## STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STATE	STATE P	ROJECT REFERENCE NO.	SHEET NO.	SHEETS
N.C.	3	3387.1.1	1	43
STATE	PROJ. NO.	F.A. PROJ. NO.	DESCRIP	TION
B-	-4020	BRZ-1403(4)	P.E	
			CONS	ST.

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SHEET

# STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 33387.1.1 I.D. NO. B-4020

COUNTY BEAUFORT/PITT F.A. NO. BRZ-1403(4)

PROJECT DESCRIPTION

BRIDGE NO. 8 OVER TRANTER'S CREEK

ON SR 1403 AND SR 1567

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CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

For Letting

INVESTIGATED BY

MACTEC ENGINEERING AND CONSULTING, INC.

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J. HOWARD

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DATE

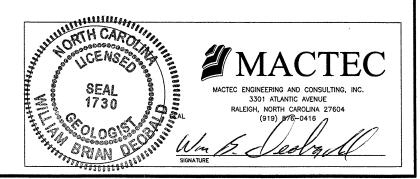
12/22/06

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01/09/07

D. RHODES



DRAWN BY: R.RAHIE

### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

### DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

### SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

B-4020 33387.1.1

SOIL DESCRIPTION			GRADATION				( DESCRIPTION	** / · · · · · · · · · · · · · · · · · ·	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED E		1	EPRESENTATION OF PARTICLE SIZES FROM		HARD ROCK IS NON-	COASTAL PLAIN MATERIAL THA	AT WHEN TESTED, WOULD YIELD SPT RE COASTAL PLAIN MATERIAL WOULD YIELD	FUSAL, AN INFERRED	ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.
WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELD 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D			TICLES ARE ALL APPROXIMATELY THE SAME OF UNIFORM PARTICLES OF TWO OR MORE		SPT REFUSAL IS PE	ETRATION BY A SPLIT SPOON :	SAMPLER EQUAL TO OR LESS THAN 0.1	FOOT PER 60 BLOWS.	AQUIFER - A WATER BEARING FORMATION OR STRATA,
CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY S CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINE	SHALL INCLUDE:		ANGULARITY OF GRAINS		OF WEATHERED RO	CK.	N BETWEEN SOIL AND ROCK IS OFTEN R	EPRESENTED BY A ZONE	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:		THE ANGULARITY OR ROUNDNESS O	F SOIL GRAINS ARE DESIGNATED BY THE TE			RE TYPICALLY DIVIDED AS FOLO	OWS:		ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLA	ASTIC, A-7-6	SUBANGULAR, SUBROUNDED, OR RO			WEATHERED ROCK (WR)	NON-COASTAI PER FOOT.	L PLAIN MATERIAL THAT YIELDS SPT N V	ALUES > 100 BLOWS	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICAT	TION	MIN	ERALOGICAL COMPOSIT	ION		00000	RSE GRAIN IGNEOUS AND METAMORPHI	C BOCK THAT	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS OR	RGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, F WHENEVER THEY ARE CONSIDERED	ELDSPAR, MICA, TALC, KAOLIN, ETC. ARE US	SED IN DESCRIPTIONS	CRYSTALLINE ROCK (CR)	WOULD YIELD	SPT REFUSAL IF TESTED. ROCK TYPE		GROUND SURFACE.
CLASS. (≤ 35% PASSING #200) (>35% PASSING #200)  GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1 A-2	2 44 45	WILLIAM CONSIDERED			NON-CRYSTALLINE	FINE TO COAF	BRO, SCHIST, ETC. RSE GRAIN METAMORPHIC AND NON-CO.	ASTAL PLAIN	CALCAREOUS (CALC.) - SOILS WHICH 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 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-1, A-2-6 A-3-7 A-3	2 A-4, A-5 A-6, A-7	SLIGHTLY COMPRESSIBLE	COMPRESSIBILITY LIQUID LIMIT L	ESS THAN 30	ROCK (NCR)		Y ROCK THAT WOULD YEILD SPT REFUS. YYLLITE, SLATE, SANDSTONE, ETC.	AL IF TESTED. ROCK TYPE	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL COCCOOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOC	:\ <u> </u>	MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE	IBLE LIQUID LIMIT 3	1-50	COASTAL PLAIN	COASTAL PLA	AIN SEDIMENTS CEMENTED INTO ROCK,		CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
### PASSING	`\	1	PERCENTAGE OF MATER	GREATER THAN 50	SEDIMENTARY ROCK (CP)	SPT REFUSAL SHELL BEDS,	L. ROCK TYPE INCLUDES LIMESTONE, SA ETC.	ANDSTONE, CEMENTED	LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
# 10   50 MX   GRANULA			NULAR SILT-CLAY			W	EATHERING		<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
# 40   30 MX   50 MX   51 MN   SOILS # 200   15 MX   25 MX   10 MX   35 MX   35 MX   35 MX   36 MN   36 MN   36 MN   36 MN	SOILS PEAT			OTHER MATERIAL	FRESH ROCK F	RESH, CRYSTALS BRIGHT, FEW	V JOINTS MAY SHOW SLIGHT STAINING. F	ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
LIQUID LIMIT 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 60 MX		LITTLE ORGANIC MATTER 3	1-5% 5-12% LIT		1	R IF CRYSTALLINE.			HORIZONTAL.
Sur	LS WITH		i - 10% 12 - 20% SO! >10% >20% HIG	ME 20 - 35% GHLY 35% AND ABOVE			AINED, SOME JOINTS MAY SHOW THIN CI FACE SHINE BRIGHTLY. ROCK RINGS UND		DIP DIRECTION (DIP AZIMUTH). THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX No MX MOD	DERATE ORGANIC		GROUND WATER	33% AND ABOVE		YSTALLINE NATURE.			FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
USUAL TYPES STONE FRAGS FINE SILTY OF CLAVEY SILTY CLAVEY ORG	OUNTS OF SOILS	□ WATER LEVEL	IN BORE HOLE IMMEDIATELY AFTER DRILLIN	NG.			AINED AND DISCOLORATION EXTENDS IN CLAY. IN GRANITOID ROCKS SOME OCCA		SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
	ITER		R LEVEL AFTER 24 HOURS.				ED. CRYSTALLINE ROCKS RING UNDER H		FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
GEN. RATING							DW DISCOLORATION AND WEATHERING I		FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AS A EXCELLENT TO GOOD FAIR TO POOR POOR SUBGRADE		1	TER, SATURATED ZONE OR WATER BEARING	SSIRATA			S ARE DULL AND DISCOLORED, SOME SH S AND SHOWS SIGNIFICANT LOSS OF STF		PARENT MATERIAL.
P.I. OF A-7-5 ≤L.L 30 : P.I. OF A-7-6 >L.L 30		OM► SPRING OR SE	EPAGE		1	RESH ROCK.			FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
CONSISTENCY OR DENSENESS		M	ISCELLANEOUS SYMBOL	S	MODERATELY ALL RO	CK EXCEPT QUARTZ DISCOLOR SCOLORED AND A MAJORITY SE	RED OR STAINED. IN GRANITOID ROCKS, HOW KAOLINIZATION. ROCK SHOWS SEV	ALL FELDSPARS DULL VERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
PRIMARY SOIL TYPE COMPACTNESS OR RANGE OF STANDARD RANGE OF STANDARD COMPACTNESS OR RESERVENCE C	IGE OF UNCONFINED PRESSIVE STRENGTH	[I] ROADWAY EMBANKMEN			(MOD. SEV.) AND CA	N BE EXCAVATED WITH A GEO!	LOGIST'S PICK. ROCK GIVES "CLUNK" SO		THE FIELD.
CONSISTENCY PENETRATION RESISTENCE COMP	(TONS/FT <sup>2</sup> )	WITH SOIL DESCRIPTION		G REF SPT REFUSAL	1	TED. WOULD YIELD SPT RI			JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE <4		SOIL SYMBOL	AUGER BORING	ASPHALT	(SEV.) IN STR	NGTH TO STRONG SOIL. IN GR	ORED OR STAINED. ROCK FABRIC CLEAR RANITOID ROCKS ALL FELDSPARS ARE K	AND EVIDENT BUT REDUCED AOLINIZED TO SOME	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
GRANULAR LOOSE 4 TO 10 MATERIAL MEDIUM DENSE 10 TO 30	N/A	ARTIFICIAL FILL OTHER	BULK SAMPLE	SAMPLE	EXTEN	T. SOME FRAGMENTS OF STRO TED. YTELDS SPT N VALUE	ONG ROCK USUALLY REMAIN.		ITS LATERAL EXTENT.  LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
(NON-COHESIVE) DENSE 30 TO 50		ROADWAY EMBANKMEN		DESIGNATIONS	1		RED OR STAINED. ROCK FABRIC ELEMEN	NTS ARE DISCERNIDI E DI IT	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN
		INFERRED SOIL BOUNDA	RIES - CORE BORING	S - BULK SAMPLE	(V. SEV.) THE MA	SS IS EFFECTIVELY REDUCED	TO SOIL STATUS, WITH ONLY FRAGMENT	TS OF STRONG ROCK	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY SOFT <2 GENERALLY SOFT 2 TO 4	<0.25 0.25 TO 0.5	SITETIE INFERRED ROCK LINE	eg	SS - SPLIT SPOON SAMPLE			LE OF ROCK WEATHERED TO A DEGREE BRIC REMAIN. IF TESTED, YIELDS		PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
SILT-CLAY MEDIUM STIFF 4 TO 8 MATERIAL STIFF 8 TO 15	0.5 TO 1		MONITORING WE	GI - GILLEDI TODE	i		RIC NOT DISCERNIBLE, OR DISCERNIBLE		RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
(COHESIVE) VERY STIFF 15 TO 30	1 TO 2 2 TO 4	TTTTT ALLUVIAL SOIL BOUNDA	RY PIEZOMETER INSTALLATION	SAMPLE RS - ROCK SAMPLE	SCATTE		RTZ MAY BE PRESENT AS DIKES OR STR		ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF
HARD >30	>4	25/025 DIP/DIP DIRECTION OF	SLOPE INDICATOR	8	ALSOA		OCK HARDNESS	· · · · · · · · · · · · · · · · · · ·	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE	***************************************	ROCK STRUCTURES	INSTALLATION	RT - RECOMPACTED TRIAXIAL SAMPLE					SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE
U.S. STD. SIEVE SIZE 4 10 40 60	200 270	O SOUNDING ROD	SPT N-VALUE	CBR - CBR SAMPLE		OT BE SCRATCHED BY KNIFE OF IAL HARD BLOWS OF THE GEOL	R SHARP PICK. BREAKING OF HAND SPE LOGISTS PICK.	ECIMENS REQUIRES	PARENT ROCK.
OPENING (MM) 4.76 2.0 0.42 0.25	0.075 0.053		ABBREVIATIONS		HARD CANE	E SCRATCHED BY KNIFE OR PIC	CK ONLY WITH DIFFICULTY. HARD HAMA	MER BLOWS REQUIRED	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL
BOULDER COBBLE GRAVEL SAND SAND	SILT CLAY (SL.) (CL.)	AR - AUGER REFUSAL	FRAGS FRAGM	FNTS	TO DE	TACH HAND SPECIMEN.			TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS
(BLDR.) (COB.) (GR.) (CSE. SD.) (F. SD.)	(SL.) (CL.)	BT - BORING TERMINATE	D MED MEDIUM				ICK. GOUGES OR GROOVES TO 0.25 INCH EOLOGISTS PICK. HAND SPECIMENS CAN		SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25	0.05 0.005	C.I CAVE IN CL CLAY	PMT - PRESSURE SD SAND, SANI			DERATE BLOWS.	EULUGISTS FICK. HAND SPECIMENS CAN	BE DETACHED	SLIP PLANE.
SIZE IN. 12° 3°		CPT - CONE PENETRATION	ON TEST SL SILT, SILTY				INCHES DEEP BY FIRM PRESSURE OF KI		STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH
SOIL MOISTURE - CORRELATION OF TER SOIL MOISTURE SCALE FIELD MOISTURE	MS	CSE COARSE DMT - DILATOMETER TE	SLI SLIGHTLY ST TCR - TRICONE F	REFUSAL		OF A GEOLOGISTS PICK.	S TO PEICES 1 INCH MAXIMUM SIZE BY HA	ARD BLOWS OF THE	A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION
(ATTERBERG LIMITS)  DESCRIPTION  GUIDE FOR FIELD MC	DISTURE DESCRIPTION	DPT - DYNAMIC PENETR					ILY BY KNIFE OR PICK. CAN BE EXCAVA		WITH 60 BLOWS.
- SATURATED - USUALLY LIQUID; VER	OVWET HEHALLY	e -VOID RATIO F FINE	7 - DRY UNIT	WEIGHT	1	CHIPS TO SEVERAL INCHES IN S CAN BE BROKEN BY FINGER I	I SIZE BY MODERATE BLOWS OF A PICK I PRESSURE.	POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
(SAT.) FROM BELOW THE GR		FIAD - FILLED IMMEDIAT FOSS FOSSILIFEROUS	ELY AFTER DRILLING V VERY VST - VANE SHE	AD TEST	VERY CAN B	E CARVED WITH KNIFE. CAN BE	E EXCAVATED READILY WITH POINT OF I	PICK. PIECES 1 INCH	STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY:
PLASTIC LIQUID LIMIT		FRAC FRACTURED	W - MOISTURE C		SOFT OR MO		DKEN BY FINGER PRESSURE. CAN BE SC	RATCHED READILY 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:
RANGE < -WET - (W) SEMISOLID; REQUIRE ATTAIN OPTIMUM MOI		EQUIPM	IENT USED ON SUBJECT	PROJECT		RE SPACING	BEDD	ING	TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(PI) PL PLASTIC LIMIT				HAMMER TYPE:	TERM	SPACING	TERM	THICKNESS	BENCH MARK: -BL- 6, -L- STA. 24+20.97, 18.52' RT, ELEV. 8.56'
- MOIST - (M) SOLID; AT OR NEAR O	PTIMUM MOISTURE	1	ADVANCING TOOLS:	X AUTOMATIC X MANUAL	VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	> 4 FEET	BM#11, -L- STA. 24+20.97, 16.32 KT, ELEV. 6.36
OM — OPTIMUM MOISTURE  SL — SHRINKAGE LIMIT ———————————————————————————————————		MOBILE B-	CLAY BITS	AUTOMATIC A MANUAL	WIDE MODERATELY CLOS	3 TO 10 FEET 1 TO 3 FEET	THICKLY BEDDED THINLY BEDDED	1.5 - 4 FEET 0.16 - 1.5 FEET	
REQUIRES ADDITIONA			6" CONTINUOUS FLIGHT AUGER	CORE SIZE:	CLOSE	0.16 TO 1 FEET	VERY THINLY BEDDED THICKLY LAMINATED	0.03 - 0.16 FEET 0.008 - 0.03 FEET	NOTES:
ATTAIN OPTIMUM MOI	ISTURE	BK-51	8" HOLLOW AUGERS		VERY CLOSE	LESS THAN 0.16 FEET	THINLY LAMINATED	< 0.008 FEET	Geotechnical Exploration
PLASTICITY		X CME-45 LC	HARD FACED FINGER BITS				NDURATION		Performed By:
	STRENGTH		TUNGCARBIDE INSERTS	Li	FOR SEDIMENTARY RO	CKS, INDURATION IS THE HARD	DENING OF THE MATERIAL BY CEMENTING	G, HEAT, PRESSURE, ETC.	
	RY LOW LIGHT		CASING W/ADVANCER	X-H_Q	FRIABLE		BING WITH FINGER FREES NUMEROUS G		MACTEC
MED. PLASTICITY 16-25 ME	EDIUM		X TRICONE 3" STEEL TEETH	HAND TOOLS:			TLE BLOW BY HAMMER DISINTEGRATES:		
	HIGH		<del></del> 1	POST HOLE DIGGER	MODERATE		INS CAN BE SEPARATED FROM SAMPLE I AKS EASILY WHEN HIT WITH HAMMER.	WITH STEEL PROBE;	MACTEC ENGINEERING AND CONSULTING, INC.  3301 ATLANTIC AVENUE
COLOR				HAND AUGER SOUNDING ROD	INDURATED	GRAI	INS ARE DIFFICULT TO SEPARATE WITH S	STEEL PROBE;	RALEIGH, NORTH CAROLINA 27604
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN,	•		X CORE BIT	VANE SHEAR TEST		DIFFI	ICULT TO BREAK WITH HAMMER.	,	(919) 876-0416
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARA	ANCE,	OTHER	OTHER	OTHER	EXTREMELY		RP HAMMER BLOWS REQUIRED TO BREA PLE BREAKS ACROSS GRAINS.	K SAMPLE;	
		<u> </u>				SAMI	FLE DREARS MURUSS GRAINS.		1

Subject:

**Geotechnical Report** 

**Description:** 

Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567

**Project Number:** 

33387.1.1

Tip Number: F.A. Number:

B-4020 BRZ-1403 (4)

MACTEC Project Number: 6468-06-1557

#### **Project Information**

The purpose of this investigation was to obtain geotechnical information for design and construction of the proposed replacement of Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 (Clarks Neck Road), on the Beaufort / Pitt County line, North Carolina (Drawings 1 and 2). Our understanding of this project comes from conversations with NCDOT Geotechnical Engineering Unit personnel and from documents and drawings provided by the Geotechnical Engineering Unit, including a Request for Proposal dated October 2, 2006, a Bridge Survey and Hydraulic Design Report dated February 15, 2006, and electronic drawings obtained via the NCDOT file transfer website.

The existing bridge is approximately 310 feet long. The proposed replacement bridge is approximately 440 feet long and constructed on 10 bents with one span 40 feet long, six spans 50 feet long, one span 55 feet long, and one span 45 feet long. The bents are skewed 90° to the alignment (-L-). The proposed structure will be constructed approximately at the same grade as the existing alignment.

We were requested to drill one boring per bent. Borings were to be drilled though the existing roadway embankment or the existing bridge deck, alternating left and right of centerline. Initially, NCDOT requested borings be advanced to the depth of 135 feet or terminate after encountering a total of 40 feet of 50+ blow-per-foot material below the depth of 60 feet. The minimum boring depth was to be 100 feet. Borings at Bents 4 through 7 were to be cored upon encountering rock or cemented coastal plain soil. All other borings were to be Standard Penetration Test borings.

Drilling criteria was subsequently modified by NCDOT, allowing termination of borings after encountering a total of 40 feet of 30+ blow-per-foot material. The minimum boring depth was to be 75 feet. The maximum boring depth was to be 100 feet.

#### **Field Testing**

During October and November, 2006, MACTEC advanced 10 structure-related borings at locations shown on the Boring Location Plan (Drawing 3). The borings were drilled with either a CME-45C trailer-mounted drill rig, CME 55LC track-mounted drill rig, or D-50 ATV-mounted drill rig. The borings were advanced using rotary-wash drilling techniques. HQ-sized core drilling techniques were also utilized for borings at Bents 4 through 7.

The boring at Bent 4 (B4) was the only boring advanced to the depth of 135 feet. All other borings were terminated around the depth 100 feet based on the modified termination criteria. Standard penetration tests (SPT) were conducted and soil samples collected at approximately five foot

SHEET 3

Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 North Carolina Department of Transportation

January 9, 2007 MACTEC Project No. 6468-06-1557

intervals, including in between core runs. Samples were collected from within the soil profile using a split-barrel sampler. A majority of the SPTs were performed with 140 lb. manual hammers. A 140 lb. auto hammer was utilized in boring B4 between the depths of 0.0 to 89.0 feet.

Additional borings, P1 to P5b, were performed along the western approach of the proposed bridge to determine the thickness of the pavement and to collect undisturbed samples of the alluvial, low N-value soil underlying the roadway approach embankment. These borings were advanced using 2.25 in hollow stem auger techniques. SPTs and soil samples were collected in boring P5b only. Two hand auger probes, HA-1 and HA-2, were also performed in this area to evaluate the depth of the embankment fill. A drive-tube was used for collection of undisturbed samples of the roadway embankment soils from the roadway shoulder to the toe of the embankment slope for determination of unit weight. Results of the unit weight testing are included in this report.

Proposed boring locations were established at the project site utilizing GPS equipment. Borings for Bents 3 through 8 were drilled through the existing bridge deck. All other borings were drilled through the roadway embankment. Borings locations were alternated left and right of centerline with the exception of the boring at End Bent 1. Boring EB1 was relocated right of center to accommodate concurrent work by the NCDOT Bridge Maintenance Unit requiring a lane closure.

As-drilled boring location coordinates were captured with GPS equipment. The collected coordinates were corrected as necessary using post-processing differential correction. Conventional survey techniques were used to establish the collar elevations at all boring locations and selected ground surface points depicted on the subsurface profile drawings included with this report (Drawings 4, 5 and 6). Base Line Survey point -BL-6 and BM #11, established at the project site by NCDOT personnel, were used as benchmarks.

### **Laboratory Testing**

Laboratory testing consisting of AASHTO classification and grain-size distribution tests were performed on split-barrel samples SS-2 through SS-17 and bulk samples S-1 and S-2. Samples SS-1 and SS-2 were tested for organic and moisture content.

Laboratory testing was performed in general accordance with applicable ASTM/AASHTO/ NCDOT specifications. Test results for AASHTO classification, grain-size distribution, organic content, and moisture content are included with this report.

Undisturbed samples, ST-1 and ST-2, were taken in borings P-5 and P-5A, respectively. These samples were submitted to the NCDOT Soils Laboratory on November 14, 2006, for strength and compressibility testing. Results of this testing were not available at the time of this report.

#### Physiography

The site is a generally flat, low-lying setting located approximately 4000 feet upstream from the confluence of Tranter's Creek and the Tar River. The roadway approach from the west to the existing bridge is built on a causeway. The causeway is flanked on the north and south by a cypress swamp. The roadway surface is approximately 9 feet above the swamp at the existing bridge. The elevation of the roadway is approximately 10 feet mean sea level (msl).

Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 North Carolina Department of Transportation

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The roadway approach from the east traverses slightly higher ground. The property at the northeast corner of the existing bridge is occupied by a private residence. The North Carolina Wildlife Commission maintains a boat launch on the property at the southeast corner of the existing bridge.

The existing bridge spans Tranter's Creek at an eastward bend in the creek. Tranter's creek is tidally-influenced. We observed fluctuations in the water level of up to  $2\pm$  feet during the time of our fieldwork. Surface water typically tops the western bank and flows into the cypress swamp at high tide. The water surface elevation of the Tranter's Creek was measured at 0.7 feet msl on November 20, 2006. Site photographs included in this report show site conditions during our field investigation.

#### Geology

The project site is located within the Carolina Coastal Plain Physiographic Province. Sediments of the Carolina Coastal Plain were deposited during depositional cycles caused by fluctuating sealevels, and the processes in existence today. Younger sediments lie at the surface near the coast. Older sediments, which underlie these younger sediments, lie at or near the surface further inland. The 1985 Geologic Map of North Carolina, compiled by the N.C. Geologic Survey, indicates that the Yorktown, Castle Hayne and Peedee Formations may be at or near the surface at the project site. Without additional evidence to subdivide marine soils/sedimentary rock into these three formations, we have assigned the marine soils/sedimentary rock encountered at the site to either the Castle Hayne or Peedee Formation. We encountered stratigraphic units in the following descending order:

- Roadway Embankment Fill
- Alluvium
- Castle Hayne Formation
- Peedee Formation

Boring and coring logs describing subsurface conditions at each of the boring locations are included in this report. A generalized profile, Drawings 4, 5 and 6, depict subsurface conditions 13 feet left of alignment -L-.

#### Soil

Roadway Embankment Fill was encountered below the asphalt in borings drilled along the approaches to the existing bridge. Fill consists of very loose to loose, dry to saturated, silty, fine to coarse sand (A-2-4). The base of the fill is at elevation -4± feet msl in the vicinity of End Bent 1, and overlies a layer of alluvial muck. Based on the findings in hand auger borings HA-1 and HA-2, it is our opinion that all of the sand encountered above the muck in borings along the approach to existing End Bent 1 is embankment fill. HA-1, which was advanced through the toe of the embankment slope, encountered sand to a depth of 6 feet, then muck. HA-2, which was advanced into natural ground further right of the embankment, encountered only muck to a depth of 10 feet. Thus, we did not observe evidence of naturally-occurring sandy soil at or near the surface beyond the embankment. The base of the fill is at elevation 0± feet msl at End Bent 2 and overlies a layer of alluvial sand.

Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 North Carolina Department of Transportation SHEET 4 January 9, 2007 MACTEC Project No. 6468-06-1557

Alluvium was encountered below the roadway embankment fill, at the creek banks and in the creek channel. Alluvium consists of very loose to medium dense, wet to saturated, clayey, silty, fine to coarse sand (A-2-4/A-2-6/A-1-b) with trace to little organics; very soft, saturated, sandy silt (A-5) with little organics; and muck. Muck was encountered beneath the roadway embankment fill at elevation -4± feet msl in the vicinity of End Bent 1 and extends to elevation -13± feet msl. The muck overlies a layer of alluvial sand. The alluvial sand is present along the entire length of the project alignment. The base of the sand is at elevation -25± feet msl from End Bent 1 to Bent 6, then gradually gains elevation to -8± feet msl at End Bent 2 where the sand layer directly underlies roadway embankment fill. A thin layer of sand also overlies the muck at Bent 3. A thin layer of silt overlies the sand at Bent 4.

Castle Hayne Formation soil/sedimentary rock underlie the alluvium. Castle Hayne soils primarily consist of loose to very dense, moist to saturated, silty, fine to coarse sand (A-2-4); and locally, very stiff to hard, fine to coarse sandy silt (A-4). The soils contain friable, thinly bedded, limestone. The top of the formation is marked by an upper limestone layer (discussed below) from End Bent 1 to Bent 6 at elevation -25± feet msl, and shell hash from Bent 7 to End Bent 2 at elevation -17 to -8± feet msl. The shell hash did not appear to be indurated and the layer is 10± feet thick at Bent 7 and 24± feet thick at End Bent 2. The base of the Castle Hayne Formation is marked by a lower limestone layer (discussed below) at elevation -70± feet msl.

Peedee Formation soil/sedimentary rock underlie the Castle Hayne Formation. Peedee soils consist of medium to very dense, moist to wet, silty, fine to coarse sand (A-2-4 / A-1-b). The soils contain friable, thinly bedded limestone. The top of the formation is at elevation -70± feet msl. All borings were terminated in the Peedee Formation.

#### Rock

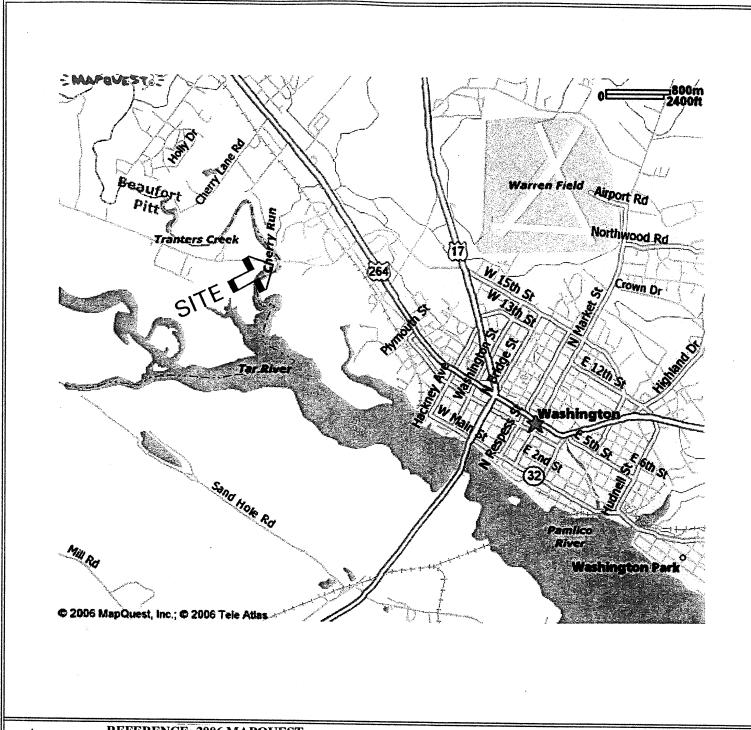
Castle Hayne Formation upper rock layer consists of white and gray, friable, thickly to very thickly bedded, shell-hash limestone. The top of the limestone was encountered from End Bent 1 to Bent 7 at elevation -25± feet msl. The layer varies in thickness from 2 to 8± feet.

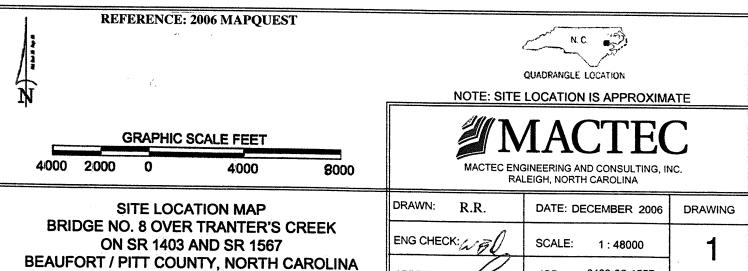
Castle Hayne Formation lower rock layer primarily consists of blue-green to gray, indurated, very thickly bedded limestone. The base of the limestone was encountered at elevation -70± feet msl along the entire length of the project alignment. The layer varies in thickness from 4 to 6± feet. The indurated limestone is locally capped by a discontinuous layer of green-gray, friable to moderately indurated, very thickly bedded, sandy, shell-hash limestone. The discontinuous, shell-hash limestone is generally, highly shelly, partially cemented Castle Hayne soil (A-2-4).

Peedee Formation rock consists of green-gray, indurated, thickly bedded limestone. The limestone was encountered in boring B4 at elevation -110± feet msl.

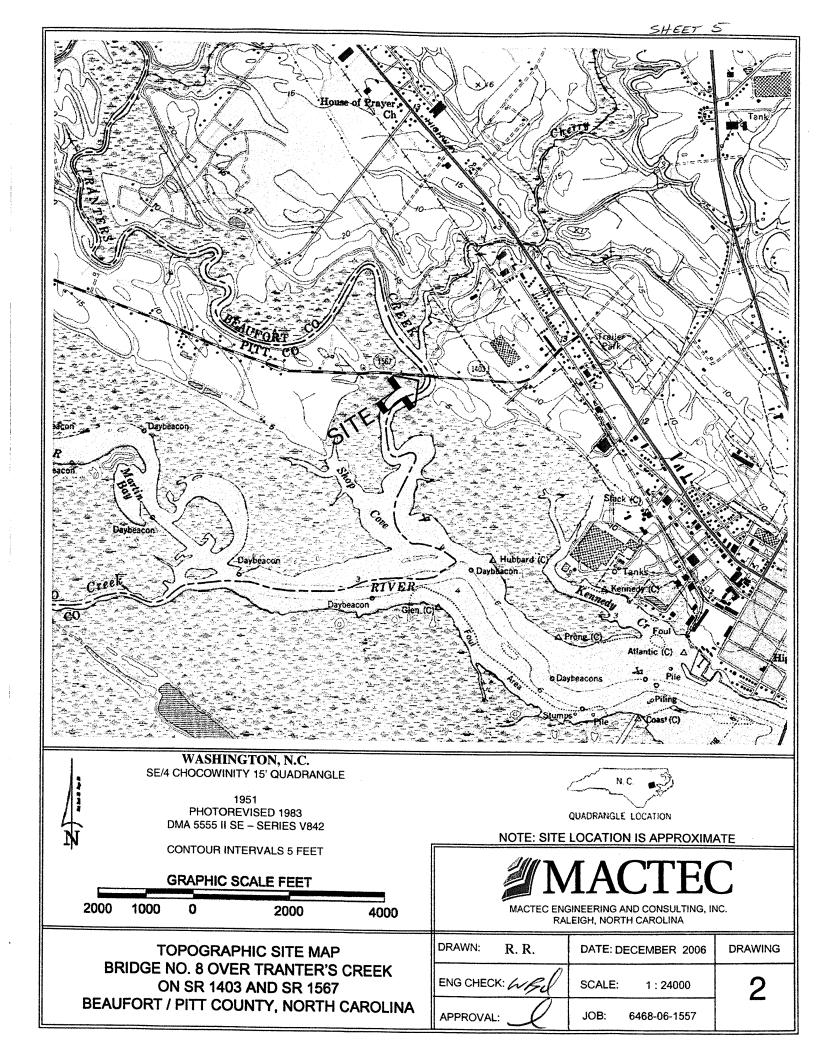
#### Groundwater

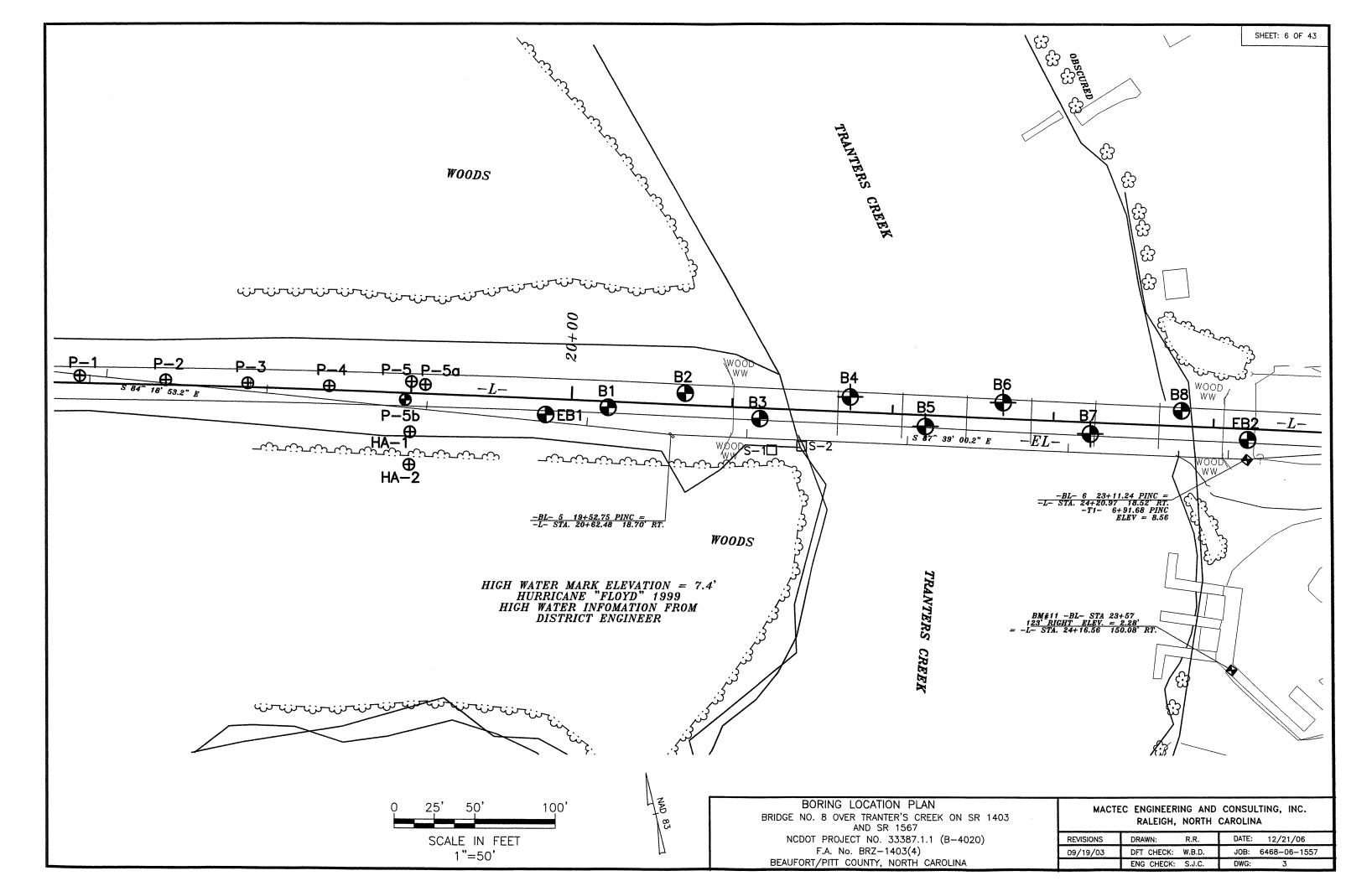
The 24-hour groundwater level elevations measured in borings completed through roadway embankment fill ranged from 1.2 to 1.8 feet msl. The 24-hour groundwater level elevation measured in boring B3, located on the bank of Tranter's Creek, was 0.7 feet msl.

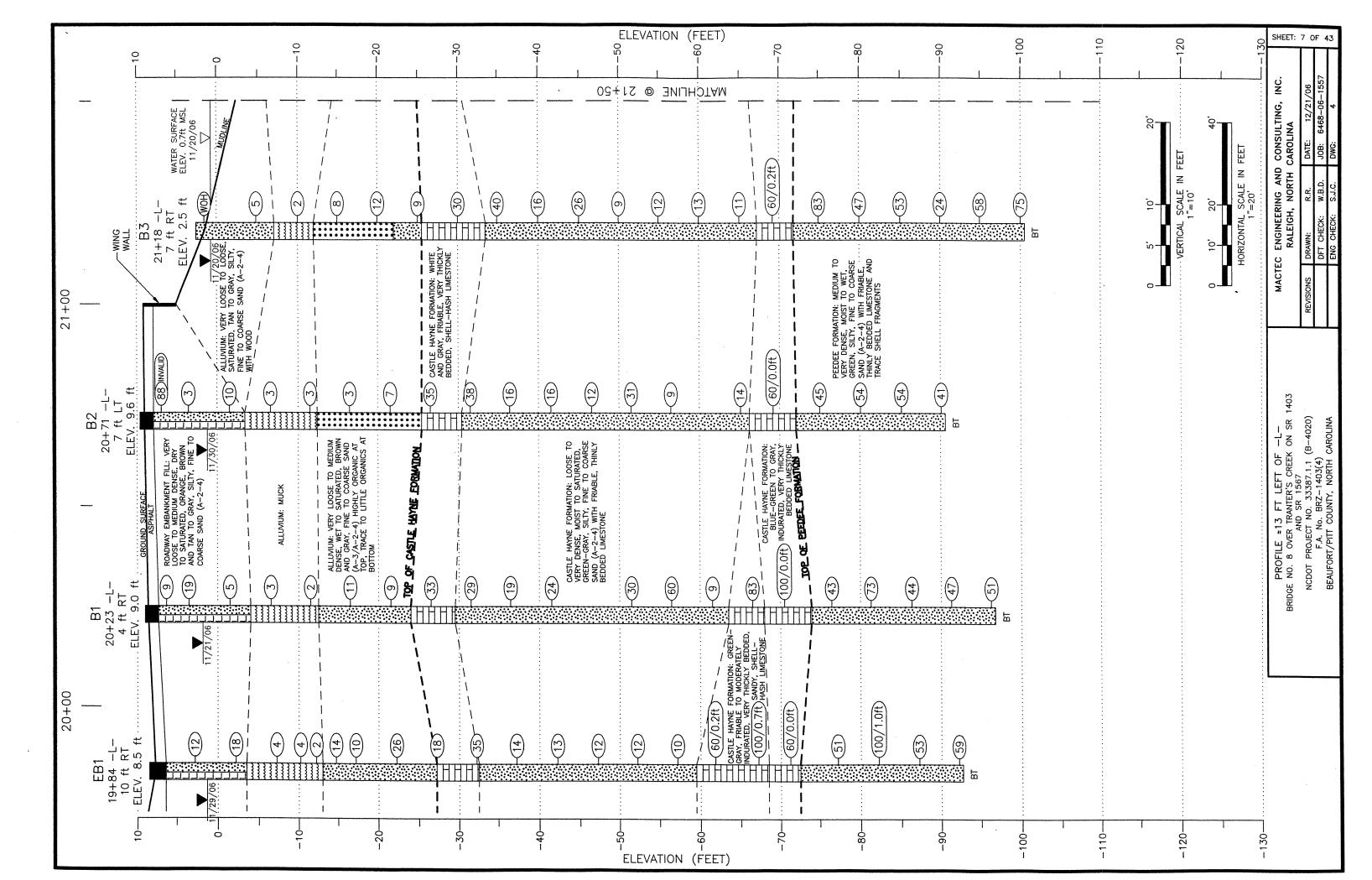


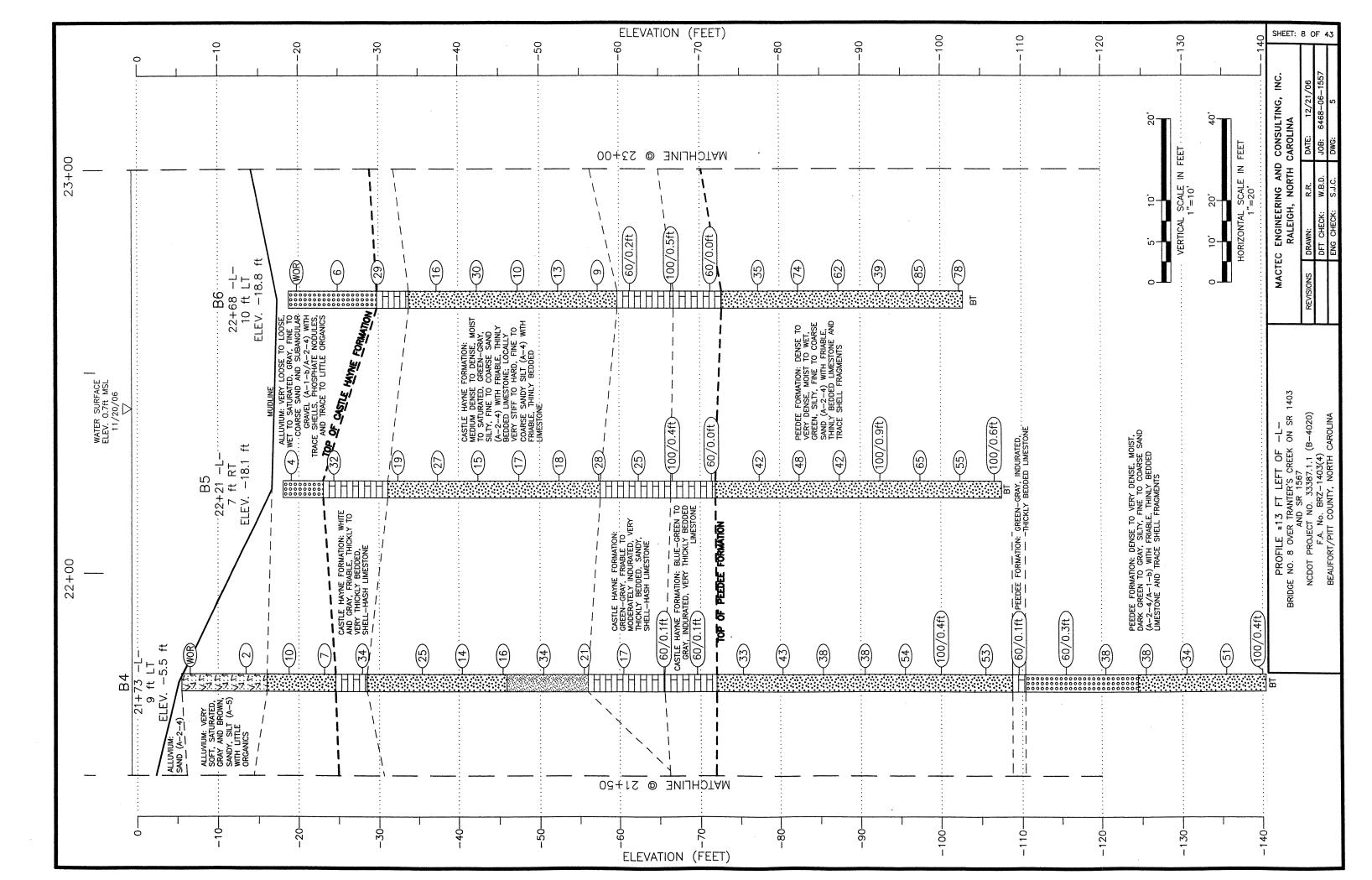


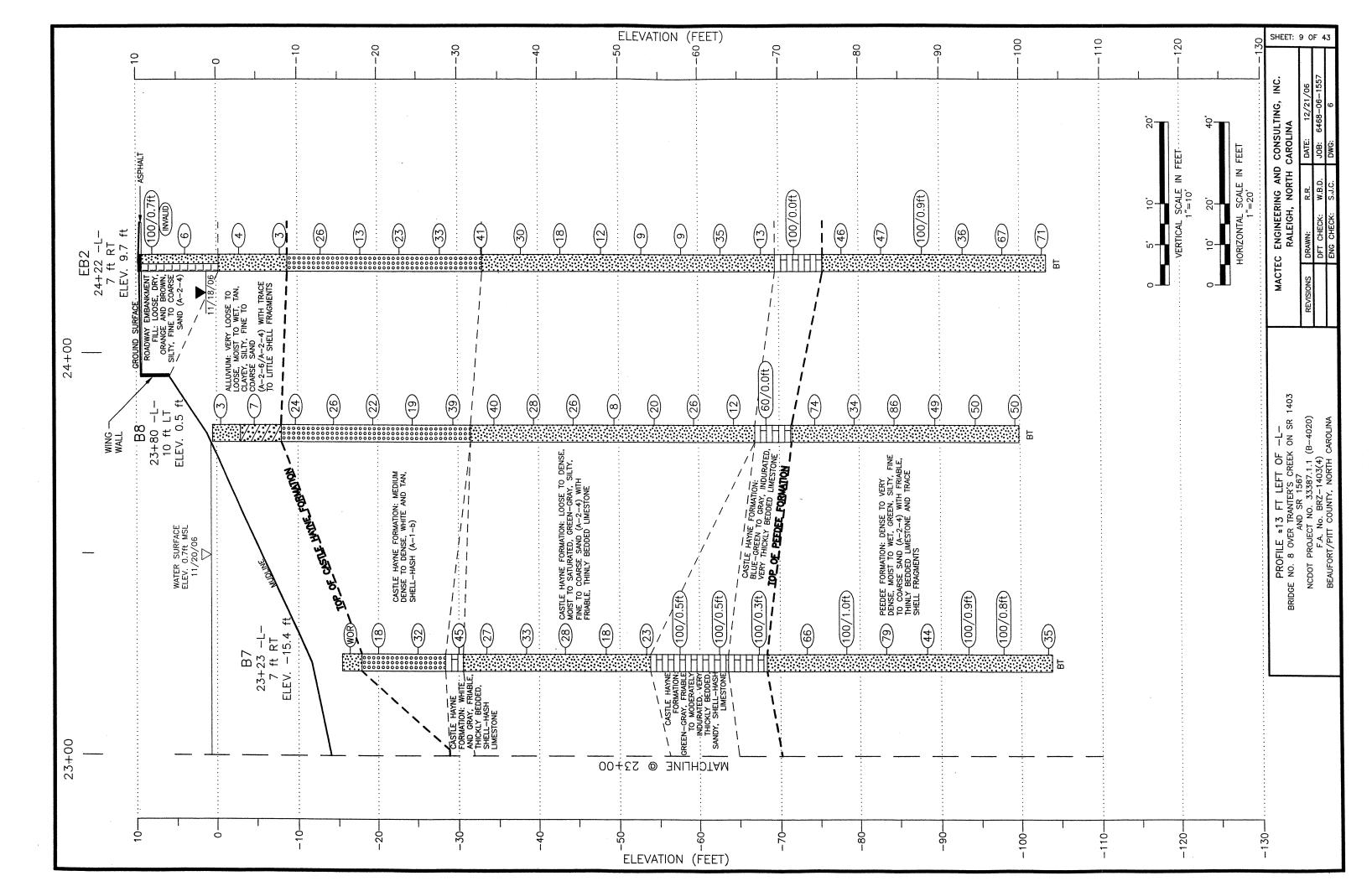
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N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

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PROJE	CT NO.	3338	37.1.1			ID.	B-4020		С	OUNTY	Beau	fort/Pi	tt		GEO	LOGIST J.	
SITE D	ESCRIP	TION	Bridge No	o. 8 over	Trante	r's Creel	k on SR 1	403 and SR 1	567								GROUND WATER (ft)
	G NO.			<del></del>			TION			OFFS	ET 4ff	LT		ALIGNI	MENT	-L-	OHR. FIAD
	R ELEV			<del></del>		665			JS ft	<del> </del>	ING 2		42	1		US ft	24 HR.
	DEPTH			<del> </del>		HINE			,	<del> </del>				ow-stem A			R TYPE N/A
				DRILL	INIMC	<del></del>		44/0/00		<del> </del>						HAIVINE	RITPE IN/A
	STARTE	,	1/9/06	15.07	T	COIVII		11/9/06		SURF	,	T		PTH N/A	·		
ELEV. (ft)	DEPTH (ft)	0.5ft	OW COL	0.5ft	0	20	40 40	PER FOOT 60	80	100	SAMP.	/	0		SO	IL AND ROCK	DESCRIPTION
(11)	(11)	0.011	0.011	0.01			I				NO.	MOI	G				
5.7							Groun	d Surface						5.7			0.0
_	-													_	Roadway	/ Embankment	Fill: Asphalt
_	-				ļ · · ·									3.4	Roadway	/ Embankment	Fill: Sand and gravel 2.3
	-													r 1	Crush &	Run	Fill: Black and tan, silty
-	-														SAND (A	·-2-4)	
-	<b>-</b> -													_	Boring te Roadway	rminated at 3.t / Embankment	oft (Elev. 2.7 ft) in Fill: Silty SAND (A-2-4)
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SITE D	ESCRIP	TION	Bridge No	o. 8 over	Trante	r's Creek	on SR 14	403 and SF									<del></del>	WATER (	ft)
BORIN	IG NO.	P2		ВС	RING	LOCA	TION	17+47		OFFS	ET 3 fi	t LT	********	ALIGN	MENT .	-L-	0 HR.	FIAD	
COLLA	AR ELEV.	6.2	ft	<del></del>		665,			US ft	<del> </del>	ING 2		95	1		US ft	24 HR.	, .	
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	STARTE		/9/06	l				11/9/06		<del> </del>				TH N/A		71744444			
	DEPTH		OW COL	JNT		00		PER FOO		CO.	SAMP.	7		111 19/2	····				
(ft)	(ft)	0.5ft	0.5ft	0.5ft	ọ	20	40	60	80	100	ł	MOI	0		SOIL	AND ROCK	K DESCRIPTIO	N	
					1							VIVIOI	9				······································		
6.2								d Surface			ļ	ļ		6.2	Janelium.	Freebanken	4 Fills Applicate		0.0
-	<u> </u>		ļ							· · ·	_			7.8			nt Fill: Asphalt nt Fill: Black and	tan silty	1.6 2.8
	<u> </u>													- 19	SAND (A-	2-4)	.0 ft (Elev. 4.2 f	- 1	
														- F	Roadway	Embankmen	nt Fill: Silty SAN	i) iii ID (A-2-4)	
														- E	Bit used: H	-lollow-stem	Auger Bit		
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N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

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PROJE	CT NO.	333	87.1.1			ID.	B-4020		C	OUNTY	Beau	ufort/P	itt	GEOLOGIST J.	
SITE D	ESCRIP	TION	Bridge N	lo. 8 over	Trante	r's Creel	k on SR 1	403 and SR 1	567		.,			1	GROUND WATER (ft)
BORIN	G NO.	P3		ВС	ORING	LOCA	TION	17+98		OFFS	ET 3f	t LT		ALIGNMENT -L-	OHR. FIAD
COLLA	R ELEV	<b>.</b> 6.7	ft	NORT	THING	665	,348	Ĺ	JS ft	EAST	NG 2	,568,5	47	US ft	24 HR.
TOTAL	DEPTH	4.0	ft	DRILL	L MAC	HINE	D-50			DRILL	METH	IOD	Holid	ow-stem Auger HAMME	R TYPE N/A
DATES	STARTE	D 1	1/9/06	-	·	COMF	PLETED	11/9/06		SURF	ACE W	ATER	DEF	PTH N/A	
ELEV.	DEPTH	BL	ow co	UNT			BLOWS	PER FOOT			SAMP.	<b>V</b> /	L	COIL AND DOOR	DECODIDATION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	9	20	40	60 	80	100	NO.	MO	O G	SOIL AND ROCK	DESCRIPTION
6.7							Groun	d Surface						6.7	
-	<del>-</del>							····						- Roadway Embankmen	: Fill: Asphalt
	-				: :										
	<del>-</del>							<u>i</u>						Roadway Embankmen	Fill: Black and tan, silty
-														<ul> <li>Boring terminated at 4.</li> </ul>	Oft (Elev. 2.7 ft) in
	-													<b>-</b>	Fill: Silty SAND (A-2-4)
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N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

SHEET 11 ET 1 OF 1

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ROJE	CT NO.	3338	37.1.1			ID. B-	4020		C	OUNTY	Beau	fort/Pi	tt		GEOLO	GIST J. H	Howard
ITE D	ESCRIPT	ION	Bridge No	o. 8 over	Trante	er's Creek o	n SR 14	403 and SR 1	567								GROUND WATER (ft)
ORIN	G NO.	P4		ВС	RING	LOCATI	ON	18+49		OFFSI	ET 2 ft	LT		ALIGNN	IENT -L	-	OHR. FIAD
OLLA	R ELEV.	7.0	ft	NORT	HING	665,34	47	U	S ft		NG 2		97			US ft	24 HR.
	. DEPTH			<del> </del>		CHINE D-								ow-stem Au	iger		R TYPE N/A
	STARTE		/9/06					11/9/06		<del> </del>				TH N/A	-30.		1 1 1 to 1 1//"\
LEV.	DEPTH		ow cor	INT	Γ	J		PER FOOT		JOIN	SAMP.	7		111 10/			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	o	2,0	40	60	80	100	i		0		SOIL A	AND ROCK	DESCRIPTION
											110.	/MOI	G				
7.0						(	Groun	d Surface						7.0			0
	E I												observator stran		oadway Ei	mbankment	Fill: Asphalt
	-													- 4.4 - 3.5 R	oadway Er	mbankment	Fill: Black and tan, silty3
-	-													- \s	AND (A-2-	4)	ft (Elev. 3.5 ft) in
_	-													R	oadway Er	nbankment	Fill: Silty SAND (A-2-4)
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N.C.D.O.T. GEOTECHNICAL UNIT **BORING LOG** 

ROJE	CT NO.	3338	37.1.1			ID. B-402	20		C	YTNUC	Beau	fort/Pi	tt	GEOLOGIST B	Deobald	
ITE DI	ESCRIF	PTION	Bridge N	o. 8 over	Trante	er's Creek on S	R 1403 a	nd SR 1	567						GROUND	WATER (ft
ORIN	G NO.	P5b		ВС	ORING	LOCATION	18+9	97		OFFS	ET 4 fl	RT		ALIGNMENT -L-	0 HR.	8.0
OLLA	R ELE\	<b>/</b> . 7.5	ft	NORT	HING	665,338		L	JS ft	EAST	NG 2	,568,6	44	US ft	24 HR.	FIAD
TAL	DEPTH	1 14.5	ft	DRILL	_ MA	CHINE D-50				DRILL	METH	OD	Hollo	w-stem Auger HAMME	R TYPE 140	lb. Manual
ATE S	TARTE	ED 11	/28/06			COMPLET	ED 11/	/28/06		SURF	ACE W	ATER	DEP	TH N/A	***************************************	
EV.	DEPTH	BL	ow co	JNT			WS PER	FOOT		<del></del>	SAMP.	<b>V</b> /	L	SOIL AND ROCH	, DESCRIPTION	\1
(ft)	(ft)	0.5ft	0.5ft	0.5ft	P	20	40 	60 L	80	100	NO.	MOI		SOIL AND ROOF		
į																
7.5						Gr	ound Su	rface						7.5		
					T									Roadway Embankmen	t Fill: Asphalt	······································
.5	- 3.0	5	5	60/0.3'									4::	5.2 Roadway Embankmen	t Fill: Tan to gra	ıy, silty,
ł		"		00/0.3		: : : : :				iņvalid			Lif	fine SAND (A-2-4)		
0.5	- 8.0				::				· · ·					<ul> <li>3.0ft: Blow counts inva-</li> <li>fragments</li> </ul>	alid due to aspha	ait
<del>).5 T</del>	. 0.0	5	4	4		8						- <del></del>		<del></del>		
3.2	10.7	2			: <i>:</i> /								-::	•		
5.5	- 13.0		2	2	. •4	1							Fit			
‡		2	2	3		5		<u> </u>	<u></u>					-6.0 -7.0 Alluvium: Muck		
‡							•						<u> </u>	Boring terminated at 14 Alluvium: Muck	4.5 ft (Elev7.0	ft) in
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## N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

SHEET 12 SHEET 1 OF 1

PROJECT NO.	3338	7.1.1			ID.	B-4020		С	YTNUC	Beau	fort/Pi	tt	GEOLOGIST J. Howard	
SITE DESCRIP		Bridge No	<del></del>				403 and SR	1567	·		·····		GROUND WATER (ft	)
BORING NO.							19+00		<del> </del>	ET 7 ft			ALIGNMENT -L- 0 HR. FIAD	1
COLLAR ELEV			NORT			·		US ft		NG 2			US ft 24 HR.	
TOTAL DEPTH			DRILL	MAC			·····						ow-stem Auger HAMMER TYPE N/A	
DATE STARTE	· · · · · · · · · · · · · · · · · · ·	/9/06			COM		11/9/06		SURF	ACE W	1	DEP	PTH N/A	
ELEV. DEPTH (ft) (ft)	0.5ft	0.5ft	O.5ft	0	20	BLOWS 40	PER FOO	T 80	100	SAMP. NO.	MOI	0 G	SOIL AND ROCK DESCRIPTION	
7.6						Groun	d Surface						7.6	0.0
I. I						 		 					- Roadway Embankment Fill: Asphalt 5.1	2.5
													Roadway Embankment Fill: Black and tan, silty SAND (A-2-4)	13.6
Ŧ						 		<i>.</i> 					Alluvium: Muck	
-10.0 77.6					· · · · · · · · · · · · · · · · · · ·	  		· · · · ·		ST-1			ST-1: Shelby tube pushed from 17.6 - 18.9 ft	
													Alluvium: Grey, silty SAND (A-2-4) Boring terminated at 21.3 ft (Elev13.7 ft) in Alluvium: Silty SAND (A-2-4) Bit used: Hollow-stem Auger Bit	313



#### N.C.D.O.T. GEOTECHNICAL UNIT **BORING LOG**

or reason				·										SHEE	T 1 OF 1	
ROJECT NO.	33387.1	.1		ID.	B-4020	)	С	OUNTY	Beau	fort/Pi	tt		GEOLG	<b>DGIST</b> B.	Deobald	
ITE DESCRIPT	ION Bridg	ge No. 8 ove	r Trante	r's Creek	on SR	1403 and SF	R 1567						-		GROUND W	ATER #
ORING NO.	HA-1	8	ORING	LOCA	TION	19+00		OFFS	ET 24	ff RT		ALIGN	MENT -	L-	0 HR.	ND
OLLAR ELEV.	2.5 ft			665,			US ff	EAST			47	1		US ft	24 HR.	ND
OTAL DEPTH				HINE				<del></del>				A	<del></del>			ND
ATE STARTE				7		D 44/20/0		<del></del>	METH					HAMME	R TYPE NA	
LEV. DEPTH			<del></del>	COMP		D 11/30/0		SURF		72	DEP	TH NA		***************************************		***************************************
1 +		COUNT	٠,	20	40	S PER FOC		100	SAMP.		0		SOIL	AND ROCK	DESCRIPTION	
(ft) (ft)	0.5ft 0	.5ft 0.5ft	<del>  ĭ                                   </del>			60	- 80	100	NO.	MO	G					····
2.5					Grou	ind Surface										
+ 1			<b>†</b>			· · · · · ·						2.5	Roadway E	Embankment	Fill: Brown, moist	to
<b>‡</b>			• •								1		wet, silty, fi	ine to coarse	SAND (A-2-4)	•
‡																
+ 1					· · ·							- <u>2.5</u> - <u>3.5</u>	Roadway E	Embankment	Fill: Gray, wet, sil	<u> </u>
<b>-</b>			<del></del>	····					l	-		-4.5	fine to coar	rse SAND (A	-2-4)	-راد راد
t l											1 +		Hand auge	MUCK/PEAT er terminated	at 7.0 ft in Alluviur	/ n:
+ 1				*									MUCK/PE/	AT	at 7.0 ft in Alluviur	
‡													Elevation of	of hand auge	r is approximate.	
+												•		<b>U</b> -		
Į l											1 1					
± 1											1 +					
+												<del></del>				
1	I										1 1					
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<b>†</b>											1 1	-				
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## N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

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PROJ	ECT NO.	3338	7.1.1			ID. E	3-4020		С	OUNTY	Beau	fort/Pi	tt		GEOLO	GIST B. [		
SITE	ESCRIPT	ION E	Bridge No	o. 8 over	Tranter	's Creek	on SR	1403 and S	R 1567						*	I	GROUND WA	TER (#1)
	IG NO.			<del></del>				19+00		OFFS	ET 44	ft RT		ALIGNM	MENT -L		0 HR.	
	AR ELEV.		t .			665,			US ft	+			47					ND
	DEPTH								05 n	<del> </del>						US ft	24 HR.	ND
		10.0		DKILL	. MAC	HINE 1				<del></del>				Auger		HAMMER	TYPE NA	
	STARTED	<del></del>	/30/06		1	~~~~		11/30/0		SURF	ACE W	ATER	DEP	TH NA				
ELEV.	DEPTH	BLC	OM COF	TAL				S PER FO	TC		SAMP.	$\mathbf{V}/$	L		0011	ND DOOK	25022125	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	P	20	40	60	80	100	NO.	MOI			SUIL	AND ROCK	DESCRIPTION	
												·						·
1.0							Grou	nd Surfac	е					1.0				0.0
•	†							· · · · ·						_ A	illuvium: M	UCK/PEAT		
	+													•				
	Į																	
-	‡																	
	+																	
	<del></del>						· · ·					<u></u>	<u> </u>	-9.0	· · · · · · · · · · · · · · · · · · ·			10.0
-	‡												1 }	_ H	łand auger /IUCK/PEA	terminated a	at 10.0 ft in Alluviui	n:
	+												F					
	Į													. <b>t</b>	levation of	hand auger	is approximate.	
-	‡											1		-				
	+												F	•				
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### N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

OF 11						7								***************************************		SHEE	T 1 OF 1	
PROJE			37.1.1			<del> </del>	4020			UNTY	Beau	fort/P	itt		GEOLO	OGIST J.	Howard	
			Bridge N					403 and SR 15	67					7			GROUND WATER	(ft)
BORING			***	<del></del>		LOCATI	ON	19+09		OFFS	ET 6f	LT		ALIGN	/ENT -		OHR. FIAD	)
COLLA				NORT				US	S ft	EAST	ING 2	,568,6	57			US ft	24 HR.	
		19.3	ft	DRILL	MAC	HINE D-	50			DRILL	METH	OD	Hollo	w-stem A	uger	HAMME	R TYPE 140 lb. Manu	al
DATE S	TARTE	ED 11	/9/06		·,···	COMPL	ETED	11/9/06		SURF	ACE W	ATER	DEP	TH N/A				
	DEPTH		ow cor	7	_			PER FOOT			SAMP.	<b>V</b> /	LO		SOIL	AND BOCK	DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	P	20 	40	60 l	80	100	NO.	МО				AND NOOK		
7.7							Groun	d Surface						~ ~				
							Oroun	· · · · · ·							Roadway E	mbankment	t Fill: Asphalt	
+	-				: :									5.2 F	Roadway F	mbankment	t Fill: Black and tan, silty	
Ŧ					::	· · · · ·		· · · · · · · · ·					F:	_	SAND (Á-2	-4)	or me black and tan, only	
Ŧ						· · · · ·							F	-				
†														<del></del> -				
‡	•													-				
#					::									-				
‡	•				: :								-1.00	-6.0 -	Alluvium: N	iuck		1
-8.8	16.5	13	5	5		· · · · ·				· · ·				• •	0 56		and a	
-10.6	18.3	13	5	5	Invalid	10					ST-2						alid due to wood	
Ī	·						<u> </u>	• • • • • •	<u></u>	<u> </u>	31-2			- E	Boring term	inated at 19	ned from 18.3 - 19.3 ft 0.3 ft (Elev11.6 ft) on	1
1														•		ilty SAND (A		
1														. E	3it used: H	ollow-stem A	Auger Bit	
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+	•													-				
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SHEET 1 OF 2

PROJECT NO.	33387.1.1		ID. B-4020 C	OUNTY Beau	fort/Pitt	GEO	DLOGIST B.	. Deobald	
		No. 8 over	Tranter's Creek on SR 1403 and SR 1567					GROUND WATE	R (ff)
BORING NO.			DRING LOCATION 19+84	OFFSET 10	# DT	ALIGNMENT	-L-	-	7.0
		<del></del>		ļ		ALIGINIEN		<b></b>	
OLLAR ELEV.			THING 665,329 US ft				US ft		7.2
OTAL DEPTH	101.2 ft	DRILL	MACHINE D-50	DRILL METH	IOD Muc	Rotary	HAMME	R TYPE 140 lb. Mar	uai
ATE STARTE	11/27/0	3	COMPLETED 11/28/06	SURFACE W	ATER DE	PTH N/A			
LEV. DEPTH	BLOW CO	DUNT	BLOWS PER FOOT	SAMP.	L				
(ft) (ft)	0.5ft 0.5ft	0.5ft	0 20 40 60 80	100 NO.	MOI G	S	OIL AND ROCK	K DESCRIPTION	
					I WICH G				
8.5			Ground Surface			8.5			
Ī						- Roadwa	ay Embankmer	nt Fill: Asphalt	,
+ 1						Roadw		nt Fill: Brown and tan to	
3.8 1 4.7			1::::::::::::::::::::::::::::::::::::::			gray, si	ity, fine to coan	se SAND (A-2-4)	
<u>†</u>	5 6	6	12		<b>→</b> F:	ŧ			
+ 1						_			
-1.2 9.7		<del> </del>	<b>↓</b> : : : <b>∖</b> : : : : : : : : : : : : : : : : : : :			F			
‡	10 8	10			Sat.	3.5			
<u>+</u> 1							m: Muck		
-6.2 14.7		<del></del>	<b>.</b>	: : :		<del>-</del>			
‡	2 2	2	•4		Sat.	‡			
-9.2   17.7	1 2	2	<b>∤</b>		Sat.	Ł			
-11.2 19.7						}			
-13.7 + 22.2	2   1	1	•2		Sat.	-13.0			
Ī	6 6	8	• • • • • • • • • • • • • • • • • • •		Sat.	Alluviui (A-2-4)	m: Gray, silty, fi with trace woo	ine to coarse SAND	
-16.2 24.7	9 4	6	<u> </u>		Sat.	<b>†</b>			
‡	9 4	1 8	10		Jal.	<b>:</b>			
<u> </u>						<u> </u>			
-21.2 29.7	6 12	14	: : : : . \		Sat.	-		r	
‡	12	'-	26	: : :	J Jai.	<b>:</b>			
			/						
26.2   34.7	3 6	12	: : : : <u>/</u> : : : : : : : : : : : : : : : : : : :		Sat.	-27.2			
Ŧ l		'-	<del>• 18</del>			Castle		on: White and gray,	
a, ‡						- made, - LIMES	TONE	dded, shell-hash	
-31.2 _ 39.7	19 17	18				32.5			
+ 1						Castle	Hayne Formati	on: Green-gray, silty, fir	
-36.2 + 44.7							se SAND (A-2- d limestone	4) with friable, thinly	
44.7	7 9	5	14		w	<u> </u>			
± 1			: : : <u> </u> : : : : : : : : : : : : : : : : : : :			ŧ			
41.2 1 49.7						<b>:</b>			
+ 70.1	7 6	7	1 •13		w .	<b>;</b>		•	
‡ l						‡			
46.2 ± 54.7						<u>+</u>			
	6 5	7	1		w	<b>.</b>			
‡	1					<u> </u>			
51.2 ± 59.7	.					<b>:</b>			
+ 1	8 6	6	]		W	<b>}</b>			
‡						<b>‡</b>			
-56.2 ± 64.7			]::  ::::::::::::::::::::::::::::::::::			-			
7	4 4	6	10		w	<b>}</b>			
‡						- 59.5			_
-61.2				]		Castle	Hayne Formati	ion: Green-Gray, friable	
T	15 60/0.	2'		60/0.2		to mod sandv.	lerately indurate shell-hash LIM	ed, very thickly bedded, IESTONE	
‡ l						‡			
-66.2 $\pm$ 74.7				: : :		<del> -</del>			



### N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

SHEET 15 SHEET 2 OF 2

									-					SHEE	T 2 OF 2	
PROJE	CT NO.	3338	37.1.1			ID. B-4020	)	C	OUNTY	Beaut	fort/Pi	tt	GEOLO	GIST B. [	Deobaid	
SITE D	ESCRIP	TION E	Bridge No	o. 8 over	Tranter	r's Creek on SR	1403 and SR 150	67							GROUND WATE	R (ft)
BORIN	G NO.	EB1		ВС	RING	LOCATION	19+84		OFFS	ET 101	t RT		ALIGNMENT -			7.0
<del> </del>	R ELEV		ft	NORT			US	S ft	<del> </del>	NG 2,		32		US ft		7.2
ļ	DEPTH					HINE D-50				METHO			Rotary		TYPE 140 lb. Mai	
ļ				DIVILL	. 10170		D 44/00/00		<del> </del>					HAMMEN	TIPE 140 ID. IVIAI	luai
ļ	STARTE		/27/06		, l	COMPLETE			SURF	ACE W	ATER	DEP	TH N/A			
l	DEPTH		OW COL	T	0		S PER FOOT	90	100	SAMP.	▼/	ō	SOIL	AND ROCK I	DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	Ĭ.	20 40	) 60 l	80	100	NO.	/MOI	G		***************************************		
-66.3						Continued f	rom previous p	oa <b>c</b> €	•							
	-	8	40	60/0.2'		<del></del>	· · · · · · ·		100/0.7				-			
	_					<i></i>							68.5 - Castle Hay	ne Formation	: Blue-green to gray,	77.0
-71.2	79.7											片井	indurated, t	hickly bedde	d LIMESTONE	
		60/0.0'							60/0.0				72.5 - Peedee Fo	mation: Gree	en, silty, fine to coarse	81.0
:	_												<ul> <li>SAND (A-2</li> </ul>	-4) with friable	e, thinly bedded	-
-76.2	84.7	39	22	29	: :	· · · · · · · ·					w		ilmestone a	nd trace shel	ii iragments	
:	F	,53		23		 	. •51				٧٧					
								· ·					- 			
-81.2	89.7	23	44	56					· · · ·		w		_			
					: :		• • • • • • •	٠٠. د٠	10011.0				_			
-86.2	94.7						· · · · · · /	<u>/</u> .					_			
-00.2	- 34.7	19	22	31			•53				w		-			
													-			
-91.2	99.7						/						<u> </u>		4	
		14	23	36				· ·	· · ·		W		92.7			101.2
													Peedee Fo coarse SAI bedded lim Bit used: 3'	rmation: Very ND (A-2-4) wi	1.2 ft (Elev92.7 ft) in dense, silty, fine to th friable, thinly ace shell fragments	
-													- -			





SHEET 1 OF 2

PROJECT NO.	33387.1	.1	ID. B-4020 C	OUNTY	Beaut	fort/Pi	tt	GEOLOGIST J. H	loward
			Tranter's Creek on SR 1403 and SR 1567						GROUND WATER (ft)
	··	<del></del>		T					
BORING NO.			DRING LOCATION 20+23	<del> </del>	ET 4ft			ALIGNMENT -L-	<b>0 HR.</b> 8.2
COLLAR ELEV.	9.0 ft	NORT	HING 665,334 US ft	EASTI	NG 2,	568,7	71	US ft	<b>24 HR.</b> 7.2
TOTAL DEPTH	105.8 ft	DRIL	MACHINE D-50	DRILL	METH(	OD I	Mud F	Rotary HAMMER	TYPE 140 lb. Manual
DATE STARTED	11/17	/06	COMPLETED 11/20/06	SURF	ACE W	ATER	DEP	TH N/A	
LEV. DEPTH	BLOW	COUNT	BLOWS PER FOOT		SAMP.	<b>V</b> /	L		
(ft) (ft)	0.5ft 0.	5ft 0.5ft	0 20 40 60 80	100	NO.	MOI	0 G	SOIL AND ROCK	DESCRIPTION
						7 10101			
		- <b>(</b>							
9.0		*	Ground Surface					9.0	
7.3 + 1.7		·						7.3 Roadway Embankment	
I	7	4 5	•9			M		Roadway Embankment gray, silty, fine to coarse	Fill: Brown and tan to
4.5 + 4.5	36	9 10			SS-10	м	H:		( ) = .,
± 1		:				<b>X</b>	Fit.		
-0.5 + 9.5		-	1::/:::			$\nabla$	<b>L::</b>		
-0.5 + 9.5	3 :	2 3	• • • • • • • • • • • • • • • • • • •		SS-11	Sat.	上:	<del>-</del> ·	
‡			:[":::::::::::::::::::::::::::::::::::				H::		
-5.5 + 14.5		4	l ::::::::::::::::::::::::::::::::::::					Alluvium: Muck	1
+ 17.0	2	1 2	•3			Sat.		•	
Į l	1							•	,
10.5 + 19.5								<del></del>	
± 1	0	1 1	•2				<b>****</b>		
Ŧ l								Alluvium: Gray, silty, fin	e SAND (A-2-4) with
15.5 + 24.5		**						wood	
<u> </u>	3 5	5 6	1::•0::::::::::::::::::::::::::::::::::			Sat.		•	
+							-		
20.5 + 29.5			]:: :::::::::::::::::::::::::::::::::::					• •	
‡	3	4 5	• • • • • • • • • • • • • • • • • • •						
t l								-24.0	3
25.5 + 34.5							田	Castle Hayne Formation friable, very thickly bedo	n: White and gray,
Į l	13   1	4 19	33				甲	LIMESTONE	ica, siicii-ilasii
‡ 1			::::::::::::::::::::::::::::::::::::::				田	· · -29.5	3
30.5 + 39.5	17 1	1- 18	<b> </b>   : : : : : : : : : : : : : : : : : :					Castle Hayne Formation	n: Green-gray, silty, fine
+	"   '	.   .0					+	to coarse SAND (A-2-4) bedded limestone	with mable, thinly
F			: : : : : / : : : : : : : : : : : :					•	
35.5 + 44.5	11 6	3 13				Sat.			
<u> </u>			1					· •	
40.5 + 49.5			1					•	
40.5 + 49.5	6 1	1 13	24		SS-12	Sat.		<del>-</del> •	
‡			: : : : : : : : : : : : : : : : : : :					•	
#			1::::::					<del>-</del>	
<u>†</u> .			1::::::					54.5 ft: SPT not perform	ned. Inadvertently
Ŧ I			: : : : : : : : : : : : : : : : : : :					overdrilled.	
50.5 + 59.5			]::::::::::::::::::::::::::::::::::::::					<del>-</del>	
<b>T</b>	6 1	8 12	] : : : : : : •30 : : : : : : : : : : :			Sat.		•	
<u> </u>	Temperature of the Control of the Co							•	
55.5 + 64.5								• <del>-</del>	
‡ T	4 2	8 32	· · · · · · · · · · · · · · · · · · ·			Sat.			
±		· ·						<u>.</u>	
60.5 + 69.5								<del>-</del>	
‡ T	2	4 5	• • • • • • • • • • • • • • • • • • • •			Sat.		•	
<u> </u>								63.5	7
65.5 - 74.5							口	_	



#### N.C.D.O.T. GEOTECHNICAL UNIT **BORING LOG**

00.													SHEE	T 2 OF 2	
PROJE	CT NO.	3338	37.1.1		ID. B-402	0 C	OUNTY	Beau	fort/Pi	tt		GEOLO	GIST J. H	Howard	
SITE D	ESCRIP	TION E	Bridge No	o. 8 over	Tranter's Creek on SF	R 1403 and SR 1567	<del></del>					+	T	GROUND WA	TER (ff)
	G NO.				RING LOCATION	<del></del>	OFFSE	T 4ft	RT		ALIGNM	ENT -L-	_	0 HR.	8.2
	R ELEV		F4	NORT		US ft	<del> </del>			74	ALIGITATIO				
				<del> </del>	~~···	υ ο π	ļ						US ft	24 HR.	7.2
	DEPTH			DRILL	MACHINE D-50		DRILL				Rotary		HAMMER	R TYPE 140 lb. N	lanual
DATE	STARTE		/17/06		COMPLETE	ED 11/20/06	SURFA	CE W	ATER	DEP.	TH N/A				
	DEPTH	BLO	OW COL	JNT	4	NS PER FOOT	i	SAMP.	lacksquare	0		SOIL A	ND ROCK	DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 20 4	0 60 80	100	NO.	MOI						
						<u>.</u>	İ								
-65.8		9	8	75	Continued	from previous page						antle Have	- Fi	. 0 0 6:-1	
		9	°	/5			33			III:	-68.0 to	moderatel	y indurated	n: Green-Gray, friat , very thickly bedde	ed, 77.0
70.5	70.5										\si	andy, shell- astle Havn	hash LIME	STONE (continued)  1: Blue-green to gra	
-70.5 -	- 79.5 -	100/0.0'					100/0.01			二	in in	durated, ve	ery thickly b	edded LIMESTON	E
							: :			一	•				
7E E	04 5										-74.0	eedee For	nation: Gre	en, silty, fine to coa	83.0
-75.5 <del>-</del>	- 84.5 -	13	17	26		43			М	::	. s	AND (A-2-	4) with friab	le, thinly bedded	
							: : :				. 107	mestone ar	ic trace she	Il fragments	
-80.3	_ 89.3														
	- 00.0	19	29	44			: : :		М		<del>-</del>				
						/	: : :								
-85.3	94.3					<i>./</i>					•				
	- 04.0	16	18	26		. •44	: : :		M		<del>-</del>				
-90.3 <del>-</del>	99.3										•				
	- 00.0	10	20	27		47	: : :		М		•				
				Ì		· .\	: : :								
-95.3 <sub></sub>	104.3										•				
	-	15	20	31		51			М	F F	·-96.8				105.8
,										T	В	oring termi	nated at 10	5.8 ft (Elev96.8 ft y dense, silty, fine t	) in
_			}				İ			lt	_	parse SAN	nation. ver D (A-2-4) w	ith friable, thinly race shell fragment	0
٠.	-									F	b	edded lime	stone and t	race shell fragment	s
										F	. в	it used: 3"	roller cone		
-										<u> </u>	- D	rilling fluid:	N/D		
	_					*					•				
	F									F	•				
-	<u> </u>										<del></del>				
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_	_									F	• <del></del>				
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-	F .						1				<del></del>				
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SHEET 1 OF 2

PROJE	ECT NO.	3338	37.1.1			ID. B	4020		CC	YTAUC	Beau	fort/Pi	tt	GEOLOGIST J. Ho	ward/B. Deoba	ald
SITE D	ESCRIP	TION	Bridge N	o. 8 over	Trante	's Creek o	on SR 1	403 and SF	1567						GROUND WA	TER (ft)
BORIN	IG NO.	B2		ВС	ORING	LOCAT	ION	20+71		OFFS	ET 7ft	LT		ALIGNMENT -L-	0 HR.	4.8
COLLA	R ELEV	<b>7.</b> 9.6	ft	NORT	HING	665,3	43		US ft	EAST	NG 2	,568,8	19	US ft	24 HR.	8.4
TOTAL	DEPTH	100.	2 ft	DRILL	MAC	HINE D	-50			DRILL	METH	OD	Mud	Rotary HAMMER T	YPE 140 lb. N	lanual
DATE	STARTE	D 11	/20/06					11/29/0	6					TH N/A		
	DEPTH	<del></del>	ow co		Γ		~	PER FOO			SAMP.	V/	1			***************************************
(ft)	(ft)	0.5ft	0.5ft	0.5ft	ó	20	40	60	80	100	i	MOI	0 G	SOIL AND ROCK DE	SCRIPTION	
												10101				
9.6							Groun	d Surface	<u> </u>					9.6		
7.9	1.7	7	28	60	1::									Roadway Embankment Fil		<u>,                                     </u>
	‡	1	20	60	1:1:				Invalid	88		D		1.7 ft: Blow counts invalid of Roadway Embankment Fil	tue to asphalt  Orange and bro	OWD
4.5 -	5.1	2	1	2	1.							M		to gray, silty, fine to coarse	SAND (A-2-4)	OW.1
•	ţ	_			. \							_		• •		
-0.5 <del>-</del>	10.1				: \									-		
-0.5	10.1	3	5	5	1::	 ▶10 · ·						w	F	-		
	F													3.4 3.4		1;
-5.5 -	15.1				] : :									- Alluvium: Muck		
-	‡	2	1	2	•3									• •		
	<u> </u>													• •		
-10.5 -	20.1	2	1	2	: :									<del></del>		
• •	+	2	'	2	. •3		 						***	12.4		2
	F				: :									Alluvium: Brown and gray, highly organic at top	tine SAND (A-3)	)
-15.5 -	25.1	3	1	2	·   ·		<i>.</i> .					w		<del>-</del>		
-	<u> </u>				1.									• •		
-20.5	30.1				]: [									<del>.</del> 		
		3	3	4	1	 7						w				
-	F						 							• •		
-25.5 -	35.1				] : :L			· · · · ·								3:
-		16	15	20			35						<del> </del>	<ul> <li>Castle Hayne Formation: V</li> <li>friable, very thickly bedded</li> </ul>	Vhite and gray, . shell-hash	
-							.							LIMESTONE	,	
-30.5 -	- 40.1	13	17	21			: ५: :							30.4 Castle Hayne Formation: 0	roon aray cilty	fine 4
-		15	''	21	: :		38							to coarse SAND (A-2-4) wi	th friable, thinly	mic
35.5	45.4				: :	/	/ 							<ul> <li>bedded limestone and trace fragments</li> </ul>	e to some shell	
-35.5 <del>-</del>	- 45.1 -	5	5	11	1 : :		 					Sat.		<del>-</del> -		
-	F .				: :		. <i>.</i>							<del>-</del> -		
-40.5 <b>-</b>	- - 50.1				: :									• •••		
-	-	6	9	7	]	16						Sat.		• •		
1	<u> </u>				: :									• •		
-45.5 -	- 55.1	12			] : :	: /: : :	· · · ·					0-1		_		
1	_	12	5	7	: :	12	 					Sat.		: •		
					: :	:	<i>.</i> .							- -		
-50.5 <del>-</del>	- 60.1 -	7	15	16	::							Sat.		<del></del>		
-	-					· · · /	,							• •		
-55.5 -	- - 65.1				: : ,	/:								- 		
		6	4	5			 					Sat.		<b>-</b>		
7	-				: :		 							•		
-	-					1:::	 							• <del>-</del>		
1	-					1:::										
-64.1	73.7				• •									• •		
	-	66	66	8	<u> </u>	-14			· · · ·	· · ·	<u> </u>	Sat.				



### N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

THE OF THE	A TO STATE OF THE PARTY OF THE						_							SHEE	T 2 OF 2	. ,	
PROJE	CT NO.	3338	7.1.1			ID.	3-4020		CC	OUNTY	Beau	fort/Pi	tt	GEOLOGIST J.		obald	
SITE DI	ESCRIP	TION E	Bridge No	. 8 over	Trante	er's Creel	on SR 14	103 and SR 1	567						GROUND V	VATER (ft)	T
BORIN	G NO.	B2		ВО	RINC	LOCA	TION 2	20+71		OFFS	<b>ET</b> 7 ft	LT		ALIGNMENT -L-	0 HR.	4.8	
COLLA	R ELEV	. 9.6 f	t	NORT	HING	665	,343	L	JS ft	EASTI	NG 2,	568,8	19	US ft	24 HR.	8.4	
TOTAL	DEPTH	100.	2 ft	DRILL	MAC	CHINE	D-50			DRILL	METH	OD	Mud	Rotary HAMMER	R TYPE 140 lb	. Manual	
DATE S	TARTE	D 11	/20/06		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	COM	PLETED	11/29/06		SURF	ACE W	ATER	DEP	TH N/A			
<u> </u>	DEPTH	BLC	ow cor					PER FOOT			SAMP.	lacksquare		SOIL AND ROCK	DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 	40	60	80	100	NO.	MOI	G				4
-65.2						Conti	nued fro	m previous	page	:							
	-								<del></del>	<del></del> .				66.2 _ Castle Hayne Formation	n: Blue-green to	gray,	5.8
-69.1	78.7	60/0.0'					 						田	<ul> <li>indurated, very thickly be</li> </ul>	edded LIMEST(	ONE	l
	-	60/0.0								60/0.0			田	 - -72.1		0	31.7
-74.1	83.7						:::[		<del></del>	<del>!</del>				Peedee Formation: Gre	en, silty, fine to	coarse	4
-/4.1	- 65.7	28	21	24								w		SAND (A-2-4) with friab limestone and trace she	ell fragments	1	
	-							\									l
-79.1	88.7	16	22	32			 	.\				w		- -			
-	-	10	22	52			· · · · ·	. •54				"		<del>-</del>			
-84.1	93.7				::		· · · · ·							<u>-</u>			-
-04.1	- 30.7	20	24	30				. 54				w		<del>-</del>			
-	-	ŀ			· ·		 	/: : : : : : : : : : : : : : : : : : :						<del>-</del>			ı
-89.1	98.7	13	17	24			· · · /.	/ 				w		<del>-</del> <del>-</del>			-
_	-	10	11	24	<u> </u>		•4.	<u> </u>	<del></del>					-90.6 Boring terminated at 10	0.2 ft (Elev90.	6 ft) in	0.2
	-													Peedee Formation: Der SAND (A-2-4) with friat	nse, silty, fine to ble, thinly bedded	coarse i	l
	<del>-</del>													limestone and trace she			l
-	- -						٠							Bit used: 3" roller cone			
	-													Drilling fluid: 8.2 lbs/gal			ļ
-	-													-			
	-													-			
_	_													F			l
	_													<u> </u>			
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## N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

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Or TRANS									SHEET 1 OF 2
PROJECT N	I <b>O</b> . 333	87.1.1		ID. B-4020 C	OUNTY	Beau	fort/Pi	itt	GEOLOGIST B. Deobald
SITE DESCR	RIPTION	Bridge N	lo. 8 over	Tranter's Creek on SR 1403 and SR 1567					GROUND WATER (ff
ORING NO				ORING LOCATION 21+18	OFFS	ET 7ft	RT		ALIGNMENT -L- 0 HR. 2.2
OLLAR EL		i ft	<del></del>	THING 665,327 US ft	<del> </del>	ING 2,		65	US ft 24 HR. 1.8
			<del> </del>		<del> </del>	METH			
OTAL DEP		3.0 ft		L MACHINE CME 55 LC Track					
ATE STAR		1/18/06		COMPLETED 11/19/06	SURF	ACE W	ATER	DEP	PTH N/A
LEV. DEP		LOW CO	<del></del>	BLOWS PER FOOT		SAMP.	▼/	0	SOIL AND ROCK DESCRIPTION
(ft) (ft)	0.5ft	0.5ft	0.5ft	0 20 40 60 80	100	NO.	MO	G	
2.5 + 0.0	0	0	0	Ground Surface			Sat.	1000	2.5 Alluvium: Tan to gray, silty, fine to coarse
土				φH()			Sat.		SAND (A-2-4) with wood
Ŧ									-
-3.8 + 6.3	3			1:\::::::::::::::::::::::::::::::::::::					
# # # # # # # # # # # # # # # # # # # #	2	3	2	5			Sat.		6.3 ft: Blow counts invalid due to wood
±									-7.0
-9.0 T 11.1	5							<b></b>	Alluvium: Muck
+ '''	1	1	1	1.			Sat.		<del>,</del>
‡									-12.0
14.0 16.	5						·		Alluvium: Brown and gray, fine SAND (A-3) highly organic at top, little organics at bottom
+	4	4	4				Sat.	1	-
‡									<del>}</del>
19.0 † 21.				]::\:::::::::::::::::::::::::::::::::::					<u> </u>
+	4	4	8			SS-13	Sat.		
Ŧ	1			1::1:::::::::::::::::::::::::::::::::::					-22.0 Alluvium: Gray, fine to coarse SAND (A-2-4)
24.0 † 26.		ļ <u>.</u>					١		with trace organics and rounded gravel, and
$\pm$	4	6	3	· · • • · · · · · · · · · · · · · · ·			Sat.		25.5 little shell fragments Castle Hayne Formation: White and gray,
Ŧ									friable, very thickly bedded, shell-hash
29.0 7 31.	5 13	16	14	4::::::				胃	LIMESTONE
‡	13	10	14	φ30				井	<del>-</del> -
±								田	-33.5
-34.0 T 36.	5 23	22	18	1::::::::::::::::::::::::::::::::::::::		1	Sat.		Castle Hayne Formation: Green-gray, silty, fine
Ŧ	23			40					to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments
200 ‡	_								
·39.0 <u> </u>	5 6	8	8				Sat.		
Ŧ									<u>-</u>
440 ‡ 40	_								- -
44.0 46.	6	12	14	26			Sat.		<del>-</del>
<u> </u>									<u> </u>
49.0 T 51.:	5			1:::/::::::::::::::::::::::::::::::::::					<b>;</b>
+ 51.	3	4	5	1			Sat.		<b>-</b>
<u> </u>									<u>.</u>
54.0 T 56.	5			1:: 1::::::::::::::::::::::::::::::::::					<del> </del>
+	5	5	7	] • i2			Sat.		<del>-</del>
‡									<u> </u>
59.0 + 61.				]::: ::::::::::::::::::::::::::::::::::					
+	5	6	7	• • • • • • • • • • • • • • • • • • •			Sat.		_
Ţ				1::::::::::::::::::::::::::::::::::::::					• <del>-</del>
64.0 66.				1 : : 1 : : : : : : : : : : : : : : : :					<del>-</del>
+	4	5	6				Sat.		<del>1</del> _
Ŧ				1:::	· · · ·				-67.2
69.0 71.								H	Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded LIMESTONE
+	60/0.2	2			60/0.2			田	<del>]-</del>
I			<u></u>	<u> </u>	لننن				-71.8



## N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

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	CT NO.	3338	37.1.1			<b>ID</b> . B-4020		CC	YTNUC	Beau	fort/P	tt		GEOL	OGIST B.	Deobald	
SITE D	ESCRIP	TION	Bridge No	o. 8 over	Trante	's Creek on SR 1	1403 and SR 15	567						,		GROUND	WATER (ft)
BORIN	G NO.	B3		BC	RING	LOCATION	21+18		OFFSI	ET 7ft	RT		ALIGN	IMENT -	L-	0 HR.	2.2
COLLA	R ELEV	<b>7.</b> 2.5 1	ft	NORT	HING	665,327	U	S ft	EASTI	NG 2	568,8	65			US ft	24 HR.	1.8
TOTAL	DEPTH	103.	0 ft	DRILL	. MAC	HINE CME 55	LC Track		DRILL	METH	OD	Mud I	Rotary		HAMME	R TYPE 140 I	b. Manual
DATE S	STARTE	D 11	/18/06			COMPLETED	11/19/06		SURF	ACE W	ATER	DEP	TH N/	A			
	DEPTH	BL	ow col	JNT			PER FOOT			SAMP.	lacksquare	L		SOIL	AND ROCK	DESCRIPTION	J
(ft)	(ft)	0.5ft	0.5ft	0.5ft	P	20 40	60	80	100	NO.	MO						•
-72.3						Continued fro	om previous	page									
-74.0	76.5						• • • • • • •							Peedee Fo	ormation: Gre 2-4) with trac	en, silty, fine to e to little shell	coarse
	-	35	40	43	: :			8:	3		W		<del></del>	fragments	(continued)		
70.0	- 04 5						: : : : <i>: //</i> : :										
-79.0 -	81.5 -	12	20	27	: :		. 47				w						
-	-				: :		:/:::::::										
-84.0	86.5						: \: : : : :										
-	_	22	23	30	::		53				W		·-				
	-					: : : : : <i>: //</i>											
-89.0	91.5	8	10	14	1::						w						
-	-				: :		· · · · · · ·										
<b>-94</b> .0	96.5						· · · · · · · ·										
-	_	.21	24	34	: :		58				W		<del>-</del>				
	_				::		: : : : \ : :										
-99.0	101.5	24	32	43	1::		: : : : : <u> </u>	 D75			w		- 				103
_														Boring terr	ninated at 10	3.0 ft (Elev10 y dense, silty, f	0.5 ft) in
-														coarse SA	ND (A-2-4) v	vith trace to little	shell
-	_											1 5	-	fragments			
															" roller cone		
_	_											1	<del>-</del>	Drilling flui	d: 8.5 lbs/gal		
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OF 18								,						<del></del>	T 1 OF 2	
PROJEC	CT NO.	3338	37.1.1			<b>ID</b> . B-402	0	COUNTY	' Beau	ifort/P	itt		GEOL	OGIST J.	Howard	
SITE DE	SCRIP	TION	Bridge N	o. 8 over	Trante	er's Creek on SF	R 1403 and SR 156	57			···				GROUND W	VATER (ft)
BORING	S NO.	B4		ВС	DRING	G LOCATION	21+73	OFFS	ET 9f	LT		ALIGN	MENT -	L	0 HR.	Water
COLLA	R ELEV	· -5.5	ft	NORT	HING	665,340	US	ft EAST	ING 2	,568,9	22			US ft	24 HR.	Boring
TOTAL	DEPTH	134.	9 ft	DRILL	_ MA	CHINE CME	45C Trailer/D-5	DRIL	L METH	IOD	Mud	Rotary/Co	re	HAMME	R TYPE 140lb	Auto/Manua
DATE S	TARTE	D 10	/16/06	-l		COMPLETE	<b>D</b> 11/10/06	SURF	ACE W	ATER	DEP	TH 7.3	ft			
ELEV.	DEPTH	BL	OW CO	JNT		BLOV	NS PER FOOT		SAMP.	<b>V</b> /	1		······································			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	ļ	20 4	o 60 1	30 100	1	МО	0		SOIL	AND ROCK	DESCRIPTION	
			ŝ.	<u> </u>	<u> </u>	<del></del>	<u> </u>	<u> </u>	T	1010						· · · · · · · · · · · · · · · · · · ·
-5.5 -5.5 +	0.0						Mudline				1	-5.5				0
-5.5	0.0	0	0	0 W	OR .				SS-1	65.9	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	٠ ٧	vith little or	rganics	wn, sandy, SILT	(A-5)
‡							• • • • • • • •				13.7	•	Sample SS	-1: Organic	Content 5.6% Content 12%	
	•		-								77.7	-		•	HAMMER USED	EOD
-12.4 +	6.9	0	1	1	: :					94.6%	VI		SPT FROM	1 0.0 TO 89.	.0 FEET; 140 LB.	
Ŧ		U	1	'	. 2				35-2	194.6%	17.		MANUAL F 94.0 TO 13		SED FOR SPT F	ROM
‡					·L.		• • • • • • •				177	-16.0			. <del> </del>	10
-17.8	12.3				] : :						1::1	. <i>F</i>	Muvium: G A-2-4) with	Bray, silty, fir n little organ	ne to coarse SAN ics	D
+		1	3	7	: :	10				W			',			
an T	40.7					<u>                                     </u>										
-22.2	16.7	3	3	4												
+						· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · ·					-24.6				19
-26.9 T	21.4				: :							- (	Castle Hay	ne Formatio	on: White and gray shell-hash LIMES	y, STONE
		7	15	19	1					w	<del>二</del>	· -28.5	nabio, and	my boddod,	Onch flagri Envice	23
土					: :							(	Castle Hay	ne Formatio	on: Green-gray, si	Ity, fine
+					: :								o coarse S edded lim		) with friable, thin	ily
‡																
-34.4 +	28.9	15	12	13	: :					w						
+			.2	"	1::	25 .				"		•				
‡						/										
-39.4	33.9	4	5	9					SS-3	W						
±		·			: :	. 14	· · · · · · · · · ·			1 "			•			
-44.4 I	35 (				: :							•				
<del></del> +	38.9	6	6	10		. 16.	<b>.</b>			w		/5.0				
‡												·(	Castle Hay	ne Formatio	on: Green-gray, fir	ne to 40
-49.4	43.9				: :		• • • • • • • • •						coarse san	dy SILT (A-	4) with friable, this	niy
Ŧ		5	4	30	::	34			SS-4	w		. <b>`</b>				
‡	1				• •							, ,				
-54.5	49.0					/							. •			
+	40.0	5	10	11		· · · /· · · · · · · · · · · · · · · ·				w		-  -56.0				50
Ţ															on: Green-Gray, fr	rable
-59.5	54.0										田			ely indurate II-hash LIME	d, very thickly bed ESTONE	ided,
十		5	4	13		. •17					一	-	J, =			
Ŧ											<del> </del>	•				
-64.5 +	59.0										田					
$\pm$		5	20	60/0.1								-65.6				60
Ŧ	İ							60/0.1			<del> </del>				on: Blue-green to bedded LIMESTO	
-69.5	64.0										田			. Signification of		
Ŧ		60/0.1'						60/0.1				<del></del>				
f	1											-72.0	Peeden En	mation: C-	een, silty, fine to o	66
-74.3	68.8												SAND (A-2	-4) with frial	ble, thinly bedded	
‡	l	15	16	17	: :				SS-5	W		ii	mestone a	and trace sh	ell fragments	
1	l															
-79.3 I	73.8					\	\									
		_14	18	25	<u>.                                    </u>					M/W	1					



N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

OP 11	LA MAROE												SHEE	T 2 OF 2	
PROJE	CT NO.	3338	7.1.1			<b>ID</b> . B-4020		CC	UNTY	Beau	fort/Pi	itt	GEOLOGIST J. H	loward	
SITE D	ESCRIP	TION E	Bridge No	o. 8 over	Trante	r's Creek on SR	1403 and SR 15	67						GROUND W	/ATER (ft)
BORIN	G NO.	B4		во	RING	LOCATION	21+73		OFFSE	ET 9 ft	LT		ALIGNMENT -L-	0 HR.	Water
COLLA	R ELEV	5.5	ft	NORT	HING	665,340	US	S ft	EASTI	NG 2,	,568,9	22	US ft	24 HR.	Boring
TOTAL	DEPTH	134.9	9 ft	DRILL	MAC	HINE CME 4	5C Trailer/D-5	0	DRILL	METH	OD	Mud	Rotary/Core HAMMER	TYPE 140lb	Auto/Manual
DATE S	TARTE	<b>D</b> 10	/16/06		,	COMPLETE	D 11/10/06		SURFA	ACE W	ATER	DEP	<b>TH</b> 7.3 ft	*	
	DEPTH		OW COL	r			S PER FOOT		- 1	SAMP.		0	SOIL AND ROCK	DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	9	20 40	60	80	100	NO.	MOI	G		······································	
															į
-80.3						Continued fr	om previous p	oage				-			
	-												<ul> <li>Peedee Formation: Green</li> <li>SAND (A-2-4) with friable</li> </ul>	le, thinly bedded	
-84.3	78.8												<ul> <li>limestone and trace she</li> <li>(continued)</li> </ul>	Il fragments	
	-	15	17	21			8				M		<u>-</u> -		į
	-												<del>-</del> -		
-89.5	- 84.0 -	9	12	26					: : :	SS-6	М		<del>-</del>		
	-						8				1		<u>.</u> -		
-94.5	- - 89.0						./						NOTE: 140 LB. AUTO F SPT FROM 0.0 TO 89.0		FOR
	-	14	22	32			54				М		MANUAL HAMMER US 94.0 TO 134.0 FEET		ROM
	-												94.0 TO 134.0 FEET		
-99.5	- 94.0 -	46	100/0.4						·		М		<u>.</u>		
	-	,0	100/0.4					1	00/0.4				<u>.</u> -		
-104.5	- - 99 0									٠			<del>_</del> _		
104.0	-	19	24	29			• 53		: : :	SS-7	М				
	-							: :							
-109.5	- 104.0	60/0.1'						<del>-: :</del>	· · ·				-108.8 Peedee Formation: Gre		103.3 ed, 104.9
	-	00/0.1										000	Peedee Formation: Dark	k green to gray,	silty,
-114.5	- - 109.0							: :				000		-1-b) with friable, race shell fragme	thinly ents
		55	25	60/0.3					69/03		М	000	<u> </u>	_	ĺ
	-				: :			<i>-</i>				000			
-119.5 -	- 114.0 -	9	10	28			· · · · · · · · · · · · · · · · · · ·			SS-8	м	000	_		
	-	J	10	20			8				1 '''	000	-		
-124.5	- - 119 0				: :							000	- 124.5		119.0
	-	11	15	23			8				M	000	Peedee Formation: Dark	k green to gray,	silty,
													fine to coarse SAND (A- bedded limestone and to		
-129.5	- 124.0	8	12	22		:::::::::::::::::::::::::::::::::::::::		: :			B.4		_		
	_	O	12	22		34	• • • • • • • •	: :			M				
-134.5	120 0						· · · · · · · · ·						_		
104.0	- ,23.0	11	17	34			51			SS-9	М				
	_														
-139.5	- 134.0	4	100/0.4		::				: <u> </u>				- - 140.4		134.9
		4	100/0.4			······································	· · · · · · · · · · · · · · · · · · ·	1	00/0.4		M_	1	<ul> <li>Boring terminated at 13-</li> </ul>	4.9 ft (Elev140	.4 ft) in
1	-												Peedee Formation: Ven	ith friable, thinly	
] -													bedded limestone and to	·	ents
													Bit used: 3" roller cone a	and HQ core bit	
	-												Drilling fluid: 8.5 lbs/gal		
	-												<u>-</u>		
3 1	-														
				<u> </u>		·							<u> </u>		



## N.C.D.O.T. GEOTECHNICAL UNIT CORE BORING REPORT

SHEET 1 OF 2

PROJE	CT NO.	333	387.1.1			ID. B-40	20			COUNTY Beaufort/Pitt GEOLOGIST J. Howard
				. 8 over		s Creek on		ng and 9	SD 15	
	IG NO.		ge NC	<del></del>		LOCATIO		1+73	JI 18	GROUND WATER (ft)  OFFSET 9 ft LT  ALIGNMENT -L-  0 HR. Water
	AR ELEV		5 #		HING			1773	1 10	
	DEPTH							Tasila		
				DRILL		HINE CME				
	STARTE		0/16/06			COMPLE				SURFACE WATER DEPTH 7.3 ft
CORE	SIZE +	<del></del>	DRILL	I R	UN	TOTAL R		82.7 ft RATA	τ.	DRILLER D. Rhodes/T. Hahn
ELEV. (ft)	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC.	RQD (ft)	SAMP. NO.	REC.	RQD (ft)	ÖG	DESCRIPTION AND REMARKS
			(WINDIC)	- %	1 %		<u>%</u>	<del>  %</del>	+	
		5.1	0:15	(4.2)	(N/A)		(0.0)	(N/A)	ļ.,	Begin Coring @ 23.8 ft
-29.3	23.8	] 3.1	2:00	(1.3) 25%	(14/7)		(2.8) 23%	(IVA)		<ul> <li>Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone (continued)</li> </ul>
-34.4	28.9		1:45 1:30/1.1							
-34.4	20.9	<del> </del>	N=25	+	<del> </del>					<u>-</u>
-35.9	30.4	3.5	4:15 0:45	(0.8) 23%	(N/A)					
-39.4	33.9		1:15 0:30/0.5	2070						
-40.9	35.4	3.5	N=14 0:30	(0.7)	(N/A)	SS-3				<b>-</b>
			0:30 0:45	20%	(14/4)					
-44.4	38.9	<u> </u>	0:45 0:15/0.5 N=16	┼─	<del> </del>	<del> </del>				7.450
-45.9	40.4	3.5	0:15/0.5	(0.0)	(N/A)		(3.2)	(N/A)		Castle Hayne Formation: Green-gray, fine to coarse sandy SILT (A-4) with
-49.4	43.9		0:45 0:30	0%			17%			friable, thinly bedded limestone
			0:30 N=34	1		SS-4				<u>.</u>
-50.9	45.4	3.6	0:45 0:30	(0.4)	(N/A)					
-54.5	49.0		1:15 0:45/0.6	<b></b>						
-56.0	50.5	3.5	N=21 1:30	(2.3)	(N/A)		(5.7)	(N/A)		-56.0
			1:30 0:15/1.5	66%	(		81%	"""	=	thickly bedded, sandy, shell-hash LIMESTONE
-59.5	54.0		N=17		-				日	<u>.</u>
-61.0	55.5	3.5	0:15/0.5 0:45	(3.4) 97%	(N/A)					
-64.5	59.0		0:45 0:45	37.70	<u> </u>				H	
-65.6	60.1	3.9	N=60/0.1° 2:30	(3.2)	(N/A)	-	(5.6)	(N/A)		Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded
			7:15 6:00	82%			89%		Ħ	LIMESTONE
-69.5 -69.6	64.0 64.1	4.7	6:00/0.9 N=60/0.1	(2.4)	(N/A)					-
			2:30	51%	<u> </u>		(O O)	(N/A)	=	-72.0 66
-74.3	68.8		1:45 1:00 0:45/0.7				(2.0) 7%	(N/A)		Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments
-75.8	70.3	3.5	N=33 0:30	(0.0)	(N/A)	SS-5				-
		5.5	0:15 0:15	0%	(,,,,,)					
-79.3	73.8		0:08/0.5 N=43	<del> </del>	<u> </u>	<del>  </del>				<u>-</u>
-80.8	75.3	3.5	0:15 0:10	(0.0)	(N/A)					
-84.3	78.8		0:10 0:10 0:07/0.5	0%	L					
-85.8	80.3	27	N=38	1	(A1/A)					<u>-</u>
-65.6	60.3	3.7	0:30	(0.0)	(N/A)					
-89.5	84.0		0:15 0:15/0.7	<del> </del>	<u> </u>	SS-6				. ·
-91.0	85.5	3.5	N=38 0:30	(0.2)	(N/A)	33-0				
-94.5	89.0		0:30 0:30	6%						NOTE: 140 LB. AUTO HAMMER USED FOR SPT FROM 0.0 TO 89.0 FEET;
	09.0		0:10/0.5 N=54							140 LB. MANUAL HAMMER USED FOR SPT FROM 94.0 TO 134.0 FEET
-96.0	90.5	3.5	0:45 0:30	(0.0)	(N/A)					
-99.5	94.0	·	0:15 0:10/0.5		ļ					
-100.4	94.9	4.1	N=100/0.4 0:15	(0.0)	(N/A)					-
			0:15	0%				1		

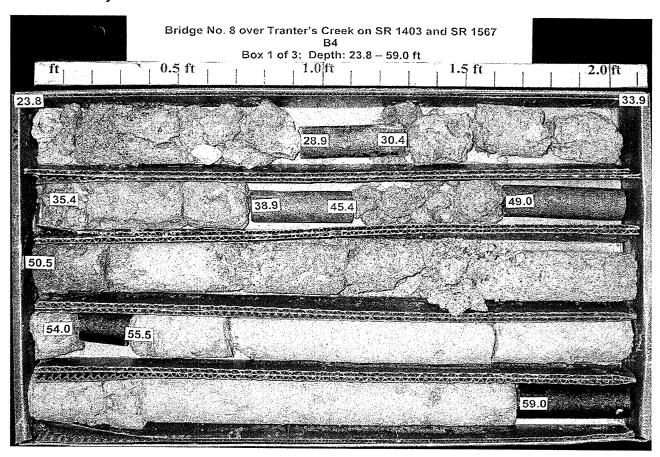


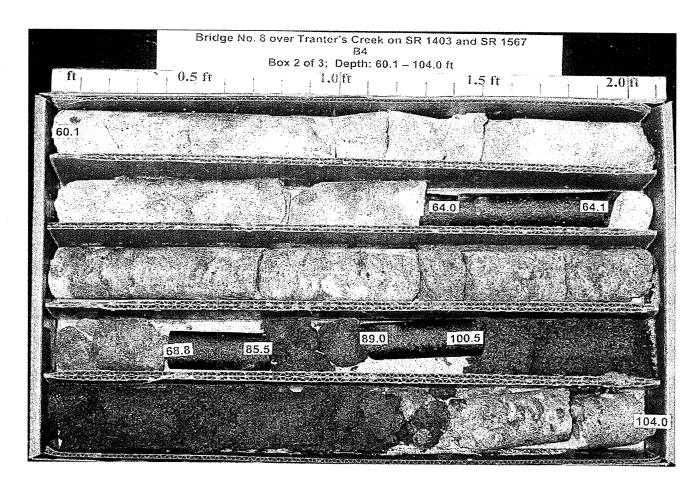
## N.C.D.O.T. GEOTECHNICAL UNIT CORE BORING REPORT

SHEET 2 OF 2

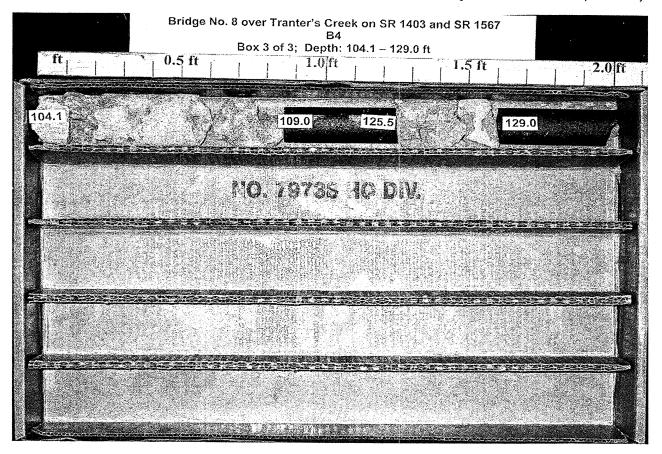
8 to 10 TI	11119														SHE	T 2 OF	2
PROJE	CT NO.	333	87.1.1			ID. B-40	020			COU	NTY Beaufort/Pitt		GEO	LOG	IST J.	Howard	
SITE D	ESCRIP	TION	Bridge No.	8 over 1	ranter	's Creek on	SR 140	3 and S	SR 15	67						GROUNE	O WATER (ft)
BORIN	G NO.	B4		BOI	RING	LOCATIO	N 21	+73		0	FFSET 9ft LT	ALIGNN	ENT	<b>-</b> L-		0 HR.	Water
COLLA	R ELEV	5.5	ft	NORTH	IING	665,340	)		US	Sft E	ASTING 2,568,922				US ft	24 HR.	Boring
TOTAL	DEPTH	134	.9 ft	DRILL	MAC	HINE CM	E 45C	Traile	r/D-5	50 <b>D</b>	RILL METHOD Mud R	otary/Co	re	F	IAMME	R TYPE 140	lb Auto/Manuai
DATES	TARTE	D 10	0/16/06			COMPLE	TED	11/10/	06	S	URFACE WATER DEPTI	H 7.3 f	t		····	<del></del>	
CORE	SIZE H	IQ				TOTAL R	UN 8	32.7 ft		D	RILLER D. Rhodes/T. H	lahn					
ELEV.	DEPTH	RUN	DRILL	REC.	JN RQD	SAMP.	STR REC.	RQD	L	T							
(ft)	(ft)	(ft)	RATE (Min/ft)	(ft) %	(f) %	NO.	(ft) %	(ff) (ff)	0 G		· DE	ESCRIPT	ION AN	DRE	MARKS	·	***************************************
																_	
-104.5/	99.0/		0:15/1.1	<del> </del>		SS-7	-				Peedee Formation: Gree	ntinued	ne to co	arse	SAND (A	A-2-4) with friat	ole. thinly
-106.0	100.5	3.5	N=53 0:15	(2.5)	(N/A)					:	bedded limestone and tra	ace shell t	fragmer	nts (co	ontinued	) '	,
			0:30 2:00	71%	,					-108.8							103.3
-109.5 -109.6	104.0 104.1	4.9	0:45/0.5 N=60/0.1'	(0.8)	(N/A)		(1.6) 100%	(N/A)		110.4							104.9
			1:15 1:15	16%			(0.0)	(N/A)	000	SC.	Peedee Formation: Dark friable, thinly bedded lime						1-b) with
-114.5	109.0		0:10 0:10				076		000		•						
115.0	110.3	0.7	0:10/0.9 N=60/0.3'	1	(N/A				000	3							
-115.8	110.3	3.7	0:15 0:15	(0.0)	(IWA)	1			000								
-119.5	114.0		0:15 0:08/0.7 N=38	<b></b>	ļ	SS-8	ŀ		000	SL.	•						
-121.0	115.5	3.5	0:15	(0.0)	(N/A		1		000								
-124.5	119.0		0:15 0:15	0%					000	<b>&gt;</b>							110.0
-124.5	119.0		0:08/0.5 N=38	1		1	(0.3)	(N/A)		-124.5	Peedee Formation: Dark						119.0 2-4) with
-126.0	120.5	3.5	0:15 0:15	(0.0)	(N/A	)	3%			-	friable, thinly bedded lime	estone ar	nd trace	snell	tragmer	nts	
-129.5	124.0		0:15 0:15/0.5			<u> </u>				‡							
-131.0	125.5	3.5	N=34 1:30	(0.3)	(N/A	<del>. </del>	1			#							
-131.0	120.0	3.5	0:15 0:15	9%	(IN)	<b>'</b>				<u>‡</u>							
-134.5	129.0		0:08/0.5 N=51	├──		SS-9	1			#							
-136.0	130.5	3.5	0:30	(0.0)	(N/A	<u> </u>	1.			‡							
-139.5	134.0		0:30 0:30	0%						-139.5							134.0
			0:15/0.5	1					T	F	Coring terminated at 134 silty, fine to coarse SAN	1.0 ft (Elev	v139.5	oft) ir	Peeded	Formation: Vo	erv dense.
										E	shell fragments	D (1 1 2 - 1)	***************************************	, .	y 200		o and trace
										Ł							
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										F							
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Core Photos MACTEC Proj. No. 6468-06-1557





SHEET 2/ Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 NCDOT Proj. No. 33387.1.1 (B-4020)





## N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 2

														SHE	ET 1 OF 2	2
PROJE	CT NO.	. 3338	37.1.1			<b>ID</b> . B-4020		COL	JNTY	Beaut	fort/P	itt		GEOLOGIST	B. Deobald	
SITE D	ESCRIF	MOIT	Bridge N	o. 8 over	Trante	er's Creek on SR	1403 and SR 15	67							GROUND	WATER (ft)
BORIN	G NO.	B5		ВО	RING	LOCATION	22+21	C	OFFSE	<b>ET</b> 7 ft	RT		ALIGNN	IENT -L-	0 HR.	Water
COLLA	R ELE	<b>/.</b> -18.	1 ft	NORTI	HING	665,322	US	ft E	ASTI	NG 2,	568.9	68		US ft	24 HR.	Boring
TOTAL	DEPTH	1 89.4	ft	DRILL	MAC	HINE CME 5	5 I C Track			METHO			Rotary/Co	<del></del>	IER TYPE 140	
	STARTE		/15/06	1		COMPLETE							TH 18.6		LICITIE 140	ib. Wanda
	DEPTH		ow co	LINIT :		<del>1</del>	S PER FOOT			SAMP.	W/	TIT	10.0	- 14		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40		80	100	NO.		ō		SOIL AND RO	CK DESCRIPTION	N
(11)	(14)	10.01	0.010	0.51		TT		Ι	-1-	NO.	/MOI	G				·
									1							
-18.1						N	Mudline						-18.1			0.0
-18.1	0.0	0	2	2	- •4				}	SS-14	Sat.	000	A	Illuvium: Gray, fine to	to coarse SAND (	A-1-b)
-	_				-  -							1000	•	Mar adoc wood		
-23.4 -	- 5.3		- 10		Ŀ				: :			888	-23.1	Satio Hayne Forms		5.0
_	_	6	13	19		32		: : :	::			圕	. fr	astle Hayne Forma iable, very thickly b	ition: vvnite and gr edded, shell-hash	ay,
-	-								::			二	L	IMESTONE		
-	-								::			量				
-31.4	_ - 13.3											一	-31.1			13.0
-		27	8	11		19			: :		Sat.		C	Castle Hayne Forma coarse SAND (A-2	tion: Green-gray,	silty, fine
-	_											i i	b	edded limestone	. –) with mable, th	<b>y</b>
-36.4	- - 18.3	<u> </u>		<u></u> _	: :		· · · · · · · ·		::		_		•			
1	-	11	20	7	• •	27			: :		Sat.					
_	_					: : :/: : : :			: :							
-41.4	- 23.3 -	13	6	9		/					Sat.					
-	-	,,,				15					Sal.					
	_								::				-			
<del>-46.4</del> -	- 28.3 -	10	7	10	• •	17			::		Sat.					
1	_					: · <b>T</b> :' : : : :			::							
-51.4	_ - 33.3															
		6	9	9		18					Sat.					
-	-					\			: :							
-56.4	- 38.3				: :	: : : \ : : :		: : :	::				•			
1	-	5	5	23		28		· · ·	: :		W		<u>-57.6</u>	astle Hayne Forma	tion: Green-Grav	39.5
4	-				• •				::			井	to	moderately indura andy, shell-hash Ll	ted, very thickly b	edded,
<u>-61.4</u>	- 43.3 -	14	14	11					::			団	S	unuy, anen-nasii Lii	AILO I OINE	
1	- -					\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			: :			世				
-66.4	- - 48.3											田	-66.4			48,3
	-	100/0.4					<del>: : : : : : :</del>	100	10.4			岸	C	astle Hayne Forma	tion: Blue-green to	gray,
1	<u>-</u>								:			屈	ir	ndurated, very thickl	y bedded LIMEST	ONE
-71.4	- 53.3	00:0			• •		· · · · · · · ·	: : :				耳	-71.9			53.8
‡	-	60/0.0'				::::::[	<del></del> 		10:0				P	eedee Formation: (	Green, silty, fine to	coarse
‡	- 				: :				: :			<b>**</b>		AND (A-2-4) with fr mestone and trace :		ea
<del>-76.4</del>	- 58.3 -	14	20	22					$\cdot \cdot  $		w				-	
1	-	, ,		-		• • • • • • •	42				**	i.:.F				
-81.4	- - 63.3				• •		[::::::	: : :					•			
<del></del>	- 00.0	10	21	27				: : :	::		w					
‡	-				• •		J		::							
-86.4	- 68.3				 		l : : : : · ·		: 1				•			
1	• •	11	18	24			42				W	F				
Ŧ								: : :				I I				
-91.4	- 73.3				: :		: : : : : : : : :	· · · ·					•			
	-	13	34	66/0.4'							W	::: <u>-</u>				



## N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

01.																SHEE	1 2 OF 2	
ROJE	CT NO.	3338	7.1.1			ID. E	3-4020	)	C	OUNTY	Beau	fort/Pi	tt		GEOLO	GIST B.	Deobaid	
ITE D	ESCRIPT	ION B	ridae No	o. 8 over	Trante	r's Creek	on SR	1403 and	SR 1567								GROUND	WATER (ft)
										T = ===				T				
	G NO.							22+21		<del> </del>	ET 7ft	RI		ALIGNM	ENT -L	-	0 HR.	Water
OLLA	R ELEV.	-18.1	ft	NORT	HING	665,	322		US ft	EAST	ING 2,	568,9	68			US ft	24 HR.	Boring
OTAL	DEPTH	89.4	ft	DRILL	MAC	HINE	CME 5	5 LC Tra	ıck	DRILL	METH	OD	Mud	Rotary/Cor	e l	HAMMER	R TYPE 140 I	h Manuai
			15/06			<del></del>				<del> </del>								o. Maria
	STARTED					1		D 11/17		SUKF	ACE W	AIEK	DEP	TH 18.6	π			
LEV.	DEPTH	BLC	W COL	TML				S PER FO	TOC		SAMP.	lacksquare	0		SOU A	ND BOCK	DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	P	20	40	) ရုပ	80	100	NO.	MOI			OOIL	WED INCOM	DESCRIP HO	•
				-					***************************************									
92.9		.				Contin	nued fi	rom prev	ious page	•								
									<del></del>	/				Pe	edee Fon	mation: Gre	en, silty, fine to	coarse
~									/.					_ SA	AND (A-2-	4) with friab	ole, thinly bedde	d
96.4	- 78.3	26	30	35					•65 · · ·			w		. (C	ontinued)	iu liace sile	en nagments	
-	-							,	<i>7</i>						,			
1		1						,						_				
101.4 -	- 83.3							/.						•				
1		37	30	25			· · ·	55				W						
4	-	l							·									
106.4	- 88.3	l								<u>```</u>				<del>-</del>				
-	-	13	22	78/0.1'		<u></u>			<u></u>	100/0.0	<u></u>	_w_		- 107.5				89.4
1	-									100/0.0				· Bo	oring termi	nated at 89	.4 ft (Elev107 y dense, silty, fi	.5 ft) in
+	-													- 00	arse SAN	D (A-2-4) w	ith trace shell	ile iO
1	-	1												fra	agments			
+	-	1											<b> </b>	Bit	t used: 4"	casing shoe	e and HQ core i	oit
4	-	-																
+	-	1												. Dr	rilling fluid:	8.5 lbs/gal		. *
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+	-													•				
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### N.C.D.O.T. GEOTECHNICAL UNIT CORE BORING REPORT

SHEET 1 OF 2

DDO II	CT NO	222	0711			ID D 4	000	<del></del>	1	STEEL LOF Z
	ECT NO.		887.1.1			ID. B-4				COUNTY Beaufort/Pitt GEOLOGIST B. Deobald
SITE D	ESCRIP	TION	Bridge No	. 8 over	Tranter	's Creek on	SR 140	3 and 5	SR 1567	GROUND WATER (ft)
BORIN	G NO.	B5		ВО	RING	LOCATIO	ON 22	2+21		OFFSET 7 ft RT ALIGNMENT -L- 0 HR. Water
COLL	R ELEV	<b>/</b> 18	3.1 ft	NORT	HING	665,32	2		US f	t EASTING 2,568,968 US ft 24 HR. Boring
TOTAL	DEPTH	89.	4 ft	DRILL	MACI	HINE CM	E 55 L	C Trac	sk	DRILL METHOD Mud Rotary/Core HAMMER TYPE 140 lb. Manual
27.5	STARTE		1/15/06		T	COMPLE				SURFACE WATER DEPTH 18.6 ft
	SIZE +		1710700							
	r	<del> </del>	DRILL	I R	UN	TOTAL F		OU.2 π RATA	T . T	DRILLER D. White
ELEV.	DEPTH (ft)	RUN (ft)	RATE	REC.	RQD	SAMP.	REC.	RQD	1 - 1	DESCRIPTION AND REMARKS
43	(10)	(11)	(Min/ft)	(ft) // %	(ft) %	140.	(ft) %	(ft) %	G	
di.										Begin Coring @ 8.3 ft
-26.4	8.3	5.0	0:30	(0.0)	(N/A)		(0.0)	(N/A)	<b> </b>	Castle Hayne Formation: White and gray, friable, very thickly bedded,
			0:21 0:25	0%			0%			shell-hash LIMESTONE (continued)
-31.4	13.3		0:26 0:55	Ì	l					31,1
			N=19				(0.4)	(N/A)	-	Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone
-32.9	14.8	3.5	1:30 1:25	(0.0)	(N/A)		-/"			
-36.4	18.3		1:05 0:20/0.5							
			N=27	1						
-37.9	19.8	3.5	0:50 0:50	(0.0)	(N/A)				F	
-41.4	23.3		0:55 0:25/0.5				1			
-42.9	24.8	3.5	N=15 0:55	(0.4)	(N/A)	1	-			
-12.5	24.0	3.5	0:30	11%	(IV/A)					
-46.4	28.3		1:00 0:20/0.5	<b></b>	ļ	<u> </u>	-			
-47.9	29.8	3.5	N=17 0:40	(0.0)	(N/A)	<del> </del>	-			
77.0	20.0	3.5	0:30	0%	(14/7)					
-51.4	33.3		0:30 0:10/0.5	<del> </del>	ļ	ļ	-			
-52.9	34.8	3.5	N=18 0:33	(0.0)	(N/A)	-	1		F	
=	<u>.</u>		0:30 0:25	0%	( ,					
-56.4	38.3		0:12/0.5 N=28	<del> </del>	ļ	<del> </del>				57.6 39.5
-57.9	39.8	3.5	1:25	(3.0)	(N/A)	<u> </u>	(3.0)	(N/A)		Castle Hayne Formation: Green-Gray, friable to moderately indurated, very
-61.4	43.3		1:55 0:20	86%			43%		三	thickly bedded, sandy, shell-hash LIMESTONE
-01.4	45.5		0:13/0.5 N=25	<del>                                     </del>	ļ					
-62.9	44.8	3.5	0:20 0:25	(0.0)	(N/A)				巴	
-66.4	48.3		0:20	0%		ĺ			世	66.4 48.3
-66.8	48.7	4.6	0;05/0.5 N=100/0.4'	(4.2)	(N/A)	<del> </del>	(4.7)	(N/A)	H	Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded
			3:55 7:00	91%	· ′		92%		田	LIMESTONE
-71.4	53.3		3:40 3:25	1					世	74.0
* 2		5.0	3:20/0.6 N=60/0.0'	(0.5) 10%	(N/A)		(3.0)	(N/A)		71.9 53.8 Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly
**	2		2:40 2:25	.5%			12%			bedded limestone and trace shell fragments
-76.4	58.3		1:05 0:40				]			
-77.9	59.8	3.5	0:35 N=42	(0.0)	(N/A)	<del> </del>				
100	(0) (1)	ა.მ	0:35 0:30	0%	(IWA)					
-81.4	63.3		0:30 0:20/0.5			<del> </del>				
-82.9	64.8	3.5	N=48 1:00	(0.0)	(N/A)	<del> </del>			i I	
0			0:50 0:40	0%	,					
-86.4	68.3		0:20/0.5 N=42	<del>  </del>		<del> </del>				
-87.9	69.8	3.5	0:50	(0.0)	(N/A)				·:-	
-91.4	73.3		0:47 0:35	0%						
01.4	13.3		0:15/0.5 N=100/0.9'	$\vdash \vdash \vdash$		<del> </del>				
-92,8	74.7	3.6	0:28 0:55	(0.0)	(N/A)		1			
-96.4	78.3		0:30	0%					<b>:::</b>	
			0:25/0.6 N=65	1		<u> </u>				
-97.9	79.8	3.5	0:35 0:30	(3.0)	(N/A)					
-101 4	83.3		0:35	86%					-	



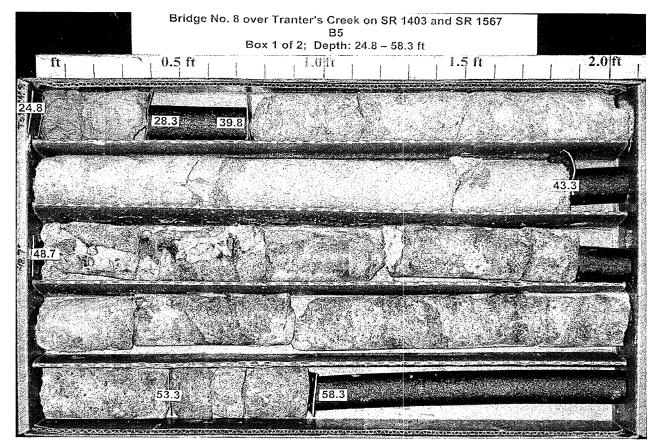
## N.C.D.O.T. GEOTECHNICAL UNIT CORE BORING REPORT

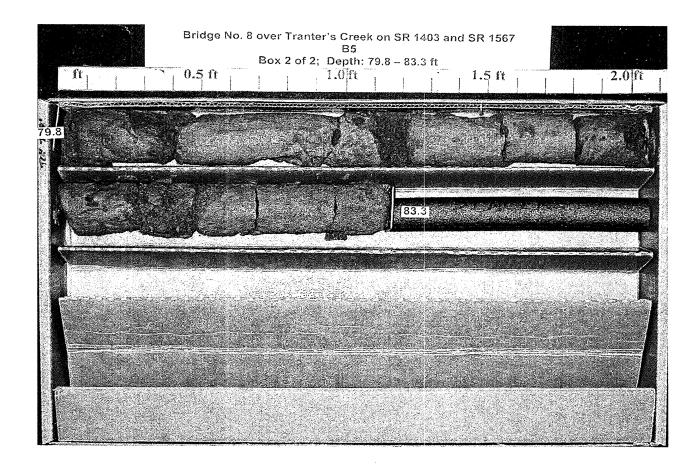
SHEET 23 SHEET 2 OF 2

PROJE	CT NO.	3338	87.1.1		1	ID. B-40	)20		(	COUNTY Beaufort/Pitt GEOLOGIST B. Deobald
SITE D	ESCRIP	TION	Bridge No.	. 8 over T	ranter's	s Creek on S	SR 140	3 and S	R 1567	GROUND WATER (ft)
BORIN	G NO.	B5		BOI	RING I	LOCATIO	N 22	+21		OFFSET 7 ft RT ALIGNMENT -L- 0 HR. Water
COLLA	R ELEV	18.	,1 ft	NORTH	HING	665,322	2		US ft	<b>EASTING</b> 2,568,968
TOTAL	DEPTH	89.4	i ft	DRILL	MACH	HINE CME	E 55 L(	C Trac	:k	DRILL METHOD Mud Rotary/Core HAMMER TYPE 140 lb. Manuai
	STARTE		1/15/06			COMPLET	TED 1	11/17/0	J6	SURFACE WATER DEPTH 18.6 ft
CORE	SIZE H			T DI		TOTAL R				DRILLER D. White
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	UN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L 0 G	DESCRIPTION AND REMARKS
	<u> </u>			!						Continued from previous page
			0:25/0.5 N=55						i i i	Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments (continued)
-102.9	84.8	3.5	0:30 0:35	(0.0) 0%	(N/A)					bodded innoctorio dira dado orion nagritoria. (22-miles)
-106.4	88.3		0:50 0:30/0.5		<u> </u>				<b> </b>	106.4 88.3 Coring terminated at 88.3 ft (Elev106.4 ft) in Peedee Formation: Very dense,
										silty, fine to coarse SAND (A-2-4) with trace shell fragments

Core Photos MACTEC Proj. No. 6468-06-1557

SHEET 24 Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 NCDOT Proj. No. 33387.1.1 (B-4020)









SHEET 1 OF 2

OF 1					SHE	ET 1 OF 2
PROJE	CT NO.	3338	37.1.1		ID. B-4020 COUNTY Beaufort/Pitt GEOLOGIST B	. Deobald
SITE D	ESCRIP	TION	Bridge N	o. 8 over	nter's Creek on SR 1403 and SR 1567	GROUND WATER (ft)
BORIN	IG NO.	B6		ВО	NG LOCATION 22+68 OFFSET 10 ft LT ALIGNMENT -L-	0 HR. Water
COLLA	R ELEV	<b>/.</b> -18.	8 ft	NORT	NG 665,337 US ft EASTING 2,569,017 US ft	24 HR. Boring
	DEPTH			<del> </del>		R TYPE 140 lb. Manual
	STARTE		/29/06		COMPLETED 11/30/06 SURFACE WATER DEPTH 19.5 ft	STATE 140 ID. Manda
	T	<del></del>	OW CO	INT	The state of the s	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	20 40 60 80 100 NO SOIL AND ROC	K DESCRIPTION
(11)	(11)	0.51	0.511	0.511	20 40 80 100 NO. MOI G	
-18.8					Mudline -18.8	
-18.8	0.0	0	0	0	O	coarse SAND and
-	ŧ			W	\	(A-1-b) with trace shells
-23.9	5.1				\· · · · · · · · · · · · · · · · · · ·	
_		1	2	4	Sat. Sat.	
	<u> </u>				000	
-28.9	10.1			·	000	
-	F	15	12	17	Sat. Sat. Castle Hayne Format	on: White and gray.
•	‡				friable, thickly bedded	, shell-hash LIMESTONE
	ţ				-33.6	15
-36.3	17.5				Castle Hayne Format to coarse SAND (A-2-	on: Green-gray, silty, fine 4) with friable, thinly
-	- 17.0	11	9	7		trace shell fragments
	‡.					
- -41.3	22.5					
-	-	4	19	11	Sat. Sat.	
	Į.					
-46.3 -	27.5					
	t	4	5	5	910	
•	+					
-51.3	32.5					
	‡	4	7	6	Sat.   Sa	
•	Ł					
-56.3 -	37.5	4	4	5	Sat.	
-	F		-		9	
	F				-59.8 Caette Havro Format	ion: Green-Gray, friable
<u>-61.3</u>	42.5	20	60/0.2	-	to moderately indurate	ed, very thickly bedded,
•	ŀ				sandy, shell-hash LIN	IESTONE
-66.3 -	F .= =				·····	
00.3	47.5	100/0.5			-66.8 Castle Havne Format	ion: Blue-green to gray,
-	<u> </u>				indurated, very thickly	bedded LIMESTONE
-71.3 -	52.5					
-		60/0.0'	1		-72.7	5
1	ļ.				Peedee Formation: G	reen, silty, fine to coarse
76.3	57.5				SAND (A-2-4) with fri	
	-	12	17	18	w	
-	F					
- 81.3	62.5	<u> </u>				
	E	23	32	42	w	
1	F					
- 86.3	67.5	<u> </u>	<u></u>		· · · · · · · · · · · · · · / · · · · ·	
-	<u> </u>	15	26	36	w <b>w</b>	
-	-					•
91.3	72.5					
	-	10	15	24		



N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

We .														SHEE	1 2 OF 2
ROJE	CT NO.	3338	7.1.1			ID. B	4020	)	С	OUNTY	Beau	fort/Pi	itt	GEOLOGIST B.	Deobald
ITE D	ESCRIPT	ION B	ridge No	o. 8 over	Trante	r's Creek	on SR	1403 and S	R 1567						GROUND WATER (ft)
ORIN	G NO.	36		ВО	RING	LOCAT	ION	22+68		OFFS	ET 101	ft LT		ALIGNMENT -L-	0 HR. Water
	R ELEV.		3 ft	NORT					US ft		ING 2,		17	US ft	24 HR. Boring
	DEPTH					HINE D			JJ 11	<del> </del>				<del></del>	
				DRILL	. WIAC	<del></del>				<del> </del>	METH				R TYPE 140 lb. Manual
	STARTED		/29/06			J		D 11/30/		SURF	,	ATER	DEF	PTH 19.5 ft	
LEV.	DEPTH		ow cor					S PER FO			SAMP.	<b>V</b> /	0	SOIL AND ROCK	DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	9	20	40	60	80	100	NO.	MOI	G		,
93.6						Contin	ued f	rom previo							
33.0							···		ous page	<del></del>				Peedee Formation: Gre	en, silty, fine to coarse
96.3	77.5								$\langle \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot$					SAND (A-2-4) with friate limestone and trace she	ole, thinly bedded
	<u> </u>	53	37	48	: :					85		w		(continued)	sii iragineriis
	+								/ .					-	
101.3	82.5								[ .					-	
	<b></b>	27	43	35	<u> </u>				78			W	<b>:::</b>	102.8 Boring terminated at 84	84.0 0 ff /Flex -102 8 ft\ in
-	<u> </u>													Peedee Formation: Ver	y dense, silty, fine to
	t l													coarse SAND (A-2-4) w	vith friable, thinly trace shell fragments
	.													Bit used: 4" casing sho	e and HQ core bit
-														Drilling fluid: 8.5 lbs/gal	
	‡													-	
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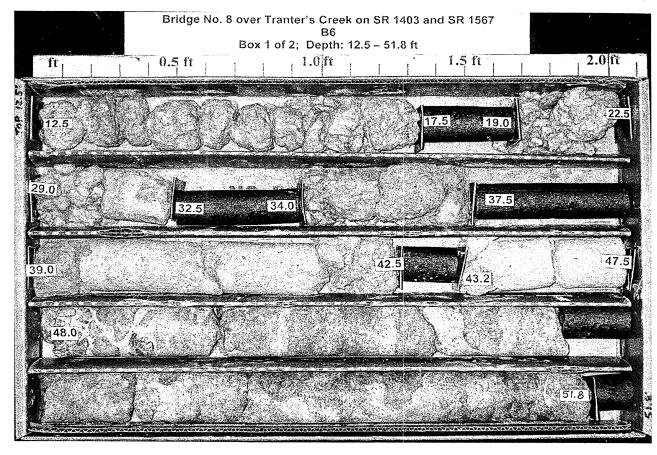


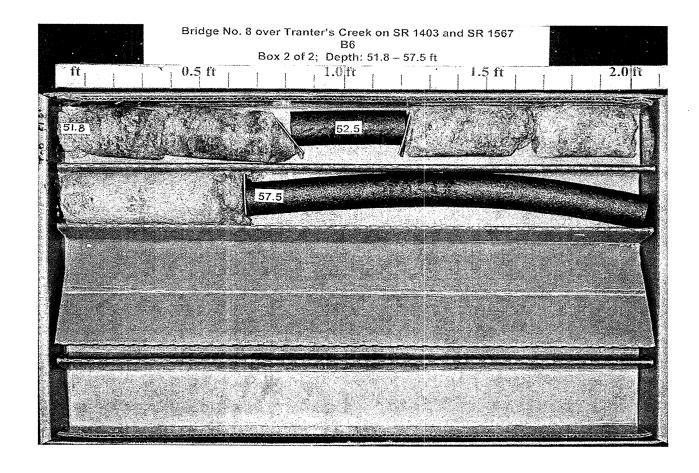
### N.C.D.O.T. GEOTECHNICAL UNIT CORE BORING REPORT

See or	BANN 10																SHE		OF		·
PROJE	CT NO.	333	87.1.1			<b>ID.</b> B-4	020			CC	OUNTY	Beaufort	/Pitt		GEO	OLOG	ST B				
SITE D	ESCRIP	TION	Bridge No	. 8 over	Tranter	r's Creek on	SR 140	03 and 8	SR 156	67					,			G	ROUNE	WATE	R (ft)
BORIN	G NO.	B6		во	RING	LOCATIO	ON 2:	2+68			OFFSET	10 ft L	Γ	ALIGN	IMENT	-L-		7	0 HR.	Wa	ater
COLLA	R ELEV	'18	.8 ft	NORTI	HING	665,33	7		US	S ft	EASTIN	<b>G</b> 2,569	,017	·· <b>!</b>			US ft	7 :	24 HR.	Bor	ing
TOTAL	DEPTH	84.	0 ft	DRILL	MAC	HINE D-5	0				DRILL N	ETHOD	Mudi	Rotary/0	Core	F	IAMME	ER TY	PE 140	lb. Ma	nual
DATE	STARTE	D 1	1/29/06			COMPLE	TED	11/30/	06		SURFAC	E WATE	R DEP	<b>TH</b> 19	.5 ft						
CORE	SIZE +	IQ.				TOTAL F					DRILLE	R T. Hai	hn							***************************************	
ELEV.	DEPTH	RUN	DRILL	REC.	UN RQD	SAMP.	REC.	RATA	0 7				f	DESCRIF	ΣΙΩΝ ΔΙ	ND BE	MARKS	2			
(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ												
											٠			Begin	Coring	m 12	.5 ft				
-31.3	12.5	5.0	0:20 0:27	(1.2)	(N/A)	)	(0.0)	(N/A)		-	1 18 45	le Hayne I		n: White				ly bedo	led, shell	-hash	
			0:45 0:30	2470			(2.4)	(N/A)		33		STONE ( le Hayne l		·	-gray, sil	ty, fine	to coan	se SAI	ND (A-2-	4) with	15.0
-36.3	17.5		0:27 N=16	<del> </del>			11%			-	friabl	e, thinly b	edded lir	mestone :	and trace	e shell	fragmer	nts		,	
-37.8	19.0	3.5	0:40	(0.3)	(N/A)	)															
-41.3	22.5		0:30 0:25	9%																	
			0:12/0.5 N=30	1			1			Ē											
-42.8	24.0	3.5	0:11 0:11	(0.0)	(N/A)	)				-											
-46.3	27.5		0:12 0:06/0.5							-											
-47.8	29.0	3.5	N=10 0:13	(0.4)	(N/A)	<u> </u>	-			_											
-51.3	20 5		0:11 0:25	11%	( ,					_											
-51.5	32.5		0:08/0.5 N=13	<del> </del>			1			-					*						
-52.8	34.0	3.5	0:26 0:45	(0.5) 14%	(N/A)	)				-											
-56.3	37.5		0:25 0:06/0.5	1770						-											
-57.8	39.0	3.5	N=9 0:43	(1.2)	(N/A)					-											
		0.0	1:40 0:12	34%	(147.4)		(1.7)	(N/A)		<u>-59</u>	88	e Hayne f			Crov fri						41.0
-61.3 -62.0	42.5 43.2	4.3	0:05/0.5 N=60/0.2'	(0.5)	(N/A)		29%	(14/74)	H	-	thick	y bedded,	sandy,	shell-has	h LIMES	TONE	modera	atery in	idurated,	very	
-02.0	70.2	4.5	0:55 0:16	(0.5) 12%	(IWA)	'			崫	-											
-66.3	47.5		0:06 0:05 0:03/0.3						世	 66.	8										48.0
-66.8	48.0	4.5	N=100/0.5' 3:15	(4.3) 96%	(N/A)		(5.7) 97%	(N/A)			Casti	e Hayne F	ormatio	n: Blue-g	reen to g	ray, in	durated	, very	hickly be	dded	40.0
-71.3	52.5		3:10 3:20				5. 76		田	-	E-1141E-	OTONE									
-7 1.5	32.3	5.0	2:55 1:20/0.5	(1.4)	(N/A)	1			岸	- 72.	7				•						53.9
			N=60/0.0' 2:30 1:30	28%			(0.0) 0%	(N/A)		-	Peed	lee Forma ed limesto	tion: Gre	en, silty,	fine to co	oarse S	SAND (A	A-2-4)	with friab	le, thinly	
-76.3	57.5		1:15 0:40							-	~000			3110							
-77.8	59.0	3.5	\0:30 N=35	(0.0)	(N/A)	-				-											
-81.3	62.5		0:18 0:15 0:30	`0%	, ,					_											,
			0:30 0:18/0.5 N=74							-											
-82.8	64.0	3.5	0:18 0:15	(0.0)	(N/A)					<del>-</del>											
-86.3	67.5		0:20 0:10/0.5			-				-							•				
-87.8	69.0	3.5	N=62 0:30	(0.0)	(N/A)	-				-											
1			0:15 0:18	0%	(- <del>/-</del> 1)					_											
-91.3	72.5		0:12/0.5 N=39	<del>                                     </del>						-											
-92.8	74.0	3.5	0:30 0:30	(0.0)	(N/A)					-											
-96.3	77.5		0:20 0:10/0.5	J 70						-											
-97.8	79.0	3.5	N=85 0:35	(0.0)	(N/A)					-											
		٥.٥	0:25 0:18	0%	(14/74)					-											Ì
-101.3	82.5		0:12/0.5	╁─┤						<u>101</u>	Corin	g terminat	ed at 82	.5 ft (Elev	/101.3	ft) in P	eedee F	Forma	tion: Ven	dense	82.5
										-	silty, 1	fine to coa fragments	rse SAN	ID (A-2-4	) with fria	able, th	inly bed	dded lir	nestone	and trac	e
											5.1011										

Core Photos MACTEC Proj. No. 6468-06-1557

SHEET 27 Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 NCDOT Proj. No. 33387.1.1 (B-4020)







## N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 2

						T 1 OF 2
PROJE	ECT NO.	3338	7.1.1		ID. B-4020 COUNTY Beaufort/Pitt GEOLOGIST J.	Howard
SITE D	ESCRIP	TION E	Bridge N	o. 8 over	nter's Creek on SR 1403 and SR 1567	GROUND WATER (ft)
BORIN	IG NO.	B7		ВО	NG LOCATION 23+23 OFFSET 7 ft RT ALIGNMENT -L-	0 HR. Water
COLLA	AR ELEV	15.4	4 ft	NORT	IG 665,318 US ft EASTING 2,569,071 US ft	24 HR. Boring
TOTAL	. DEPTH	88.5	ft	DRILL		R TYPE 140 lb. Manual
	STARTE		/13/06	1	COMPLETED 11/15/06 SURFACE WATER DEPTH 15.0 ft	THE PHOID MANAGE
ELEV.			OW COL	INT	BLOWS PER FOOT SAMP. V	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	20 40 60 90 100 O SOIL AND ROCK	DESCRIPTION
(11)	(19)	0.01	0.010	0.01	25 40 30 80 100 NO. MOI G	
-15.4					Mudline -15.4	
-15.4 -	0.0	3	0	o W	O	oarse SAND (A-2-4)
-19.0	3.6				Castle Hayne Formatic	n: White and tan,
-	<del> </del>	18	10	8	W   SHELL-HASH (A-1-b)	
-	F					
-24.0	8.6	10	22	10		
-	‡ l		22	10		
20.0	100				000-	1
-29.0	13.6	12	20	25	Castle Hayne Formatic	n: White and gray,
-32.4 -	17.0				Castle Hayne Formation	shell-hash LIMESTONE 1 n: Green-gray, silty, fine
-	17.0	8	12	15	to coarse SAND (A-2-4	) with friable, thinly trace shell fragments
_	F					
-37.4 -	22.0					
1		22	16	17	M M	
-	<u> </u>					
42.3	26.9	47	40	40	:::::/:::/::::::::::::::::::::::::::::	
•	- 1	17	12	16	W W	
	- 1				····/····	
<del>-47.3</del> -	31.9	6	10	8		
	E l					
-52.3	36.9				:::\::::::::::::	
-02.0	- 30.9	6	8	15	· · · · • • • • · · · · · · · · · · · ·	3
_	<u> </u>				Castle Hayne Formation	n: Green-Gray, friable
57.3	41.9				to moderately indurated sandy, shell-hash LIME	s, very tnickly bedded, STONE
		100/0.5				
-	-				·····	
-62.3	46.9	100/0.51			······	
1	F ľ	100/0.5'				n: Blue-green to gray.
1	-				indurated, very thickly l	pedded LIMESTONE
67.3	<u>51.9</u>	100/0.3			100/0.3	. 5
					Peedee Formation: Gre	en, silty, fine to coarse
-72.3	- 56.9				SAND (A-2-4) with frial limestone and trace sh	ell fragments
1	-	22	30	36		
4	-					
77.3	61.9					
1		33	46	54	100/10 W	
1	-					
82.3	- 66.9	21	33	46	w	
Ŧ	-	-	55	-5	**************************************	
87.3	- 71.0	İ				
-01.3	- 71.9 -	9	19	25	M M	
+	-	ŀ				



## N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

Ster 27 12	AMILO																:	SHE	ET	2 OF	2		
PROJE	CT NO.	3338	37.1.1			ID. B~	4020		C	OUNTY	Beau	fort/Pi	tt		GE	EOL	OGI	ST J.	. Ho	ward			
SITE DE	SCRIP	TION	Bridge No	o. 8 over	Trante	r's Creek o	n SR 1	403 and SR 156	37											GROUN	D W	ATER	(ft)
BORING	S NO.	B7		BC	RING	LOCATI	ON	23+23		OFFS	ET 7ft	RT		ALIG	NMEN.	Т -	-L-			0 HR.		Wate	r
COLLA	R ELEV	15.	4 ft	NORT	HING	665,31	18	US	ft	EAST	NG 2,	569,0	71					US ft		24 HR.		Boring	9
TOTAL	DEPTH	88.5	ft	DRILL	. MAC	HINE D-	50			DRILL	METH	OD	Mud	Rotary	Core		Н	AMME	ER T	YPE 14	0 lb.	Manu	ai
DATE S	TARTE	D 11	/13/06			COMPL	ETED	11/15/06		SURF	ACE W	ATER	DEF	PTH 1	5.0 ft								
- 1	DEPTH	BLO	ow cor	JNT				PER FOOT			SAMP.	lacktriangledown/	L		:	SOIL	ANI	ROC	K DE	ESCRIPT	ON		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	Ŷ	20	40	60	80	100	NÒ.	MOI											
-90.2						Continu	ed fro	m previous p	age	,													
-92.4	77.0					· · · · ·			···					E						, silty, fine thinly bed		oarse	
		27	43	57/0.4'						100/0.9		M		Ł		tone :	and t			ragments			
1	-													_	(00/10)	,,,,,,	,						
-97.4	82.0	55	45/0.3'							::		м		Ł									
1	·	00	10,0.0							100/0.8		101		Ŀ									
-102.4	- 87.0																						
1		15	15	20	::	<u> </u>	•35 ·	<u> </u>	<u> </u>	: : :		M		-103.9				***********					88.5
+	-													E	Peed	ee Fo	orma	tion: De	ense	ft (Elev1 , silty, fine	e to c		
İ	·													E	SANE	O (A-2 tone :	2-4) v and 1	with fria trace st	able, heli f	thinly bed ragments	ded		
<u> </u>	·													E						nd HQ co			
<u> </u>	·													E				7 lbs/ga					
1	.													E	J.,,,,,,,	.9	<b></b> . 0.	, .bag.					
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## N.C.D.O.T. GEOTECHNICAL UNIT CORE BORING REPORT

SHEET 29

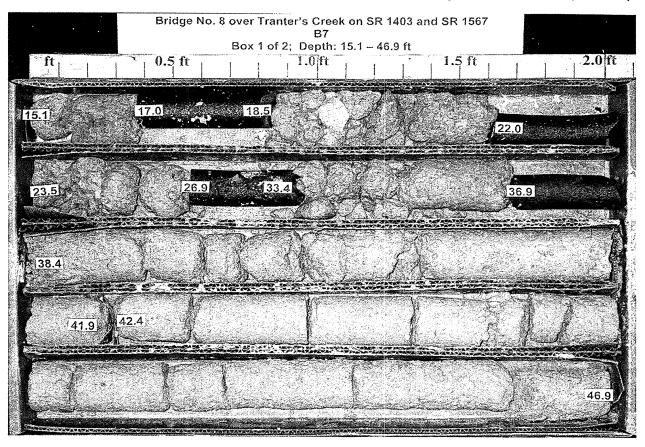
SHEET 1 OF 1

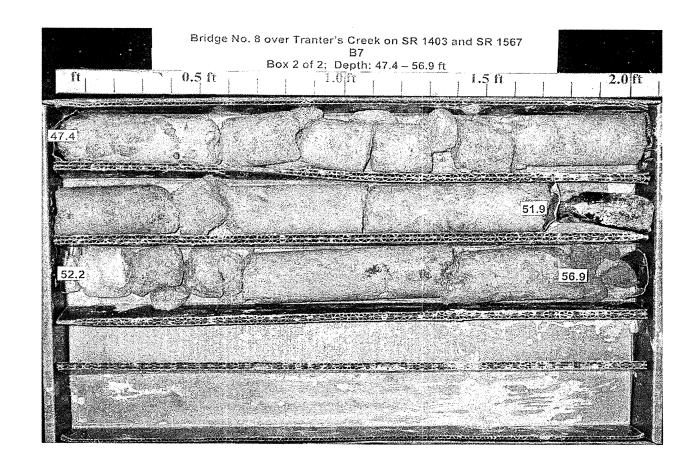
20 7														SHE	ET 1 OF 1	
PROJE	CT NO.	3338	37.1.1			<b>ID</b> . B-40	020			cou	NTY Beaufort/Pitt		GEOLO	OGIST J.	Howard	
SITE D	ESCRIP	TION	Bridge No.	. 8 over T	ranter	's Creek on	SR 140	3 and S	R 156	7					GROUND V	NATER (ft)
BORIN	G NO.	B7		BOI	RING	LOCATIO	N 23	+23		0	FFSET 7ftRT	ALIGNM	ENT -	L-	0 HR.	Water
COLLA	R ELEV	15.	4 ft	NORTH	IING	665,318	3		US	ft E	ASTING 2,569,071			US ft	24 HR.	Boring
TOTAL	DEPTH	88.5	ft	DRILL	MAC	HINE D-5	0			D	RILL METHOD Mud R	Rotary/Co	re	HAMME	R TYPE 140 lb	. Manuai
DATE	STARTE	D 11	1/13/06			COMPLE	TED '	11/15/	06	SI	URFACE WATER DEPT	H 15.0	ft	******		
CORE	SIZE H	Q				TOTAL R	UN 5	4.9 ft		DI	RILLER T. Hahn					
ELEV.	DEPTH	RUN	DRILL	REC	JN	SAMP.	STR REC.	ATA RQD	L			FOODIDTI	ON AND	DEMARKS		
(ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	NO.	(ft) %	(ft) %	0 G			ESCRIPTI	ON AND	REMARKS	•	
												Begin C	orina @	151#		
-30.5	15.1	1.9	0:20	(0.4)	(N/A		(2.4)	(N/A)	.:::-	-30.5	Castle Hayne Formation				se SAND (A-2-4)	with 15.1
-32.4	17.0		0:40/0.9 N=27	21%		-	15%				friable, thinly bedded lim	nestone an	d trace sh	nell fragmer	nts	
-33.9	18.5	3.5	0:20 0:30	(0.8)	(N/A	)				-						
-37.4	22.0		0:30 0:30 0:15/0.5	23%												
			N=33	1	()											
-38.9	23.5	3.4	0:20 0:15	(0.5) 15%	(N/A	'				<del>-</del>						
-42.3	26.9		0:15 0:10/0.4	<del> </del>		-										
-43.8	28.4	3.5	N=28 0:45	(0.0)	(N/A	<del>,   </del>										
-47.3	31.9		0:15 0:30	0%					F	-						
77.0	31.3		0:15/0.5 N=18	1												
-48.8	33.4	3.5	0:20 0:40	(0.7)	(N/A	)				<del>-</del>						
-52.3	36.9		0:45 0:10/0,5													
-53.8	38.4	3.5	N=23 1:30	(2.3)	(N/A		(5.9)	(N/A)		-53.8	Castle Hayne Formation	o: Green-G	ray friahl	e to moder	ately indurated w	38.4
		3.5	1:15 0:15	66%	(IWA	<b>'</b>	67%	(14/7)	冒	<del></del>	thickly bedded, sandy, s	hell-hash I	LIMESTO	NE	atery indurated, v	Si <b>y</b>
-57.3			0:05/0.5 N=100/0.5	J (2.0)	/21/2				岸							
-57.8	42.4	4.5	1:15 0:30	(3.6) 80%	(N/A	<b>'</b>			旦							
-62.3	46.9		0:15 0:15						臣	,			,			
-62.8		4.5	0:05/0.5 N=100/0.5	(3.7)	(N/A				片	-63.6						48.2
			2:30 2:00	82%			(4.8) 100%	(N/A)	田	- -	Castle Hayne Formation LIMESTONE	n: Blue-gre	en to gray	y, indurated	i, very tnickly bed	aea
-67.3			4:00 4:45						岸	68.4						53,0
-67.6	52.2	4.7	2:00/0.5 N=100/0.3 2:00	(1.9) 40%	(N/A	'	(1.1)	(N/A)		-00.4	Peedee Formation: Gre				A-2-4) with friable	
-72.3	56.9		2:00 2:00 2:15				4%			-	bedded limestone and to	race snell f	ragments	5		
-12.3	8.00		0:20 0:30/0.7				1			•						
-73.8	58.4	3.5	N=66 0:30	(0.0)	(N/A	)	1			-						
-77.3	61.9		0:20 0:20													
-78.8	63.4	3.5	0:10/0.5 N=100	(0.0)	(N/A	,	-									
		3.5	0:20 0:30 0:20	0%	(IWA	<b>'</b>				-						
-82.3	66.9		0:20 0:10/0.5 N=79	┼──	<del> </del>		1									
-83.8	68.4	3.5	0:30	(0.0)	(N/A	)	1			<u>.                                    </u>						
-87.3	71.9		0:30 0:15	0%												
			0:10/0.5 N=44	1			1									
-88.8	73.4	3.6	0:30 0:30	(0.0)	(N/A	)				-						
-92.4	77.0		0:30 0:10/0.6		<u> </u>					•						
-93.8	78.4	3.6	N=100/0.9 0:20	(0.0)	(N/A	1	1			•						
l		J.0	0:20 0:20	0%	""	<b>'</b>				-						
-97.4			0:10/0.6 N=100/0.8				1			- -						
-98.2	82.8	4.2	0:20 0:15	(0.0)	(N/A	)				-						
-102.4	87.0		0:20 0:20							- 102.4						87.0
			0:50/0.2	1						-	Coring terminated at 87 fine to coarse SAND (A	.0 ft (Elev. -2-4) with f	-102.4 ft)	in Peedee	Formation: Dens	e, silty, ace shell
1	i	1	l	ł	1	1	I	I .	1 1			- /		.,		

Core Photos MACTEC Proj. No. 6468-06-1557



SHEET 30 Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 NCDOT Proj. No. 33387.1.1 (B-4020)







### N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 2

00.1					Т						1 1 OF 2
PROJE	CT NO.	3338	37.1.1		ID. B-4020 CO	UNTY	Beau	fort/Pi	tt	GEOLOGIST B.	***************************************
SITE D	ESCRIP	TION	Bridge No	o. 8 over	er's Creek on SR 1403 and SR 1567						GROUND WATER (ft)
BORIN	IG NO.	B8		ВС	G LOCATION 23+80	OFFSE	ET 10	ft LT		ALIGNMENT -L-	0 HR. Water
COLLA	AR ELEV	0.5	ft	NORT	G 665,332 US ft	EASTI	NG 2,	569.1	28	US ft	24 HR. Boring
	DEPTH			<del> </del>			METH				R TYPE 140 lb. Manual
				DRILL	<del></del>						TIPE 140 ID. IVIANUAL
	STARTE		/19/06		<del></del>	SURF	ACE W	ATER	DEP	TH 0.2 ft	
ELEV.	DEPTH	BL	ow cor	<del></del>	BLOWS PER FOOT		SAMP.	<b>V</b> /	0	SOIL AND ROCK	DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	20 40 60 80	100	NO.	MOI	G		22001(II) 1101(
0.5 0.5 =	- 0.0	1	1	2	Mudline			0-4		0.5	0.
5.0	- 5.5	1	'	2	} · · · · · · · · · · · · · · · · · · ·	: : :		Sat.		<ul> <li>Alluvium: Tan, fine to co</li> </ul>	Darse SAND (A-2-4)
-3.7	4.2				· · · · · · · · · · · · · · · · · · ·					- - <u>3.0</u>	
	<u> </u>	3	4	3	7			w		Alluvium: Tan, clayey, s SAND (A-2-6) with little	sity, tine to coarse shell fragments
7	+					: : :				-	
-8.7	9.2				<u></u>					-8.0	8.
<del></del>	<del></del>	8	12	12	•24				000	Castle Hayne Formatio SHELL-HASH (A-1-b) v	n: White and tan, vith phosphate nodules
7	+ 1					: : :			000	-	privaprima rioduloo
-13.4	13.9				\				000	<u>-</u>	
		12	14	12	26			1	000	<del>-</del> 	
7	<u> </u>		1			: : :			000	_ •	
-18.4	18.9							i i	000	- -	
		9	10	12	\$22				000	•	
						: : :			000	-	
-23.4	23.9					$\cdots$			000	- -	
		4	8	11	• 19			<u> </u>	000	-	
-	- 1					: : :			000	-	
-28.4	28.9								000	<u>.</u> -	
		15	20	19	39				000	- -	
7	+ 1		l			· · ·			000		32.
-33.4	- 33.9									<ul> <li>Castle Hayne Formatio</li> <li>to coarse SAND (A-2-4</li> </ul>	n: Green-gray, silty, fine
]		12	15	25	40			Sat.		bedded limestone and	
1	-				/					-	
-38.4	38.9				/					<del>-</del>	
		5	14	14	28			Sat.		<del>-</del>	
+	<u> </u>					: : :				<u>.</u>	
-43.4	43.9			<u> </u>						<del>-</del> : <del>-</del>	
	<b>L</b>	18	18	8	26			Sat.			
+						: : :				-	
-48.4	48.9				/			1			
1	-	4	4	4	<b>•</b> 8 · · · · · · · · · · · · · · · · · · ·			Sat.		<del>-</del>	
1	<u> </u>				.\					: <del>-</del>	
-53.4	- 53.9				. \	: : :   : : :				<del>-</del> -	
1	F	6	11	9	20			Sat.		<u>-</u>	
İ										_	
-58.4	- 58.9		45			· · ·					
4	F	4	15	11	26			Sat.		<del>-</del>	
1	t l										
-63.4	- 63.9			<u> </u>	. /						
1	Γ	3	6	6	<b>\$12</b>			Sat.		<u>-</u>	
1	<u> </u>					<u></u> .				- -67.0	67
-68.4	- 68.9							•		_ Castle Hayne Formatio	n: Blue-green to gray,
4	F 1'	60/0.0'				0.00.0				_ indurated, very thickly t	redued LIMES I ONE
1	- 1					· · ·				71.5	72
			1	1	· · · · · · · · · · · · · ·	[		I		<ul> <li>Peedee Formation: Green</li> </ul>	en, slity, fine to coarse



N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 2

PROJECT NO. 33387.1.1 ID. B-4020 COUNTY Beaufort/Pitt GEOLOGIST B. Deobald SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 **GROUND WATER (ft)** BORING LOCATION 23+80 BORING NO. B8 OFFSET 10 ft LT ALIGNMENT -L-0 HR. Water COLLAR ELEV. 0.5 ft **NORTHING** 665,332 US ft | EASTING 2,569,128 US ft 24 HR. Boring HAMMER TYPE 140 lb. Manual TOTAL DEPTH 100.4 ft DRILL MACHINE CME 55 LC Track DRILL METHOD Mud Rotary DATE STARTED 11/19/06 **COMPLETED** 11/20/06 SURFACE WATER DEPTH 0.2 ft ELEV. DEPTH **BLOW COUNT BLOWS PER FOOT** SAMP. MOI G SOIL AND ROCK DESCRIPTION 40 60 (ft) 0.5ft 0.5ft 0.5ft 20 100 NO. Continued from previous page -74.3 Peedee Formation: Green, silty, fine to coarse W -99.9 31 SAND (A-2-4) with trace shell fragments (continued) 15 -83.4 + 83.9 36 50 -88.4 + 88.9 18 20 29 -93.4 + 93.9 20 <u>-98.4 I</u> 98.9 18 22 28 Boring terminated at 100.4 ft (Elev. -99.9 ft) in Peedee Formation: Very dense, silty, fine to coarse SAND (A-2-4) with trace shell Bit used: 3" roller cone Drilling fluid: 8.6 lbs/gal



## N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 2

OP TRANS			-	······································					T 1 OF 2
PROJECT NO.	33387.1.1		ID. B-4020 C	OUNTY	Beau	fort/Pi	itt	GEOLOGIST J.	Howard
SITE DESCRIP	TION Bridge	No. 8 over Tran	ter's Creek on SR 1403 and SR 1567						GROUND WATER (ft)
BORING NO.	EB2	BORIN	IG LOCATION 24+22	OFFSI	ET 7 ft	RT		ALIGNMENT -L-	<b>0 HR.</b> 5.5
COLLAR ELEV	9.7 ft	NORTHIN	G 665,314 US ft	EAST	NG 2,	569,1	69	US ft	<b>24 HR.</b> 8.5
TOTAL DEPTH	113.1 ft	DRILL MA	ACHINE D-50	DRILL	METH	OD	Mud F	Rotary HAMME	R TYPE 140 lb. Manual
DATE STARTE	D 11/15/06	<del></del>	COMPLETED 11/17/06	SURF	ACE W	ATER	DEP"	TH N/A	
ELEV. DEPTH	BLOW CO	DUNT	BLOWS PER FOOT	1	SAMP.	<b>V</b> /	L		
(ft) (ft)	0.5ft 0.5ft	0.5ft O	20 40 60 80	100	NO.	MOI	0 G	SOIL AND ROCK	DESCRIPTION
						10101			
9.7			Ground Surface					9.7 Roadway Embankment	Eill: Asphalt
+	10 32	68/0.2'		100/0.7	SS-15	D		Roadway Embankment	: Fill: Orange and
4.9  4.8			• • • • • • • • • • • • • • • • • • • •				Lif	brown, silty, fine to coa	rse SAND (A-2-4)
+	3 3	3 :	• · · · · · · · · · · · · · · · · · · ·			D_	┟誹	- 0.7 ft: Blow count invali	d due to asphalt
‡			· · · · · · · · · · · · · · · · · · ·			v	Fi	fragments	
<u> </u>								0.3	10
-1.9 11.6		:						Alluvium: Orange to tar SAND (A-2-4) with trac	, silty, fine to coarse
<u> </u>	3 2	2 :	)4 ·			M	i:::F	Onito (n-2-4) with tide	o onon nagmento
Ŧ								-	
-6.9	1 1	2				w			
‡		] -   :T	<u>3</u>			•	000	-8.8 Castle Hayne Formatio	n: White and ton
-11.9 + 21.6							000	SHELL-HASH (A-1-b)	n. white and tan,
11.9 21.0	18 13	13	•26			w	000		
<u>+</u>							000		
-16.9 26.6			· · ·/· · · · · · · · · · · · · · · · ·				0000	-	•
+	9 7	6 .	• 13				000		
Ŧ	Ì		· · · · · · · · · · · · · · · · · · ·				000	<del></del>	
-21.9   31.6	11 11	12	· · · \ · · · · · · · · · · · · · · · ·				000		
‡		'-   -	•23				000		
-26.9 36.6		1 :						-	
1 30.0	14 16	17				М	000		
<u> </u>		.					000	_	
-31.9 + 41.6							000		
+ 1	18 22	19 :	41			М	000	-33.0 Castle Havne Formatio	n: Green-gray, silty, fine
+ 1								to coarse SAND (A-2-4 bedded limestone	
-36.9   46.6	21 17	13				м		bedded imjestorie	
‡			<del>P</del> 3V						
<del>-41.9</del> 51.6			· · · · /· · · · · · · · · · · · · · ·					-	
1 71.0	11 9	9 :	<b>•</b> 18		SS-16	М			
1			/					_	
-46.9 56.6									
<u>†</u>	5 5	7 .	12			М			
Ŧ								-	
-51.9	8 4	5 :				м			
‡			. <del>-</del> 9			101		•	
-56.9 66.6		1 1:						-	
- 00.0	5 4	5			SS-17	М			
<u>+</u>								_	
-61.9 71.6							l:::F	-	
-	18 18	17	35			М			
<u> </u>			<u>, , , , , , , , , , , , , , , , , , , </u>				.::+		



N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

ERF. 01 .	11119															SHEE	T 2 OF 2	
PROJE	CT NO.	3338	37.1.1			ID.	3-4020		С	OUNTY	Beau	fort/P	itt		GEOL	OGIST J.	Howard	
SITE D	ESCRIP	TION E	Bridge N	o. 8 over	Trante	er's Creel	on SR	1403 and SR	1567								GROUND I	NATER (ft)
BORIN	G NO.	EB2		ВС	RINC	S LOCA	TION	24+22		OFFS	<b>ET</b> 7 f	RT		ALIGN	NMENT -	L-	0 HR.	5.5
COLLA	R ELEV	'. 9.7 f	ft	NORT	HING	665	314		US ft	EAST	ING 2	,569,1	69			US ft	24 HR.	8.5
TOTAL	DEPTH	113.	1 ft	DRILL	MAC	CHINE	D-50			DRILL	METH	OD	Mud	Rotary		HAMME	R TYPE 140 lb	. Manual
DATE	STARTE	D 11	/15/06			COM	PLETE	11/17/06		SURF	ACE W	ATER	DEP	TH N/	/A			
ELEV.	DEPTH	BLO	ow co	UNT			BLOW	S PER FOOT			SAMP.	V	LO		SOII	AND BOCK	DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80 	100	NO.	МО					DECORAL FICH	
-65.1						Conti	nued fr	om previous	s nage	2								
-66.9	76.6					/.						1	.:::	-	Castle Hay	yne Formatio	n: Green-gray, s	ilty, fine
	- 10.0	6	6	7		13.						M		-	bedded lin	nestone (con	) with friable, this inued)	nıy
-	<u> </u>					· <u> </u>	<del></del>	<del></del>	<del></del>					69.6	Castle Hav	vne Formatio	n: Blue-green to	79. grav.
-71.9	81.6	100/0.0'								100/0.01				- -			edded LIMEST	
:	‡	100/0.0								100/0.0			日	-				
700	+ 00.0							J <del> </del>						<del>75.5</del>	Peedee Fo	ormation: Gre	en, silty, fine to	85 coarse
-76.9	86.6	18	24	22				<b>4</b> 6				w		- -	SAND (A-		le, thinly bedde	
_	<u> </u>							1						-	iiiiestorie	and have sin	sii iragirients	
-81.9	91.6							1:::::		· · · ·				-				
	1	16	21	26				47				W		-				
-	Ŧ													_				
-86.9	96.6	25	53	47/0.4	: :							w		-				
	Ŧ				: :					100/0.9				-				
-91.9	101.6									 				-				
	<u> </u>	11	16	20	: :							W		-				
_	‡				: :			X:::::						_				
-96.9	106.6	21	30	37	: :			::		 		w		<del>-</del> -				
	‡	-		"					7 	<i>.</i> .				-				
-101.9	+ 111.6							: : : : : \						_				
101.5		12	27	44	<u> </u>				 <b>⊅</b> 71	<i></i>		w		- 103.4				113
_	‡					,								_	Boring ten	minated at 11 ormation: Vei	3.1 ft (Elev10 y dense, silty, fi	3.4 ft) in ne to
	‡											-		_	coarse SA	ND (A-2-4) v	vith friable, thinly trace shell fragn	,
	‡													-		3" roller cone		
-	‡													-		id: 8.5 lbs/ga	ı	
	‡														Dinning na	id. 6.5 ibs/ga		
	1													_				
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FIELD DENSITY TEST WORK SHEET SHELBY TUBE METHOD - (ASTM 2937)

11-08-06

DATE:

NCDOT Project #33387.1.1 - T.I.P. #B-4020

CLIENT:

Depth Ft. From Shoulder 4 ∞ 0 19+56 - L-, 10' left of edge of pavement 19+53 -L-, 17' left of edge of pavement 19+58 -L-, 4' left of edge of pavement 6468-06-1557 MACTEC JOB NO.: % Comp Require N/A A/A N/A % Comp (K) = (J ÷ P) N/A N/A A/N N/A N/A N/A Dry Density (J) = (D÷(1+H)) 101.8 83.6 96.0 % Moist (H) = (G ÷ F) 25.5 15.4 21.5 Wt. Moist (G) = (E- F) 61 40 53 D.Wt. Moist Sample (F) 239 260 247 W.Wt. Moist Sample (E) 300 300 300 W.Wt. Cu Ft (D) =  $(C \times M)$ 104.9 117.5 116.6 PROJECT: Bridge #8 at Tranter's Creek W.Wt. Sample (C) = (A-B) 3.51 3.93 3.90 Wt. Mold (B) 1.38 1.36 1.37 W.W.t. Sample & Mold (A) 4.87 5.31 5.27 Test No. က 8 ~

* Tests Compared To:			
Proctor Curve No. (P)	Maximum	pcf Optimum Moisture	
Proctor Curve No. (P)	Maximum	pd Optimum Moisture	- International Control of the Contr
Proctor Curve No. (P)	Maximum	pcf Optimum Moisture	
Test Performed by: Pablo Rios	Rios	Mold Volume Factor ( <b>M</b> ):	ctor ( <b>M</b> ); 29.89
Checked by: Sill	salm hell	Test Results Reported To:	oorted To:
Pound Scale ID # 3-1-121	Date of Calibration 09-01-06		
Gram Scale ID # 3-1-115	Date of Calibration 09-01-06	9-01-06	



### MACTEC ENGINEERING AND CONSULTING, INC. 3301 ATLANTIC AVENUE RALEIGH, NORTH CAROLINA 27604

### N.C.D.O.T./AASHTO CLASSIFICATIONS

REPORT ON SAMPLES OF: SOILS FOR QUALITY

MACTEC PROJECT NAME/ NUMBER: Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 (6468-06-1557)

PROJECT: 33387.1.1 (B-4020)

COUNTY: Beaufort / Pitt

OWNER: N.C.D.O.T.

DATE SAMPLED: Oct / Nov 2006

RECEIVED: 10/23/06 and 11/13/06

REPORTED BY: MACTEC

**SAMPLED FROM: Boring B4** 

SUBMITTED BY: MACTEC ENGINEERING AND CONSULTING, INC.

1992 STANDARD SPECIFICATIONS

#### **TEST RESULTS**

Lab Sample No.		SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Retained 4.75 mm Sieve	(%)		0.0	0.0	0.0	0.0	4.2
Passing 2.00 mm Sieve	(%)		100.0	100.0	100.0	98.8	80.4
Passing 425 µm Sieve	(%)	· · · · · · · · · · · · · · · · · · ·	96.2	96.8	92.3	67.5	61.0
Passing 75 µm Sieve	(%)		38.1	27.2	42.0	27.2	16.2

#### **MINUS 2.00mm FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - 250 µm	(%)	5.2	6.1	12.5	57.7	50.1
Fine Sand Ret - 53 µm	(%)	62.1	68.8	47.8	15.4	30.7
Silt 0.05 - 0.005 mm	(%)	25.6	22.1	28.7	16.7	12.8
Clay < 0.005 mm	(%)	7.1	3.0	11.0	. 10.2	6.3

Moisture Content	(%)	65.9	94.6	ND	ND	ND	ND
Liquid Limit, L.L.		ND	61	20	19	28	25
Plasticity Index, P.I.		ND	NP	NP	NP	NP	NP
AASHTO Classification		ND	A-5(0)	A-2-4(0)	A-4(0)	A-2-4(0)	A-2-4(0)
Organic Content	(%)	5.6	12.0	ND	ND	ND	ND

Boring No.		B-4	B-4	B-4	B-4	B-4	B-4
Station		21+73	21+73	21+73	21+73	21+73	21+73
Offset		9 ft LT	9 ft LT	9 ft LT	9 ft LT	9 ft LT	9 ft LT
Alignment		-L-	-L-	-L-	-L-	-L-	-L-
Depth (ifti)	From	0.0	6.9	33.9	43.9	68.8	84.0
· · · · · ·	to	1.5	8.4	35.4	45.4	70.3	85.5

REMARKS: ND=Not Determined, NP=Non-Plastic

mitted by: bus differences



### MACTEC ENGINEERING AND CONSULTING, INC. 3301 ATLANTIC AVENUE RALEIGH, NORTH CAROLINA 27604

### N.C.D.O.T./AASHTO CLASSIFICATIONS

REPORT ON SAMPLES OF: SOILS FOR QUALITY

MACTEC PROJECT NAME/ NUMBER: Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 (6468-06-1557)

PROJECT:NCDOT 33387.1.1(B-4020)

**COUNTY:** Beaufort / Pitt

OWNER: N.C.D.O.T.

DATE SAMPLED: Nov 2006

RECEIVED: 11/13/06

REPORTED BY: MACTEC

SAMPLED FROM: Borings B4 and B1

SUBMITTED BY: MACTEC ENGINEERING AND CONSULTING, INC.

1992 STANDARD SPECIFICATIONS

#### **TEST RESULTS**

Lab Sample No.		SS-7	SS-8	SS-9	SS-10	SS-11	SS-12
Retained 4.75 mm Sieve	(%)	17.4	0.8	0.0	0.1	4.3	0.4
Passing 2.00 mm Sieve	(%)	70.5	94.1	97.2	99.2	92.9	97.8
Passing 425 µm Sieve	(%)	49.0	40.0	92.9	66.9	61.1	85.2
Passing 75 µm Sieve	(%)	29.9	8.8	15.9	11.3	20.0	19.9

### MINUS 2.00mm FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - 250 µm	(%)	46.1	77.5	21.9	57.8	49.9	16.6
Fine Sand Ret - 53 µm	(%)	12.1	14.7	61.9	32.6	32.7	65.3
Silt 0.05 - 0.005 mm	(%)	34.3	2.9	5.2	1.1	10.0	0.2
Clay < 0.005 mm	(%)	7.5	5.0	10.9	8.6	7.3	17.9

Moisture Content	(%)	ND	ND	ND	ND	ND	ND
Liquid Limit, L.L.		24	28	29	20	17	24
Plasticity Index, P.I.		NP	ŃΡ	NP	NP	NP	NP
AASHTO Classification		A-2-4(0)	A-1-B	A-2-4(0)	A-2-4(0)	A-2-4(0)	A-2-4(0)
Organic Content	(%)	ND	ND	ND	ND	ND	ND

Boring No.		B-4	B-4	B-4	B-1	B-1	B-1
Station	_	21+73	21+73	21+73	20+23	20+23	20+23
Offset		9 ft LT	9 ft LT	9 ft LT	4 ft RT	4 ft RT	4 ft RT
Alignment	<u> </u>	-L-	-L-	-L-	-L-	-L-	-L-
Depth (ft)	From	99.0	114.0	129.0	4.5	9.5	49.5
	to	100.5	115.5	130.5	6.0	11.0	51.0

REMARKS: ND=Not Determined, NP=Non-Plastic

Submitted by: '

Laboratory Manager



### MACTEC ENGINEERING AND CONSULTING, INC. 3301 ATLANTIC AVENUE RALEIGH, NORTH CAROLINA 27604

### N.C.D.O.T./AASHTO CLASSIFICATIONS

REPORT ON SAMPLES OF: SOILS FOR QUALITY

MACTEC PROJECT NAME/ NUMBER: Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567 (6468-06-1557)

PROJECT: 33387.1.1 (B-4020)

**COUNTY: Beaufort / Pitt** 

OWNER: N.C.D.O.T.

DATE SAMPLED: Nov 2006

**RECEIVED: 11/21/06** 

REPORTED BY: MACTEC

SAMPLED FROM: Borings B3, B5, EB2

SUBMITTED BY: MACTEC ENGINEERING AND CONSULTING, INC.

1992 STANDARD SPECIFICATIONS

#### **TEST RESULTS**

Lab Sample No.		SS-13	SS-14	SS-15	SS-16	SS-17	
Retained 4.75 mm Sieve	(%)	0.0	0.0	0.3	3.4	0.7	
Passing 2.00 mm Sieve	(%)	100.0	100.0	98.7	91.8	95.8	
Passing 425 µm Sieve	(%)	90.7	47.5	77.0	68.5	52.3	
Passing 75 µm Sieve	(%)	7.5	9.9	17.9	25.6	22.3	

#### **MINUS 2.00mm FRACTION**

SOIL MORTAR - 100%							
Coarse Sand Ret - 250 µm	(%)	65.5	83.9	41.9	29.2	56.4	
Fine Sand Ret - 53 µm	(%)	27.7	8.0	42.6	44.4	21.8	
Silt 0.05 - 0.005 mm	(%)	2.1	4.9	9.3	13.0	6.2	
Clay < 0.005 mm	(%)	4.7	3.2	6.2	13.4	15.7	

Moisture Content	(%)	ND	ND	ND	ND	ND	
Liquid Limit, L.L.		24	22	19	22	27	
Plasticity Index, P.I.		NP	NP	NP	NP	NP	
AASHTO Classification		A-3	A-1-b	A-2-4(0)	A-2-4(0)	A-2-4(0)	
Organic Content	(%)	ND	ND	ND	ND	ND	

Boring No.		B-3	B-5	EB-2	EB-2	EB-2	
Station		21+18	22+21	24+22	24+22	24+22	
Offset		7 ft RT	7 ft RT	7 ft RT	7 ft RT	7 ft RT	
Alignment		-L-	-L-	-L-	-L-	-L-	
Depth (ft)	From	21.5	0.0	0.0	51.6	66.6	
1	to	23.0	1.5	1.5	53.1	68.1	

REMARKS: ND=Not Determined, NP=Non-Plastic

Submitted by: Run du Laboratory Manage



### MACTEC ENGINEERING AND CONSULTING, INC. 3301 ATLANTIC AVENUE RALEIGH, NORTH CAROLINA 27604

### N.C.D.O.T./AASHTO CLASSIFICATIONS

REPORT ON SAMPLES OF: SOILS FOR QUALITY

MACTEC PROJECT NAME/ NUMBER: Bridge NO. 8 over Tranter's Creek on SR 1403 and SR 1567 (6468-06-1557)

PROJECT: 33387.1.1 (B-4020)

COUNTY: Beaufort / Pitt

OWNER: N.C.D.O.T.

**DATE SAMPLED: November 2006** 

RECEIVED: 11/21/06

REPORTED BY: MACTEC

SAMPLED FROM: Channel Bank / Channel Bed

SUBMITTED BY: MACTEC ENGINEERING AND CONSULTING, INC.

1992 STANDARD SPECIFICATIONS

#### **TEST RESULTS**

Lab Sample No.		S-1	S-2			
Retained 4.75 mm Sieve	(%)	1.7	0.3			
Passing 2.00 mm Sieve	(%)	97.8	99.5		·	
Passing 425 µm Sieve	(%)	72.9	70.7			-
Passing 75 um Sieve	(%)	11.0	4.8	 		

#### **MINUS 2.00mm FRACTION**

				-	 	
SOIL MORTAR - 100%				 	 	
Coarse Sand Ret - 250 µm	(%)	49.1	58.4			·
Fine Sand Ret - 53 µm	(%)	42.4	36.9			
Silt 0.05 - 0.005 mm	(%)	4.9	1.4			
Clay < 0.005 mm	(%)	3.6	3.3			

					1
Moisture Content	(%)	ND	ND		
Liquid Limit, L.L.		27	25		
Plasticity Index, P.I.		NP	NP		
AASHTO Classification		A-2-4(0)	A-3		
Organic Content	(%)	ND	ND		

Boring No.	C	hannel Bank	Channel Bed		
Station		21+26	21+44		
Offset		26 ft RT	22 ft RT		
Alignment		-L-	-L-		
Depth (ft)	From	0.0	0.0		
	to	0.5	0.5		

REMARKS: ND=Not Determined, NP=Non-Plastic

Submitted by:

Laboratory Manager

Template Revised 02/07/06



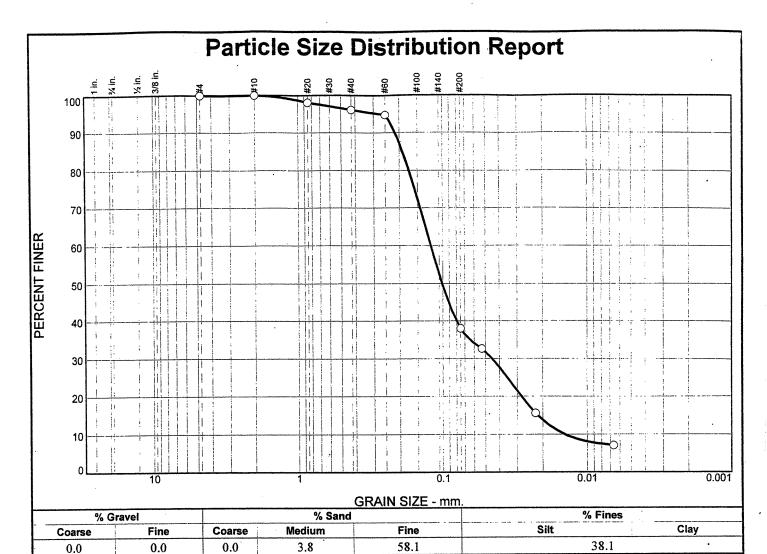
# FIELD SCOUR REPORT

WBS:	33387.1.1 TIP: B-4020 COUNTY: Beaufort / Pitt						
DESCRIPTION(1):	Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567						
·	EXISTING BRIDGE						
Information from:	Field Inspection X Microfilm (reel pos:) Other (explain)						
Bridge No.: Foundation Type:	8 Length: 307.5 Total Bents: 8 Bents in Channel: 6 Bents in Floodplain: 2 Steel plank floor on I-beams, timber piles and timber abutments						
EVIDENCE OF S	SCOUR(2)						
Abutments or E	End Bent Slopes: Little to none; lack of vegetation under existing bridge						
Interior Renter							
interior bents.	None observed						
Channel Bed:	None observed; channel bed not visible through water						
Channel Bank:	None observed; banks well vegetated						
EXISTING SCOU	JR PROTECTION						
	Wooden wing-walls at both end bents						
Extent(4):	10' left and right of structure						
Effectiveness(5):	Appears to be working						
Obstructions(6):	No obstructions observed at existing bents						

#### **INSTRUCTIONS**

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoritical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

			DESIGN IN	IFORMA	TION				
Channel	Bed Material(	7): Silty, fine t	o coarse sand	A-3, A-1-b	)				
					***************************************	According to the contract of t			
Channel E	Bank Material(	8): Silty, fine t	o coarse sand	A-2-4					
Channe	l Bank Cover(	9): Marsh gra	sses, shrubs, s	mall to lar	ge trees	S			
Flood	lplain Width(1	0): Approxima	tely 1200 ft						
Flood	plain Cover(1	1): Grass, shr	ubs, small to la	arge trees	at end I	pent 1; g	rass at e	nd bent 2	2
	Stream is(1	2): Aggı	ading	Degra	ding		Sta	tic X	
Channel Migration	n Tendency(1	3): East; outer	r bend of chan	nel					
Observations a	and Other Co	mments: Quite	e water, tidal-in	fluenced s	tream.	Water to	ops bank	to the w	est during
			BILL L	Ocola ngineering	and Co	nsulting,	Inc.	Date:	12-22-06
DESIGN SCO	UR ELEVATIO	ONS(14)			Feet	X	Mete	ers	
	BEN	TC							
	B1		B3 B4	<b>B</b> 5	В6	B7	В8		
į	50yr/OT -0.8		-1.2 -9.7	-22.9	-23.7	-19.9	-1.3		
					· · · · · · · · · · · · · · · · · · ·				
				<u> L</u>					
•	•		oretical scour: the Bridge Sur		Iraulic [	Design R	eport sig	ned 2/15	/06.
	DSE de	etermined by:	Club Ch	m av	bely			Date:	1/4/2007
					V				
		·	INEL BED ANI	<del>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</del>	IATERI	AL			<del></del>
Bed or Bank	Bank	Bed	Bed	Bed		····			
Sample No.	S-1	S-2	SS-2	SS-14	+				
Retained #4 Passed #10	1.7	0.3	100	0					
Passed #40	97.8 72.9	99.5 70.7	100 96.2	100					
Passed #200	11	4.8	38.1	47.5 9.9					
Coarse Sand	49.1	58.4	5.2	83.9					
Fine Sand	42.4	36.9	62.1	8					
Silt	4.9	1.4	25.6	4.9					
Clay	3.6	3.3	7.1	3.2					
LL	27	25	61	22					
PI	NP	NP	NP	NP					
AASHTO	A-2-4(0)	A-3	A-5(0)	A-1-b	, —				
Station	21+26	21+44	21+73	22+2					
Offset	26 ft RT	22 ft RT	9 ft LT	7 ft R		· · · · · · · · · · · · · · · · · · ·			
Denth	0.0-0.5 ft	0.0-0.5 ft	6 Q-8 / ft	0.0-1.5					



	0.0				
					_
	SIEVE	PERCENT	SPEC.*	PASS?	
	SIZE	FINER	PERCENT	(X=NO)	
	#4	100.0			
	#10	100.0			
	#20	98.1			
	#40	96.2			
ı	#60	94.8			
	#200	38.1			
	#270	32.7			
	0.0224 mm.	15.6			
	0.0066 mm.	7.1			
			1		

Green gray brown	Soil Description a sandy silt	
PL= NP	Atterberg Limits	PI= NP
D <sub>85</sub> = 0.1896 D <sub>30</sub> = 0.0448 C <sub>u</sub> = 8.55	Coefficients D60= 0.1211 D15= 0.0216 Cc= 1.17	D <sub>50</sub> = 0.1010 D <sub>10</sub> = 0.0142
USCS= SM	Classification AASH	ΓO= A-5(0)
ND-NOT DETE	· <u>Remarks</u> RMINED	

Sample No.: B-4 SS-2 Location: Boring B-4 Source of Sample: BORING 4

Date: 10/27/06 Elev./Depth: 6.9-8.4'

MACTEC, Inc.

Client: N.C.D.O.T.

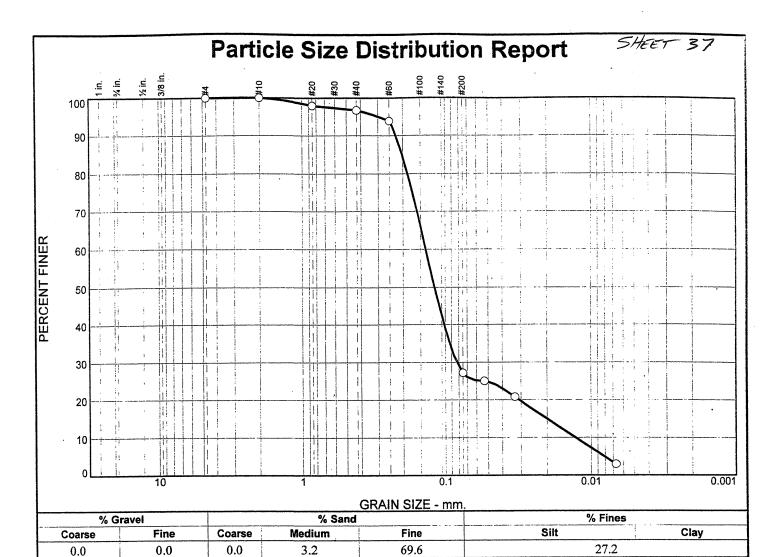
Project: Bridge NO.8 over Tranter's Creek on SR1403 and SR1567

Raleigh, North Carolina

Project No: 6468061557

Figure

Tested By: JD Checked By: AB



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4	100.0		
#10	100.0		
#20	98.0		
#40	96.8		
#60	93.9		
#200	27.2		-
#270	25.1		
0.0330 mm.	20.8		
0.0067 mm.	3.0		

C: 14 4.	Soil Description	1
Gray silty sand		
DI - ND	Atterberg Limits	
PL= NP	LL= 20	PI= NP
-	Coefficients	5 01104
D <sub>85</sub> = 0.2024	D <sub>60</sub> = 0.1379 D <sub>15</sub> = 0.0201	D <sub>50</sub> = 0.1194 D <sub>10</sub> = 0.0128
D <sub>85</sub> = 0.2024 D <sub>30</sub> = 0.0825 C <sub>u</sub> = 10.77	$C_{c}^{15} = 3.86$	210 0.0120
	Classification	•
USCS= SM	AASH	TO = A-2-4(0)
	Remarks	
Non Plastic		•
Spatula method u	used to determine LI	,

(no specification provided)

Sample No.: B-4 SS-3 Location: Boring B-4 Source of Sample: BORING 4

Date: 10/27/06 Elev./Depth: 33.9-35.4

MACTEC, Inc.

Client: N.C.D.O.T.

Project: Bridge NO.8 over Tranter's Creek on SR1403 and SR1567

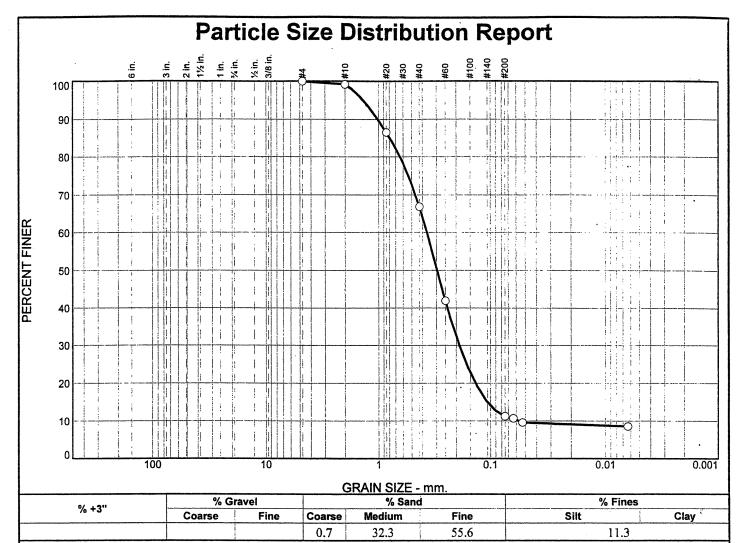
Raleigh, North Carolina

Project No: 6468061557

Figure

Tested By: JD

Checked By: AB



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4	99.9		
#10	99.2		
#20	86.6		
#40	66.9		
#60	41.9		
#200	11.3		
0.0637 mm.	10.7		
#270	9.6		
0.0063 mm.	8.5		

	Soil Description	•
Black tan silty sand		
PL= NP	Atterberg Limits LL= 20	PI= NP
D <sub>85</sub> = 0.788 D <sub>30</sub> = 0.186 C <sub>u</sub> = 6.42	Coefficients D60= 0.3638 D15= 0.1060 Cc= 1.69	D <sub>50</sub> = 0.2961 D <sub>10</sub> = 0.0567
USCS= S	Classification W-SM AASHT	TO= A-2-4(0)
Remarks		

Sample No.: SS-10 Location:

Tested By: LBJ

Source of Sample: Boring B-1

Date: 11/25/06 Elev./Depth: 4.5-6.0'

**Figure** 

MACTEC, Inc.

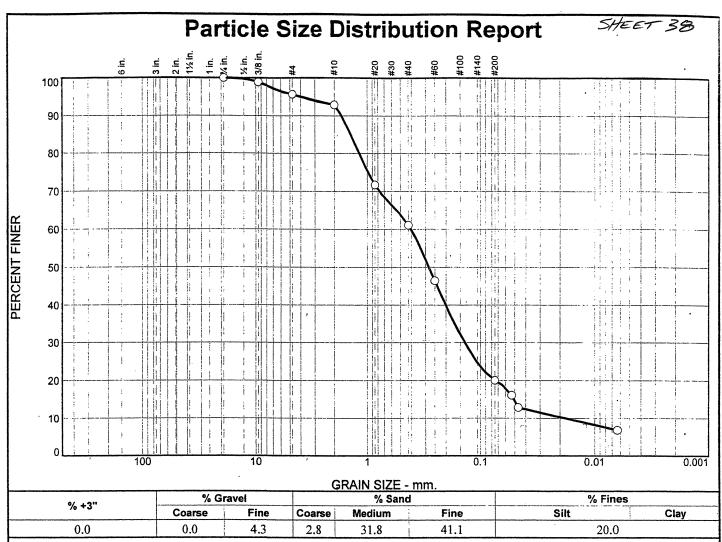
Client: NCDOT

**Project:** Bridge #8 over Tranter's Creek on SR1403 and SR1567

Raleigh, North Carolina

**Project No:** 6468061557.05

Checked By: ABS



		·		
	SIEVE	PERCENT	SPEC.*	PASS?
	SIZE	FINER	PERCENT	(X=NO)
	.75	100.0		
	.375	98.9		•
	#4	95.7		
	#10	92.9		
	#20	71.7		
	#40	61.1		
	#60	46.5		
	#200	20.0		
	#270	16.1		
	0.0467 mm.	12.9		
	0.0063 mm.	6.8		
l				
1				

Tan gray silty sar	Soil Description	
PL= NP	Atterberg Limits LL= 17	PI= NP
D <sub>85</sub> = 1.4106 D <sub>30</sub> = 0.1371 C <sub>u</sub> = 22.27	Coefficients D60= 0.4030 D15= 0.0506 C <sub>C</sub> = 2.58	D <sub>50</sub> = 0.2804 · D <sub>10</sub> = 0.0181
USCS= SM	Classification AASHT	O= A-2-4(0)
	<u>Remarks</u>	

(no specification provided)

Sample No.: SS-11 Location:

Source of Sample: Boring B-1

**Date:** 11/25/06 **Elev./Depth:** 9.5-11'

MACTEC, Inc.

Client: NCDOT

Project: Bridge #8 over Tranter's Creek on SR1403 and SR1567

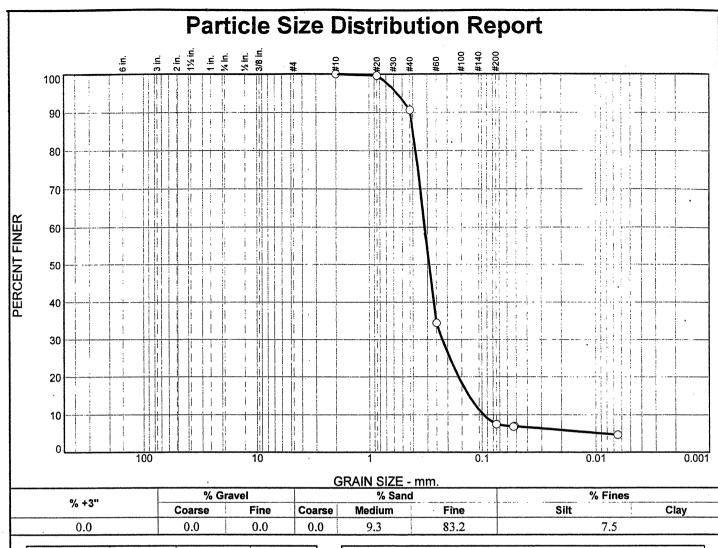
Raleigh, North Carolina

**Project No:** 6468061557.05

Figure

Tested By: LBJ

Checked By: ABS



PERCENT	SPEC.*	PASS?
FINER	PERCENT	(X=NO)
100.0		
99.6		
90.7		
34.5		
7.5		
6.8		
7.0		
4.7		
	100.0 99.6 90.7 34.5 7.5 6.8 7.0	100.0 99.6 90.7 34.5 7.5 6.8 7.0

Gray fine sand wi	Soil Description Gray fine sand with organics		
PL= NP	Atterberg Limits LL= 24	PI= NP	
D <sub>85</sub> = 0.3969 D <sub>30</sub> = 0.2213 C <sub>u</sub> = 3.25	Coefficients D60= 0.3152 D15= 0.1297 Cc= 1.60	D <sub>50</sub> = 0.2893 D <sub>10</sub> = 0.0969	
USCS= SP-SM	Classification AASHT	TO= A-3	
	<u>Remarks</u>		

Sample No.: SS-13 Location: **Source of Sample:** BORING B-3

**Date:** 11/25/06 **Elev./Depth:** 21.5-23

MACTEC, Inc.

Client: NCDOT

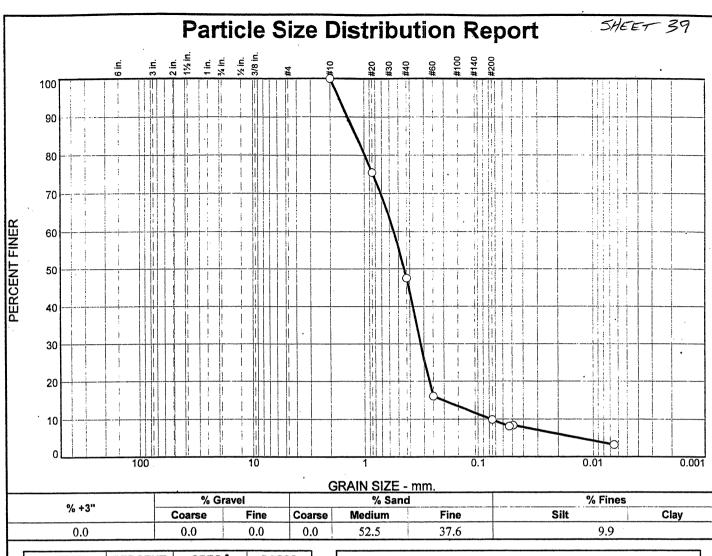
**Project:** Bridge #8 over Tranter's Creek on SR1403 and SR1567

Raleigh, North Carolina

**Project No:** 6468061557.05

Figure

Tested By: LBJ Checked By: ABS



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#10	100.0		
#20	75.5		
#40	47.5		
#60	16.1	•	
#200	9.9	**	
#270	8.1		
0.0492 mm.	8.4		
0.0065 mm.	3.2		

Gray sand	Soil Description	
PL= NP	Atterberg Limits LL= 22	PI= NP
D <sub>85</sub> = 1.1732 D <sub>30</sub> = 0.3215 C <sub>u</sub> = 7.14	Coefficients D60= 0.5465 D15= 0.2029 Cc= 2.47	D <sub>50</sub> = 0.4441 D <sub>10</sub> = 0.0766
USCS= SW-SM	Classification AASH	ΓO= A-1-b
Remarks Specific gravity is assumed.		
		Α

(no specification provided)

Sample No.: SS-14 Location: **Source of Sample:** BORING B-5

**Date:** 11/25/06 **Elev./Depth:** 0-1.5'

MACTEC, Inc.

Client: NCDOT

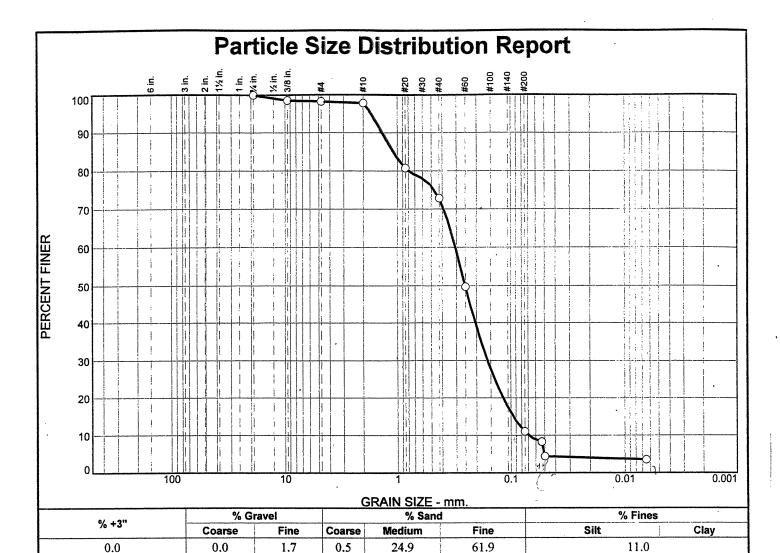
Project: Bridge #8 over Tranter's Creek on SR1403 and SR1567

Raleigh, North Carolina

**Project No:** 6468061557.05

Figure

Tested By: LBJ Checked By: ABS



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
.75	100.0		
.375	98.6		
#4	98.3		
#10	97.8		
#20	80.8		
#40	72.9		
#60	49.8		
#200	11.0		
#270	8.3		
0.0499 mm.	4.4		
0.0065 mm.	3.5		

GRAY SAND	Soil Description	
PL= NP	Atterberg Limits LL= 27	PI= NP
D <sub>85</sub> = 1.0819 D <sub>30</sub> = 0.1597 C <sub>u</sub> = 4.44	Coefficients D <sub>60</sub> = 0.3060 D <sub>15</sub> = 0.0949 C <sub>c</sub> = 1.21	D <sub>50</sub> = 0.2512 D <sub>10</sub> = 0.0689
USCS= SP-SM	Classification AASHT	O= A-2-4(0)
Remarks SPECIFIC GRAVITY IS ASSUMED.		

Sample No.: S-1 Location:

Source of Sample: CHANNEL BANK

**Date:** 11/27/06 **Elev./Depth:** 0-.5'

MACTEC, Inc.

Client: NCDOT

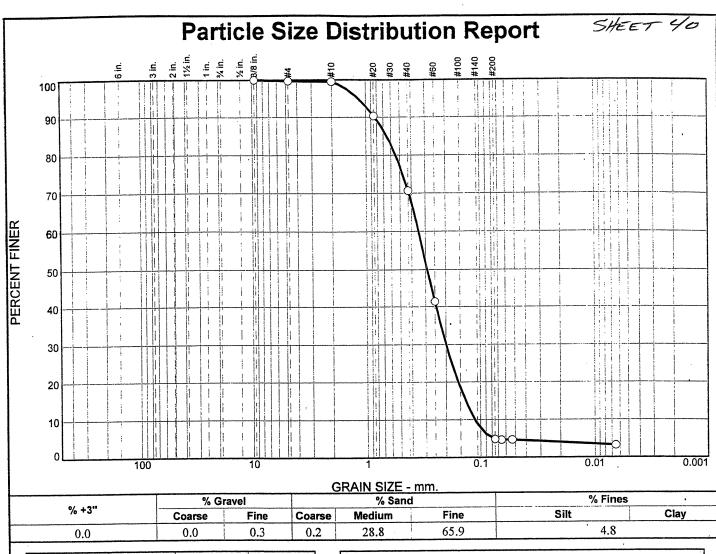
**Project:** Bridge #8 over Tranter's Creek on SR1403 and SR1567

Raleigh, North Carolina

**Project No:** 6468061557.05

Figure

Tested By: LBJ Checked By: ABS



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
.375	100.0		
#4	99.7		
#10	99.5		
#20	90.4		
#40	70.7		
#60	41.4		
#200	4.8		
0.0655 mm.	4.6		
<b>#270</b> ,	4.7		
0.0065 mm.	3.3		

	Soil Description	
BROWN GRAY S	SAND	
PL= NP	Atterberg Limits LL= 25	PI= NP
D <sub>85</sub> = 0.6498 D <sub>30</sub> = 0.1995 C <sub>u</sub> = 3.10	Coefficients D <sub>60</sub> = 0.3459 D <sub>15</sub> = 0.1351 C <sub>c</sub> = 1.03	D <sub>50</sub> = 0.2908 D <sub>10</sub> = 0.1117
USCS= SP	Classification AASHT	O= A-3 .
SPECIFIC GRAV	Remarks VITY IS ASSUMED.	

MACTEC, Inc.

(no specification provided)

Client: NCDOT

Source of Sample: CHANNEL BED

**Project:** Bridge #8 over Tranter's Creek on SR1403 and SR1567

Raleigh, North Carolina

**Project No:** 6468061557.05

Figure

Elev./Depth: 0-.5

Date: 11/27/06

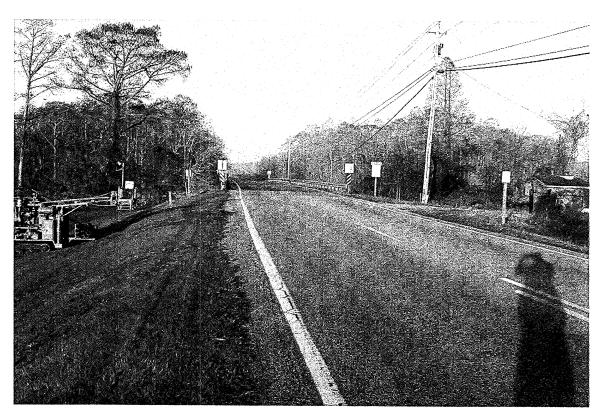
Tested By: LBJ

Sample No.: S-2

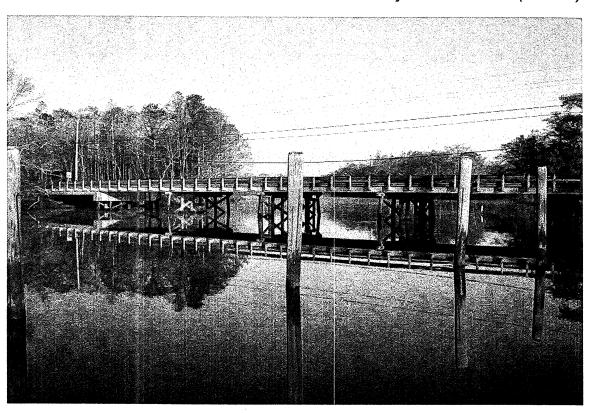
Checked By: ABS



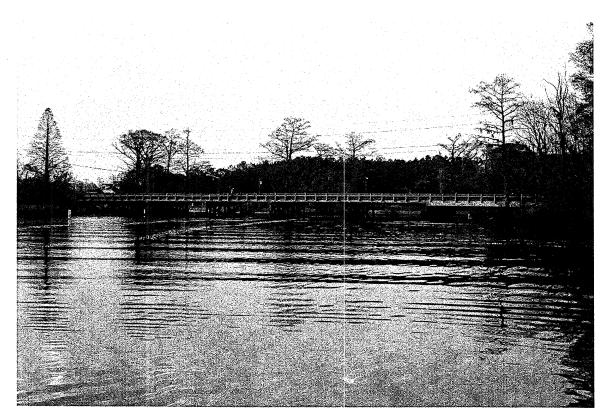
View looking east along approach to EB1



View looking west along approach to EB2



View looking north upstream



View looking south downstream

Site Photos MACTEC Proj. No. 6468-06-1557

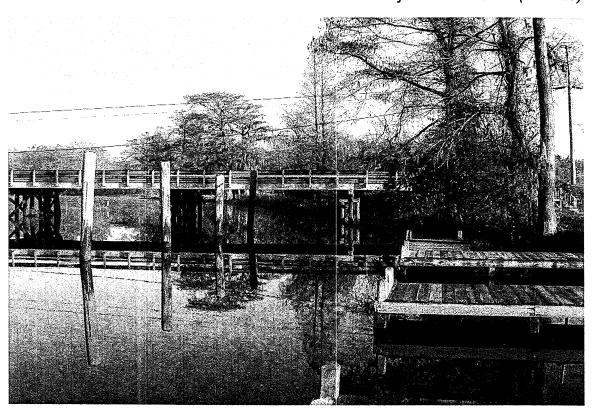


View looking south; drill rig at Bent 1

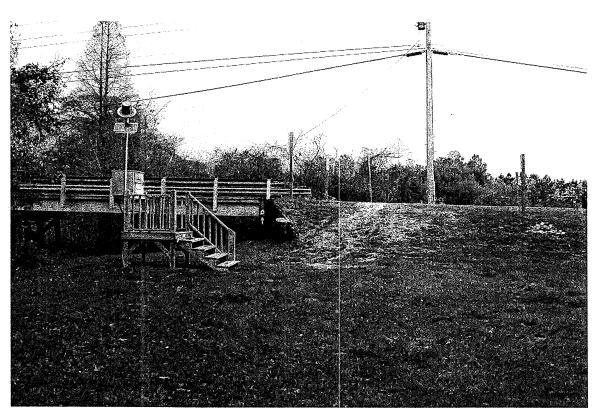


View looking north; drill rig at Bent 3

### SHEET 42 Bridge No. 8 over Tranter's Creek on SR 11403 and SR 1567 NCDOT Proj. No. 33387.1.1 (B-4020)



View looking north along Bents 7 and 8



View looking north along End Bent 2



View looking down-station from Bent 6 along north side of bridge



View looking down-station from Bent 6 along south side of bridge



View looking up-station from Bent 6 along north side of bridge



View looking up-station from Bent 6 along south side of bridge