ID: 33813.1.1

CONTRACT: C203000

NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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LINE	STATION	PLAN	PROFILE
-L-	16+30 TO 39+20	4-5	6-7

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-L-	16+50 TO 25+00	8-13
-L-	28+75 TO 39+00	14-21

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *33813.1.1 (B-4647)* F.A. PROJ. *BRSTP-94(1)*

COUNTY *TYRRELL*

PROJECT DESCRIPTION *BRIDGE NO. 6 ON NC 94 OVER NORTHWEST FORK*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4647	1	21

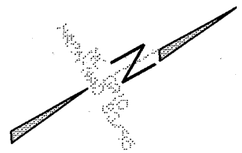
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33813.1.1	BRSTP-94(1)	P.E.
33813.2.1	BRSTP-94(1)	R/W & UTILITY
33813.3.1	BRSTP-94(1)	CONST.

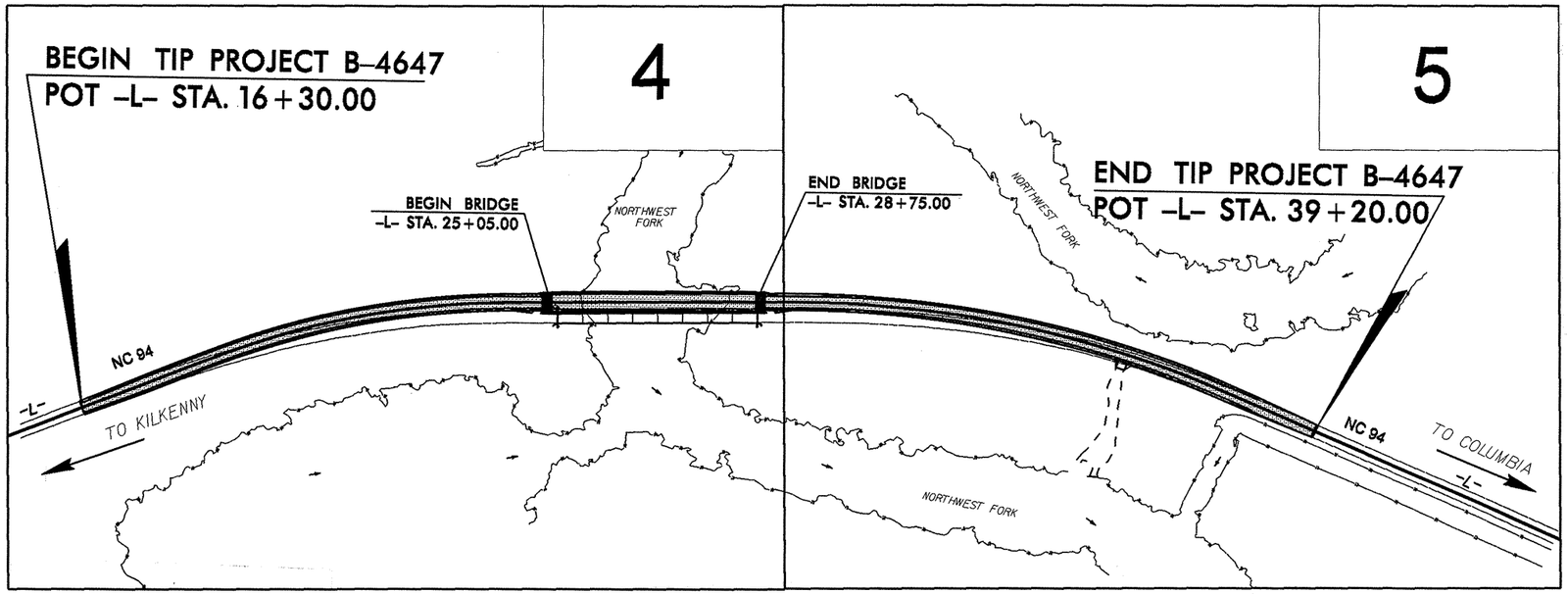
CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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





PERSONNEL

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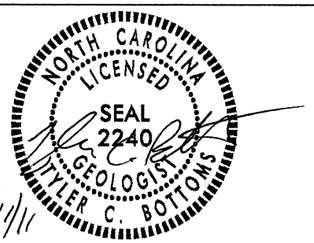
INVESTIGATED BY *T.C. BOTTOMS*

CHECKED BY *D.N. ARGENBRIGHT*

SUBMITTED BY *D.N. ARGENBRIGHT*

DATE *FEBRUARY 2011*



DRAWN BY: *C.P. TURNER*

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

PROJECT REFERENCE NO.	SHEET NO.
33813.1.1	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

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	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT	6 MX		N.P.	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR				FAIR TO POOR		POOR		UNSUITABLE		

P.I. OF A-7-5 SUBGROUP IS ≤ L.L. - 30 : P.I. OF A-7-6 SUBGROUP IS > L.L. - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12"	3"				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL - LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL - PLASTIC LIMIT		
OM - OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL - SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

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

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.

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
- STATIC WATER LEVEL AFTER 24 HOURS.
- PW - 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
- 25/025 - DIP/DIP DIRECTION OF ROCK STRUCTURES
- ● - SOUNDING ROD
- SPT DCP DPT DMT VST PMT - TEST BORING
- AUGER BORING
- CORE BORING
- PW - MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- SPT LAB SAMPLE

SAMPLE DESIGNATIONS
S- BULK SAMPLE
SS- SPLIT SPOON SAMPLE
ST- SHELBY TUBE SAMPLE
RS- ROCK SAMPLE
RT- RECOMPACTED TRIAXIAL SAMPLE
CBR - CBR SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F. - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
W - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- ☐ MOBILE B-___
- ☐ BK-51
- ☐ CME-45
- ☐ DIEDRICH D-50
- ☐ PORTABLE HOIST
- ☒ OTHER CME-750
- ☐ OTHER _____

ADVANCING TOOLS:
- ☐ DRAG BITS _____
- ☐ 6" CONTINUOUS FLIGHT AUGER
- ☐ 8" HOLLOW AUGERS
- ☐ HARD FACED FINGER BITS
- ☐ TUNG.-CARBIDE INSERTS
- ☒ CASING ☐ W/ ADVANCER
- ☒ TRICONE 2-15/16 " STEEL TEETH
- ☐ TRICONE _____ " TUNG.-CARB.
- ☐ CORE BIT
- ☐ OTHER _____

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

CORE SIZE:
- ☐ -B_____
- ☐ -N_____
- ☐ -H_____

HAND TOOLS:
- ☐ POST HOLE DIGGER
- ☐ HAND AUGER
- ☐ SOUNDING ROD
- ☐ VANE SHEAR TEST
- ☐ OTHER _____

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 FOLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK. BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V. SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGISTS PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGISTS PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	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 GEOLOGISTS PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	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 FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

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	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

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 IS 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 - 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 SOILS 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.

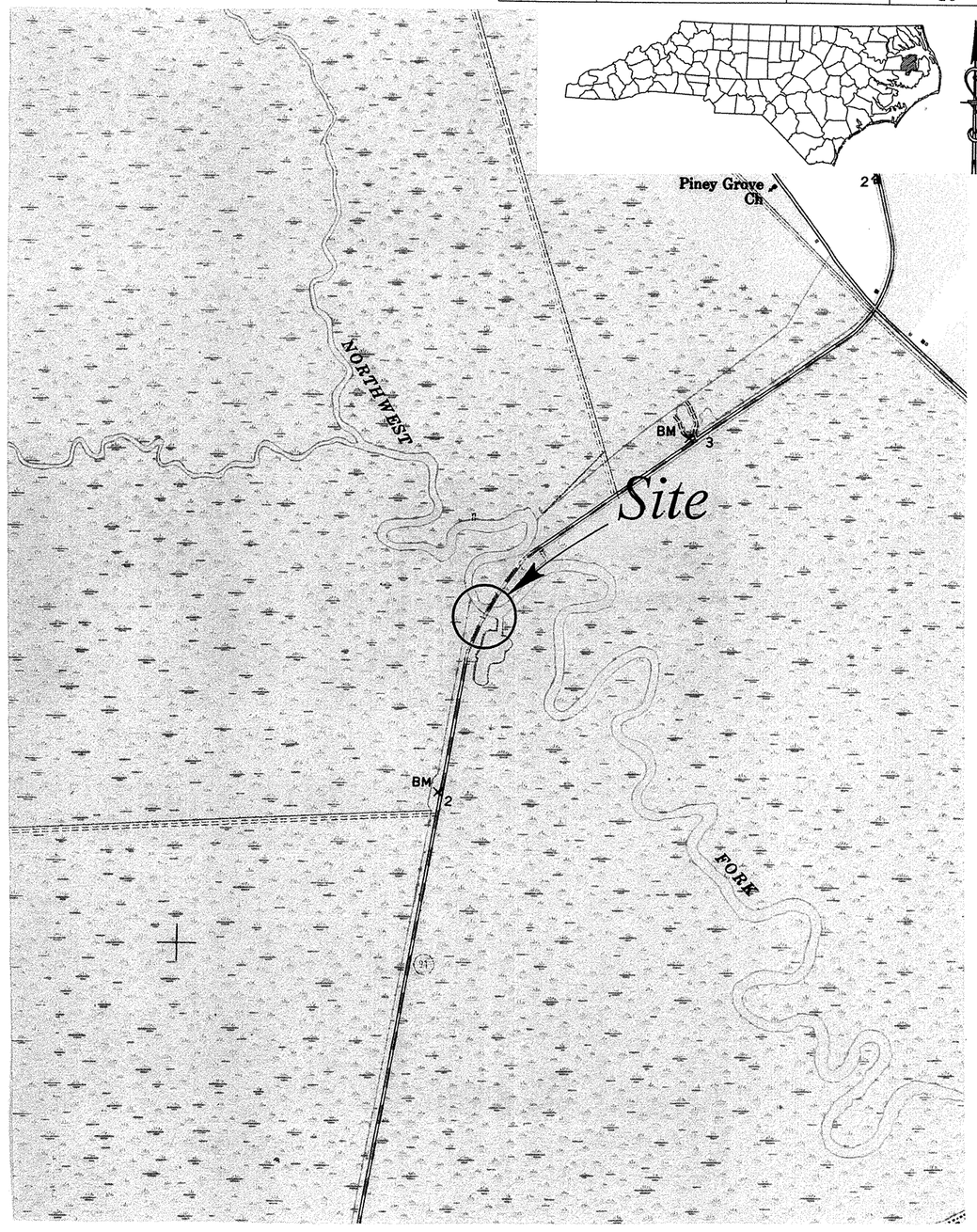
TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BL-5 NCDOT Traverse Station Rebar & Cap Stamped "BL-5"
Located at Station 48+40.36, -BL-
ELEVATION: 1.56'

NOTES:

REVISED 02/23/06

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-4647	33813.1.1	3	26



S:\PROJECTS\2008\08-202\GEOTECH\CADD\U-2826A -SITEVIC

SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	JUNE 2009
JOB NO.	1051-09-124

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING •TESTING

SITE VICINITY MAP

BRIDGE No. 6 ON NC 94
OVER NORTHWEST FORK OF ALLIGATOR RIVER
STATE PROJECT NO. 33813.1.1 TIP NO. B-4647
FEDERAL I.D. NO. BRSTP-94(1)
TYRRELL COUNTY, NORTH CAROLINA

-L- STA. 25+12.71 (7.21' RT)=
-BL- STA. 38+16.02 (BL-4)

BEGIN BRIDGE
-L- STA. 25+05.00

BEGIN APPR. SLAB
-L- STA. 24+90.00

NC GRID NAD 83/95

NORTHWEST FORK CREEK

BRIDGE# 6
LOWEST SEAT ELEV 4.90'
HIGH WATER MARK
1.8' HURRICANE ISABEL 2003

END BRIDGE
-L- STA. 28+75.00

END APPR. SLAB
-L- STA. 28+90.00

ABAND ISFD

WOODS

25

TO KILKENNY

TO COLUMBIA

6"PVC

6"PLASTIC

CONC WING WALL

-L- N 28° 47' 61" E 175' (BORE UNDER CREEK)

LIMITS OF 7 CORED SLABS

6"D.I. (SUSPENDED FROM BRIDGE)

ABANDONED

CONC WING WALL

EB1–B B1–B B2–B B3–B B4–B B5–B B6–B B7–B EB2–B

CONC WING WALL

CONC WING WALL

PT Sta. 24+30.89

PC Sta. 29+25.69

BENCHMARK:
BL-5 NCDOT TRAVERSE STATION REBAR & CAP STAMPED "BL-5"
LOCATED AT STA 48+40.36 -BL-
ELEV. = 1.56'

SKEW ANGLE FOR BENTS 90°00'00" (TYPICAL)

0 40 80
SCALE IN FEET

S:PROJECTS/2009/09-124/GEOTECH/CADD/B-4647 SITE PLAN.DGN

SCALE:	1" = 40'
DATE:	JUNE 2009
JOB NO.	105I-09-124
APPROVED BY:	AFR
DRAWN BY:	TRP
FIGURE	4

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

BORING LOCATION PLAN

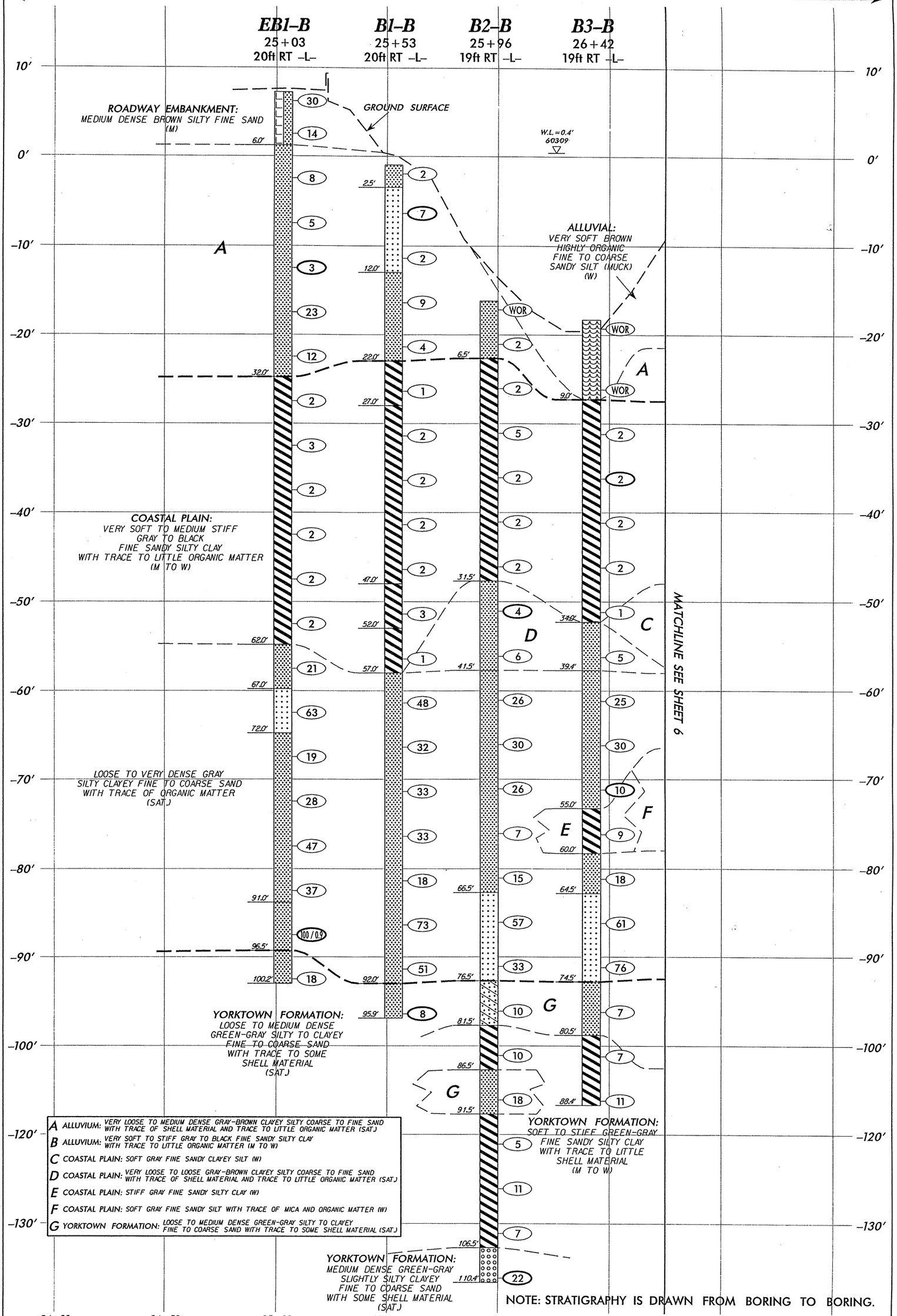
BRIDGE No. 6
OVER NORTHWEST FORK ALLIGATOR RIVER ON NC 94
TIP No. B-4647 STATE PROJECT No. 33813.1.1 FEDERAL I.D. BRSTP-94(1)
TYRRELL COUNTY, NORTH CAROLINA

GENERALIZED SUBSURFACE PROFILE 13' RIGHT OF -L-

TO KILKENNY

TO COLUMBIA

EB1–B	B1–B	B2–B	B3–B
25+03	25+53	25+96	26+42
20ft RT –L–	20ft RT –L–	19ft RT –L–	19ft RT –L–



- **A** ALLUVIUM: VERY LOOSE TO MEDIUM DENSE GRAY-BROWN CLAYEY SILTY COARSE TO FINE SAND WITH TRACE OF SHELL MATERIAL AND TRACE TO LITTLE ORGANIC MATTER (SAT.)
- **B** ALLUVIUM: VERY SOFT TO STIFF GRAY TO BLACK FINE SANDY SILTY CLAY WITH TRACE TO LITTLE ORGANIC MATTER (M TO W)
- **C** COASTAL PLAIN: SOFT GRAY FINE SANDY CLAYEY SILT (W)
- **D** COASTAL PLAIN: VERY LOOSE TO LOOSE GRAY-BROWN CLAYEY SILTY COARSE TO FINE SAND WITH TRACE OF SHELL MATERIAL AND TRACE TO LITTLE ORGANIC MATTER (SAT.)
- **E** COASTAL PLAIN: STIFF GRAY FINE SANDY SILTY CLAY (W)
- **F** COASTAL PLAIN: SOFT GRAY FINE SANDY SILT WITH TRACE OF MICA AND ORGANIC MATTER (W)
- **G** YORKTOWN FORMATION: LOOSE TO MEDIUM DENSE GREEN-GRAY SILTY TO CLAYEY FINE TO COARSE SAND WITH TRACE TO SOME SHELL MATERIAL (SAT.)

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE 13' RIGHT OF -L-

STATION 24+00 TO STATION 26+75

BRIDGE No. 6

OVER NORTHWEST FORK ALLIGATOR RIVER ON NC 94

TIP No. B-4647 STATE PROJECT No. 33813.1.1 FEDERAL I.D. BRSTP-94(1)

TYRRELL COUNTY, NORTH CAROLINA

S&ME

ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10' (H) 1" = 40'	APPROVED BY:	AFR
DATE:	JUNE 2009	DRAWN BY:	TRP
JOB NO.	1051-09-124	FIGURE	5

S:PROJECTS/2009/09-124/GEOTECH/CADD/B-4647 PROFILE.DGN

GENERALIZED SUBSURFACE PROFILE 13' RIGHT OF -L-

TO KILKENNY

TO COLUMBIA

B4–B	B5–B	B6–B	B7–B	EB2–B
26+88	27+32	27+77	28+24	28+74
19ft RT –L–	6ft RT –L–	21ft RT –L–	19ft RT –L–	20ft RT –L–

10′ 0′ -10′ -20′ -30′ -40′ -50′ -60′ -70′ -80′ -90′ -100′ -120′ -130′

W.L.=0.4' 6/30/09

GROUND SURFACE

5/20/2009

ALLUVIAL: VERY SOFT BROWN HIGHLY ORGANIC FINE TO COARSE SANDY SILT (MUCK) (W)

2.0′ 6.0′ 14.5′ 16.0′ 17.0′ 18.0′ 23.0′ 25.0′ 31.0′ 34.0′ 38.5′ 43.5′ 46.5′ 50.0′ 51.0′ 56.0′ 59.5′ 61.0′ 62.0′ 63.0′ 68.0′ 73.5′ 86.0′ 85.0′ 88.0′ 88.0′ 90.5′ 91.0′ 95.0′ 96.0′ 96.5′ 98.5′ 100.0′ 103.5′ 109.0′ 110.1′ 111.2′ 112.0′

A B C D E F G

MATCHLINE SEE SHEET 5

COASTAL PLAIN: VERY SOFT TO MEDIUM STIFF GRAY TO BLACK FINE SANDY SILTY CLAY WITH TRACE TO LITTLE ORGANIC MATTER (M TO W)

LOOSE TO VERY DENSE GRAY SILTY CLAYEY FINE TO COARSE SAND WITH TRACE OF ORGANIC MATTER (SAT.)

YORKTOWN FORMATION: SOFT TO STIFF GREEN-GRAY FINE SANDY SILTY CLAY WITH TRACE TO LITTLE SHELL MATERIAL (M TO W)

YORKTOWN FORMATION: SOFT TO STIFF GREEN-GRAY FINE SANDY SILTY CLAY WITH TRACE TO LITTLE SHELL MATERIAL (M TO W)

A	ALLUVIUM: VERY LOOSE TO MEDIUM DENSE GRAY-BROWN CLAYEY SILTY COARSE TO FINE SAND WITH TRACE OF SHELL MATERIAL AND TRACE TO LITTLE ORGANIC MATTER (SAT.)
B	ALLUVIUM: VERY SOFT TO STIFF GRAY TO BLACK FINE SANDY SILTY CLAY WITH TRACE TO LITTLE ORGANIC MATTER (M TO W)
C	COASTAL PLAIN: SOFT GRAY FINE SANDY CLAYEY SILT (W)
D	COASTAL PLAIN: VERY LOOSE TO LOOSE GRAY-BROWN CLAYEY SILTY COARSE TO FINE SAND WITH TRACE OF SHELL MATERIAL AND TRACE TO LITTLE ORGANIC MATTER (SAT.)
E	COASTAL PLAIN: STIFF GRAY FINE SANDY SILTY CLAY (W)
F	COASTAL PLAIN: SOFT GRAY FINE SANDY SILT WITH TRACE OF MICA AND ORGANIC MATTER (W)
G	YORKTOWN FORMATION: LOOSE TO MEDIUM DENSE GREEN-GRAY SILTY TO CLAYEY FINE TO COARSE SAND WITH TRACE TO SOME SHELL MATERIAL (SAT.)

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

26+00 26+50 27+00 27+50 28+00 28+50 29+00 29+50

GENERALIZED SUBSURFACE PROFILE 13' RIGHT OF -L-

STATION 26+75 TO STATION 29+50

BRIDGE No. 6

OVER NORTHWEST FORK ALLIGATOR RIVER ON NC 94

TIP No. B-4647 STATE PROJECT No. 33813.1.1 FEDERAL I.D. BRSTP-94(1)

TYRRELL COUNTY, NORTH CAROLINA

S&ME ENVIRONMENTAL SERVICES ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 40'	APPROVED BY:	AFR
DATE:	JUNE 2009	DRAWN BY:	TRP
JOB NO.	1051-09-124	FIGURE	6

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 25+03	**OFFSET** 20ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.2 ft	**TOTAL DEPTH** 100.2 ft	**NORTHING** 729,162	**EASTING** 2,832,865	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/28/09	**COMP. DATE** 05/28/09	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
	10									
	7.2	0.0								7.2 ASPHALT PAVEMENT 0.0
5			16	14	16	30		M		**ROADWAY EMBANKMENT** Medium Dense Brown Silty Fine SAND (A-2-4)
	3.5	3.7								1.2 6.0
0			5	6	8	14		M		**ALLUVIAL** Very Loose to Medium Dense Gray to Brown Clayey Silty Coarse to Fine SAND (A-2-4) With Trace of Shell Material and Organic Matter
	-1.5	8.7								
-5			5	4	4	8		Sat.		
	-6.5	13.7								
			2	3	2	5		Sat.		
-10										
	-11.5	18.7								2.9% Organics
			1	1	2	3	SS-1	Sat.		
-15										
	-16.5	23.7								
			9	10	13	23		Sat.		
-20										
	-21.5	28.7								
			7	8	4	12		Sat.		
-25										
	-26.5	33.7								
			1	1	1	2		W		
-30										
	-31.5	38.7								
			1	1	2	3		M		
-35										
	-36.5	43.7								
			1	1	1	2		M		
-40										
	-41.5	48.7								
			1	1	1	2		M		
-45										
	-46.5	53.7								
			WOH	1	1	2		M		
-50										
	-51.5	58.7								
			WOH	1	1	2		M		
-55										
	-56.5	63.7								
			5	9	12	21		Sat.		
-60										
	-61.5	68.7								
			14	25	38	63		Sat.		
-65										
	-66.5	73.7								
			5	9	10	19		Sat.		
-70										-24.8 32.0 **COASTAL PLAIN** Soft Gray Silty CLAY (A-7-6)
										-54.8 62.0 Medium Dense Gray Silty Fine SAND (A-2-4)
										-59.8 67.0 Very Dense Gray Fine to Coarse SAND (A-3)
										-64.8 72.0 Medium Dense to Dense Gray Silty Fine to Coarse SAND (A-2-4)

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 25+03	**OFFSET** 20ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.2 ft	**TOTAL DEPTH** 100.2 ft	**NORTHING** 729,162	**EASTING** 2,832,865	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/28/09	**COMP. DATE** 05/28/09	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
	-70					Match Line				
	-71.5	78.7	6	8	20	28		Sat.		Medium Dense to Dense Gray Silty Fine to Coarse SAND (A-2-4) *(continued)*
-75										
	-76.5	83.7	13	20	27	47		Sat.		
-80										
	-81.5	88.7	7	15	22	37		Sat.		
-85										-83.8 91.0
	-86.5	93.7	20	45	55/0.4	100/0.9	SS-2	Sat.		Very Dense Gray Slightly Silty Fine to Coarse SAND (A-2-4)
-90										-89.3 96.5
	-91.5	98.7	8	8	10	18		Sat.		**Yorktown Formation**: Medium Dense Green-Gray Silty Clayey Fine to Coarse SAND (A-2-4) With Some Shell Material
-95										-93.0 100.2
-100										Boring Terminated at Elevation -93.0 ft in Medium Dense Green-Gray Silty Clayey Fine to Coarse Sand.
-105										1) Advanced NW casing to 8.7 feet. 2) Advanced 2-15/16" Tricone to 98.7 feet. 3) River water used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) Some loss of drilling fluid observed. 6) Asphalt thickness 0.5 inches.
-110										
-115										
-120										
-125										
-130										
-135										
-140										
-145										
-150										

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94			**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 25+53	**OFFSET** 20ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -1.0 ft	**TOTAL DEPTH** 95.9 ft	**NORTHING** 729,205	**EASTING** 2,832,889	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/28/09	**COMP. DATE** 05/28/09	**SURFACE WATER DEPTH** 1.2ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
	5									WATER SURFACE (05/28/09)
0	-1.0	0.0								MUDLINE -1.0 0.0
			WOH	1	1	2		Sat.		**ALLUVIAL** Very Loose Gray Silty Fine SAND (A-2-4) With Trace of Organic Matter -3.5 2.5
-5	-5.4	4.4								
			3	3	4	7	SS-3	Sat.		Loose to Very Loose Gray Coarse to Fine SAND (A-3)
-10	-10.4	9.4								
			1	1	1	2		Sat.		-13.0 12.0
-15	-15.4	14.4								Loose Brown to Gray Silty Fine SAND (A-2-4)
			2	2	7	9		Sat.		
-20	-20.4	19.4								
			1	2	2	4		Sat.		-23.0 22.0
-25	-25.4	24.4								**COASTAL PLAIN** Very Soft Gray Fine Sandy CLAY (A-7-5)
			WOH	WOH	1	1		W		-28.0 27.0
-30	-30.4	29.4								Soft Gray Silty CLAY (A-7-6)
			1	1	1	2		M		
-35	-35.4	34.4								
			1	1	1	2		M		
-40	-40.4	39.4								
			1	1	1	2		M		
-45	-45.4	44.4								
			WOH	WOH	2	2		M		-48.0 47.0
-50	-50.4	49.4								Soft Gray Fine Sandy CLAY (A-7-5)
			4	1	2	3		W		-53.0 52.0
-55	-55.4	54.4								Very Soft Gray Silty CLAY (A-7-5) With Trace of Organic Matter
			WOH	WOH	1	1		W		-58.0 57.0
-60	-60.4	59.4								Medium Dense to Very Dense Gray Silty Fine to Coarse SAND (A-2-4) With Trace of Organic Matter
			12	20	28	48		Sat.		
-65	-65.4	64.4								
			9	11	21	32		Sat.		
-70	-70.4	69.4								
			10	14	19	33		Sat.		
-75										

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94			**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 25+53	**OFFSET** 20ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -1.0 ft	**TOTAL DEPTH** 95.9 ft	**NORTHING** 729,205	**EASTING** 2,832,889	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/28/09	**COMP. DATE** 05/28/09	**SURFACE WATER DEPTH** 1.2ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
	-75					Match Line				
	-75.4	74.4	11	16	17	33		Sat.		Medium Dense to Very Dense Gray Silty Fine to Coarse SAND (A-2-4) With Trace of Organic Matter *(continued)*
-80	-80.4	79.4								
			4	8	10	18		Sat.		
-85	-85.4	84.4								
			16	28	45	73		Sat.		
-90	-90.4	89.4								
			16	24	27	51		Sat.		-93.0 92.0
-95	-95.4	94.4								**Yorktown Formation**: Loose Green-Gray Slightly Silty Clayey Coarse to Fine SAND (A-2-4) With Trace of Shell Material -96.9 95.9
			5	4	4	8	SS-4	Sat.		
-100										Boring Terminated at Elevation -96.9 ft in Loose Green-Gray Slightly Silty Clayey Coarse to Fine Sand.
-105										1) Advanced NW casing to 29.4 feet. 2) Advanced 2-15/16" Tricone to 94.4 feet. 3) River water used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) Some loss of drilling fluid observed. 6) Bridge deck to mudline 9.3 feet.
-110										
-115										
-120										
-125										
-130										
-135										
-140										
-145										
-150										
-155										

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94			**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 25+96	**OFFSET** 19ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -16.2 ft	**TOTAL DEPTH** 110.4 ft	**NORTHING** 729,244	**EASTING** 2,832,909	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/27/09	**COMP. DATE** 05/27/09	**SURFACE WATER DEPTH** 16.3ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
	5									
0								▼		WATER SURFACE (05/27/09)
-5										
-10										
-15										
	-16.2	0.0	WOR	WOR	WOR	WOR		Sat.		-16.2 MUDLINE 0.0
-20	-20.1	3.9								**ALLUVIAL** Very Loose Gray Silty Fine SAND (A-2-4) With Trace of Organic Matter
			WOH	1	1	2		Sat.		
-25	-25.1	8.9								-22.7 6.5
			WOH	1	1	2		W		**COASTAL PLAIN** Soft to Medium Stiff Gray Fine Sandy Silty CLAY (A-7-6)
-30	-30.1	13.9								
			2	2	3	5		M		
-35	-35.1	18.9								
			1	1	1	2		M		
-40	-40.1	23.9								
			1	1	1	2		M		
-45	-45.1	28.9								
			WOH	1	1	2		M		-47.7 31.5
-50	-50.1	33.9								Loose Gray Slightly Silty Clayey Coarse to Fine SAND (A-2-4)
			2	2	2	4	SS-5	Sat.		
-55	-55.1	38.9								
			1	2	4	6		Sat.		-57.7 41.5
-60	-60.1	43.9								Medium Dense to Loose Gray Silty Fine SAND (A-2-4)
			8	11	15	26		Sat.		
-65	-65.1	48.9								
			13	14	16	30		Sat.		
-70	-70.1	53.9								
			11	13	13	26		Sat.		
-75	-75.1	58.9								

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94			**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 25+96	**OFFSET** 19ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -16.2 ft	**TOTAL DEPTH** 110.4 ft	**NORTHING** 729,244	**EASTING** 2,832,909	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/27/09	**COMP. DATE** 05/27/09	**SURFACE WATER DEPTH** 16.3ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
	-75					Match Line				
			4	3	4	7		Sat.		Medium Dense to Loose Gray Silty Fine SAND (A-2-4) *(continued)*
-80	-80.1	63.9								
			3	3	12	15		Sat.		-82.7 66.5
-85	-85.1	68.9								Very Dense to Dense Gray Fine to Coarse SAND (A-3) With Trace of Organic Matter
			12	23	34	57		Sat.		
-90	-90.1	73.9								-92.7 76.5
			10	12	21	33		Sat.		**Yorktown Formation**: Loose Green-Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material
-95	-95.1	78.9								-97.7 81.5
			6	5	5	10		Sat.		Stiff Green-Gray Fine Sandy CLAY (A-7-5) With Trace of Shell Material
-100	-100.1	83.9								
			3	3	7	10		W		-102.7 86.5
-105	-105.1	88.9								Medium Dense Green-Gray Silty Fine SAND (A-2-4) With Trace of Shell Material
			8	8	10	18		Sat.		-107.7 91.5
-110	-110.1	93.9								Medium Stiff to Stiff Green-Gray Fine Sandy CLAY (A-7-5) With Trace of Shell Material
			2	2	3	5		M		
-115	-115.1	98.9								
			3	5	6	11		M		
-120	-120.1	103.9								
			2	4	3	7		M		-122.7 106.5
-125	-125.1	108.9								Medium Dense Green-Gray Slightly Silty Clayey Fine to Coarse SAND (A-1-b) With Some Shell Material
			11	10	12	22	SS-6	Sat.		-126.6 110.4
-130										Boring Terminated at Elevation -126.6 ft in Medium Dense Green-Gray Slightly Silty Clayey Fine to Coarse Sand.
-135										1) Advanced NW casing to 13.9 feet. 2) Advanced 2-15/16" Tricone to 108.9 feet. 3) River water used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) Moderate loss of drilling fluid observed. 6) Bridge deck to mudline 24.8 feet.
-140										
-145										
-150										
-155										

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. B3-B	**STATION** 26+42	**OFFSET** 20ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -18.3 ft	**TOTAL DEPTH** 88.4 ft	**NORTHING** 729,284	**EASTING** 2,832,932	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing /2-15/16" Tricone			**HAMMER TYPE** Automatic
START DATE 05/26/09	**COMP. DATE** 05/26/09	**SURFACE WATER DEPTH** 18.1ft		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	0							▼		WATER SURFACE (05/26/09)
-18.3		0.0	WOR	WOR	WOR	WOR		W		**ALLUVIAL** Very Soft Brown Highly Organic Fine Sandy Silt (Muck)
-25.2		6.9	WOR	WOR	WOR	WOR		W		
-27.3		9.0								**COASTAL PLAIN** Soft to Very Soft Gray Fine Sandy Silty CLAY (A-7-5)
-30.2		11.9	WOH	1	1	2		M		
-35.2		16.9	1	1	1	2	SS-7	58%		
-40.2		21.9	1	1	1	2		M		
-45.2		26.9	WOH	1	1	2		M		
-50.2		31.9	WOH	WOH	1	1		M		
-52.3		34.0								Loose Gray Silty Fine SAND (A-2-4)
-55.2		36.9	1	1	4	5		Sat.		
-57.7		39.4								Loose to Medium Dense Gray Slightly Silty Clayey Fine SAND (A-2-4)
-60.2		41.9	7	10	15	25		Sat.		
-65.2		46.9	12	15	15	30		Sat.		
-70.2		51.9	4	3	7	10	SS-8	Sat.		
-73.3		55.0								Stiff Gray Fine Sandy Silty CLAY (A-7-5)
-75.2		56.9	WOR	6	3	9		W		
-78.3		60.0								
-80.2		61.9								

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NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. B3-B	**STATION** 26+42	**OFFSET** 20ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -18.3 ft	**TOTAL DEPTH** 88.4 ft	**NORTHING** 729,284	**EASTING** 2,832,932	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing /2-15/16" Tricone			**HAMMER TYPE** Automatic
START DATE 05/26/09	**COMP. DATE** 05/26/09	**SURFACE WATER DEPTH** 18.1ft		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-80					Match Line				
-85.2		66.9	5	5	13	18		Sat.		Medium Dense Silty Fine SAND (A-2-4) *(continued)*
-90.2		71.9	15	26	35	61		Sat.		Very Dense Gray Fine to Coarse SAND (A-3)
-95.2		76.9	24	30	46	76		Sat.		
-100.2		81.9	6	3	4	7		Sat.		**Yorktown Formation**: Loose Green-Gray Silty Fine SAND (A-2-4) With Trace of Shell Material
-105.2		86.9	2	3	4	7		M		Medium Stiff to Stiff Green-Gray Fine Sandy CLAY (A-7-5) With Trace of Shell Material
			5	5	6	11		M		
-106.7		88.4								Boring Terminated at Elevation -106.7 ft in Stiff Green-Gray Fine Sandy Clay.

1) Advanced NW casing to 16.9 feet (45 feet total used).
2) Advanced 2-15/16" Tricone to 86.9 feet.
3) River water used as drilling fluid.
4) Approximate drilling fluid density 62.4 pcf.
5) No loss of drilling fluid observed.
6) Bridge deck to mudline 27.0 feet.

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. B4-B	**STATION** 26+88	**OFFSET** 19ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -4.5 ft	**TOTAL DEPTH** 112.0 ft	**NORTHING** 729,324	**EASTING** 2,832,953	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/26/09	**COMP. DATE** 05/26/09	**SURFACE WATER DEPTH** 4.4ft		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	0									WATER SURFACE (05/26/09)
-5	-4.5	0.0								-4.5 MUDLINE 0.0
-10	-10.0	5.5	WOR	WOR	WOR	WOR		W		**ALLUVIAL** Very Soft Brown Highly Organic Fine Sandy Silt (Muck)
-15	-15.0	10.5	WOR	WOR	WOR	WOR		W		
-20	-20.0	15.5	WOR	WOR	WOR	WOR		W		
-25	-25.0	20.5	WOR	WOR	WOR	WOR		W		-21.5 17.0 Very Loose Brown Silty Fine SAND (A-2-4)
-30	-30.0	25.5	2	1	1	2		Sat.		-27.5 23.0 **COASTAL PLAIN** Soft to Very Soft Gray Silty CLAY (A-7-6)
-35	-35.0	30.5	WOH	1	1	2		W		
-40	-40.0	35.5	WOH	1	1	2		W		
-45	-45.0	40.5	1	1	1	2		W		
-50	-50.0	45.5	WOH	WOH	WOH	WOH		W		-48.0 43.5
-55	-55.0	50.5	4	1	2	3	SS-9	30%		Soft Gray Fine Sandy Clayey SILT (A-4)
-60	-60.0	55.5	WOH	1	2	3		W		-58.0 53.5 Loose to Medium Dense Gray Silty Fine SAND (A-2-4)
-65	-65.0	60.5	6	4	5	9		Sat.		
-70	-70.0	65.5	3	4	7	11		Sat.		-66.5 62.0 Soft Gray Fine Sandy Clayey SILT (A-4) With Trace of Mica and Organic Matter
-75	-75.0	70.5	WOH	2	2	4	SS-10	42%		
-80	-80.0	75.5	2	2	1	3		W		-78.0 73.5

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. B4-B	**STATION** 26+88	**OFFSET** 19ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -4.5 ft	**TOTAL DEPTH** 112.0 ft	**NORTHING** 729,324	**EASTING** 2,832,953	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/26/09	**COMP. DATE** 05/26/09	**SURFACE WATER DEPTH** 4.4ft		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-80					Match Line				
-85	-85.0	80.5	6	11	15	26		Sat.		Medium Dense to Dense Gray Silty Fine to Coarse SAND (A-2-4) *(continued)*
-90	-90.0	85.5	16	20	30	50		Sat.		
-95	-95.0	90.5	16	18	24	42		Sat.		-92.5 88.0 **Yorktown Formation**: Medium Dense to Loose Green-Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material
-100	-100.0	95.5	7	6	4	10		Sat.		
-105	-105.0	100.5	2	3	5	8		Sat.		-102.5 98.0 Medium Stiff to Soft Green-Gray Fine Sandy CLAY (A-7-5) With Trace of Shell Material
-110	-110.0	105.5	4	2	4	6		M		
-115	-115.0	110.5	2	2	2	4		M		
			2	2	2	4		M		-116.5 112.0 Boring Terminated at Elevation -116.5 ft in Soft Green-Gray Fine Sandy Clay. 1) Advanced NW casing to 30.5 feet. 2) Advanced 2-15/16" Tricone to 110.5 feet. 3) River water used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed. 6) Bridge deck to mudline 13.2 feet.
-120										
-125										
-130										
-135										
-140										
-145										
-150										
-155										
-160										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. B5-B	**STATION** 27+32	**OFFSET** 19ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -1.9 ft	**TOTAL DEPTH** 100.0 ft	**NORTHING** 729,363	**EASTING** 2,832,975	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/22/09	**COMP. DATE** 05/22/09	**SURFACE WATER DEPTH** 1.5ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	0									WATER SURFACE (05/22/09)
	-1.9	0.0								ELEV. (ft) -1.9 MUDLINE 0.0
-5	-5.4	3.5	WOR	WOR	WOR	WOR		W		**ALLUVIAL** Very Soft Brown Highly Organic Fine to Coarse Sandy Clayey SILT (Muck) 23.4% Organics
-10	-10.4	8.5	WOR	WOR	WOR	WOR	SS-11	W		-7.9 6.0
			WOH	1	2	3		Sat.		Very Loose Gray Silty Fine SAND (A-2-4)
-15	-15.4	13.5								
			WOH	WOH	WOH	WOH		Sat.		-17.9 16.0
-20	-20.4	18.5								Very Soft to Soft Dark Gray Silty CLAY (A-7-6) With Trace of Organic Matter
			WOR	WOR	WOR	WOR		W		
-25	-25.4	23.5								
			WOR	WOR	WOR	WOR		W		
-30	-30.4	28.5								
			WOH	WOH	WOH	WOH		W		
-35	-35.4	33.5								
			WOH	1	2	3		W		-35.9 34.0
-40	-40.4	38.5								**COASTAL PLAIN** Very Soft to Soft Dark Gray Silty CLAY (A-7-6) With Trace of Organic Matter
			1	1	1	2		W		
-45	-45.4	43.5								
			WOH	1	1	2		W		
-50	-50.4	48.5								
			1	1	1	2		W		-52.9 51.0
-55	-55.4	53.5								Loose Gray Silty Fine SAND (A-2-4)
			2	2	2	4		Sat.		
-60	-60.4	58.5								-61.4 59.5
			2	2	4	6		Sat.		Loose to Very Dense Gray Slightly Silty Clayey Fine SAND (A-2-4)
-65	-65.4	63.5								
			2	4	8	12		Sat.		
-70	-70.4	68.5								
			6	4	13	17		Sat.		
-75	-75.4	73.5								
			10	14	22	36	SS-12	Sat.		
-80										

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. B5-B	**STATION** 27+32	**OFFSET** 19ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -1.9 ft	**TOTAL DEPTH** 100.0 ft	**NORTHING** 729,363	**EASTING** 2,832,975	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/22/09	**COMP. DATE** 05/22/09	**SURFACE WATER DEPTH** 1.5ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-80					Match Line				
	-80.4	78.5	16	19	29	48		Sat.		Loose to Very Dense Gray Slightly Silty Clayey Fine SAND (A-2-4) *(continued)*
-85	-85.4	83.5								
			17	28	45	73		Sat.		-87.9 86.0
-90	-90.4	88.5								Very Dense Gray Fine to Coarse SAND (A-3)
			20	40	43	83		Sat.		
-95	-95.4	93.5								-93.9 92.0
			7	4	5	9		Sat.		**Yorktown Formation:** Loose Green-Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material
-100	-100.4	98.5								-98.4 96.5
			2	2	4	6		W		Medium Stiff Green-Gray Fine Sandy CLAY (A-7-5) With Trace of Shell Material
-105										-101.9 100.0
										Boring Terminated at Elevation -101.9 ft in Medium Stiff Green-Gray Fine Sandy Clay.
-110										1) Advanced NW casing to 38.5 feet. 2) Advanced 2-15/16" Tricone to 98.5 feet. 3) River water used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed. 6) Bridge deck to mudline 10.4 feet.
-115										
-120										
-125										
-130										
-135										
-140										
-145										
-150										
-155										
-160										

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. B6-B	**STATION** 27+77	**OFFSET** 21ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -2.9 ft	**TOTAL DEPTH** 109.0 ft	**NORTHING** 729,401	**EASTING** 2,832,998	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/21/09	**COMP. DATE** 05/21/09	**SURFACE WATER DEPTH** 2.3ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	0									WATER SURFACE (05/21/09)
	-2.9	0.0								-2.9 MUDLINE 0.0
-5			WOH	WOH	WOH	WOH		W		**ALLUVIAL** Very Soft Brown Highly Organic Fine Sandy SILT (Muck) -4.9 2.0
-10	-10.4	7.5	3	2	1	3		Sat.		Very Loose Gray Fine SAND (A-3)
-15	-15.4	12.5	WOH	WOH	WOH	WOH		Sat.		-17.4 14.5
-20	-20.4	17.5								Very Soft Black Silty CLAY (A-7-6) With Little Organic Matter
-25	-25.4	22.5	WOH	WOH	WOH	WOH		W		
-30	-30.4	27.5	WOR	WOR	WOR	WOR		W		
-35	-35.4	32.5	WOH	1	3	4		Sat.		-27.9 25.0 Loose Gray Silty Fine SAND (A-2-4) With Little Organic Matter
-40	-40.4	37.5	WOH	1	1	2		W		-33.9 31.0 **COASTAL PLAIN** Soft Dark Gray Silty CLAY (A-7-6)
-45	-45.4	42.5	1	1	2	3		W		
-50	-50.4	47.5	WOH	1	1	2		W		
-55	-55.4	52.5	1	3	6	9		Sat.		-49.4 46.5 Loose Gray Silty Fine SAND (A-2-4)
-60	-60.4	57.5	1	2	1	3		W		-52.9 50.0 Soft to Medium Stiff Gray Fine Sandy Silty CLAY (A-7-6)
-65	-65.4	62.5	1	3	2	5	SS-13	44%		-63.9 61.0 Loose to Dense Gray Silty Fine to Coarse SAND (A-2-4)
-70	-70.4	67.5	6	9	11	20		Sat.		
-75	-75.4	72.5	9	9	10	19		Sat.		
-80			7	3	6	9		Sat.		

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. B6-B	**STATION** 27+77	**OFFSET** 21ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -2.9 ft	**TOTAL DEPTH** 109.0 ft	**NORTHING** 729,401	**EASTING** 2,832,998	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/21/09	**COMP. DATE** 05/21/09	**SURFACE WATER DEPTH** 2.3ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-80	-80.4	77.5	6	4	8	12		Sat.		Match Line Loose to Dense Gray Silty Fine to Coarse SAND (A-2-4) *(continued)*
-85	-85.4	82.5	13	20	17	37		Sat.		-87.9 85.0 Very Dense Gray Fine to Coarse SAND (A-1-b)
-90	-90.4	87.5	19	34	48	82	SS-14	Sat.		-93.4 90.5 **Yorktown Formation**: Medium Dense Green-Gray Silty Fine SAND (A-2-4)
-95	-95.4	92.5	8	6	5	11		Sat.		-97.9 95.0 With Trace of Shell Material
-100	-100.4	97.5	3	6	3	9		W		Stiff to Medium Stiff Green-Gray Fine Sandy CLAY (A-7-5) With Little Shell Material
-105	-105.4	102.5	2	2	3	5		W		
-110	-110.4	107.5	2	3	3	6		W		-111.9 109.0 Boring Terminated at Elevation -111.9 ft in Medium Stiff Green-Gray Fine Sandy Clay.
-115										1) Advanced NW casing to 37.5 feet. 2) Advanced 2-15/16" Tricone to 107.5 feet. 3) River water used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) Moderate loss of drilling fluid observed. 6) Bridge deck to mudline 11.0 feet.
-120										
-125										
-130										
-135										
-140										
-145										
-150										
-155										
-160										

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94			**GROUND WTR (ft)**
BORING NO. B7-B	**STATION** 28+24	**OFFSET** 19ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -2.4 ft	**TOTAL DEPTH** 110.1 ft	**NORTHING** 729,443	**EASTING** 2,833,019	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/20/09	**COMP. DATE** 05/20/09	**SURFACE WATER DEPTH** 2.0ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft) — DEPTH (ft)
	0							▼		WATER SURFACE (05/20/09)
	-2.4	0.0								-2.4 MUDLINE 0.0
-5	-6.0	3.6	1	4	4	8		Sat.		**ALLUVIAL** Very Loose to Medium Dense Gray to Brown Coarse to Fine SAND (A-3) With Trace of Shell Material and Organic Matter
-10	-11.0	8.6	4	4	3	7		Sat.		
-15	-16.0	13.6	2	1	1	2		Sat.		
-20	-21.0	18.6	1	1	1	2		Sat.		
-25	-26.0	23.6	2	1	2	3		Sat.		
-30	-31.0	28.6	2	1	1	2		Sat.		
-35	-36.0	33.6	5	4	8	12	SS-15	Sat.		-33.4 31.0 **COASTAL PLAIN** Soft to Very Soft Gray Fine Sandy Silty CLAY (A-7-6)
-40	-41.0	38.6	WOH	1	1	2		W		
-45	-46.0	43.6	1	1	1	2		W		
-50	-51.0	48.6	WOH	1	1	2		W		
-55	-56.0	53.6	1	1	2	3		W		
-60	-61.0	58.6	WOH	WOH	1	1		W		-58.4 56.0 Loose Gray Silty Fine SAND (A-2-4)
-65	-66.0	63.6	1	2	3	5		Sat.		-63.4 61.0 Medium Dense to Very Dense Gray Silty Fine to Coarse SAND (A-2-4)
-70	-71.0	68.6	7	18	27	45		Sat.		
-75	-76.0	73.6	11	16	25	41		Sat.		
-80			12	11	12	23		Sat.		

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94			**GROUND WTR (ft)**
BORING NO. B7-B	**STATION** 28+24	**OFFSET** 19ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. -2.4 ft	**TOTAL DEPTH** 110.1 ft	**NORTHING** 729,443	**EASTING** 2,833,019	**24 HR.** N/A
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone		**HAMMER TYPE** Automatic	
START DATE 05/20/09	**COMP. DATE** 05/20/09	**SURFACE WATER DEPTH** 2.0ft	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft) — DEPTH (ft)
	-80					Match Line				
-85	-81.0	78.6	16	15	20	35		Sat.		Medium Dense to Very Dense Gray Silty Fine to Coarse SAND (A-2-4) *(continued)*
-90	-86.0	83.6	19	27	36	63		Sat.		-88.4 86.0 Very Dense Gray-Brown Fine to Coarse SAND (A-3)
-95	-91.0	88.6	11	25	28	53	SS-16	Sat.		-93.4 91.0 **Yorktown Formation**: Loose Green-Gray Silty Fine SAND (A-2-4) With Trace of Shell Material
-100	-96.0	93.6	5	4	5	9		Sat.		-98.4 96.0 Medium Stiff Green-Gray Fine Sandy Silty CLAY (A-7-5) With Trace of Shell Material
-105	-101.0	98.6	2	5	3	8		W		
-110	-106.0	103.6	2	2	3	5		W		
-115	-111.0	108.6	1	2	3	5		W		-112.5 110.1 Boring Terminated at Elevation -112.5 ft in Medium Stiff Green-Gray Fine Sandy Silty Clay.
-120										1) Advanced NW casing to 23.6 feet. 2) Advanced 2-15/16" Tricone to 108.6 feet. 3) River water used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) Some loss of drilling fluid observed. 6) Bridge deck to mudline 10.0 feet.
-125										
-130										
-135										
-140										
-145										
-150										
-155										
-160										

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 28+74	**OFFSET** 20ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 3.1 ft	**TOTAL DEPTH** 111.2 ft	**NORTHING** 729,487	**EASTING** 2,833,044	**24 HR.** 3.2
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone			**HAMMER TYPE** Automatic
START DATE 05/19/09	**COMP. DATE** 05/19/09	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	5									ELEV. (ft) DEPTH (ft)
	3.1	0.0								3.1 GROUND SURFACE 0.0
0			WOH	1	1	2		M		**ALLUVIAL** Very Loose to Medium Dense Brown-Gray Fine SAND (A-3) With Shell Material and Trace of Organic Matter
	-1.7	4.8								
-5			5	7	4	11		Sat.		
	-6.7	9.8								
-10			2	2	3	5		Sat.		
	-11.7	14.8								
-15			2	1	2	3		Sat.		
	-16.6	19.7								-14.9 18.0
-20			1	7	2	9	SS-17	W		Stiff Black Fine Sandy Silty CLAY (A-7-5)
	-21.6	24.7								-19.9 23.0
-25			3	3	6	9		Sat.		Loose to Medium Dense Brown-Gray Fine SAND (A-3) With Trace of Organic Matter
	-26.6	29.7								
-30			3	3	4	7		Sat.		
	-31.6	34.7								
-35			8	9	5	14		Sat.		
	-36.6	39.7								-35.4 38.5
-40			1	1	1	2		W		**COASTAL PLAIN** Very Soft to Medium Stiff Gray Fine Sandy Silty CLAY (A-7-6)
	-41.6	44.7								
-45			WOH	WOH	1	1		W		
	-46.6	49.7								
-50			WOH	1	2	3		W		
	-51.6	54.7								
-55			1	2	3	5		W		
	-56.6	59.7								
-60			1	WOH	WOH	WOH		W		
	-61.6	64.7								-59.9 63.0
-65			2	7	8	15		W		Stiff Gray Fine Sandy Silty CLAY (A-7-5)
	-66.6	69.7								-64.9 68.0
-70			6	10	16	26		Sat.		Medium Dense to Dense Gray Silty Fine SAND (A-2-4)
	-71.6	74.7								
-75			11	11	18	29		Sat.		

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 33813.1.1	**ID.** B-4647	**COUNTY** Tyrrell		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 6 over Northwest Fork Alligator River on N.C.94				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 28+74	**OFFSET** 20ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 3.1 ft	**TOTAL DEPTH** 111.2 ft	**NORTHING** 729,487	**EASTING** 2,833,044	**24 HR.** 3.2
DRILL MACHINE CME-750	**DRILL METHOD** NW Casing/2-15/16" Tricone			**HAMMER TYPE** Automatic
START DATE 05/19/09	**COMP. DATE** 05/19/09	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-75					Match Line				ELEV. (ft) DEPTH (ft)
	-76.6	79.7	9	15	16	31		Sat.		Medium Dense to Dense Gray Silty Fine SAND (A-2-4) *(continued)*
-80										
	-81.6	84.7	13	13	17	30		Sat.		
-85										-84.9 88.0
	-86.6	89.7	23	34	30	64		Sat.		Very Dense Gray Fine to Coarse SAND (A-3)
-90										
	-91.6	94.7	19	31	34	65		Sat.		
-95										-95.4 98.5
	-96.6	99.7	3	4	3	7	SS-18	Sat.		**Yorktown Formation:** Loose Gray Silty Clayey Coarse to Fine SAND (A-2-4) With Trace of Shell Material
-100										-100.4 103.5
	-101.6	104.7	5	5	4	9		W		Stiff to Soft Green-Gray Fine Sandy CLAY (A-7-5) With Trace of Shell Material
-105										
	-106.6	109.7	2	2	2	4		W		-108.1 111.2
-110										Boring Terminated at Elevation -108.1 ft in Soft Green-Gray Fine Sandy Clay.
-115										1) Advanced NW casing to 14.8 feet.
-120										2) Advanced 2-15/16" Tricone to 109.7 feet.
-125										3) River water used as drilling fluid.
-130										4) Approximate drilling fluid density 62.4 pcf.
-135										5) No loss of drilling fluid observed.
-140										6) Top of bridge deck to subgrade 3.7 feet.
-145										
-150										
-155										

NCDOT BORE SINGLE 124D.GPJ NC_DOT.GDT 7/20/09

SUMMARY OF LABORATORY TEST DATA

S&ME

Soil Classification and Gradation

S&ME Project #:	1051-09-124	Test Date(s):	5/29 - 6/6/09
State Project No.:	33813.1.1 County: Tyrrell	Report Date:	6/6/2009
Federal ID No.:	BRSTP-94(1)		
Project Name:	Bridge No. 6 on NC 94 over Northwest Fork Alligator River		
Client Name:	NCDOT		
Client Address:	Raleigh, North Carolina		

Boring No.	Sample No.	Sample Depth (feet)	AASHTO Classification	Total % Passing Sieve # 10	40	60	200	270	Total Mortar Fraction: Coarse Sand	Fine Sand	Silt	Clay	LL	PL	PI	Organic Content %	Moisture Content %
EB1-B	SS-1	18.7-20.2	A-2-4 (0)	99	94	85	33.1	19.4	14	66	14	6	24	0	N.P.	2.9	ND
EB1-B	SS-2	93.7-95.1	A-2-4 (0)	98	62	37	10.8	8.7	62	29	5	4	17	0	N.P.	ND	ND
B1-B	SS-3	4.4-5.9	A-3 (0)	100	100	96	4.4	2.5	4	94	0	2	25	0	N.P.	ND	ND
B1-B	SS-4	94.4-95.9	A-2-4 (0)	99	87	78	16.3	14.0	21	65	4	10	19	0	N.P.	ND	ND
B2-B	SS-5	33.9-35.4	A-2-4 (0)	100	100	86	30.4	22.8	14	63	11	12	19	0	N.P.	ND	ND
B2-B	SS-6	108.9-110.4	A-1-b (0)	86	46	37	11.5	9.7	57	32	3	8	22	0	N.P.	ND	ND
B3-B	SS-7	16.9-18.4	A-7-5 (28)	100	100	100	95.3	90.0	0	10	57	33	55	31	24	ND	57.7
B3-B	SS-8	51.9-53.4	A-2-4 (0)	100	100	100	17.2	9.1	0	91	4	5	25	0	N.P.	ND	ND
B4-B	SS-9	45.5-47.0	A-4 (0)	100	100	95	49.2	37.1	5	58	21	16	24	18	6	ND	30.3
B4-B	SS-10	65.5-67.0	A-4 (3)	100	100	99	58.9	49.4	1	50	24	25	28	19	9	ND	42.0
B5-B	SS-11	3.5-5.0	A-4 (0)	100	55	50	43.5	42.1	50	8	24	18	37	35	2	23.4	ND
B5-B	SS-12	73.5-75.0	A-2-4 (0)	100	100	99	11.9	7.2	1	92	3	4	26	0	N.P.	ND	ND
B6-B	SS-13	57.5-59.0	A-7-6 (12)	100	100	100	57.0	38.4	0	61	24	15	49	24	25	ND	43.9
B6-B	SS-14	87.5-90	A-1-b (0)	96	19	8	3.2	2.5	91	6	1	2	18	0	N.P.	ND	ND
B7-B	SS-15	28.6-30.1	A-3 (0)	100	94	77	3.7	2.9	22	75	1	2	23	0	N.P.	ND	ND
B7-B	SS-16	88.6-90.1	A-3 (0)	100	53	14	4.7	3.6	86	10	2	2	18	0	N.P.	ND	ND
EB2-B	SS-17	19.7-21.2	A-7-5 (15)	100	100	98	90.2	83.5	2	14	60	24	53	42	11	ND	ND
EB2-B	SS-18	99.7-101.2	A-2-4 (0)	100	100	87	24.9	21.0	13	66	6	15	23	0	N.P.	ND	ND

Note: N.P.=Non-plastic; ND=Not Determined.

References: AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils

AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes

AASHTO T89: Determining the Liquid Limit of Soils AASHTO T265: Laboratory Determination of Moisture Content of Soils

Mal Krajan, AET
Technician Name:
S&ME, Inc.

Signature

104-01-0703
Certification #

Abner F. Riggs, Jr., P.E.
Technical Responsibility:
3201 Spring Forest Road, Raleigh, NC 27616

Senior Engineer
Position

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

FIELD SCOUR REPORT

WBS: 33813.1.1 TIP: B-4647 COUNTY: Tyrrell

DESCRIPTION(1): Bridge No. 6 on N.C. 94 over Northwest Fork Alligator River

EXISTING BRIDGE

Information from: Field Inspection x Microfilm ____ (reel ____ pos: ____)
Other (explain) Bridge Survey & Hydraulic Design Report

Bridge No.: 6 Length: 360 FT. Total Bents: 17 Bents in Channel: 15 Bents in Floodplain: 2
Foundation Type: Timber Piles

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: Minor signs of erosion at the End Bents

Interior Bents: None observed

Channel Bed: None observed

Channel Bank: None observed

EXISTING SCOUR PROTECTION

Type(3): None - soil and grass vegetation

Extent(4): Abutment concrete wingwalls

Effectiveness(5): Adequate

Obstructions(6): None at bridge but dead trees in river adjacent to banks upstream

INSTRUCTIONS

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

DESIGN INFORMATION

Channel Bed Material(7): Gray to Brown Clayey Silty Coarse to Fine Sand With Trace of Shells and Organics(A-3,A-2-4)Brown Highly Organic Fine to Coarse Sandy Clayey Silt(Muck)

Channel Bank Material(8): Gray to Brown Clayey Silty Coarse to Fine Sand With Trace of Shells and Organic Matter(A-3,A-2-4)

Channel Bank Cover(9): Dense hardwood trees and vegetation

Floodplain Width(10): 15,000 feet to the south and 7,000 feet to the north

Floodplain Cover(11): Dense trees and vegetation

Stream is(12): Aggrading x Degrading ____ Static ____

Channel Migration Tendency(13): South

Observations and Other Comments: Telephone&power lines cross river upstream.Water line attached to west side of bridge.Left pile at interior bent No. 2 cased in concrete.

Reported by: [signature] Date: 6/2/09
Consultant Signature

DESIGN SCOUR ELEVATIONS(14) Feet X Meters ____

BENTS

B1	B2	B3	B4	B5	B6	B7				
-9.1	-18.8	-26.9	-10.8	-7.8	-8.8	-7.8				

Comparison of DSE to Hydraulics Unit theoretical scour:

The NCDOT Geotechnical Engineering Unit agress with the NCDOT Hydraulics Unit's theoretical scour.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank	Bank/Bed	Bank/Bed	Bed	Bed	Bed	Bed	Bed
Sample No.	SS-1	SS-3	SS-5	SS-7	SS-9	SS-11	SS-13
Retained #4	0.40%	0%	0%	0%	0%	0%	0%
Passed #10	99%	100%	100%	100%	100%	100%	100%
Passed #40	94%	100%	100%	100%	100%	55%	100%
Passed #200	33.10%	4.40%	30.40%	95.30%	49.20%	43.50%	57%
Coarse Sand	14%	4%	14%	0%	5%	50%	0%
Fine Sand	66%	94%	63%	10%	58%	8%	61%
Silt	14%	0%	11%	57%	21%	24%	24%
Clay	6%	2%	12%	33%	16%	18%	15%
LL	24	25	19	55	24	37	49
PI	N.P.	N.P.	N.P.	24	6	2	25
AASHTO	A-2-4(0)	A-3(0)	A-2-4(0)	A-7-5(28)	A-4(0)	A-4(0)	A-7-6(12)
Station	25+03	25+53	25+96	26+42	26+88	27+32	27+77
Offset	20 ft RT	20 ft RT	19 ft RT	20 ft RT	19 ft RT	19 ft RT	21 ft RT
Depth	18.7-20.2'	4.4-5.9'	33.9-35.4'	16.9-18.4'	45.5-47.0'	3.5-5.0'	57.5-59.0'

Form GEU-017e Revised 7/26/2007

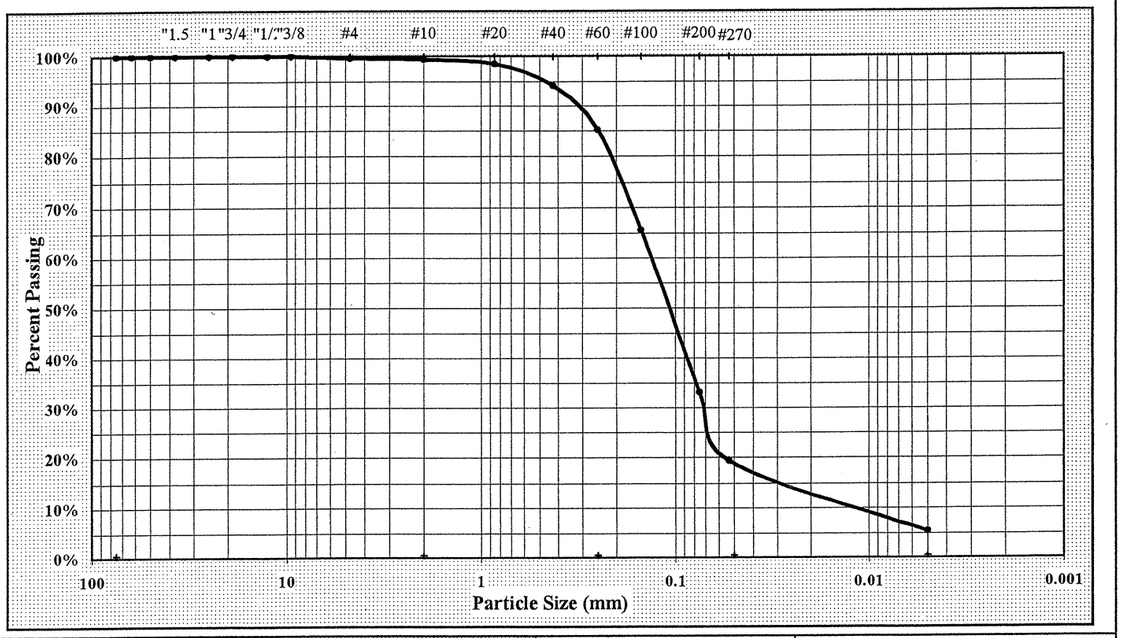
DSE Reported by: [signature] Date: 7-28-09

Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #: **1051-09-124** Report Date: 6/6/2009
Project Name: **Bridge No. 6 on NC94 over Northwest Fork Alligator River** Test Date(s): 5/29 - 6/6/09
Client Name: NCDOT
Client Address: Raleigh, North Carolina
State Project #: 33813.1.1 F.A. Project No: BRSTP-94(1) TIP NO: B-4647

Boring #: EB1-B Sample #: SS-1 Sample Date: 5/19 - 5/28/09
Location: STA 25+03 Offset: 20 FT RT.-L- Depth (ft): 18.7 - 20.2
Sample Description: Gray to Brown Clayey Silty Cse. to F. SAND with Trace of Organic Matter A-2-4 (0)



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Maximum Particle Size	3/8"	Coarse Sand	14.2%	Silt	14.0%
Gravel	0.6%	Fine Sand	65.8%	Clay	6.0%
Apparent Relative Density		Moisture Content		% Passing #200	33.1%
Liquid Limit	24	Plastic Limit	0	Plastic Index	N.P.

Soil Mortar (-#10 Sieve)

Coarse Sand 14.3% Fine Sand 66.2% Silt 14.0% Clay 5.5%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T265: Laboratory Determination of Moisture Content of Soils
AASHTO T89: Determining the Liquid Limit of Soils
AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes

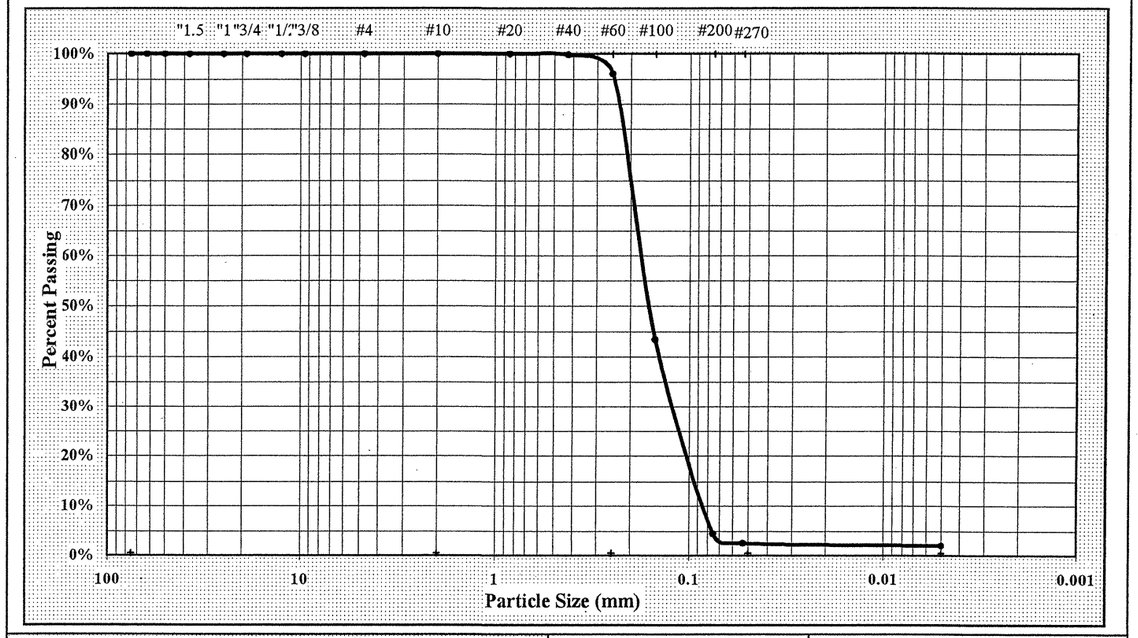
Technician Name: Mal Krajan 104-01-0703 *Certification #*
Technical Responsibility: Mal Krajan *Signature* Laboratory Manager *Signature*

Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #: **1051-09-124** Report Date: 6/6/2009
Project Name: **Bridge No. 6 on NC94 over Northwest Fork Alligator River** Test Date(s): 5/29 - 6/6/09
Client Name: NCDOT
Client Address: Raleigh, North Carolina
State Project #: 33813.1.1 F.A. Project No: BRSTP-94(1) TIP NO: B-4647

Boring #: B1-B Sample #: SS-3 Sample Date: 5/19 - 5/28/09
Location: STA 25+53 Offset: 20 FT RT. -L- Depth (ft): 4.4 - 5.9
Sample Description: Gray Coarse to Fine SAND A-3 (0)



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Maximum Particle Size	3/8"	Coarse Sand	3.9%	Silt	1.0%
Gravel	0.0%	Fine Sand	93.6%	Clay	2.0%
Apparent Relative Density		Moisture Content		% Passing #200	4.4%
Liquid Limit	25	Plastic Limit	0	Plastic Index	N.P.

Soil Mortar (-#10 Sieve)

Coarse Sand 3.9% Fine Sand 93.6% Silt 0.5% Clay 2.0%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T265: Laboratory Determination of Moisture Content of Soils
AASHTO T89: Determining the Liquid Limit of Soils
AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes

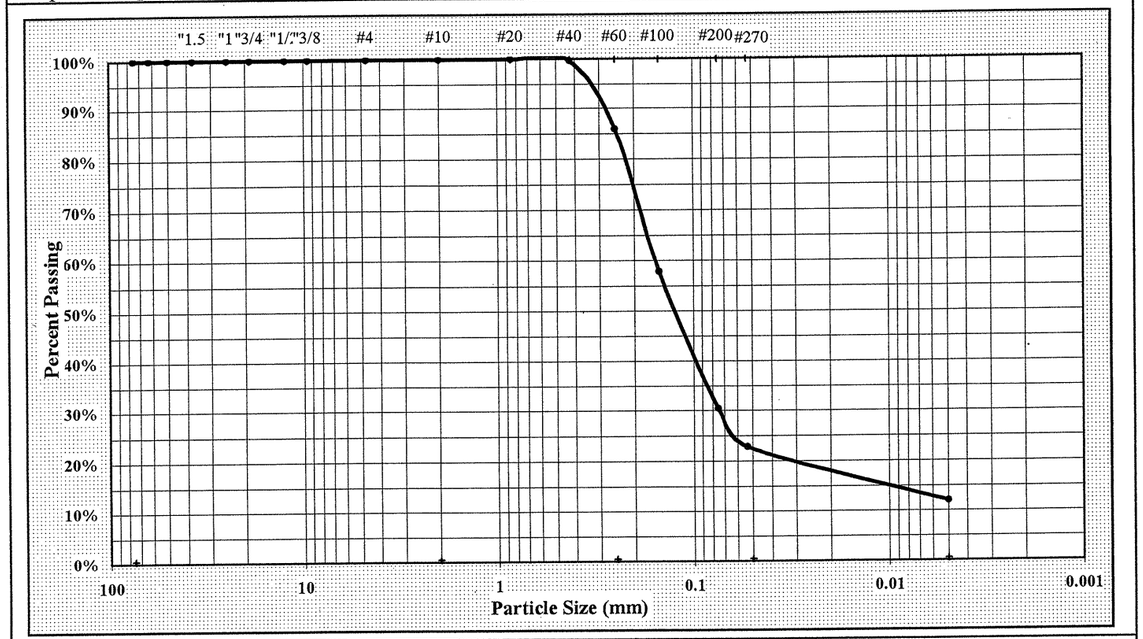
Technician Name: Mal Krajan 104-01-0703 *Certification #*
Technical Responsibility: Mal Krajan *Signature* Laboratory Manager *Signature*

Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #: **1051-09-124** Report Date: 6/6/2009
Project Name: **Bridge No. 6 on NC94 over Northwest Fork Alligator River** Test Date(s): 5/29 - 6/6/09
Client Name: NCDOT
Client Address: Raleigh, North Carolina
State Project #: 33813.1.1 F.A. Project No: BRSTP-94(1) TIP NO: B-4647

Boring #: B2-B Sample #: SS-5 Sample Date: 5/19 - 5/28/09
Location: STA 25+96 Offset: 19 FT RT. -L- Depth (ft): 33.9 - 35.4
Sample Description: Gray Slightly Silty Clayey Coarse to Fine SAND A-2-4 (0)



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Maximum Particle Size	#20	Coarse Sand	14.1%	Silt	11.0%
Gravel	0.0%	Fine Sand	63.1%	Clay	12.0%
Apparent Relative Density		Moisture Content	32.0%	% Passing #200	30.4%
Liquid Limit	19	Plastic Limit	0	Plastic Index	N.P.

Soil Mortar (-#10 Sieve)

Coarse Sand 14.1% Fine Sand 63.1% Silt 10.8% Clay 12.0%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T265: Laboratory Determination of Moisture Content of Soils
AASHTO T89: Determining the Liquid Limit of Soils
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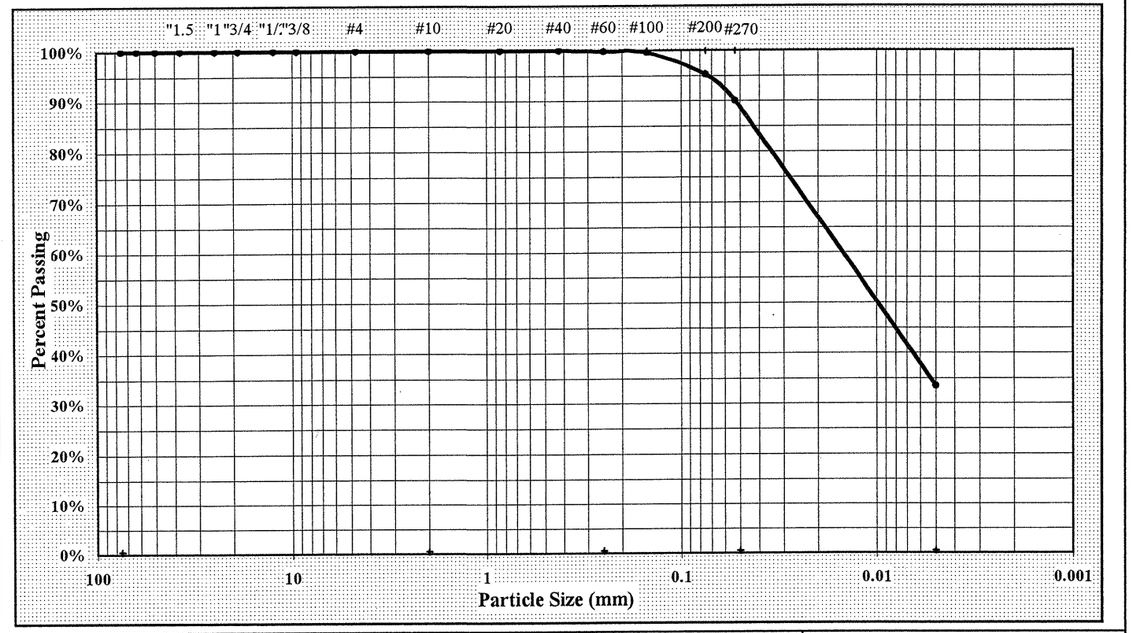
Technician Name: Mal Krajan 104-01-0703 *Certification #*
Technical Responsibility: Mal Krajan *Signature* Laboratory Manager *Signature*

Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #: **1051-09-124** Report Date: 6/6/2009
Project Name: **Bridge No. 6 on NC94 over Northwest Fork Alligator River** Test Date(s): 5/29 - 6/6/09
Client Name: NCDOT
Client Address: Raleigh, North Carolina
State Project #: 33813.1.1 F.A. Project No: BRSTP-94(1) TIP NO: B-4647

Boring #: B3-B Sample #: SS-7 Sample Date: 5/19 - 5/28/09
Location: STA 26+42 Offset: 20 FT RT. -L- Depth (ft): 16.9 - 18.4
Sample Description: Gray Fine Sandy Silty CLAY A-7-5 (28)



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Maximum Particle Size	#40	Coarse Sand	0.2%	Silt	57.0%
Gravel	0.0%	Fine Sand	9.8%	Clay	33.0%
Apparent Relative Density		Moisture Content	57.7%	% Passing #200	95.3%
Liquid Limit	55	Plastic Limit	31	Plastic Index	24

Soil Mortar (-#10 Sieve)

Coarse Sand 0.2% Fine Sand 9.8% Silt 56.6% Clay 33.4%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T265: Laboratory Determination of Moisture Content of Soils
AASHTO T89: Determining the Liquid Limit of Soils
AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
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Technician Name: Mal Krajan 104-01-0703 *Certification #*
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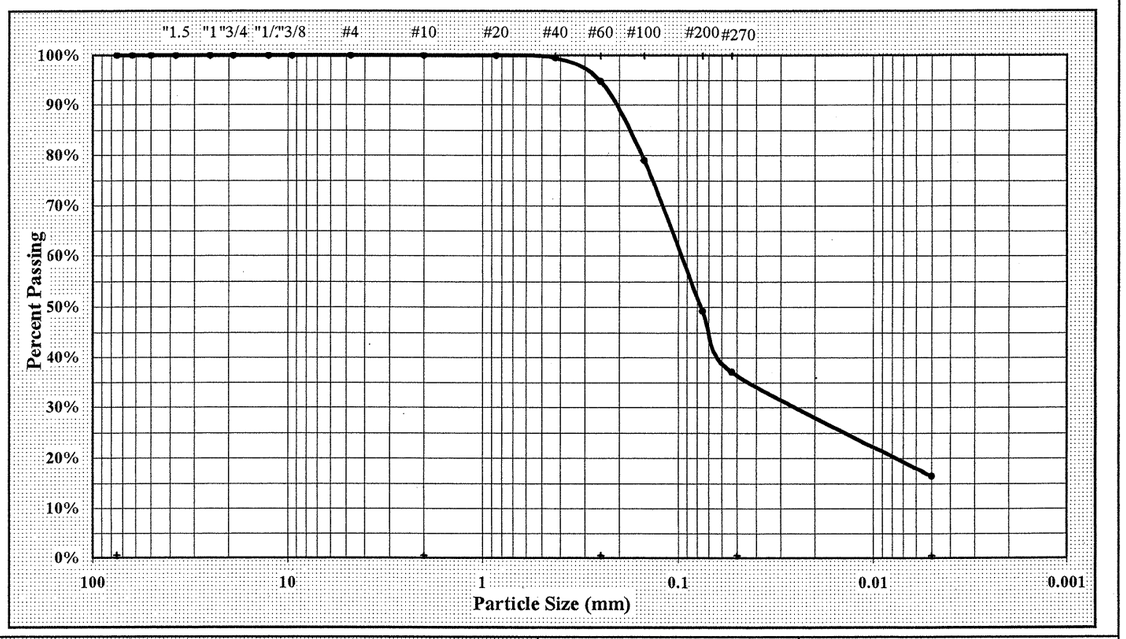
Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #: **1051-09-124** Report Date: 6/6/2009
Project Name: **Bridge No. 6 on NC94 over Northwest Fork Alligator River** Test Date(s): 5/29 - 6/6/09
Client Name: NCDOT
Client Address: Raleigh, North Carolina
State Project #: 33813.1.1 F.A. Project No: BRSTP-94(1) TIP NO: B-4647

Boring #: B4-B Sample #: SS-9 Sample Date: 5/19 - 5/28/09
Location: STA 26+88 Offset: 19 FT RT. -L- Depth (ft): 45.5 - 47.0
Sample Description: Gray Fine Sandy Clayey SILT A-4 (0)



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Maximum Particle Size	#20	Coarse Sand	5.3%	Silt	21.0%
Gravel	0.0%	Fine Sand	57.6%	Clay	17.0%
Apparent Relative Density		Moisture Content	30.3%	% Passing #200	49.2%
Liquid Limit	24	Plastic Limit	18	Plastic Index	6

Soil Mortar (-#10 Sieve)

Coarse Sand 5.3% Fine Sand 57.6% Silt 20.6% Clay 16.5%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T265: Laboratory Determination of Moisture Content of Soils
AASHTO T89: Determining the Liquid Limit of Soils
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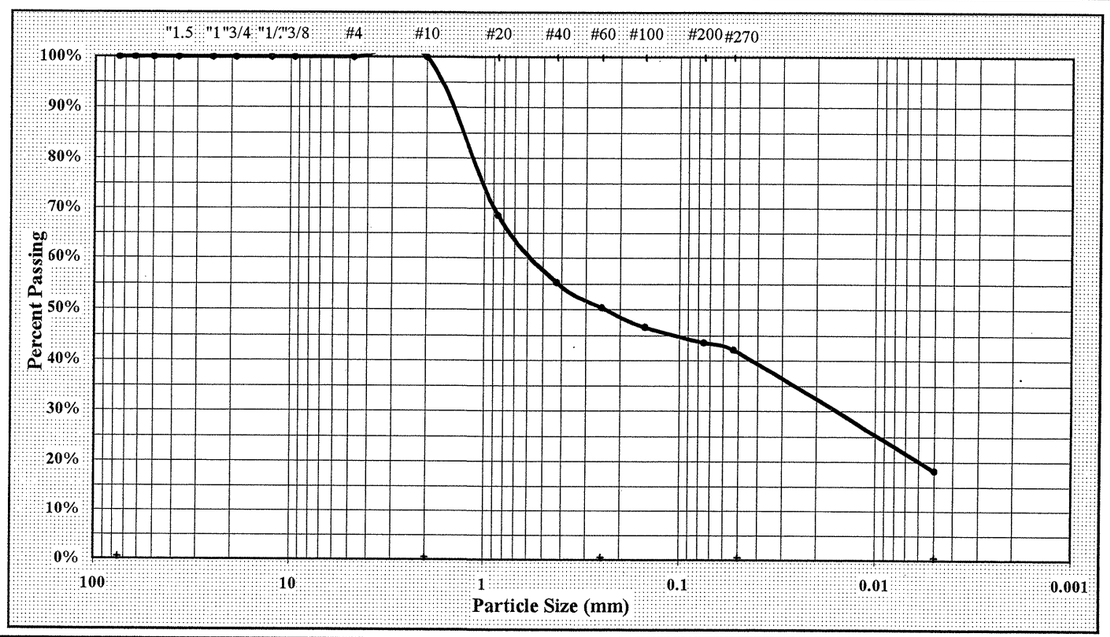
Technical Responsibility: Mal Krajan *Signature* Laboratory Manager *Signature*

Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #: **1051-09-124** Report Date: 6/6/2009
Project Name: **Bridge No. 6 on NC94 over Northwest Fork Alligator River** Test Date(s): 5/29 - 6/6/09
Client Name: NCDOT
Client Address: Raleigh, North Carolina
State Project #: 33813.1.1 F.A. Project No: BRSTP-94(1) TIP NO: B-4647

Boring #: B5-B Sample #: SS-11 Sample Date: 5/19 - 5/28/09
Location: STA 27+32 Offset: 19 FT RT. -L- Depth (ft): 3.5 - 5
Sample Description: Brown Highly Organic Fine to Coarse Sandy Clayey SILT (Muck) A-4 (0)



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Maximum Particle Size	#10	Coarse Sand	49.7%	Silt	24.0%
Gravel	0.0%	Fine Sand	8.2%	Clay	18.0%
Apparent Relative Density		Moisture Content	620.0%	% Passing #200	43.5%
Liquid Limit	37	Plastic Limit	35	Plastic Index	2

Soil Mortar (-#10 Sieve)

Coarse Sand 49.7% Fine Sand 8.2% Silt 23.9% Clay 18.2%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T265: Laboratory Determination of Moisture Content of Soils
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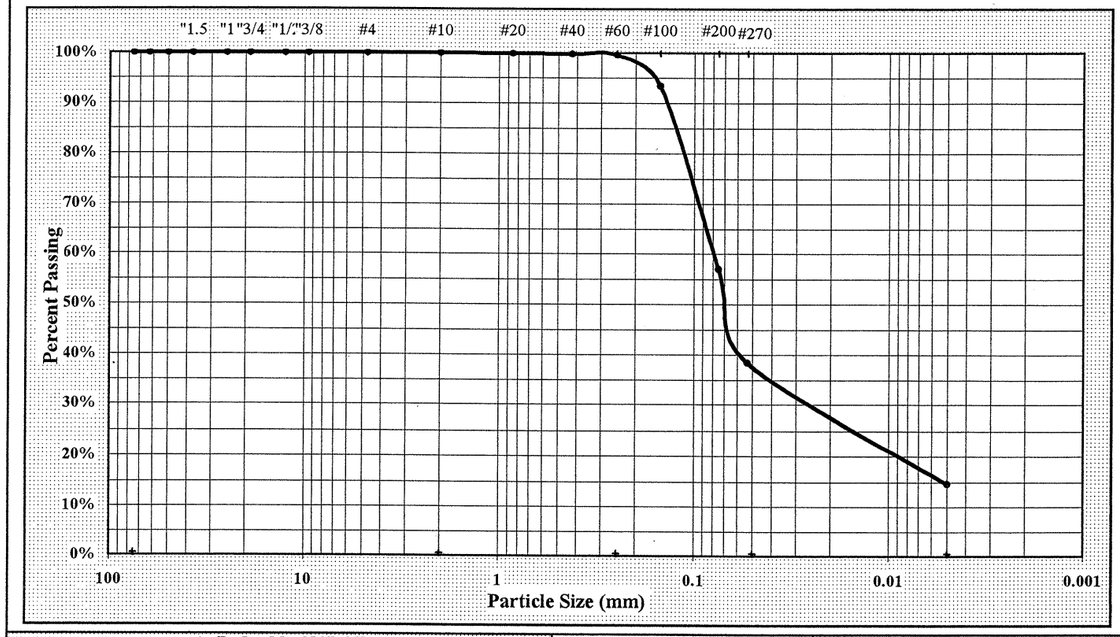
Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #: **1051-09-124** Report Date: 6/6/2009
Project Name: **Bridge No. 6 on NC94 over Northwest Fork Alligator River** Test Date(s): 5/29 - 6/6/09
Client Name: NCDOT
Client Address: Raleigh, North Carolina
State Project #: 33813.1.1 F.A. Project No: BRSTP-94(1) TIP NO: B-4647

Boring #: B6-B Sample #: SS-13 Sample Date: 5/19 - 5/28/09
Location: STA 27+77 Offset: 21 FT RT. -L- Depth (ft): 57.5 - 59.0
Sample Description: Gray Fine Sandy Silty CLAY A-7-6 (12)



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Maximum Particle Size	3/8"	Coarse Sand	0.4%	Silt	24.0%
Gravel	0.0%	Fine Sand	61.2%	Clay	15.0%
Apparent Relative Density		Moisture Content	43.9%	% Passing #200	57.0%
Liquid Limit	49	Plastic Limit	24	Plastic Index	25

Soil Mortar (-#10 Sieve)

Coarse Sand 0.4% Fine Sand 61.2% Silt 23.8% Clay 14.6%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T265: Laboratory Determination of Moisture Content of Soils
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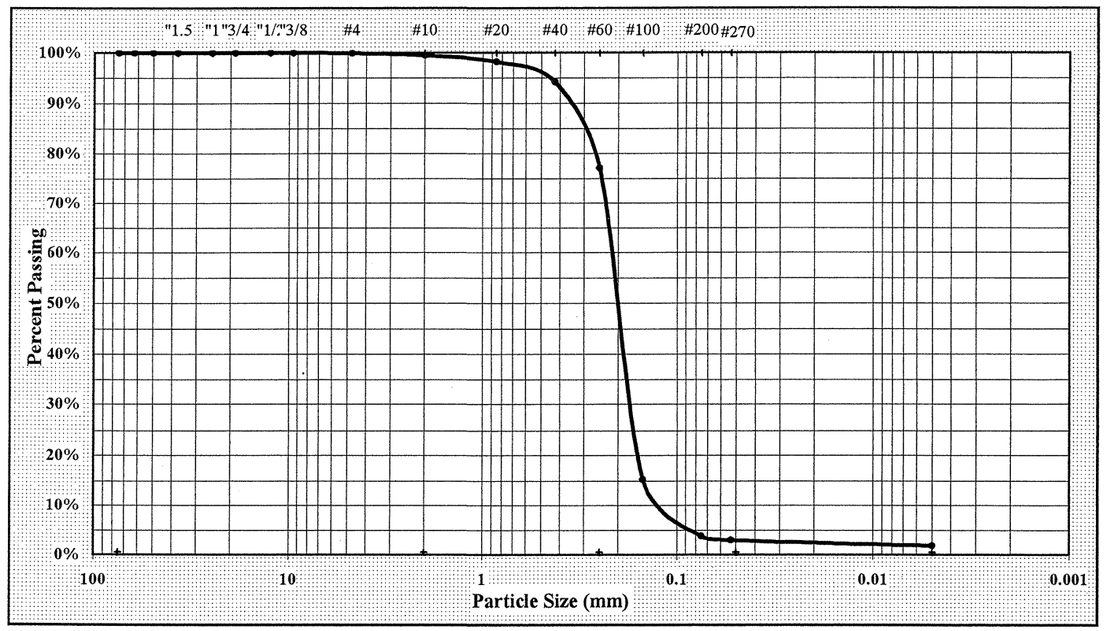
Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #: **1051-09-124** Report Date: 6/6/2009
Project Name: **Bridge No. 6 on NC94 over Northwest Fork Alligator River** Test Date(s): 5/29 - 6/6/09
Client Name: NCDOT
Client Address: Raleigh, North Carolina
State Project #: 33813.1.1 F.A. Project No: BRSTP-94(1) TIP NO: B-4647

Boring #: B7-B Sample #: SS-15 Sample Date: 5/19 - 5/28/09
Location: STA 28+24 Offset: 19 FT RT. -L- Depth (ft): 28.6 - 30.1
Sample Description: Gray to Brown Coarse to Fine SAND A-3 (0)



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Maximum Particle Size	3/8"	Coarse Sand	22.4%	Silt	1.0%
Gravel	0.5%	Fine Sand	74.2%	Clay	2.0%
Apparent Relative Density		Moisture Content		% Passing #200	3.7%
Liquid Limit	23	Plastic Limit	0	Plastic Index	N.P.

Soil Mortar (-#10 Sieve)

Coarse Sand 22.5% Fine Sand 74.6% Silt 1.1% Clay 1.8%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T265: Laboratory Determination of Moisture Content of Soils
AASHTO T89: Determining the Liquid Limit of Soils
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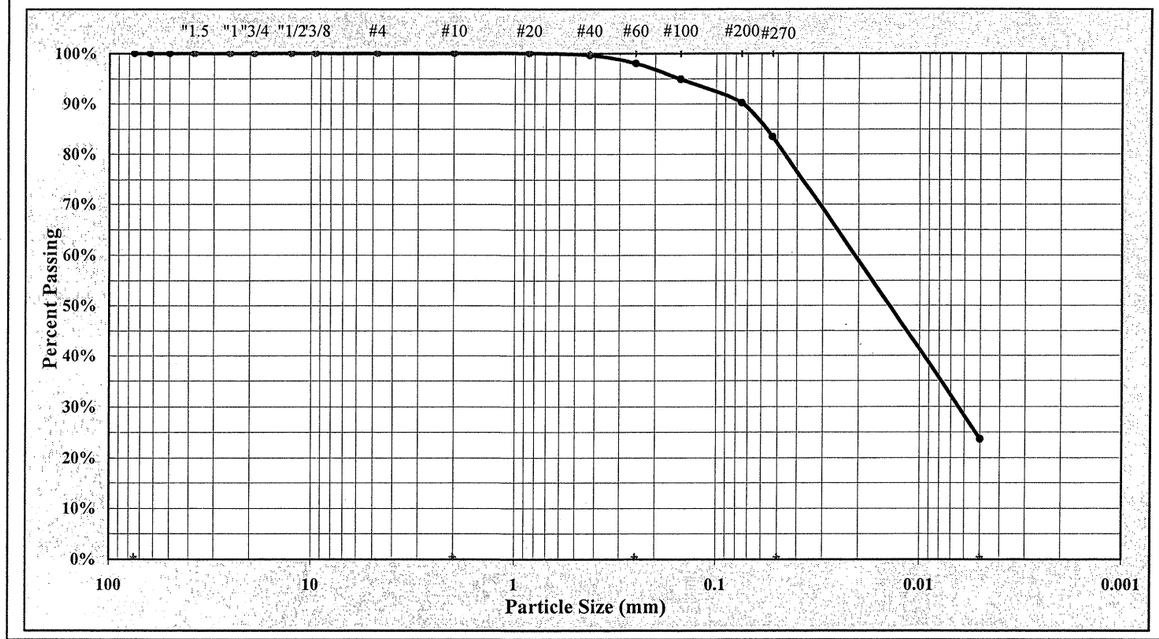
Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #:	**1051-09-124**	Report Date:	6/6/2009
Project Name:	**Bridge No. 6 on NC94 over Northwest Fork Alligator River**	Test Date(s):	5/29 - 6/6/09
Client Name:	NCDOT		
Client Address:	Raleigh, North Carolina		
State Project #:	33813.1.1	F.A. Project No: BRSTP-94(1)	TIP NO: B-4647

Boring #:	EB2-B	Sample #: SS-17	Sample Date: 5/19 - 5/28/09
Location:	STA 28+74	Offset: 20 FT RT -L-	Depth (ft): 19.7 - 21.2
Sample Description:			Black Fine Sandy Silty CLAY A-7-5 (15)



As Defined by NCDOT			
Gravel	< 75 mm and > 2.00 mm	Fine Sand	< 0.25 mm and > 0.05 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Silt	< 0.05 and > 0.005 mm
		Clay	< 0.005 mm

Maximum Particle Size	#10	Coarse Sand	2.0%	Silt	60.0%
Gravel	0.0%	Fine Sand	14.5%	Clay	24.0%
Apparent Relative Density		Moisture Content	119.1%	% Passing #200	90.2%
Liquid Limit	53	Plastic Limit	42	Plastic Index	11

Soil Mortar (-#10 Sieve)

Coarse Sand	2.0%	Fine Sand	14.5%	Silt	59.9%	Clay	23.6%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT

AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test

AASHTO T265: Laboratory Determination of Moisture Content of Soils

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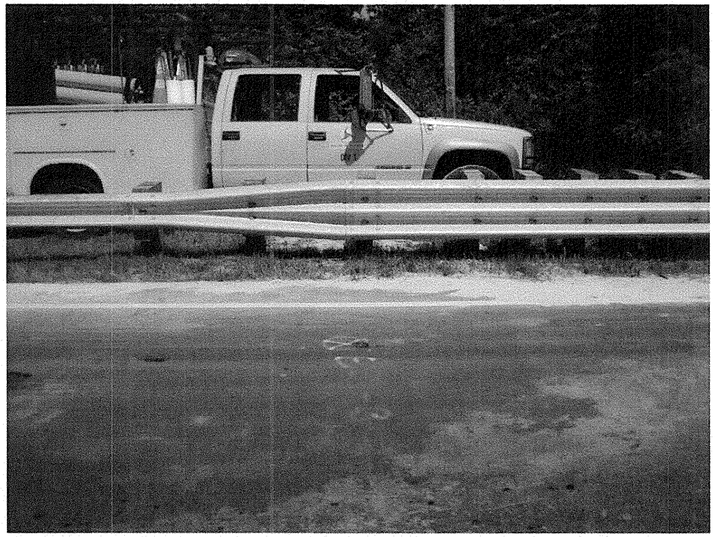
Technician Name: Mal Krajan 104-01-0703 *Certification #*

Technical Responsibility: Mal Krajan *Signature* Laboratory Manager *Signature*

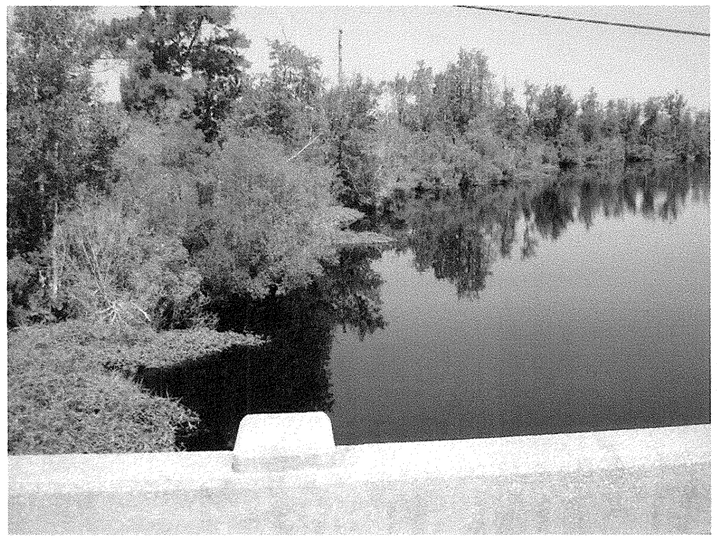
Photograph No. 1:
This photograph was taken from the south approach, right of the -L- alignment, looking north.



Photograph No. 3:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed End Bent No. 1.

Photograph No. 2:
This photograph was taken at proposed End Bent No. 1, along the -L- alignment, looking north.

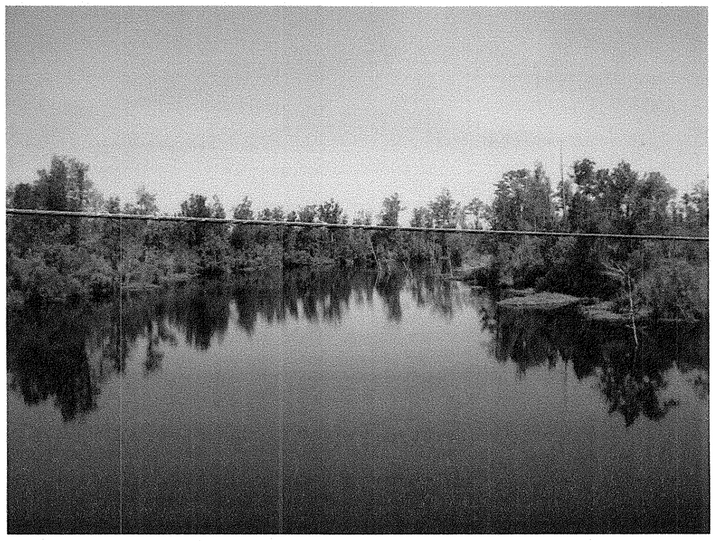
Photograph No. 4:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 1.



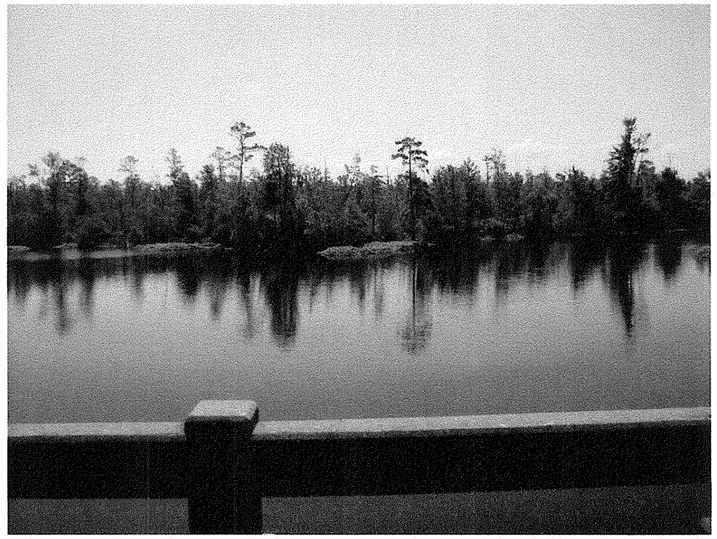
Photograph No. 5:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 2.

Photograph No. 6:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 3.

Photograph No. 7:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 4.



Photograph No. 8:
This photograph was taken from the right side of the -L- alignment, from the center of the existing bridge deck, looking west (up river).



Photograph No. 9:
This photograph was taken from the right side of the -L- alignment, from the center of the existing bridge deck, looking east (down river).

Photograph No. 10:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 5.

Photograph No. 11:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 6.

Photograph No. 12:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 7.

Photograph No. 13:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed End Bent No. 2.

Photograph No. 14:
This photograph was taken at proposed End Bent No. 2, along the -L- alignment, looking south.

Photograph No. 15:
This photograph was taken from the north approach, right of the -L- alignment, looking south.