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TITLE SHEET LEGEND (SOIL & RO	ск)
SITE PLAN	
PROFILE	
CROSS SECTIONS	
BORE LOGS	
SITE PHOTOGRAPHS	

DESCRIPTION

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION _____

COUNTY ANSON

PROJECT DESCRIPTION BRIDGE NO. 11 ON NC 109 OVER DEADFALL CREEK

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5818	1	17

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 1919 TO7-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAIL

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

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

NOTES

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PERSONNEL

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SUBMITTED BY <u>P. ALTON, P.E.</u>

DATE NOVEMBER 2019



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

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

	SOIL I	DESCRIPTION			GRADATION		ROCK DESCRIPTION							
BE PENETRATED WI ACCORDING TO THE IS BASED ON	ED UNCONSOLIDATED, SEMI-CO ITH A CONTINUOUS FLIGHT PC E STANDARD PENETRATION TE THE AASHTO SYSTEM, BASIC	DWER AUGER AND YIELD LESS EST (AASHTO T 206.ASTM DI DESCRIPTIONS GENERALLY IN	THAN 100 BLOWS PER FOO 586). SOIL CLASSIFICATION CLUDE THE FOLLOWING:	UNIFORMLY GRADED -	ATES A GOOD REPRESENTATION OF PARTIC INDICATES THAT SOIL PARTICLES ARE ALL TES A MIXTURE OF UNIFORM PARTICLE SIZ	APPROXIMATELY THE SAME SIZE. ES OF TWO OR MORE SIZES.	ROCK LINE INDICATE SPT REFUSAL IS PE BLOWS IN NON-COA	ES THE LEVEL AT WHICH NON-COA ENETRATION BY A SPLIT SPOON SA ASTAL PLAIN MATERIAL, THE TRA	WOULD YIELD SPT REFUSAL IF TESTE(NSTAL PLAIN MATERIAL WOULD YIELD AMPLER EQUAL TO OR LESS THAN 0.1 NNSITION BETWEEN SOIL AND ROCK I					
)R, TEXTURE, MOISTURE, AASHT _OGICAL_COMPOSITION, ANGULA				ANGULARITY OF GRAIN			DI ZONE OF WEATHERED ROCK. RE TYPICALLY DIVIDED AS FOLLOW	vS:					
VERY STIFF.	GRAY.SILTY CLAY.MOIST WITH IN	TERBEDDED FINE SAND LAYERS.	HIGHLY PLASTIC.A-7-6		ITY OR ROUNDNESS OF SOIL GRAINS IS DE ANGULAR, SUBROUNDED, OR <u>ROUNDED</u> .	SIGNATED BY THE TERMS:	WEATHERED		IN MATERIAL THAT WOULD YIELD SPT					
	SOIL LEGEND AND GRANULAR MATERIALS	AASHTO CLASSIFIC	CATION		MINERALOGICAL COMPOSI	TION	ROCK (WR)	100 BLOWS PER FO						
GENERAL CLASS.	$(\leq 35\% \text{ PASSING *200})$	(> 35% PASSING *200)	ORGANIC MATERIALS		AMES SUCH AS QUARTZ, FELDSPAR, MICA, TA		CRYSTALLINE ROCK (CR)	WOULD YIELD SPT	GRAIN IGNEOUS AND METAMORPHIC ROC REFUSAL IF TESTED, ROCK TYPE INC					
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 DESCRIPTIONS WHEN THEY ARE CONSIDE	ERED OF SIGNIFICANCE.		GNEISS, GABBRO, SC	CHIST.ETC. GRAIN METAMORPHIC AND NON-COASTAL					
CLASS. A-1-a A-1-b	b A-2-4 A-2-5 A-2-6 A-2	2-7 A-7-5, A-7-6	A-3 A-6, A-7	SI I	COMPRESSIBILITY GHTLY COMPRESSIBLE	LL < 31	NON-CRYSTALLINE ROCK (NCR)		K THAT WOULD YEILD SPT REFUSAL IN DES PHYLLITE, SLATE, SANDSTONE, ETC.					
SYMBOL SCORES				MO	DERATELY COMPRESSIBLE	LL = 31 - 50	COASTAL PLAIN	COASTAL PLAIN SE	EDIMENTS CEMENTED INTO ROCK, BUT I					
% PASSING #10 50 MX			GRANULAR SILT- MUC		PERCENTAGE OF MATER	LL > 50	SEDIMENTARY ROCK (CP)	SPT REFUSAL. ROL	CK TYPE INCLUDES LIMESTONE, SANDST					
*40 30 MX 50 MX			GRANULAR CLAY MUC SOILS SOILS PEA				1	WEATH	HERING					
	1X 10 MX 35 MX 35 MX 35 MX 35	MX 36 MN 36 MN 36 MN 36 MN		ORGANIC MATERI TRACE OF ORGANIC		OTHER MATERIAL TRACE 1 - 10%		FRESH, CRYSTALS BRIGHT, FEW JOIN ER IF CRYSTALLINE.	TS MAY SHOW SLIGHT STAINING. ROCK R					
MATERIAL PASSING #40				LITTLE ORGANIC MA	TTER 3 - 5% 5 - 12%	LITTLE 10 - 20%	-		SOME JOINTS MAY SHOW THIN CLAY CO					
LL – PI 6 MX		MN 40 MX 41 MN 40 MX 41 MN	SOILS WITH LITTLE OR HIGH	MODERATELY ORGAN HIGHLY ORGANIC	IC 5 - 10% 12 - 20% > 10% > 20%	SOME 20 - 35% HIGHLY 35% AND ABOVE	(V SLI.) CRYST	TALS ON A BROKEN SPECIMEN FACE	SHINE BRIGHTLY. ROCK RINGS UNDER HA					
GROUP INDEX Ø	0 0 4 MX	MN 10 MX 10 MX 11 MN 11 MN 8 MX 12 MX 16 MX NO MX	MODERATE ORGA		GROUND WATER			CRYSTALLINE NATURE.						
USUAL TYPES STONE FRAGS			ORGANIC SOIL	s 🗸	WATER LEVEL IN BORE HOLE IMMEDIA				AND DISCOLORATION EXTENDS INTO ROC IN GRANITOID ROCKS SOME OCCASIONAL					
OF MAJOR GRAVEL, AND		SILTY CLAYEY SOILS SOILS	MATTER				CRYST	ALS ARE DULL AND DISCOLORED. CF	RYSTALLINE ROCKS RING UNDER HAMMER					
MATERIALS SAND		30123 30123			STATIC WATER LEVEL AFTER 24 H				SCOLORATION AND WEATHERING EFFECTS. DULL AND DISCOLORED, SOME SHOW CLAY					
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD	FAIR TO POOR	FAIR TO POOR UNSUIT	0 000	PERCHED WATER, SATURATED ZONE, OR	WATER BEARING STRATA	DULL	SOUND UNDER HAMMER BLOWS AND S	SHOWS SIGNIFICANT LOSS OF STRENGTH					
	PIOF A-7-5 SUBGROUP IS ≤ LL	- 30 ; PI OF A-7-6 SUBGROUP IS >			SPRING OR SEEP			FRESH ROCK.						
		CY OR DENSENESS			MISCELLANEOUS SYMBO	LS			R STAINED. IN GRANITOID ROCKS, ALL FE KAOLINIZATION. ROCK SHOWS SEVERE LO					
	COMPACTNESS OR	RANGE OF STANDARD	RANGE OF UNCONFINE		ARANKMENT (RE) 25/025 DIP & DIP DIR			CAN BE EXCAVATED WITH A GEOLOGIS STED, WOULD YIELD SPT REFUSAL	ST'S PICK. ROCK GIVES "CLUNK" SOUND W					
PRIMARY SOIL TYPE	CONSISTENCY	PENETRATION RESISTENCE (N-VALUE)	COMPRESSIVE STRENG (TONS/FT ²)		MBANKMENT (RE) 25/025 DIP & DIP DIRE DESCRIPTION - FROCK STRUC				R STAINED. ROCK FABRIC CLEAR AND EV					
GENERALLY	VERY LOOSE	< 4		SOIL SYMBO	L SPT DMT TEST BOR	ING SLOPE INDICATOR	(SEV.) REDUC	CED IN STRENGTH TO STRONG SOIL.	IN GRANITOID ROCKS ALL FELDSPARS AF					
GRANULAR	LOOSE MEDIUM DENSE	4 TO 10 10 TO 30	N/A	l ⊠*				DME EXTENT. SOME FRAGMENTS OF S STED, WOULD YIELD SPT N VALUES 2						
MATERIAL (NON-COHESIVE)	DENSE	30 TO 50			FILL (AF) OTHER AUGER BORING	CONE PENETROMETER			R STAINED. ROCK FABRIC ELEMENTS ARE					
	VERY DENSE	> 50				SOUNDING ROD			SOIL STATUS, WITH ONLY FRAGMENTS OF F ROCK WEATHERED TO A DEGREE THAT					
GENERALLY	VERY SOFT SOFT	< 2 2 TO 4	< 0.25 0.25 TO 0.5	INFERRED S		1			AIN. IF TESTED. WOULD YIELD SPT N VA					
SILT-CLAY MATERIAL	MEDIUM STIFF STIFF	4 TO 8 8 TO 15	0.5 TO 1.0 1 TO 2	INFERRED R	OCK LINE MONITORING WE	LL - TEST BORING WITH CORE			T DISCERNIBLE, OR DISCERNIBLE ONLY IN					
(COHESIVE)	VERY STIFF	15 TO 30	2 TO 4	ALLUVIAL S	OIL BOUNDARY A PIEZOMETER	SPT N-VALUE		AN EXAMPLE.	Y BE PRESENT AS DIKES OR STRINGERS.					
	HARD	> 30	> 4				-	ROCK H	ARDNESS					
	TEXTURE	OR GRAIN SIZE			RECOMMENDATION SYMB				RP PICK. BREAKING OF HAND SPECIMENS					
U.S. STD. SIEVE SIZE OPENING (MM)	4 10 4.76 2.00		270 0.053		UNCLASSIFIED EXCAVATION -	ACCEPTABLE, BUT NOT TO BE		RAL HARD BLOWS OF THE GEOLOGIST						
		COARSE FINE		SHALLOW	UNCLASSIFIED EXCAVATION -	USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		BE SCRATCHED BY KNIFE OR PICK OM ETACH HAND SPECIMEN.	NLY WITH DIFFICULTY. HARD HAMMER BLI					
	COBBLE GRAVEL (COB.) (GR.)	SAND SAND	SILT CLAY (SL.) (CL.)	UNDERCUT					OUGES OR GROOVES TO 0.25 INCHES DEE					
6041NL 144 205		(CSE. SD.) (F SD.)		AR - AUGER REFUSAL	ABBREVIATIONS MED MEDIUM	VST - VANE SHEAR TEST		VATED BY HARD BLOW OF A GEOLOGI DDERATE BLOWS.	ST'S PICK. HAND SPECIMENS CAN BE DE					
GRAIN MM 305 SIZE IN. 12	75 2.0 3	0.25	0.05 0.005	BT - BORING TERMINAT		WEA WEATHERED			DEEP BY FIRM PRESSURE OF KNIFE OR					
	SOTI MOISTURE -	CORRELATION OF	TERMS	CL CLAY CPT - CONE PENETRAT	MOD MODERATELY ION TEST NP - NON PLASTIC	2 - UNIT WEIGHT		BE EXCAVATED IN SMALL CHIPS TO F OF A GEOLOGIST'S PICK.	PEICES 1 INCH MAXIMUM SIZE BY HARD E					
SOIL MOISTURE		INTSTURE	IELD MOISTURE DESCRIPTI	CSE COARSE	ORG ORGANIC	$\gamma_{ m d}$ - DRY UNIT WEIGHT			KNIFE OR PICK. CAN BE EXCAVATED IN I					
(ATTERBERG L	LIMITS) DESCR	IPTION GOIDE FOR F	IELD MOISTURE DESCRIPTI	DMT - DILATOMETER T DPT - DYNAMIC PENET		ST <u>SAMPLE ABBREVIATIONS</u> S - BULK	FROM	CHIPS TO SEVERAL INCHES IN SIZE	BY MODERATE BLOWS OF A PICK POINT					
	- SATUR		UID; VERY WET, USUALLY	e - VOID RATIO	SD SAND, SANDY	SS - SPLIT SPOON		S CAN BE BROKEN BY FINGER PRESS	SURE. SAVATED READILY WITH POINT OF PICK.					
	ID LIMIT	.) FROM BELOW	THE GROUND WATER TABL	E F - FINE FOSS FOSSILIFEROUS	SL SILT, SILTY SLI SLIGHTLY	ST - SHELBY TUBE RS - ROCK	SOFT OR MO	DRE IN THICKNESS CAN BE BROKEN E	BY FINGER PRESSURE. CAN BE SCRATCHE					
PLASTIC		SEMISOLID; R	EQUIRES DRYING TO	FRAC FRACTURED. FR	ACTURES TCR - TRICONE REFUSAL	RT - RECOMPACTED TRIAXIAL	FINGE							
(PI) PL PLAST	- WET -	ATTAIN OPTI	MUM MOISTURE	FRAGS FRAGMENTS HI HIGHLY	ω - MOISTURE CONTENT V - VERY	CBR - CALIFORNIA BEARING RATIO		TURE SPACING	BEDDING					
					QUIPMENT USED ON SUBJECT		VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED					
	MUM MOISTURE - MOIST	- (M) SOLID; AT OR	NEAR OPTIMUM MOISTURE	DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:	WIDE MODERATELY CLO	3 TO 10 FEET OSE 1 TO 3 FEET	THICKLY BEDDED 1.5 THINLY BEDDED 0.16					
SL SHRIN	NKAGE LIMII			CME-45C	CLAY BITS	X AUTOMATIC MANUAL	CLOSE	Ø.16 TO 1 FOOT	VERY THINLY BEDDED 0.03					
	- DRY -		DITIONAL WATER TO MUM MOISTURE		6 CONTINUOUS FLIGHT AUGER	CORE SIZE:	VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED 0.008 THINLY LAMINATED <					
	PL	ASTICITY		X CME-55	X 2.25" I.D. HOLLOW AUGERS	□ -в □-н			RATION					
		TICITY INDEX (PI)	DRY STRENGTH	CME-550	HARD FACED FINGER BITS		FOR SEDIMENTARY F	ROCKS, INDURATION IS THE HARDEN	NING OF MATERIAL BY CEMENTING, HEA					
NON PLASTIC		0-5	VERY LOW		TUNGCARBIDE INSERTS		FRIABLE		FINGER FREES NUMEROUS GRAINS; BY HAMMER DISINTEGRATES SAMPLE.					
SLIGHTLY PLA MODERATELY		6-15 16-25	SL IGHT MEDIUM	VANE SHEAR TEST	CASING W/ ADVANCER	HAND TOOLS:								
HIGHLY PLAST		26 OR MORE	HIGH	PORTABLE HOIST			MODERATELY		E SEPARATED FROM SAMPLE WITH STE Y WHEN HIT WITH HAMMER.					
		COLOR			TRICONE 'TUNGCARB.	HAND AUGER	INDUDATED	GRAINS ARE DI	IFFICULT TO SEPARATE WITH STEEL P					
DESCRIPTIONS MAY	Y INCLUDE COLOR OR COLOF						INDURATED	DIFFICULT TO	BREAK WITH HAMMER.					
	SUCH AS LIGHT, DARK, STRE						EXTREMELY I		BLOWS REQUIRED TO BREAK SAMPLE; S ACROSS GRAINS.					
•							1	SAMPLE BREAK	S HUNDS UNHINS.					

PROJECT REFERENCE NO. **B-5818**

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TERMS AND DEFINITIONS D. AN INFERRED SPT REFUSAL. FOOT PER 60 ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. 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 A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. N VALUES > ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT HICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND °К ТНАТ SURFACE. LUDES GRANITE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. PLAIN COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. TESTED. . MAY NOT YIELD 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. FONE, CEMENTED $\underline{\text{DIKE}}$ - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. INGS UNDER $\underline{\text{DIP}}$ - The angle at which a stratum or any planar feature is inclined from the horizontal. ATINGS IF OPEN DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP. MEASURED CLOCKWISE FROM NORTH. MMER BLOWS IF $\underline{\mathsf{FAULT}}$ - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. UP TO FELDSPAR FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. BLOWS. \underline{FLOAT} - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIG1NAL POSITION AND DISLODGED FROM PARENT MATERIAL. ROCK HAS AS COMPARED FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. DSPARS DULL ISS OF STRENGTH HEN STRUCK. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDCE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. IDENT BUT RE 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 USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. DISCERNIBLE STRONG ROCK PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. ALUES < 100 BPF RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. IN SMALL AND . 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. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. REQUIRES SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND THE RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. OWS REQUIRED $\underline{\text{SLICKENSIDE}}$ - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. EP CAN BE TACHED STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF PICK POINT. A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOL VITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL BLOWS OF THE TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. $\frac{\text{STRATA CORE RECOVERY (SREC.)}{\text{TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY}{\text{TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.}$ RAGMENTS SMALL, THIN STRATA ROCK QUALITY DESIGNATION (SRQD) - 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. PIECES 1 INCH D READILY BY TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: TBM -BL4- 27' LT. -L- STA. 28+56 THICKNESS 4 FEET 5 - 4 FEET N: 394,113.9610, E: 1,641,571.7970 ELEVATION: 275.77 FEET - 1.5 FEET NOTES: - 0.16 FEET - 0.03 FEET 0.008 FEET T. PRESSURE. ETC EL PROBE: ROBE:

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

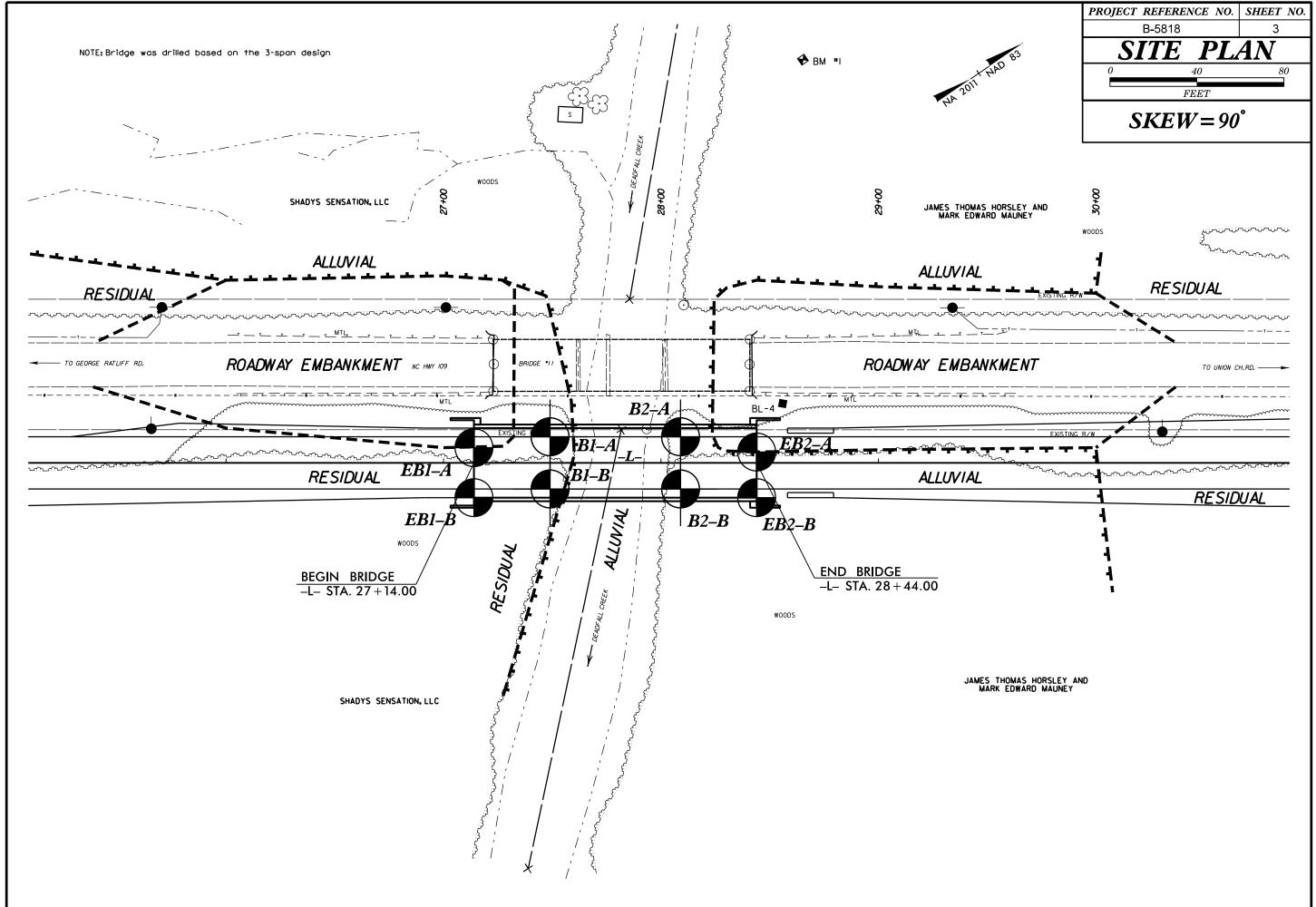
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

AASHTO LRFD Figure 10.4.6.4–1 $-$ Determination of GSI for Jointed F	Rock Mass (Marı	nos and Hoek,2	2000)			AASHTO LRFD Figure 10.4.6.4-2 $-$ Determination of GSI for T
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. STRUCTURE	VERY GOOD Very rough, fresh unweathered surfaces	BB B GOOD Surfaces Surfaces	BEFAIR A Smooth, moderately weathered and altered surfaces	 POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments 	V 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 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. COMPOSITION AND STRUCTURE
INTACT OR MASSIVE - intact						A. Thick bedded, very blocky sandstone
rock specimens or massive in situ rock with few widely spaced discontinuities	90			N/A	N/A	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
BLOCKY - well interlocked un- disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		70 60				Controlled Instability. B. Sand- stone with stone and the or siltstone or silty shale
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			thun inter- layers of siltstone amounts with sand- stone layers
formed by many intersecting			40	30		$ \begin{array}{c} \textbf{C, D, E, and G} & - \text{ may be more or} \\ \text{less folded than illustrated but} \\ \text{this does not change the strength.} \\ \text{Tectonic deformation, faulting and} \\ \text{loss of continuity moves these} \\ \text{categories to F and H.} \end{array} \right. \\ \end{array}$
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	Sandstone are trad into small rock pur → Means deformation after tectonic disturbance

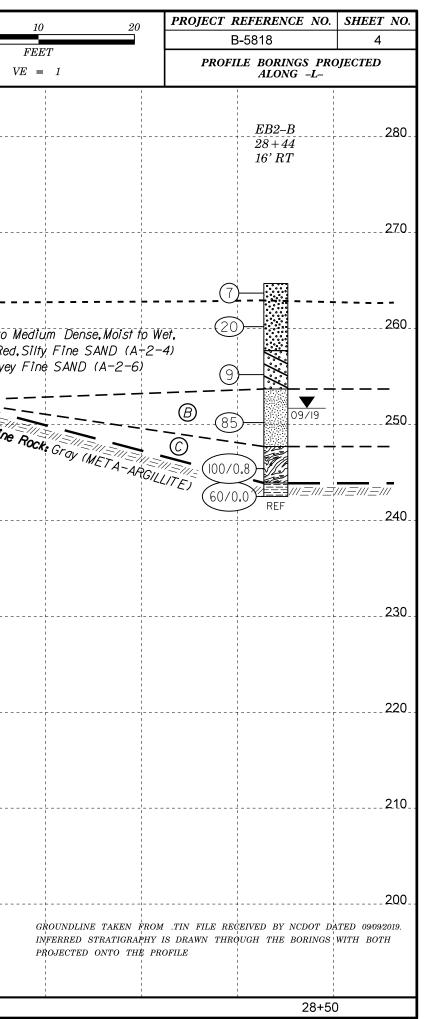
		B–5	818		2A
Fectonically Defo	ormed Heteroc	geneous Rock	Masses (Marin	ios and H	loek, 2000)
SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)	VERY GOOD - Very Rough, fresh unweathered surfaces	GOOD - Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered 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
	70 60	A			
E. Weak suitstone or clayey shale with sandstone layers		50 B 40	СС		E
formed, 1/faulted, ale or siltstone deformed forming an ructure			30	F/ 20	
formed silty orming a with pockets ars of ansformed neces.			¢		H ¹⁰

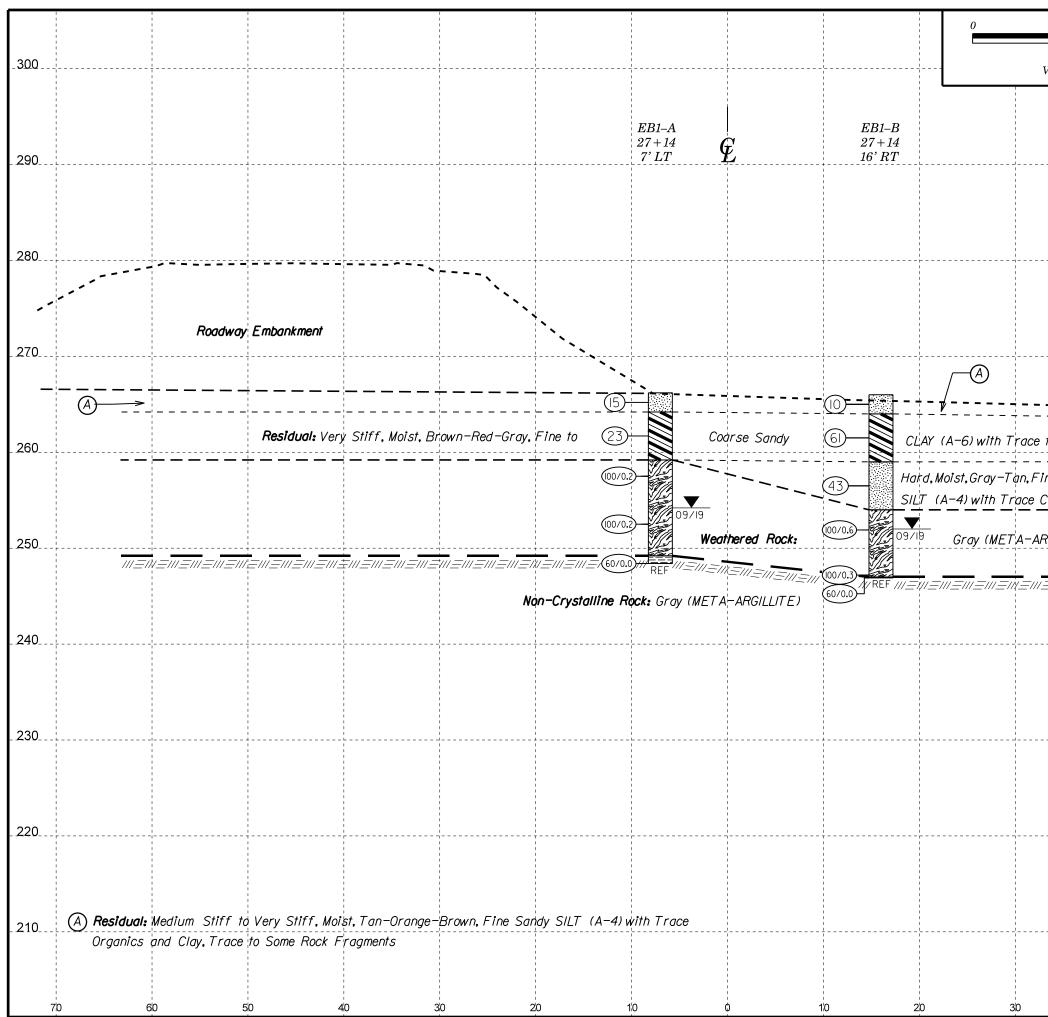
PROJECT REFERENCE NO.

SHEET NO.

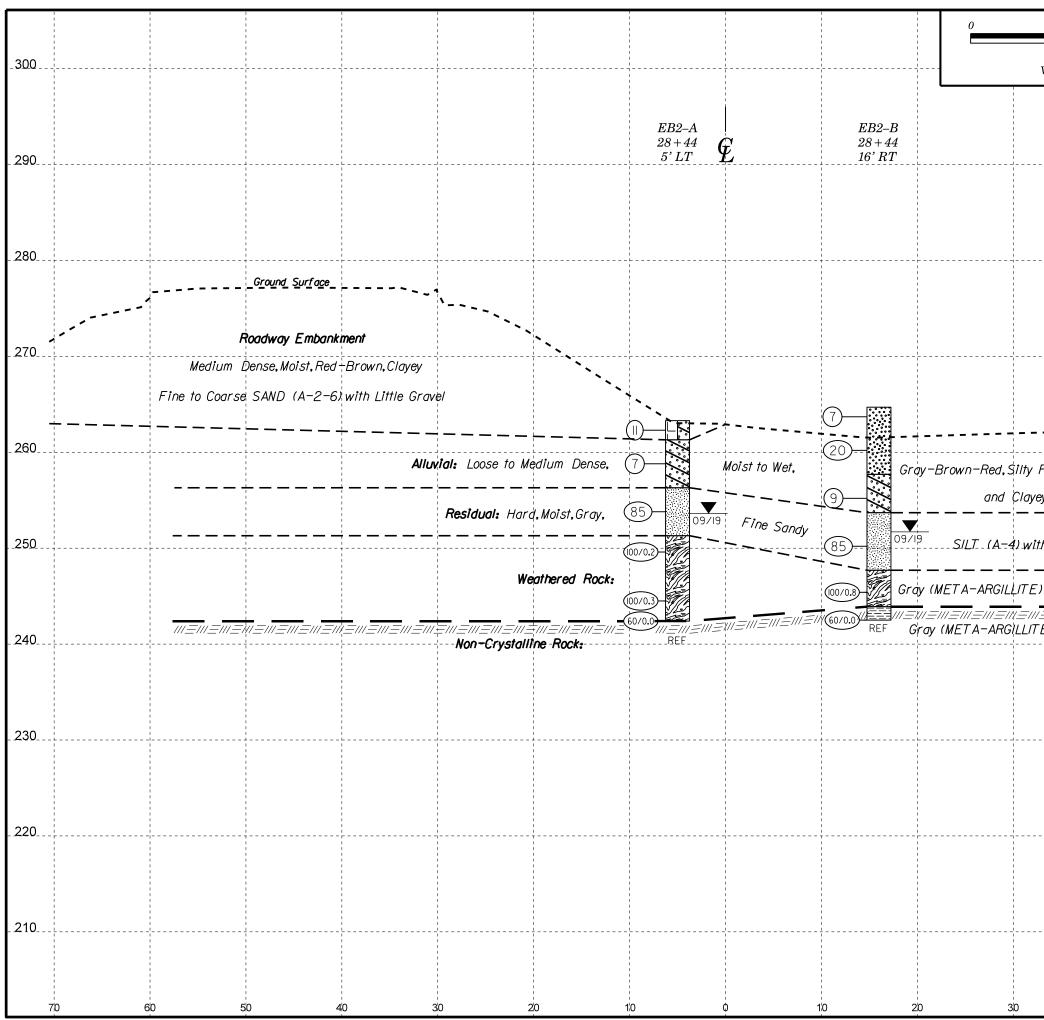


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l l		1		1	
	EB1-B			i I	
. 280	27+14	-+			
	$\frac{27+14}{16' RT}$				
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		- 			
l l		l l		1	
				1	
. 270					
1	$\neg \neg A$			1	
				i I	
	6 Residual: Very Stiff, Moist, Brown-Red-Gray, Fine to				
_ 260	Coarse Sandy CLAY (A-6) with Some Rock Fragments	\$	i i i		
		+ - •	DEADFALL CREFK		Alluvial: Loose to
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	· – – ` \	DEADFALL CREEK WATER SURFACE 2/17		Gray−¦₿rown−R
	(43) SILT (A-4) with Trace Clay and Rock Fragments				and Clay
l l		~~~_//_//_//_/////	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
	(00/0.6) Weathered North TE				
. 250	= $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$				Non-Cryce
					15/0///
/// <u>=</u> /	M REF Non-Crystaline	1		1	
	(60/0.0) NOI C				
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1	A Residual: Stiff, Moist, Brown-Tan, Fine Sandy SILT (A-4) with Trace	Oraanics			
				1	
	B Residual: Hard, Moist, Gray, Fine Sandy SILT (A-4) with Trace Rock F	ragments			
	Weathered Rock: Gray, META-ARGILLITE				
	Wearing teo Trock: Gray, META-ARGILLITE			1	
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	27+50			28+0	00





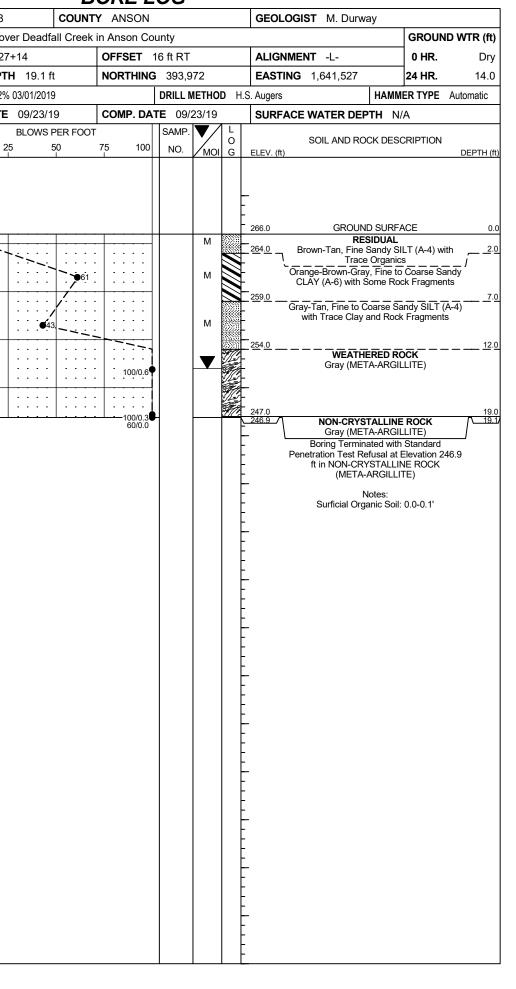
10	20	PROJECT REFER	RENCE NO.	SHEET NO.
FEET		B-5818		5
VE = 1:1		CROSS SECTION AT -L-	THROUGH STATION 27 KEW=90°	END BENT 1 +14
				290
+-		 		280
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				210
(Ground Surface			
to Some Roc				-
· 				260.
ine to Coarse Clay and Roc				
		<u>+</u>		
RGILLITE)				
		<u>;</u> 	<u></u>	-///
				240
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				210_
INFERRED		TIN FILE RECEIVED PRAWN THROUGH T S\$ SECTION	1	1
40		50	60	70



10 20	PROJECT REFERENCE NO.	SHEET NO.					
	B-5818	6					
FEET	CROSS SECTION THROUGH AT -L- STATION 28	END BENT 2 +44					
VE = 1:1	AT -L- STATION 28 SKEW=90°						
		290					
		280					
		270					
Fine SAND (A-2-4)		200					
- THE SAND ((A-2-4)							
y Fine SAND (A-2-6)							
h Trace Rock Fragments		250					
		_					
<i>≡///≡///≡///≡///≡///≡//</i> E)	<u> = = = = = = =</u> = =	=///=///=.					
_ / 		240					
		1 					
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GROUNDLINE TAKEN FROM	TIN FILE RECEIVED BY NCDOT D	!					
INFERRED STRATIGRAPHY I	S PRAWN THROUGH THE BORINGS						
PROJECTED ONTO THE CRO	DS\$ SECTION						
40	50 60	70					
+0		10					

GEOTECHNICAL BORING REPORT BORE LOG

										JREL							-									
	45771					P B-581				ANSON				G	EOLOGIST M. Durway	1	4 1		4577					P B-5818		CC
				lge No				eadfall		n Anson Co						GROUND WTR (ft)		SITE	DESCR	RIPTION	Bric	lge No.	11 or	NC 109	over Dea	dfall C
BOR	ING NO.	. EB1	-A		ST	TATION	27+14			OFFSET	7 ft LT			A	LIGNMENT -L-	0 HR. Dry	[BOR	ING NO	. EB1	-В		ST	ATION 2	27+14	
COL	LAR ELI	EV . 26	6.2 ft		тс	OTAL DEI	PTH 17	7.8 ft		NORTHIN	3 393,	985		E	ASTING 1,641,508	24 HR. 12.0	ļĪ	COLI	AR EL	EV. 26	6.0 ft		тс	TAL DEP	TH 19.1	1 ft
DRILL	L RIG/HA	MMER E	FF./DA	TE F8	R3495	CME-55 8	32% 03/01	/2019			DRILL	METHO	DD H	Ι.S. Αι	ugers HAMM	ER TYPE Automatic] [DRILL	RIG/HA	MMER E	FF./DA	TE F&	R3495	CME-55 82	2% 03/01/2	019
DRIL	.LER D). Tigno	or		ST	ART DA	TE 09/2	23/19		COMP. DA	TE 09	/23/19		S	URFACE WATER DEPTH N/	A	1	DRIL	LER [). Tianc	or		ST	ART DAT	E 09/23	3/19
	DRIVE			W CO	JNT		BLO	WS PEF	R FOOT		SAMP	. 💙 /	L				1 1	ELEV	DRIVE ELEV		1	DW COU			BLOW	
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50		75 100 I	NO.	мо	O I G	ELE	SOIL AND ROCK DESC	CRIPTION DEPTH (ft)	1 1	(ft)	ELEV (ft)	(ft)	·	0.5ft		0	25	50
270		Ļ																270								
	266.2													- 266	.2 GROUND SURFA	VCE 0.0			266.0	- - - 0.0						
265		F	3	6	9	· · · •	5					М		264	.2 Brown-Orange, Clavev Fine to	Coarse Sandy2.0		265	- 200.0	- 0.0	3	4	6			
	262.7	3.5			44		<u>, : :</u>		· · · · ·						.2 _ Brown-Orange, Clayey Fine to	nics and Rock]		262.5	- - 3.5					` † `;`,`	
260	-	‡	5	9	14		23	·	 . <u></u>	· · · · ·		M		F	Brown-Tan-Red, Fine to Coar	se Sandy CLAY		260		‡	12	30	31		· · · ·	:]].
200	-	ŧ												259	.2 (A-6) with Trace Rock F WEATHERED RO	7.0	4	260	-	‡					<u> </u>	
	257.7 -	8.5	100/0.2	5			· · · ·		 					F	Gray (META-ARGIL	LITE)			257.5	8.5	25	19	24			·/ :
255		t												F				255		Ŧ	20		27			43 -
	252.7 -	135												F			[- -						
		<u>- 13.5</u>	100/0.2						· · · · ·	. 100/0.2				F					252.5	+ 13.5 +	79	21/0.1				- -
250		Ŧ												- 249 - 248	.2	<u>17.0</u>	רו וי	250	-	Ŧ					· · · ·	
i i	248.4	<u>† 17.8</u> †	60/0.0					••		60/0.0	H	-		248	.4 NON-CRYSTALLINE Gray (META-ARGIL		4		247.5 246.9	+ - <u>18.5</u>						
	-	Ī												E	Boring Terminated with Penetration Test Refusal at E	Standard			246.9	+ 19.1	100/0.3 60/0.0					- -
1		ŧ													ft in NON-CRYSTALLIN (META-ARGILLI	IE ROCK			-	Ī						
	-	÷												F	Notes: Surficial Organic Soil:	0.0-0.2'				+						
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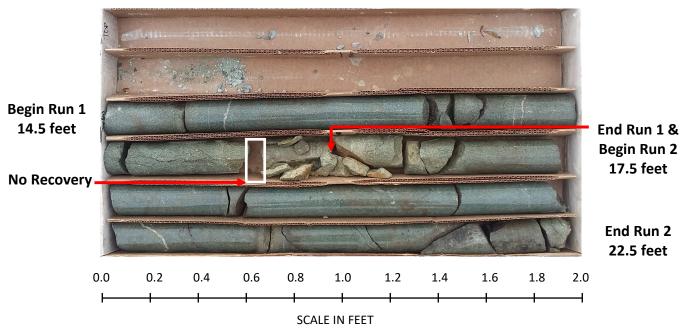


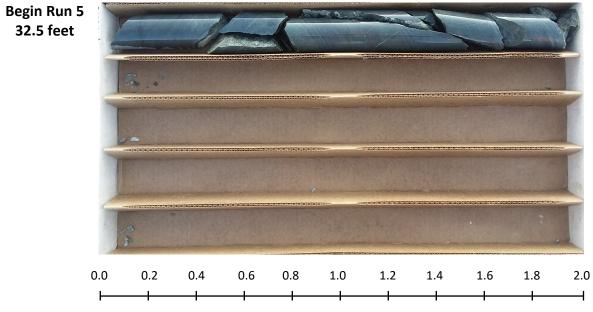
GEOTECHNICAL BORING REPORT CORE LOG

		BORE LOG								(
WBS 45771.1.1	TIP B-5818	COUNTY ANSON	GEOLOGIST M. Durway		WE	3S 45771.1.1		TIP B-5818 COU				
SITE DESCRIPTION Bridge N	o. 11 on NC 109 over Deadfal	Il Creek in Anson County		GROUND WTR (ft)	SIT	E DESCRIPTION	Bridge No	11 on NC 1	09 over De	adfall Cree		
BORING NO. B1-A	STATION 27+49	OFFSET 12 ft LT	ALIGNMENT -L-	0 HR. NM	во	RING NO. B1-A	١	STATIO	N 27+49			
COLLAR ELEV. 264.0 ft	TOTAL DEPTH 34.5 ft	NORTHING 394,017	EASTING 1,641,524	24 HR. 4.0	со	DLLAR ELEV. 20	64.0 ft	TOTAL	DEPTH 34	.5 ft		
DRILL RIG/HAMMER EFF./DATE	&R3495 CME-55 82% 03/01/2019	DRILL METHO	H.S. Augers HAM	MER TYPE Automatic	DRI	ILL RIG/HAMMER E	FF./DATE F&	R3495 CME-5	5 82% 03/01/	/2019		
DRILLER D. Tignor	START DATE 09/24/19		SURFACE WATER DEPTH	۱/A	DR	ILLER D. Tigno	r	START I	DATE 09/2	24/19		
ELEV DRIVE DEPTH BLOW CO (ft) (ft) 0.5ft 0.5ft			0 SOIL AND ROCK DES	SCRIPTION	со	RE SIZE N			RUN 20.0			
(ft) (ft) (ft) 0.5ft 0.5f	0.5ft 0 25 50	0 75 100 NO. MOI	G ELEV. (ft)	DEPTH (ft)	ELE			L RUN E REC. RC (ft) (ft 't) % %	D SAMP.	STRATA REC. RQE (ft) (ft) % %		
					(ft)) (ft) (ft)	(ft) (Min/f	t) % %) NO.	(it) (it) % %		
265			264.0 GROUND SUR		249.4	48 249.5 + 14.5	3.0 N=60/	0.0 (2.7) (2.7	3)	(77) (49		
5 10	9	M	RESIDUAL 262.0 Orange-Brown, Fine to Coa	arse Sandy SILT 2.0		246.5 + 17.5	3.0 N=60/ 2:23/1 2:04/1 1:560	.0 90% 77	%	(7.7) (4.9 96% 61%		
260 260.5 + 3.5 12 12		· · · · · · · · ·	(A-4) with Trace Clay and I Orange-Brown, Fine Sandy	Rock Fragments	245		5.0 2:38/1 2:01/1 1:49/1	.0 (5.0) (2.0 .0 100% 52	6) %			
			with Trace Rock Fr	agments		1	1:49/1	.0				
255 255.5 8.5		· · · · · [·····]	257.0 WEATHERED F		240	241.5 - 22.5	1:57/1 5.0 2:25/1	.0	9)	(4.8) (0.9		
255 - 255.5 + 8.5 - 70 - 30/0.	1 +	100/0.6	Gray (META-ARG	ILLITE)	240		2:00/1	.0 96% 18 .0	%	(4.8) (0.9 96% 18%		
						236.5 + 27.5	2:29/1 2:08/1	.0				
250 250.5 + 13.5 249.5 + 14.5 100/0.3		· · · · · · · · · · · · · · · · · · ·	249.5	14.5	235	5	5.0 2:10/1	.0 (5.0) (3. .0 100% 70	5) %	(7.0) (4.2 100% 60%		
60/0.0		· · · · · · · · · · · · · · · · · · ·	NON-CRYSTALLIN Gray (META-ARG	IE ROCK		1 1	2:04/1 2:24/1	.0				
					230	231.5 + 32.5	2:00/1 2.0 2:10/1	.0 (2.0) (0.1	7)			
		····				229.5 - 34.5	2:10/1	.0 100% 35	%			
		· · · · · · · ·	241.5	22.5								
240 +		····	Gray (META-ARG			+						
						l Ŧ						
235		· · · · · · · ·		ILLITE) — — — — <u>27.5</u>		l Ŧ						
		····										
						The second secon						
230		····	- 229.5	34.5								
			- Boring Terminated at Elev NON-CRYSTALLIN	IE ROCK		Ŧ						
			- (META-ARGILI	.ITE)		1 I						
			Notes: NM=Not Meas	ured		<u>+</u>						
			-			±						
			-									
			-			<u>+</u>						
			F		11/5/19							
			F			<u>+</u>						
			F		T.GDT	<u>+</u>						
			Ē-		DOT							
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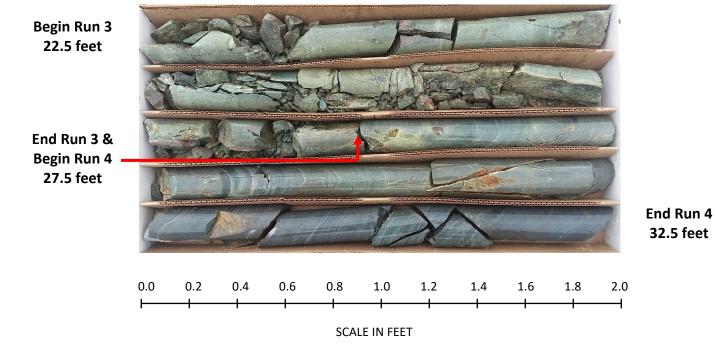
				NSON		GEOLOGIST	M. Durway		
22	idfall (Creek							ID WTR (ft)
1	5 ft				2 ft LT 394,017			0 HR.	NM 4 O
_	019		NU			EASTING 1,6		24 HR.	4.0 Automatic
_	4/19		со		E 09/24/19	SURFACE WA			Automatic
fl									
	STR REC.	ATA RQD	L						
	(ft) %	(ft) %	O G	ELEV. (ft)		ESCRIPTION AND) REMARKS		DEPTH (ft)
	()	(1.2)				Begin Coring (
	(7.7) 96%	(4.9) 61%		- 249.5 -	Slight to Moderately S	NON-CRYSTALI evere Weathering,	Moderately Ha	rd to Soft, Tan-	Gray
				_	META-ARGILLITE, w	ith Moderately Clo GSI=55		e Fracture Spa	cing
	(4.8)	(0.9)		<u>- 241.5</u>	Moderate to Seve	ro Woothoring Ma		- Modium Hard	<u>22</u> .5
	(4.8) 96%	18%		_		A-ARGILLITE, with	Very Close Fra		,
				- 236.5		GSI=30	-50		27.5
	(7.0) 100%	(4.2) 60%			Slight to Moderately S META-ARGILL	Severe Weathering			Gray
		/0		-		GSI=65			
				-					
			÷	<u>-</u> 229.5 -	Boring Terminated			STALLINE ROO	34.5 CK
				-		(META-ARG	ILLITE)		
				-		Notes NM=Not Me			
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SCALE IN FEET



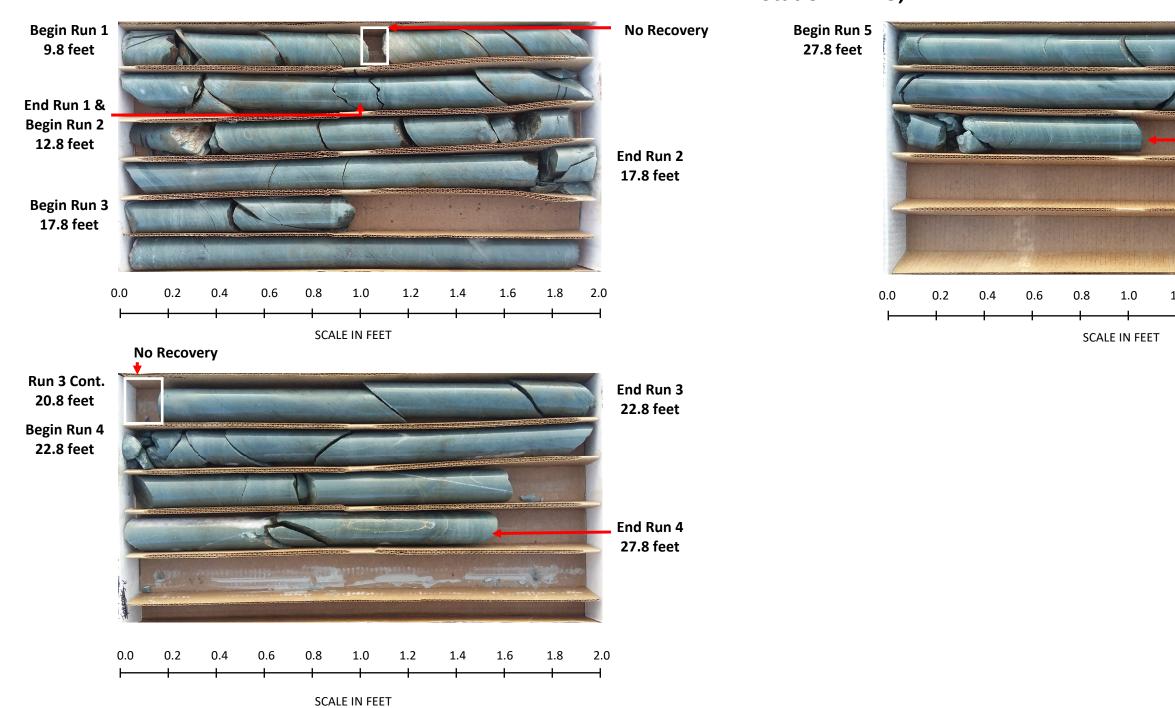
End Run 5 34.5 feet

GEOTECHNICAL BORING REPORT CORE LOG

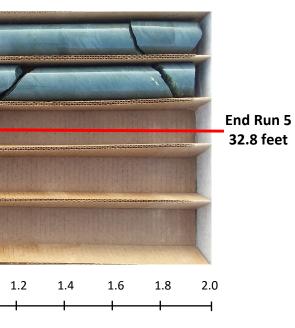
											_0G																
	45771					IP B-581	-			ANSON				GEOL	DGIST M. Durway	1			3 4577					B-581			OUN
				dge No		on NC 109		adfall Cre									R (ft)	SITE	E DESCR	RIPTION	Bric	lge No. 1	-			adfall	Creel
BORI	NG NO	. B1-E	3		S	TATION	27+49		0	OFFSET	12 ft R	Г		ALIGN	MENT -L-	0 HR.	Dry	BOF	ring no). B1-E	3		STA	TION	27+49		
COLL	AR ELI	EV. 20	64.5 ft		Т	OTAL DE	PTH 32	.8 ft	N	IORTHIN	G 394,	004		EASTI	NG 1,641,544	24 HR.	9.0	COL	LAR EL	. EV . 26	64.5 ft		тоти	AL DEI	PTH 32	2.8 ft	
DRILL	RIG/HA	MMER E	FF./DA	TE F&	R3495	5 CME-55 8	2% 03/01/	2019			DRILL	METHO	OD H	.S. Augers	НАМ	MER TYPE Autom	atic	DRIL	L RIG/HA	MMER E	FF./DA	TE F&R	495 CN	/IE-55 8	2% 03/01/	/2019	
DRILL	.ER D	. Tigno	or		S	TART DA	TE 09/2	23/19	C	OMP. D	ATE 09	/24/19	9	SURF	CE WATER DEPTH	I/A		DRI	LLER	D. Tigno	or		STA	rt da [.]	TE 09/2	23/19	
	DRIVE ELEV	DEPTH	·——	ON COL		41		VS PER FC			SAMP	P. ▼ ∕			SOIL AND ROCK DES	SCRIPTION		COF	RE SIZE	Ν			TOT	AL RUI	N 23.0		
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75	5 100	NO.	/мс	DI G	ELEV. (ft)		DEF	ΡΤΗ (ft)	ELEV	, RUN ELEV	DEPTH	RUN	DRILL RATE	REC.	UN RQD	SAMP.	REC	RATA
																		(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %
265	264.5	0.0				<u> </u>								-264.5	GROUND SURI		0.0	254.6	6 254.7	9.8	3.0	N-60/0 ((2.9)	(1.6)		(2.0)	(0.7)
	-	ŧ	3	4	4	. •8						M			RESIDUAI Tan, Fine Sandy SILT (A	-4) with Trace 🚬	2.0			12.8	5.0	2:29/1.0	97%	53%		100%	∫ 35%
260	261.0	3.5	6	8	8	$\left \begin{array}{c} \cdot \cdot \cdot \\ \cdot \cdot \\ \cdot \end{array} \right $	· · · · ·	· · · · · · · ·	•••	· · · · ·		м		- (Organics Tan-Brown, Fine Sandy			250		-	5.0	N=60/0.0 2:29/1.0 2:24/1.0 3:00/1.0 2:17/1.0 1:56/1.0 2:10/1.0	(5.0) 100%	(3.9)		(20.6) 98%) (16.8 80%
	-	Ŧ			Ū		16		<u> </u>		1			-			_]]	Ŧ		2:10/1.0	100 /8	1070			
	256.0	- 8.5									1		, 🎅	<u>257.5</u>	WEATHERED		<u>7.0</u>			17.8	5.0	2:40/1.0 2:29/1.0 2:10/1.0	(4.8)	(3.9)			
255	254.7 -		100/0.							100/0.2			- M	254.7	Gray (META-ARG	,	9.8	245		Ŧ	0.0	2:22/1.0	96%	78%			
	-	Ŧ	00/0.0	΄I Ι							!			<u> </u>	Gray (META-ARG	ILLITE)	<u>11.8</u>		241.7	22.8		2:01/1.0 2:08/1.0 2:10/1.0					
250	-	Ŧ								· · · · ·	[]			-	Gray (META-ARC	ILLITE)		240		1	5.0	1:40/1.0 2:20/1.0	(5.0)	(4.1)			
	-	Ŧ									1			-						ŧ		2:09/1.0 2:56/1.0	10070	0270			
	-	Ŧ								· · · · ·	!			-						27.8	5.0	2:39/1.0	(4.9)	(4.0)			
245	-	Ŧ								· · · · ·	41			-				235		Ŧ	0.0	1:34/1.0	98%	80%			
	-	Ŧ												-					231.7	32.8		1:38/1.0					
240	_	E																		±							
	-	Ŧ]			-						ŧ							
	-	Ŧ												-						ŧ							
235	-	Ŧ									$\left\{ \right\}$		3	_					-	ŧ							
	-	Ŧ									!			- 231.7			32.8			ŧ							
Ē	-	Ē									-			-	Boring Terminated at Elev NON-CRYSTALLIN	ation 231.7 ft in	02.0			ŧ							
	-	Ŧ												-	(META-ARGILI					ŧ							
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				NSON		GEOLOGIST M. Durway		
	adtall (reek		nson Coun	-			ND WTR (ft)
9	8 ft			FSET 12 RTHING		ALIGNMENT -L- EASTING 1,641,544	0 HR. 24 HR.	Dry 9.0
	2019				RILL METHOD H.S		AMMER TYPE	
	3/19		co		09/24/19			/ atomatic
.0 f								
P.	STR REC.	ATA RQD	L					
-	(ft) %	(ft) %	O G	ELEV. (ft)	D	ESCRIPTION AND REMARKS		DEPTH (ft)
	(0.0)	(0.7)				Begin Coring @ 9.8 ft		
	(2.0) 100%	(0.7) 35%		- 254.7 - <u>252.7</u> _ ;	Slight to Moderately S	NON-CRYSTALLINE ROCK Severe Weathering, Hard to Med	lium Hard, Blue-	9.8 Gray <u>11.8</u>
	(20.6) 98%	(16.8) 80%		E <u>i</u>		TE, with Close to Very Close Fr GSI=45-65		i
				_	Very Slight to Mode META-ARGILLITE, w	rate Weathering, Hard to Mediu ith Moderately Close to Very Clo	m Hard, Blue-Gr ose Fracture Spa	ay acing
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				- 231.7	Desire e Terresia etc.d.			32.8
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SHEET 11



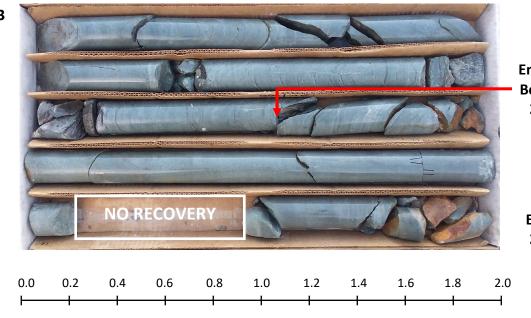
GEOTECHNICAL BORING REPORT CORE LOG

											RE L	.00												_				
	4577					IP B-58					ANSON				G	EOLOGIST M. Durway	1			3S 457					B-581			OUN
SITE DESCRIPTION Bridge No. 11 on NC 109 over Deadfall Cr BORING NO. B2-A STATION 28+09							fall Cree	_		•						• •					11 on NC 109 over Deadfall C							
										_	FSET					IGNMENT -L-	0 HR.	NM	ВС	RING N	0. B2-A	4		STA	TION	28+09		
		.EV . 26				OTAL D				NC	ORTHIN					STING 1,641,558	24 HR.	6.0	CC	ILLAR E	LEV . 2	62.9 ft		TOT	AL DE	PTH 27	7.7 ft	
	DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 82% 03/01/2019										DRILL			H.S. Au	gers HAMN	IER TYPE Automa	atic	DR	ILL RIG/H	AMMER E	R3495 CME-55 82% 03/01/2019							
DRILLER D. Tignor START DATE 09/25/19 FLEV DRIVE DEPTH BLOW COUNT BLOWS PER FC									omp. Da		_	9	SI	IRFACE WATER DEPTH N	/A				D. Tigno	START DATE 09/25/19								
ELEV (ft)	DRIVE	DEPTH (ft)	·	OW COU 0.5ft			25		PER FO	DT 75	100	SAMP	17			SOIL AND ROCK DES			co			· · · ·		тот		N 18.0		
()	(ft)	(,	0.51	0.51	0.511		20		1	10	100	NO.	/мс	DI G	ELE	V. (ft)	DEP	TH (ft)	ELE (ft			RUN (ft)	DRILL RATE	REC. (ft) %	RQD (ft)	SAMP. NO.	REC.	RATA RQD (ft)
																				(11)	(11)	(14)	(Min/ft)	%	% 		(ft) %	(ft) %
265		\pm													F				253	16 253.2	2 - 9.7	3.0	N=60/0.0	2 (3.0)	(1.5)		(13.9)	(8.9) 64%
	262.9	+ 0.0	4	7	7		14						м	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	262	ALLUVIAL		0.0	25	250.2	2 12.7		N=60/0.0 2:18/1.0 2:45/1.0 2:41/1.0	100%	50%		99%	64%
260	250.4	+ 3.5								• •						Gray-Brown-Red, Clayey Fir with Trace Orga	ne SAND (A-2-6) nics				Ŧ	5.0	1:48/1.0 2:04/1.0 1:23/1.0	(5.0) 100%	(3.5) 70%			
		- 3.5	4	2	3	∮ 5.		· · · ·			· · · ·		M	/./.	- -	_					<u> </u>		1:54/1.0					
055		±					· ·	· · · ·							255			7.0	24	5 245.2	<u>17.7</u>	5.0	2:01/1.0 2:25/1.0	(4.8)	(3.3)			
255		8.5	100/0.5										W	14-17	254	Tan-Red, Silty Fine to Coars		8.8 9.7			Ŧ		2:41/1.0		66%			
	253.2	9.7	60/0.0					· · · ·			100/0.5			7///	200	WEATHERED R Gray (META-ARGI		9.7	24	240.2	2 22.7		1:31/1.0 1:46/1.0					
250		±				· ·				• •						NON-CRYSTALLIN	EROCK				Ŧ	5.0	2:00/1.0	84%	(2.8) 56%		(2.0)	(1.8)
		t						· · · ·							ł	Gray (META-ARGI					Ŧ		1:44/1.0				100%	90% (0.4)
0.45		±						· · · ·												235.2	2 <u>† 27.7</u>		1:19/1.0				55%	20%
245		‡													-						Ŧ							
		‡						· · · · ·			· · · ·										1							
240		‡								· ·					239	2		23.7			ł							
		‡						· · · · ·			· · · ·				235	Gray (META-ARGI	LLITE) — — — — —	25.7			Ŧ							
		‡						· · · · ·			· · · ·				235	Gray (META-ARGI		27.7			\pm							
·		+													- 200	Boring Terminated at Eleva NON-CRYSTALLIN	ation 235.2 ft in	21.1			Ŧ							
		‡													Ę	(META-ARGILL					1							
		‡													F	Notes:					ŧ							
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7.7 ft NORTHING 394,067 EASTING 1,641,558 24 HR. 6 /2019 DRILL METHOD H.S. Augers HAMMER TYPE Automatic 25/19 COMP. DATE 09/25/19 SURFACE WATER DEPTH N/A ft			0							
OFFSET 12 ft LT ALIGNMENT -L- 0 HR. N 7.7 ft NORTHING 394,067 EASTING 1,641,558 24 HR. 6 /2019 DRILL METHOD H.S. Augers HAMMER TYPE Automatic 25/19 COMP. DATE 09/25/19 SURFACE WATER DEPTH N/A ft							GEOLOGIST M. Durwa	ıy		
7.7 ft NORTHING 394,067 EASTING 1,641,558 24 HR. 6 /2019 DRILL METHOD H.S. Augers HAMMER TYPE Automatic 25/19 COMP. DATE 09/25/19 SURFACE WATER DEPTH N/A ft	2	adfall (Creek				·		-	
J2019 DRILL METHOD H.S. Augers HAMMER TYPE Automatic 25/19 COMP. DATE 09/25/19 SURFACE WATER DEPTH N/A ft Image: Complexity of the second s	-	7.0							4	NM
25/19 COMP. DATE 09/25/19 SURFACE WATER DEPTH N/A ft Image: constraint of the second s				NÖ	RTHING					6.0
ft STRATA REC. ROD (ft) G G ELEV. (ft) DESCRIPTION AND REMARKS DEPTH Begin Coring @ 9.7 ft NON-CRYSTALLINE ROCK Very Slight to Moderate Weathering, Hard to Moderately Hard, Blue-Gray META-ARGILLITE, with Moderately Close to Close Fracture Spacing GSI=50-70 (2.0) (1.8) (2.0) (1.8) 239.2 Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing (1.1) (0.4) 55% 20% 235.2 Moderately Severe to Very Severe Weathering, Median Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=70-90 SIGN Devere to Very Severe Weathering, Median Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=70-90 Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=20-40 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:				<u> </u>			-			utomatic
STRATA REC. (1) ROD (1) L (13.9) L (8.9) DESCRIPTION AND REMARKS 99% 64% 253.2 NON-CRYSTALLINE ROCK 99% 64% 253.2 NON-CRYSTALLINE ROCK 99% 64% 253.2 Very Slight to Moderate Weathering, Hard to Moderately Hard, Blue-Gray META-ARGILLITE, with Moderately Close to Close Fracture Spacing GSI=50-70 239.2 (2.0) (1.8) 237.2 Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, S5% 237.2 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=70-90 2 235.2 100% 90% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=70-90 2 2 35.2 100% 20% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=20-40 2 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE)	-				WIP. DAI	E 09/20/19	JURFACE WATER DEP	IT N/	~	
(ft) (ft) G ELEV. (ft) DESCRIPTION FARE FLEWARD (13.9) (8.9) 253.2 NON-CRYSTALLINE ROCK 99% 64% 253.2 Very Slight to Moderate Weathering, Hard to Moderately Hard, Blue-Gray META-ARGILLITE, with Moderately Close to Close Fracture Spacing GSI=50-70 (2.0) (1.8) 237.2 Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, 100% 237.2 Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing CSI=70-90 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, 235.2 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, 100% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, 235.2 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, 245.2 100% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, 245.2 20% 100% 20% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, 245.2 20% 100% 10.1 10.1 10.2 10.2 10.2 10.2 100% 10.1 10.1 10.1 10.2 10.2 10.2 10.2 100% 10.1 10		STR	ATA							
(13.9) (8.9) 253.2 NON-CRYSTALLINE ROCK 99% 64% Very Slight to Moderate Weathering, Hard to Moderately Hard, Blue-Gray META-ARGILLITE, with Moderately Close to Close Fracture Spacing GSI=50-70 (2.0) (1.8) 239.2 (2.0) (1.8) 100% 90% 237.2 Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing CSI=70-90 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=70-90 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=20-40 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:		(ft) %	(ft) %		ELEV. (ft		ESCRIPTION AND REMARKS	6		DEPTH (ft)
99% 64% Very Slight to Moderate Weathering, Hard to Moderately Hard, Blue-Gray META-ARGILLITE, with Moderately Close to Close Fracture Spacing GSI=50-70 (2.0) (1.8) 237.2 Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, 100% 90% 99% 237.2 Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=70-90 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=20-40 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:							Begin Coring @ 9.7 ft			
(2.0) (1.8) 239.2 Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, 100% 20% 237.2 Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing CSI=70-90 2 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, 235.2 2 Metric ARGILLITE, with Close to Very Close Fracture Spacing CSI=70-90 2 2 55% 20% 20% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, 2 Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing CSI=70-90 2 2 55% 20% 20% Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing CSI=20-40 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:					253.2	Very Slight to Moder			ard, Blue-Grav	9.7 V
(2.0) (1.8) Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing CSI=70-90 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, S5% 20% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, S5% Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=20-40 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:					-	META-ARGILLITE		se Fract	ure Spacing	
(2.0) (1.8) Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing CSI=70-90 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, S5% 20% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, S5% Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=20-40 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:					-					
(2.0) (1.8) Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing CSI=70-90 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, S5% 20% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, S5% Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=20-40 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:					-					
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(2.0) (1.8) Slight to Moderately Severe Weathering, Moderately Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing CSI=70-90 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, S5% 20% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, S5% Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=20-40 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:					F					
100% 90% 237.2 Blue-Gray META-AŔGILLITE, with Close to Very Close Fracture Spacing (1.1) 235.2 (1.1) (0.4) 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing (SI=20-40) 2 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:		(20)	(1.0)		239.2	Slight to Moderate	Severe Westboring Mederat		to Vory Soft	23.7
55% 20% 235.2 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft, Blue-Gray META-ARGILLITE, with Close to Very Close Fracture Spacing GSI=20-40 2 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:		100%	<u>90%</u>		237.2		GILLITE, with Close to Very C			$\frac{25.7}{1}$
GSI=20-40 Boring Terminated at Elevation 235.2 ft in NON-CRYSTALLINE ROCK (META-ARGILLITE) Notes:					235.2		Very Severe Weathering, Med			
(META-ARGILLITE)					-	Blue-Gray META-AR		lose Fra	cture Spacino	3
					-	Boring Terminated		RYSTAL	LINE ROCK	
Surficial Organic Solt: 0.0-0.2'					-		Notes:			
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SCALE IN FEET

17.7 feet

Begin Run 3 17.7 feet

End Run 1 & Begin Run 2 12.7 feet

End Run 3 & Begin Run 4 22.7 feet

End Run 4 27.7 feet

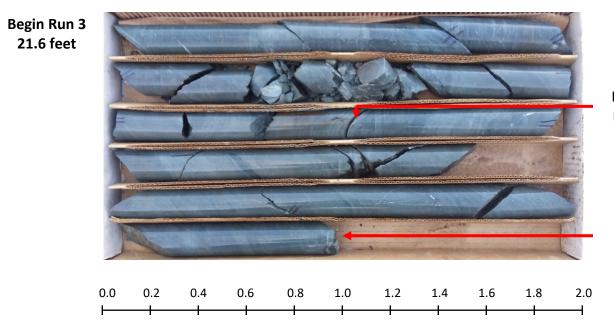
GEOTECHNICAL BORING REPORT CORE LOG

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WBS	4577	71.1.1				TIP	B-5	818			COUN	TY	ANSON	N					GEOLOGIST M. Durway	-			WBS	45771	1.1.1			TIP	B-581	8	C	OUN	
SITE	DESC	RIPTIO	N Bri	idge I	No. 1	1 on	NC 10	09 ov	er De	adfa	ll Cree	k in A	Anson (Count	ty				1	GROUN	D WTR (ft)		SITE	DESCR		l Bric	1 on NC 109 over Deadfall Cre						
BORI	NG NG	0 . B2-E	В			ST/	ATION	1 28	+09			0	FFSET	12 1	ft RT				ALIGNMENT -L-	0 HR.	NM		BOR	NG NO.	. B2-B			STATION 28+09					
COLL	AR E	LEV. 2	64.5 f	t		ТОТ	TAL D	DEPT	H 31	.6 ft		N	ORTHIN	IG (394,0)53			EASTING 1,641,578	24 HR.	10.0		COLI	AR ELE	EV. 26	64.5 ft		тот	AL DE	PTH 31	.6 ft		
DRILL	RIG/H	AMMER	EFF./D	ATE	F&R3	3495 C	CME-55	5 82%	03/01/	/2019				DF	RILL M	METH	OD	H.S	S. Augers HAMN	IER TYPE	Automatic		DRILL	. RIG/HAI	MMER E	FF./DA	TE F&R3	R3495 CME-55 82% 03/01/2019					
DRILI		D. Tigno	or			ST/	ART D	DATE	09/2	25/19)	C	OMP. D	ATE	09/	25/19	9		SURFACE WATER DEPTH N	/A			DRIL	LER D	. Tigno	START DATE 09/25/19							
ELEV	DRIVE ELEV		·	.ow c							ER FOC				SAMP.	\mathbf{V}			SOIL AND ROCK DES	CRIPTION			COR	E SIZE	N					N 18.01			
(ft)	(ft)	(ft)	0.5ft	t 0.5	ift 0.	.5ft	0	25	5	50	0	75	10	0	NO.	/м	OI G		ELEV. (ft)		DEPTH (ft)		ELEV	RUN ELEV	DEPTH		DRILL RATE	REC.	UN RQD (ft) %	SAMP.	REC.	RATA RQD (ft) %	
																						ŀ	(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	
265	264.5					_													-264.5 GROUND SURF	ACE	0.0	-	<u>250.9</u> 250	250.9	13.6	3.0	1:37/1.0	(2.1)	(1.2)		(0.3)	(0.0)	
		Ŧ	2	3		4	• 7		•••		· · · ·		· · · · ·			M			ALLUVIAL Brown-Red to Tan-Gray, S	ilty Fine SA	ND	ľ	200	247.9	16.6	3.0	1:41/1.0	70%	40%		25%	≬ 0%	
260	261.0) = 3.5	6	6		8	: \ : \	· ·	•••	· ·	· · · ·		· · · · · · · ·			м			(A-2-4) with Trace C	rganics				-	- 10.0	5.0	2:03/1.0 2:27/1.0	(5.0) 100%	(4.5)		(9.4) 100%	(7.4) 79%	
		Ŧ					-	•14										-	-			-	245	-	ŧ		1:58/1.0	100 %	90 %				
	256.0							ΞX.	•••				· · · · ·											242.9	21.6	5.0	1:48/1.0	(5.0)	(3.4)				
255	200.0	+ 0.0	6	11	· ·	15			26				· · · ·				<u> </u>	ŀ					240	-	ŧ	0.0	1:40/1.0	100%	68%				
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200		Ŧ	00/01																^{249.7} ¬Gray (META-ARGI Gray (META-ARGI			-	235	-	+		1:50/1.0	100%	92%		100%	9470	
		Ŧ					· · ·		· · · ·	•••	· · · · · ·		· · · · · · · ·											232.9	31.6		2:15/1.0					<u> </u>	
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235		+							· ·		· · ·		· · · ·	-11				-						-	Ŧ								
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COUNTY GEOLOGIST M. Durway addall Creek in Anson County GROUND WTR (ft) 0 HR. NM 16 ft NORTHING 394,053 EASTING 1,641,578 24 HR. 10.0 2019 DRILL METHOD H.S. Augers HAMMER TYPE Automatic 25/19 COMP. DATE 09/25/19 SURFACE WATER DEPTH N/A 1 TRATE DESCRIPTION AND REMARKS DEPTH (m) DEPTH (m) 1 Strava L Begin Coring (2) 13.6 ft. DEPTH (m) 103 COMP. DATE 09/25/19 SURFACE Weathering, Mediam Hard to Very Soft. 10.0 103 DESCRIPTION AND REMARKS DEPTH (m) DEPTH (m) DEPTH (m) 104 Begin Coring (2) 13.6 ft. SURFACE Weathering, Mediam Hard to Very Soft. 10.0 104 Belge Cory META-ARCILLTE, with Yey Close Fracture Spacing SURFACE Weathering, Mediam Hard to Very Soft. 10.0 105 76% Mediameter Soft. SURFACE Weathering, Mediam Hard to Very Soft. 10.0 106% 76% Mediameter Soft. Very Soft. SURFACE Weatherin			0				l .			
OFFSET 12 ft RT ALIGNMENT -L- 0 HR. NM 1.6 ft NORTHING 394,053 EASTING 1,641,578 24 HR. 10.0 2019 DRILL METHOD H.S. Augers HAMMER TYPE Automatic 25/19 COMP. DATE 09/25/19 SURFACE WATER DEPTH N/A ft DESCRIPTION AND REMARKS DEPTH (ft) (ft) G ELEV. (ft) DESCRIPTION AND REMARKS DEPTH (ft) (0.3) (0.0) 250.9 Moderately Severe to Complete Weathering, Medium Hard to Very Soft. 13.6 (9.4) (7.4) Superative to Medicate Weathering, Medium Hard to Soft, Blue-Gray META-ARGILLITE, with Very Close Fracture Spacing - - (0.7) (0.0) 240.3 Moderately Severe to Very Severe Weathering, Medium Hard to Very Soft. - 24.2 (0.7) (0.0) - - - - - - (100% 0% - - - - - - - - - - 24.2 - - - - - - - -							GEOLOGIST M. Durwa	iy		
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SCALE IN FEET

End Run 1 & Begin Run 2 16.6 feet

End Run 2 21.6 feet

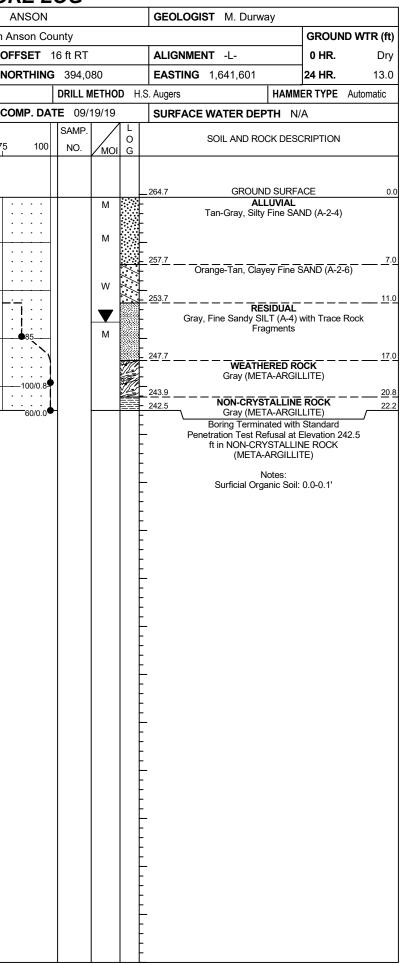
End Run 3 & Begin Run 4 26.6 feet

End Run 4 31.6 feet

GEOTECHNICAL BORING REPORT

									L			.OG																			SOF
WBS	45771	.1.1			Т	P B-581	8		COUN	ty ai	NSON				GEC	DLOG		/I. Durwa	ay			WBS	4577	1.1.1			Т	IP B-5818	}	COUN	ΓΥ Α
SITE	DESCR	IPTION	Brid	lge No		n NC 109			all Cree	_		-								GROUNI	D WTR (ft)					dge No		n NC 109 (Ifall Creel	
BOR	ING NO.	EB2-	-A		S	TATION	28+44	4		OFF	SET	5 ft LT			ALIO	GNME	ENT -I	L-		0 HR.	Dry	BOR	ING NC). EB2	2-B		S	TATION 2	28+44		OF
COL	LAR ELE	EV. 26	63.3 ft		т	OTAL DE	PTH	20.9 ft		NOF	RTHING	3 394,	092		EAS	TING	3 1,64	1,583		24 HR.	9.7	COL	LAR EL	EV. 2	264.7 ft		Т	OTAL DEP	TH 22.2	ft	NO
DRILI	RIG/HAI	MMER E	FF./DA	TE F8	R3495	CME-55 8	32% 03/	/01/2019)			DRILL	METH	OD	H.S. Auge	rs			HAMME	R TYPE	Automatic	DRIL	RIG/HA	MMER	EFF./DA	ATE Få	&R3495	CME-55 82	2% 03/01/20	19	
DRIL	LER D	. Tigno	or		ST	FART DA	TE 0	9/19/19	9	CON	/IP. DA	TE 09	/19/19	9	SUR	RFACI	E WAT	ER DEP	TH N/A	١		DRIL	LER [D. Tign	or		S	TART DAT	E 09/19/	/19	co
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	·	0.5ft		0	BL 25		PER FOC	75	100	SAMP NO.	17			(ft)	SOIL	AND RO	CK DESC	RIPTION	DEPTH (ft)	ELEV (ft)	DRIVE ELEV (ft)	DEPT (ft)	· · ·	OW CO 0.5ft		0	BLOWS 25	S PER FOO 50	75 75
265 260 255 250	_263.3 - 	- <u>3.5</u> - <u>8.5</u>	2 4 17 100/0.2	6 4 35	5 3 50						85 · · · · · · · · · · · · · · · · · · ·		м м		263.3 261.3 261.3 256.3 256.3	Gra	RO 2ed-Brown ay-Brown ay, Fine S	ADWAY rn, Clayey A-2-6) with ALI n-Red, Cl 	h Little Gr .UVIAL ayey Fine SIDUAL	MENT oarse SAN avel SAND (A-: ith Trace F	<i>I</i> 2-6) 7.0	260	_264.7 _261.2 _256.2 _251.2	- - - - - - 8.5 - - -	2 8 6 48	4 9 4 27	3 11 5 58				
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																	ft on I	NON-CR` (META-/ N	ARGILLIT otes: inic Soil: (Ξ)											

BORE LOG





Bridge No. 11 on NC 109 over Deadfall Creek SITE PHOTOGRAPHS



Photograph No. 1: View at End Bent 1 looking north



Photograph No. 2: View looking south at End Bent 1



Photograph No. 3: View of End Bent 2 looking north

SHEET 17