

PROJECT: 33387.1.1 ID: B-4020

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33387.1.1	1	43
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
B-4020	BRZ-1403(4)	P.E.	
		CONST.	

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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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DRAWN BY: R.RAHIE

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SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:
VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION
GENERAL CLASS., GRANULAR MATERIALS (<= 35% PASSING #200), SILT-CLAY MATERIALS (> 35% PASSING #200), ORGANIC MATERIALS.
GROUP CLASS., A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7.
SYMBOL, % PASSING # 10, # 40, # 200, LIQUID LIMIT, PLASTIC INDEX, GROUP INDEX, USUAL TYPES OF MAJOR MATERIALS, GEN. RATING AS A SUBGRADE.

GRADATION
WELL GRADED: INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE **UNIFORM:** INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED: INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.
ANGULARITY OF GRAINS
THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

ROCK DESCRIPTION
HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:
WEATHERED ROCK (WR), CRYSTALLINE ROCK (CR), NON-CRYSTALLINE ROCK (NCR), COASTAL PLAIN SEDIMENTARY ROCK (CP).

TERMS AND DEFINITIONS
ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.
AQUIFER - A WATER BEARING FORMATION OR STRATA.
ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
JOINT - A FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN ROCKS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.
STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

MINERALOGICAL COMPOSITION
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIONIBILITY
SLIGHTLY COMPRESSIBLE (LIQUID LIMIT LESS THAN 30)
MODERATELY COMPRESSIBLE (LIQUID LIMIT 31-50)
HIGHLY COMPRESSIBLE (LIQUID LIMIT GREATER THAN 50)

PERCENTAGE OF MATERIAL
ORGANIC MATERIAL, GRANULAR SOILS, SILT-CLAY SOILS, OTHER MATERIAL. TRACE OF ORGANIC MATTER, LITTLE ORGANIC MATTER, MODERATELY ORGANIC, HIGHLY ORGANIC.

GROUND WATER
WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
STATIC WATER LEVEL AFTER 24 HOURS.
PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA.
SPRING OR SEEPAGE.

MISCELLANEOUS SYMBOLS
ROADWAY EMBANKMENT WITH SOIL DESCRIPTION, SOIL SYMBOL, ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS, INFERRED SOIL BOUNDARIES, INFERRED ROCK LINE, ALLUVIAL SOIL BOUNDARY, DIP/DIP DIRECTION OF ROCK STRUCTURES, SOUNDING ROD, SPT, CPT, DMT, TEST BORING, AUGER BORING, BULK SAMPLE LOCATION, CORE BORING, MONITORING WELL, PIEZOMETER INSTALLATION, SLOPE INDICATOR INSTALLATION, SPT N-VALUE, SPT REFUSAL, ASPHALT, SAMPLE DESIGNATIONS, BULK SAMPLE, S-SPLIT SPOON SAMPLE, ST-SHELBY TUBE SAMPLE, RS-ROCK SAMPLE, RT-RECOMPACTED TRIAXIAL SAMPLE, CBR-CBR SAMPLE.

ABBREVIATIONS
AR - AUGER REFUSAL, BT - BORING TERMINATED, C.I. - CAVE IN, CL - CLAY, CPT - CONE PENETRATION TEST, CSE - COARSE DMT - DILATOMETER TEST, DPT - DYNAMIC PENETRATION TEST, e - VOID RATIO, F - FINE, FIAD - FILLED IMMEDIATELY AFTER DRILLING, FOSS. - FOSSILIFEROUS, FRAC. - FRACTURED, FRAGS. - FRAGMENTS, MED. - MEDIUM, PMT - PRESSUREMETER TEST, SD. - SAND, SANDY, SL. - SILT, SILTY, SLI. - SLIGHTLY, TCR - TRICONE REFUSAL, % - UNIT WEIGHT, % - DRY UNIT WEIGHT, V. - VERY, VST - VANE SHEAR TEST, W - MOISTURE CONTENT.

EQUIPMENT USED ON SUBJECT PROJECT
DRILL UNITS: MOBILE B-, BK-51, CME-45 LC, CME-45 C, PORTABLE HOIST, OTHER D-50 ATV, OTHER.
ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG.-CARBIDE INSERTS, CASING W/ ADVANCER, TRICONE 3" STEEL TEETH, TRICONE " TUNG.-CARB., CORE BIT, OTHER.
HAMMER TYPE: AUTOMATIC, MANUAL.
CORE SIZE: B, N, H, Q.
HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST, OTHER.

ROCK HARDNESS
VERY HARD, HARD, MODERATELY HARD, MEDIUM HARD, SOFT, VERY SOFT. CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.

FRACTURE SPACING
TERM, SPACING: VERY WIDE, WIDE, MODERATELY CLOSE, CLOSE, VERY CLOSE.

BEDDING
TERM, THICKNESS: VERY THICKLY BEDDED (> 4 FEET), THICKLY BEDDED (1.5 - 4 FEET), THINLY BEDDED (0.16 - 1.5 FEET), VERY THINLY BEDDED (0.03 - 0.16 FEET), THICKLY LAMINATED (0.008 - 0.03 FEET), THINLY LAMINATED (< 0.008 FEET).

INDURATION
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.
FRIABLE, MODERATELY INDURATED, INDURATED, EXTREMELY INDURATED. RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

CONSISTENCY OR DENSENESS
PRIMARY SOIL TYPE, COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE), RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²).

TEXTURE OR GRAIN SIZE
U.S. STD. SIEVE SIZE, OPENING (MM), BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE, SD.), FINE SAND (F. SD.), SILT (SL.), CLAY (CL.), GRAIN SIZE MM, IN.

SOIL MOISTURE - CORRELATION OF TERMS
SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION.

PLASTICITY
NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY. PLASTICITY INDEX (PI), DRY STRENGTH.

COLOR
DESCRIPTORS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL.-BRN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

NOTES:
Geotechnical Exploration Performed By:
MACTEC ENGINEERING AND CONSULTING, INC. 3301 ATLANTIC AVENUE RALEIGH, NORTH CAROLINA 27604 (919) 876-0416

Subject: Geotechnical Report

Description: Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567
Project Number: 33387.1.1
Tip Number: B-4020
F.A. Number: 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 through 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

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).

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± 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 sea-levels, 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.

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

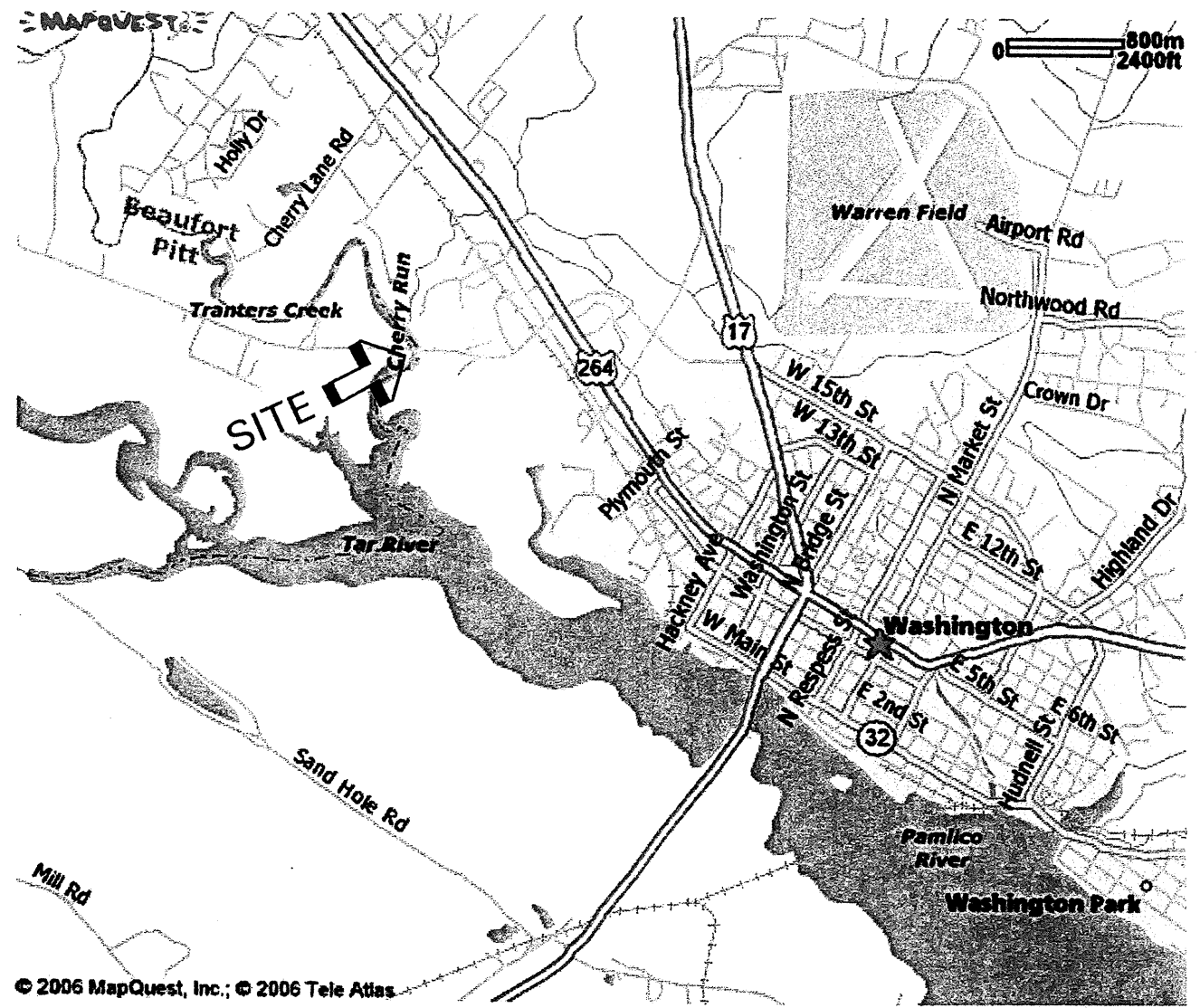
Castle Hayne Formation upper rock layer consists of white and gray, friable, thickly to very thickly bedded, shell-hash limestone. The top of the limestone was encountered from End Bent 1 to Bent 7 at elevation -25± feet msl. The layer varies in thickness from 2 to 8± feet.

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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REFERENCE: 2006 MAPQUEST

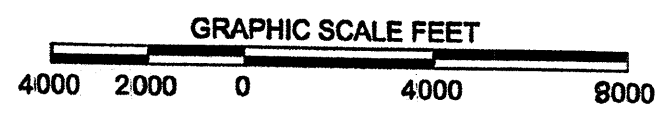


QUADRANGLE LOCATION

NOTE: SITE LOCATION IS APPROXIMATE

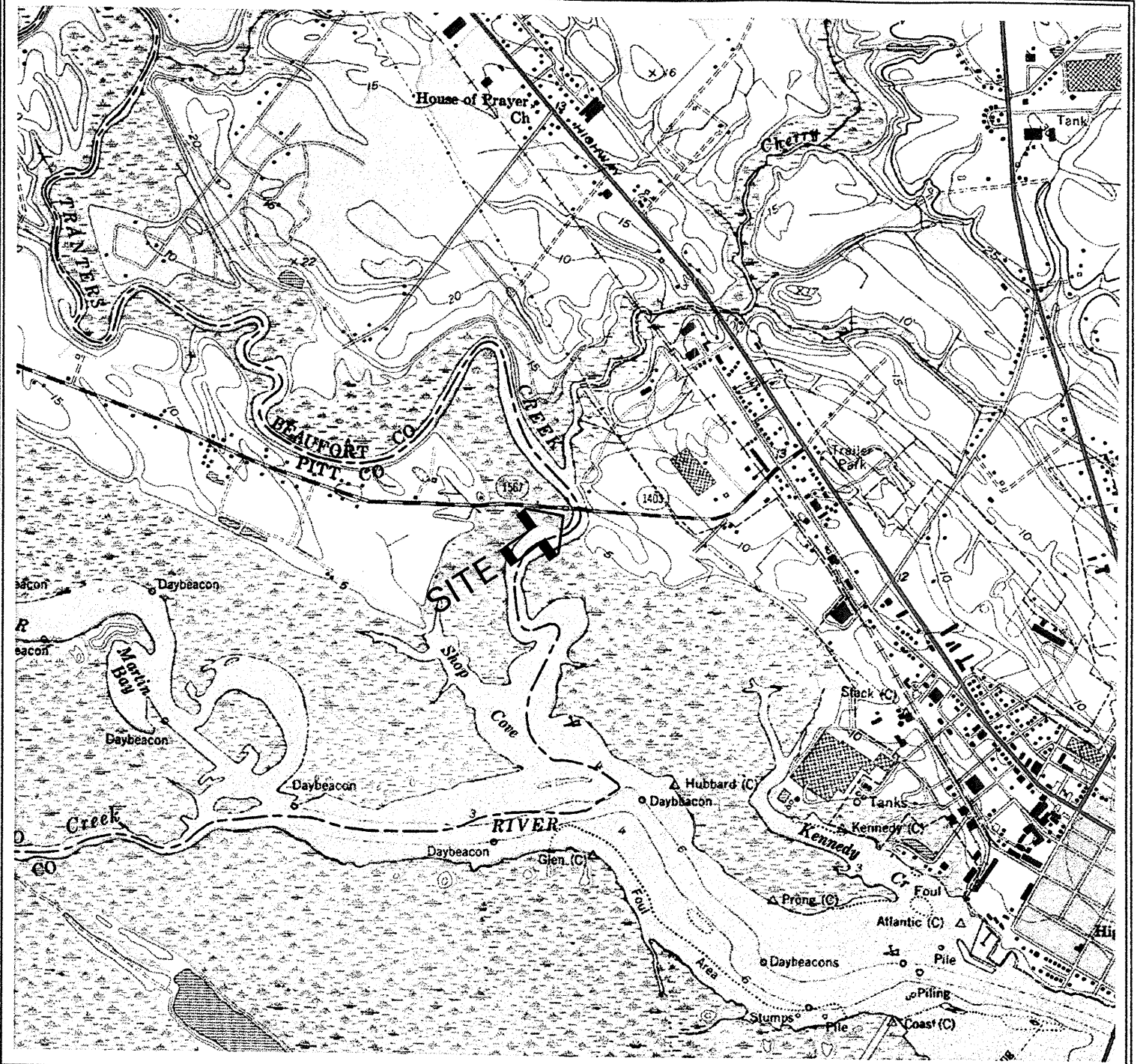


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RALEIGH, NORTH CAROLINA

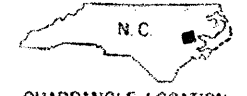


SITE LOCATION MAP
BRIDGE NO. 8 OVER TRANTER'S CREEK
ON SR 1403 AND SR 1567
BEAUFORT / PITT COUNTY, NORTH CAROLINA

DRAWN: R.R.	DATE: DECEMBER 2006	DRAWING
ENG CHECK: <i>wfd</i>	SCALE: 1 : 48000	1
APPROVAL: <i>[Signature]</i>	JOB: 6468-06-1557	



WASHINGTON, N.C.
SE/4 CHOCOWINITY 15' QUADRANGLE



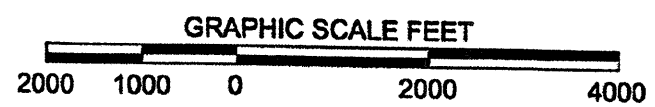
QUADRANGLE LOCATION

1951
PHOTOREVISED 1983
DMA 5555 II SE - SERIES V842
CONTOUR INTERVALS 5 FEET

NOTE: SITE LOCATION IS APPROXIMATE

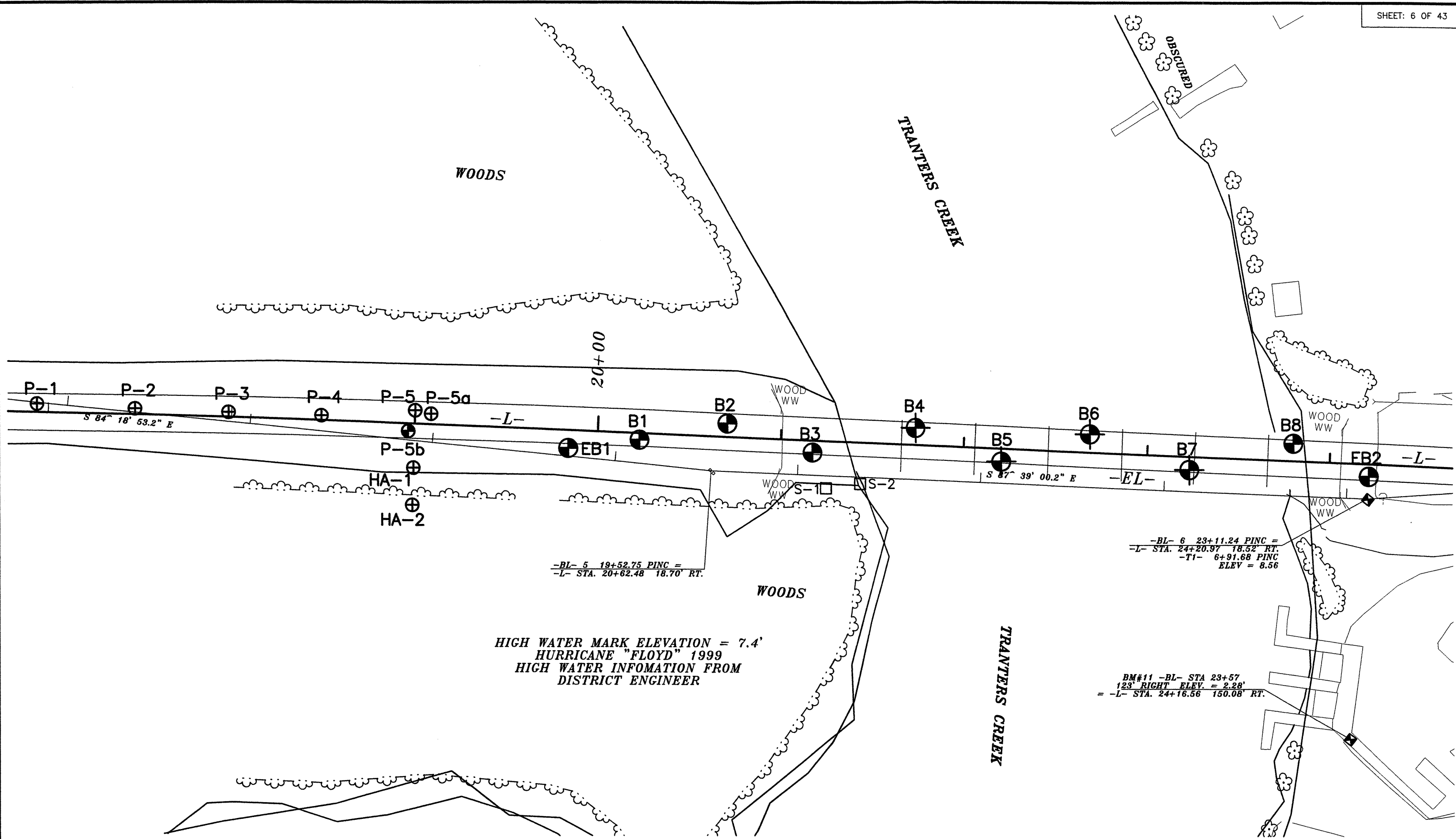


MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

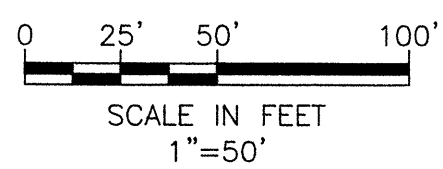


TOPOGRAPHIC SITE MAP
BRIDGE NO. 8 OVER TRANTER'S CREEK
ON SR 1403 AND SR 1567
BEAUFORT / PITT COUNTY, NORTH CAROLINA

DRAWN: R. R.	DATE: DECEMBER 2006	DRAWING
ENG CHECK: <i>wfd</i>	SCALE: 1 : 24000	2
APPROVAL: <i>[Signature]</i>	JOB: 6468-06-1557	

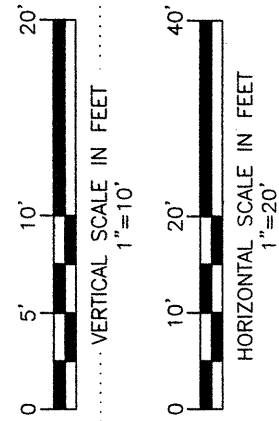
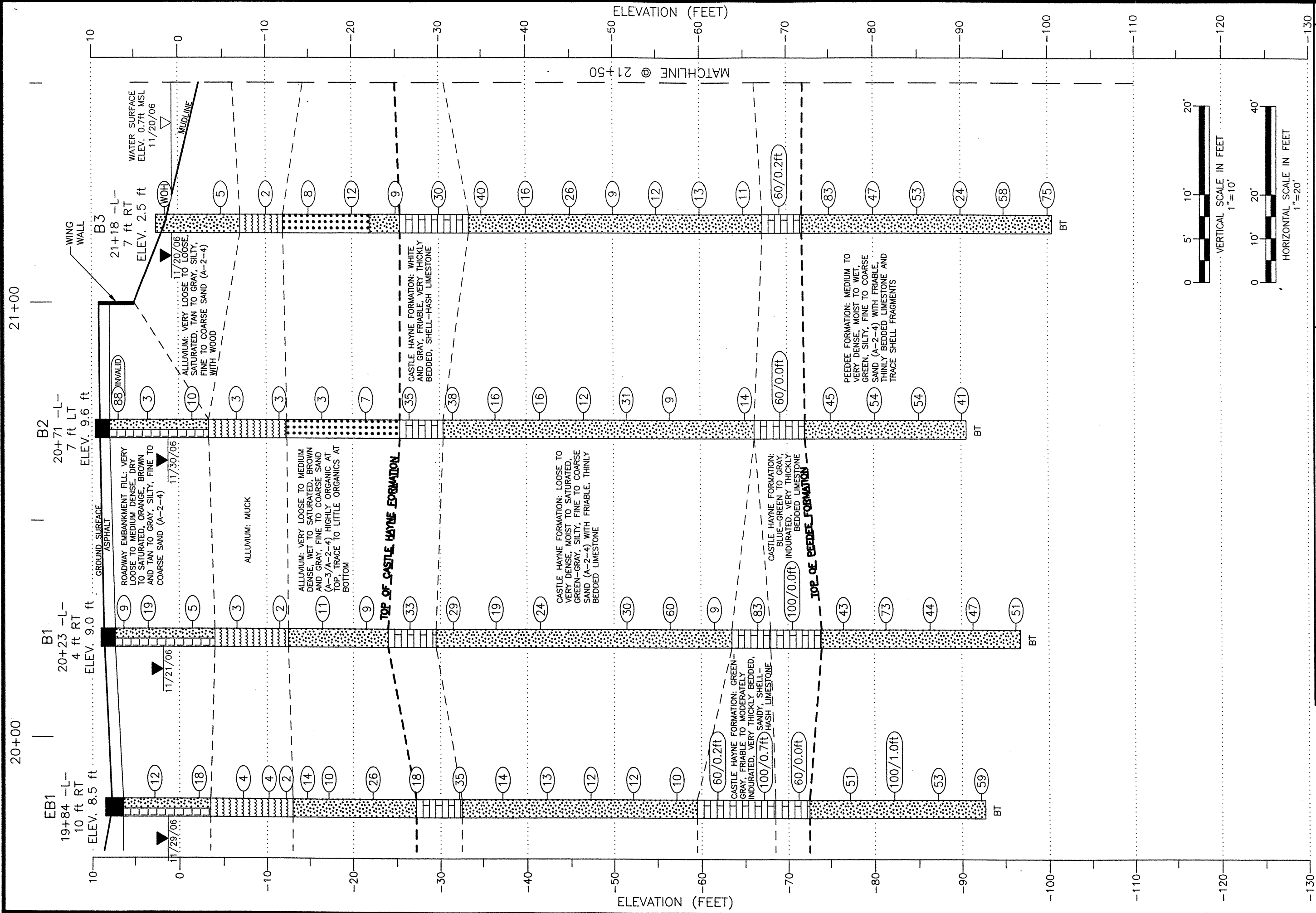


HIGH WATER MARK ELEVATION = 7.4'
 HURRICANE "FLOYD" 1999
 HIGH WATER INFORMATION FROM
 DISTRICT ENGINEER



BORING LOCATION PLAN
 BRIDGE NO. 8 OVER TRANTER'S CREEK ON SR 1403
 AND SR 1567
 NCDOT PROJECT NO. 33387.1.1 (B-4020)
 F.A. No. BRZ-1403(4)
 BEAUFORT/PITT COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC. RALEIGH, NORTH CAROLINA			
REVISIONS	DRAWN:	R.R.	DATE: 12/21/06
09/19/03	DFT CHECK:	W.B.D.	JOB: 6468-06-1557
	ENG CHECK:	S.J.C.	DWG: 3



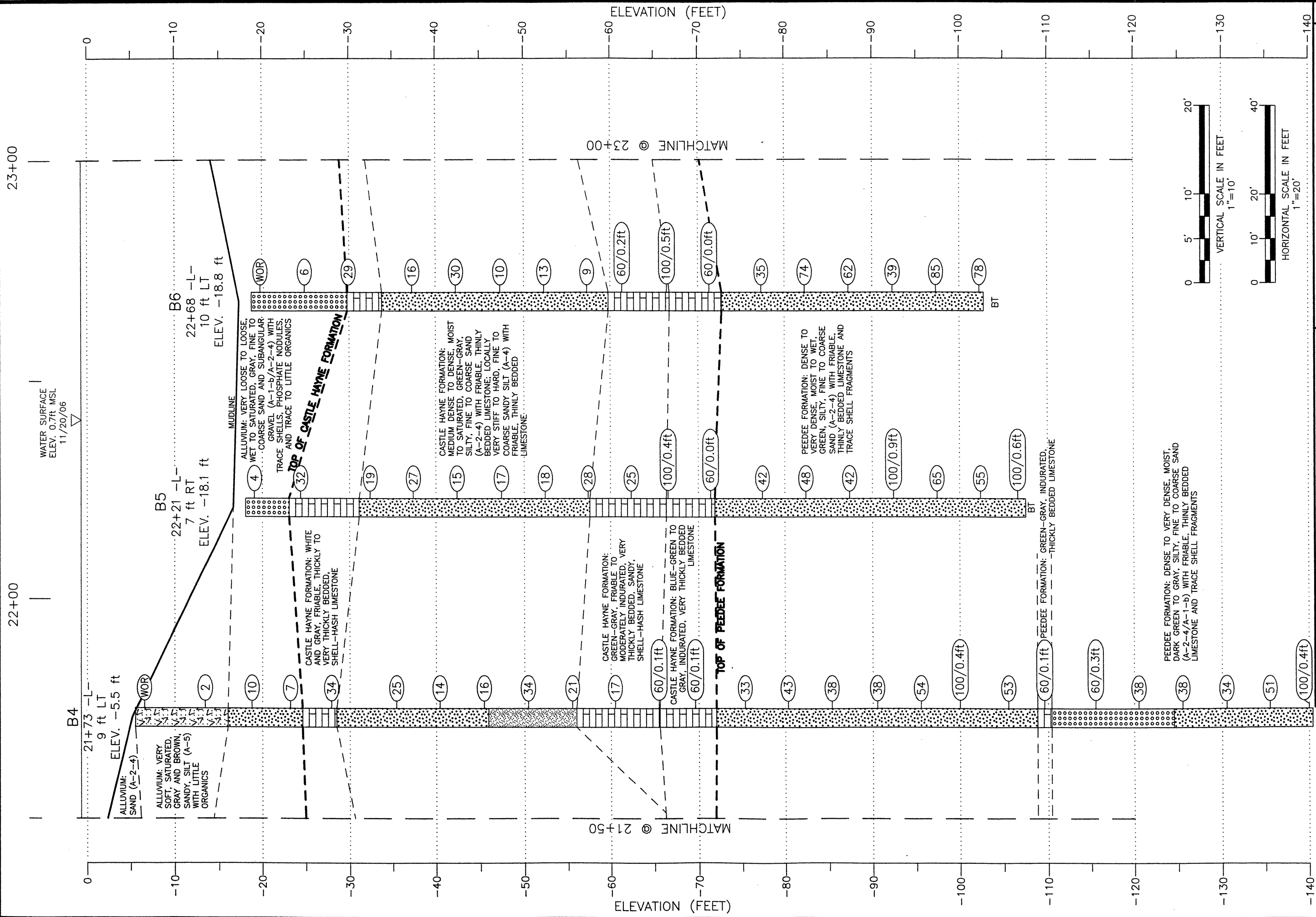
PROFILE ≈ 13 FT LEFT OF -L- BRIDGE NO. 8 OVER TRANTER'S CREEK ON SR 1403 AND SR 1567

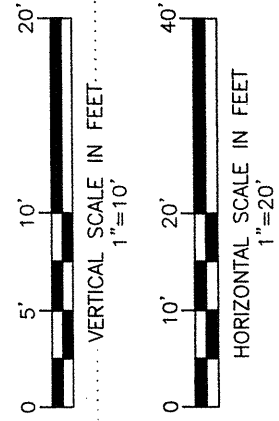
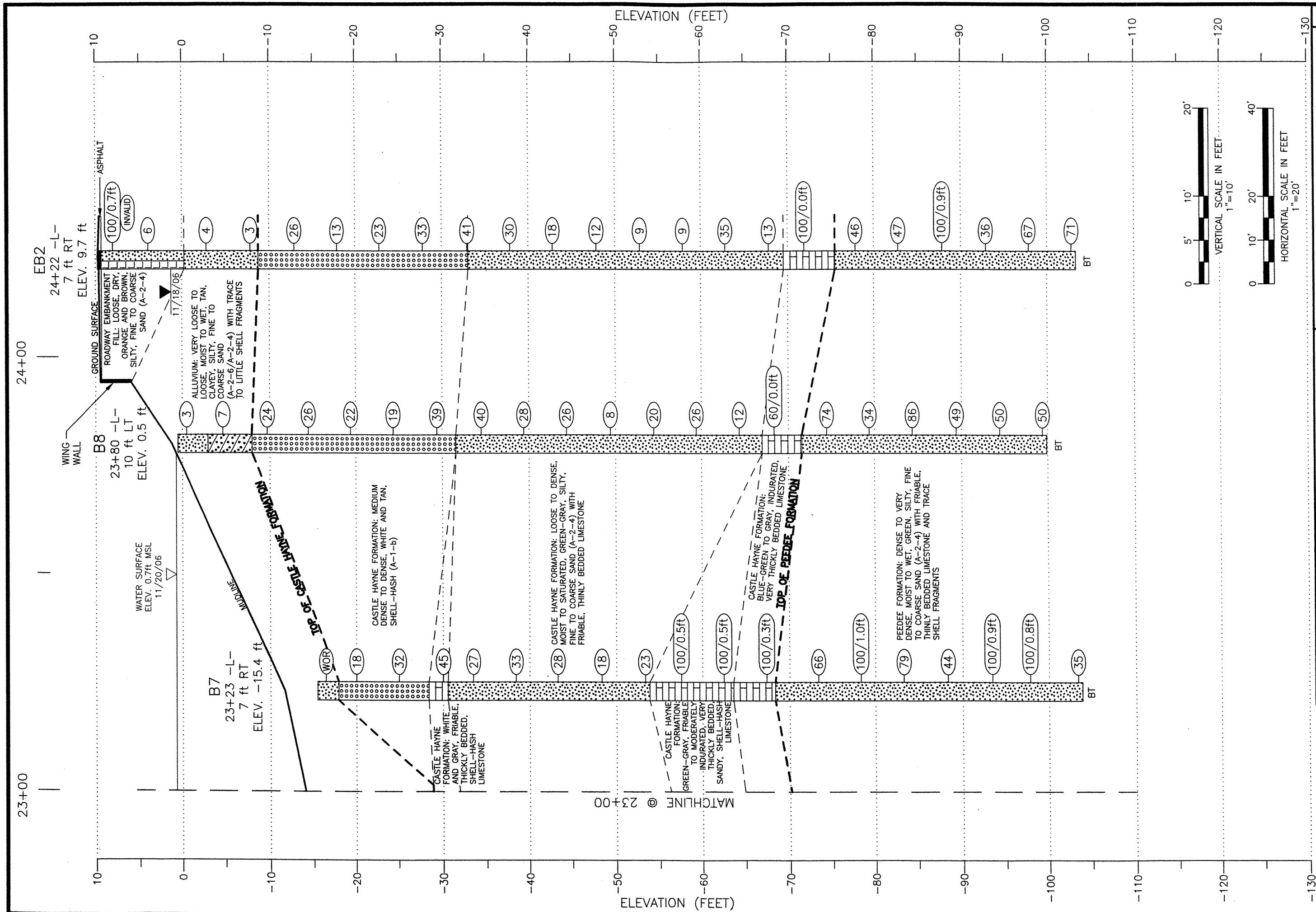
NCDOT PROJECT NO. 33387.1.1 (B-4020)
F.A. No. BRZ-1403(4)
BEAUFORT/PITT COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 12/21/06
	DFT CHECK: W.B.D.	JOB: 6468-06-1557
	ENG CHECK: S.J.C.	DWG: 4

SHEET: 7 OF 43





PROFILE #13 FT LEFT OF -L- BRIDGE NO. 8 OVER TRANTER'S CREEK ON SR 1403 AND SR 1567

NCDOT PROJECT NO. 33387.1.1 (B-4020)
F.A. No. BRZ-1403(4)
BEAUFORT/PITT COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 12/21/06
	DFT CHECK: W.B.D.	JOB: 6468-06-1557
	ENG CHECK: S.J.C.	DWG: 6

SHEET: 9 OF 43

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard							
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)						
BORING NO. P1		BORING LOCATION 16+94		OFFSET 4 ft LT	ALIGNMENT -L-		0 HR. FIAD						
COLLAR ELEV. 5.7 ft		NORTHING 665,353 US ft		EASTING 2,568,442 US ft		24 HR.							
TOTAL DEPTH 3.0 ft		DRILL MACHINE D-50		DRILL METHOD Hollow-stem Auger		HAMMER TYPE N/A							
DATE STARTED 11/9/06		COMPLETED 11/9/06		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
5.7													Ground Surface
													5.7 Roadway Embankment Fill: Asphalt
													3.4 Roadway Embankment Fill: Sand and gravel Crush & Run
													2.7 Roadway Embankment Fill: Black and tan, silty SAND (A-2-4)
													Boring terminated at 3.0 ft (Elev. 2.7 ft) in Roadway Embankment Fill: Silty SAND (A-2-4)
													Bit used: Hollow-stem Auger Bit

NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/22/06

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard							
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)						
BORING NO. P2		BORING LOCATION 17+47		OFFSET 3 ft LT	ALIGNMENT -L-		0 HR. FIAD						
COLLAR ELEV. 6.2 ft		NORTHING 665,350 US ft		EASTING 2,568,495 US ft		24 HR.							
TOTAL DEPTH 2.0 ft		DRILL MACHINE D-50		DRILL METHOD Hollow-stem Auger		HAMMER TYPE N/A							
DATE STARTED 11/9/06		COMPLETED 11/9/06		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
6.2													Ground Surface
													6.2 Roadway Embankment Fill: Asphalt
													4.6 Roadway Embankment Fill: Black and tan, silty SAND (A-2-4)
													Boring terminated at 2.0 ft (Elev. 4.2 ft) in Roadway Embankment Fill: Silty SAND (A-2-4)
													Bit used: Hollow-stem Auger Bit

NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/22/06



MACTEC

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

SHEET 1 OF 1

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard							
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)						
BORING NO. P3		BORING LOCATION 17+98		OFFSET 3 ft LT	ALIGNMENT -L-		0 HR. FIAD						
COLLAR ELEV. 6.7 ft		NORTHING 665,348		US ft	EASTING 2,568,547		US ft						
TOTAL DEPTH 4.0 ft		DRILL MACHINE D-50		DRILL METHOD Hollow-stem Auger		HAMMER TYPE N/A							
DATE STARTED 11/9/06		COMPLETED 11/9/06		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
6.7													Ground Surface
													Roadway Embankment Fill: Asphalt
													Roadway Embankment Fill: Black and tan, silty SAND (A-2-4) Boring terminated at 4.0 ft (Elev. 2.7 ft) in Roadway Embankment Fill: Silty SAND (A-2-4) Bit used: Hollow-stem Auger Bit

NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/22/06



MACTEC

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

SHEET 11
SHEET 1 OF 1

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard							
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)						
BORING NO. P4		BORING LOCATION 18+49		OFFSET 2 ft LT	ALIGNMENT -L-		0 HR. FIAD						
COLLAR ELEV. 7.0 ft		NORTHING 665,347		US ft	EASTING 2,568,597		US ft						
TOTAL DEPTH 3.5 ft		DRILL MACHINE D-50		DRILL METHOD Hollow-stem Auger		HAMMER TYPE N/A							
DATE STARTED 11/9/06		COMPLETED 11/9/06		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
7.0													Ground Surface
													Roadway Embankment Fill: Asphalt
													Roadway Embankment Fill: Black and tan, silty SAND (A-2-4) Boring terminated at 3.5 ft (Elev. 3.5 ft) in Roadway Embankment Fill: Silty SAND (A-2-4) Bit used: Hollow-stem Auger Bit

NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/22/06

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 NO. P5b		BORING LOCATION 18+97		OFFSET 4 ft RT	ALIGNMENT -L-		0 HR. 8.0						
COLLAR ELEV. 7.5 ft		NORTHING 665,338		US ft	EASTING 2,568,644		US ft 24 HR. FIAD						
TOTAL DEPTH 14.5 ft		DRILL MACHINE D-50		DRILL METHOD Hollow-stem Auger		HAMMER TYPE 140 lb. Manual							
DATE STARTED 11/28/06		COMPLETED 11/28/06		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
7.5													Ground Surface
4.5	3.0	5	5	60/0.3'									Roadway Embankment Fill: Asphalt
-0.5	8.0	5	4	4									Roadway Embankment Fill: Tan to gray, silty, fine SAND (A-2-4)
-3.2	10.7	2	2	2									3.0ft: Blow counts invalid due to asphalt fragments
-5.5	13.0	2	2	3									Alluvium: Muck
													Boring terminated at 14.5 ft (Elev. -7.0 ft) in Alluvium: Muck
													Bit used: Hollow-stem Auger Bit

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/22/06

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard							
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)						
BORING NO. P5		BORING LOCATION 19+00		OFFSET 7 ft LT	ALIGNMENT -L-		0 HR. FIAD						
COLLAR ELEV. 7.6 ft		NORTHING 665,350		US ft	EASTING 2,568,648		US ft 24 HR. FIAD						
TOTAL DEPTH 21.3 ft		DRILL MACHINE D-50		DRILL METHOD Hollow-stem Auger		HAMMER TYPE N/A							
DATE STARTED 11/9/06		COMPLETED 11/9/06		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
7.6													Ground Surface
													Roadway Embankment Fill: Asphalt
													Roadway Embankment Fill: Black and tan, silty SAND (A-2-4)
													Alluvium: Muck
													ST-1: Shelby tube pushed from 17.6 - 18.9 ft
													Alluvium: Grey, silty SAND (A-2-4)
													Boring terminated at 21.3 ft (Elev. -13.7 ft) in Alluvium: Silty SAND (A-2-4)
													Bit used: Hollow-stem Auger Bit

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/22/06

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 NO. HA-1		BORING LOCATION 19+00		OFFSET 24 ft RT		ALIGNMENT -L-		0 HR. ND					
COLLAR ELEV. 2.5 ft		NORTHING 665,318 US ft		EASTING 2,568,647 US ft				24 HR. ND					
TOTAL DEPTH 7.0 ft		DRILL MACHINE NA		DRILL METHOD Hand Auger		HAMMER TYPE NA							
DATE STARTED 11/30/06		COMPLETED 11/30/06		SURFACE WATER DEPTH NA									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
2.5													Ground Surface
													2.5 Roadway Embankment Fill: Brown, moist to wet, silty, fine to coarse SAND (A-2-4)
													-2.5 Roadway Embankment Fill: Gray, wet, silty, fine to coarse SAND (A-2-4)
													-3.5 Alluvium: MUCK/PEAT
													-4.5 Hand auger terminated at 7.0 ft in Alluvium: MUCK/PEAT
													Elevation of hand auger is approximate.

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC_DOT.GDT 1/8/07

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 NO. HA-2		BORING LOCATION 19+00		OFFSET 44 ft RT		ALIGNMENT -L-		0 HR. ND					
COLLAR ELEV. 1.0 ft		NORTHING 665,298 US ft		EASTING 2,568,647 US ft				24 HR. ND					
TOTAL DEPTH 10.0 ft		DRILL MACHINE NA		DRILL METHOD Hand Auger		HAMMER TYPE NA							
DATE STARTED 11/30/06		COMPLETED 11/30/06		SURFACE WATER DEPTH NA									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
1.0													Ground Surface
													1.0 Alluvium: MUCK/PEAT
													-9.0 Hand auger terminated at 10.0 ft in Alluvium: MUCK/PEAT
													Elevation of hand auger is approximate.

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC_DOT.GDT 12/22/06



MACTEC

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard							
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)						
BORING NO. P5a		BORING LOCATION 19+09		OFFSET 6 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 7.7 ft		NORTHING 665,348		EASTING 2,568,657		US ft							
TOTAL DEPTH 19.3 ft		DRILL MACHINE D-50		DRILL METHOD Hollow-stem Auger		HAMMER TYPE 140 lb. Manual							
DATE STARTED 11/9/06		COMPLETED 11/9/06		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
7.7													Ground Surface
													7.7 Roadway Embankment Fill: Asphalt 0.0
													5.2 Roadway Embankment Fill: Black and tan, silty SAND (A-2-4) 2.5
													-6.0 Alluvium: Muck 13.7
-8.8	16.5												16.5ft: Blow counts invalid due to wood
-10.6	18.3	13	5	5									ST-2: Shelby tube pushed from 18.3 - 19.3 ft 19.3 Boring terminated at 19.3 ft (Elev. -11.6 ft) on Alluvium: Silty SAND (A-2-4) Bit used: Hollow-stem Auger Bit

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/22/06



MACTEC

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard								
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)							
BORING NO. B1		BORING LOCATION 20+23		OFFSET 4 ft RT	ALIGNMENT -L-		0 HR. 8.2							
COLLAR ELEV. 9.0 ft		NORTHING 665,334 US ft		EASTING 2,568,771 US ft		24 HR. 7.2								
TOTAL DEPTH 105.8 ft		DRILL MACHINE D-50		DRILL METHOD Mud Rotary		HAMMER TYPE 140 lb. Manual								
DATE STARTED 11/17/06		COMPLETED 11/20/06		SURFACE WATER DEPTH N/A										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
9.0					Ground Surface							9.0		0.0
7.3	1.7										M		Roadway Embankment Fill: Asphalt	1.7
4.5	4.5	7	4	5							M		Roadway Embankment Fill: Brown and tan to gray, silty, fine to coarse SAND (A-2-4)	
		36	9	10							SS-10			
-0.5	9.5	3	2	3							SS-11	Sat.		
-5.5	14.5	2	1	2								Sat.	Alluvium: Muck	-4.0
-10.5	19.5	0	1	1								Sat.		
-15.5	24.5	3	5	6								Sat.	Alluvium: Gray, silty, fine SAND (A-2-4) with wood	-12.5
-20.5	29.5	3	4	5								Sat.		
-25.5	34.5	13	14	19								Sat.	Castle Hayne Formation: White and gray, friable, very thickly bedded, shell-hash LIMESTONE	-24.0
-30.5	39.5	17	11	18								Sat.	Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone	-29.5
-35.5	44.5	11	6	13								Sat.		
-40.5	49.5	6	11	13							SS-12	Sat.		
-50.5	59.5	6	18	12								Sat.		
-55.5	64.5	4	28	32								Sat.		
-60.5	69.5	2	4	5								Sat.		
-65.5	74.5											Sat.		
													54.5 ft: SPT not performed. Inadvertently overdrilled.	
														-63.5
														72.5

NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/17/06



MACTEC

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard								
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)							
BORING NO. B1		BORING LOCATION 20+23		OFFSET 4 ft RT	ALIGNMENT -L-		0 HR. 8.2							
COLLAR ELEV. 9.0 ft		NORTHING 665,334 US ft		EASTING 2,568,771 US ft		24 HR. 7.2								
TOTAL DEPTH 105.8 ft		DRILL MACHINE D-50		DRILL METHOD Mud Rotary		HAMMER TYPE 140 lb. Manual								
DATE STARTED 11/17/06		COMPLETED 11/20/06		SURFACE WATER DEPTH N/A										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
-65.8					Continued from previous page									
		9	8	75										
-70.5	79.5												Castle Hayne Formation: Green-Gray, friable to moderately indurated, very thickly bedded, sandy, shell-hash LIMESTONE (continued)	-68.0
													Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded LIMESTONE	77.0
-75.5	84.5													-74.0
		13	17	26									Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments	83.0
-80.3	89.3	19	29	44										
-85.3	94.3	16	18	26										
-90.3	99.3	10	20	27										
-95.3	104.3	15	20	31										
													Boring terminated at 105.8 ft (Elev. -96.8 ft) in Peedee Formation: Very dense, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments	-96.8
													Bit used: 3" roller cone	
													Drilling fluid: N/D	
														105.8

NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/17/06

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard/B. Deobald							
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)						
BORING NO. B2		BORING LOCATION 20+71		OFFSET 7 ft LT		ALIGNMENT -L-		0 HR. 4.8					
COLLAR ELEV. 9.6 ft		NORTHING 665,343 US ft		EASTING 2,568,819 US ft		24 HR. 8.4							
TOTAL DEPTH 100.2 ft		DRILL MACHINE D-50		DRILL METHOD Mud Rotary		HAMMER TYPE 140 lb. Manual							
DATE STARTED 11/20/06		COMPLETED 11/29/06		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
9.6													Ground Surface
7.9	1.7	7	28	60									Roadway Embankment Fill: Asphalt
4.5	5.1	2	1	2									1.7 ft. Blow counts invalid due to asphalt Roadway Embankment Fill: Orange and brown to gray, silty, fine to coarse SAND (A-2-4)
-0.5	10.1	3	5	5									Alluvium: Muck
-5.5	15.1	2	1	2									Alluvium: Muck
-10.5	20.1	2	1	2									Alluvium: Brown and gray, fine SAND (A-3) highly organic at top
-15.5	25.1	3	1	2									Alluvium: Brown and gray, fine SAND (A-3) highly organic at top
-20.5	30.1	3	3	4									Alluvium: Brown and gray, fine SAND (A-3) highly organic at top
-25.5	35.1	16	15	20									Castle Hayne Formation: White and gray, friable, very thickly bedded, shell-hash LIMESTONE
-30.5	40.1	13	17	21									Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace to some shell fragments
-35.5	45.1	5	5	11									Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace to some shell fragments
-40.5	50.1	6	9	7									Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace to some shell fragments
-45.5	55.1	12	5	7									Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace to some shell fragments
-50.5	60.1	7	15	16									Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace to some shell fragments
-55.5	65.1	6	4	5									Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace to some shell fragments
-64.1	73.7	6	6	8									Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace to some shell fragments

NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/21/06

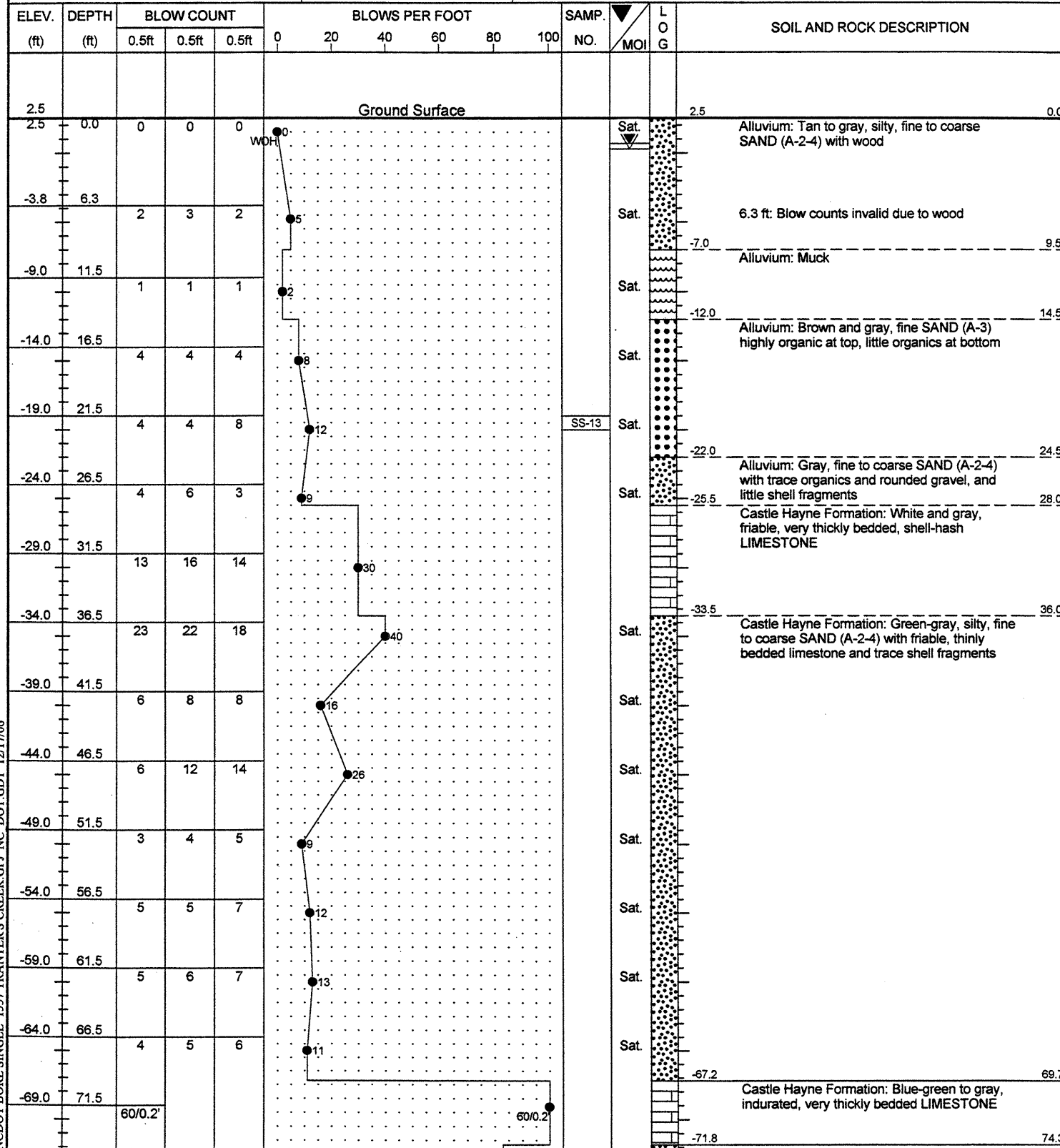
PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard/B. Deobald							
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)						
BORING NO. B2		BORING LOCATION 20+71		OFFSET 7 ft LT		ALIGNMENT -L-		0 HR. 4.8					
COLLAR ELEV. 9.6 ft		NORTHING 665,343 US ft		EASTING 2,568,819 US ft		24 HR. 8.4							
TOTAL DEPTH 100.2 ft		DRILL MACHINE D-50		DRILL METHOD Mud Rotary		HAMMER TYPE 140 lb. Manual							
DATE STARTED 11/20/06		COMPLETED 11/29/06		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
-65.2													Continued from previous page
-69.1	78.7												Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded LIMESTONE
-74.1	83.7												Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded LIMESTONE
-79.1	88.7	28	21	24									Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments
-84.1	93.7	16	22	32									Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments
-89.1	98.7	20	24	30									Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments
-90.6	100.2	13	17	24									Boring terminated at 100.2 ft (Elev. -90.6 ft) in Peedee Formation: Dense, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments

NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/21/06

Bit used: 3" roller cone
Drilling fluid: 8.2 lbs/gal



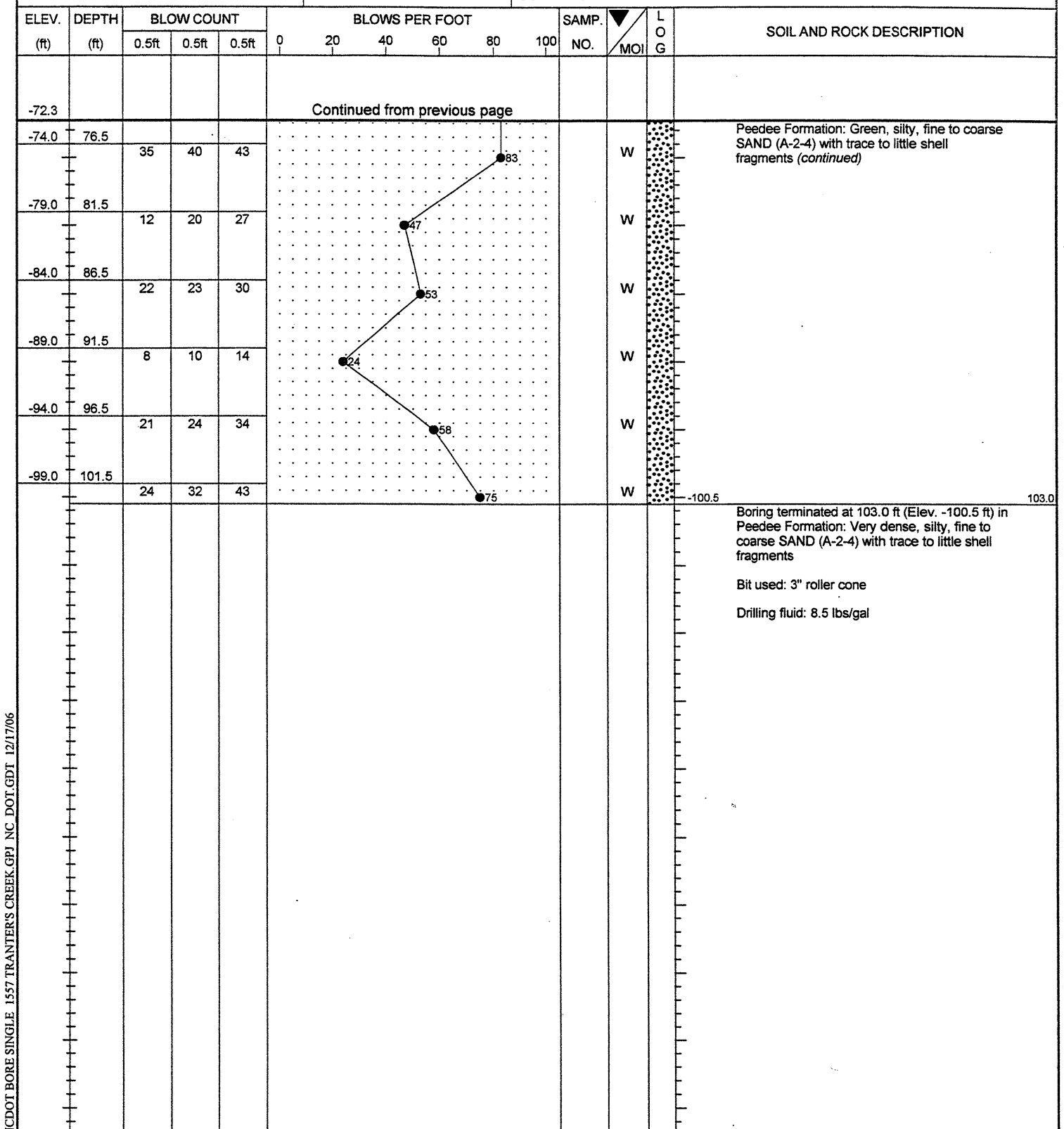
PROJECT NO. 33387.1.1	ID. B-4020	COUNTY Beaufort/Pitt	GEOLOGIST B. Deobald
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567			GROUND WATER (ft)
BORING NO. B3	BORING LOCATION 21+18	OFFSET 7 ft RT	ALIGNMENT -L-
COLLAR ELEV. 2.5 ft	NORTHING 665,327	US ft	EASTING 2,568,865
TOTAL DEPTH 103.0 ft	DRILL MACHINE CME 55 LC Track	DRILL METHOD Mud Rotary	HAMMER TYPE 140 lb. Manual
DATE STARTED 11/18/06	COMPLETED 11/19/06	SURFACE WATER DEPTH N/A	



NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/17/06



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 NO. B3	BORING LOCATION 21+18	OFFSET 7 ft RT	ALIGNMENT -L-
COLLAR ELEV. 2.5 ft	NORTHING 665,327	US ft	EASTING 2,568,865
TOTAL DEPTH 103.0 ft	DRILL MACHINE CME 55 LC Track	DRILL METHOD Mud Rotary	HAMMER TYPE 140 lb. Manual
DATE STARTED 11/18/06	COMPLETED 11/19/06	SURFACE WATER DEPTH N/A	



NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/17/06

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard						
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)					
BORING NO. B4		BORING LOCATION 21+73		OFFSET 9 ft LT	ALIGNMENT -L-		0 HR. Water					
COLLAR ELEV. -5.5 ft		NORTHING 665,340 US ft		EASTING 2,568,922 US ft		24 HR. Boring						
TOTAL DEPTH 134.9 ft		DRILL MACHINE CME 45C Trailer/D-50		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140lb Auto/Manual						
DATE STARTED 10/16/06		COMPLETED 11/10/06		SURFACE WATER DEPTH 7.3 ft								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-5.5	0.0	0	0	0	Mudline							
-12.4	6.9	0	1	1	Alluvium: Gray and brown, sandy, SILT (A-5) with little organics Sample SS-1: Organic Content 5.6% Sample SS-2: Organic Content 12%					SS-1	65.9	
-17.8	12.3	1	3	7	NOTE: 140 LB. AUTO HAMMER USED FOR SPT FROM 0.0 TO 89.0 FEET; 140 LB. MANUAL HAMMER USED FOR SPT FROM 94.0 TO 134.0 FEET					SS-2	94.6%	
-22.2	16.7	3	3	4	Alluvium: Gray, silty, fine to coarse SAND (A-2-4) with little organics							
-26.9	21.4	7	15	19	Castle Hayne Formation: White and gray, friable, thickly bedded, shell-hash LIMESTONE							
-34.4	28.9	15	12	13	Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone							
-39.4	33.9	4	5	9						SS-3		
-44.4	38.9	6	6	10								
-49.4	43.9	5	4	30	Castle Hayne Formation: Green-gray, fine to coarse sandy SILT (A-4) with friable, thinly bedded limestone							
-54.5	49.0	5	10	11						SS-4		
-59.5	54.0	5	4	13	Castle Hayne Formation: Green-Gray, friable to moderately indurated, very thickly bedded, sandy, shell-hash LIMESTONE							
-64.5	59.0	5	20	60/0.1								
-69.5	64.0	60/0.1		60/0.1								
-74.3	68.8	15	16	17	Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded LIMESTONE							
-79.3	73.8	14	18	25	Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments					SS-5		

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/21/06

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard						
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)					
BORING NO. B4		BORING LOCATION 21+73		OFFSET 9 ft LT	ALIGNMENT -L-		0 HR. Water					
COLLAR ELEV. -5.5 ft		NORTHING 665,340 US ft		EASTING 2,568,922 US ft		24 HR. Boring						
TOTAL DEPTH 134.9 ft		DRILL MACHINE CME 45C Trailer/D-50		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140lb Auto/Manual						
DATE STARTED 10/16/06		COMPLETED 11/10/06		SURFACE WATER DEPTH 7.3 ft								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-80.3		Continued from previous page										
-84.3	78.8	15	17	21	Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments (continued)							
-89.5	84.0	9	12	26						SS-6		
-94.5	89.0	14	22	32								
-99.5	94.0	46	100/0.4	100/0.4	NOTE: 140 LB. AUTO HAMMER USED FOR SPT FROM 0.0 TO 89.0 FEET; 140 LB. MANUAL HAMMER USED FOR SPT FROM 94.0 TO 134.0 FEET							
-104.5	99.0	19	24	29						SS-7		
-109.5	104.0	60/0.1		60/0.1	Peedee Formation: Green-gray, indurated, thickly bedded LIMESTONE							
-114.5	109.0	55	25	60/0.3	Peedee Formation: Dark green to gray, silty, fine to coarse SAND (A-1-b) with friable, thinly bedded limestone and trace shell fragments							
-119.5	114.0	9	10	28						SS-8		
-124.5	119.0	11	15	23	Peedee Formation: Dark green to gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments							
-129.5	124.0	8	12	22								
-134.5	129.0	11	17	34						SS-9		
-139.5	134.0	4	100/0.4	100/0.4	Boring terminated at 134.9 ft (Elev. -140.4 ft) in Peedee Formation: Very dense, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments							

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/21/06

Bit used: 3" roller cone and HQ core bit
Drilling fluid: 8.5 lbs/gal

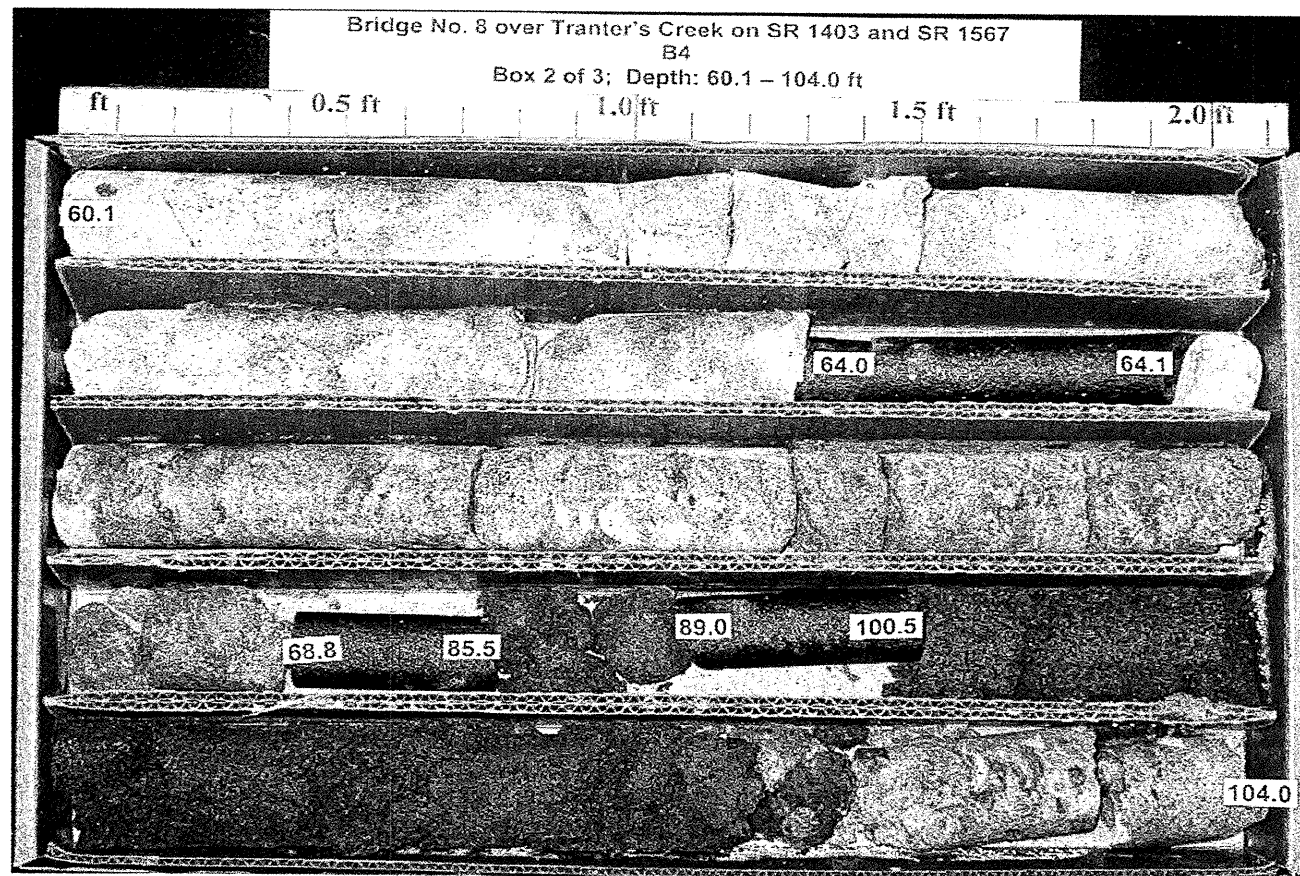
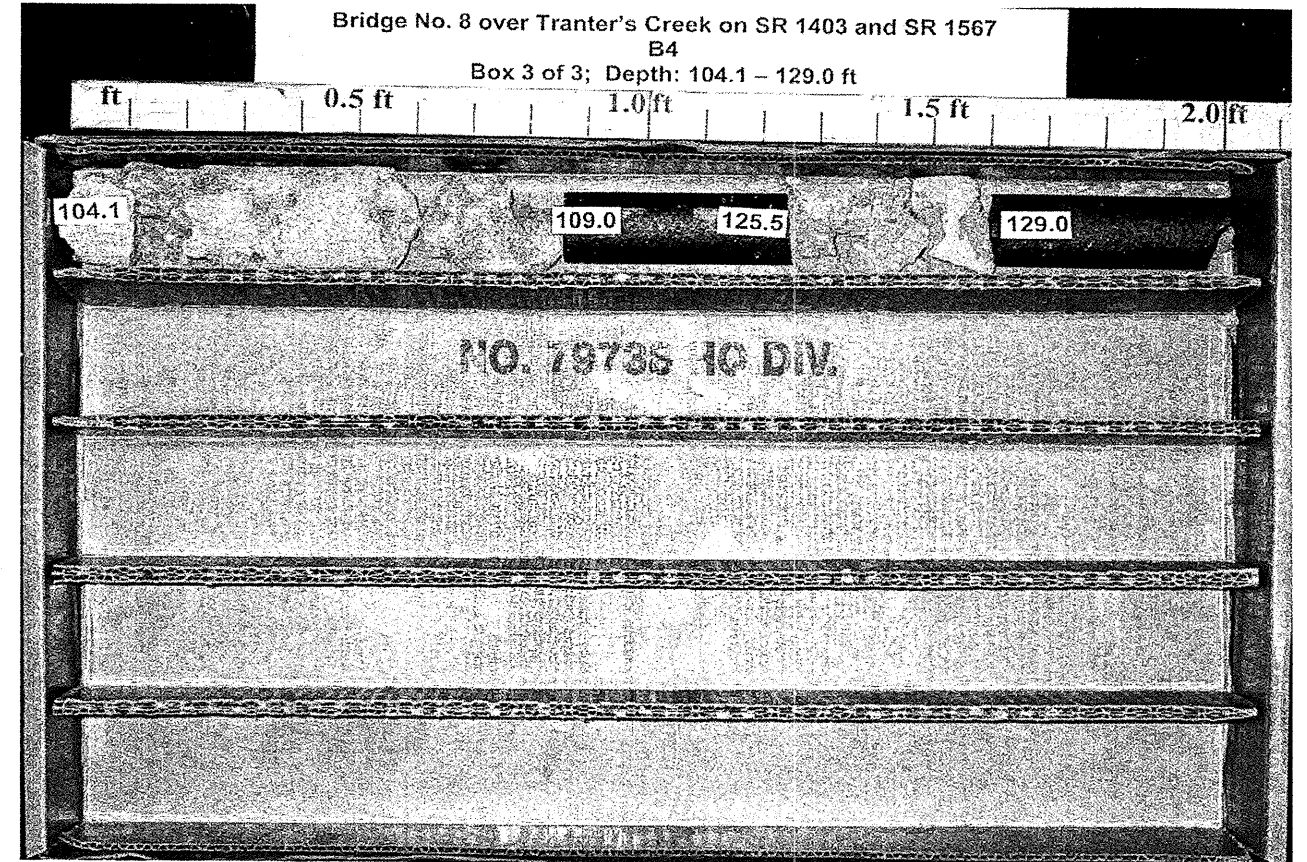
PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard				
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)			
BORING NO. B4		BORING LOCATION 21+73		OFFSET 9 ft LT		ALIGNMENT -L-		0 HR. Water		
COLLAR ELEV. -5.5 ft		NORTHING 665,340 US ft		EASTING 2,568,922 US ft				24 HR. Boring		
TOTAL DEPTH 134.9 ft		DRILL MACHINE CME 45C Trailer/D-50		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140lb Auto/Manual				
DATE STARTED 10/16/06		COMPLETED 11/10/06		SURFACE WATER DEPTH 7.3 ft						
CORE SIZE HQ		TOTAL RUN 82.7 ft		DRILLER D. Rhodes/T. Hahn						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (%)	RQD (%)	SAMP. NO.	STRATA REC. (%)	RQD (%)	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 23.8 ft
-29.3	23.8	5.1	0:15 2:00	(1.3) 25%	(N/A)		(2.8) 23%	(N/A)		Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone (continued)
-34.4	28.9		1:00 1:45 1:30/1.1							
-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			SS-3				
-40.9	35.4	3.5	0:30 0:30	(0.7) 20%	(N/A)					
-44.4	38.9		0:45 0:15/0.5							
-45.9	40.4	3.5	0:30 0:45	(0.0) 0%	(N/A)		(3.2) 17%	(N/A)		Castle Hayne Formation: Green-gray, fine to coarse sandy SILT (A-4) with friable, thinly bedded limestone
-49.4	43.9		0:30 0:30			SS-4				
-50.9	45.4	3.6	0:45 0:30	(0.4) 11%	(N/A)					
-54.5	49.0		1:15 0:45/0.6							
-56.0	50.5	3.5	1:30 1:30	(2.3) 66%	(N/A)		(5.7) 81%	(N/A)		Castle Hayne Formation: Green-Gray, friable to moderately indurated, very thickly bedded, sandy, shell-hash LIMESTONE
-59.5	54.0		0:15/1.5							
-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							
-65.6	60.1	3.9	2:30 7:15 6:00	(3.2) 82%	(N/A)		(5.6) 89%	(N/A)		Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded LIMESTONE
-69.5	64.0		6:00/0.9							
-69.6	64.1	4.7	4:30 2:30	(2.4) 51%	(N/A)					
-74.3	68.8		1:45 1:00 0:45/0.7			SS-5	(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	0:30 0:15	(0.0) 0%	(N/A)					
-79.3	73.8		0:15 0:08/0.5							
-80.8	75.3	3.5	0:15 0:10	(0.0) 0%	(N/A)					
-84.3	78.8		0:10 0:07/0.5							
-85.8	80.3	3.7	0:30 0:30	(0.0) 0%	(N/A)					
-89.5	84.0		0:15 0:15/0.7			SS-6				
-91.0	85.5	3.5	0:30 0:30	(0.2) 6%	(N/A)					
-94.5	89.0		0:30 0:10/0.5							
-96.0	90.5	3.5	0:45 0:30	(0.0) 0%	(N/A)					
-99.5	94.0		0:15 0:10/0.5							
-100.4	94.9	4.1	0:15 0:15 0:30	(0.0) 0%	(N/A)					

NOTE: 140 LB. AUTO HAMMER USED FOR SPT FROM 0.0 TO 89.0 FEET;
140 LB. MANUAL HAMMER USED FOR SPT FROM 94.0 TO 134.0 FEET

NCDOT CORE SINGLE 1557 TRANTER'S CREEK.GPJ NC_DOT.GDT 12/17/06

PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard				
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							GROUND WATER (ft)			
BORING NO. B4		BORING LOCATION 21+73		OFFSET 9 ft LT		ALIGNMENT -L-		0 HR. Water		
COLLAR ELEV. -5.5 ft		NORTHING 665,340 US ft		EASTING 2,568,922 US ft				24 HR. Boring		
TOTAL DEPTH 134.9 ft		DRILL MACHINE CME 45C Trailer/D-50		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140lb Auto/Manual				
DATE STARTED 10/16/06		COMPLETED 11/10/06		SURFACE WATER DEPTH 7.3 ft						
CORE SIZE HQ		TOTAL RUN 82.7 ft		DRILLER D. Rhodes/T. Hahn						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (%)	RQD (%)	SAMP. NO.	STRATA REC. (%)	RQD (%)	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-104.5	99.0		0:15/1.1 N=53			SS-7				Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments (continued)
-106.0	100.5	3.5	0:15 0:30	(2.5) 71%	(N/A)					
-109.5	104.0		2:00 0:45/0.5				(1.6) 100%	(N/A)		Peedee Formation: Green-gray, indurated, thickly bedded LIMESTONE
-109.6	104.1	4.9	0:15 1:15	(0.8) 16%	(N/A)		(0.0) 0%	(N/A)		Peedee Formation: Dark green to gray, silty, fine to coarse SAND (A-1-b) with friable, thinly bedded limestone and trace shell fragments
-114.5	109.0		0:10 0:10/0.9							
-115.8	110.3	3.7	0:15 0:15	(0.0) 0%	(N/A)					
-119.5	114.0		0:15 0:08/0.7			SS-8				
-121.0	115.5	3.5	0:15 0:15	(0.0) 0%	(N/A)					
-124.5	119.0		0:15 0:08/0.5				(0.3) 3%	(N/A)		Peedee Formation: Dark green to gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments
-126.0	120.5	3.5	0:15 0:15	(0.0) 0%	(N/A)					
-129.5	124.0		0:15 0:15/0.5							
-131.0	125.5	3.5	1:30 0:15	(0.3) 9%	(N/A)					
-134.5	129.0		0:15 0:08/0.5			SS-9				
-136.0	130.5	3.5	0:30 0:30	(0.0) 0%	(N/A)					
-139.5	134.0		0:30 0:15/0.5							Coring terminated at 134.0 ft (Elev. -139.5 ft) in Peedee Formation: Very dense, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments

NCDOT CORE SINGLE 1557 TRANTER'S CREEK.GPJ NC_DOT.GDT 12/17/06



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 NO. B5		BORING LOCATION 22+21		OFFSET 7 ft RT		ALIGNMENT -L-						
COLLAR ELEV. -18.1 ft		NORTHING 665,322 US ft		EASTING 2,568,968 US ft		0 HR. Water						
TOTAL DEPTH 89.4 ft		DRILL MACHINE CME 55 LC Track		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140 lb. Manual						
DATE STARTED 11/15/06		COMPLETED 11/17/06		SURFACE WATER DEPTH 18.6 ft								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-18.1	0.0	0	2	2	Mudline							
-23.4	5.3	6	13	19								Alluvium: Gray, fine to coarse SAND (A-1-b) with trace wood
-31.4	13.3	27	8	11								Castle Hayne Formation: White and gray, friable, very thickly bedded, shell-hash LIMESTONE
-36.4	18.3	11	20	7								Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone
-41.4	23.3	13	6	9								
-46.4	28.3	10	7	10								
-51.4	33.3	6	9	9								
-56.4	38.3	5	5	23								
-61.4	43.3	14	14	11								
-66.4	48.3	100/0.4'			100/0.4'							Castle Hayne Formation: Green-Gray, friable to moderately indurated, very thickly bedded, sandy, shell-hash LIMESTONE
-71.4	53.3	60/0.0'			60/0.0'							Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded LIMESTONE
-76.4	58.3	14	20	22								Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments
-81.4	63.3	10	21	27								
-86.4	68.3	11	18	24								
-91.4	73.3	13	34	66/0.4'	66/0.4'							Boring terminated at 89.4 ft (Elev. -107.5 ft) in Peedee Formation: Very dense, silty, fine to coarse SAND (A-2-4) with trace shell fragments

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC_DOT.GDT 12/17/06

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 NO. B5		BORING LOCATION 22+21		OFFSET 7 ft RT		ALIGNMENT -L-						
COLLAR ELEV. -18.1 ft		NORTHING 665,322 US ft		EASTING 2,568,968 US ft		0 HR. Water						
TOTAL DEPTH 89.4 ft		DRILL MACHINE CME 55 LC Track		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140 lb. Manual						
DATE STARTED 11/15/06		COMPLETED 11/17/06		SURFACE WATER DEPTH 18.6 ft								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-92.9					Continued from previous page							
-96.4	78.3	26	30	35								Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments (continued)
-101.4	83.3	37	30	25								
-106.4	88.3	13	22	78/0.1'	78/0.1'							Boring terminated at 89.4 ft (Elev. -107.5 ft) in Peedee Formation: Very dense, silty, fine to coarse SAND (A-2-4) with trace shell fragments

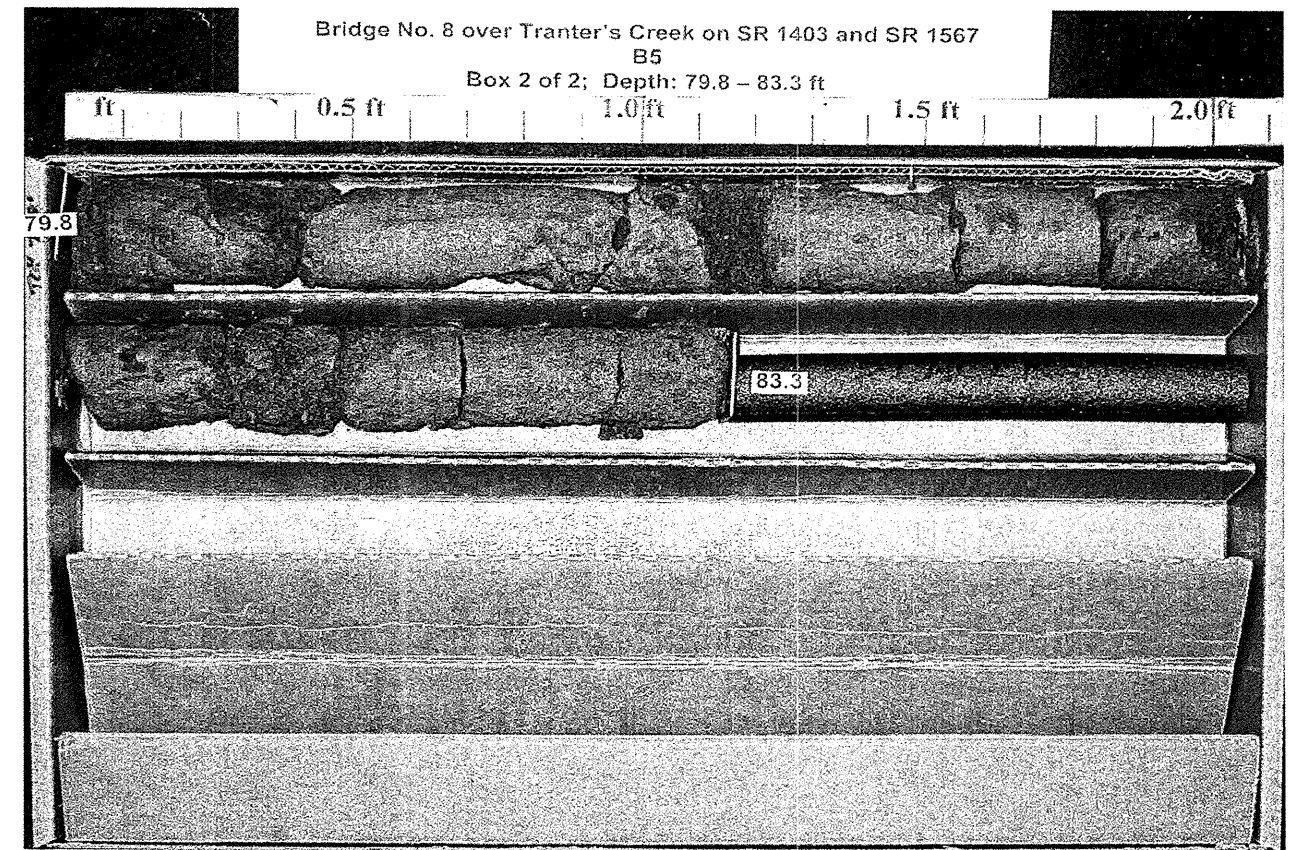
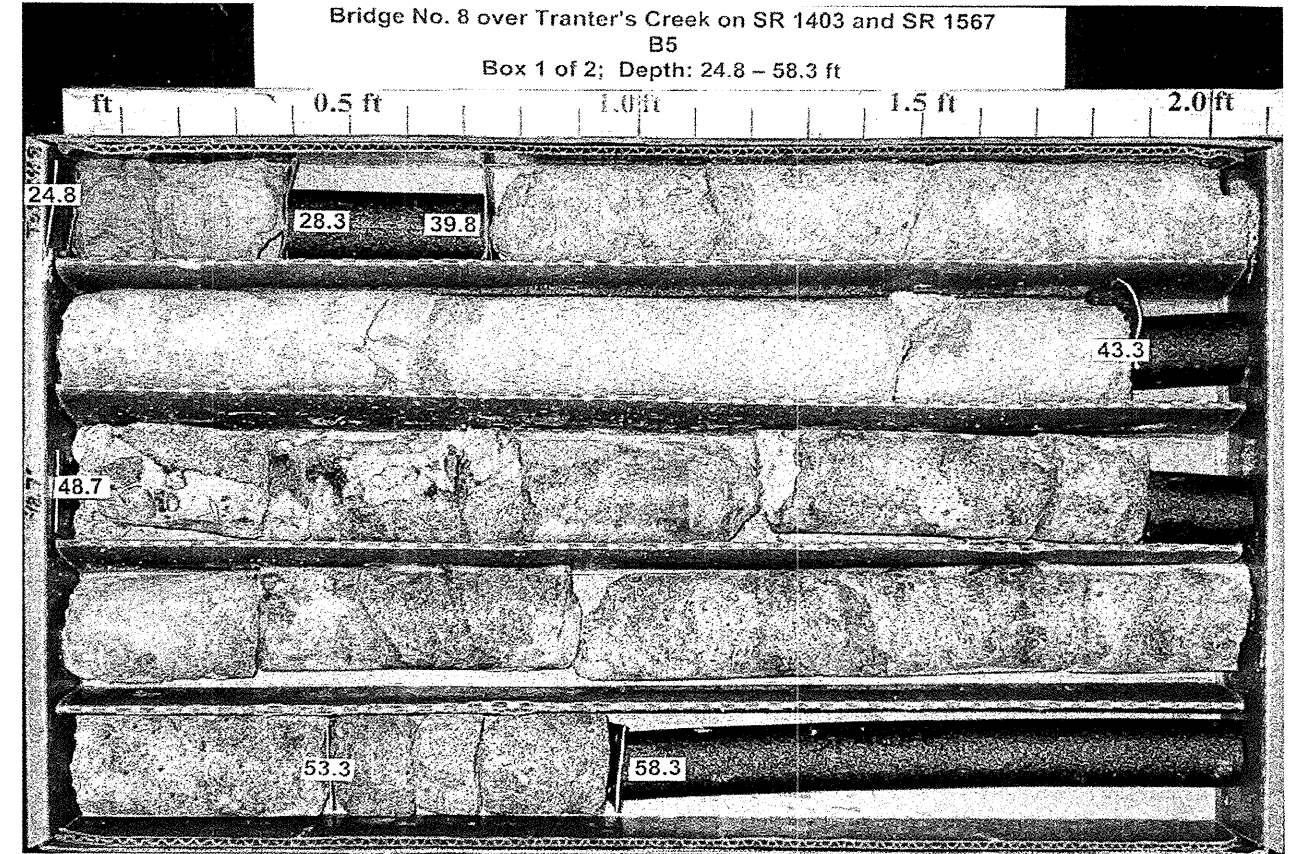
NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC_DOT.GDT 12/17/06

PROJECT NO.		ID.		COUNTY		GEOLOGIST		SITE DESCRIPTION		GROUND WATER (ft)	
BORING NO.		BORING LOCATION		OFFSET		ALIGNMENT		0 HR.		Water	
COLLAR ELEV.		NORTHING		US ft		EASTING		US ft		24 HR.	
TOTAL DEPTH		DRILL MACHINE		DRILL METHOD		HAMMER TYPE					
DATE STARTED		COMPLETED		SURFACE WATER DEPTH							
CORE SIZE		TOTAL RUN		DRILLER							
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (%)	RQD (%)	SAMP. NO.	STRATA REC. (%)	RQD (%)	LOG	DESCRIPTION AND REMARKS	
										Begin Coring @ 8.3 ft	
-26.4	8.3	5.0	0:30 0:21 0:25 0:26 0:55 N=19	(0.0) 0%	(N/A)		(0.0) 0%	(N/A)		Castle Hayne Formation: White and gray, friable, very thickly bedded, shell-hash LIMESTONE (continued)	
-31.4	13.3						(0.4) 2%	(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 1:05 0:20/0.5 N=27	(0.0) 0%	(N/A)						
-36.4	18.3										
-37.9	19.8	3.5	0:50 0:50 0:55 0:25/0.5 N=15	(0.0) 0%	(N/A)						
-41.4	23.3										
-42.9	24.8	3.5	0:55 0:30 1:00 0:20/0.5 N=17	(0.4) 11%	(N/A)						
-46.4	28.3										
-47.9	29.8	3.5	0:40 0:30 0:30 0:10/0.5 N=18	(0.0) 0%	(N/A)						
-51.4	33.3										
-52.9	34.8	3.5	0:33 0:30 0:25 0:12/0.5 N=28	(0.0) 0%	(N/A)						
-56.4	38.3										
-57.9	39.8	3.5	1:25 1:55 0:20 0:13/0.5 N=25	(3.0) 86%	(N/A)		(3.0) 43%	(N/A)		Castle Hayne Formation: Green-Gray, friable to moderately indurated, very thickly bedded, sandy, shell-hash LIMESTONE	
-61.4	43.3										
-62.9	44.8	3.5	0:20 0:25 0:20 0:05/0.5 N=100/0.4'	(0.0) 0%	(N/A)		(4.7) 92%	(N/A)		Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded LIMESTONE	
-66.4	48.3										
-66.8	48.7	4.6	3:55 7:00 3:40 3:25 3:20/0.6 N=60/0.0'	(0.5) 10%	(N/A)		(3.0) 12%	(N/A)		Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments	
-71.4	53.3	5.0	2:40 2:25 1:05 0:40 0:35 N=42	(0.0) 0%	(N/A)						
-76.4	58.3										
-77.9	59.8	3.5	0:35 0:30 0:30 0:20/0.5 N=48	(0.0) 0%	(N/A)						
-81.4	63.3										
-82.9	64.8	3.5	1:00 0:50 0:40 0:20/0.5 N=42	(0.0) 0%	(N/A)						
-86.4	68.3										
-87.9	69.8	3.5	0:50 0:47 0:35 0:15/0.5 N=100/0.9'	(0.0) 0%	(N/A)						
-91.4	73.3										
-92.8	74.7	3.6	0:28 0:55 0:30 0:25/0.6 N=65	(0.0) 0%	(N/A)						
-96.4	78.3										
-97.9	79.8	3.5	0:35 0:30 0:35	(3.0) 86%	(N/A)						
-101.4	83.3										

NCDOT CORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/20/06

PROJECT NO.		ID.		COUNTY		GEOLOGIST		SITE DESCRIPTION		GROUND WATER (ft)	
BORING NO.		BORING LOCATION		OFFSET		ALIGNMENT		0 HR.		Water	
COLLAR ELEV.		NORTHING		US ft		EASTING		US ft		24 HR.	
TOTAL DEPTH		DRILL MACHINE		DRILL METHOD		HAMMER TYPE					
DATE STARTED		COMPLETED		SURFACE WATER DEPTH							
CORE SIZE		TOTAL RUN		DRILLER							
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (%)	RQD (%)	SAMP. NO.	STRATA REC. (%)	RQD (%)	LOG	DESCRIPTION AND REMARKS	
										Continued from previous page	
-102.9	84.8	3.5	0:25/0.5 N=55 0:30 0:35 0:50 0:30/0.5	(0.0) 0%	(N/A)					Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments (continued)	
-106.4	88.3									Coring terminated at 88.3 ft (Elev. -106.4 ft) in Peedee Formation: Very dense, silty, fine to coarse SAND (A-2-4) with trace shell fragments	

NCDOT CORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/20/06



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 NO. B6		BORING LOCATION 22+68		OFFSET 10 ft LT		ALIGNMENT -L-								
COLLAR ELEV. -18.8 ft		NORTHING 665,337 US ft		EASTING 2,569,017 US ft		0 HR. Water								
TOTAL DEPTH 84.0 ft		DRILL MACHINE D-50		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140 lb. Manual								
DATE STARTED 11/29/06		COMPLETED 11/30/06		SURFACE WATER DEPTH 19.5 ft										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
-18.8	0.0	0	0	0										
-23.9	5.1	1	2	4										
-28.9	10.1	15	12	17										
-36.3	17.5	11	9	7										
-41.3	22.5	4	19	11										
-46.3	27.5	4	5	5										
-51.3	32.5	4	7	6										
-56.3	37.5	4	4	5										
-61.3	42.5	20	60/0.2'											
-66.3	47.5	100/0.5'												
-71.3	52.5	60/0.0'												
-76.3	57.5	12	17	18										
-81.3	62.5	23	32	42										
-86.3	67.5	15	26	36										
-91.3	72.5	10	15	24										

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC_DOT.GDT 12/17/06

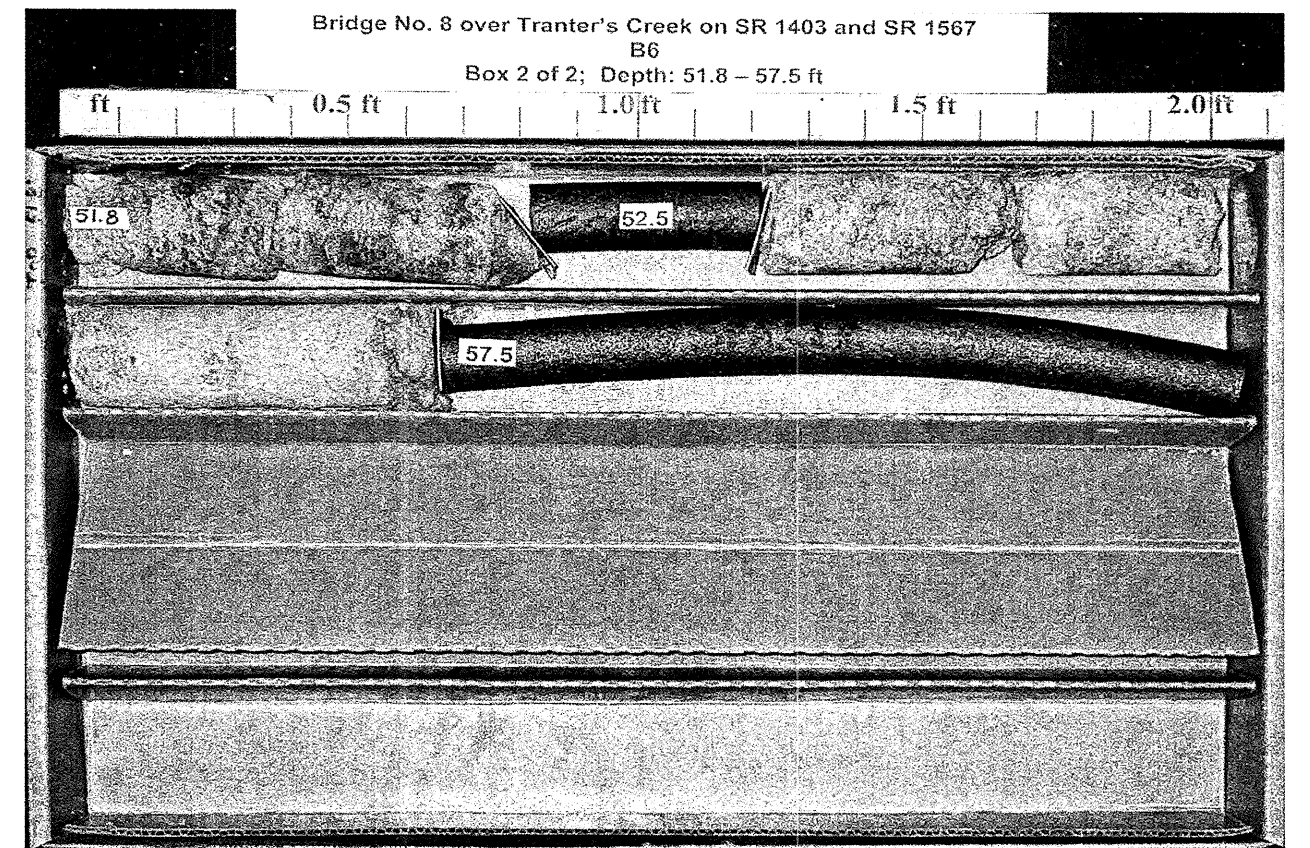
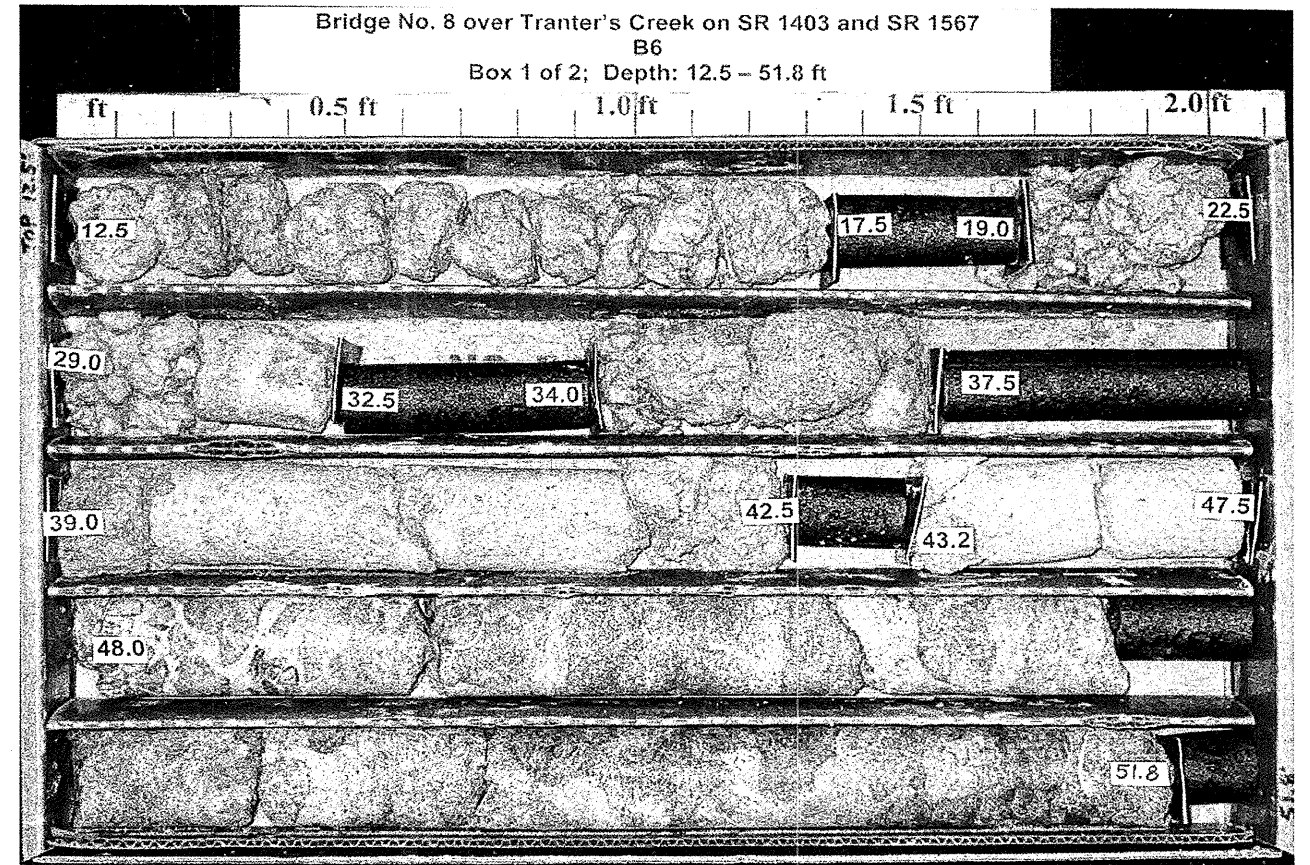
PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST B. Deobald								
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567						GROUND WATER (ft)								
BORING NO. B6		BORING LOCATION 22+68		OFFSET 10 ft LT		ALIGNMENT -L-								
COLLAR ELEV. -18.8 ft		NORTHING 665,337 US ft		EASTING 2,569,017 US ft		0 HR. Water								
TOTAL DEPTH 84.0 ft		DRILL MACHINE D-50		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140 lb. Manual								
DATE STARTED 11/29/06		COMPLETED 11/30/06		SURFACE WATER DEPTH 19.5 ft										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
-93.6														
-96.3	77.5	53	37	48										
-101.3	82.5	27	43	35										

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC_DOT.GDT 12/17/06



PROJECT NO.		ID.		COUNTY		GEOLOGIST				
33387.1.1		B-4020		Beaufort/Pitt		B. Deobald				
SITE DESCRIPTION							GROUND WATER (ft)			
Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							0 HR. Water			
BORING NO.		BORING LOCATION		OFFSET		ALIGNMENT				
B6		22+68		10 ft LT		-L-				
COLLAR ELEV.		NORTHING		US ft		EASTING				
-18.8 ft		665,337				2,569,017				
TOTAL DEPTH		DRILL MACHINE		DRILL METHOD		HAMMER TYPE				
84.0 ft		D-50		Mud Rotary/Core		140 lb. Manual				
DATE STARTED		COMPLETED		SURFACE WATER DEPTH						
11/29/06		11/30/06		19.5 ft						
CORE SIZE		TOTAL RUN		DRILLER						
HQ		53.8 ft		T. Hahn						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		
										Begin Coring @ 12.5 ft
-31.3	12.5	5.0	0:20 0:27 0:45 0:30	(1.2) 24%	(N/A)		(0.0) 0%	(N/A)		Castle Hayne Formation: White and gray, friable, thickly bedded, shell-hash Limestone (continued) 15.0
-36.3	17.5		0:27 N=16				(2.4) 11%	(N/A)		Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments 33.8
-37.8	19.0	3.5	0:40 0:30 0:25	(0.3) 9%	(N/A)					
-41.3	22.5		0:12/0.5 N=30							
-42.8	24.0	3.5	0:11 0:11 0:12	(0.0) 0%	(N/A)					
-46.3	27.5		0:06/0.5 N=10							
-47.8	29.0	3.5	0:13 0:11 0:25	(0.4) 11%	(N/A)					
-51.3	32.5		0:09/0.5 N=13							
-52.8	34.0	3.5	0:26 0:45 0:25	(0.5) 14%	(N/A)					
-56.3	37.5		0:06/0.5 N=9							
-57.8	39.0	3.5	0:43 1:40 0:12	(1.2) 34%	(N/A)					
-61.3	42.5		0:05/0.5 N=60/0.2'				(1.7) 29%	(N/A)		Castle Hayne Formation: Green-Gray, friable to moderately indurated, very thickly bedded, sandy, shell-hash Limestone 41.0
-62.0	43.2	4.3	0:55 0:16 0:06 0:05	(0.5) 12%	(N/A)					
-66.3	47.5		0:03/0.3 N=100/0.5'							
-66.8	48.0	4.5	3:15 3:10 3:20 2:55	(4.3) 96%	(N/A)		(5.7) 97%	(N/A)		Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded Limestone 48.0
-71.3	52.5	5.0	1:20/0.5 N=60/0.0'	(1.4) 28%	(N/A)					
-76.3	57.5		2:30 1:30 1:15 0:40 0:30				(0.0) 0%	(N/A)		Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments 53.9
-77.8	59.0	3.5	0:18 0:15 0:30	(0.0) 0%	(N/A)					
-81.3	62.5		0:19/0.5 N=74							
-82.8	64.0	3.5	0:18 0:15 0:20	(0.0) 0%	(N/A)					
-86.3	67.5		0:10/0.5 N=62							
-87.8	69.0	3.5	0:30 0:15 0:18	(0.0) 0%	(N/A)					
-91.3	72.5		0:12/0.5 N=39							
-92.8	74.0	3.5	0:30 0:30 0:20	(0.0) 0%	(N/A)					
-96.3	77.5		0:10/0.5 N=85							
-97.8	79.0	3.5	0:36 0:25 0:18	(0.0) 0%	(N/A)					
-101.3	82.5		0:12/0.5							
										Coring terminated at 82.5 ft (Elev. -101.3 ft) in Peedee Formation: Very dense, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments 82.5

NCDOT CORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/20/06



PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard											
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567						GROUND WATER (ft)											
BORING NO. B7		BORING LOCATION 23+23		OFFSET 7 ft RT		ALIGNMENT -L-											
COLLAR ELEV. -15.4 ft		NORTHING 665,318		US ft		EASTING 2,569,071											
TOTAL DEPTH 88.5 ft		DRILL MACHINE D-50		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140 lb. Manual											
DATE STARTED 11/13/06		COMPLETED 11/15/06		SURFACE WATER DEPTH 15.0 ft													
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION					
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100				
-15.4	0.0	3	0	0									0.0				
-19.0	3.6	18	10	8									2.5				
-24.0	8.6	10	22	10									13.0				
-29.0	13.6	12	20	25									15.1				
-32.4	17.0	8	12	15													
-37.4	22.0	22	16	17													
-42.3	26.9	17	12	16													
-47.3	31.9	6	10	8													
-52.3	36.9	6	8	15													
-57.3	41.9	100/0.5'															
-62.3	46.9	100/0.5'															
-67.3	51.9	100/0.3'															
-72.3	56.9	22	30	36													
-77.3	61.9	33	46	54													
-82.3	66.9	21	33	46													
-87.3	71.9	9	19	25													

NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/17/06

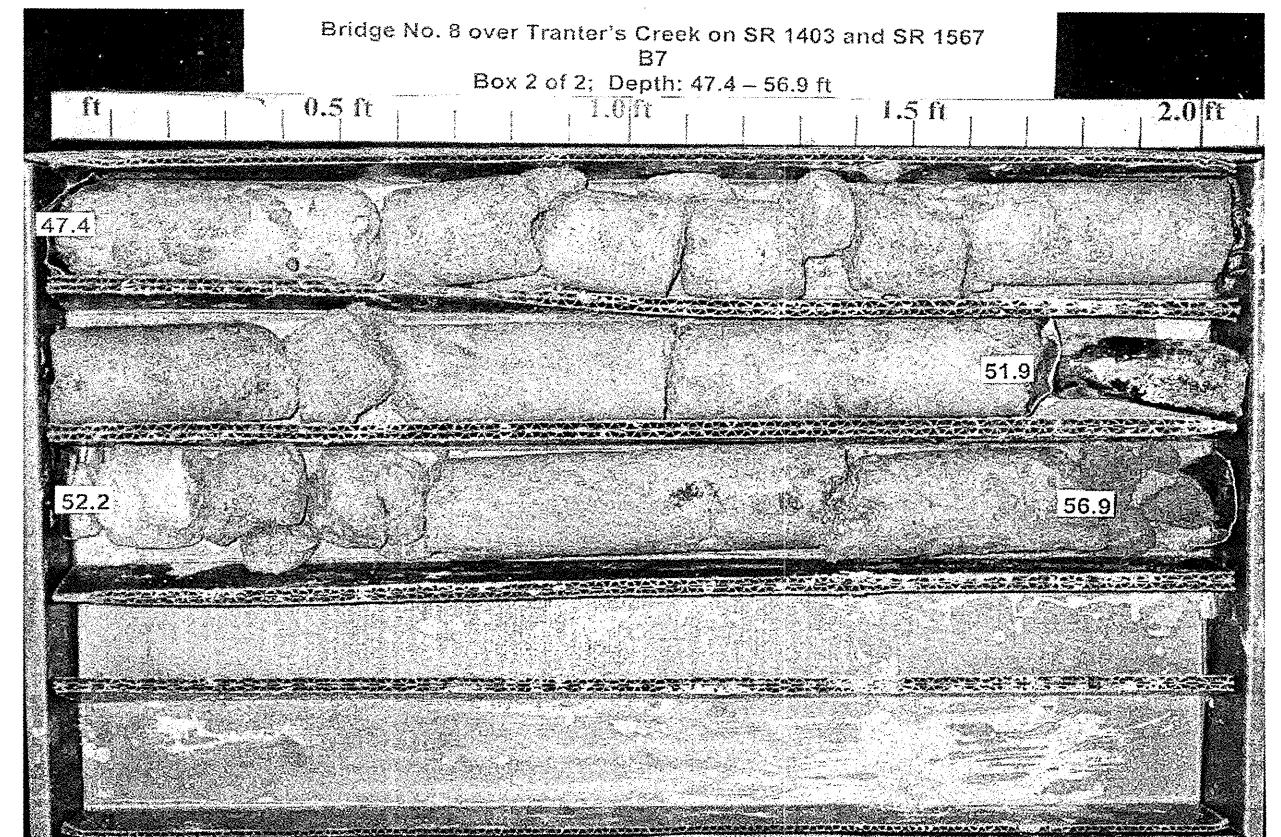
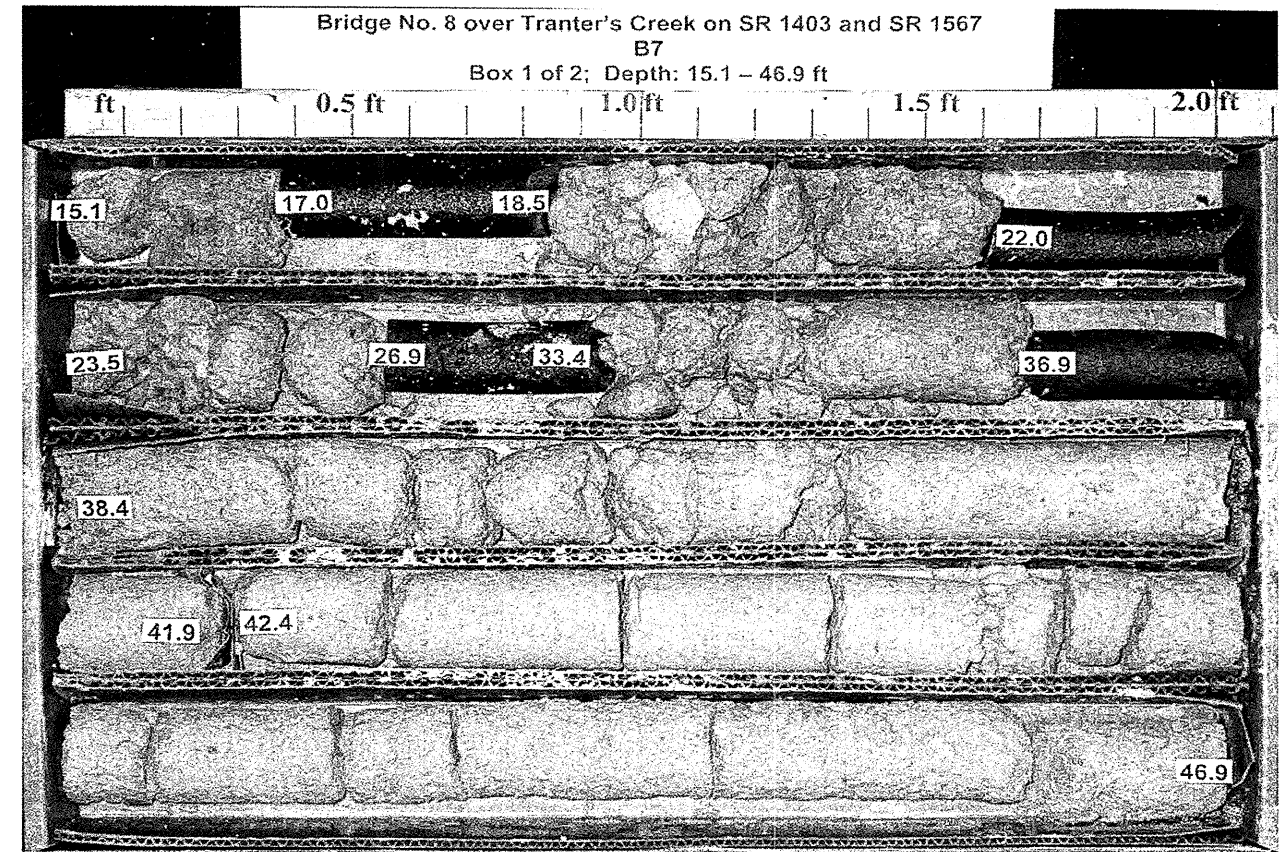
PROJECT NO. 33387.1.1		ID. B-4020		COUNTY Beaufort/Pitt		GEOLOGIST J. Howard											
SITE DESCRIPTION Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567						GROUND WATER (ft)											
BORING NO. B7		BORING LOCATION 23+23		OFFSET 7 ft RT		ALIGNMENT -L-											
COLLAR ELEV. -15.4 ft		NORTHING 665,318		US ft		EASTING 2,569,071											
TOTAL DEPTH 88.5 ft		DRILL MACHINE D-50		DRILL METHOD Mud Rotary/Core		HAMMER TYPE 140 lb. Manual											
DATE STARTED 11/13/06		COMPLETED 11/15/06		SURFACE WATER DEPTH 15.0 ft													
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION					
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100				
-90.2																	
-92.4	77.0	27	43	57/0.4'													
-97.4	82.0	55	45/0.3'														
-102.4	87.0	15	15	20													

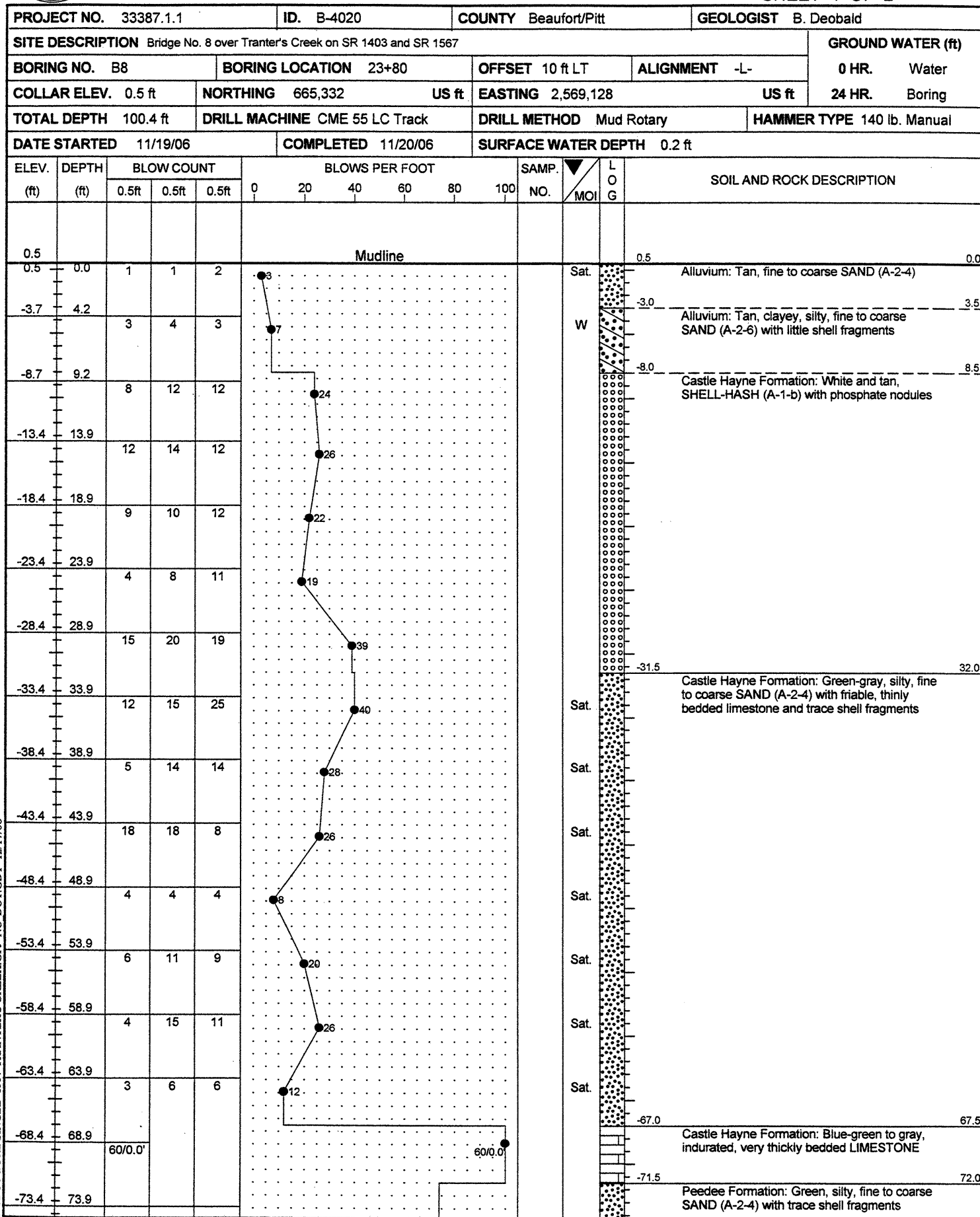
NCDOT BORE SINGLE 1557 TRANTER'S CREEK.GPJ NC DOT.GDT 12/17/06



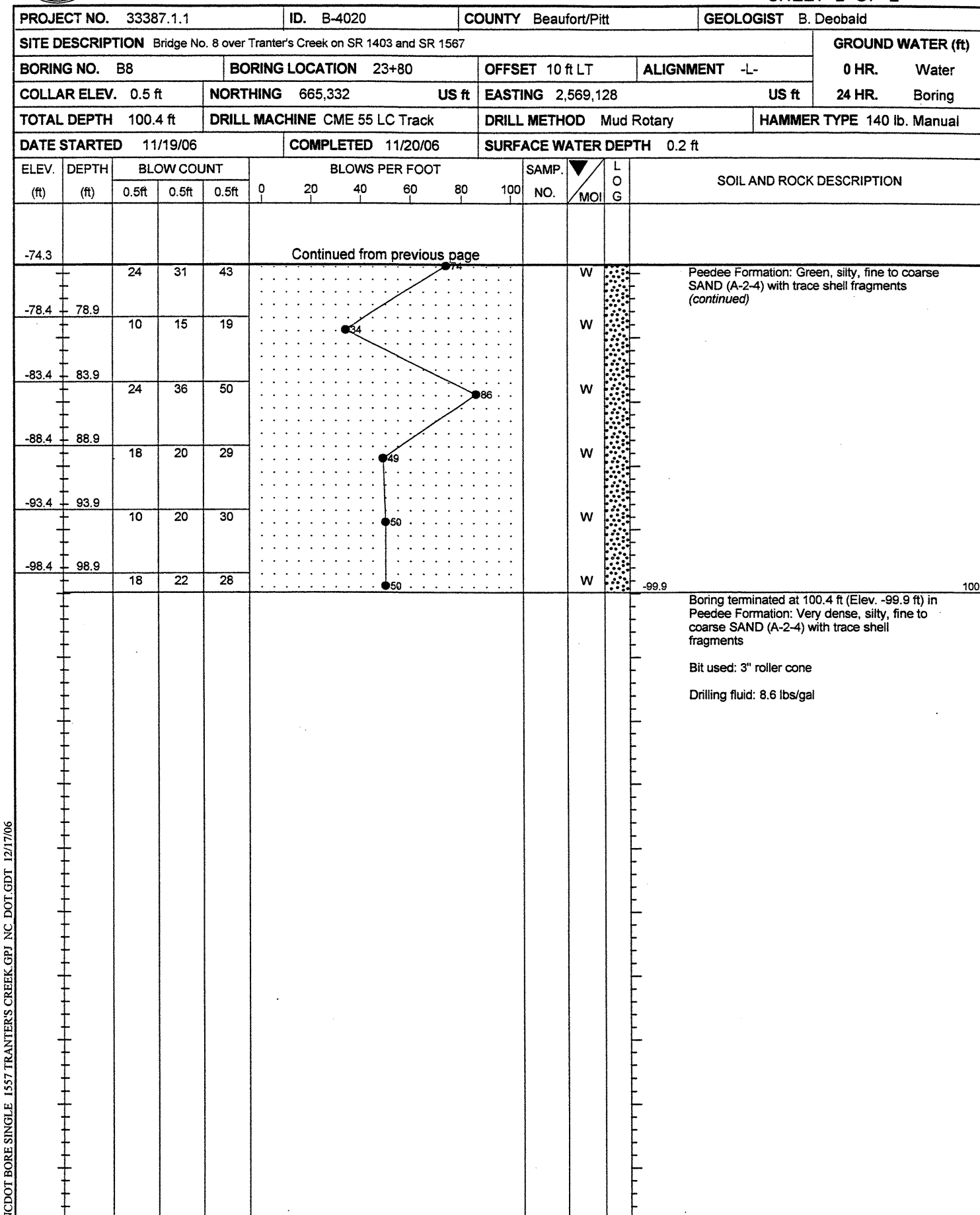
PROJECT NO.		ID.		COUNTY		GEOLOGIST				
33387.1.1		B-4020		Beaufort/Pitt		J. Howard				
SITE DESCRIPTION							GROUND WATER (ft)			
Bridge No. 8 over Tranter's Creek on SR 1403 and SR 1567							0 HR. Water			
BORING NO.		BORING LOCATION		OFFSET		ALIGNMENT				
B7		23+23		7 ft RT		-L-				
COLLAR ELEV.		NORTHING		EASTING		US ft				
-15.4 ft		665,318		2,569,071		US ft				
TOTAL DEPTH		DRILL MACHINE		DRILL METHOD		HAMMER TYPE				
88.5 ft		D-50		Mud Rotary/Core		140 lb. Manual				
DATE STARTED		COMPLETED		SURFACE WATER DEPTH						
11/13/06		11/15/06		15.0 ft						
CORE SIZE		TOTAL RUN		DRILLER						
HQ		54.9 ft		T. Hahn						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (%)	RCD (%)	SAMP. NO.	STRATA REC. (%)	RCD (%)	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 15.1 ft
-30.5	15.1	1.9	0:20	(0.4)	(N/A)		(2.4)	(N/A)		Castle Hayne Formation: Green-gray, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments
-32.4	17.0		0:40/0.9	21%			15%			
			N=27							
-33.9	18.5	3.5	0:20	(0.8)	(N/A)					
			0:30	23%						
-37.4	22.0		0:30							
			0:15/0.5							
			N=33							
-38.9	23.5	3.4	0:20	(0.5)	(N/A)					
			0:15	15%						
-42.3	26.9		0:15							
			0:10/0.4							
			N=28							
-43.8	28.4	3.5	0:45	(0.0)	(N/A)					
			0:15	0%						
-47.3	31.9		0:30							
			0:15/0.5							
			N=18							
-48.8	33.4	3.5	0:20	(0.7)	(N/A)					
			0:40	20%						
-52.3	36.9		0:45							
			0:10/0.5							
			N=23							
-53.8	38.4	3.5	1:30	(2.3)	(N/A)		(5.9)	(N/A)		Castle Hayne Formation: Green-Gray, friable to moderately indurated, very thickly bedded, sandy, shell-hash LIMESTONE
			1:15	66%			67%			
-57.3	41.9		0:15							
			0:05/0.5							
-57.8	42.4	4.5	N=100/0.5'	(3.6)	(N/A)					
			1:15	80%						
-62.3	46.9		0:30							
			0:15							
			0:05/0.5							
-62.8	47.4	4.5	N=100/0.5'	(3.7)	(N/A)		(4.8)	(N/A)		Castle Hayne Formation: Blue-green to gray, indurated, very thickly bedded LIMESTONE
			2:30	82%			100%			
-67.3	51.9		2:00							
			4:00							
			4:45							
-67.6	52.2	4.7	2:00/0.5	(1.9)	(N/A)		(1.1)	(N/A)		Peedee Formation: Green, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments
			N=100/0.3'	40%			4%			
-72.3	56.9		2:00							
			2:00							
			2:15							
			0:20							
			0:30/0.7							
-73.8	58.4	3.5	N=66	(0.0)	(N/A)					
			0:30	0%						
-77.3	61.9		0:20							
			0:20							
			0:10/0.5							
-78.8	63.4	3.5	N=100	(0.0)	(N/A)					
			0:20	0%						
-82.3	66.9		0:30							
			0:20							
			0:10/0.5							
-83.8	68.4	3.5	N=79	(0.0)	(N/A)					
			0:30	0%						
-87.3	71.9		0:30							
			0:15							
			0:10/0.5							
-88.8	73.4	3.6	N=44	(0.0)	(N/A)					
			0:30	0%						
-92.4	77.0		0:30							
			0:30							
			0:10/0.6							
-93.8	78.4	3.6	N=100/0.9'	(0.0)	(N/A)					
			0:20	0%						
-97.4	82.0		0:20							
			0:20							
			0:10/0.6							
-98.2	82.8	4.2	N=100/0.8'	(0.0)	(N/A)					
			0:20	0%						
-102.4	87.0		0:15							
			0:20							
			0:20							
			0:50/0.2							
										Coring terminated at 87.0 ft (Elev. -102.4 ft) in Peedee Formation: Dense, silty, fine to coarse SAND (A-2-4) with friable, thinly bedded limestone and trace shell fragments

NCDOT CORE SINGLE 1557 TRANTERS CREEK GPI NC DOT.GDT 12/17/06





NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/17/06



NCDOT BORE SINGLE 1557 TRANTERS CREEK.GPJ NC DOT.GDT 12/17/06



FIELD DENSITY TEST WORK SHEET
SHELBY TUBE METHOD - (ASTM 2937)

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

DATE: 11-08-06

PROJECT: Bridge #8 at Tranter's Creek

MACTEC JOB NO.: 6468-06-1557

Test No.	W.Wt. Sample & Mold (A)	Wt. Mold (B)	W.Wt. Sample (C) = (A-B)	W.Wt. Cu Ft (D) = (C x M)	W.Wt. Moist Sample (E)	D.Wt. Moist Sample (F)	Wt. Moist (G) = (E - F)	% Moist (H) = (G ÷ F)	Dry Density (J) = (D ÷ (1+H))	*	% Comp (K) = (J ÷ P)	% Comp Require	Location	Depth Ft. From Shoulder
1	4.87	1.36	3.51	104.9	300	239	61	25.5	83.6	N/A	N/A	N/A	19+58 -L-, 4' left of edge of pavement	0'
2	5.31	1.38	3.93	117.5	300	260	40	15.4	101.8	N/A	N/A	N/A	19+56 - L-, 10' left of edge of pavement	4'
3	5.27	1.37	3.90	116.6	300	247	53	21.5	96.0	N/A	N/A	N/A	19+53 -L-, 17' left of edge of pavement	8'

* Tests Compared To:

Proctor Curve No. (P) _____ Maximum _____ pcf Optimum Moisture _____
 Proctor Curve No. (P) _____ Maximum _____ pcf Optimum Moisture _____
 Proctor Curve No. (P) _____ Maximum _____ pcf Optimum Moisture _____

Test Performed by: Pablo Rios Mold Volume Factor (M): 29.89

Checked by: Bill Deaton Test Results Reported 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



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 (ft) 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

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: 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	NP	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	-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
to	23.0	1.5	1.5	53.1	68.1

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: 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 µm Sieve (%)	11.0	4.8

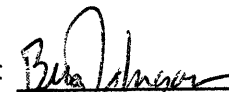
MINUS 2.00mm FRACTION

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				

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.	Channel 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



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 Microfilm _____ (reel _____ pos: _____)
 Other (explain) _____

Bridge No.: 8 Length: 307.5 Total Bents: 8 Bents in Channel: 6 Bents in Floodplain: 2
 Foundation Type: Steel plank floor on I-beams, timber piles and timber abutments

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: Little to none; lack of vegetation under existing bridge

Interior Bents: None observed

Channel Bed: None observed; channel bed not visible through water

Channel Bank: None observed; banks well vegetated

EXISTING SCOUR PROTECTION

Type(3): 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

- Describe the specific site's location, including route number and body of water crossed.
- Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- Note existing scour protection (e.g. rip rap).
- Describe extent of existing scour protection.
- Describe whether or not the scour protection appears to be working.
- Note obstructions such as dams, fallen trees, debris at bents, etc.
- Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- Determine the approximate floodplain width from field observation or a topographic map.
- Describe the material covering the floodplain (e.g. grass, trees, crops).
- Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 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 theoretical 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 INFORMATION

Channel Bed Material(7): Silty, fine to coarse sand A-3, A-1-b

Channel Bank Material(8): Silty, fine to coarse sand A-2-4

Channel Bank Cover(9): Marsh grasses, shrubs, small to large trees

Floodplain Width(10): Approximately 1200 ft

Floodplain Cover(11): Grass, shrubs, small to large trees at end bent 1; grass at end bent 2

Stream is(12): Aggrading _____ Degrading _____ Static

Channel Migration Tendency(13): East; outer bend of channel

Observations and Other Comments: Quite water, tidal-influenced stream. Water tops bank to the west during high tide

Reported by: *Bill Deobald* Date: 12-22-06
 MACTEC Engineering and Consulting, Inc.

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

		BENTS							
		B1	B2	B3	B4	B5	B6	B7	B8
50yr/OT		-0.8	-0.8	-1.2	-9.7	-22.9	-23.7	-19.9	-1.3

Comparison of DSE to Hydraulics Unit theoretical scour:

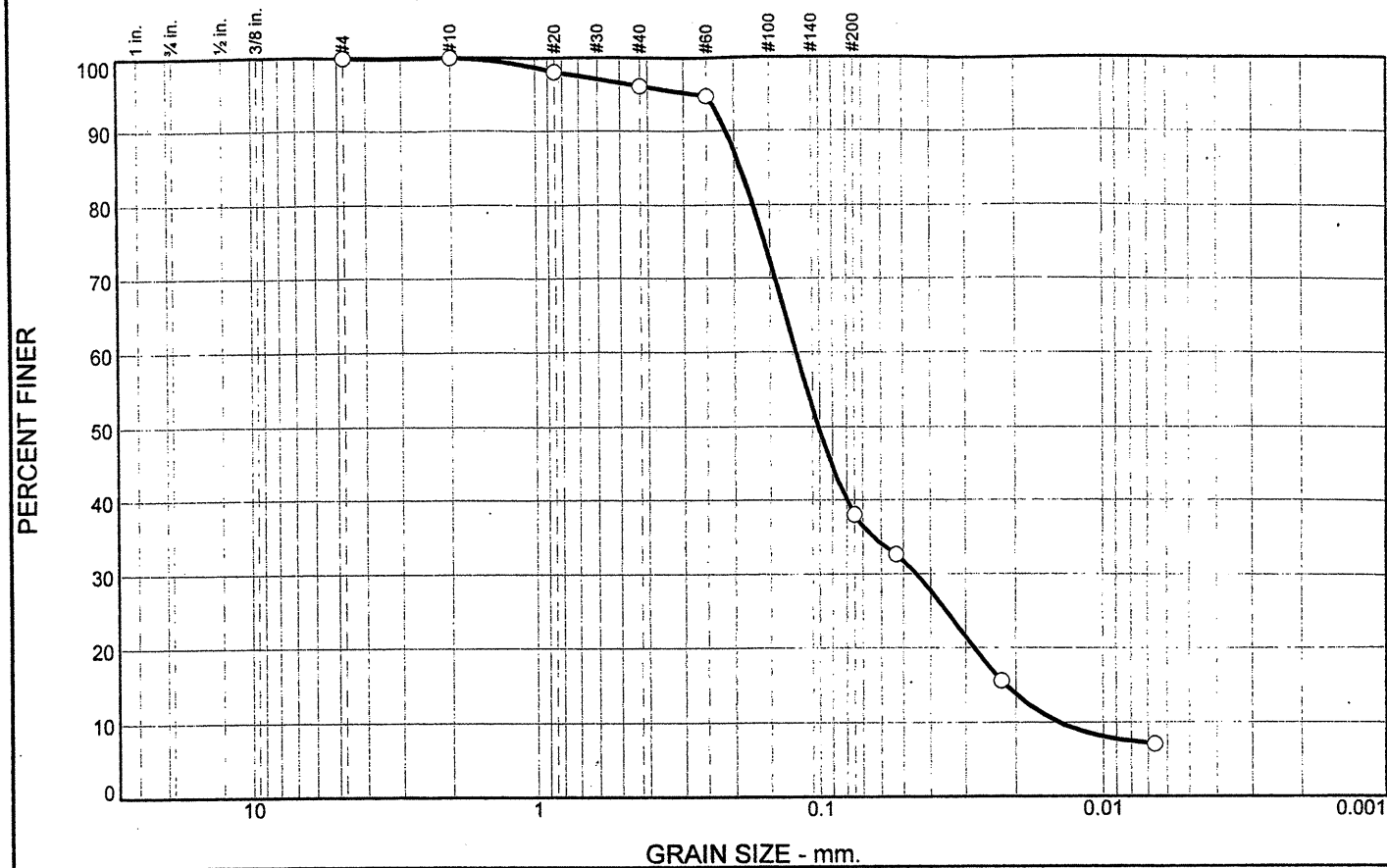
Based on theoretical scour calculations in the Bridge Survey & Hydraulic Design Report signed 2/15/06.

DSE determined by: *Charles M. Whalen, Jr.* Date: 1/4/2007

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank	Bank	Bed	Bed	Bed
Sample No.	S-1	S-2	SS-2	SS-14
Retained #4	1.7	0.3	0	0
Passed #10	97.8	99.5	100	100
Passed #40	72.9	70.7	96.2	47.5
Passed #200	11	4.8	38.1	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+21
Offset	26 ft RT	22 ft RT	9 ft LT	7 ft RT
Depth	0.0-0.5 ft	0.0-0.5 ft	6.9-8.4 ft	0.0-1.5 ft

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	3.8	58.1		38.1

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

Soil Description
Green gray brown sandy silt

Atterberg Limits
PL= NP LL= 61 PI= NP

Coefficients
D₈₅= 0.1896 D₆₀= 0.1211 D₅₀= 0.1010
D₃₀= 0.0448 D₁₅= 0.0216 D₁₀= 0.0142
C_u= 8.55 C_c= 1.17

Classification
USCS= SM AASHTO= A-5(0)

Remarks
ND-NOT DETERMINED

* (no specification provided)

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

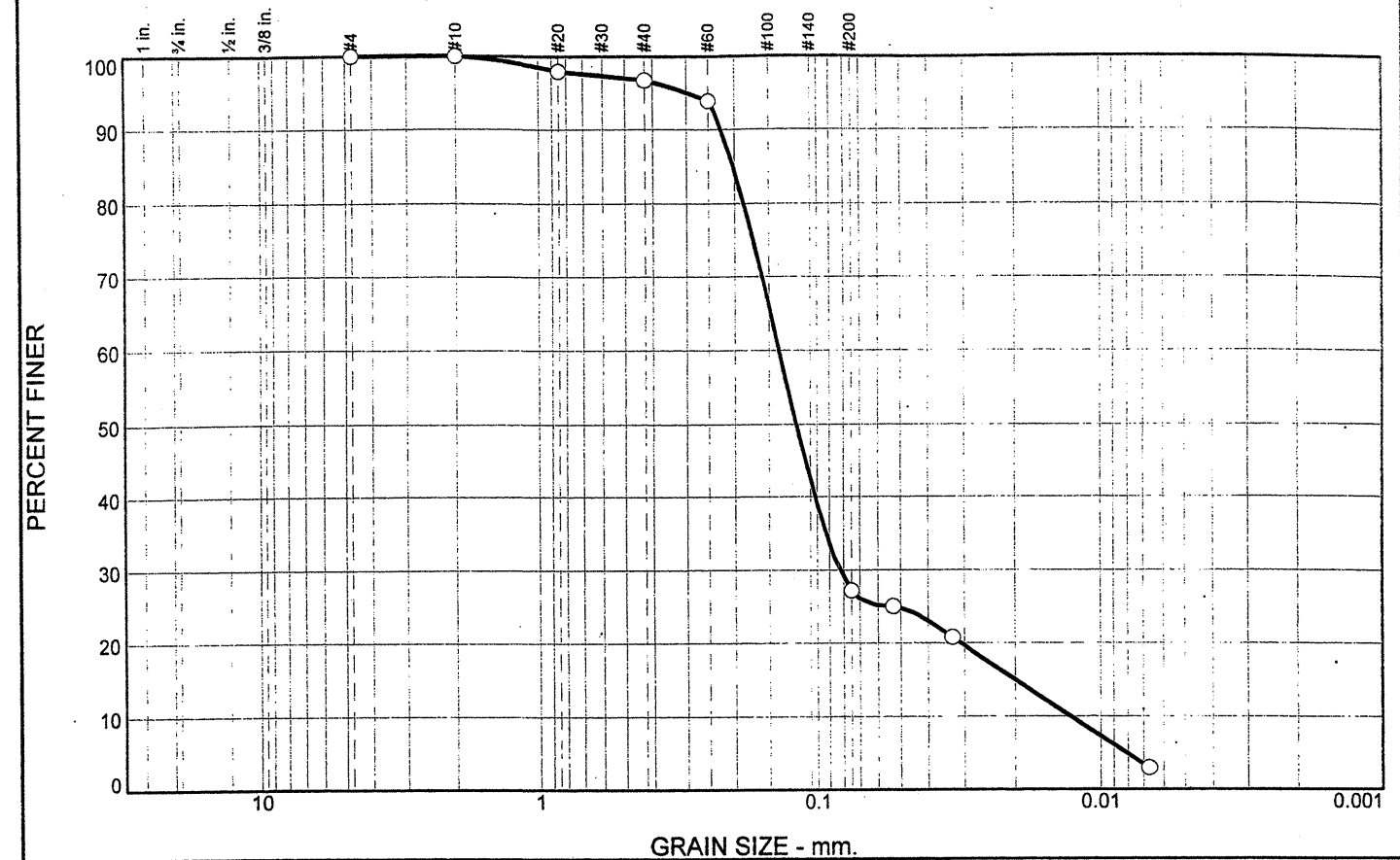
Figure

Tested By: JD

Checked By: AB

Particle Size Distribution Report

SHEET 37



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	3.2	69.6		27.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (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		

Soil Description
Gray silty sand

Atterberg Limits
PL= NP LL= 20 PI= NP

Coefficients
D₈₅= 0.2024 D₆₀= 0.1379 D₅₀= 0.1194
D₃₀= 0.0825 D₁₅= 0.0201 D₁₀= 0.0128
C_u= 10.77 C_c= 3.86

Classification
USCS= SM AASHTO= A-2-4(0)

Remarks
Non Plastic
Spatula method used to determine LL

* (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

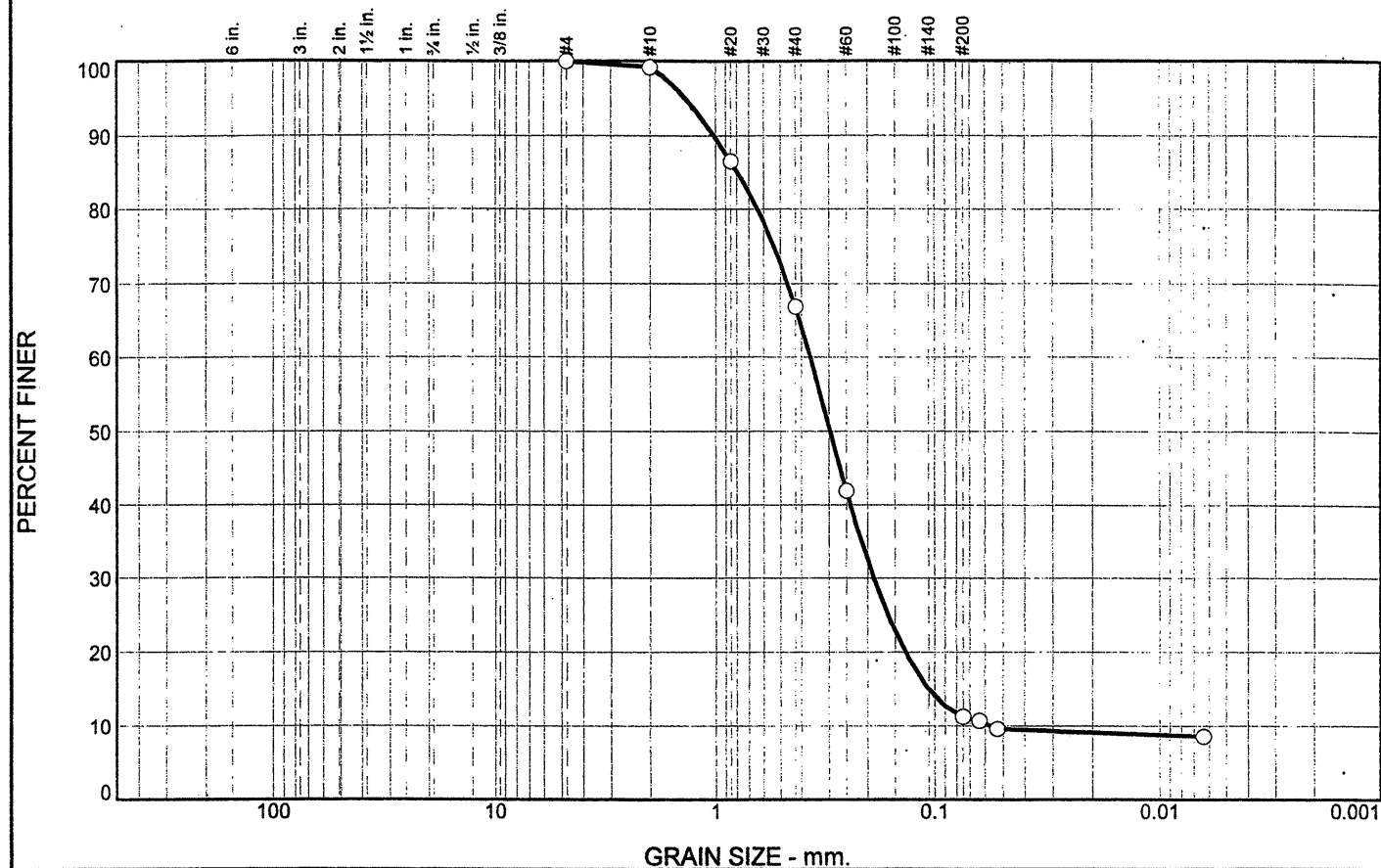
Project No: 6468061557

Figure

Tested By: JD

Checked By: AB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			0.7	32.3	55.6		11.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (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

Atterberg Limits
PL= NP LL= 20 PI= NP

Coefficients
D₈₅= 0.7889 D₆₀= 0.3638 D₅₀= 0.2961
D₃₀= 0.1868 D₁₅= 0.1060 D₁₀= 0.0567
C_u= 6.42 C_c= 1.69

Classification
USCS= SW-SM AASHTO= A-2-4(0)

Remarks

(no specification provided)

Sample No.: SS-10
Location:

Source of Sample: Boring B-1

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

MACTEC, Inc.

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

Raleigh, North Carolina

Project No: 6468061557.05

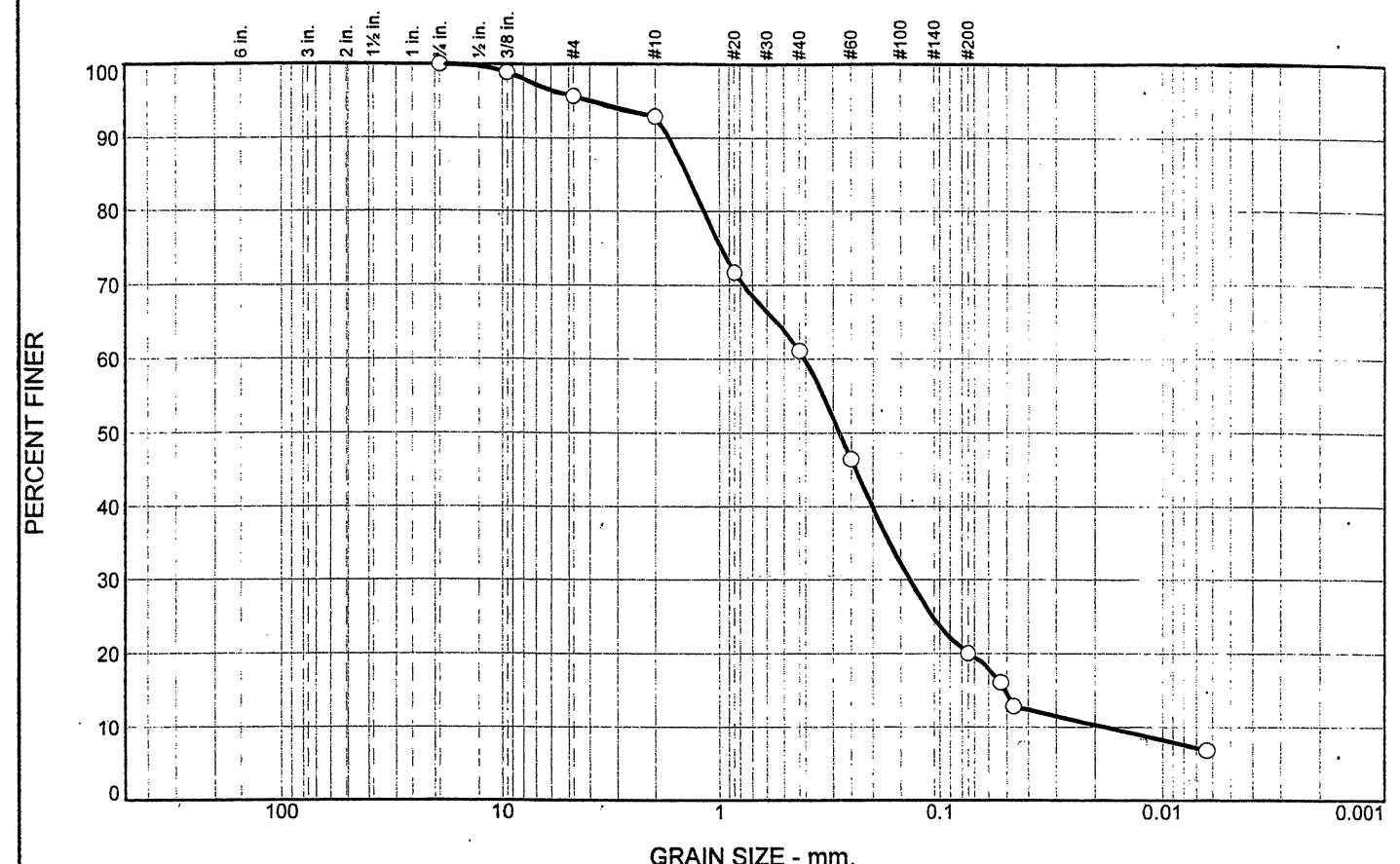
Figure

Tested By: LBJ

Checked By: ABS

Particle Size Distribution Report

SHEET 38



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.3	2.8	31.8	41.1		20.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (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		

Soil Description
Tan gray silty sand

Atterberg Limits
PL= NP LL= 17 PI= NP

Coefficients
D₈₅= 1.4106 D₆₀= 0.4030 D₅₀= 0.2804
D₃₀= 0.1371 D₁₅= 0.0506 D₁₀= 0.0181
C_u= 22.27 C_c= 2.58

Classification
USCS= SM AASHTO= A-2-4(0)

Remarks

(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.

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Raleigh, North Carolina

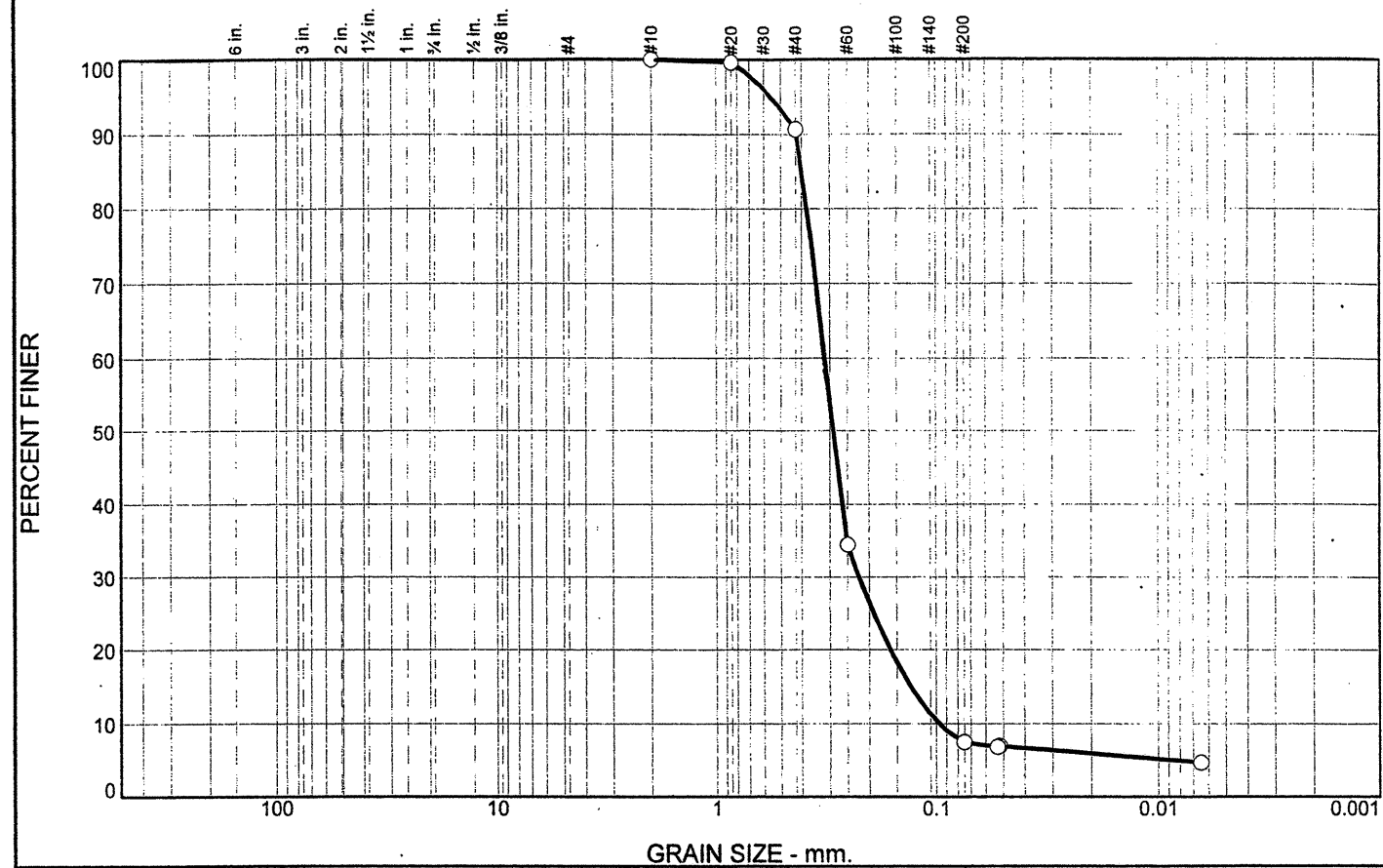
Project No: 6468061557.05

Figure

Tested By: LBJ

Checked By: ABS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	9.3	83.2	7.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.6		
#40	90.7		
#60	34.5		
#200	7.5		
#270	6.8		
0.0520 mm.	7.0		
0.0065 mm.	4.7		

Soil Description
Gray fine sand with organics

PL= NP **Atterberg Limits** PI= NP
LL= 24

Coefficients
D₈₅= 0.3969 D₆₀= 0.3152 D₅₀= 0.2893
D₃₀= 0.2213 D₁₅= 0.1297 D₁₀= 0.0969
C_u= 3.25 C_c= 1.60

Classification
USCS= SP-SM AASHTO= A-3

Remarks

* (no specification provided)

Sample No.: SS-13 Source of Sample: BORING B-3 Date: 11/25/06
Location: Elev./Depth: 21.5-23

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

Raleigh, North Carolina

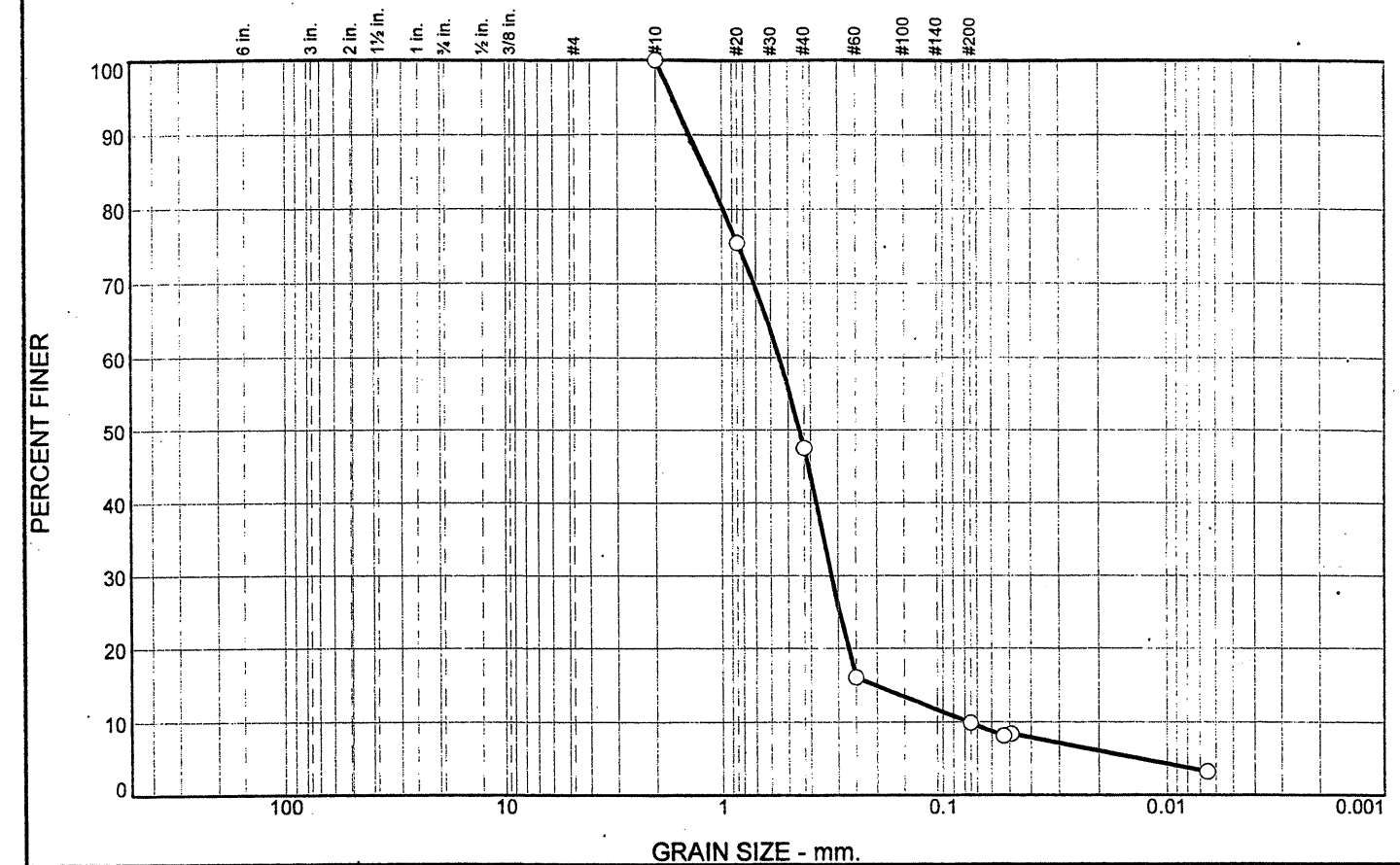
Project No: 6468061557.05 Figure

Tested By: LBJ

Checked By: ABS

Particle Size Distribution Report

SHEET 39



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	52.5	37.6	9.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (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		

Soil Description
Gray sand

PL= NP **Atterberg Limits** PI= NP
LL= 22

Coefficients
D₈₅= 1.1732 D₆₀= 0.5465 D₅₀= 0.4441
D₃₀= 0.3215 D₁₅= 0.2029 D₁₀= 0.0766
C_u= 7.14 C_c= 2.47

Classification
USCS= SW-SM AASHTO= A-1-b

Remarks
Specific gravity is assumed.

* (no specification provided)

Sample No.: SS-14 Source of Sample: BORING B-5 Date: 11/25/06
Location: Elev./Depth: 0-1.5'

MACTEC, Inc.

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

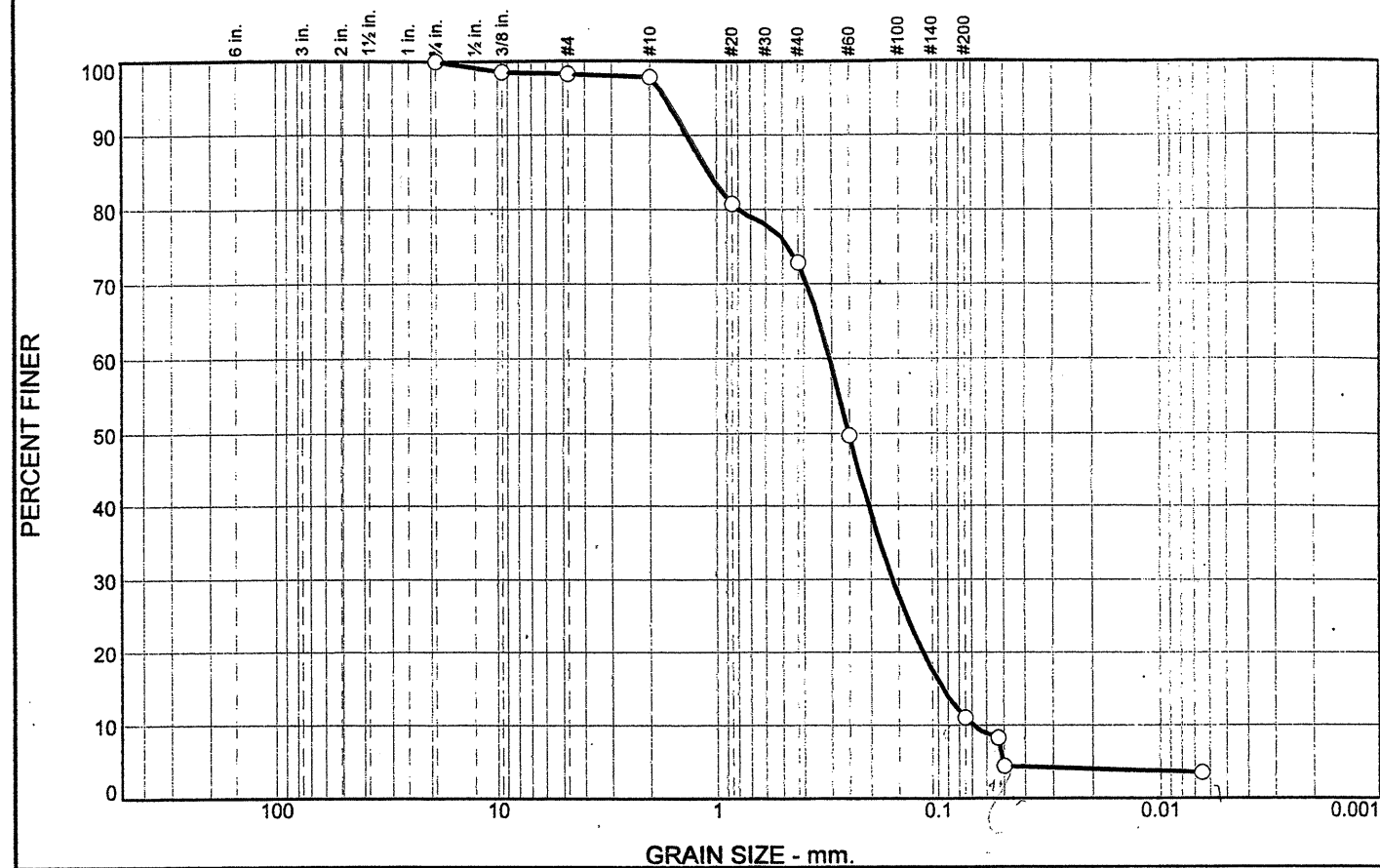
Raleigh, North Carolina

Project No: 6468061557.05 Figure

Tested By: LBJ

Checked By: ABS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.7	0.5	24.9	61.9		11.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (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		

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

(no specification provided)

Sample No.: S-1 Source of Sample: CHANNEL BANK Date: 11/27/06
 Location: Elev./Depth: 0-.5'

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

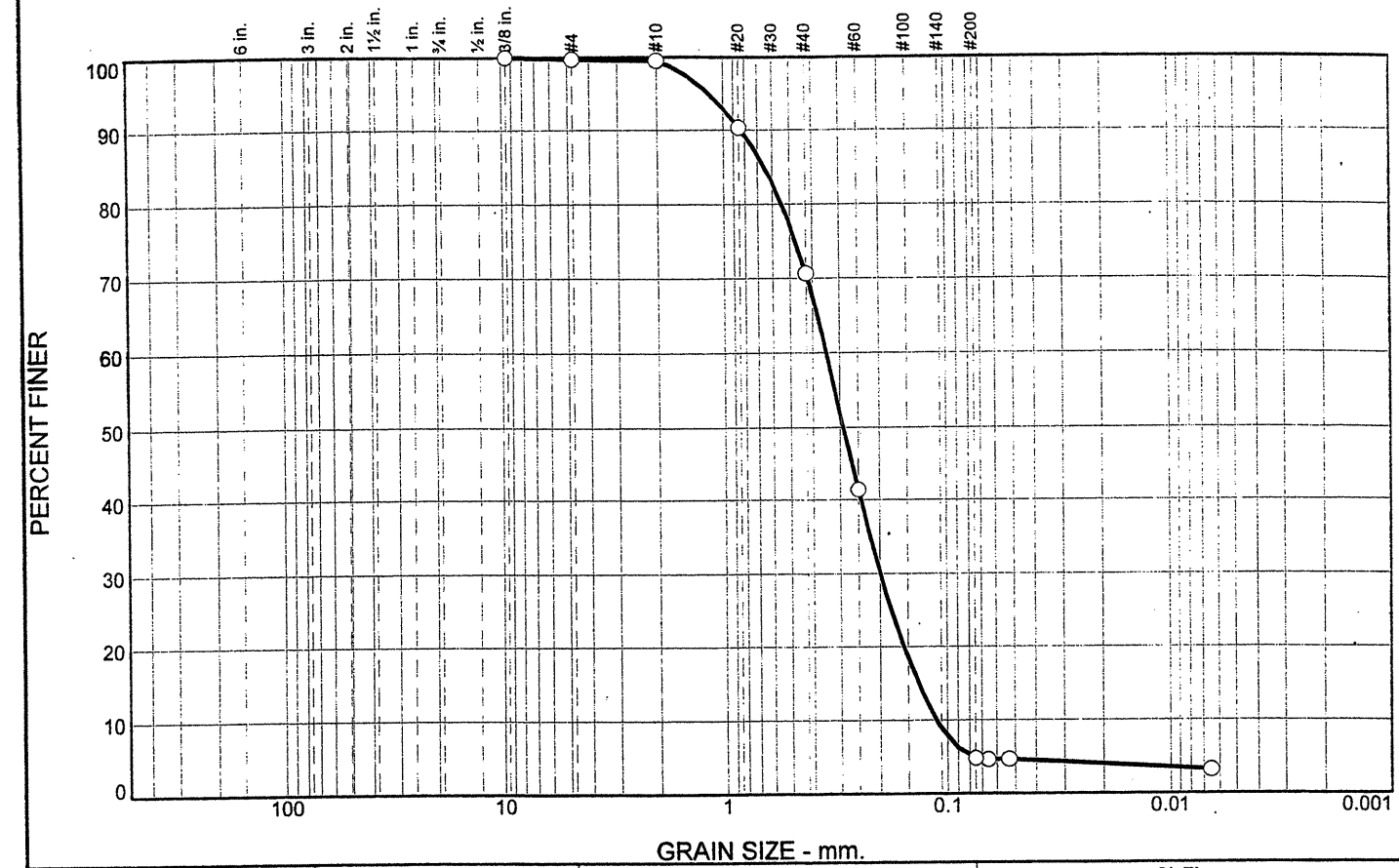
Raleigh, North Carolina

Project No: 6468061557.05 Figure

Tested By: LBJ Checked By: ABS

Particle Size Distribution Report

SHEET 40



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.2	28.8	65.9		4.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (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		
#270	4.7		
0.0065 mm.	3.3		

Soil Description		
BROWN GRAY SAND		
PL= NP	Atterberg Limits LL= 25 PI= NP	
Coefficients		
D ₈₅ = 0.6498	D ₆₀ = 0.3459	D ₅₀ = 0.2908
D ₃₀ = 0.1995	D ₁₅ = 0.1351	D ₁₀ = 0.1117
C _u = 3.10	C _c = 1.03	
Classification		
USCS= SP	AASHTO= A-3	
Remarks		
SPECIFIC GRAVITY IS ASSUMED.		

(no specification provided)

Sample No.: S-2 Source of Sample: CHANNEL BED Date: 11/27/06
 Location: 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

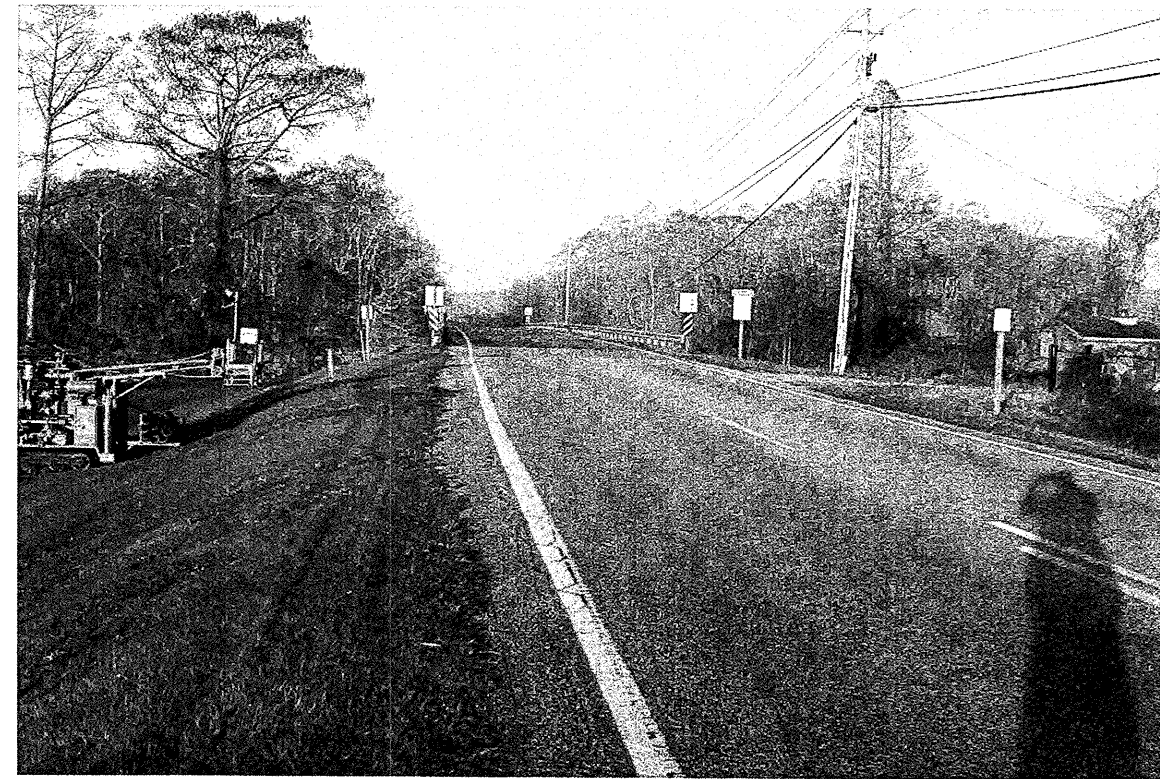
Tested By: LBJ Checked By: ABS



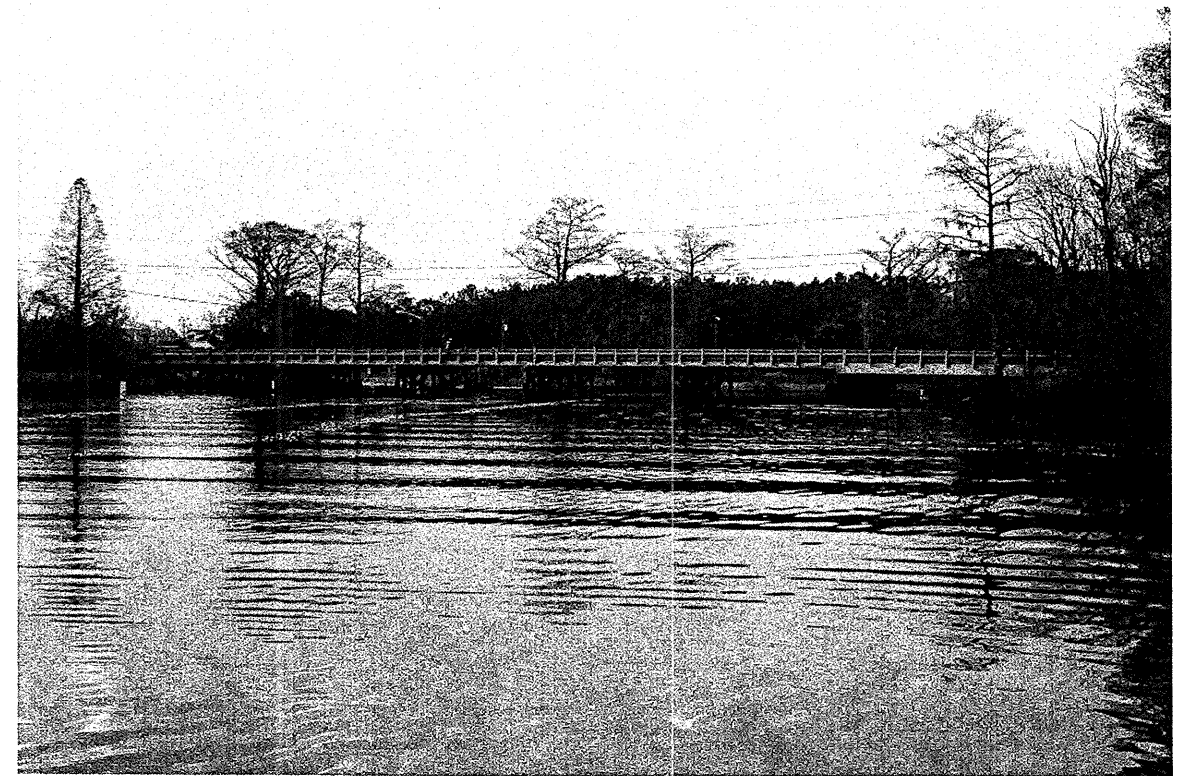
View looking east along approach to EB1



View looking north upstream



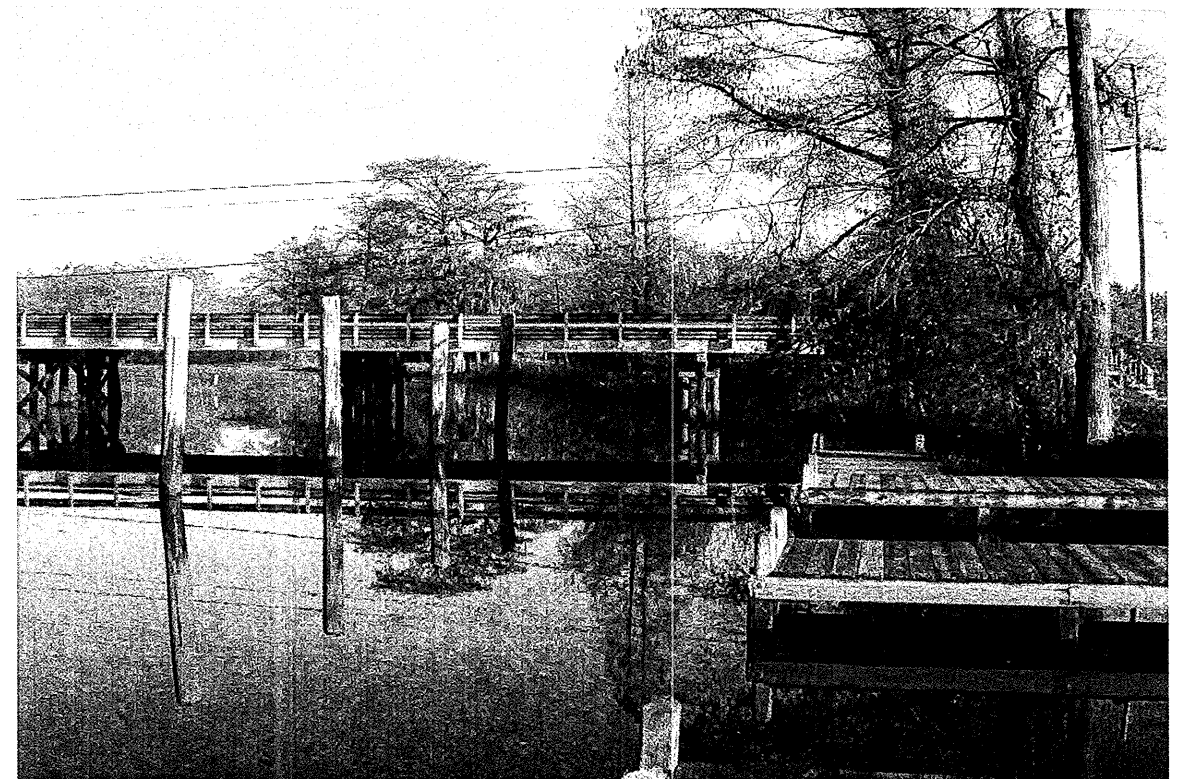
View looking west along approach to EB2



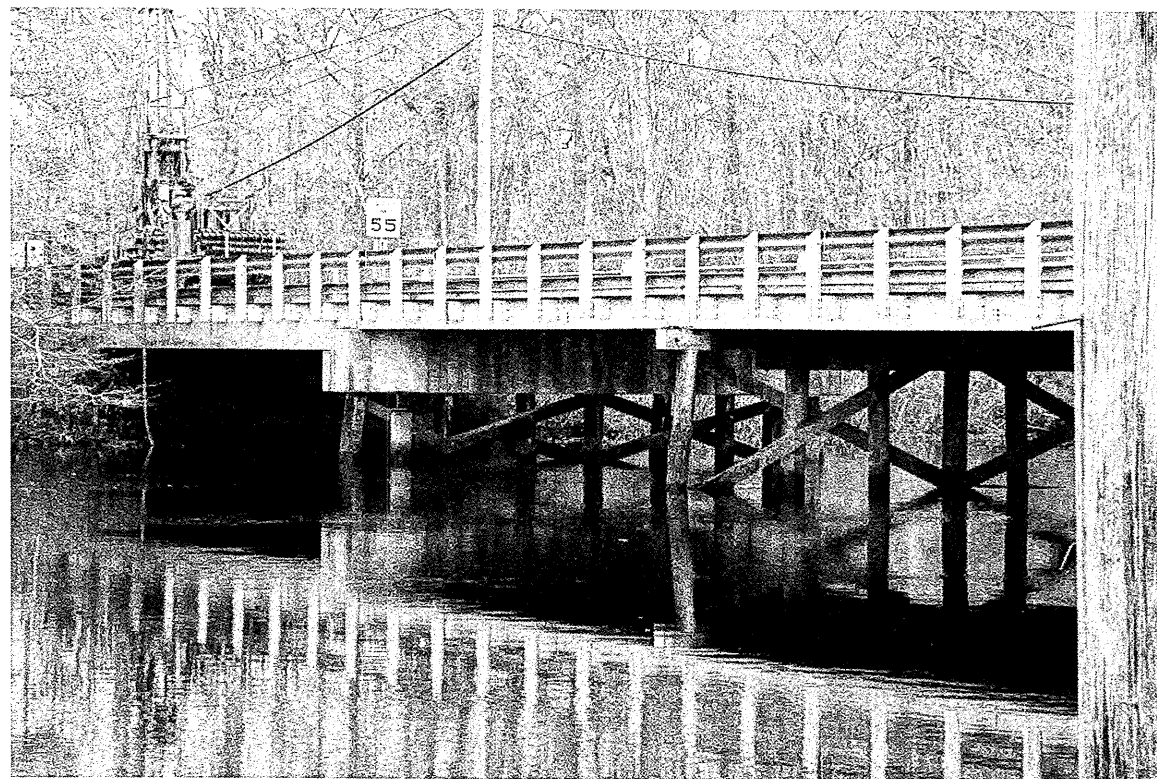
View looking south downstream



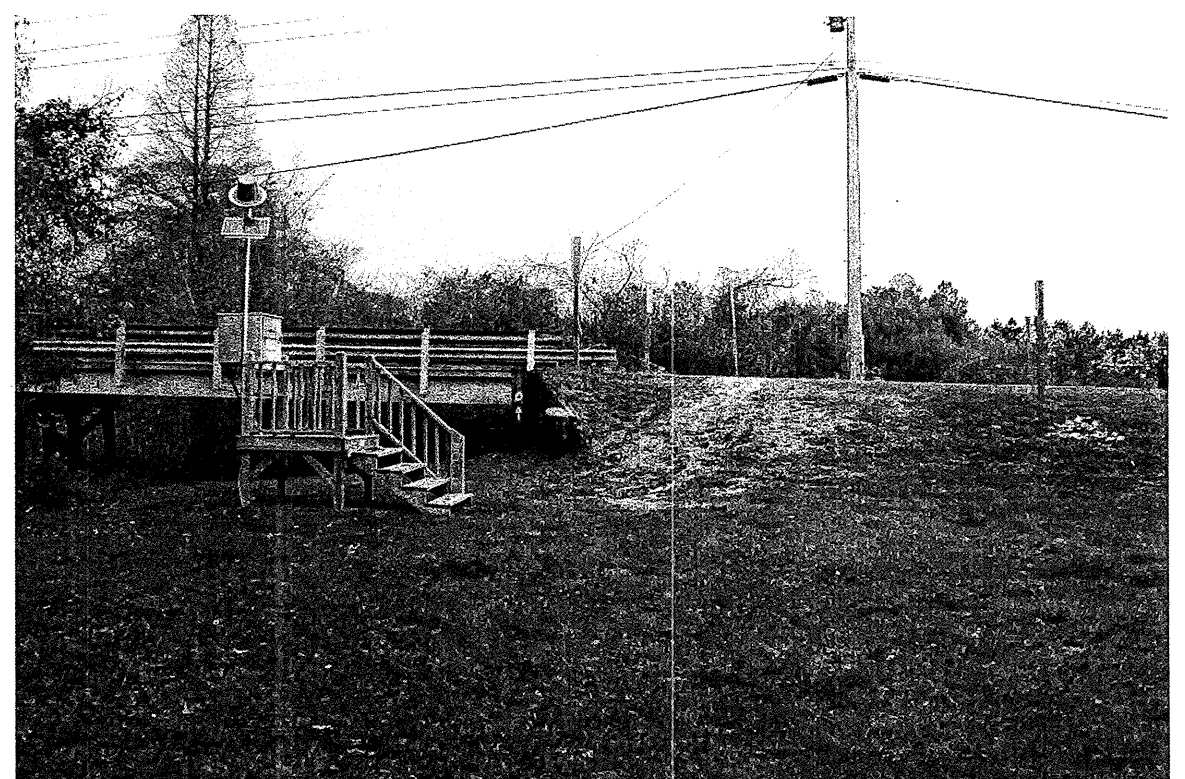
View looking south; drill rig at Bent 1



View looking north along Bents 7 and 8



View looking north; drill rig at Bent 3



View looking north along End Bent 2



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



View looking up-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 south side of bridge