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5981

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REFERENCE

DESCRIPTION TITLE SHEET LEGEND SITE PLAN PROFILE BORE LOGS SITE PHOTOGRAPH

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY DUPLIN

PROJECT DESCRIPTION REPLACEMENT OF BRIDGE NO. 16 ON US 117 (NBL) OVER CSX RR BETWEEN SR 1320 AND US 117 ALT

STATE N.C

NO.

1





CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICL ENCINEERING UNIT AT (1991 707-686). THE SUBSIFICATE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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 WARANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATION AS HE DEEMS NECESSARY TO SATISY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONS TO DEENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONS TO BE INCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

- TES: THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT. BY HAVING REDUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

E. FERREIRA, EI

PERSONNEL

CATLIN

EJ. EDMONDSON

A. CLISTER

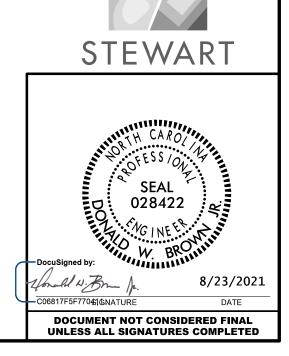
INVESTIGATED BY <u>E. FERREIRA, EI</u>

DRAWN BY <u>E. FERREIRA</u>, EI

CHECKED BY _____ D. BROWN, PE

SUBMITTED BY D. BROWN, PE

DATE ______ 2021



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

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

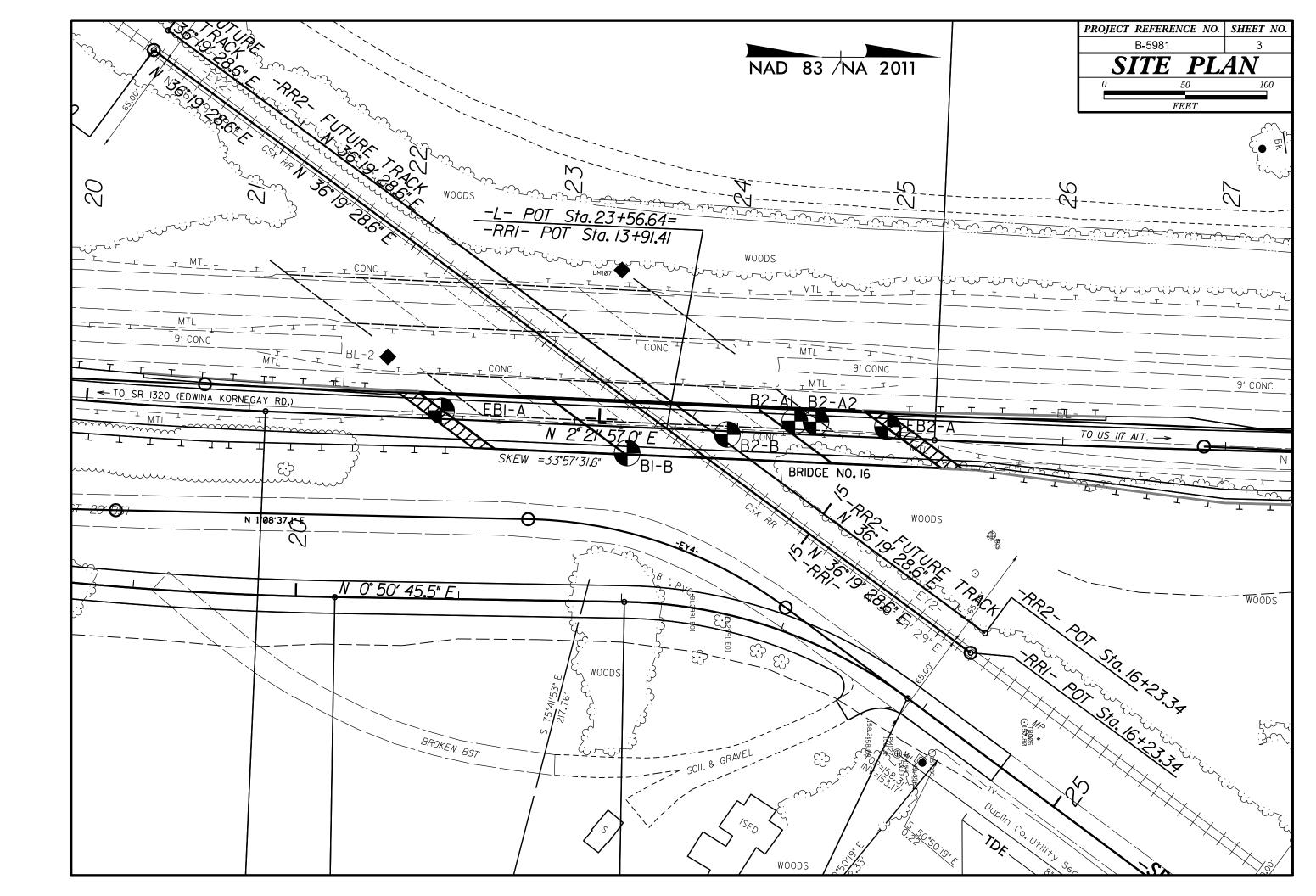
		SOIL	DESCRIPTION					GRADATION				ROCK DE	SCRIPTION	
		UNCONSOLIDATED, SEMI-CO						TES A GOOD REPRESENTATION OF PAR				TAL PLAIN MATERIAL THAT W HE LEVEL AT WHICH NON-COA		
		H A CONTINUOUS FLIGHT P STANDARD PENETRATION T						NDICATES THAT SOLL PARTICLES ARE		SPT REFUS	AL IS PENETRA	ATION BY A SPLIT SPOON SA	AMPLER EQUAL TO OR LESS	THAN Ø.1 FOOT
IS	BASED ON TH	HE AASHTO SYSTEM. BASIC	DESCRIPTIONS GENE	RALLY INC	LUDE THE FOLLOWIN	G:	GAP-GRADED - INDICATE	S A MIXTURE OF UNIFORM PARTICLE				PLAIN MATERIAL, THE TRA OF WEATHERED ROCK.	INSITION BETWEEN SOIL AN	ND ROCK IS OF
		, TEXTURE, MOISTURE, AASH1 GICAL COMPOSITION, ANGUL				SULH		ANGULARITY OF GRA				PICALLY DIVIDED AS FOLLOW	/S:	
	VERY STIFF.G	GRAY, SILTY CLAY, MOIST WITH IN						Y OR ROUNDNESS OF SOIL GRAINS IS NGULAR, SUBROUNDED, OR ROUNDED.	DESIGNATED BY THE TERMS:	WEATHERED	,	NON-COASTAL PLA	IN MATERIAL THAT WOULD Y	IELD SPT N VA
	S	OIL LEGEND AND	AASHTO CLA	<u>SSIFIC</u>	ATION			MINERALOGICAL COMPO	SITION	ROCK (WR)		100 BLOWS PER FC	DOT IF TESTED.	
GENERAL		GRANULAR MATERIALS	SILT-CLAY MATE		ORGANIC MATERIA	LS	MINERAL NA	MES SUCH AS QUARTZ, FELDSPAR, MICA		CRYSTALLI	VE		GRAIN IGNEOUS AND METAMO REFUSAL IF TESTED. ROCK	
CLASS.	A-1	≤ 35% PASSING #200) A-3 A-2	(> 35% PASSING	_				N DESCRIPTIONS WHEN THEY ARE CON		ROCK (CR)		GNEISS, GABBRO, SC		THE INCLUDES
GROUP CLASS.	A-1-a A-1-b	A-3 A-2 A-2-4 A-2-5 A-2-6 A-		A-7-5	A-1, A-2 A-4, A-5 A-3 A-6, A-7			COMPRESSIBILITY		NON-CRYST			GRAIN METAMORPHIC AND NO K THAT WOULD YEILD SPT R	
	000000000000000000000000000000000000000			A-7-6			SLIG	HTLY COMPRESSIBLE	LL < 31	ROCK (NCR)			DES PHYLLITE, SLATE, SANDS	
SYMBOL			· · · · · · ·					RATELY COMPRESSIBLE	LL = 31 - 50	COASTAL P SEDIMENTA			EDIMENTS CEMENTED INTO RO CK TYPE INCLUDES LIMESTON	
% PASSING	59.14				SILT-	MUCK	поп	PERCENTAGE OF MATI		(CP)		SHELL BEDS, ETC.	K TIPE INCLUDES LIMESTON	NE, SHINDSTUNE,
	50 MX 30 MX 50 MX	51 MN			SRANULAR CLAY	MUCK, PEAT						WEATH	HERING	
		10 MX 35 MX 35 MX 35 MX 35	i MX 36 MN 36 MN 36 M	1N 36 MN	SOILS		ORGANIC MATERIAL		OTHER MATERIAL	FRESH	ROCK FRESH	, CRYSTALS BRIGHT, FEW JOIN	TS MAY SHOW SLIGHT STAININ	NG. ROCK RINGS
MATERIAL							TRACE OF ORGANIC M LITTLE ORGANIC MAT		TRACE 1 - 10% LITTLE 10 - 20%		HAMMER IF (CRYSTALLINE.		
PASSING •40 LL	_	- 40 MX 41 MN 40 MX 41			SOILS WITH		MODERATELY ORGANIC		SOME 20 - 35%			RALLY FRESH, JOINTS STAINED,		
PI	6 MX	NP 10 MX 10 MX 11 MN 11			LITTLE OR MODERATE	HIGHLY	HIGHLY ORGANIC	> 10% > 20%	HIGHLY 35% AND ABOVE	(V SLI.)		ON A BROKEN SPECIMEN FACE : TALLINE NATURE.	SHINE BRIGHTLY. RULK RINGS	UNDER HAMMER
GROUP INDEX	0	0 0 4 MX	8 MX 12 MX 16 M	IX NO MX	AMOUNTS OF	ORGANIC		GROUND WATER		SLIGHT		RALLY FRESH, JOINTS STAINED	AND DISCOLORATION EXTENDS	S INTO ROCK UP
USUAL TYPES	STONE FRAGS.				ORGANIC	SOILS	∇	WATER LEVEL IN BORE HOLE IMME	DIATELY AFTER DRILLING	(SLI.)	1 INCH. OPEN	N JOINTS MAY CONTAIN CLAY.	IN GRANITOID ROCKS SOME O	DCCASIONAL FELD
OF MAJOR	GRAVEL, AND	FINE SILTY OR CLAYEY SAND GRAVEL AND SAND		LAYEY SOILS	MATTER		T	STATIC WATER LEVEL AFTER 24				ARE DULL AND DISCOLORED. CR		
MATERIALS	Sand		50125	50125						MODERATE (MOD.)		F PORTIONS OF ROCK SHOW DIS ROCKS,MOST FELDSPARS ARE D		
GEN, RATING		EXCELLENT TO GOOD	Fair to Po	DR	FAIR TO POOR	UNSUITABLE	<u>∑Pw</u>	PERCHED WATER, SATURATED ZONE,	OR WATER BEARING STRATA	(100.7) UNDER HAMMER BLOWS AND S		
AS SUBGRADE					POOR			SPRING OR SEEP			WITH FRESH	ROCK.		
		PI OF A-7-5 SUBGROUP IS ≤ LI	CY OR DENSE		LL - 30				BOL 6	MODERATEL		XCEPT QUARTZ DISCOLORED OF		
			RANGE OF STA					MISCELLANEOUS SYM	BULS	SEVERE (MOD. SEV.)		ORED AND A MAJORITY SHOW I E EXCAVATED WITH A GEOLOGIS		
PRIMARY	SOIL TYPE	COMPACTNESS OR	PENETRATION RES		RANGE OF UNCC			ANKMENT (RE) 25/025 DIP & DIP 1	DIRECTION			WOULD YIELD SPT REFUSAL		
		CONSISTENCY	(N-VALUE)	(TONS/FT	2)	WITH SOIL DE	SCRIPTION DF ROCK ST	RUCTURES	SEVERE		XCEPT QUARTZ DISCOLORED OF		
GENERA	LLY	VERY LOOSE	< 4				SOIL SYMBOL		BORING SLOPE INDICATOR INSTALLATION	(SEV.)		STRENGTH TO STRONG SOIL.		
GRANUL		LOOSE MEDIUM DENSE	4 TO 10 10 TO 3		N/A							WOULD YIELD SPT N VALUES 2		•
MATERI (NON-CO	AL DHESIVE)	DENSE	30 TO 5					ILL (AF) OTHER AUGER BORI	NG 🛆 CONE PENETROMETER	VERY	ALL ROCK E	EXCEPT QUARTZ DISCOLORED OF	R STAINED. ROCK FABRIC ELEM	MENTS ARE DISC
		VERY DENSE	> 50					\leftarrow		SEVERE		IS EFFECTIVELY REDUCED TO S SAPROLITE IS AN EXAMPLE OF		
GENERA		VERY SOFT SOFT	< 2 2 TO 4		< 0.25 0.25 TO 0	=	- INFERRED SOI	IL BOUNDARY - CORE BORIN	G SOUNDING ROD	(V SEV.)		F ORIGINAL ROCK FABRIC REM		
SILT-CL		MEDIUM STIFF	4 TO 8		0.5 TO 1.		INFERRED ROO		WELL - TEST BORING	COMPLETE		ED TO SOIL. ROCK FABRIC NO		
MATERI		STIFF	8 TO 15		1 TO 2				WITH CORE		SCATTERED (CONCENTRATIONS. QUARTZ MAY		
(COHES)	IVE)	VERY STIFF HARD	15 TO 3 > 30	٥	2 TO 4		ALLUVIAL SOI		DN OP SPT N-VALUE		ALSO AN EX			
			OR GRAIN S	IZF				RECOMMENDATION SYN	1BOLS			ROCK H	ARDNESS	
								UNCLASSIFIED EXCAVATION -	[초고적] UNCLASSIFIED EXCAVATION -	VERY HARD		SCRATCHED BY KNIFE OR SHAP		SPECIMENS REQU
U.S. STD. SI OPENING (M		4 10 4.76 2.0		200 0.075	270 0.053			UNSUITABLE WASTE	ACCEPTABLE, BUT NOT TO BE			ARD BLOWS OF THE GEOLOGIST		
			COARSE	FINE			SHALLOW	UNCLASSIFIED EXCAVATION -	USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	HARD		RATCHED BY KNIFE OR PICK ON HAND SPECIMEN.	NLY WITH DIFFICULTY. HARD H	1AMMER BLUWS R
BOULDE (BLDR.		BBLE GRAVEL	SAND	SAND	SILT (SL.)	CLAY (CL.)		ACCEPTABLE DEGRADABLE ROCK		MODERATEL		RATCHED BY KNIFE OR PICK. G	OUGES OR GROOVES TO 0.25 I	INCHES DEEP CAN
	, ".		(CSE, SD.)	(F SD.)	(32.7	(CL.)		ABBREVIATIONS		HARD	EXCAVATED	BY HARD BLOW OF A GEOLOGI		
GRAIN MM		75 2.0	0.25		0.05 0.005		AR - AUGER REFUSAL	MED MEDIUM	VST - VANE SHEAR TEST		BY MODERAT			
SIZE IN	. 12	3					BT - BORING TERMINATED CL CLAY	D MICA MICACEOUS MOD MODERATELY	WEA WEATHERED γ - UNIT WEIGHT	MEDIUM HARD		DOVED OR GOUGED 0.05 INCHES CAVATED IN SMALL CHIPS TO F		
	9	<u>SOIL MOISTURE -</u>	CORRELATIO	NOFT	ERMS		CPT - CONE PENETRATIO	N TEST NP - NON PLASTIC	γ_{d} - DRY UNIT WEIGHT			GEOLOGIST'S PICK.		0
	MOISTURE			DE FOR FI	ELD MOISTURE DESC	RIPTION	CSE COARSE	ORG ORGANIC	TEST SAMPLE ABBREVIATIONS	SOF T		OVED OR GOUGED READILY BY		
(HT	IERBERG LI	DESCR	RIPTION				DMT - DILATOMETER TES DPT - DYNAMIC PENETRA		S - BULK			5 TO SEVERAL INCHES IN SIZE BE BROKEN BY FINGER PRESS		PICK POINT. SMAL
					JID; VERY WET, USUA		e - VOID RATIO	SD SAND, SANDY	SS - SPLIT SPOON	VERY		RVED WITH KNIFE, CAN BE EXC		
LL		(SA)	T.) FRO	M BELOW	THE GROUND WATER	TABLE	F - FINE	SL SILT, SILTY SLI SLIGHTLY	ST - SHELBY TUBE RS - ROCK	SOFT		I THICKNESS CAN BE BROKEN E		
PLASTIC	T		SEM		QUIRES DRYING TO		 FOSS FOSSILIFEROUS FRAC FRACTURED, FRAC 				FINGERNAIL.			
RANGE <		- WET	- (W)		IUM MOISTURE		FRAGS FRAGMENTS	w - MOISTURE CONTEN	T CBR - CALIFORNIA BEARING		FRACTURE	E SPACING	BED	DDING
(PI) PL	+ PLASTI	C LIMIT					HI HIGHLY	V - VERY	RATIO	TERN		SPACING	TERM	THICKN
		- MOISI	T - (M) SOL	ID: AT OR	NEAR OPTIMUM MOI	STURE		UIPMENT USED ON SUBJE		VERY W WIDE	.DE	MORE THAN 10 FEET 3 TO 10 FEET	VERY THICKLY BEDDED THICKLY BEDDED	D 4 FE 1.5 - 4
OM SL		M MOISTURE					DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:	MODERA	TELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5
			REO	UIRES ADD	DITIONAL WATER TO		CME-45C	CLAY BITS	X AUTOMATIC MANUAL	CLOSE VERY CL	055	0.16 TO 1 FOOT LESS THAN 0.16 FEET	VERY THINLY BEDDED THICKLY LAMINATED	0.03 - 0.1 0.008 - 0.
		- DRY -			UM MOISTURE			6" CONTINUOUS FLIGHT AUGER	CORE SIZE:		USE	LESS THAT DID TELT	THINLY LAMINATED	< 0.008
		PI	ASTICITY				X CME-55	8" HOLLOW AUGERS	П-вП-н			INDUF	RATION	
			TICITY INDEX (PI)			·u	СМЕ-550	HARD FACED FINGER BITS		FOR SEDIM	ENTARY ROCKS.	, INDURATION IS THE HARDEN	NING OF MATERIAL BY CEMEN	NTING, HEAT, PRE
NON	N PLASTIC	PLAS	0-5		DRY STRENGT VERY LOW	<u>n</u>		TUNGCARBIDE INSERTS	N	FRIA		RUBBING WITH	FINGER FREES NUMEROUS G	GRAINS;
SL1	GHTLY PLAS		6-15		SLIGHT		VANE SHEAR TEST		HAND TOOLS:	FRIE	DLC	GENTLE BLOW	BY HAMMER DISINTEGRATES	SAMPLE.
	DERATELY P HLY PLASTI		16-25 26 OR MORE		MEDIUM HIGH			X CASING W/ ADVANCER	POST HOLE DIGGER	мол	ERATELY INDUR		E SEPARATED FROM SAMPLE	WITH STEEL PR
HIU	HEI FEHSTI				100		PORTABLE HOIST	TRICONE STEEL TEE	TH HAND AUGER			BREAKS EASILY	Y WHEN HIT WITH HAMMER.	
			COLOR				1 🗆	TRICONE TUNGCARB		INDU	JRATED		FFICULT TO SEPARATE WITH BREAK WITH HAMMER.	H STEEL PROBE:
DESCRIP	TIONS MAY	INCLUDE COLOR OR COLO	R COMBINATIONS (T	AN, RED, Y	ELLOW-BROWN, BLUE	-GRAY).		CORE BIT	VANE SHEAR TEST					
м	DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.					•		X PDC BIT <u>2-15/16</u> 0.D.		EXT	REMELY INDURA		BLOWS REQUIRED TO BREAM S ACROSS GRAINS.	K SAMPLE:

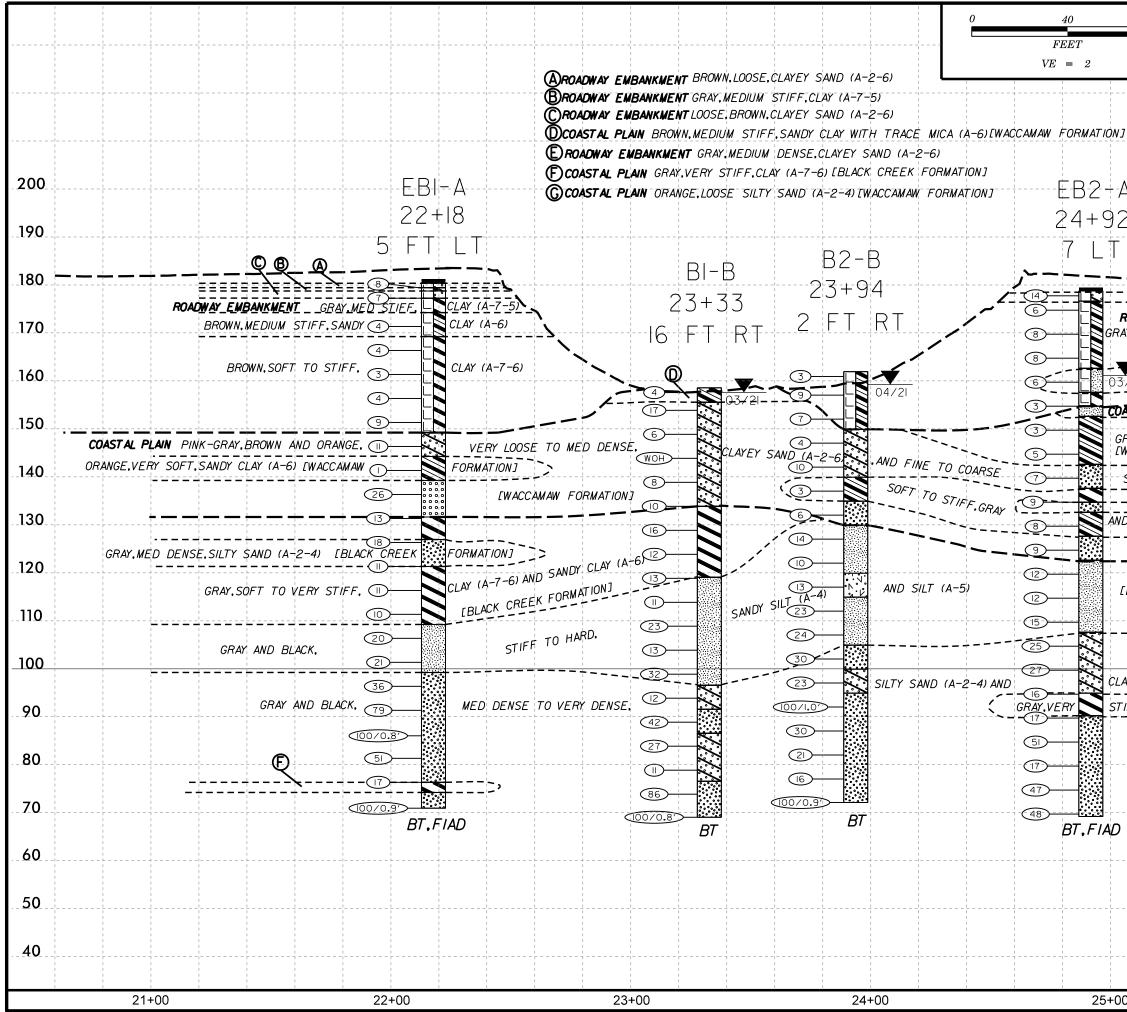
PROJECT REFERENCE NO. B-5981



TERMS AND DEFINITIONS D AN INFERRED ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. SPT REFUSAL. 1 FOOT PER 60 IS OFTEN AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. 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 IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND СК ТНАТ SURFACE. CLUDES GRANITE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. AL PLAIN IF TESTED. MAY NOT YIELD STONE, 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. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. RINGS UNDER DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DATINGS IF OPEN. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. AMMER BLOWS IF FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE СК ИР ТО SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FELDSPAR FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. BLOWS. $\underline{\mathsf{FLOAT}}$ - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. . IN 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. ELDSPARS DULL OSS OF STRENGTH WHEN STRUCK. 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 VIDENT BUT ITS LATERAL EXTENT. ARE KAOLINIZED LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. E DISCERNIBLE STRONG ROCK PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE ONLY MINOR OF AN INTERVENING IMPERVIOUS STRATUM. ALUES < 100 BPF RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. IN SMALL AND 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 SAPROLITE IS RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. REQUIRES <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 LOWS REQUIRED THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. $\underline{\text{SLICKENSIDE}}$ - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. EEP CAN BE TACHED STANDARD PENETRATION TEST (PENETRATION RESISTANCE)(SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL B PICK POINT WITH 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. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. FRAGMENTS T. 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 ED READILY BY TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: BM#2: RR SPIKE IN 30'' OAK 93.9' LT OF -L- STA. 12+64.16 MH: MANHOLE LID 30.8' RT OF -SRI- STA. 24+03.48 THICKNESS 4 FEET 1.5 - 4 FEET ELEVATION: 165.35, 158.31 FEET 16 - 1.5 FEET NOTES: 3 - 0.16 FEET EXISTING GROUND SURFACE SHOWN WAS TAKEN FROM 98 - Ø.Ø3 FEET 0.008 FEET ELECTRONIC TIN FILE (DATED APRIL 2020). AT, PRESSURE, ETC. FIAD: FILLED IMMEDIATELY AFTER DRILLING EEL PROBE:

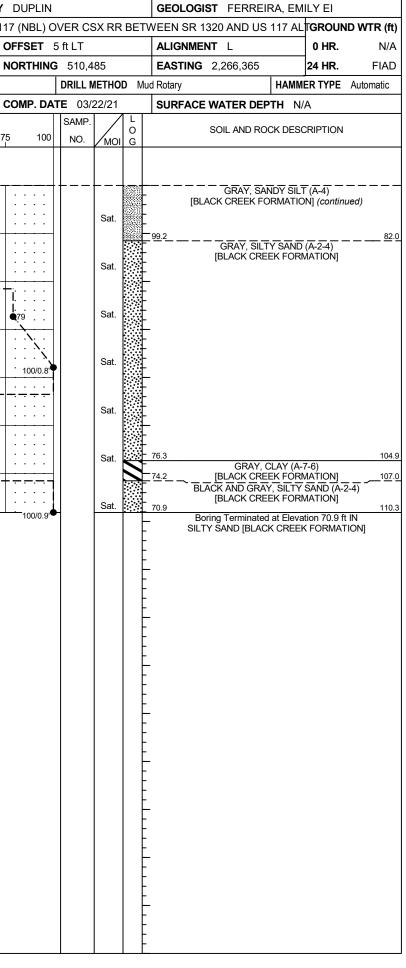
DATE: 8-15-1-



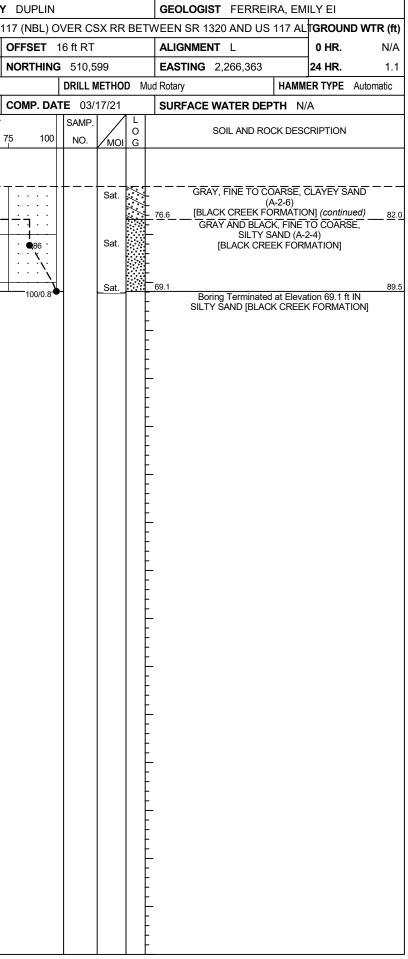


PROJECT REFERENCE NO. SHEET NO. 4080 B-5981 4 FEET **PROFILE ALONG -L- CENTERLINE** VE = 2200 EB2-A 24+92 190 GROUND SURF 180 ROADWAY EMBANKMENT _17_0 RAY-AND -RED, MED -STIFF, SANDY-CLAY- (A-6 GRAY, MED 160 AST AL PLAIN GRAY, SC [WACCAMAW_FORMATION] 150 GRAY.SOFT TO MED STIFF.CLAY (A-7-5) [WACCAMAW FORMATION] 140 SILTY SAND (A-2-4) AND SAND (A-3) ND RED, SANDY CLAY (A-6) AND SILTY CLAY (A-7-6) 130 [WACCAMAW FORMATION] 120 [BLACK CREEK FORMATION] 110 100 CLAYEY SAND (A-2-6) [BLACK CREEK FORMATION] GRAY.VERY STIFF, CLAY (A-7-6) [BLACK CREEK FORMATION] 90 80 70 BT.FIAD 60 NOTE: EXISTING GROUND SURFACE SHOWN WAS TAKEN FROM ELECTRONIC TIN FILE (DATED 50 -APRIL- 2021). INFERRED- STRATIGRAPHY- IS ---DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE -L- PROFILE. 40 25+00 26+00

SIT BOI						IP B-8				COUNT	Y DI	JPLIN				GEOLO	GIST FERREIRA, I	EMILY EI		WBS	47747	11			<u> ти</u>	P B-5981	l	COUNT	v
BO		RIPTION																										000111	1
				PLACE	EMEN	T OF E	BRIDO	GE NO). 16 (ON US	117 (NBL) C	VER C	SX RF	R BE	TWEEN SI	R 1320 AND US 117	ALTGROUND	WTR (ft)	SITE	DESCR	IPTION	REP	PLACE	EMENT	OF BRID	GE NO. 1	6 ON US	117
	RING NO). EB1-	-A		S	TATIO	N 22	2+18			OFF	SET :	5 ft LT			ALIGN	MENT L	0 HR.	N/A	BOR	ING NO.	EB1-	A		ST	TATION 2	22+18		OF
COI	LAR EL	.EV. 18	31.2 ft		T	OTAL I	DEPT	H 11	0.3 ft		NOF	RTHING	5 510,4	85		EASTIN	G 2,266,365	24 HR.	FIAD	COLI	AR ELE	EV. 18	1.2 ft		т)TAL DEP	TH 110.3	3 ft	NC
DRII	L RIG/HA	AMMER E	FF./DA	TE CA	AT4425	CME-5	5 87%	01/16/2	2019		•		DRILL N	NETHO	DD N	lud Rotary	HA	MMER TYPE A	utomatic	DRILL	RIG/HAI	MMER E	FF./DA1	TE CA	AT4425	CME-55 87%	% 01/16/2019)	
DRI	LLER E	Edmond	son, J	М.	S	TART I	DATE	03/2	22/21		CON	IP. DA	TE 03/	22/21		SURFA	CE WATER DEPTH	N/A		DRIL	LER E	dmonds	son, J.	M.	ST	ART DAT	E 03/22/2	21	C
ELE\	, DRIVE	DEPTH	BLC	w co	UNT			BLO	WS PE	R FOO	Г		SAMP.	V /	L					ELEV	DRIVE ELEV	DEPTH	BLO	W CO	UNT		BLOWS	PER FOOT	r T
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	2	5	50)	75	100	NO.	мо	O I G	ELEV. (ft)	SOIL AND ROCK D	ESCRIPTION	DEPTH (ft)	(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
185																				105							Mate	ch Line	
		Ŧ														F]			
		Ŧ														- 181.2	GROUND SU		0.0		102.3	78.9	5	8	13		21		
180	180.3	<u>+ 0.9</u>	5	4	4					· · ·	· ·	· · ·		w		- 180.3 - 179.4	ROADWAY EMB ASPHALT 7 INCHES,		0.9	100	-	-				· · · •	<u></u>		·
	178.2	3.0	7	4	3		· · ·							w	1 0 0	- 178.7 177.2	INCHES BROWN, CLAYEY	3			- 97.3 ⁻	83.9					$\begin{pmatrix} \ddots & \cdot & \cdot \\ & \ddots & \cdot & \cdot \end{pmatrix}$:
175		‡				.! .	•••			· · · · · ·		· · ·					GRAY, CLAY			95	-	-	10	16	20		. • 36 .		:
175		‡														174.2	BROWN, CLAYEY			95	-	+					<u>+:j</u>		-+-
	172.3	8.9	 woн	1	3	!:	•••			· · ·		 					BROWN, SANDY		_/		92.3	88.9	15	31	48				:
170		1				● ⁴ .	•••							W		-			10.0	90	-		10	01					
		±				ŀ.	•••									<u>169.2</u>	BROWN, CLAY	7 (A-7-6) — — — —	<u> </u>		-	<u> </u>							
	167.3	<u>† 13.9</u> †	WOH	1	3		• •				. .			Sat.		F					87.3	- <u>93.9</u>	32	49	51/0.3'				
165		Ŧ					· ·									-				85	_	F				· · · ·			·
	162.3	+ 18.9				i	•••									-					- 82.3	98.9							·
160		1	WOH	1	2	•3 :	•••		•••	· · · · · ·		· · ·		Sat.		-				80	-		35	30	21	· · · ·		9 51	:
100		‡				 i -					: :					-				00	-							· 	
	157.3	23.9	2	2	2	 	· · · ·	· · ·	•••	· · ·	· · ·	· · ·				-					77.3	103.9	3	7	10			,	:
155		Ŧ		2		Q 4 .	• •		•••					Sat.		_				75	-	Ł	5	'			7		•
		+				<u>'</u> ·										-					-	+				! .		-+	• + ·
	152.3	<u>† 28.9</u> †	3	4	5		9				. .			Sat.		F					72.3	<u> 108.9</u>	23	41	59/0.4'				
150		‡					· · ·				· ·					149.2			32.0		_	-					_ · · · ·		<u> </u>
	147.3	+ 33.9				·] · 1	•••			•••					<i>~</i> ~/		PINK-GRAY, CLAYE				-	ŧ I							
145		7	3	4	7] :;	 11 .			· · · · · ·		· · ·		Sat.	///	È	[WACCAMAW FC				-								
145		‡				- 7.					: :					144.2			<u> </u>		-								
	142.3	38.9	WOH	WOH	1	/	•••			· · ·		 				-	[WACCAMAW FC				-								
140		1		WOIT	'		• •		• •					Sat.					10.0		-								
		±					\sim	· · ·		· · ·						139.2	ORANGE, FINE TO CO	ARSE SAND (A-3	42.0		-	Ł							
	137.3	<u>+ 43.9</u> +	6	13	13			■26 .			. .			Sat.	0000	-	[WACCAMAW FC	RMATION]			-	-							
135		Ŧ					/								0000	_					_	F							
	132.3	+ 48.9								· · · · · ·	. .				0 0 0 0 0 0 0 0 0 0 0 0				10.0		-	-							
130		Ŧ	4	6	7		• 13	· · · ·		· · · · · ·		· · ·		Sat.	Ň	- 131.6 -	GRAY, CLAY	(A-7-6)	49.6		-								
100		‡					1.									-	[BLACK CREEK F	ORMATION]			-								
	127.3	53.9	3	8	10	::	Ϊ.	· · ·		· · · · · ·		· · ·		Sat.		126.9			54.3		-								
125		1		Ŭ			.¶18	• •	• •	• • •	· ·			Sal.		-	GRAY, SILTY SA [BLACK CREEK F				-								
	400.0	+					<i>†</i> :	· · ·	::	· · ·						-					-								
	122.3	<u>† 58.9</u> I	3	6	5	1 : ;	11 .			· · ·		 		Sat.		121.3		(4 7 0)	59.9		-								
120		+										· · · ·				-	GRAY, CLAY [BLACK CREEK F				-	+							
	117.3	 									. .					F					-	F							
115		Ŧ	4	4	7	:4	11	· · · ·		· · · · · ·		· · · ·		Sat.		F					-	F							
	1 .	Ŧ				.;										F					-	FI							
	112.3	<u>+ 68.9</u> +	4	5	5	╢┊╏		· · · ·		· · · · · ·	. .	· · ·		Sat.		F					-	‡							
110		‡		-		·•¶	10 .		•••		· ·					109.2			72.0		-	‡							
	107.3	+ 73.9				: :	Ϊ.			· · · · · ·		 				- <u></u>			'2.0		-	<u> </u>							
	107.3	+ (3.9 -	5	8	12	1	. •20		· ·	· · ·		 		Sat.			[BLACK CREEK F	URIVIATION]			-	t l							
105													1																



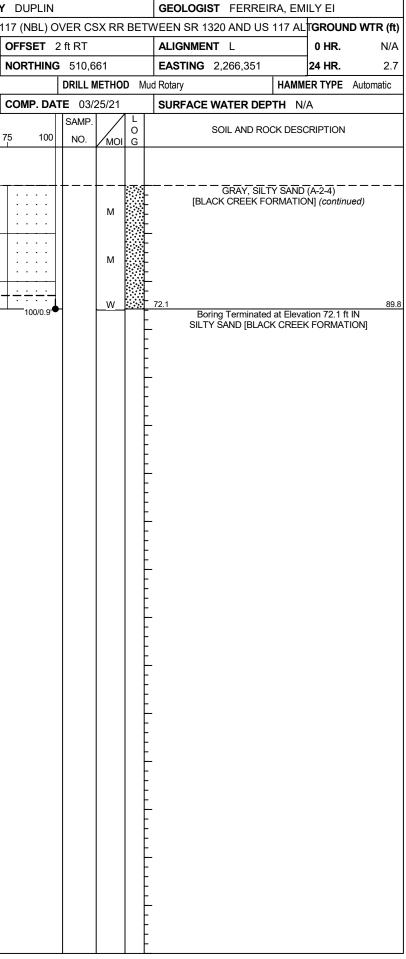
BORING COLLAR DRILL RIC DRILLER	script No. e Relev. G/hamm	TION B1-B	REP	LACE				TY DUPLIN				BEOLOGIST FERREIRA, EN				47747	.1.1				IP B-5981		COUNT	Y
BORING COLLAR DRILL RIC DRILLER	NO. E R ELEV. G/HAMM	B1-B	REP	LACE			6 ON US	117 (NRL) (
	R ELEV. G/HAMM							1				EN SR 1320 AND US 117 A	_	(ft)					PLACE		T OF BRIDG		ONUS	11
DRILL RIC DRILLEF	g/hamm	. 158			S	TATION 23+33		OFFSET	16 ft RT			LIGNMENT L	0 HR. N	/A	BOR	NG NO.	B1-B	3		S	TATION 23	+33		0
			8.6 ft		т	OTAL DEPTH 89.5	ft	NORTHING	G 510,5	599	E	ASTING 2,266,363	24 HR. 1	1.1	COLL	AR ELE	IV. 15	58.6 ft		<u>т</u>	OTAL DEPT	H 89.5 ft		N
	R Edm	ER EF	F./DAT	E CA	AT4425	CME-55 87% 01/16/2019)		DRILL N	NETHOD	D Mud F	lotary HAMN	MER TYPE Automation	с	DRILL	RIG/HAM	/MER E	FF./DA	TE CA	AT4425	CME-55 87%	01/16/2019		
(ff) EL		nonds	on, J.	M.	S	TART DATE 03/17/2	21	COMP. DA	TE 03/	17/21	5	URFACE WATER DEPTH	I/A		DRIL	LER Ed	dmond	son, J.	М.	S	TART DATE	03/17/2	1	0
		PTH	BLO	w col	JNT	BLOWS	PER FOOT		SAMP.	$\mathbf{\nabla}$	L O	SOIL AND ROCK DES	SCRIPTION		ELEV	DRIVE ELEV	DEPTH	BLO	w co	UNT		BLOWS P	PER FOOT	Г
	(ft) ((ft)	0.5ft	0.5ft	0.5ft	0 25	50	75 100	NO.		-	EV. (ft)	DEPTH	H (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	5 5	0	75
160											L				_80						↓ ,	Match	<u>Line</u>	
15	58.6 <u>+</u> (0.0	2	2	2	. . .					- 15	B.6 GROUND SURF COASTAL PLA		0.0		<u>79.9</u>		4	5	6	•11	· · · ·		:
	ŧ		_	_	_	$\left \begin{array}{c c} \bullet, \bullet \\ \bullet, \bullet, \bullet \\ \bullet, \bullet \\ \bullet, \bullet, \bullet, \bullet, \bullet, \bullet \\ \bullet, $						BROWN, SANDY CLAY WIT	TH TRACE MICA	3.0		-	-				: <u> </u>		+ ÷ ÷ ÷ ;	-
155 15	54.9 <u> </u>	3.7	4	6	11		+			w			MATION]	0.0	75	74.9	- 83.7	21	41	45				\pm
	Ŧ											BROWN, RED, CLAYEY				-	-							
150 14	19.9 <u> </u>	8.7											-		70	69.9	_ _ 88.7							
	+	0.7	3	3	3	ϕ_{6} · · · · · ·			1	w							- 00.7	55	45/0.3'					
	Ŧ							 								1	-							
145 14	14.9 🕇 1	3.7	WOH	WOU	WOU			· · · · · ·								4	-							
	‡		WOIT	WOII	WOII			· · · · · ·		Sat.						1	-							
140 13	‡					<u>`</u> ; ; ; ; ; ; ; ; ;		· · · · · ·								-	-							
13	39.9 <u> </u> 1 -	8.7	2	3	5	· · · · · · · · · · · · · · · · · · ·				Sat.						4	-							
	t							· · · · · ·									-							
135 13	$\frac{1}{34.9 \pm 2}$	23.7						 								_	-							
	Ŧ		6	5	5		· · ·			Sat.		3.9 GRAY, CLAY (A		24.7			-							
	ł					,						[BLACK CREEK FOR	RMATION]			-	_							
130 12	<u>29.9 2</u>	28.7	4	6	10		+			м	N-					-	-							
	Ŧ			Ũ		1 1 1 1 1 1 1 1 1 1										-	-							
125 12	24.9 3	33.7						· · · · · ·								1	-							
120 12	<u>4.9 + 3</u> +	53.7	5	5	7	• • • 12 • • • • •				м						4	-							
	‡															4	-							
120 11	19.9 + 3	38.7			_	 		 			N_	2.4		39.5		4	-							
	ŧ		4	6	1	· · • • 13· · · · · ·				м		GRAY, SANDY SIL	_T (A-4)	59.5		-	-							
	ŧ					: : : : : : : :					Ŀ	[BLACK CREEK FOR	RMATIONJ			-	-							
115 11	14.9 + 4	3.7	3	5	6		+			Sat.	Ŀ					_	-							
	Ŧ							· · · · · · ·		- Jul.	Ł						-							
110 10	19.9 ± 4	8.7				$ \cdots \langle \langle \cdot \rangle \rangle$					F					-	_							
		9.1	5	8	15					Sat.	F					1	-							
	‡					:::/ ::::					je t					1	-							
105 10	<u>)4.9 [±] 5</u>	53.7	3		0		· · ·	· · · · ·			j l					4	-							
	‡		З	4	9					Sat.						4	-							
100	‡					::::\\ ::::		.								4	-							
100 <u>9</u>	9.9 <u>+ 5</u> +	58.7	7	12	20	· · · · \	· · ·			Sat.						4	-							
	ŧ							.			L 96	6	f	62.0		-	-							
95 g.	4.9 1 6	3.7										DARK GRAY, FINE TO CO. SAND (A-2-6), WITH	ARSE, CLAYEY	<u> </u>		_	-							
			4	5	7	• •12 • • • • •				Sat.		WOOD/LIGNI	TE			-	_							
	Ŧ										<u>91</u>	6 [BLACK CREEK FOR GRAY, FINE TO COARSE	6	<u>67.0</u>		1	_							
90 <u>8</u>	<u>9.9 ‡ 6</u>	8.7	21	21	21		+ • • •					(A-2-4)				-	-							
	‡		~ 1	<u> </u>	21	4	2			Sat.		[BLACK CREEK FOR				4	-							
85 g	. ‡					· · · · · /· ·		· · · · · ·				GRAY, FINE TO COARSE,	CLAYEY SAND	<u>72.0</u>		4	-							
8	4.9 <u>+</u> 7 +	/3.7	14	14	13	· · · · 6 27 · · ·	<u> </u>			Sat.		(A-2-6) [BLACK CREEK FOR				4	-							
	‡						· · ·	· · · · · ·									-							
80	+					<u> · · · <i>j</i>· · · ·</u> · ·	· · · ·																	



										.00															
	47747					IP B-598			Y DUPLIN					LOGIST FERREIRA,				6 47747					IP B-5981		COUNTY
				PLAC							SX RF	R BE	_	SR 1320 AND US 117							PLACE		T OF BRID		ON US 1
BORI	NG NO	. B2-A	\ 1		S	TATION 2	24+35		OFFSET	8 ft LT			ALIG	NMENT L	0 HR	. N/A	BOR	ING NO.	B2-A	42		S	TATION 2	4+48	
COLL	AR ELI	EV. 17	71.3 ft		T	OTAL DEP	TH 20.9 f	t	NORTHING	G 510,7	703		EAS	TING 2,266,342	24 HR	. Dry	COL	LAR ELE	EV. 18	80.0 ft		T(OTAL DEPT	H 30.4 ft	t
DRILL	RIG/HA	MMER E	FF./DA	TE C	AT4425	CME-55 879	% 01/16/2019			DRILL	METHC	DD N	/lud Rotar	y HA		E Automatic	DRIL	L RIG/HAI	MMER E	EFF./DA	TE CA	AT4425	CME-55 87%	01/16/2019	•
DRIL	LER E	dmond	lson, J	. M.	S	TART DAT	E 03/23/2	:1	COMP. DA	TE 03/	23/21		SUR	FACE WATER DEPTH	N/A		DRIL	LER E	dmond	lson, J	. M.	S.	TART DATE	03/23/2	1
ELEV	DRIVE ELEV	DEPTH	BLO	ow co	UNT		BLOWS	PER FOOT		SAMP.	▼/	L		SOIL AND ROCK D		N	ELEV	DRIVE ELEV	DEPTH	H BLC	ow cou	UNT		BLOWS F	PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	мо	I G	ELEV. (DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	25 5	50 7
175		L											L				180								
	-	ł											E					179.1	0.9	7	5	3			
		E											- 171.3	GROUND SU		0.0		176.1	3.9				· L		·
170	1/0.6	= 0.7	2	8	13		21				D		<u> </u>	ASPHALT 2 INCHE CONCRE		i l	175		-	60/0.1					
		ŧ											<u>168.3</u>	C ROADWAY EME	ANKMENT	<u> </u>		-	F						+
165	166.4	<u>+ 4.9</u> +	4	2	2						м		+	RED AND GRAY, SA	NDY SILT (A	<u>4-4)</u>	170	171.1	8.9	WOH	WOH	1			· · · · ·
	-	ŧ											<u>164.3</u>	BROWN AND RED, CLA		(A-2-6) 7.0	110	-	F.						
	161.4	+ 99												2.1011171121125, 02		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		-	+ 					· · · · ·	· · · ·
160	 	L 0.0	4	3	3						Sat.		- 159.3			12.0	165		13.9	7	8	7	1 · · · · · ·		
	157 4	- T 13.9				::::						⊿∠ ∟∟	<u> </u>	BROWN AND RED, SA	NDY CLAY	(A-6) <u>12.0</u>		-	l l						
-	157.4	13.9	WOH	1	2						Sat.	L	Ŀ					161.1	18.9				$ \cdot \cdot \cdot \cdot \rangle$		· · · ·
155	-	ł				+		<u> </u>				L.⊻ L.⊻	÷				160	-	L	9	10	10	• • • • • • • • • • • • • • • • • • •	0	
		Ŧ										Lv Lv	F					-	F						
	151.4	† 19.9 †	WOH	WOH	60/0.0	<u> </u>				-	Sat.		150.4			20.9	155	156.1	23.9	6	7	7			
	-	Ŧ							60/0.0				F	Boring Terminated at Ele A PRESUMED		4 ft ON		-	F				· · · · ·		
		Ŧ											F	HOLE WAS OFFSET A	ND TERMIN	ATED		- 151.1	28.9						· · · · ·
	-	‡											F	DUE TO HITTING A PRI OR PILE (BJECT	150		20.3	4	4	5			
		Ŧ											F					-	F						
	•	ŧ											F					-	F						
	-	ŧ											F						F						
		‡											F					-	÷						
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r DUPLIN		GEOLOGIST FERREIRA,	EMILY EI
117 (NBL) OVER	CSX RR BET	WEEN SR 1320 AND US 117	ALTGROUND WTR (ft)
OFFSET 8 ft L	Т	ALIGNMENT L	0 HR. N/A
NORTHING 51	0,716	EASTING 2,266,342	24 HR. 0.4
DRIL	L METHOD Mu	Id Rotary HA	MMER TYPE Automatic
COMP. DATE	03/23/21	SURFACE WATER DEPTH	N/A
SAN	AP. L		
75 100 NC	D. MOI G	SOIL AND ROCK D	ESCRIPTION
		180.0 GROUND SU	RFACE 0.0
		ASPHALT 3 INCHES, INCHES	9. 1. STONE BASE 7
· +		ROADWAY EMB	ANKMENT
· 60/0.1'		- GRAVEL/SO	IL MIX
		173.0	
		DROWN AND RED, SA	ANDY SILT (A-4)
<u> </u>		-	
· · · ·		-	
		<u>163.0</u>	17.0
		GRAVEL/SO	IL MIX
+		-	
· · · ·		-	07.0
			WITH ROCK 27.0
· · · ·		- 149.6	NTS 30.4
		Boring Terminated at Ele SAND WITH C	evation 149.6 ft IN
		HOLE WAS OFFSET AN DUE TO LOSING SEA	L WITH CASING
		THROUGHOUT THE	HOLE DEPTH.
		-	
		-	
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		-	
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																		1_			
	47747					IP B-5981		Y DUPLIN					_	6 47747					B-5981		COUNTY
				PLACE			ON US	1 ,		X RR B		EN SR 1320 AND US 117 ALTGROUND WTR (ft				REPL	ACEM	1	OF BRIDGE		
	ING NO.					TATION 23+94		OFFSET				IGNMENT L 0 HR. N/A		ING NO.					TION 23+9		0
COLI	LAR ELE	EV. 16	61.9 ft		Т	OTAL DEPTH 89.8 ft		NORTHING	3 510,66	61	EA	ASTING 2,266,351 24 HR. 2.7	COL	LAR ELE	IV. 16	1.9 ft		ТОТ	AL DEPTH	89.8 ft	N
DRILL	RIG/HAI	MMER E	FF./DA	TE CA	AT4425	CME-55 87% 01/16/2019					Mud Rot	tary HAMMER TYPE Automatic	DRIL	L RIG/HAI	MMER E	FF./DATE	CAT4	425 CN	ME-55 87% 01/	/16/2019	
DRIL	LER E	dmond	·			TART DATE 03/25/2		COMP. DA				IRFACE WATER DEPTH N/A	DRIL	LER E				L	RT DATE		
ELEV	DRIVE ELEV	DEPTH				BLOWS F			SAMP.			SOIL AND ROCK DESCRIPTION	ELEV	DRIVE ELEV			COUN			BLOWS PE	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25 5	0	75 100	NO.	/мог (G ELE	V. (ft) DEPTH (t) (ft)	(ft)	(ft)	0.5ft 0	0.5ft 0.	.5ft (0 25	50) 75
165		+									F		85			+		-+-	<i>_</i> _	Match	Line
	-	‡									- 161.9	GROUND SURFACE 0	0	83.0	78.9	9	9	12			
160	161.9	0.0	2	1	2	4 3 · · · · · · · ·				м	-8-	ROADWAY EMBANKMENT	80	-	-	5	5	"	$ \cdot \cdot \cdot \cdot \phi_{21} \cdot \cdot \cdot \cdot \phi_{21} \cdot \cdot$		· · · · ·
100	-	<u>+</u>										BROWN, SANDY CLAY (A-6) [WACCAMAW FORMATION]	00		-				···/·		
	158.0	3.9	3	3	6	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	· · · ·	 		wL				78.0	_ 83.9 -	6	8	8	· · · · · · · · · · · · · · · · · · ·		· · · · ·
155	-	t											75		_						
	153.0	8.9						. .						73.0	88.9		10.41		!	+	·÷÷:-;+
	-	ŧ	3	3	4	$\left \begin{array}{c c c c c c c c c c c c c c c c c c c$		 		WL						29 71	/0.4'				
150	_	Ł				 :		<u> </u>		_%:	149.9	⁹	0	-							
	148.0	13.9	WOH	2	2					Sat.		ORANGE AND RED, CLAYEY SAND (A-2-6) [WACCAMAW FORMATION]		-	_						
145	-	ł				$\left \left \left$		• • • • • •		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		[-	-						
	143.0	18.9				· <u>\</u> · · · · · · · ·				% *				-	-						
	-	-	WOH	3	7	$\left \begin{array}{c c} \cdot \cdot \cdot \cdot \\ \cdot \\ \cdot \\ \bullet \\ 10 \end{array}\right \left \begin{array}{c c} \cdot \cdot \cdot \\ \cdot $		· · · · · ·		Sat.				-	-						
140	-	ŧ						· · · · ·			139.9	$\frac{9}{3}$ — $-\overline{\text{GRAY AND RED, SANDY CLAY (A-6)}}$ $\frac{22}{3}$	0	-	-						
	138.0	23.9	1	2	1			· · · · · ·				[WACCAMAW FORMATION]		-	-						
135	-	ŧ	·	-		$\left \begin{array}{c cccccccccccccccccccccccccccccccccc$	· · · ·	 		w	134.9	9 27		-	-						
100	-	‡				1					-	ORANGE, SILTY SAND (A-2-4)			-						
	133.0	28.9	1	3	3	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	· · · ·	. .		Sat.	-	[WACCAMAW FORMATION]		-	-						
130	-	t				- \					129.9	932	0		_						
	128.0	33.9		-		$: \chi : : : : :$					Ľ	GRAY, SANDY SILT (A-4) [BLACK CREEK FORMATION]		-							
	-	ŧ	4	6	8					Sat.	Ľ			-	_						
125	_	Ł									Ŀ			-							
	123.0	38.9	3	4	6					Sat.	Ľ			-							
120	-	ł						• • • • • •			119.9	9 42	0	-	-						
	118.0	43.9								1				-	-						
	-	F	3	5	8	$\left \begin{array}{c} \cdot \cdot \bullet \\ \cdot \cdot \bullet \\ 13 \cdot \end{array}\right \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot$		· · · · · · · ·		Sat.				-	-						
115	_	Ŧ								.1	¹ <u>v </u> <u>114.9</u>	9 GRAY, SANDY SILT (A-4) 47	0	-	-						
	113.0	48.9	6	8	15					Sat.	F	[BLACK CREEK FORMATION]		-	-						
110	-	Ŧ				$\left \begin{array}{cccc} \cdot \cdot \cdot \cdot \cdot \bullet 23 \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \bullet 1 \right \cdot \cdot \cdot \cdot \cdot \\ \end{array} \right $				Oat.	F			-	-						
	108.0	53.9									Ē				-						
105	- 100.0	- 55.9	8	8	16	· · · · • • 24 · · ·		 		Sat.				-	-						
	-	‡									104.9		0	-	-						
100	103.0	58.9	7	10	20		· · · ·	· · · · · ·			-	GRAY, SILTY SAND (A-2-4) [BLACK CREEK FORMATION]		-	-						
100	-	ŧ	'	10	20	$\begin{array}{ } & \cdot & \cdot & \cdot \\ & \cdot & \cdot & \cdot \\ & \cdot & \cdot & \cdot$	· · · ·	. .		Sat.	-			-	-						
i <u>100</u>	-	ŧ				/				****	<u>99.9</u>				-						
5	98.0	63.9	4	10	13					м		[BLACK CREEK FORMATION]		-							
95	-	ŧ								<u>/°%</u> °	94.9		0								
	93.0	68.9										GRAY, SILTY SAND (A-2-4) [BLACK CREEK FORMATION]		-							
			33	37	63			100/1.0		М	F	[,,,,,,		-	-						
90		Ŧ								* * * * * * * * * * * * * * * * * * *	F			-	-						
	88.0	73.9	10	11	19			.		м	F			-							
90	-	ŧ				$\left \begin{array}{cccccccccccccccccccccccccccccccccccc$		 		IVI	ļ			-							
00	I	L	1			1					•••••			I							

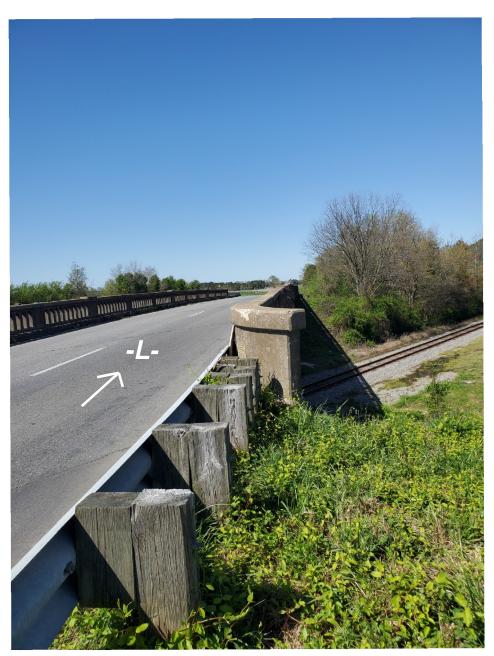


							BURE			r											1	
	47747				-		NTY DUPLIN	-			GEOLOGIST FERREIRA, EMILY EI			47747					P B-5981		COUNT	
				PLACE			, ,		SX RR		EEN SR 1320 AND US 117 ALTGROUND WT	• •					PLACE		T OF BRID		6 ON US	
	ING NO.				_	TATION 24+92	OFFSET				ALIGNMENT L 0 HR.	N/A		NG NO.					TATION 2			0
	LAR ELE					OTAL DEPTH 110.4 ft	NORTHIN	1			EASTING 2,266,346 24 HR. 18.3			AR ELE					OTAL DEP			N
					AT4425	CME-55 87% 01/16/2019		DRILL N				natic							CME-55 87%			
DRIL	LER E	dmond				TART DATE 03/24/21	COMP. DA				SURFACE WATER DEPTH N/A		DRIL	LER E	dmond							C
ELEV (ft)	ELEV	DEPTH (ft)	·		-	BLOWS PER FO		SAMP.	17	0	SOIL AND ROCK DESCRIPTION		ELEV (ft)	ELEV	DEPTH (ft)			-			PER FOO	
(11)	(ft)		0.5ft	0.5ft	0.5ft	0 25 50	75 100	NO.	/моі	I G E	ELEV. (ft) DE	EPTH (ft)	(11)	(ft)	(11)	0.5ft	0.5ft	0.5ft		25	50	75 I
1																						
180		<u> </u>									79.4 GROUND SURFACE	0.0	100			-10-	- 11-	-16		Mate	ch Line	
	178.5 -	<u>+ 0.9</u> +	8	8	6	$ \begin{vmatrix} & \cdot & \cdot & \cdot \\ & \cdot & \cdot & \cdot \\ & \cdot & \cdot & \cdot$			м		ASPHALT 4 INCHES, STONE BASE 7	0.9		-	-			-		/		
175	- 175.5 -	- 3.9					· · · · · · ·				$\frac{76.4}{1}$ $ \frac{1000}{10000000000000000000000000000000$	<u>3.0</u>	95	- 95.5 -	- - 83.9							:
	-	ŧ	2	2	4			1	W		GRAY AND RED, SANDY CLAY (A-6)			-	-	6	6	10	1 6			
	-	ŧ					· · · · · · · · · · · · · · · · · · ·			L				-	-							:
170	170.5 -	+ 8.9 -	2	3	5	.	· · · · · · ·	41	w				90	90.5 -	- 88.9 -	4	7	10				<u>·</u>
	-	ŧ					· · · · · · ·							-	-				· · · •			:
165	- 165.5 -	+ 13.9					· · · · · · ·						85	- 85.5 -	- - 93.9							:
105	-	+	2	3	5				w				00	_	-	20	23	28	1	· · · · ,	51	
	-	ŧ					· · · · · · ·				62.4 GRAY, SANDY SILT (A-4)	<u> </u>		-	-							•
160	160.5 -	18.9	2	2	4		· · · · · ·		Sat.				80	80.5 -	- <u>98.9</u>	6	7	10				·
	-	ŧ					· · · · · · ·		Jai.		57.4	22.0		-	-	-		-				:
	- 155.5 -	- 23.0					· · · · · · ·				GRAY, CLAY (A-7-5) [WACCAMAW FORMATION]			- 75.5 -	- - 103.9							:
155		- 20.3	WOH	WOH	3	¶ ¶ ³			Sat.		54.5 COASTAL PLAIN	24.9	75		-	16	19	28	1		47	-
	-	ŧ									52.4 GRAY, SILT (A-4)	<u> 27.0</u>		-	-							
150	150.5 -	28.9	WOH	1	2						GRAY, SANDY CLAY (A-6) [WACCAMAW FORMATION]		70	70.5 -	108.9	10	15	33				•
	-	Ł		'		$\left \begin{array}{c c c c c c c c c c c c c c c c c c c$	· · · · · · ·		Sat.								10	- 55			4 8	
	-						· · · · · · ·							-	-							
145	145.5 -	<u> </u>	WOH	3	2	↓ ↓ ● 5			Sat.					-								
	-	Ŧ								1		<u>37.0</u>		-	-							
140	140.5 -	38.9			3					Ē	ORANGE, SILTY SAND (A-2-4) [WACCAMAW FORMATION]			-	-							
	-	Ŧ	4	4		• • • • • • • • • • • • • • • • • • • •]	Sat.	F		10.0		-	-							
	-	Ŧ									GRAY, CLAY (A-7-6)	<u> </u>		-	-							
135	135.5 -	<u>+ 43.9</u> 	3	4	5				Sat.		34.5 [WACCAMAW FORMATION]	44.9		_	-							
	-	Ŧ									ORANGE, SILTY SAND (A-2-4) 32.4 [WACCAMAW FORMATION]	<u> </u>		-	-							
130	- 130.5 -	48.9					· · · · · · ·				GRAY, RED AND ORANGE, SANDY CLAY (A-6)			-	-							
	-	Ŧ	WOH	3	5]	Sat.		[WACCAMAW FORMATION]			-	-							
		Ŧ									27.4 ORANGE, SILTY SAND (A-2-4)	<u> </u>		-	-							
125	125.5	<u>+ 53.9</u>	2	3	6		· · · · · · · ·		Sat.		[WACCAMAW FORMATION]			-	-							
	-	Ŧ									22.4	<u> </u>		-	-							
120	- 120.5 -	58.9					· · · · · · ·			Į į				-	-							
	-	ŧ	3	4	8			11	Sat.	F	-			-	-							
	-	ŧ								je standard i s				-	-							
115	115.5 -	† 63.9 -	4	5	7	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	· · · · · · ·		Sat.	L.				-	-							
	-	ŧ								ļ,				-	-							
110	- 110.5 -	+ 68.9				\ \ .								-	-							
	-	‡	4	6	9			11	Sat.					-	-							
105	-	‡				· · · · · · · · · · · ·					07.4 BLACK, CLAYEY SAND (A-2-6)	72.0		-	-							
105	105.5	+ 73.9 -	9	10	15		· · · · · ·	 	Sat.		[BLACK CREEK FORMATION]			-	-							
	-	ŧ				$\begin{bmatrix} & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$								-	-							
400	- 100.5 -	+ 78 0												-	-							
100	100.0	1 10.9	1	1	1	1																

DUPLIN		GEOLOGIST FE	RREIRA, EM	ILY EI	
17 (NBL) OVER CSX	RR BETV	VEEN SR 1320 AN	D US 117 AL	IGROUN	ID WTR (ft)
OFFSET 7 ft LT		ALIGNMENT L		0 HR.	N/A
NORTHING 510,759		EASTING 2,266	346	24 HR.	18.3 FIAD
DRILL MET	HOD Muc	d Rotary	HAMM	ER TYPE	Automatic
COMP. DATE 03/24/	'21	SURFACE WATE	R DEPTH N/	A	
75 100 NO.	L O MOI G	SOIL A	ND ROCK DESC	RIPTION	
		BLACK		D (A-2-6)	
· · · · · · · · · · · · · · · · · · ·			EEK FORMATIO	N] (contin	
· · · · · · · · · · · · · · · · · · ·		94.7 G [BLAC	RAY, CLAY (A-7 K CREEK FORM	7-6) Mation]	84.7
· · · · · · · · · · · · · · · · · · ·	~ N	90.0 GRA [BLAC	Y, SILTY SAND K CREEK FORM	(A-2-4) Mation]	89.4
s	at.				
· · · · · · · · · · · · · · · · · · ·	w				
· · · · · · · · · · · · · · · · · · ·	w				
	w	69.0 Boring Terr	ninated at Eleva	tion 69.0 f	110.4
		SILTY SAND	IBLACK CREEK	FORMAT	ïŌŊ

SITE PHOTOGRAPH

BRIDGE 16



VIEW LOOKING NORTH



B-5981