CONTENTS

5883

REFERENCE

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STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY _HARNETT

PROJECT DESCRIPTION IMPROVE I-95 INTERCHANGES AT SR 1808 (JONESBORO RD.) AND SR 1709 (HODGES CHAPEL RD.)

SITE DESCRIPTION BRIDGE NO. 81 ON -Y2- (SR 1709) **OVER** -L- (I-95)

STATE STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C. I–5883	1	15

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 SOLT TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (1991) 707-8050. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNICS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU UN-FLACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE ONSERVED WATER LEVELS OR SOL MOISTURE CONDITIONS MOLATED IN THE SUBSURFACE RELIVESTIGATIONS AND REAS RECORDED AT THE TIME OF THE INVESTIGATION. THES WATER LEVELS OR SOL MOISTURE CONDITIONS MAY LARY CONSIDERABLY WITH THE ACCORDING TO CLIMATIC CONDITIONS NICLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIODER 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 INTERPRETATIONS MADE, OR OPHION 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 INVESTIGATIONS TO CONTINNS TO BE ENCOUNTERED. THE GIDDER OR CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES: I. 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. 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 - PERSONNEL

E.G. BLONSHINE

M.S. HAYES

G.H. GOSLIN

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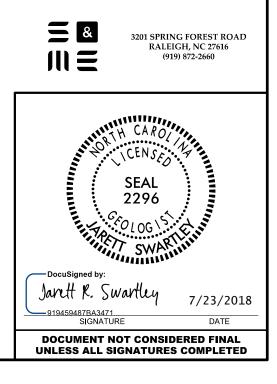
INVESTIGATED BY ______. SWARTLEY

DRAWN BY _J.R. SWARTLEY

CHECKED BY _____S.S. LANEY

SUBMITTED BY ______S.S. LANEY

DATE _____ FEBRUARY 2018



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

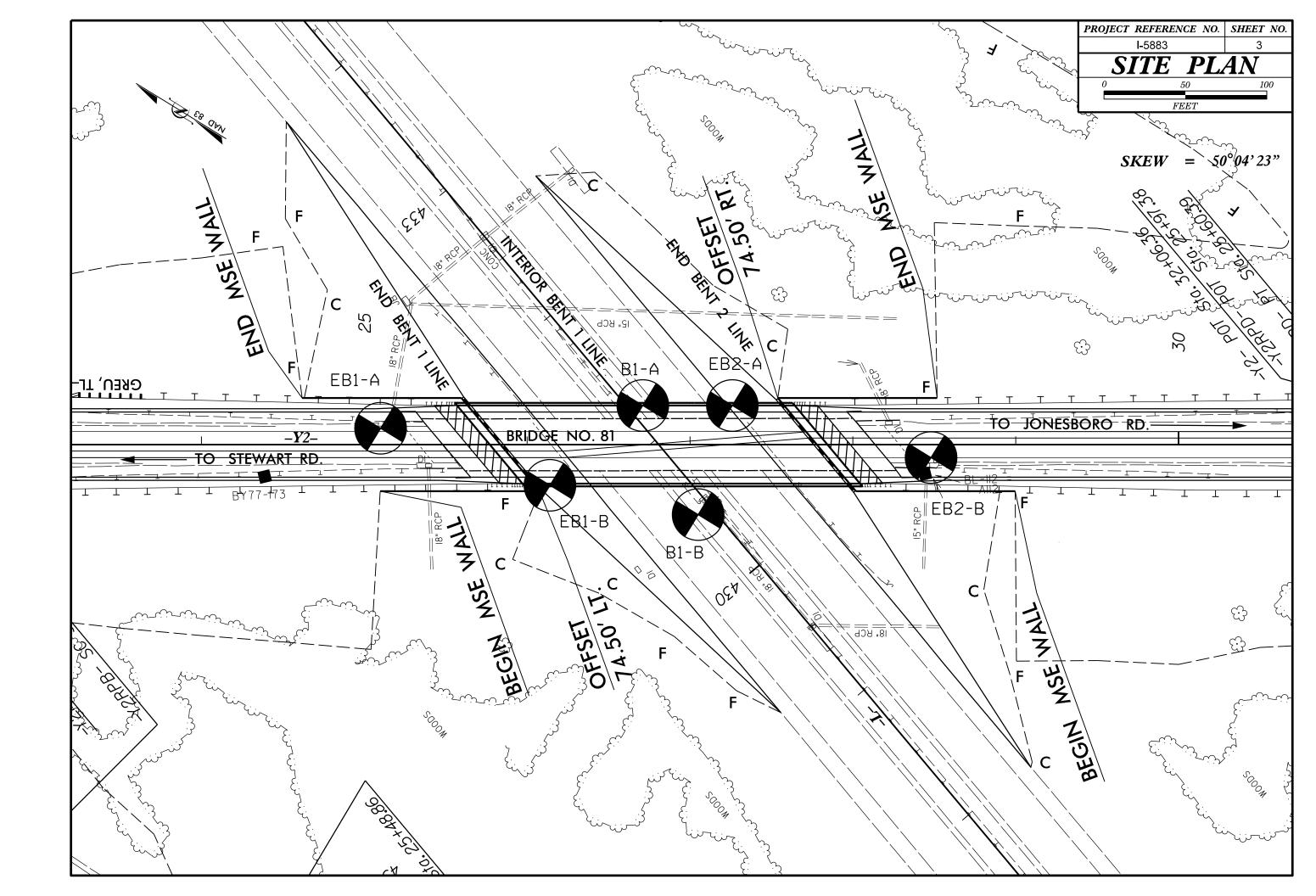
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS		
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.		
BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.		
IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.		
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING		
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT		
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS OPCOMIC MATERIALS	MINERALOGICAL COMPOSITION	CRYSTALLINE FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND		
ULASS. (\$354 PASSINU *200) (>354 PASSINU *200)	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.		
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-6 A-7 A-1, A-2 A-4, A-5	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	<u>COLLUVIUM</u> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM		
SYMBOL	SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR) ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.		
2 PASSING	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, 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.		
*10 50 MX GRANULAR CLAY MUCK,	PERCENTAGE OF MATERIAL		DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT		
*40 30 MX 50 MX 51 MN *200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.		
MATERIAL	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	HAMMER IF CRYSTALLINE.	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.		
PASSING *40	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE		
PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN 11 MN MODERATE HIGHLY	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.		
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX ND MX ANUNTS OF ORGANIC SOILS	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.		
DE MAIOR CRAVEL AND FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.		
MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS	STATIC WATER LEVEL AFTER <u>24</u> HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM		
GEN. RATING GEN. RATING C. SUBCEARE EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR DOOR UNSUITABLE DOOR DOOR UNSUITABLE	✓ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL.		
AS SUBGRADE	SPRING OR SEEP	WITH FRESH ROCK.	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		
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.		
RANGE OF STANDARD RANGE OF UNCONFINED	I∏ 25 (025	(MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	$\underline{\text{JOINT}}$ - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.		
PRIMARY SOIL TYPE COMPACINESS OF PENETRATION RESISTENCE COMPRESSIVE STRENGTH CONSISTENCY (N-VALUE) (TONS/FT ²)	ROADWAY EMBANKMENT (RE) 20/065 DIP & DIP DIRECTION WITH SOIL DESCRIPTION OF ROCK STRUCTURES	IF TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.		
CENERALLY VERY LOOSE < 4	SOIL SYMBOL	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.		
GRANULAR LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30	N	TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</u>	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS		
MATERIAL DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT CAUGER BORING CONE PENETROMETER	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.		
VERY DENSE > 50 VERY SOFT < 2	INFERRED SOIL BOUNDARY - CORE BORING • SOUNDING ROD	SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.		
GENERALLY SOFT 2 TO 4 0.25 TO 0.5		VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.		
SILT-CLAY MEDIUM STIFF 4 T0 8 0.5 T0 1.0 MATERIAL STIFF 8 T0 15 1 T0 2	INFERRED RUCK LINE O MUNITURING WELL T WITH CORE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF		
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4		ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.		
HARD 30 30 4	RECOMMENDATION SYMBOLS	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT		
U.S. STD. SIEVE SIZE 4 10 40 60 200 270		VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	ROCK. <u>SILL</u> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND		
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNDERCOT UNSUITABLE WASTE	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO		
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF UNDERCUT ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. <u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT		
(BLDR.) (COB.) (GR.) SAND SAND (SL.) (CL.) (CL.)	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.		
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF		
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY γ - UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	A 140 LB.HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL		
SOIL MOISTURE - CORRELATION OF TERMS	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\dot{\gamma}_{ m d}$ - DRY UNIT WEIGHT	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.		
SOIL MOISTURE SCALE FIELD MOISTURE (ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u>	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.		
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY		
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY	LENGTH OF ROLK SEGMENTS WITHIN A STRATOM EQUAL TO DR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.		
	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.		
RANGE < - WET - (W) SCHIDGLIGHTED MUNICIPUL SHITNE - WET - (W) ATTAIN OPTIMUM MOISTURE	FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO	FRACTURE SPACING BEDDING	BENCH MARK: BY77-I73		
	EQUIPMENT USED ON SUBJECT PROJECT	TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	NORTHING: 580156 EASTING: 2131628 ELEVATION: 259.26 FEET		
OM _ OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET			
SL SHRINKAGE LIMIT	CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET	NOTES:		
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6' CONTINUOUS FLIGHT AUGER	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET			
PLASTICITY	CME-55	INDURATION			
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550 HARD FACED FINGER BITS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.			
NON PLASTIC 0-5 VERY LOW	TUNG-CARBIDE INSERTS	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS: GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.			
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM	VANE SHEAR TEST	CRAINE CAN BE SERARATED FROM CANDIE WITH STEEL PROPE			
HIGHLY PLASTIC 26 OR MORE HIGH		MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.			
COLOR	X CME-550X	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;			
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).		DIFFICULT TO BREAK WITH HAMMER.			
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	Image: Second	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-		
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PROJECT REFERENCE NO.

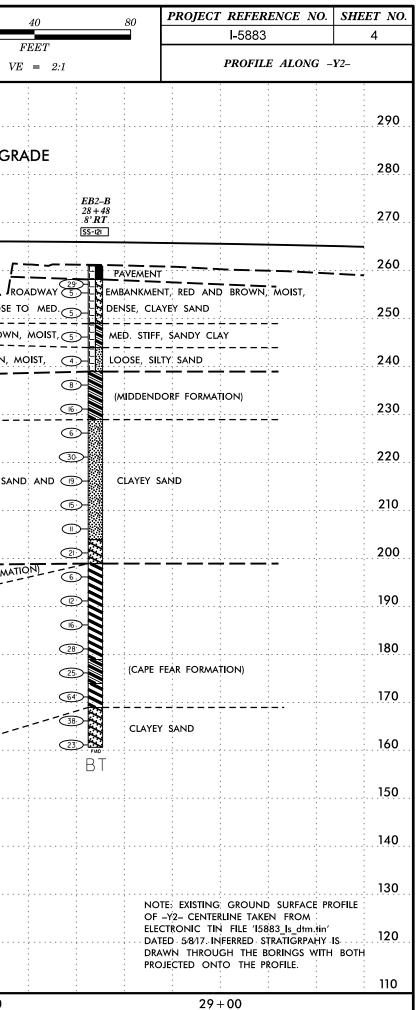


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310								. 0
300								1
290	 ⑦ ROADWAY EMBANKMENT, TAN ③ COASTAL PLAIN, BROWN AND 	D BLACK, WET, MED. STIFF TO	O STIFF, SANDY CL	AY AND SILTY CLA	Y, (CAPE FEAR FORMATIO	9N)		
	© COASTAL PLAIN, GRAY, WET,	VERY STIFF, SILTY CLAY, (CAP	e fear formation	y				
280								PROPOSED GI
270		EB1-A 25 + 10 10' LT		EB1–B 26 + 14 25' RT SS-167	BRIDGE NO. 81	BI-B 27+05 43'RT		
260		[SS-146]						
	ROADWAY EMBANKMENT, BROWN, MOIST, VERY LOC	T C C C C C C C C C C C C C	-	EXISTING (/	GROUND			
250	BROWN, MOIST, SOFT,		Y SAND			L -		RED AND BROW
240	BROWN, MOIST, SOIT, BROWN, MOIST, LOOSE,	_` ⊨S ≍÷÷−−*	 	\			/	GRAY AND BROWN,
230	COASTAL PLAIN,	(B)	N AND BLACK,		MOIST TO WET,	() ()	MED. STIFF TO VERY S	
				8		8		
220	GRAY, BROWN, RED,				PURPLE, LOOSE TO DEN			GRAVEL, SAND, SILTY SA
210	GRAT, BROWIN, RED,		ITE, TAN, ORANGE		FORFLE, LOUSE TO DEN	ISE, <u>5</u> 0000	COARSE SAIND WITH V	JRAVEL, SAIND, SILLT SA
		22						
200	· · · · · · · · · · · · · · · · · · ·					<u> </u>	·····	
	- <u> </u>		B		2		- AND CLAYEY SA	ND, (CAPE FEAR FORMA
190	COASTAL PLAIN;		CK, SATURATED, MEI	D. TT DENS	E TO VERY DENSE, SANI		AND AND	
180								
	COASTAL PLAIN,	35 GRAY,	TAN AND BLACK,		WET, MED. STIFF	33	TO VERY STIFF, S	ANDY CLAY,
170	· · · · · · · · · · · · · · · · · · ·					<u>36</u>	· · · · · · · · · · · · · · · · · · ·	
		35			`	36		
160	· · · · · · · · · · · · · · · · · · ·			39		30		
150		C21) FIAD BT						DENSE TO DENSE
	· · · · · · · · · · · · · · · · · · ·		. GRAY. AND.	40	. GREEN, SATURATED,			
140				32				
				BT		ΒT		
130							· · · · · · · · · · · · · · · · · · ·	
120								
110 24+00	<u>: : : :</u>	5+00		26+00		27+00		28+00

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								0 5 10	PROJ. REFERENCE NO. I -5883	SHEET NO.
150 140	130 120 110 100 90	80 70 60 50 40	30 20 1	0 0 10 20	30 40	50 60 70 80	90 100	110	120 130 140	150
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			· · · · · · · · · · · · · · · · · · ·	Ľ						
	(A) ROADWAY EMBANKMENT, BROWN, WET, SC		•••••••••••••••••••••••••••••••••••••••					· · · · · · · · · · · · · · · · · · ·		
280	A KOADWAT EMBANNMENT, BROWN, WEI, SC	JET, SANUT CLAT								
.200		EBI–A						· · · · · · · · · · · · · · · · · · ·		
.270		25 + 10 10' LT								970
.270		SS-146		······································						
000					EB1-B					000
. 260			-		26+14					
250					25' RT					05
250					55-167					
240	ROADWA	Y EMBANKMENT, GRAY, BROWN		SE, SAND, SILTY SAND, CLAYEY SAND AN	ND COARSE SAND	WITH GRAVEL		— -		
	COASTAL	PLAIN, GRAY AND TAN,	WET, MED. STIFF,	SANDY CLAY,		(MIDDENDORF FORMATION)				
230					6	7				
					⑧ 0000 0000 0000 0000					
220										
	GRA	Y, WHITE, BROWN AND	TAN, SATURATED, LOOSE TO M	ED. DENSE, CLAYEY SAND, SAND	B-0000	and coarse sand with gravel				
210								· · · · · · · · · · · · · · · · · · ·		
		22			9					
200	····				7					
	COAST	AL PLAIN, BROWN AND BLACK, 5	WET, MED. STIFF TO STIFF,	SANDY CLAY AND SILTY CLAY,		(CAPE FEAR FORMATION)				
. 190	GRAY	AND BLACK,	SATURATED, MED. DENSE T	O VERY DENSE,	77	· · · CLAYEY SAND AND · SAND · · · · ·		· · · · · · · · · · · · · · · · · · ·		
					25					
. 180		·····						· · · · · · · · · · · · · · · · · · ·		
	GRAY,	GREEN AND TAN, 35	WET, MED. STIFF, SAND	DY CLAY AND SILTY CLAY,	36					
. 170	····	62			47	- <u>÷</u> ;;;;;;;		· · · · · · · · · · · · · · · · · · ·		
		35-			25					
<i>. 160</i>		49-			39	MED. DENSE TO DENSE, CLAYEY SAND				
		I I I I I I I I I I I I I I I I I I I		GREEN, SATURATED		GRAY, WET, VERY STIFF, SILTY CLAY				
. 150		BT		GRAY ANU		ORAL, MEL, YENI SHIFF, SHIFT CLAY				
. 140										
				25+77.06	BT				SECTION GROUND LINES	
130								··· OF . 50° 04' 23') ALONG BENT LINE WITH	
				-72-				IS DRAWN TH PROJECTED O	IROUGH THE BORINGS WIT NTO IT.	н вотн
150 140	130 120 110 100 90	80 70 60 50 40	30 20 1	0 0 10 20	30 40	50 60 70 80	90 100		120 130 140	150

150 140 130 120 1	110 100 90 80 70 60 50	40 30 20	10 0 10 20 30	40 50 60 70 80	90
			E		
:50		<i>BI–A</i> 26+71		B1-B	
		20 + 71 24' LT		27+05 43'RT	
40	ROADWAY EMBANKMENT, RED_AND_TAN				
30	COASTÁL PLAIN, GRÀY AND TAN,	3 8	MOIST TO WET, MED. STIFF TO STIFF, SANDY CLAY AND	(5) ■ 11/17 SILTY CLAY, (MIDDENDORF FORMATIC ③	0N)
				8 4 0000	
20				$\cdots $	D 41/51
210	GRAY, TAN, ORANGE AND WHITE,		TURATED, LOOSE TO MED. DENSE, CLAYEY SAND, SILTY SAI	ND, (19)	(AVEL
~					
200			COASTAL PLAIN, GRAY AND BLACK,	SAT., 6 MED. DENSE TO VERY DENSE, SILTY S/	—— – AND,
190				(CAPE FEAR FORMATION)	
30				® 	
DU		39-1		37-	
70	COASTAL PLAIN, GRAY,	55-8	WET, MED: STIFF TO HARD, SILTY CLAY,	(CAPE FEAR FORMATION)	
60					
		26-1		32-1	
50		40-			
40	GRAY, SATURATED,	4)		CLAYEY SAND	
		BT	24 + 90 74	a BT	
30			26+80.74 - <i>Y2</i> -		
150 140 130 120 1	110 100 90 80 70 60 50	40 30 20	$-\gamma \geq -$	40 50 60 70 80	90

60 70 80 90 100 110 120 130 140 150 AND EROWN, MOUT, STIFF, SANDY CLAY						0		10	P	ROJ. REFEREN		sheet no. 6
AND BROWN MOIST, STIFF, SANDY CLAY .240 SULTY CLAY, (MIDDENDORF FORMATION) .230 SULTY .220 .220 SAND AND COARSE SAND WITH GRAVEL .210	60	7	: :0 8	80 9	0 10				120			
IND BROWN MOIST_STIFF, SANDY CLAY .240 SULTY CLAY, (MIDDENDORF FORMATION) .230 .230 SAND AND COARSE SAND WITH GRAVEL .210 .220 SAND AND COARSE SAND WITH GRAVEL .210 .200 WED. DENSE TO VERY DENSE, SILTY SAND, .900 .200 (CAPE FEAR FORMATION) .900 .900 (CAPE FEAR FORMATION) .900 .900 (CAPE FEAR FORMATION) .900 .900												
IND BROWN MOIST_STIFF, SANDY CLAY .240 SULTY CLAY, (MIDDENDORF FORMATION) .230 .230 SAND AND COARSE SAND WITH GRAVEL .210 .220 SAND AND COARSE SAND WITH GRAVEL .210 .200 WED. DENSE TO VERY DENSE, SILTY SAND, .900 .200 (CAPE FEAR FORMATION) .900 .900 (CAPE FEAR FORMATION) .900 .900 (CAPE FEAR FORMATION) .900 .900	÷											
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IND BROWN MOIST_STIFF, SANDY CLAY .240 SULTY CLAY, (MIDDENDORF FORMATION) .230 SAND AND COARSE SAND WITH GRAVEL .220 SAND AND COARSE SAND WITH GRAVEL .200 WED. DENSE TO VERY DENSE, SILTY SAND, .900 CAPE FEAR FORMATION) .900 (CAPE FEAR FORMATION) .700 (CAPE FEAR FORMATION) .700	•••••								·			
AND BROWN MOIST, STIFF, SANDY CLAY .240 SULTY CLAY, (MIDDENDORF FORMATION) .230 SULTY .220 .220 SAND AND COARSE SAND WITH GRAVEL .210			• • •									
AND BROWN MOIST, STIFF, SANDY CLAY .240 SULTY CLAY, (MIDDENDORF FORMATION) .230 SULTY .220 .220 SAND AND COARSE SAND WITH GRAVEL .210												
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IND BROWN MOIST_STIFF, SANDY CLAY .240 SULTY CLAY, (MIDDENDORF FORMATION) .230 .230 SAND AND COARSE SAND WITH GRAVEL .210 .220 WED. DENSE TO VERY DENSE, SILTY SAND, .200 .200 WED. DENSE TO VERY DENSE, SILTY SAND, .900 .900 CAPE FEAR FORMATION) .700 .600 CLATEY SAND .150 .150	:								:			
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NND. BROWN, MOIST, STIFF, SANDY CLAY 240. SILTY CLAY, (MIDDENDORF FORMATION) 230. SAND AND COARSE SAND WITH GRAVEL 220. SAND AND COARSE SAND WITH GRAVEL 200. MED. DENSE TO VERY DENSE, SILTY SAND, 90. CAPE FEAR FORMATION)			, ,									
NND. BROWN, MOIST, STIFF, SANDY CLAY 240. SILTY CLAY, (MIDDENDORF FORMATION) 230. SAND AND COARSE SAND WITH GRAVEL 220. SAND AND COARSE SAND WITH GRAVEL 200. MED. DENSE TO VERY DENSE, SILTY SAND, 90. CAPE FEAR FORMATION)									-			
AND BROWN, MOIST, STIFF, SANDY CLAY SILTY CLAY, (MIDDENDORF FORMATION) 220 SAND AND COARSE SAND WITH GRAVEL 210 WED. DENSE TO VERY DENSE, SILTY SAND, 200 WED. DENSE TO VERY DENSE, SILTY SAND, 200 (CAPE FEAR FORMATION) (CAPE FEAR FORMATION) (CAPE FEAR FORMATION) (CAPE FEAR FORMATION) (CAPE SAND (CAPE SAND (CAPE SAND	· · · · · ÷ ·						;		·			
AND BROWN, MOIST, STIFF, SANDY CLAY SILTY CLAY, (MIDDENDORF FORMATION) 220 SAND AND COARSE SAND WITH GRAVEL 210 WED. DENSE TO VERY DENSE, SILTY SAND, 200 WED. DENSE TO VERY DENSE, SILTY SAND, 200 (CAPE FEAR FORMATION) (CAPE FEAR FORMATION) (CAPE FEAR FORMATION) (CAPE FEAR FORMATION) (CAPE SAND (CAPE SAND (CAPE SAND												
SILTY CLAY, (MIDDENDORF FORMATION) 230 SAND AND COARSE SAND WITH GRAVEL 220. SAND AND COARSE SAND WITH GRAVEL 210. NED. DENSE TO VERY DENSE, SILTY SAND, 200. CAPE FEAR FORMATION) 190.	AND BRO	WN. MOIS	T. STIFF. SAI	NDY CLAY	· · · · · · · · · · · · · ·	 . .	 . :	•••••	. <u>.</u>			
230 SAND AND COARSE SAND WITH GRAVEL 210 220 NED. DENSE TO VERY DENSE, SILTY SAND, 200 CAPE FEAR FORMATION) 180 (CAPE FEAR FORMATION) 180 160 150. CLAPEY SAND			:									
SAND AND COARSE SAND WITH GRAVEL 210. MED. DENSE TO VERY DENSE, SILTY SAND, 190. CAPE FEAR FORMATION) 180. (CAPE FEAR FORMATION) 170. (CAPE FEAR FORMATION) 160. (CAPE Y SAND 150.	SILTY, C	CLAY, (MIDI	DENDORF FC									
SAND AND COARSE SAND WITH GRAVEL 210. MED. DENSE TO VERY DENSE, SILTY SAND, 190. ICAPE FEAR FORMATION) 180. ICAPE FEAR FORMATION) 170. ICAPE FEAR FORMATION) 170. ICAPE SAND 160. ICAPE Y SAND 150.									÷			
210 NED. DENSE TO VERY DENSE, SILTY SAND, CAPE FEAR FORMATION)									 			
210. 200. MED. DENSE TO VERY DENSE, SILTY SAND, (CAPE FEAR FORMATION) (CAPE FEAR FORMATION)	SAND	AND COAF	RSE SAND W	ITH GRAVEL								
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(CAPE FEAR FORMATION) (CAPE FEAR FORMATION) (CAPE FEAR FORMATION) (770. (60. (150. CLAYEY SAND		NSE TO VE	RY DENSE, S	ULTY SAND,	-				:			
(CAPE FEAR FORMATION)	CAPE FEA	AR FORMAT	ION)						-			
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CLAYEY SAND												
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CLAYEY SAND												
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NOTE: CROSS SECTION GROUND LINES						N	OTF	CROSS	SECTIO	ON GROUI		
CONSTRUCTED ALONG BENT LINE WITH SKEW OF 50° 04' 23". INFERRED STRATIGRAPHY						C	ONS	FRUCTED	ALON	NG BENT L	INE WITH	SKEW
IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO IT.						IS	DRA	WN TH	RÒUGI	H THỆ BOR		
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<i>160</i>		, , , , ,						37 24 				·····				2	BT					
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·					GRAY AND GREEN					URATED, MED. DENSE	TO DENSE,					CLAYEY	SAND			
. 170	, , , , ,	, , , ,						44 - N 54 - N								2						
. 180						GRA`	Y AND BLACK, SAT	(35)	DENSE, SILTY	SAND 						2						
. /90							ASTAL PLAIN,				, GREEN AN	ND PURPLE, WET, MED.	STIFF TO H	ARD, SILTY C				AND SANE	Y CLAY, (CAP	PE FEAR FORMATIO	ON)	
. 200												<u> </u>	<u> </u>		<u> </u>			<u></u>		<u> </u>	<u> </u>	
210	• • • • •	2																				
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			GRA	Y, BROWN, TAN,		WHITE, YELLO	W AND PURP	le, moist to	D SATURATED, LOOSE	TO DENSE,	silty sand,	CLAYEY SANE	D, SAND		AND COA	SE SAND WI	TH GRAVEL		
220	- - - - - - - - -	- - - - - - -														3						
230		, , , , ,				COA	ASTAL PLAIN,			GRAY AND	ian, moist	TO WET, STIFF, SAND	Y CLAY,					(MIDDENDC	DRF FORMATIC	N)		
240	· · · ·	· · · ·	· · ·						ROA	DWAY EMBAN	kment, gra	Y, BROWN, RED, TAN	AND BLACK	MOIST, LOC	-:	÷ – – – –:		÷ — — — —	AND CLAYE	÷-	`	
250	- - - - - - - - - - - - - - - - - - -							24' L7 SS-96								5 5 5 BROWN, C				— — — -		
. 260								EB 2– 27+2	6				-			2		PAVEMENT	•			
. 270		· · · · · · · · · · · · · · · · · · · ·														-	SS-12	<u>:</u>				
																	EB2- 28+4 8'R1	8				
280	1 1 1 1 1 1	· · · ·																				
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ME	D. STIFF, SAI	NDY CLAY								
	AND CLAY	EY SAND					•	· · ·		. 240
٩DC	ORF FORMATI	ON)	- - -				- - -			
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OAF	SE SAND W	TH GRAVEL								.220
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	Y CLAY, (CA	PE FEAR FOR	MATION)							. 190
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YEY	SAND									
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		· · · · · · · · · · · · · · · · · · ·			NOTE	CROSS S	ECTION (ROUND L	INES	
		, , , ,			CONS	TRUCTED)° 04′ 23″.	ALONG B	ENT LINE V	WITH SKEW	
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	DESCR			DGE			-		9) OV								GROUND WTR (ft)					DGE N		ON -Y2- (8		OVER -L-
BORI	NG NO.	. EB1-	A			STATI	ON 2	5+10			OFFSET	10 ft LT	-		ALIGN	IMENT -Y2-	0 HR. N/A	BOR	ING NO.	EB1-	A			TATION 2		
COLL	AR ELE	EV. 26	60.9 ft		1	ΓΟΤΑΙ	DEP1	TH 10	5.3 ft		NORTHIN	IG 580,	110		EAST	NG 2,131,691	24 HR. FIAD	COL	LAR ELE	EV . 26	60.9 ft		ТО	DTAL DEPT	H 105.3	ft
DRILL	RIG/HAI	MMER E	FF./DA	TE S	ME956	3 CME	-550X	88% 08/	10/2017	7		DRILL	METH	OD N	/lud Rotary	HAMM	IER TYPE Automatic	DRIL	RIG/HAI	MMER E	FF./DA	TE SM	IE9563	CME-550X 8	38% 08/10/2	2017
DRIL	L ER W	/hite, T	.J.		5	START	DATE	E 10/2	0/17		COMP. D	ATE 10	/20/1	7	SURF	ACE WATER DEPTH N	/A	DRIL	LER W	/hite, T	.J.		ST	ART DATE	10/20/1	7
ELEV	DRIVE ELEV	DEPTH	BLC	ow co	UNT			BLOV	/S PER	R FOOT		SAMP				SOIL AND ROCK DES	CRIPTION	ELEV	DRIVE ELEV	DEPTH		W COU			BLOWS I	PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	t 0	2	25	50	7	75 10	NO.	/м	DI G	ELEV. (ft)		DEPTH (ft	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	25 !	50 7
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	-	l													260.9	GROUND SURF			182.1	78.8	4	8	12		1 0	
260		l .													_	ROADWAY EMBAN (PAVEMENT))	180							<u></u>	+
-	258.3	+	15	11	9			20					м		258.3	RED AND BROWN, COARS	2.0	11	177.1	83.8					X · · · ·	
255	256.3	<u>† 4.6</u>	3	3	3	- .	, 6						м		F	GRAVEL		175	-		13	16	19		. 35	
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-	252.1	8.8	2	2	1	- <u> </u>	· · ·				· · · · ·		Sat			GRAY AND RED, CLAY	YEY SAND		172.1	88.8	18	26	36			
250	-	ŧ							• •									170		-		-				• • • • • • • • • • • • • • • • • • • •
	247.1	13.8					· · · · · ·								<u>- 248.4</u>	BROWN, SANDY	<u>12.5</u> CLAY	{	167.1	93.8						
245		- 13.0	1	1	1	1	· · · · · ·		· · ·	· · · ·			w	L		,		165	- 10/.1	93.0	9	14	21		 . Q 35 .	
243	-	ŧ													- 243.4		17.5		-	-						
-	242.1	18.8	3	2	2		· · · · · ·	· · ·	· ·		· · · ·					BROWN, SILTY S	SAND	1	162.1	98.8	14	21	28			
240	-	t		2					• •				Sat	Ľ	-			160		_	14	21	20)	49 • • •
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ł	237.1	23.8 [4	3	3	- i	 6						l w		_	GRAY, SANDY C	CLAY		157.1	103.8	9	10	11			
235	_	Ŧ													-	(MIDDENDORF FORM	MATION)		_	-				•••••	. <u>.</u>	
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200	-	ŧ										11			- 228.4		32.5		-	-						
-	227.1	33.8	2	2	2	- í	· · · · · ·		· · ·							GRAY AND WHITE, CLA	AYEY SAND		-	-						
225	-	ŧ	-	-	-				• •			_	Sat	/./					-	-						
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200		38.8	7	10	8	11:		8 · · ·	· ·	· · · ·	· · · · ·		Sat	///					-	-						
220	-	ŧ					!.												-	-						
	217.1	43.8				:	 	· · ·	· ·		· · · ·								-	F						
215	-	ŧ	10	9	6		• • 15	· · ·					Sat						-	Ł						
]	-	ŧ					::::		. .										-	L						
-	212.1	<u>48.8</u>	3	6	4				· ·				Sat	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					-	Ł						
215 210 205	-	É					<u> </u>	+						/~/~					-	F						
	207.1	53.8					ι .		. .					~~~~	<u>208.4</u>	BROWN AND GRAY	, SAND52.5	1	-	F						
205		F	11	11	11	7 :			. .			SS-14	6 23%	00000	F				-	F						
	-	ŧ					/.	1	. .			11		0 0 0 0 0 0 0 0 0 0 0 0	F				-	F						
ŀ	202.1	58.8	4	5	5		·/· ·						0-1	0000	F				-	F						
200	-	‡	`				¶10 ·	+ • • •	• •		· · · ·		Sat	. 0000 0000 0000	 				-	t –						
	-	1				:	.1 .1							0000					-	-						
405	197.1	63.8	7	6	9		· • • · • • 15		· · ·	· · · ·	· · · · ·		w		196.9	COASTAL PLA		1	-	-						
195	-	ŧ					1:								- 193.4	BROWN, SANDY (CAPE FEAR FORM	CLAY IATION) 67.5		-	-						
	192.1	68.8	<u> </u>			:		· · ·	: :						<u>⊢</u> <u>'³⁰.</u> 	GRAY, CLAYEY S		1	-	Ł						
190	-	Ł	5	6	10		• 16	<u> </u>					Sat	/./.					-	F						
	-	ŧ							· [-					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					-	L						
-	187.1	73.8 [6	17	21		· · · ·						Sat	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					-	Ł						
185	-	T						<u> </u>												[

HARNETT		GEOLOGIST	Goslin, G.H.	1	
(I-95)		-		GROUN	ID WTR (ft)
OFFSET 10 ft LT		ALIGNMENT	-Y2-	0 HR.	N/A
NORTHING 580,1	10	EASTING 2,	131,691	24 HR.	FIAD
DRILL M	ETHOD N	lud Rotary	HAMN	ER TYPE	Automatic
COMP. DATE 10/2	20/17	SURFACE WA	ATER DEPTH N	/A	
75 100 NO.	MOI G	SC	IL AND ROCK DES	CRIPTION	
	 *	103.4	AY, CLAYEY SAND AND GREEN, SANI SILTY CLAY	DY CLAY A	11.31
· · · · · · · · · · · · · · · · · · ·	×	- 178.4 -			82.5
	w				
	* *	 - 168.4 -			92.5
	*				
· · · · · · · · · · · · · · · · · · ·	*	 			105.3
			Terminated at Eleva STIFF SANDY CLA PLAIN)	Y (COAST)	AL

									OKE	200															1	
	53083					IP I-5833			Y HARN	IETT			GE	OLOGIST Blonshine, E.G.			WBS	5308	3.1.1			TI	P I-5833		COUNT	Yŀ
SITE	DESCR	RIPTION	BRI	DGE	NO. 8	1 ON -Y2- (SF	R 1709)	OVER -L	- (I-95)							(ft)	SITE	DESCF	RIPTION	BRI	DGE	NO. 81	ON -Y2- ((SR 1709)	OVER -L	- (I-9
BOR	ING NO	. EB1-	-B		5	TATION 26+	+14		OFFSE	25 ft R	Т		AL	GNMENT -Y2-	0 HR. N	/A	BOR	ING NO	. EB1-	·B		ST	TATION 2	26+14		OF
COLI	LAR ELI	EV. 23	38.8 ft		T	OTAL DEPTH	i 100.3	ft	NORTH	ING 580	,003		EA	STING 2,131,715	24 HR . 7	.0	COL	LAR EL	EV. 23	88.8 ft		тс	DTAL DEP	TH 100.3	ft	NO
DRILL	RIG/HA	MMER E	FF./DA	TE SM	ME956	3 CME-550X 88	8% 08/10/	2017		DRILL	METH	OD I	Mud Rot	ary HAMN	IER TYPE Automation	C	DRILL	RIG/HA	MMER E	FF./DA	TE SI	ME9563	CME-550X	88% 08/10/	2017	
DRIL	LER V	Vhite, T	.J.		S	TART DATE	10/23/1	7	COMP.	DATE 10)/24/17	7	SU	RFACE WATER DEPTH N	/A		DRIL	LER V	Vhite, T	.J.		ST	FART DAT	E 10/23/	17	со
ELEV	DRIVE ELEV	DEPTH	BLC	w co	UNT		BLOWS	PER FOO	T.	SAMF	p. ▼	L		SOIL AND ROCK DES			ELEV	DRIVE ELEV	DEPTH	BLC	w co	UNT		BLOWS	PER FOOT	-
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25		50 I	75 1	00 NO.	Им	DI G			DEPTH	l (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
240													L				160							Mate	h Line	
	238.8 -	0.0	2	5	3							- k	238.8	GROUND SURF. ROADWAY EMBAN		0.0			Ŧ	13	18	21		39	T	
		Ŧ	-	Ŭ	ľ					.	M		235.8	BROWN, CLAYEY	SAND	3.0			Ŧ							. .
235	234.4 ⁻	+ 4.4						· · ·	· · · ·	·				COASTAL PLA	AIN	3.0	155	155.0	83.8	10	7	10	· · · · ·			<u> </u>
		+	2	3	4	7	· · · · ·		· · · · ·			, 🖾	1	GRAY AND TAN, SAN (MIDDENDORF FOR	MATION)	_			ŧ		<i>'</i>			7		. .
000		‡					· · · · ·	· · · ·	· · · · ·			1	<u>231.8</u>	GRAY, CLAYEY	SAND	7.0	450		‡						· · · ·	
230	230.0	8.8	3	3	3			<u> </u>			Sat	/~/~					150	150.0	88.8	12	19	21	<u> </u>			. – .
	-	ŧ					· · · ·						226.8			12.0			ŧ							. .
225	225.0	I 13.8										000		WHITE AND TAN, COARS GRAVEL	E SAND WITH		145	145.0	L 93.8							
		+	2	3	5	. • 8					Sat			GIVAVEL					+	8	16	16		● 32 · ·		
		ŧ					· · · · ·		· · · · ·	·		000							Ŧ					1		. .
220	220.0	18.8	5	4	7					·		000	0- 0-				140	140.0	98.8	7	8	11	· · · · ·	4		<u> </u>
	-	ŧ	5	4	'		· · · · ·				Sat		0_ 0_						+ +		0		<u> </u>	19 • • • •		<u> </u>
		ŧ					· · · ·					000							ŧ							
215	215.0	23.8	8	10	8			+			Sat	000						-	ł							
		Ŧ										000	ě						Ŧ							
210	210.0	T 28.8							· · · · ·			000							Ŧ							
210		+ 20.0	7	6	5	· • 11 ·					Sat	000						-	ŧ							
	-	ŧ				::::	· · · · ·					000	0 206.8		3	32.0			t							
205	205.0	33.8								•		000	•	GRAY AND TAN,	SAND			_	t							
		ł	3	4	5	· •9 · · ·					Sat		° –						+							
		Ŧ								•		000							Ŧ							
200	200.0	38.8	3	3	4			•••			Cot	000						-	Ŧ							
		ŧ		Ŭ			· · · · ·		· · · · ·	·	Sat	. 000	÷-						ŧ							
105		‡					· · · · ·		· · · · ·				<u>196.8</u>	COASTAL PLA	NN	<u>+2.0</u>			‡							
195	195.0	43.8	1	1	5			<u> </u>			l w		193.8	BLACK, SILTY C (CAPE FEAR FORM		45.0		-	ŧ							
		ŧ								·		0000		BLACK, SAN					ŧ							
	190.0	- 48.8								•		000	• –						Ŧ							
190		Ŧ	10	35	42					. SS-16	57 23%	6	-					-	Ŧ							
		ŧ						بمبرر [· · · · ·			***	186.8			52.0			Ŧ							
185	185.0	53.8	5	10	15		· · · /	1	· · · ·	·					LAY			-	‡							
	-	ŧ		10	15		25		· · · · ·	·	W								‡							
		ŧ					· · · · ·			·									t							
180	180.0	58.8	12	23	30	$\left \right $	``	53			l w		\mathbf{t}				1	-	ŧ							
		Ŧ								:			ł						ŧ							
	175.0	T 63.8											Ŧ				1		Ŧ							
175		+	11	17	19	1	• • 36 •			-	w		₹					-	Ŧ							
170	-	‡					ΞÌΎΞ	· · · ·	· · · · ·	:			\$						‡							
170	170.0	68.8	47		0-		· · · · · · ·			·			169.3		c	69.5		-	‡							
165		t	17	22	25		:::/	47 · · ·		:	W		1 108.3 *	GRAY AND GREEN, CL					ŧ							
		ŧ										~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	╬┿						t							
165	165.0	73.8	10	12	13			+		·	Sat	/./.	ال ا ال					-	Ŧ							
165		Ŧ					25 · · · · \• · · · ·		· · · · ·	:			, Į				1		Ŧ							
160	400.0	‡ <u>-</u> ^ ^					$\sum_{i=1}^{n} \frac{1}{i} \sum_{i=1}^{n} \frac{1}{i}$		· · · · ·			<i>%</i> .,	; ; ;						‡							
160	160.0	78.8	I	I	I		<u> </u>	1			1		7				L	I	L	I	1					

NT	<u>ү</u> н/	٩R	NET	T			GEOLOG	SIST	Blonshin	e, E.G.		
-L-	· (I-95	5)									GROUN	D WTR (ft)
	OFF	SE	T 2	25 ft RT			ALIGNM	ENT	-Y2-		0 HR.	N/A
				580,0	03		EASTING				24 HR.	7.0
				DRILL N		D Mi	I Rotary	,	,. 	НАММ		Automatic
	CON	ЛР	 ר^ם	FE 10/2			1	E \//	TER DEP			
ют				SAMP.	<u> </u>							
.01	75		100	NO.	моі	0		SO	L AND RO	CK DESC	RIPTION	
	1		+	1								
	T.			+	Sat.	\sim		GRA			YEY SANI	5
•••	·	 	:						(coi	ntinued)		
•••			•				- 154.5					84.3
•••		•••	:		w	Ń	101.0		GRAY, S	SILTY CL	AY	
		•••	·				<u>151.8</u>				YEY SAN	<u> </u>
	+-		-		Sat.		-	5.74		, 0		-
•••			:									
· ·		· ·	:									
	1.				Sat.		-					
· ·		· ·	:									
•••	·		·			/	_					
					Sat.	\sim	138.5 B	orina ¹	erminated	at Flevet	ion 138 5 f	100.3 † IN
							N	1ED. D	ENSE CLA	YEY SAN	ID (COAS	TAL
							-		Р	LAIN)		
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	53083					IP I-5833		Y HARNET	Т			GEOLO	GIST Hayes, M.S.	1			53083					P 1-5833		COUNT	
SITE	DESCR	RIPTION	BR	DGE I	NO. 8	1 ON -Y2- (SR 1709)	OVER -L-	· ,						GROUND WT	R (ft)	SITE	DESCR	IPTION	BRI	DGE N	NO. 81	ON -Y2-	(SR 1709)	OVER -L	- (I-9
BOR	ING NO.	. B1-A	۱ <u> </u>		s	TATION 26+71		OFFSET	24 ft LT			ALIGNN	IENT -Y2-	0 HR.	N/A	BOR	ING NO.	. B1-A	۱		S	TATION	26+71		OFF
COL	LAR ELI	EV . 24	40.6 ft		Т	OTAL DEPTH 100.1	ft	NORTHING	3 579,9	81		EASTIN	G 2,131,787	24 HR.	6.5	COLI	LAR ELE	EV. 24	40.6 ft		т	DTAL DE	PTH 100.1	1 ft	NO
DRIL	RIG/HA	MMER E	FF./DA	TE SI	ME956	3 CME-550X 88% 08/10/	2017		DRILL N	IETHO	D M	lud Rotary	НАММ	ER TYPE Auton	natic	DRILL	RIG/HAI	MMER E	FF./DA1	TE SN	ME9563	CME-5502	K 88% 08/10	/2017	
DRIL	LER W	Vhite, T	.J.		S	TART DATE 11/07/	7	COMP. DA	TE 11/0	08/17		SURFAC	CE WATER DEPTH N/	/A		DRIL	LER W	/hite, T	.J.		S	FART DA	TE 11/07/	17	CO
ELEV	DRIVE ELEV	DEPIR		ow co		-4	PER FOOT		SAMP.	▼∕			SOIL AND ROCK DESC	CRIPTION		ELEV	DRIVE ELEV	DEPTH	' 	w col				PER FOOT	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	50	75 100	NO.	<u>/моі</u>	G	ELEV. (ft)			PTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
245		Ŧ										_				165		_					Mat	ch Line	
ĺ	-	‡										-					-	-							: :
240	- 240.6 -	+ 0.0										- 240.6	GROUND SURFA		0.0	160	162.0	78.6	6	8	11		. 19		: :
240		ŧ	3	4	4					М		-	ROADWAY EMBANI RED AND TAN, CLAYE			100	-	ŧ					<u>\ </u>		. .
1	-	ŧ										<u> 237.6 </u>	COASTAL PLA		<u>3.0</u>		157.0	83.6		40		· · · ·	:\::::		: :
235	236.0	4.6	1	2	3						\mathbf{N}	-	GRAY AND TAN, SILT (MIDDENDORF FORM	TY CLAY		155	-	Ł	11	12	14		. • 26		· ·
	-	ŧ				$\left \left \begin{array}{c} \mathbf{\tilde{I}} \\ \tilde$					\square	-					-	Ł					· · · · · · ·		
	232.0	8.6	2	3	5					w	\square	-					152.0	88.6	14	19	21		$ \begin{vmatrix} \cdot & \cdot \\ \cdot & \cdot \\ \cdot & \cdot & \bullet_{40} \end{vmatrix}$		
230	_	Ŧ					+ • • • •				\square	- 228.6			12.0	150	_	F							
	227.0	I 13.6											GRAY, CLAYEY S	AND			147.0	 93.6							. .
225		+	1	2	2	$ \left \left \begin{array}{c} 1 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 5 \\ 5 \\ 6 \\ 6 \\ 6 \\ 5 \\ $				Sat.	\mathbb{N}	-				145	-	-	16	18	23			1	
	-	Ŧ									/_/.	-					-	F					/		
	222.0	18.6	6	8	6						\mathbb{N}	-					142.0	98.6	9	12	13		· /		. .
220		‡	ľ	Ű						Sat.	///	-					-	<u>+</u>	Ŭ		10		• <u>•</u> 25 • • •	••••	·
	-	‡									/./.	-					-	ŧ							
015	217.0	<u> </u>	6	13	15	$ \begin{vmatrix} \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \bullet & 28 \cdot & \cdot & \cdot \\ \end{vmatrix} $				Sat.	$\langle \rangle$	-					-	ŧ							
215		t					<u> </u>					- 213.6			27.0			F							
	212.0	28.6		_									TAN, GRAY AND ORANGE	, SILTY SAND			-	ŧ							
210	-	Ŧ	4	7	6	· ·• 13· · · · ·				Sat.		-					-	Ł							
	-	Ŧ										-					-	F							
	207.0	33.6	3	4	3					Sat.		-					-	F							
205		Ŧ										-					-	F							
	202.0	38.6										-					-	ŧ							
200	202.0	+ 30.0	5	4	5	$\begin{bmatrix} 1 \\ 1 \end{bmatrix} \begin{bmatrix} 1 $				Sat.		-					-	ŧ							
	-	ŧ													42.0		-	ŧ							
	197.0	43.6				_						-	GRAY, SILTY CL	IN _AY			-	ŧ							
		‡	11	2	2	• 4 · · · · · · · · · · · · · · · · · · ·				W	\mathbf{P}	-	(CAPE FEAR FORM	ATION)			-	ŧ							
195	-	‡				$\left \left \begin{array}{c} 1 \\ \mathbf{\lambda} \\ \lambda$					\square	-					-	ŧ							
100	192.0	48.6	3	3	5	$- \left \begin{array}{c} \cdot \mathbf{i} \cdot \cdot \cdot \cdot \\ \cdot \bullet_8 \cdot \cdot \cdot \\ \cdot \bullet_8 \cdot \cdot \cdot \\ \cdot \bullet \cdot \cdot \cdot \end{array} \right \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot$	· · · · ·			w		-					-	ŧ							
	-	ŧ					<u> </u>				\square	_					-	F							
185	187.0	53.6				. l . l					\square	-					-	Ł							
185	-	Ŧ	3	6	5	· •11 · · · · ·				w	\square	-					-	F							
		Ŧ									\square	-					-	F							
I	182.0	58.6	6	9	15					w	\mathbb{N}	-					-	ŧ							
180		ŧ									\mathbb{N}	-					-	ŧ							
180 175	177.0	+ 63.6									\square	-					-	ŧ							
175	- 1//.0	+ 03.6	14	17	22		· · · · ·			w		-					-	ŧ							
	-	‡					+				\mathbb{N}	-					-	ŧ							
	172.0	68.6				_ _	`\					-					-	ŧ							
170		±	14	23	32		55			w		-					-	ŧ							
	-	ŧ										-					-	ŧ							
	167.0	73.6	6	8	11					w	\square	-					-	Ł							
165		I				♥19						_						Γ							

NT	Y HARNET	T			GEOLOGIST Hayes	, M.S.		
-L-	(I-95)						GROUN	D WTR (ft)
	OFFSET 2	4 ft LT			ALIGNMENT -Y2-		0 HR.	N/A
	NORTHING	579,9	81		EASTING 2,131,787	,	24 HR.	6.5
		DRILL N	IETHO	D Mud	d Rotary	HAMM	ER TYPE	Automatic
	COMP. DAT				SURFACE WATER DI			
ОТ		SAMP.		L	1			
	75 100	NO.	моі	O G	SOIL AND F	ROCK DESC	CRIPTION	
	T	+						
· ·					GRAY (CAPE FEAR F	7, SILTY CL ORMATION	.AY I) (continue	ed)
			W	N				
•••			w	N				
	+			N				
				N				
· ·			W	N				
	· · · ·			N	148.6			<u> </u>
· ·					GRÁY,	CLAYEY S	AND	
	· · · ·		Sat.					
					143.6 GRAY	, SANDY C	LAY	<u> </u>
· ·			w		140.5	,		100.1
					Boring Terminate	ed at Elevat	ion 140.5 f	t IN
				F	VERY STIFF S	PLAIN)	r (COAST	4L
				F				
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-	53083					IP I-5833				HARNE	ETT			GEO	-OGIST Hayes	s, M.S.	1			53083					P 1-58			COUNT	
				IDGE		1 ON -Y2- (-	09) OVEF		-							GROUND	. ,					DGE				,	OVER -L	<u> </u>
	NG NO.					TATION 2					43 ft R				NMENT -Y2-		0 HR.	N/A		ING NO				_	TATION				OF
						OTAL DEP			1	NORTHIN	IG 579,				ING 2,131,74		24 HR.	6.4		LAR EL							100.3		NC
				ATE SI		3 CME-550X								Mud Rotary			ER TYPE A	utomatic					TE SN				% 08/10/2		
DRIL		1	1							COMP. D	ATE 11		7		ACE WATER D	EPTH N	/A		DRIL	LER V	1	1					11/06/1		cc
ELEV (ft)	ELEV	DEPTH (ft)	·				BLO 25	WS PER F 50	00T דיי,	5 10	SAMP	17	0			ROCK DES	CRIPTION		ELEV (ft)	ELEV	DEPTH (ft)	· – – – – – – – – – – – – – – – – – – –			0	ا 25		PER FOO 50	
()	(ft)	(,	0.51	0.5ft	0.51		25		1	0 10	0 NO.		DI G	ELEV. (f	t)			DEPTH (ft)	(,	(ft)	(,	0.51	0.5ft	0.511				<u> </u>	75
																												h 1 !	
245		ł												-					165		<u>+</u>					[h Line	
	-	ŧ												F						161.5	- 79.9				· · ·		.1		· ·
240	240.3	0.0	3	4	4							<u> </u>		- 240.3		UND SURF		0.0	160		- 10.0	11	13	17		· ·] (3 0 · ·		• •
	-	ŧ		1	4	. ∳ ⁸	· · · ·					M		237.3	TAN AND B			3.0			ŧ				· · ·		1:::	· · · ·	
005	- 235.5 -	- - 4.8				::::		· · · ·	· ·					<u> </u>		ASTAL PLA D TAN, SAN		<u>3.0</u>	455	156.5	83.8	7	13	19	· · ·		$\frac{1}{1}$	· · · ·	· · ·
235			1	2	3	∮ 5	<u> </u>							-		DORF FOR			155	-	ŧ				<u> </u>		<u>•32</u> •••		. .
	- 231.5 -	- 8.8				<u>`</u> <u>i</u> :::	· · ·	· · · ·	· · ·											151.5	- 88.8				· · · ·	:: /		· · ·	• •
230		- 0.0	3	4	5	<u> </u>						w							150	- 101.0	1	6	9	16		· · •	.5	<u> </u>	•
	-	ŧ					· · ·						Į.	228.3				<u> <u> </u></u>			ŧ				· · · ·	:: `	`	· · · ·	
	226.5	13.8	1	4	4			· · · ·	· · ·			Sat.		<u>مبا الم</u>		VHITE, CLA	TET SAIND			146.5	93.8	13	16	21	· · ·		.\ . <u>\</u>		
225	-	ŧ					<u> </u>					Joan.	///	223.3				17.0	145	-	ŧ						<u></u> 37		
	- 221.5 -	- - 18.8					· · ·	· · · ·	· · ·				000	<u>- 220.0</u> -	TAN, WHITE			<u>17</u> .0		141 5	- - 98.8				· · · ·	::/	/ 	· · ·	
220		-	8	5	4	i						Sat.		<u>}</u>	SAND WIT	I GIVAVLL A	AND SAND		140			6	9	12		· ./ 21	 		
	-	ŧ				:\::	· · ·			· · · · ·			000	-							ŧ								
015	216.5	23.8	10	9	6	\		· · · · · · · ·	· · ·	· · · · ·		Sat.	000)_ }_							‡								
215	-	ŧ				4 15								- 213.3				27.0		-	ŧ								
	- 211.5 ⁻	- 28.8				:: <u>i</u> :	· · ·	· · · ·	· · ·	· · · · ·			0000	-				27.0			ŧ								
210		-	4	8	11] <u>· · · </u>	19		• •			Sat.	0000							-	‡								
	-	ŧ				· · · <i>i</i> :	· ·		· · ·	· · · · ·				<u>- 208.3</u> _		E, CLAYEY		<u>32.0</u>			ŧ								
205	206.5 -	33.8	3	5	7		· · ·		· · ·	· · · · ·		Sat.			OIGHIC		OAND				ŧ								
205	-	ŧ				• <u>12</u>	1				-1		///	<u>}_</u>						-	ŧ								
	- 201.5 -	- 38.8] . <i> </i>] . <i> </i>	· · ·	· · · ·	· · · ·	· · · · ·			/./								‡								
200	-	ŧ.	4	2	4] <u>∳</u> ∈ · · ·	· · ·		• •		_	Sat.	/./								‡								
	-	ŧ				:`\::				· · · · ·			/	<u>- 198.3</u> _	<u>_</u>		<u> </u>	<u> </u>			ŧ								
195	196.5 -	43.8	7	9	7			· · · ·	· · ·	· · · · ·		Sat.			GRAY AND		LTY SAND				‡								
		ŧ				· · · ·								<u>+</u>			,			-	ŧ								
	- 191.5 -	+ - 48.8_					·		· · · ·	· · · · ·				‡ }							ŧ								
190	-	ŧ	8	20	31	· · · ·			•••	· · · ·		Sat.		÷.						-	ŧ								
	-	ŧ						.	· ·	· · · · ·				†							ŧ								
185	186.5 -	- <u>53.8</u>	30	31	37	$\left\{ \left \begin{array}{c} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{array} \right \right\}$		· · · · ·	\. 68	· · · · ·		Sat.		<u>+</u>							ŧ								
		ŧ									11			 <u>183.3</u>				57.0		-	ŧ								
	- 181.5 -	58.8						· · / · · ·	· · ·	· · · · ·				<u>}</u>	GRA	Y, SILTY CI	AY				ŧ								
180	-	‡	8	13	20]			•••		_	W		<u>}</u>						-	‡								
	-	ŧ					•	· · · · · · · ·	· · ·	· · · · ·]							ŧ								
175	176.5	† 63.8 †	12	17	20	::::	· •	· · · · 	· ·	· · · · ·		l w]						· ·	ŧ								
		ŧ					Ţ							F						-	ŧ								
	- 171.5 -	68.8						· · · · · · · ·	· · ·	· · · · ·]							ŧ								
170	-	‡	12	17	19]		<u>.</u>	•••		_	W		Ļ						-	‡								
	-	ŧ						· · · · · · · ·	· ·	· · · · ·]							‡								
165	166.5 -	- 73.8 -	13	16	20	::::]]	· · · ·	· ·	· · · · ·		l w		ţ							‡								
165		L				11		000												I	L	1	1	I					

T	Y HARNET	Т	-			GEOLOGIST Hayes, M.	S.		
L-	(I-95)							GROUN	D WTR (ft)
	OFFSET 4	43	3 ft RT			ALIGNMENT -Y2-		0 HR.	N/A
	NORTHING	3	579,9	16		EASTING 2,131,748		24 HR.	6.4
			DRILL N	IETHO	D Mi	ud Rotary	HAMME	R TYPE	Automatic
	COMP. DA	-				SURFACE WATER DEPT	Η N//	4	
ЭΤ			SAMP.		L O	SOIL AND ROCI			
	75 100		NO.	моі		SOIL AND ROOM	N DESC		
_									
•					N	GRAY, SILTY C	LAY (co	ontinued)	
					N				
_	+			W	N	_			
					N				
				w	N				
					N	-			
					\mathbf{N}				
				W	\mathbf{N}	-			
									<u> </u>
				Cat		GRAT, CLA	ATET O		
	+			Sat.	~~~	-			
•				Sat.		140.0			100.3
					-	Boring Terminated at MED. DENSE CLAYI	t Elevati EY SAN	on 140.0 f D (COAS]	t IN Fal
					F	PL/	AIN)	_ (• • • • •	
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	5308					P 1-5833			TY HARNE	ETT			GEOL	OGIST Blonshine, E.G	I		5308					P I-583			JNTY
				DGE		ON -Y2- (S) OVER -L			_				GROUND WTR (ft)					DGEN			- (SR 170	9) OVEF	
). EB2-				TATION 27			OFFSET					NMENT -Y2-	0 HR. N/A		ING NO				_	TATION			OF
		.EV . 23				OTAL DEPT			NORTHIN		<i>,</i>			ING 2,131,816	24 HR. 8.5		LAR EL						PTH 10		NC
				TE SN		CME-550X 8							Mud Rotary		MER TYPE Automatic					TE SN)X 88% 08/		
DRIL		Nhite, T.							COMP. D			7		ACE WATER DEPTH N	J/A	DRIL	LER V					ART DA	ATE 10/1		CC
ELEV (ft)	DRIVE ELEV			W COU				S PER FOO		SAMF	17			SOIL AND ROCK DES	SCRIPTION	ELEV (ft)	DRIVE ELEV			W COL				VS PER F	
(11)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	5	50	75 10	00 NO.	<u>/</u> M	OI G	ELEV. (fl)	DEPTH (ft)	(11)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25 I	50	75 I
240	239.7	+ 0.0-	2	2	3		1				<u> </u>		239.7	GROUND SURF ROADWAY EMBAN		160	+	+					M	atch Line	e
		Ŧ		2	J	• ⁵		· · · · ·			M		236.7	TAN AND BLACK, CLA	AYEY SAND			Ŧ							
235	235.0	+ + 47				$ \cdot \cdot \cdot \cdot $		· · · · ·	· · · · ·				<u>- 230.7</u> _			155	156.1	 83.6	11	11	13				
200	235.0	+ 4./	2	3	5						м			TAN AND GRAY, SAN (MIDDENDORF FOR	RMATION)		-	ŧ					./		
	231.1	+ 8.6						· · · · ·	· · · · · · ·				<u>232.7</u>	GRAY, CLAYEY	SAND7.0		151.1	+ + 88.6					/ · · · ·		
230		+ 8.0	3	3	3			· · · ·	· · · · ·		Sat	t. 📏	, , , ,			150		<u> </u>	6	8	8	· · · ·	16		· · ·
		ŧ							:				227.7		12.0			ŧ				::i			
	226.1	13.6							· · · · · ·			000		GRAY, WHITE, TAN AN COARSE SAND WITH	ND PURPLE,		146.1	93.6							
225		Ŧ	2	3	4	—• 7 — —		+		SS-9	6 25%					145	-	Ŧ	5	6	6	— •1:	2		
		Ŧ										000						Ŧ							.
220	221.1	T 18.6	7	7	3						Sat	t 000				140	141.1	98.6	7	7	10				
	.	Ŧ				· · \ ·						000						Ŧ							
	216.1	+ + 23.6							· · · · · ·			000						ŧ							
215	- 210.1	+ 20.0	17	14	13		9 27			·	Sat	t. 000					-	‡							
		‡				/			· · · · · ·			000	2212.7		27.0			‡							
010	211.1	28.6	12	7	3	· · · / ·		· · · · ·	· · · · · · · · · · · · · · · · · · ·			<i>\.</i>	•	TAN AND BROWN, CLA	AYEY SAND			ŧ							
210		+	12		3	• 10		<u> </u>			Sat	t. 📈					-	ŧ							
		ł											ر ال					Ŧ							
205	206.1	33.6	5	5	5	. I					Sat	t. //						+							
		Ŧ				· · ·							202.7		37.0		-	Ŧ							
	201.1	T 38.6												TAN, SILTY SA	AND			Ŧ							
200		+	3	6	6	•12					Sat	t.	-				-	ŧ							
		‡											<u>197.7</u>		42.0			‡							
195	196.1	43.6	1	2	6			· · · · ·	· · · · · · · ·					COASTAL PL BLACK, SILTY C (CAPE FEAR FORM	AIN CLAY			‡							
		+	'	2	Ŭ	0 8								(CAPE FEAR FORM	MATION)		-	ŧ							
		±							· · · · · ·				1					‡							
190	191.1	48.6	3	3	4			.	· · · · ·		w		ł					±							
		ŧ											187.7		52.0			ŧ							
	186.1	53.6												GRAY AND BLACK, SI	ILTY SAND			t							
185			12	17	18		35-	+ • • •			Sat	t.	Ē				-	Ŧ							
		Ŧ											<u>182.7</u>	GRAY, SILTY CLAY AND	57.0			Ŧ							
180	181.1	58.6	11	19	24		$ \cdot \cdot \rangle$	· · · · ·	· · · · ·		w		\$	GRAT, SILTT CLAY AND	SAINDT GLAT			Ŧ							
100	1 .	‡					••••	43			vv		\$				-	ŧ							
190 185 180 175 170	170 1	‡					::: !		· · · · · ·				\$					‡							
175	176.1	63.6	15	17	27			· · · · ·	· · · · ·		w		Ł				-	‡							
		‡						N : : :					172.7		67.0			ŧ							
	171.1	68.6						: 1. : : :										ŧ							
170		\pm	14	23	31						W						-	Ŧ							
		Ŧ										Į,	167.7	GRAY AND GREEN, CL				Ŧ							
165	166.1	73.6	9	21	28				· · · · · ·		60	+	ان والم	GRAY AND GREEN, CL	ATET SAND			ŧ							
100	1 .	‡						- 9 49 / · · ·			Sat	1	},				-	ŧ							
	404.4	‡					· · · /	.	· · · · · ·			<u>/~/~</u>	d, d ,					‡							
160	161.1	78.6	13	18	19			• • • •			Sat	t.	*					<u>t</u>							

T١	и ни	٩RN	١E٦	ГТ					GEOLOGIST	Blonshine	e, E.G.		
L-	(I-95)										GROUN	D WTR (ft)
Τ	OFF	SE	Г	24	1 ft LT				ALIGNMENT	-Y2-		0 HR.	N/A
1	NOR	тн	INC	3	579,9	34		╡	EASTING 2,	131,816		24 HR.	8.5
_1				-	DRILL N		D M	lud	Rotary		НАММ	ER TYPE	
Τ	CON	/P		-	E 10/*				SURFACE WA				
T(_	SAMP.		L						
	75	1	00		NO.	моі	O G		SO	IL AND ROO	CK DESC	RIPTION	
					-	/ 10101	0						
-	Τ.			- +			Ņ.,	-			EN, CLA		
•	·	•••	•				///	F		(con	tinued)		
•		•••	•			Sat.	/./.	F					
						out.	//	F					
•		· ·	•					F					
•	·	· ·	•			Sat.	///	E					
:		· ·	:				///	E					
•		•••	•				/./.	F					
-			-			Sat.	///	F					
	.						//	F					
•		· ·				0-1		F					
-		<u> </u>	•	-		Sat.	~	F	139.6 Boring	Terminated a	at Elevati	ion 139.6 f	100.1 t IN
								F	MED. D	ENSE CLA	(EY SAN _AIN)	ID (COAST	AL
								Ł					
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	53083					IP I-5833			Y HARNE	TT			GEOLO	GIST Goslin, G.H.	1	-	5 53083					P 1-5833		COUN	
				DGE N		1 ON -Y2- (SF		OVER -L-							GROUND WTR (ft)					DGE N		ON -Y2- (OVER -I	(1-9
BOR	ING NO	. EB2-	-B		S	STATION 28+	+48		OFFSET					ENT -Y2-	0 HR. N/A	BOF	RING NO	. EB2-	·B		ST	TATION 2	28+48		OF
COLI	LAR ELI	EV. 26	60.9 ft		Т	OTAL DEPTH	1 100.3	ft	NORTHIN					G 2,131,852	24 HR. FIAD		LAR EL					OTAL DEP			NC
DRILL	RIG/HA	MMER E	FF./DA	TE SM	IE956	3 CME-550X 88	3% 08/10/2	.017		DRILL	METHO	D M	ud Rotary	НАММ	ER TYPE Automatic	DRIL	L RIG/HA	MMER E	FF./DA	TE SN	/E9563	CME-550X	88% 08/10	/2017	
DRIL	LER V	Vhite, T	.J.		S	TART DATE	10/19/1	7	COMP. DA	TE 10/	19/17		SURFAC	E WATER DEPTH N	/A	DRI	LLER V		.J.		ST		E 10/19/	17	cc
ELEV	DRIVE ELEV		·	w cou			BLOWS F	PER FOOT		SAMP.	$\mathbf{\nabla}$	L		SOIL AND ROCK DES	CRIPTION	ELEV	, DRIVE ELEV			w col			BLOWS	PER FOO	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	5	50 I	75 100	NO.	Имо	I G	ELEV. (ft)		DEPTH (f) (ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 :	25	50	75
265		Ļ											_			185	<u> </u>						Mate	ch Line	
	-	ŧ											-					ł							· ·
		ŧ											260.9	GROUND SURF		þ	182.1	78.8	10	12	16		28		· ·
260	-	f											_	ROADWAY EMBAN (PAVEMENT)	180	-	ł							-
	258.1	Т	21	18	11	$\left \left \cdot \cdot \cdot \cdot \right \right $	· · · · ·				м		258.1	RED AND BROWN, CLA	2.		177.1	83.8							
255	256.3	<u>† 4.6</u>	3	3	2						м		-			175		Ŧ	9	11	14		•25 · · ·		
	-	Ŧ				<u> </u>				1		L%	-				1.	Ŧ							
	252.1	8.8	2	3	2						Sat.	$\lfloor / /$	-				172.1	88.8	14	27	37				
250		‡		-		9 5· · ·					Jai.	L/			12	170		‡							+ ·
	247.1	‡					· · · · ·							RED AND BROWN, SA	NDY CLAY 12.	-	167.1	+ 93.8							: :
245	4/.1	+ 13.0	1	1	4	$\left \begin{array}{c c} \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet & \bullet \end{array}\right $	· · · ·	· · · ·			w		-			165		- 93.0	14	17	21				· ·
245	-	ŧ				• • • • •						LS	243.9		17.		-	ŧ							
	242.1	18.8					· · · ·						-	GRAY AND BROWN, S	ILTY SAND		162.1	98.8	10	44	10				· ·
240		ŧ	2	2	2	• 4 · · ·					Sat.		-					<u> </u>	10	11	12	<u> </u>	2 3 · · ·		<u> </u>
	-	ŧ				$i $ $: : : $	· · · ·						238.9	COASTAL PLA	<u></u> <u></u> <u></u> <u>22</u> .			ł							
	237.1	23.8	4	4	4						l w		-	GRAY, SANDY C (MIDDENDORF FOR				ł							
235	_	Ŧ												(-	Ŧ							
	232.1	T 28.8											-					Ŧ							
230		Ŧ	4	7	9						w		-					Ŧ							
	-	ŧ				1 /							228.9	RAY, BROWN, RED AND			-	ŧ							
	227.1	33.8	4	3	3		· · · · ·			SS-121			- 6	SAND	TELLOW, SILT F			ŧ							
225		‡		Ĵ	Ū				· · · ·	55-121	23%		-				-	‡							
	222.1	+ - - 38.8					· · · · ·						-					ŧ							
220		+	6	12	18	:::: `	••••••••••••••••••••••••••••••••••••••	· · · ·			Sat.		-					‡							
	-	ŧ				/	·						-				-	ŧ							
015	217.1	43.8			40	<u> :::</u> /	· · · ·						-					‡							
215		t	8	9	10	· · · • • 19					Sat.		-					t							
	-	ŧ				$\left \left \begin{array}{c} \cdot \cdot \cdot \cdot i \right \cdot \right \right $							-					t							
	212.1	48.8	3	5	10						Sat.		-					ŧ							
215	-	£											_				-	f							
	207.1	+ - 53.8											-					Ŧ							
205		F	6	5	6	· · · · · · • •11 ·	· · · · ·				Sat.		-					Ŧ							
	-	ŧ								11		$\overline{\mathbf{v}}$	203.9	RED AND BROWN, CLA	57.	4	-	ŧ							
	202.1	58.8	3	9	12	::::``;	· · · · · · · ·						-	RED AND BROWN, CLA	ATET SAIND			‡							
200		‡		Ĭ	.2			· · · ·			Sat.		-				-	‡							
200	407.1	‡					\cdot	· · · ·				Ň	<u>198.9</u>	COASTAL PLA		41		‡							
40-	197.1	63.8	3	2	4		· · · ·				w	\square	- G -	RAY, GREEN AND PURPL AND SANDY CL	AY			‡							
195		ŧ							+ · · · · ·				-	(CAPE FEAR FORM	IATION)		-	ŧ							
	192.1	68.8				· <u>i</u> · ·							-					t							
190		ł	3	5	7	· • 12 ·					W		-					Ł							
	-	Ŧ				· · <u>\</u> · ·]			-				-	Ŧ							
	187.1	73.8	4	7	9	$\left \left \begin{array}{c} \cdot \cdot I \\ \cdot I \\ \cdot \cdot I \\ I \\$	· · · · ·				w	D	-					Ŧ							
185		t			-	· · ● 16					V V		-					t							

IΤ	Y HARNET	Т			GEOLOGIST Goslin	G.H.		
·L-	(I-95)						GROUN	D WTR (ft)
	OFFSET	8 ft RT			ALIGNMENT -Y2-		0 HR.	N/A
	NORTHING	5 579.8	13		EASTING 2,131,852		24 HR.	FIAD
		DRILL N		D Mi	I Rotary		ER TYPE	
	COMP. DA		19/17		SURFACE WATER DE			
тс	JOINF . DA	SAMP.	· · · · /	L		_1° 1 11 IN/	Л	
	75 100	NO.	моі	0	SOIL AND R	OCK DESC	CRIPTION	
-	_	· ·		\mathbf{x}^{\dagger}	<u>-</u>	STAL PLA	IN — — —	
				N	GRAY, GREEN A	ND PURPL SANDY CL		CLAY
			w	N	(CAPE FEAR FO			ed)
					178.9			82.0
•			W		_			
					173.9			87.0
			14/	N				
64	· · · ·		W	N	- 400.0			
						REEN, CLA		<u> </u>
•			Sat.	$\langle \rangle$		-		
	+				-			
	· · · · ·		Sat.		160.6			100.3
					- Boring Terminate MED. DENSE CI	at Elevat		t IN
				╞		PLAIN)		
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SUMMARY OF LABORATOTY TEST DATA

Soil Classification and Gradation

					S	&ME, Inc.	. Raleigh, 3201	Spring	Forest	Road, I	Raleigh,	North	Carolina	a 27616						
Federal ID No.: N/A TIP No.: 1-5883 Project Name: Bridge No. 8 Ion -Y2. (SR 1709) over-L. (L-95) Status Clent Name: Michael Baker International Total % Passing Total Montar Fraction (%) LL PL PL PL PL Mois Sign System Status Sample AASHTO Total % Passing Total Montar Fraction (%) LL PL PL PL Mois System System Samd Suit Coarse Fine Total Montar Fraction (%) LL PL PL Mois % System System Samd Suit Coarse Fine Total Montar Fraction (%) LL PL PL Mois %<	S&ME	Project #	! :			6235-16-0)15									Date	Report	1	12/1/201	17
Bridge No. 81 on -Y2- (SR 1709) over -L- (L-9.5) Client Name: Michael Baker International Signature Sample Segmet Baker International AASHTO Depth (f) Total % Passing Total Mortar Fraction (%) L PL PI PI Moria S5 96 27+26 24 LT E82-8 Y2 10 40 60 200 270 Sand Sand <td< td=""><td>State Pr</td><td>oject No</td><td>o.:</td><td></td><td></td><td>53083.1.1</td><td></td><td></td><td></td><td>County</td><td>:</td><td>Harnet</td><td>t</td><td></td><td></td><td>Date</td><td>e Tested</td><td>11/1</td><td>/17-11/</td><td>30/17</td></td<>	State Pr	oject No	o.:			53083.1.1				County	:	Harnet	t			Date	e Tested	11/1	/17-11/	30/17
Michael Baker International 20 20 20 20 20 20 20 20 20 20 20 20 20 2	Federal	ID No.:				N/A				TIP No	.:	I-5883								
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Signed by the second	Client N	Name:	-			Michael B	aker Internation	nal					-							
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SITE PHOTOGRAPH

Bridge No. 81 on -Y2- (SR 1709) over -L- (I-95)



SHEET 15 I-5883 Harnett Co.