE		SEVERAL HARD BLOWS OF T	
OPENING (MM) 4.76	2.00 0.42 0.25 0.07	5 0.053	SHALLOW N		USED IN THE TOP 3 FEET OF	HARD		FE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLO
BOULDER COBBLE GRAVEL	COARSE FINE SAND SAND	SILT CLAY		ACCEPTABLE DEGRADABLE ROCK	EMBANKMENT OR BACKFILL	MODERATELY	TO DETACH HAND SPECIMEN.	FE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEN
(BLDR.) (COB.) (GR.)	(CSE. SD.) (F SD			ABBREVIATIONS		HARD		OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DET
GRAIN MM 305 75	2.0 0.25	0.05 0.005	AR - AUGER REFUSAL	MED MEDIUM	VST - VANE SHEAR TEST		BY MODERATE BLOWS.	
SIZE IN. 12 3			BT - BORING TERMINATE	D MICA MICACEOUS MOD MODERATELY	WEA WEATHERED γ - UNIT WEIGHT	MEDIUM HARD		D 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR LL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BI
SOIL MOISTURE	- CORRELATION OF	TERMS	CPT - CONE PENETRATIO		2 - DRY UNIT WEIGHT	HHD	POINT OF A GEOLOGIST'S PI	
	D 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 F
(ATTERBERG LIMITS) DE	SCRIPTION		DMT - DILATOMETER TES DPT - DYNAMIC PENETRA		ST <u>SAMPLE ABBREVIATIONS</u> S - BULK		FROM CHIPS TO SEVERAL IN PIECES CAN BE BROKEN BY	NCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT.
		QUID; VERY WET, USUALLY	e - VOID RATIO	SD SAND, SANDY	SS - SPLIT SPOON	VERY		E. CAN BE EXCAVATED READILY WITH POINT OF PICK. P
	SAT.) FROM BELOW	W THE GROUND WATER TABLE	F - FINE FOSS FOSSILIFEROUS	SL SILT, SILTY SLI SLIGHTLY	ST - SHELBY TUBE	SOFT		N BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED
PLASTIC	SEMISOL ID.	REQUIRES DRYING TO	FRAC FRACTURED, FRAC		RS – ROCK RT – RECOMPACTED TRIAXIAL		FINGERNAIL.	
(PI)		IMUM MOISTURE	FRAGS FRAGMENTS	w - MOISTURE CONTENT	CBR - CALIFORNIA BEARING		FRACTURE SPACING	
PLL PLASTIC LIMIT			HI HIGHLY	V - VERY	RATIO	VERY WID		
	DIST - (M) SOLID; AT O	R NEAR OPTIMUM MOISTURE		UIPMENT USED ON SUBJECT		WIDE	3 TO 10	
SL SHRINKAGE LIMIT				ADVANCING TOOLS:	HAMMER TYPE:	MODERATE CLOSE	ELY CLOSE 1 TO 3 F 0.16 TO 1	
- 09		DDITIONAL WATER TO	CME-45C			VERY CLO		
	ATTAIN OPT	IMUM MOISTURE	CME-55	6 CONTINUOUS FLIGHT AUGER	CORE SIZE:			THINLY LAMINATED < 0
	PLASTICITY			X 8 HOLLOW AUGERS	□-в □-н			INDURATION
Р	ASTICITY INDEX (PI)	DRY STRENGTH	CME-550	HARD FACED FINGER BITS	X-N WL-2	FOR SEDIME		S THE HARDENING OF MATERIAL BY CEMENTING, HEAT
NON PLASTIC	0-5	VERY LOW	VANE SHEAR TEST	TUNGCARBIDE INSERTS		FRIAB		RUBBING WITH FINGER FREES NUMEROUS GRAINS: ENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
SLIGHTLY PLASTIC MODERATELY PLASTIC	6-15 16-25	SLIGHT MEDIUM		X CASING X W/ ADVANCER	HAND TOOLS:			GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEE
HIGHLY PLASTIC	26 OR MORE	HIGH	PORTABLE HOIST			MODE		REARS CAN BE SEPARATED FROM SAMPLE WITH STEE BREAKS EASILY WHEN HIT WITH HAMMER.
	COLOR] _	TRICONE TUNGCARB.			G	RAINS ARE DIFFICULT TO SEPARATE WITH STEEL PF
DESCRIPTIONS MAY INCLUDE COLOR OR C			X <u>CME-550X</u>			INDUH		DIFFICULT TO BREAK WITH HAMMER.
MODIFIERS SUCH AS LIGHT, DARK, S						FXTR		HARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;
							c	SAMPLE BREAKS ACROSS GRAINS.

BR-0115



	TERMS AND DEFINITIONS
STED. AN INFERRED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
LD SPT REFUSAL. 0.1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
K IS OFTEN	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
SPT N VALUES >	ANOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
ROCK THAT INCLUDES GRANITE,	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
STAL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
L IF TESTED. ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
JT MAY NOT YIELD IDSTONE.CEMENTED	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.
CK RINGS UNDER	<u>DIKE</u> - A TABULAR BODY OF ICHEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
COATINGS IF OPEN.	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
HAMMER BLOWS IF	<u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
ROCK UP TO INAL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
MER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
CTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIG∖NAL POSITION AND DISLODGED FROM PARENT MATERIAL.
CLAY. ROCK HAS STH AS COMPARED	
	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
L FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
LOSS OF STRENGTH	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
DEVIDENT BUT	ITS LATERAL EXTENT.
S 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
ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
OF STRONG ROCK NAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
V VALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
Y IN SMALL AND	ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
ERS. SAPROLITE IS	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
ENS 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 BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
DEEP CAN BE	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
E OR PICK POINT. RD BLOWS OF THE	A 140 LB.HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF I FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1FOOT PER 60 BLOWS.
IN FRAGMENTS DINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
CK. PIECES 1 INCH	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEOMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
TCHED READILY BY	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
;	
THICKNESS	BENCH MARK: BM#I: RR SPIKE IN BASE OF 18" HICKORY, -BL- STA. 13+33.00, 64' RIGHT, N: 829,986, E: 1,407,394
4 FEET	N: 829,986, E: I,407,394 ELEVATION: N/A FEET
1.5 - 4 FEET 0.16 - 1.5 FEET	
0.03 - 0.16 FEET	NOTES:
.008 - 0.03 FEET < 0.008 FEET	FIAD= FILLED IMMEDIATELY AFTER DRILLING
HEAT, PRESSURE, ETC.	
.E.	
STEEL PROBE:	
L PROBE;	

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 B	Rock Mass (Marı	nos and Hoek,2	2000)			AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for 1
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 GOOD 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	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 fa 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	DEC	REASING SI	JRFACE QUA	ALITY 💳	⇒	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.
disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		70 [°]				B. Sand- stone with thun inter-
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets BLOCKY/DISTURBED/SEAMY - folded with angular blocks		5	0			layers of siltstone
formed by many intersecting			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 p

Tectonically Defo	ormed Hetero <u>c</u>	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 sıltstone or clayey shale with sandstone layers	70 60	A 50 B 40	С	DE	
leformed, ad/faulted, hale or siltstone deformed forming an tructure			30	F 20	
leformed silty forming a e with pockets jers of ransformed oieces.			¢	ŀ	+ ¹⁰

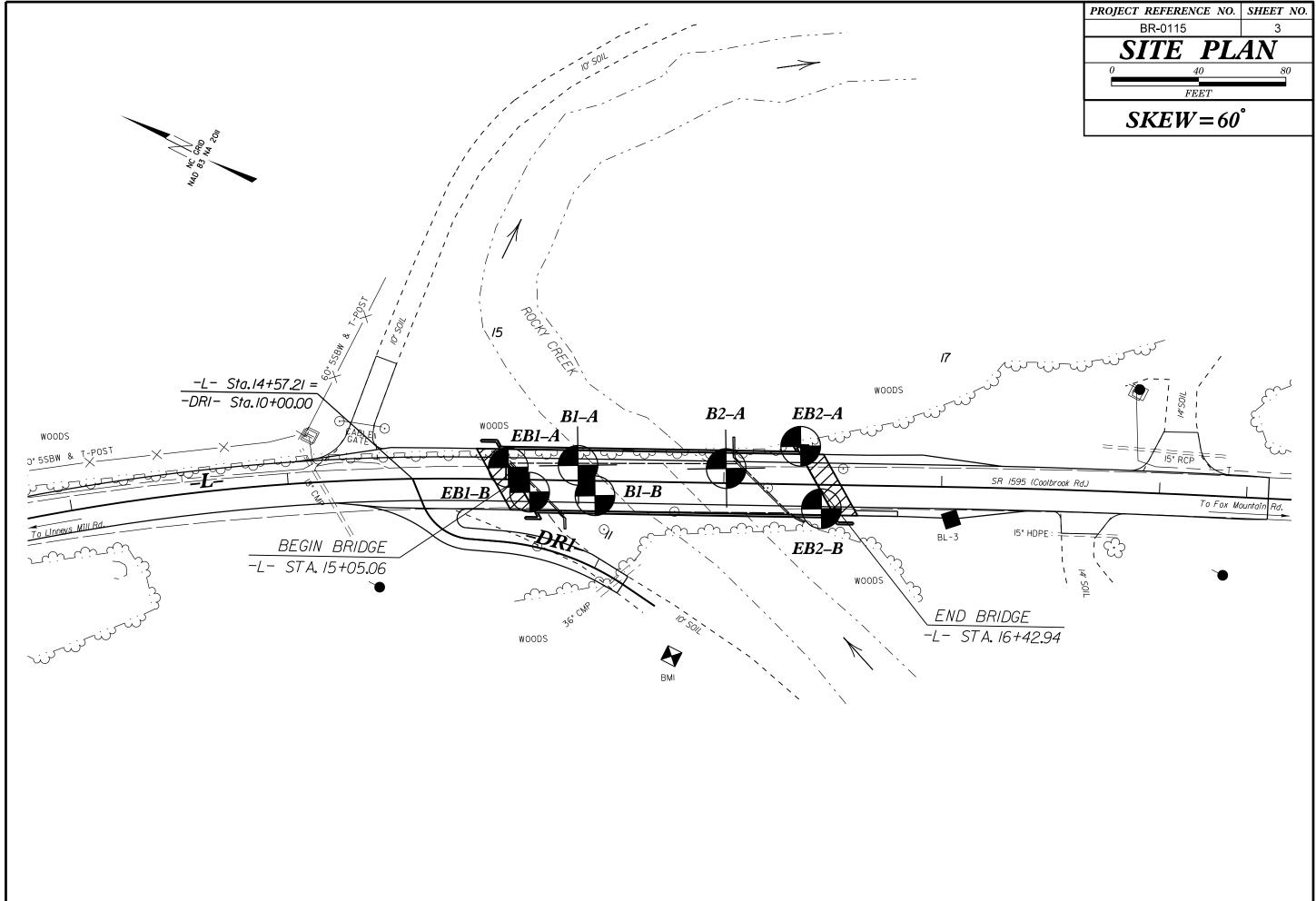
PROJECT REFERENCE NO.

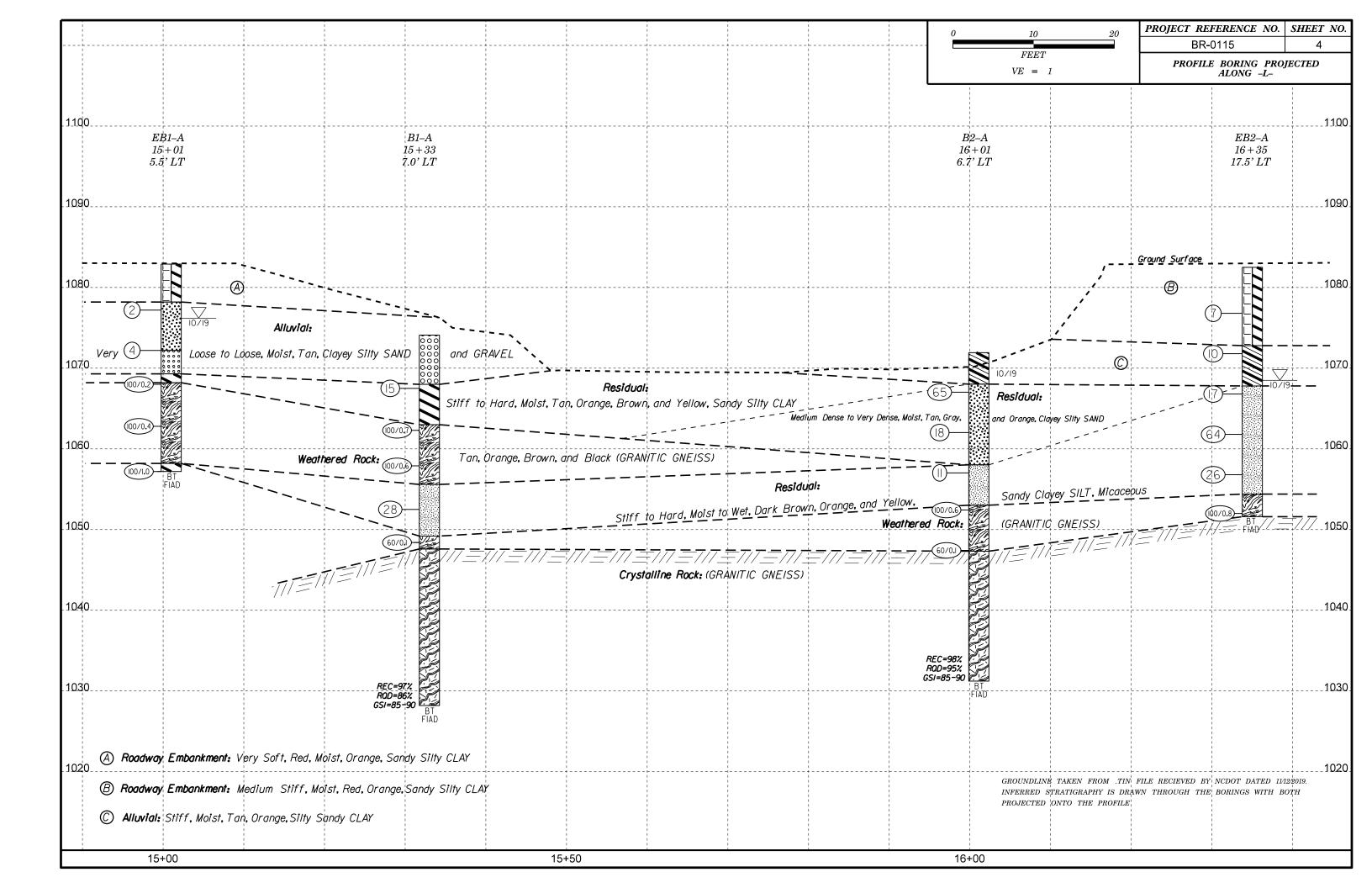
BR-0115

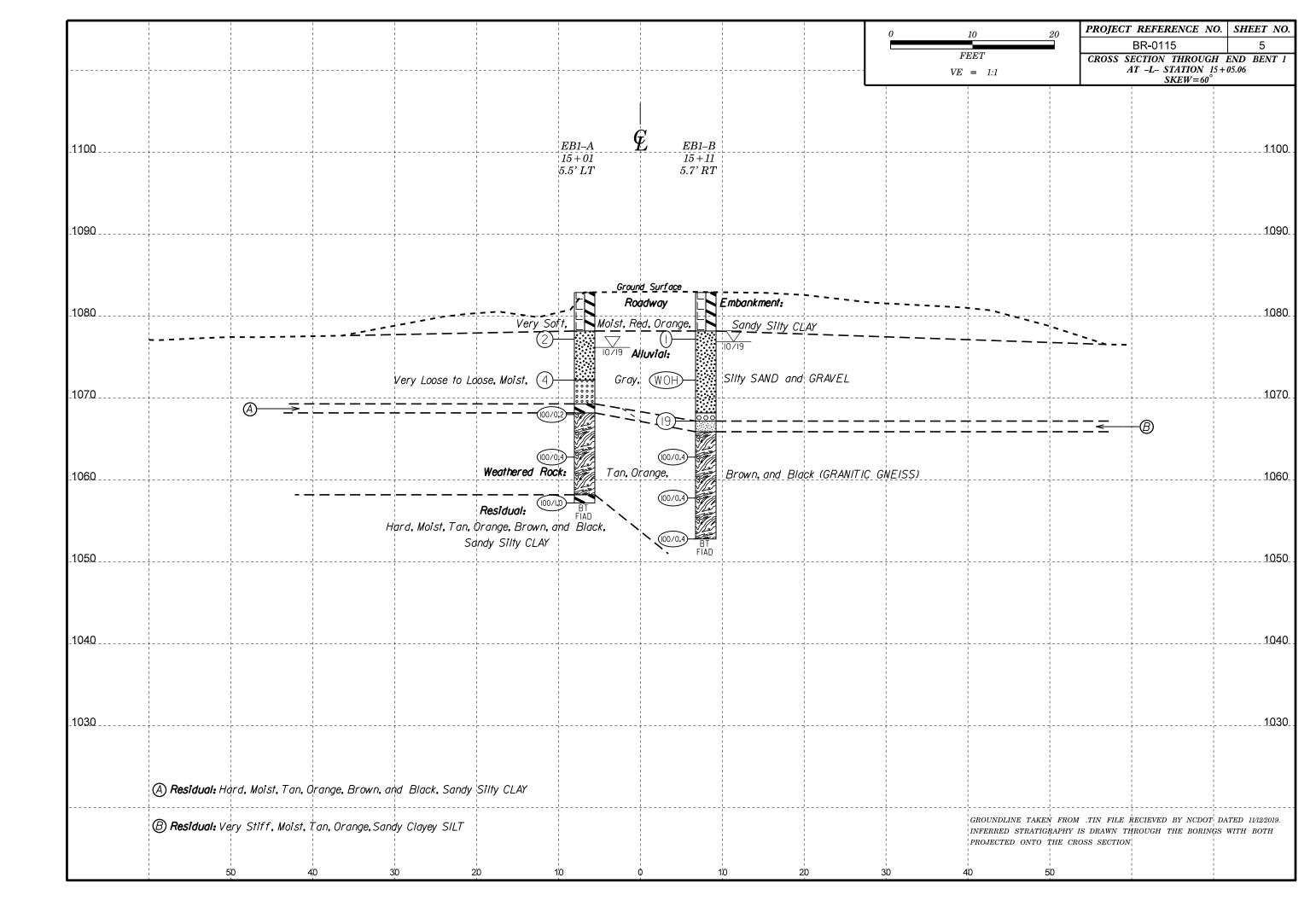
SHEET NO.

2A

DATE: 8-19-16

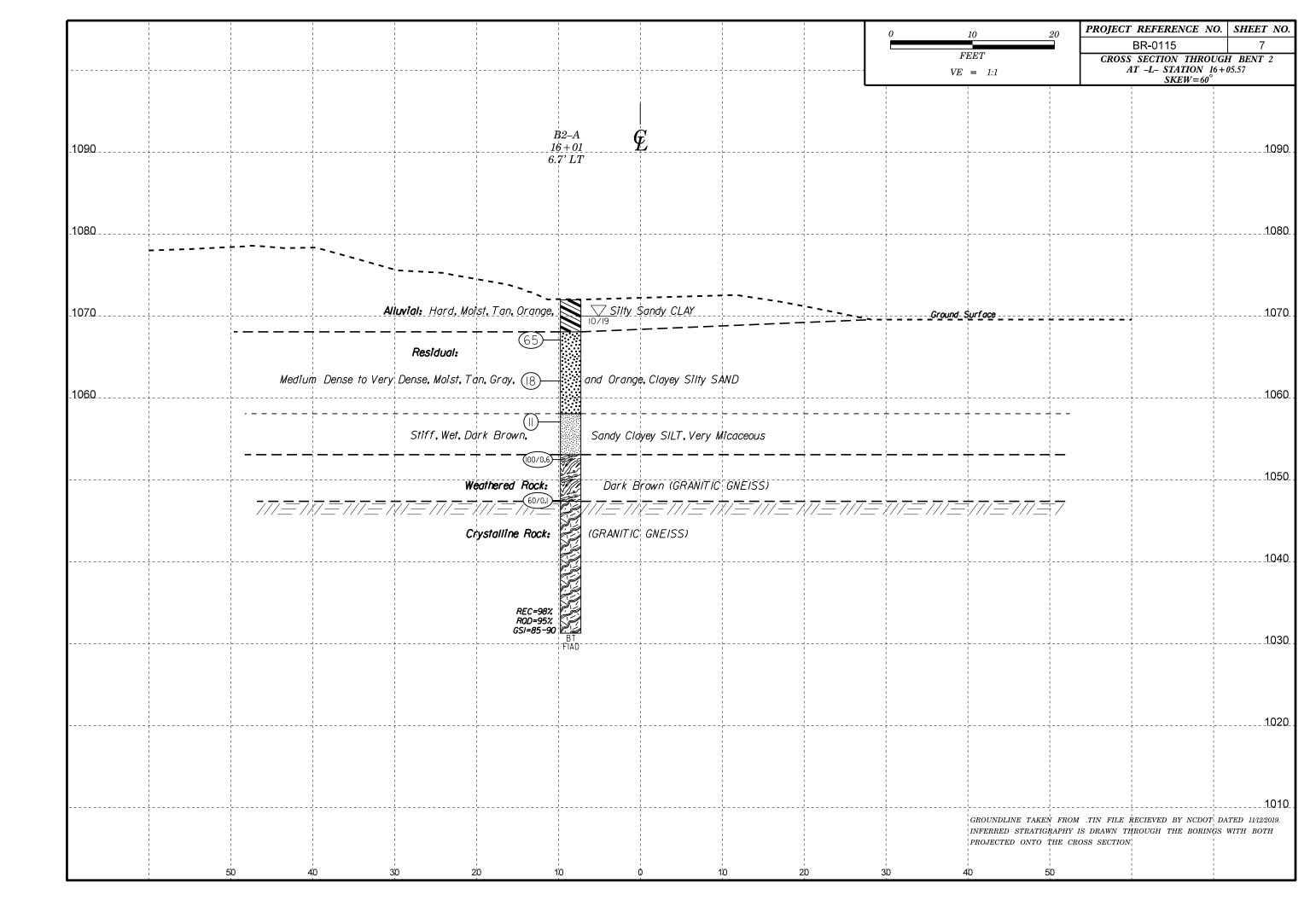


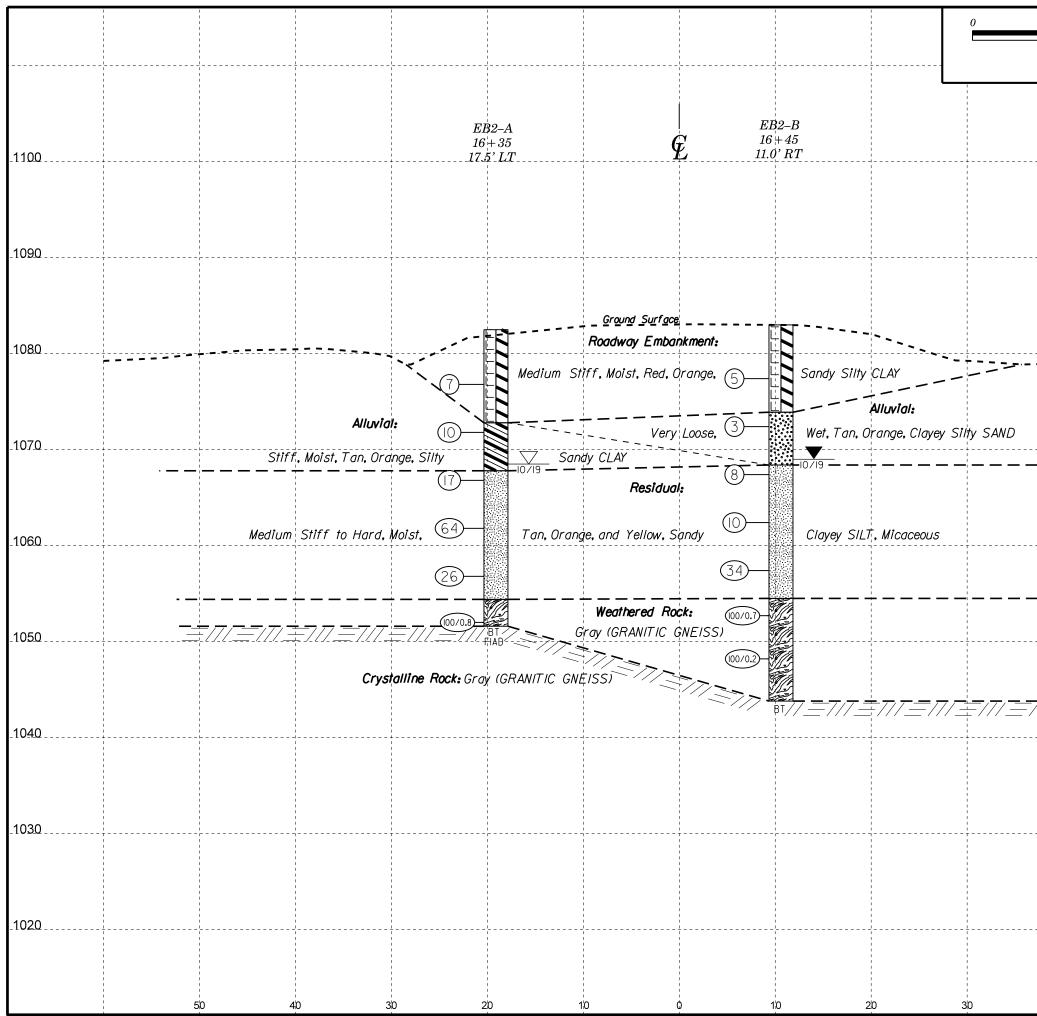




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			- - - - - - - - - - - - - - - - - - -		B1–A		<i>B1–B</i>			
_1090	 	, , , , ,	' ↓		15 + 3. 6.8' L'		15+41 6.7' RT	, , , , , ,		
			1 1 1 1 1		1 1 1 1					
_1080					, , ,			; ; ; ; ;		
		 	 		 			·		
						Alluvial:				
1070		Ground_Surface		Loose, Moist,	000 000 - 000	Tan, Orange		10719 Sandy GRAV	/FI	
	Stif	f to Very Stiff,	Residual: Moist. Tan. Yellov	v. Sandy Silty		CLAY				— — — — — — —
							(100/0.2)			
_1060		 	Weathere	d Pock.		Tan, Yellow,	Brown,	and Black (G	RANITIC GNEI	SSI
			· · · · · · · · · · · · · · · · · · ·				(00/1.0			y SILT, Micaceous
		Residu	al: Very Stiff to	o Hard, Moist, 28—		Dark Brow	100/0.2			<u>y 3127 , mrcdccoda</u>
_1050		· · · · · · · · · · · · · · · · · · · ·	Weather	red Rock: (60/0.1)		Tan, Yellow		and Black (G	RANITIC GNEI	ss)
	7/ <u>=</u> ///_	_7/77/7		V/	K	$T_{I}T = -$	(100/0.7)			
		1 1 1 1 1		Crystalline Rock:		(GRANITIC	GNEISS)			
1040		 	 	- 		 		 		
				1						
4000		 	1 1 1 1	REC=97% RQD=86% GSI=85-9						
.1030					BT					
			1 1 1 1 1		FĨAD					
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	10	20		REFERENCE N	
F	EET			BR-0115 SECTION THRO	6
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	1	1		SKEW=60°	1
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	GROUNDLINE TAK	EN FROM	TIN FILE	RECIEVED BY NCDOT	1
	INFERRED STRATI	GRAPHY I	S DRAWN TH	ROUGH THE BORIN	
	PROJECTED ONTO	THE CR	OSS SECTION		
4	¦ #0	50			
	l.				1

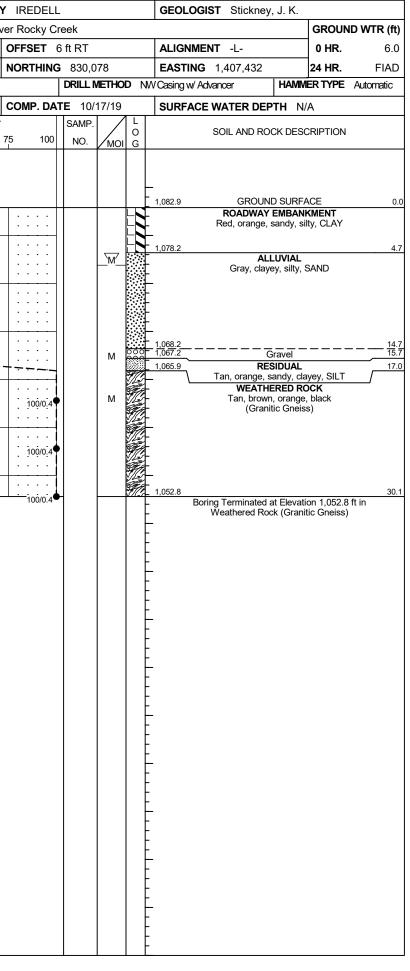




10)	20	PROJEC	CT REFE	RENCE N	0. SH	EET NO.
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VE =			CROSS	AT - L - J	THROUGH	4 END 6+42.94	BENT 2
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							1090.
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	ROUNDLINE TAKEN NFERRED STRATIGE						
	ROJECTED ONTO 1				2011114		
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14/200	0-4						0445		1												074						45	0011117
-	6711					BR-				Y IREDE					GEO	LOGIST Stic	kney, J. K.				67115			days M		BR-01		COUNTY
				ige No					ok Rd.) c	ver Rocky									• •					ige No				ok Rd.) ove
	ING NO					TATION				OFFSET					_	NMENT -L-		0 HR.	6.7		ING NO					ATION		
						OTAL D				NORTH						FING 1,407,4			IAD								TH 30.11	
						2 CME-550										w/ Advancer		NER TYPE Autom	atic								81% 06/04/	
DRIL	LER S	mith, C								COMP.			/19		SUR	FACE WATER	R DEPTH N	/A		DRIL	LER S					ART DAT	E 10/17/	
ELEV	DRIVE ELEV	DEPTH	·	W CO	_				PER FOO		SAI					SOIL AN	D ROCK DES	CRIPTION		ELEV (ft)	ELEV		·					PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25		50	75 1 I	00 N	o. /	моі	G	ELEV. (ft)		DEF	PTH (ft)	(ii)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50 7
l																												
1085		Ļ												-	_					1085		+						
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1080		‡						· · · · ·					L		-		WAY EMBAN ange, sandy, si			1080		ŧ						
1000	1,078.2	+				 							L		 				4.7	1060	1 070 0	+						
	1,078.2	4.7	1	1	1	• 2 · ·		· · · ·				7	M7		- 1,076.2		ALLUVIAL	0.4110	4.7		1,078.2	4./ -	1	0	1			
1075		t	1		1		•••					\vdash	\mathbf{x}		-	Gray	/, clayey, silty,	SAND		1075		t				[· · · ·	
-	1,073.2	9.7			<u> </u>								••••		-						1,073.2	9.7				1		
l		ł	WOH	WOH	4	4		· · · · ·			.		M		1,072.2	Gray, cla	vey, silty, sand	y, GRAVEL — —	<u>10.7</u>		.	ł	WOH	WOH No	WOH Recovery	•		
1070		Ŧ	1		1								0 0 0		- 				13.6	1070		Ŧ					+ • • • •	+ • • • •
	1,068.2	14.7	100/0.2	2		[.]		÷÷.	\rightarrow \rightarrow \rightarrow \rightarrow				М		1,068.2		RESIDUAL brown. and bla	ack. sandv. siltv. 1			1,068.2	14.7	7	6	13			
1065		‡						· · · · ·		· · · ·	• • •		2011		-	\	ĆLAY EATHERED RO	ack, sandy, silty, /		1065		ŧ					19 	+-:-:
1000	1,063.2	+									.		221152		-	Tan, or	ange, brown, a	and black,		1000	1,063.2	+						
1	1,003.2	- 19.7 -	100/0.4					· · · · ·	· · · ·	1 100/0	4		231162		-		(Granitic Gneis	5S)			1,003.2	+ 19.7	100/0.4	4				
1060		1									·		22		-					1060		ŧ.						
	1,058.2	24.7	10	58/0.5	_			· · · ·	· · · ·				24		- <u>1,058.2</u> - <u>1,057.2</u>				- <u>24.7</u> 25.7		1,058.2	24.7	100/0	4				
		<u> </u>	42	58/0.5	<u></u>					100/1	1 1				1,057.2		RESIDUAL brown, and bla	ack, sandy, silty, 厂	25.7			ŧ	100/0.4	4				
	-	Ŧ												F		Boring Termin	CLAY	tion 1,057.2 ft in		1055		Ŧ						
		Ŧ												F	-	Bonng rennin	sandy, silty CL/	AY			1,053.2	29.7	100/0.4	4				
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SHEET 9



											SOR										—									<u> </u>
WBS	67115.	1.1			Т	I P BI	R-01	15		COUN	ty iri	DELI	-			GEOL	OGIST Stick	ney, J. K.					67115.1.1				BR-01			OUNT
SITE	DESCRI	PTION	Brid	lge No	b. 166	on SR	R 159	95 (Co	oolbroo	ok Rd.) (_	-								OWTR (ft)			DESCRIPTIO		lge No. '	_		-	brook	Rd.) o
BOR	ing no.	B1-A			s	TATIC	ON ^r	15+3	3		OFF	BET	7 ft LT			ALIGN	MENT -L-		0 HR.	N/A	_		NG NO. B1-			-		15+33		
	LAR ELE								45.9 ft		NOR	THING	3 830,0				NG 1,407,45		24 HR.	FIAD			AR ELEV. 1					PTH 45		
DRIL	RIG/HAM	IMER E	FF./DA	TEH	FO0072	2 CME-	550X	92%	08/15/2	018			DRILL	METH	I DO	W Casing v	/ Core	HAMIN	IER TYPE	Automatic			RIG/HAMMER		TE HFC					5
DRIL	LER Sn	nith, C				TART	DAT		0/09/19			P. DA	TE 10	_	9		CE WATER	DEPTH N	/A				LER Smith, (-		TE 10/0		
ELEV (ft)		DEPTH (ft)		W CO	UNT 0.5ft			BI 25		PER FOO		100	SAMP	17			SOIL AND	ROCK DES	CRIPTION				RUN DEPTH	1	DRILL			N 19.4 1		
(14)	(ft)	(11)	0.5π	0.511	0.5π			25	5	1	75	100	NO.	/м	OI G	ELEV. (ft)				DEPTH (ft)		LEV (ft)	ELEV (ft)	H RUN (ft)	RATE (Min/ft)	REC. (ft)	UN RQD (ft)	SAMP. NO.	REC. (ft)	ATA RQD (ft) %
1075																					10	47.6	(11)		(10111711)	%	%		%	<u>%</u>
1075		-				Ш.									000	1,074.1	GRO	UND SURF	ACE	0.0	102		1,047.6 26.5	0.4		(0.4)	(0.0)		(18.9)	(16.7) 86%
	‡					:	: :		· · ·			· · · ·			000		Tan, orang	ALLUVIAL e, silty, sandy	y, GRAVEL		10	045	Ŧ	5.0		(5.0)	(3.2)		9170	00%
1070		-				-	. .	•				•••											1,042.2 31.9			100%				
	1,068.5	5.6	17	8	7	:	· ·		· · · · · ·			 		М	000	1,068.0		RESIDUAL		6.1	10	040	Ŧ	5.0		(4.8) 96%	(4.8) 96%		1	
1065	‡					:		2 .	· · · · · ·	 	· · · ·	· · · ·				∳ ∳	Tan, yello	w, sandy, sil	ty, CLAY				1 027 0 000							
1000	1,063.5	10.6						1.								1,063.0				11.1		Γ	<u>1,037.2 36.9</u>	5.0		(5.0)	(5.0)		1	
Ì			8	32	68/0.2		· ∟.					00/0.7				- <u>',000.0</u> -		THERED RO			10	035	+			100%	100%		1	
1060	1 +	-										•••						ranitic Gneis				╞	1,032.2 41.9	4.0		(3.7)	(3.7)		1	
	1,058.5	15.6	53	47/0.1	-	.	· · · · · ·		· · · · · ·	· · · ·		 00/0.6									10	030	‡	4.0		93%	(3.7) 93%			
1055						:	· · ·		· · · · · ·		· · · · · ·	••••				1,055.6		RESIDUAL		<u> </u>		-	1,028.2 45.9							
	1,053.5	20.6	14	16	12					· · · · ·		· · · ·				E	Dark brown,		y, SILT, very	,			ŧ							
	II		'4		12	·	· · ·	1	8			· · ·		M		E		micaceous					Ŧ							
1050	1,048.5															1,049.2				24.9			Ŧ							
	1,040.5		60/0.1			:	· · ·		· · ·	 	. • No Re	60/0.1 covery				- 1,047.6	(G	THERED RO	s)	26.5			Ŧ							
1045		-						· ·				• •						STALLINE R					Ŧ							
	‡					11	· · ·		· · · · · ·			· · ·				÷							Ŧ							
1040	‡					:	· · ·		· · · · · ·		· · · ·	· · ·											ŧ							
1040		-				11										<u>↓</u>							ţ							
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1030						11	· · ·		· · · · · ·			•••				ŧ.							‡							
	ļ							-								1,028.2				45.9			‡							
	II															E	Boring Termina Crystalline	ted at Elevati Rock (Grani	ion 1,028.2 fi tic Gneiss)	t in	11/24/19		Ŧ							
		-														F							Ŧ							
	1															F					GDT		Ŧ							
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GEOTECHNICAL BORING REPORT CORE LOG

						l			
				REDELL		GEOLOGIST Stickney,	J. K.		
oll	orook I	Rd.) oʻ	-	Rocky Cree		· · · · · · · · · · · · · · · · · · ·		1	ID WTR (ft)
6				FSET 7 f		ALIGNMENT -L-		0 HR.	N/A
	.9 ft /15/2018	<u> </u>	NO			EASTING 1,407,453		24 HR.	FIAD
		5				/Casing w/ Core			Automatic
-	9/19		co	MP. DATE	10/09/19	SURFACE WATER DEP	TH N/	A	
f	t STR	ΑΤΑ							
•	REC. (ft) %	RQD (ft) %	L		D	ESCRIPTION AND REMARKS	6		
	%	%	G	ELEV. (ft)					DEPTH (ft)
	(18.9)	(16.7) 86%		- 1,047.6	<u> </u>	Begin Coring @ 26.5 ft CRYSTALLINE ROCK			26.5
	97%	86%		-	Gray, white, fresh, ha	ard to very hard Granitic Gneis ide fracture spacing. GSI 85 -	s, mode 90.	rately close	e to
				-					
				-					
			Ê	F					
				F					
				F					
				1,028.2					45.9
				-	Boring Terminated	at Elevation 1,028.2 ft in Cryst Gneiss)	alline Ro	ock (Granit	ic
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CORE PHOTOGRAPHS: Bridge No. 166 on SR1595 (Coolbrook Rd.) over Rocky Creek, B1-A 15+33, 7.0' LT

2.0

1.8





0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	
L											
			1	1				1	1		
SCALE IN FEET											



1.0

SCALE IN FEET

1.2

1.4 1.6

0.0

.

0.2

0.4

0.6

0.8

End 41.9 feet

	WBS	67115	5.1.1			Т	IP	В	R-	01	115	5				С	οι	JN	IT
	SITE	DESCR	IPTION	l Brid	. 166	or	n SF	२ 1	ok Rd.) ov										
	BOR	ING NO.	B1-B			S	STATION 15+41												
		LAR ELE					TOTAL DEPTH 27.9 ft												
					TE H		0 CME-550X 81% 06/04/2018 START DATE 10/17/19												
		LER S		1			T/	ART	ſ D	A.	TE								
	ELEV (ft)	ELEV	DEPTH (ft)	BLC 0.5ft	0.5ft	JNT 0.5ft		0			2		LO	W		PEF 50	۲F	00	т
	()	(ft)	(,	0.51	0.51	0.511	╞	0			~	<u> </u>				ľ			
	1075								_										
		1,073.0	1.1	2	5	5		.		0	:	•	•	•	:		•	•	:
	1070	-	L					•	Ť.	•	•	•	•	•	·		•	•	•
		1,068.0	6.1					·	Ĺ			•				<u> </u> _	•	•	
	4005	-	-	100/0.3				· .				•	•		:	.	•	•	
	1065	+							:		:				:				<u>.</u>
		1,063.0	063.0 11.1 100/0.2			- .	:	•	•	•	:	:	:	.	•	•	:		
	1060	-	-					·	•	•	•	•	•	•	•		•	•	•
		1,058.0	16.1	35	57	43/0.5			:		:	•	:	:	:	:	-	:	:
	1055	-	-	35	57	43/0.5		· ·				•	•			.	•	•	
	1055	1,053.0									:				:	Γ.			
		- 1,053.0	- <u>-</u>	100/0.2				-	:	•	:	•	:	:	:	-	•	:	:
	1050	-	+					·	•	•	•	•	•	•	•				:
		1,048.0	26.1	53	47/0.2				:		:	•	:	:	:	-		:	:
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166_		-	-																
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NCDOT BORE DOUBLE BR0115_GEO_BRDG166_BL.GPJ NC_DOT.GDT 11/24/19		-	ŧ																
NC		-	t																

_	Y IREDELL				GEOLOGIST Stickney, J. K.	
)\	er Rocky Cre	ek				GROUND WTR (ft)
	OFFSET 7	ft RT			ALIGNMENT -L-	0 HR. 3.5
	NORTHING		51		EASTING 1,407,444	24 HR. FIAD
		DRILL N		DN		ER TYPE Automatic
	COMP. DAT		17/19		SURFACE WATER DEPTH N	A
Т	76 400	SAMP.	▼∕	L O	SOIL AND ROCK DESC	CRIPTION
	75 100	NO.	/моі	G	ELEV. (ft)	DEPTH (ft)
•					T 1,074.1 GROUND SURF/ ALLUVIAL	ACE 0.0
:			$\overline{}$		Tan, orange, silty, sandy	, GRAVEL
•					—	
-					1,068.0	6.1
•	_ 100/0.3				. WEATHERED RO Tan, yellow, and b	
				10	_ (Granitic gneis	s)
:				10		
•	100/0.2					
-	+				_	
•						
:	100/1.0				<u></u>	<u>18.0</u>
	+				RESIDUAL 1,054.1 Tan, yellow, and black, sand	y, clayey, SILT <u>20</u> .0
•	100/0.2					ČCK
•				10	Tan, yellow, and black, altern hard and soft	
	+				- (Granitic gneis	
•						
•	· 100/0.7				1,046.2 Boring Terminated at Elevation	27.9 on 1.046 2 ft on
					Crystalline Rock (Granit	ic Gneiss)
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GEOTECHNICAL BORING REPORT CORE LOG

													JR		.UG																							
WBS	6711	5.1.1				TIP	BR	R-011	5		со	UNTY	' IR	EDEL	L				GE	OLOG	SIST	Stickn	ey, J. K	ζ.				6 711						BR-01		I	COUN	
SITE	DESCI	RIPTIO	N Bri	dge N	lo. 1	66 on	ו SR	1595	5 (Co	olbro	ok Re	d.) ov	er Ro	ocky (Creek									GF	ROUNI	D WTR (ft)		DESCR			idge N				-	brook	Rd.)	ove
BORI	NG NC). B2-/	4			STA		N 1	6+01				OFF	SET	7 ft LT				ALI	GNMI	ENT	-L-		0	HR.	2.0		RING NO						ION				
COLL	AR EL	.EV. 1	,072.0) ft		тот		DEP	TH 4	40.7 f	ť		NOR	THIN	G 830	,003	3		EAS	STING	3 1,4	07,483	3	24	HR.	FIAD		LAR EL							PTH 40			N
DRILL	. RIG/H/	AMMER B	EFF./D	ATE	HFO	0070 C	ME-5	50X 8	31% (06/04/2	2018	1			DRILL	ME	THO	DN	W Casir	ng w/ C	Core		HAI	VIMER T	YPE	Automatic	DRIL	l Rig/Ha	MMER	EFF./D	ATE	HFC007	70 CM	E-550X	81% 06	/04/201	18	
DRIL	LER	Smith, C	D. L.			STA	ART	DATE	E 10)/10/1	9		CON	IP. DA	TE 1	0/10	/19		SUI	RFAC	E WA	TER D	EPTH	N/A			DRI	LER S	smith,	C. L.			STAR	RT DAT	E 10/	10/19		(
ELEV	DRIVE	DEPTH	H BL	OW C	OUN	τ			BL	OWS	PER F	=00T			SAM	P.		L O	T,								COF	RE SIZE	NWL	-2					1 6.1			
(ft)	ELEV (ft)	(ft)		t 0.5f	ft O	.5ft	0	:	25	:	50 I		75 I	100	NO.	. /	моі	G	ELEV.	. (ft)	501	L AND F	ROCK DE	SCRIP	HON	DEPTH (ft)	ELEV (ft)		DEPT (ft)	H RUN (ft)			REC. (ft) %	RQD (ft)	SAMP. NO.	REC. (ft)	RATA RQI (ft) %	
																												(ft)			(Mi	in/π)	%	%		%	%	+
1075		+																	F								1047.4	1,047.4 1.046.6	1 24.9	0.8		_	(0.8)	(0.8)		(15.8) 98%) (15.	3)
		Ŧ																	1,072.	0		GRO	JND SUF	RFACE		0.0	1045		+	5.0			<u>100%</u> (4.8)	100% (4.6)		98%	95%	° k
1070		+							<u> </u>		Τ.					7	$\overline{\nabla}$		-	-	Tor		ALLUVIA e, silty, s	L				1 0 1 1 0	Ŧ ,			1	96%	(4.6) 92%				li k
10/0	1 069 1	+							<u> </u>	~~].				1				 	1	Iai	i, orang	e, siity, s	anuy, C	LA I	3.9	1040	1,041.6	+ <u>30.4</u> +	5.2		-	(5.2) 100%	(4.9)				l.
	1,000.1	1 <u>7 3.9</u>	12	35		30	· · · ·	•••		 	$\left[\begin{array}{c} \\ \cdot \end{array} \right]$			 			М		1,000.		Top of	F	RESIDUA		CANE		10-0	1 -	ŧ			1	100%	94%				N.K.
1065		‡						• • •	• •	 	/_	· · ·	· ·	· · ·					Ļ		ran, g	ray, ora	nge, clay	ey, siity	, JANL	,		1,036.4	± 35.6									N.K.
	1,063.1	8.9	15	10		8		•••	<u> -</u> :	/	:	 		 					-								1035		‡	5.1			(5.0) 98%	(5.0) 98%				N.K.
1000		‡	15	10		°		•¶18	3	 	:	 		 			М												‡			ľ						
1060		+						 	+		+:		+		1				-									1,031.3	40.7	_	_							P
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1055		±							1~	· <u>·</u> ·.	L.								L			I	micaceou	IS					ŧ									
	1,053.1	18.9							· ·	· · ·									1,053.	1								_	ŧ									
		Ŧ	42	58/0	.1					 	.	· · ·		100/0.6	•								THERED Dark brov						ŧ									
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1045		Ŧ					· · · ·			· · ·		· · ·		• • •									TALLINE anitic Gn						Ŧ									
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			RE LOG		1				
C	OUNT	Y II	REDELL		GEOLOGIST	Stickne	/, J. K.		
rook l	Rd.) ov	ver F	Rocky Creek					GROUN	D WTR (ft)
		OF	FSET 7 ft LT		ALIGNMENT	-L-		0 HR.	2.0
7 ft		NO	RTHING 830,003		EASTING 1,	407,483		24 HR.	FIAD
04/2018	3		DRILL METHOD) NM	V Casing w/ Core		HAMM	ER TYPE	Automatic
0/19		со	MP. DATE 10/10/19		SURFACE WA	ATER DE	PTH N/	A	
STR REC.	RQD	L O		C	DESCRIPTION AN	D REMAR	s		
(ft) %	(ft) %	G	ELEV. (ft)						DEPTH (ft)
(15.8)	(15.3)	7-2	- 1,047.4		Begin Coring (CRYSTALLIN	@ 24.6 ft			24.6
98%	95%			sh, ha	rd to very hard Gra GSI 85	anitic Gneis	s, wide fr	acture spa	
			-		631 63	- 90.			
			-						
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		P	- - 1,031.3						40.7
			Boring Term	inated	l at Elevation 1,03 Gneis	1.3 ft in Cry	stalline Ro	ock (Granit	c
			-		Gileis	5)			
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CORE PHOTOGRAPHS: Bridge No. 166 on SR1595 (Coolbrook Rd.) over Rocky Creek, B2-A 16+01, 7.0' LT



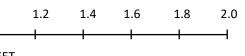
SCALE IN FEET



0.0 0.2 0.4 0.6 0.8 1.0 SCALE IN FEET

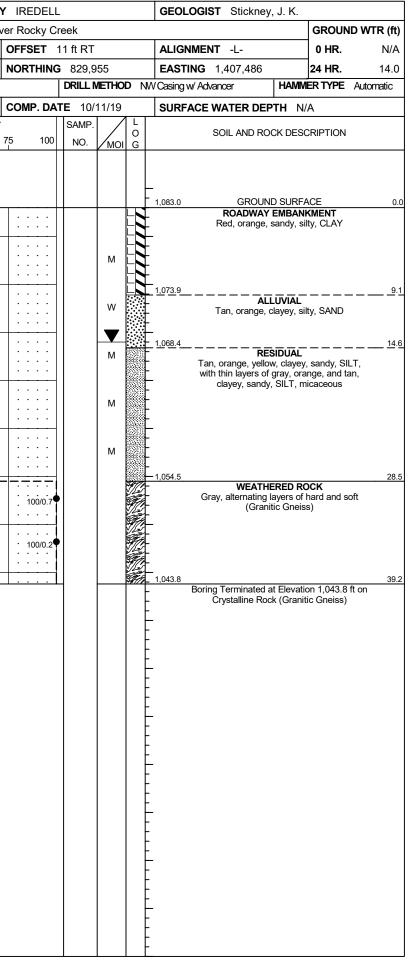
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End 40.7 feet



SITE DESCRIPTION Bridge No. 166 on SR 1595 (Coolbrook Rd.) over Rocky Creek GROUND WTR (ft) SITE DESCRIPTION Bridge No. 166 on SR 1595 (Coolbrook Rd.) over Rocky Creek BORING NO. E82-A STATION 164-35 OFFSET 18 ft.LT ALIGNMENT -L- 0 HR. 140 HR. Fi/AD COLLAR ELEV. 1.082.5 ft TOTAL DEPTH 30.9 ft NORTHING 829.977 EASTING 1.407.507 24 HR. Fi/AD COLLAR ELEV. 1.083.0 ft TOTAL DEPTH 30.9 ft NORTHING 829.977 EASTING 1.407.507 24 HR. Fi/AD DRILL ROHAMMER EFF/ADE H-COURCE 450X 82% GRUL ROHAMMER EFF/ADE H-COURCOL4550X 82% GROUND VERT 10/11/19 SURFACE WATER DEPTH N/A DRILLER CHAMMER EFF/ADE H-COURCE-550X 87% DRILLER Smith, C. L. START DATE 10/11/19 COURP. DATE 10/11/19 SURFACE WATER DEPTH N/A LEV DRIN ROK 00000T BLOW COUNT BLOW SERFFOOT SOUL AND ROCK DESCRIPTION DEPTH H ELOW COUNT BLOW COUNT										URE L																
BORING ND. EB2-A STATION 19+35 OFFSET 18 ft.LT ALIGNMENT -L- 0 HR. 140 COLLAR ELEV. 10.82.5 ft TOTAL DEPTH 30.9 ft NORTHING 829.977 EASTING 1.0/7.507 24 HR. FIAD COLLAR ELEV. 1.08.3.0 ft TOTAL DEPTH 39.2 ft I DRILL ROMANER FF7ATE I +COURCINE GOX V300 MOX000 DRILL ROMANER FF7ATE I +COURCINE GOX V300 MOX000 DRILL ROMANER FF7ATE I +COURCINE GOX V300 MOX000 DRILL ROMANER FF7ATE I +COURCINE (W MOX 004 MOX0000 MOX000 MOX0000 MOX000 MOX0000 MOX000 MOX0000 MOX0000 MOX0000 MOX0000 MOX000 MOX0000 MOX000 MOX0000 MOX0000 MOX0000 MOX000 MOX0000 MOX000 MOX0000 MOX000 MOX0000 MOX0000 MOX0000														GEOL	.OGIST Stick	kney, J. K.	1	-								COUNTY
COLLAR ELEV. 1.082.5 ft TOTAL DEPTH 30.9 ft NORTHING 629.977 EASTING 1.407.507 24 HR. FIAD DRULL ROMANNEE EFFLOATE HORDAL MORTHUNG 629.977 EASTING 1.407.507 24 HR. FIAD DRULL ROMANNEE EFFLOATE HORDAL FLOAT Image: Complex State Date: DRULL ROMANNEE FIAD COLLAR ELEV. 1.008.0 ft TOTAL DEPTH 39.2 ft 1 DRULL ROMANNEE START DATE: DRUL ROMANNEE FIAD COMP. DATE: 10/11/19 SURFACE WATER DEPTH DRUL ROMANNEE START DATE: 10/11/19 I IIIIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIII	SITE	DESCR	IPTION	Brio	dge No			,	ok Rd.) ov								GROUND WTR (ft	·				ge No				ok Rd.) ove
DRILL ROMANNEE EF-DATE HFCOR2 CME-550X 02% 09/15/2018 DRILLMETHOD NNI/Czang with Advancer HAMMER TYPE Alconsec DRILLER START DATE 10/11/19 COMP. DATE 10/11/19 SURFACE WATER DEPTH NA (m) 0 ost <	BOR	NG NO.	EB2-	-A		S	TATION 1	6+35		OFFSET	18 ft LT			ALIG	MENT -L-		0 HR. 14.0	BOF	ING NO.	. EB2	-В		S	TATION 1	6+45	1
DRILLER START DATE 10/11/19 COMP. DATE 10/11/19 SURFACE WATER DEPTH N/A LEV PRM BLOW COUNT BLOW SPER FOOT SAMP SOIL AND ROCK DESCRIPTION ELEV PRILLER Smith, C. L. START DATE 10/11/19 ILCWS PER FOOT 1085 0.51	COL	AR ELE	EV. 1,	082.5	ft	т	OTAL DEPT	TH 30.9 f	t	NORTHIN	G 829,9	977		EAST	ING 1,407,5	07	24 HR. FIAD	COL	LAR ELI	E V. 1,	083.0	ft	т	OTAL DEP	H 39.2 ft	t
LEV Deptrix BLOW COUNT BLOW SPER FOOT SAMP. NO. SOIL AND ROCK DESCRIPTION DEPTH (h) ELEV Depth (h) ELEV Depth (h) ELEV Depth (h) ELEV Depth (h) Depth (h) ELEV	DRILI	. RIG/HAI	MMER E	FF./DA	TE H	F00072	CME-550X 9	92% 08/15/2	2018		DRILL	METHO	DD N	W Casing	w/ Advancer	HAMM	ER TYPE Automatic	DRIL	l rig/ha	MMER E	FF./DA	TE H	FO0070	CME-550X 8	1% 06/04/2	2018
Internet in the left of an internet in the left of an internet of a second s	DRIL	LER S	mith, C). L.		S		E 10/11/1	9	COMP. DA	TE 10/	11/19)	SURF	ACE WATER	DEPTH N/	/Α	DRI	LER S	mith, C). L.		S	TART DATI	10/11/1	9
(fi) (fi) (fi) 0.5fi 0.	ELEV	DRIVE		1	ow co	UNT		BLOWS I	PER FOOT		SAMP.	▼/							DRIVE	1	1	W CO	UNT		BLOWS F	PER FOOT
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SHEET 15



Bridge No. 166 on SR 1595 (Coolbrook Rd.) over Rocky Creek

SITE PHOTOGRAPHS



Photograph No. 1: Looking at End Bent 1 toward End Bent 2



Photograph No. 2: Looking Downstream

SHEET 16