STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2303D	1	46

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34416.1.1 (R-2303D) F.A. PROJ. STPNHF-F-8-2(17)

COUNTY SAMPSON

PROJECT DESCRIPTION BRIDGE NO. 42 ON NC 24 OVER GREAT COHARIE CREEK AT -LREV- STA. 1311+58

ID: R-2303D

PROJECT: 34416.1.1

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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.

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PERSONNEL

J.R. SWARTLEY

C.M. WRIKE

CATLIN

MID-ATLANTIC

INVESTIGATED BY T.C. BOTTOMS

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE OCTOBER 2011

NORTH CAROLINA LICENSED SEAL 2240 GEOLOGIST TYLER C. BOTTOMS

10/17/11

DRAWN BY: C.P. TURNER

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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 THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. 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	50 MX													
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT	6 MX		NP	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

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
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 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	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	2.00	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, YELLOW-BROWN, 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 IS 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 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 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	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	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 SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT / DPT PMT / VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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, FRACTURES
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

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [ ] CME-550
- [ ] PORTABLE HOIST
- [X] DIEDRICH D-50
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF 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)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
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 ROCK 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 GEOLOGIST'S 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 GEOLOGIST'S 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 GEOLOGIST'S 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 THAT 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 THAT 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 (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

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 (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - 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 THAT 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, THAT 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 BPF) 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 PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: NCDOT GPS MONUMENT: "R2303D-6" -BL- R2303D-6 PINC
1315=31.56
ELEVATION: 93.79 FT.

NOTES:

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET
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SITE PLAN

0 100 200
FEET

SKEW = 90°

N

1305 1310 1315

TO CONCORD

TO CLINTON

EB1-B WBL
B1-B WBL
B2-B WBL
B3-B WBL
B4-A WBL
B5-A WBL
B6-B WBL
B7-B WBL
B8-B WBL
B9-B WBL
B10-A WBL
B11-B WBL
EB2-B WBL

-LREV-

EB1-B EBL
B1-B EBL
B2-B EBL
B3-B EBL
B4-B EBL
B5-B EBL
B6-B EBL
B7-B EBL
B8-B EBL
B9-B EBL
B10-B EBL
B11-B EBL
EB2-B EBL

EB1 BENT LINE
B1 BENT LINE
B2 BENT LINE
B3 BENT LINE
B4 BENT LINE
B5 BENT LINE
B6 BENT LINE
B7 BENT LINE
B8 BENT LINE
B9 BENT LINE
B10 BENT LINE
B11 BENT LINE
EB2 BENT LINE

GREAT COHARIE CREEK

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	4 OF 46
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROFILE THROUGH EBL BORINGS PROJECTED ALONG ℄ OF -EBL-

VE = 5

EB1-B EBL	B1-B EBL	B2-B EBL	B3-B EBL	B4-B EBL	B5-B EBL	B6-B EBL	B7-B EBL	B8-B EBL	B9-B EBL	B10-B EBL	B11-B EBL	EB2-B EBL
1305+58	1306+28	1307+33	1308+38	1309+43	1310+48	1311+66	1312+53	1313+38	1314+43	1315+48	1316+58	1317+58
46' RT	51' RT	51' RT	51' RT	55' RT	42' RT	42' RT	42' RT	43' RT	46' RT	52' RT	50' RT	50' RT

PAVEMENT

NWSE = 86.9

(A) VERY LOOSE TO MEDIUM DENSE TAN AND GRAY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)
(B) VERY LOOSE TO LOOSE BROWN SAND WITH TRACE TO MODERATE ORGANIC MATERIAL, SATURATED, MUCK AND VERY SOFT TO STIFF BROWN SANDY SILT AND SANDY AND SILTY CLAY WITH LITTLE TO MODERATE ORGANIC MATERIAL, WET (ALLUVIAL)
(C) VERY LOOSE TO MEDIUM DENSE BROWN, TAN AND GRAY SAND, SATURATED (ALLUVIAL)
(D) SOFT GRAY SANDY SILT, WET (ALLUVIAL)
(E) LOOSE TO VERY DENSE GRAY AND GREEN CLAYEY SAND AND SAND, SATURATED (BLACK CREEK FORMATION)
(F) STIFF TO HARD GRAY AND GREEN SANDY SILT AND SANDY AND SILTY CLAY, WET (BLACK CREEK FORMATION)

* APPROXIMATE ELEVATION OF ARTESIAN HEAD

NOTE: GROUNDLINE PROFILE ALONG ℄ -EBL- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED MARCH 23, 2011.

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

1305+00 1306+00 1307+00 1308+00 1309+00 1310+00 1311+00 1312+00 1313+00 1314+00 1315+00 1316+00 1317+00 1318+00

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	5 OF 46
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROFILE THROUGH WBL BORINGS PROJECTED ALONG ℄ OF –WBL–

VE = 5

EBI-B WBL	BI-B WBL	B2-B WBL	B3-B WBL	B4-A WBL	B5-A WBL	B6-B WBL	B7-B WBL	B8-B WBL	B9-B WBL	BI0-A WBL	BII-B WBL	EB2-B WBL
1305+58	1306+28	1307+33	1308+69	1309+44	1310+49	1311+54	1312+76	1313+52	1314+43	1315+48	1316+58	1317+58
2' LT	6' LT	14' LT	31' LT	55' LT	43' LT	26' LT	4' RT	11' LT	13' LT	51' LT	31' LT	35' LT

ST-1
ST-2

Ⓐ LOOSE GRAY SAND, SATURATED (ROADWAY EMBANKMENT)
Ⓑ VERY SOFT TO MEDIUM STIFF BROWN MUCK AND CLAY WITH LITTLE ORGANIC MATERIAL, MOIST TO WET (ALLUVIAL)
Ⓒ VERY LOOSE TO MEDIUM DENSE BROWN, TAN AND GRAY SAND, SATURATED (ALLUVIAL)
Ⓓ VERY SOFT TO MEDIUM STIFF GRAY CLAY, WET (ALLUVIAL)
Ⓔ LOOSE TO VERY DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
Ⓕ MEDIUM STIFF TO HARD GRAY AND GREEN SILT AND SANDY AND SILTY CLAY, WET (BLACK CREEK FORMATION)

* APPROXIMATE ELEVATION OF ARTESIAN HEAD

NOTE: GROUNDLINE PROFILE ALONG ℄ –WBL– TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED MARCH 23, 2011.

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

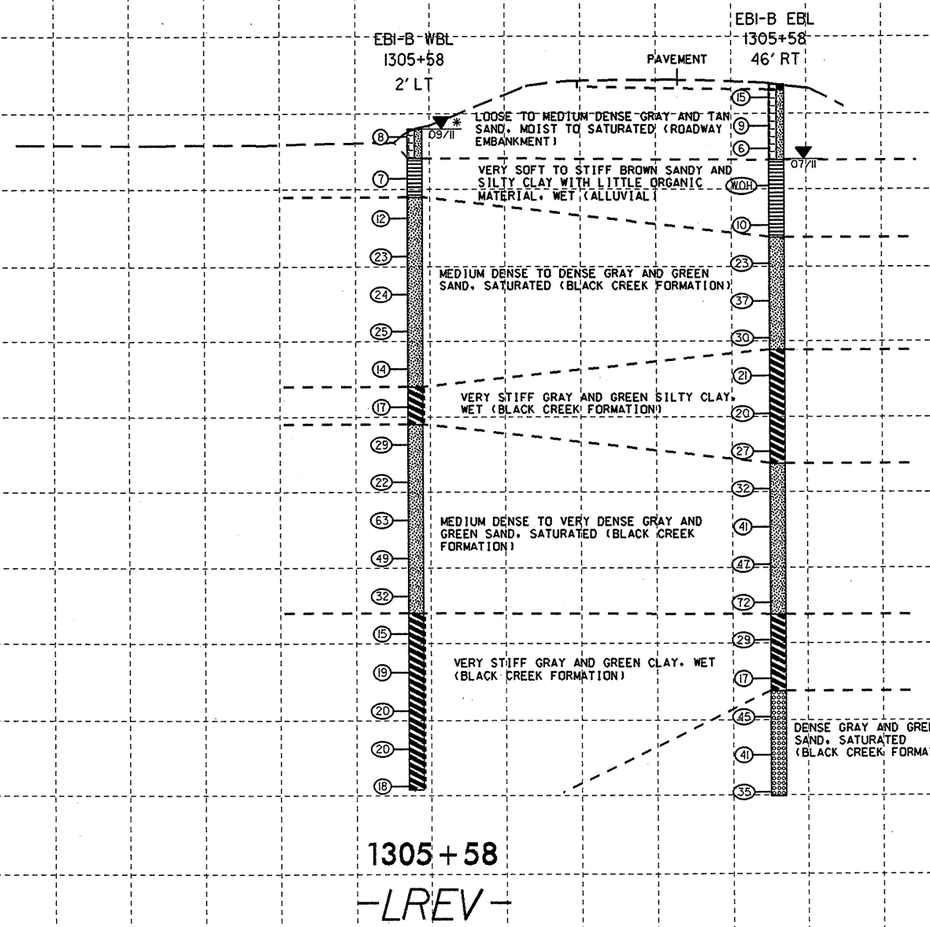
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10 -20 -30 -40 -50

1305+00 1306+00 1307+00 1308+00 1309+00 1310+00 1311+00 1312+00 1313+00 1314+00 1315+00 1316+00 1317+00 1318+00

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	6 OF 46

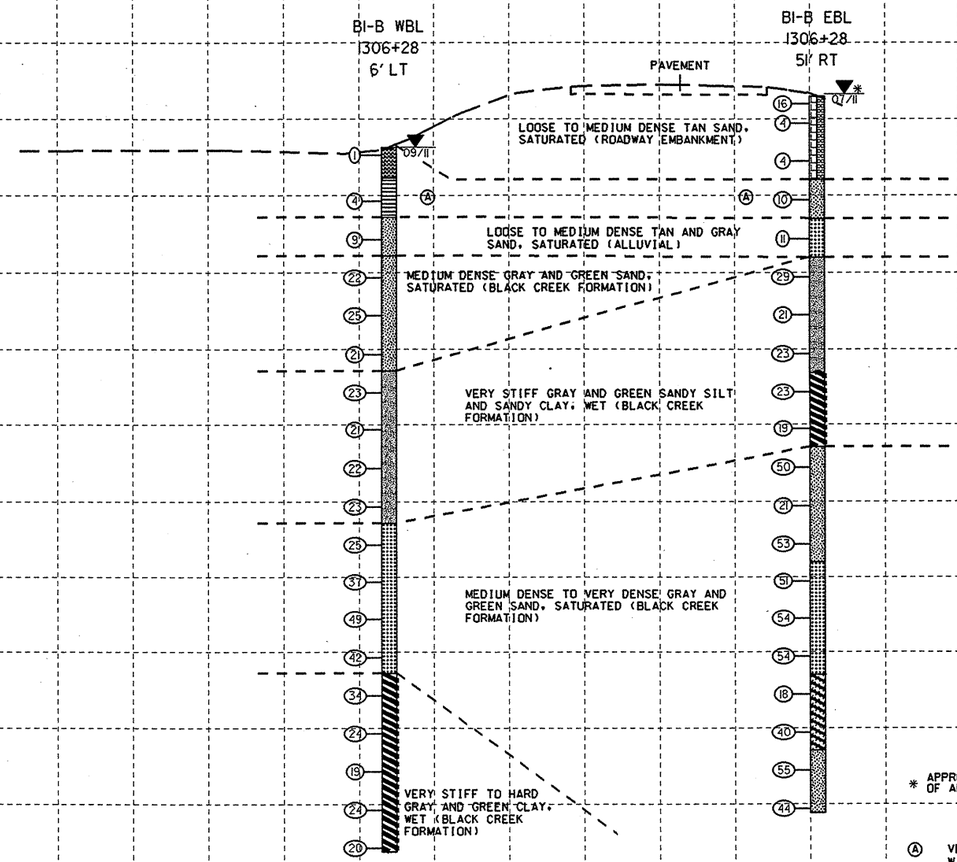
CROSS SECTION THROUGH END BENT 1



8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	7 OF 46

CROSS SECTION THROUGH BENT 1



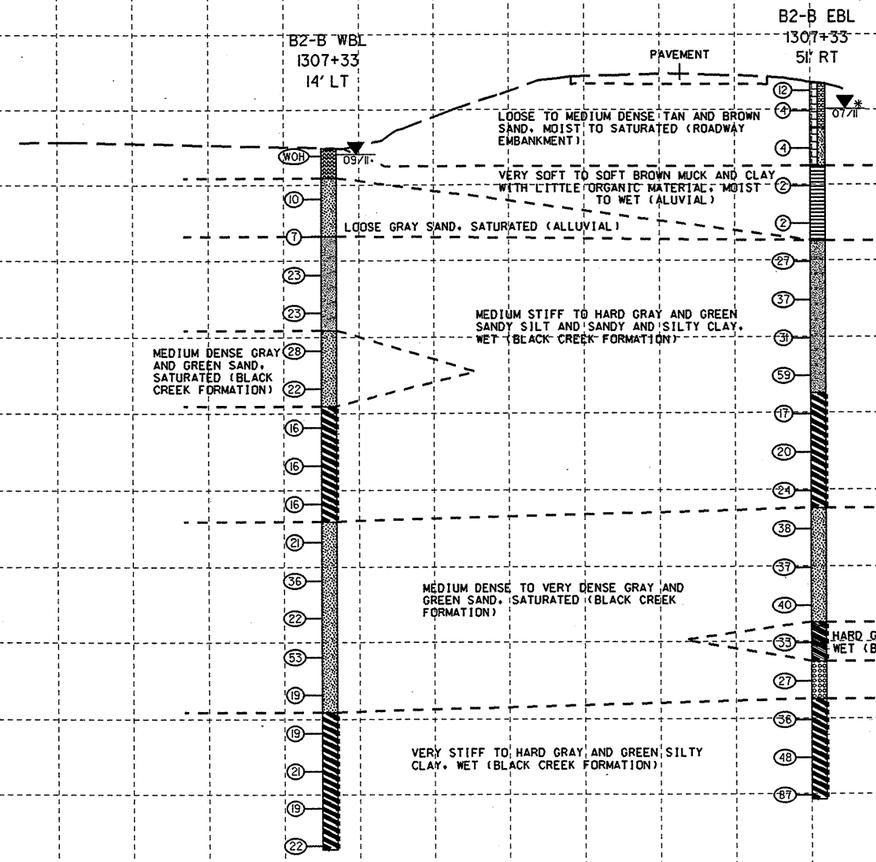
1306+28

-LREV-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	8 OF 46

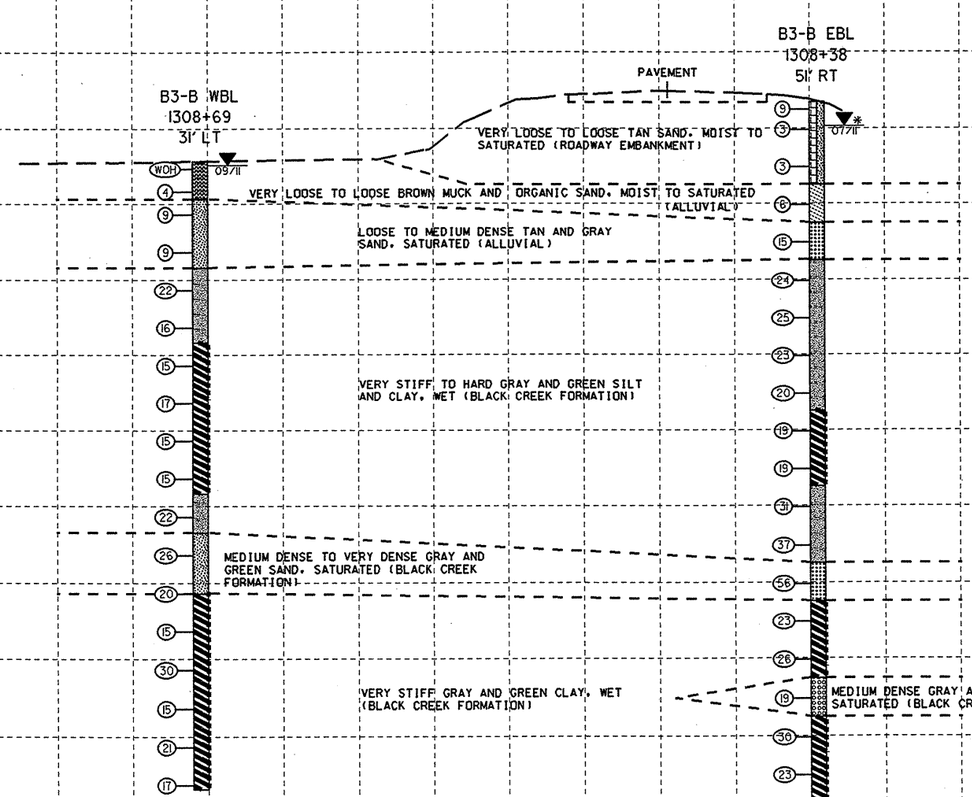
CROSS SECTION THROUGH BENT 2



8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	9 OF 46

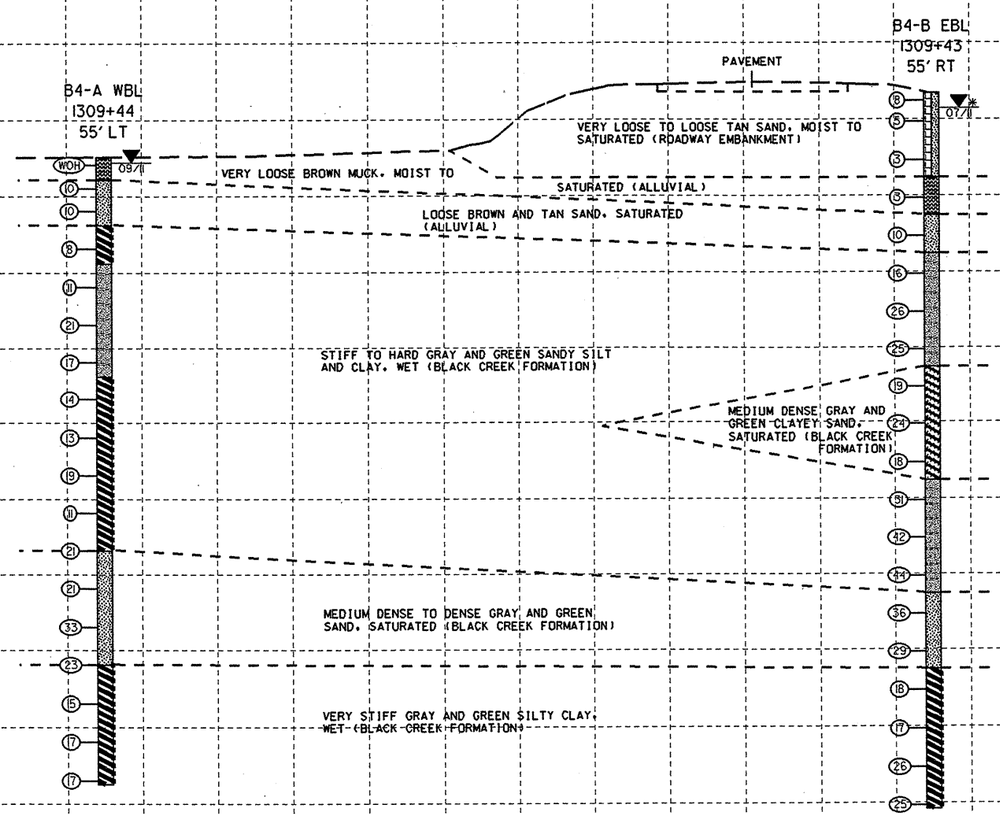
CROSS SECTION THROUGH BENT 3



8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	10 OF 46

CROSS SECTION THROUGH BENT 4



1309+43

-LREV-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	11 OF 46

CROSS SECTION THROUGH BENT 5

B5-A WBL
1310+49
43' LT

B5-B EBL
1310+48
42' RT

PAVEMENT

LOOSE TO MEDIUM DENSE TAN SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

VERY SOFT TO SOFT BROWN MUCK AND SANDY SILT WITH LITTLE ORGANIC MATERIAL, WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE BROWN AND GRAY SAND, SATURATED (ALLUVIAL)

MEDIUM STIFF TO STIFF GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)

MEDIUM DENSE TO DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)

STIFF TO VERY STIFF GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)

MEDIUM DENSE TO DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)

STIFF TO VERY STIFF GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)

* APPROXIMATE ELEVATION OF ARTESIAN HEAD

Ⓑ STIFF GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)

1310+48

-LREV-

CROSS SECTION THROUGH BENT 6

B6-B WBL
1311+54
26' LT

B6-B EBL
1311+66
42' RT

09/II

07/II

VERY SOFT BROWN MUCK AND CLAY WITH ORGANIC MATERIAL, MOIST TO WET, AND VERY LOOSE BROWN MODERATELY ORGANIC SAND, SATURATED (ALLUVIAL)

VERY LOOSE TO MEDIUM DENSE GRAY SAND, SATURATED (ALLUVIAL)

MEDIUM STIFF TO STIFF GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)

MEDIUM DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)

VERY STIFF GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)

MEDIUM DENSE TO DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)

VERY STIFF GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)

Ⓐ VERY SOFT BROWN MUCK, WET (ALLUVIAL)
Ⓒ MEDIUM DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)

1311+53
-LREV-

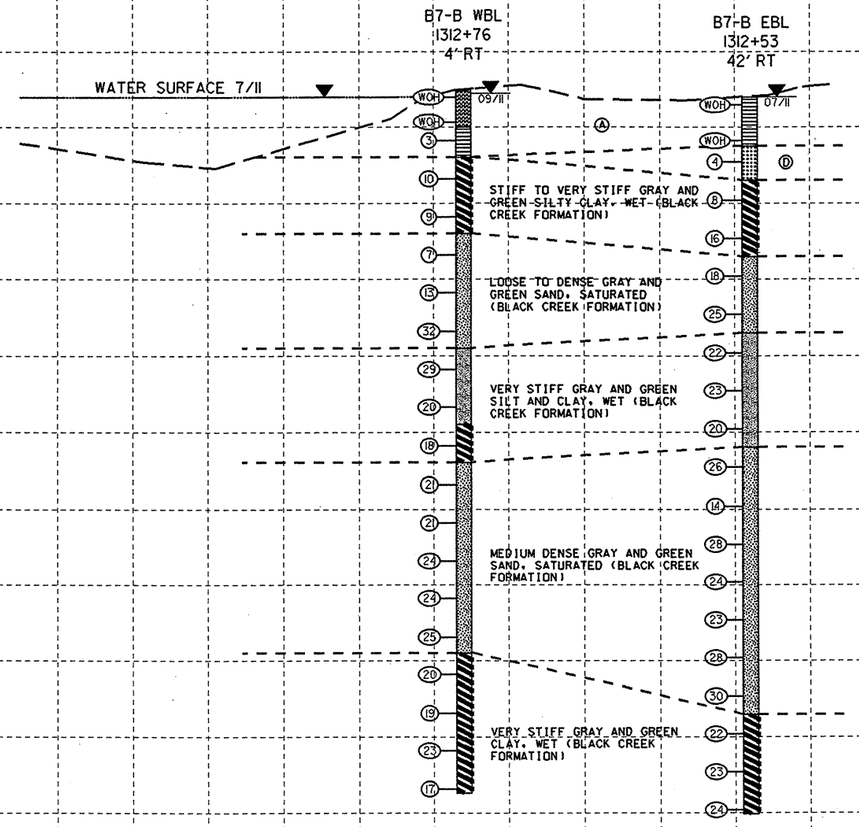
8/23/99

17-OCT-2011 14:14
L:\ERO\Greenville Investigation\TIP\R2303D_GEO_BRDG_0042\CADD_GEOTECH\xsec\R-3601_GEO_BRDG_42_xsi.dgn
plotuser Al Deaton(Al)

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	13 OF 46

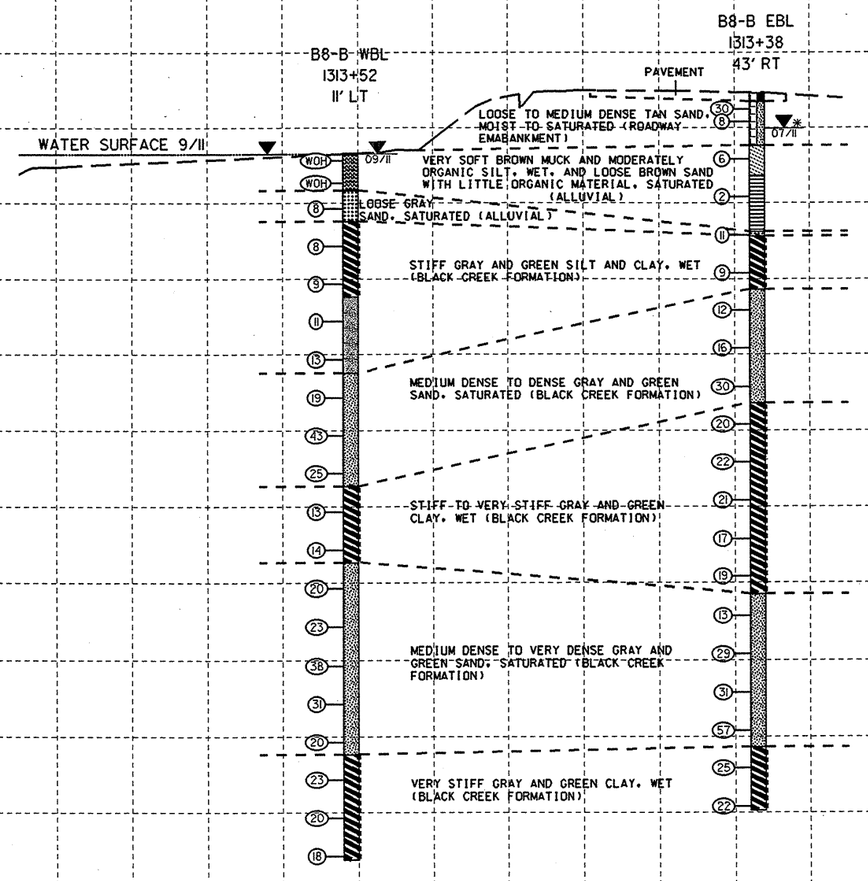
CROSS SECTION THROUGH BENT 7 -EBL-



1312+58

-LREV-

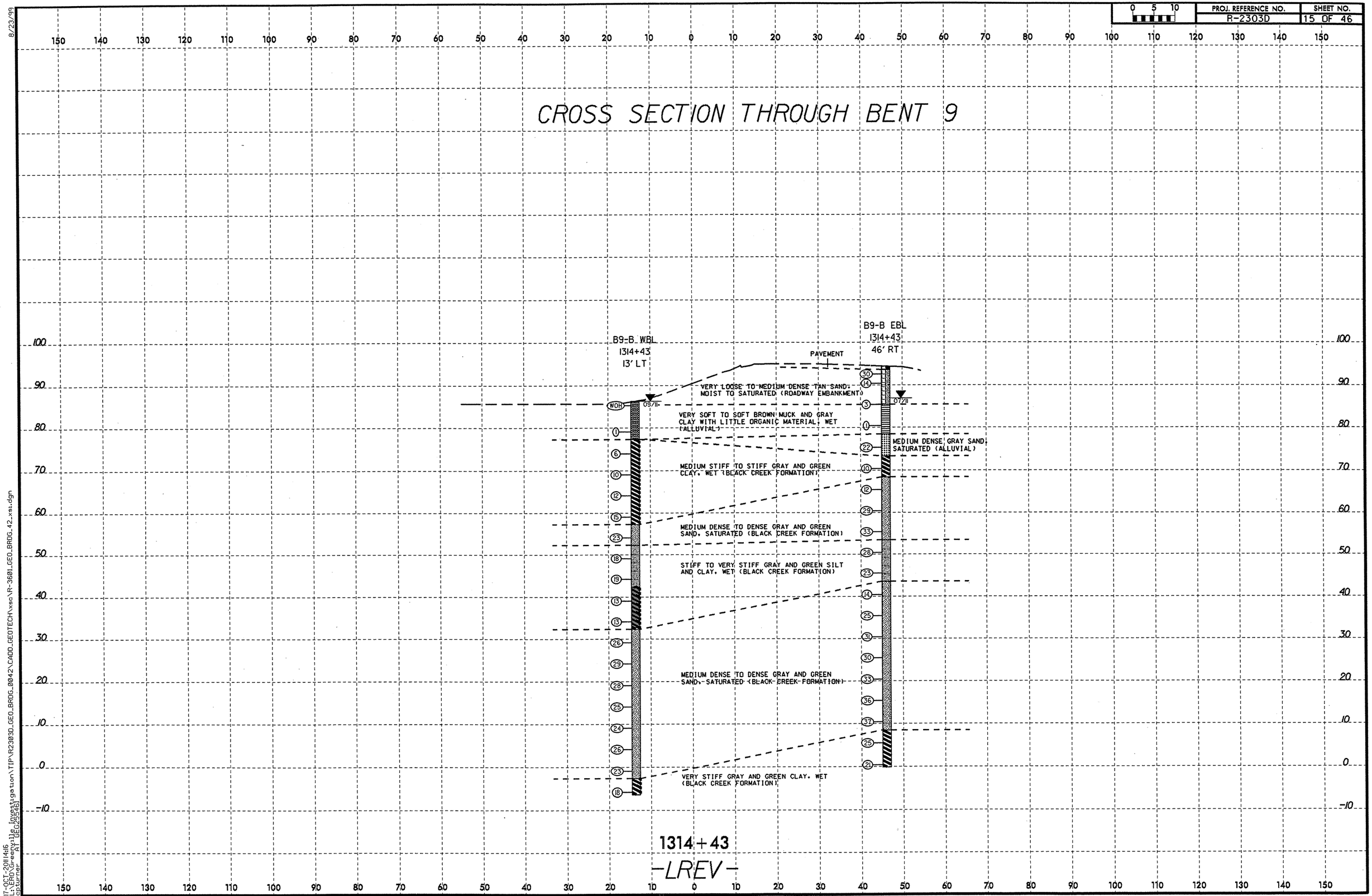
CROSS SECTION THROUGH BENT 8



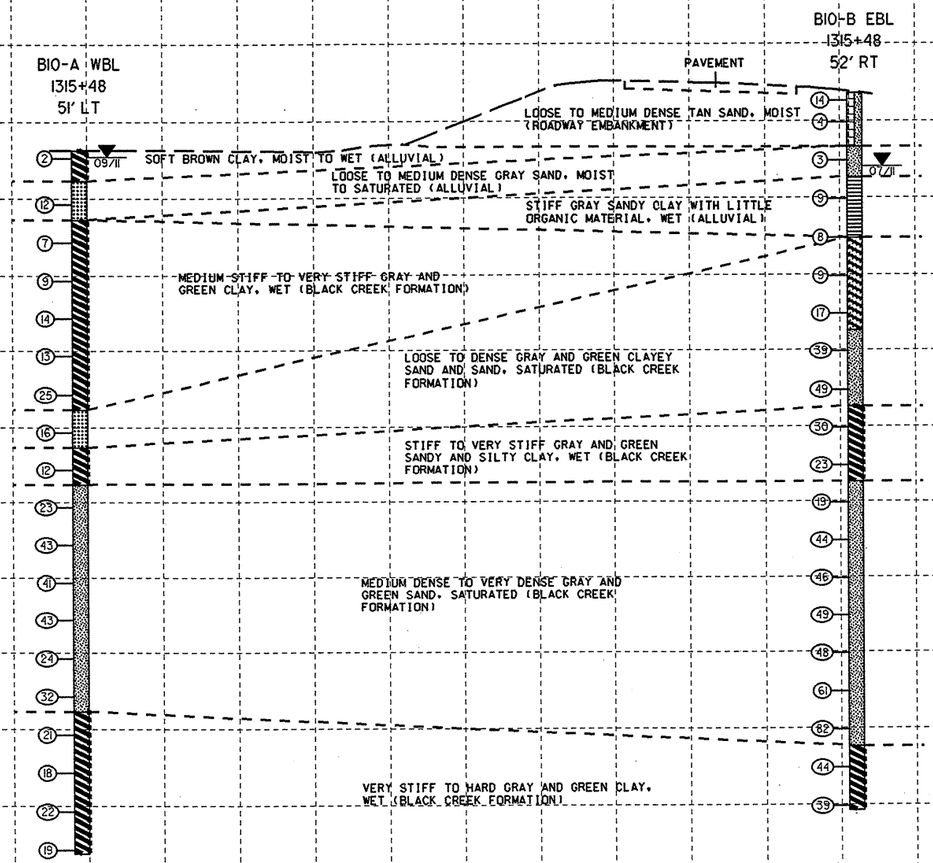
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	15 OF 46

CROSS SECTION THROUGH BENT 9



CROSS SECTION THROUGH BENT 10



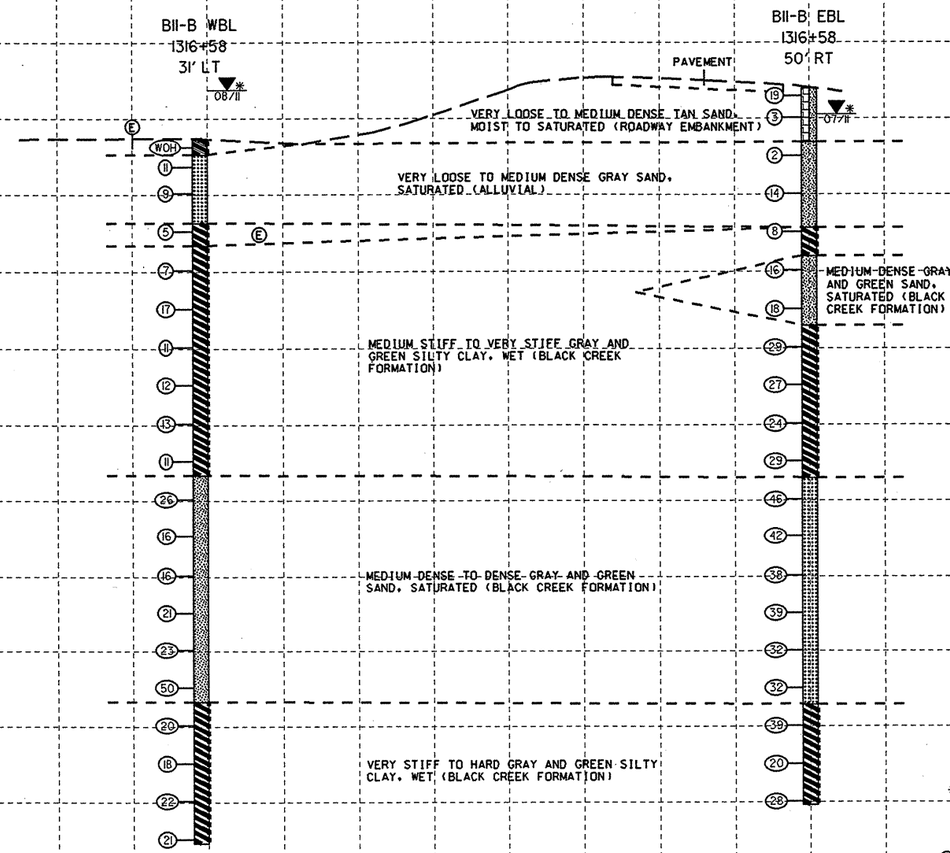
1315+48

-LREV-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	17 OF 46

CROSS SECTION THROUGH BENT II



* APPROXIMATE ELEVATION OF ARTESIAN HEAD

Ⓔ VERY SOFT TO MEDIUM STIFF ORANGE AND GRAY CLAY, WET (ALLUVIAL)

1316+53

-LREV-

CROSS SECTION THROUGH END BENT 2

EB2-B WBL
1317+58
35' LT

EB2-B EBL
1317+58
50' RT

PAVEMENT

LOOSE TO MEDIUM DENSE TAN SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

SOFT GRAY AND BROWN SANDY SILT AND SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SATURATED (ALLUVIAL)

MEDIUM STIFF TO STIFF GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)

MEDIUM DENSE TO VERY DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)

STIFF TO VERY STIFF GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)

VERY STIFF TO HARD GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)

09/11 ST-7

ST-1

ST-2

07/11 *

* APPROXIMATE ELEVATION OF ARTESIAN HEAD

1317+58

-LREV-

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. EB1-B WBL	**STATION** 1305+58	**OFFSET** 2 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 88.0 ft	**TOTAL DEPTH** 87.2 ft	**NORTHING** 453,250	**EASTING** 2,185,423	**24 HR.** ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/21/11	**COMP. DATE** 09/21/11	**SURFACE WATER DEPTH** 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)
90										
	88.0	0.0	2	3	5	8				88.0 GROUND SURFACE 0.0 **ROADWAY EMBANKMENT** GRAY SAND, SATURATED
85										84.0 4.0
	82.3	5.7	3	3	4	7				**ALLUVIAL** BROWN CLAY WITH LITTLE ORGANIC MATERIAL, WET
80										79.0 9.0
	77.3	10.7	4	6	6	12				**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
75										
	72.3	15.7	6	9	14	23				
70										
	67.3	20.7	6	12	12	24				
65										
	62.3	25.7	6	12	13	25				
60										
	57.3	30.7	5	6	8	14				
55										
	52.3	35.7	8	8	9	17				54.0 34.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
50										49.0 39.0
	47.3	40.7	9	11	18	29				**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
45										
	42.3	45.7	9	10	12	22				
40										
	37.3	50.7	13	29	34	63				
35										
	32.3	55.7	11	22	27	49				
30										
	27.3	60.7	10	15	17	32				
25										
	22.3	65.7	5	6	9	15				24.0 64.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
20										
	17.3	70.7	5	9	10	19				
15										
	12.3	75.7	6	10	10	20				
10										

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. EB1-B WBL	**STATION** 1305+58	**OFFSET** 2 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 88.0 ft	**TOTAL DEPTH** 87.2 ft	**NORTHING** 453,250	**EASTING** 2,185,423	**24 HR.** ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/21/11	**COMP. DATE** 09/21/11	**SURFACE WATER DEPTH** 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
10						Match Line				
	7.3	80.7	6	9	11	20				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5										
	2.3	85.7	7	8	10	18				0.8 87.2 Boring Terminated at Elevation 0.8 ft in Very Stiff Clay 88.0' - Approximate Elevation of Artesian Head

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. EB1-B EBL	**STATION** 1305+58	**OFFSET** 46 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.8 ft	**TOTAL DEPTH** 93.9 ft	**NORTHING** 453,203	**EASTING** 2,185,433	**24 HR.** 9.9
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/05/11	**COMP. DATE** 07/05/11	**SURFACE WATER DEPTH** 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)
95										93.8 GROUND SURFACE	0.0
	93.1	0.7	11	9	6	15	SS-1			93.1 PAVEMENT	0.7
90										ROADWAY EMBANKMENT TAN SAND, MOIST TO SATURATED	
	89.4	4.4	5	5	4	9					
	86.4	7.4	3	3	3	6					
85											
	81.4	12.4	WOH	WOH	WOH	0	SS-2	66%		83.8 ALLUVIAL BROWN SANDY AND SILTY CLAY WITH LITTLE ORGANIC MATERIAL (10.3% ORGANIC)	10.0
80											
	76.4	17.4	3	4	6	10	SS-3	85%			
75										73.8 COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	20.0
	71.4	22.4	6	9	14	23	SS-4				
70											
	66.4	27.4	9	14	23	37					
65											
	61.4	32.4	8	10	20	30					
60											
	56.4	37.4	7	9	12	21	SS-5			58.8 COASTAL PLAIN GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)	35.0
55											
	51.4	42.4	4	7	13	20					
50											
	46.4	47.4	4	8	19	27					
45											
	41.4	52.4	8	14	18	32	SS-6			43.8 COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	50.0
40											
	36.4	57.4	6	19	22	41					
35											
	31.4	62.4	9	20	27	47					
30											
	26.4	67.4	13	34	38	72					
25											
	21.4	72.4	13	15	14	29	SS-7			23.8 COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	70.0
20											
	16.4	77.4	4	7	10	17					
15											

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. EB1-B EBL	**STATION** 1305+58	**OFFSET** 46 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.8 ft	**TOTAL DEPTH** 93.9 ft	**NORTHING** 453,203	**EASTING** 2,185,433	**24 HR.** 9.9
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/05/11	**COMP. DATE** 07/05/11	**SURFACE WATER DEPTH** 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
15						Match Line				
	11.4	82.4	7	10	35	45	SS-8			13.8 COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION) 80.0
10										
	6.4	87.4	12	18	23	41				
5										
	1.4	92.4	13	16	19	35				-0.1 Boring Terminated at Elevation -0.1 ft in Dense Sand 93.9
0										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B1-B WBL	**STATION** 1306+28	**OFFSET** 6 ft LT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 86.2 ft	**TOTAL DEPTH** 92.4 ft	**NORTHING** 453,268	**EASTING** 2,185,491 — **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/19/11	**COMP. DATE** 09/20/11	**SURFACE WATER DEPTH** 0.0ft

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)
										86.2 WATER SURFACE (09/19/11)	0.0
	86.2	0.0	WOH	WOH	1	1				**ALLUVIAL** BROWN MUCK AND CLAY WITH LITTLE ORGANIC MATERIAL, WET	
										82.2	4.0
	80.3	5.9	WOH	2	2	4					
										77.2	9.0
	75.3	10.9	2	4	5	9				**ALLUVIAL** TAN SAND, SATURATED	
										72.2	14.0
	70.3	15.9	8	9	13	22				**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	
	65.3	20.9	6	11	14	25					
	60.3	25.9	7	8	13	21					
	55.3	30.9	6	10	13	23					
	50.3	35.9	6	9	12	21					
	45.3	40.9	7	10	12	22					
	40.3	45.9	5	10	13	23					
	35.3	50.9	8	11	14	25					
	30.3	55.9	6	13	24	37					
	25.3	60.9	9	22	27	49					
	20.3	65.9	13	15	27	42					
	15.3	70.9	11	13	21	34					
	10.3	75.9								57.2 **COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)	29.0
										37.2 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	49.0
										17.2 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	69.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B1-B WBL	**STATION** 1306+28	**OFFSET** 6 ft LT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 86.2 ft	**TOTAL DEPTH** 92.4 ft	**NORTHING** 453,268	**EASTING** 2,185,491 — **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/19/11	**COMP. DATE** 09/20/11	**SURFACE WATER DEPTH** 0.0ft

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
10						Match Line				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
	5.3	80.9	7	9	15	24				
5			6	9	10	19				
	0.3	85.9								
0			7	11	13	24				
	-4.7	90.9	7	10	10	20				
-5										-6.2 92.4
										Boring Terminated at Elevation -6.2 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B1-B EBL	**STATION** 1306+28	**OFFSET** 51 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.0 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 453,212	**EASTING** 2,185,502	**24 HR.** ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/06/11	**COMP. DATE** 07/06/11	**SURFACE WATER DEPTH** 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)
										93.0	0.0
										GROUND SURFACE	
										ROADWAY EMBANKMENT	
										TAN SAND, SATURATED	
100											
95											
	93.0	0.0	6	8	8	16	SS-9				
90	90.4	2.6	3	2	2	4					
	85.4	7.6	1	2	2	4					
85											
	80.4	12.6	1	3	7	10	SS-10				
80											
	75.4	17.6	4	4	7	11	SS-11				
75											
	70.4	22.6	11	14	15	29	SS-12				
70											
	65.4	27.6	8	9	12	21					
65											
	60.4	32.6	11	7	16	23					
60											
	55.4	37.6	10	10	13	23	SS-13				
55											
	50.4	42.6	5	7	12	19					
50											
	45.4	47.6	15	23	27	50	SS-14				
45											
	40.4	52.6	7	9	12	21					
40											
	35.4	57.6	14	24	29	53					
35											
	30.4	62.6	6	20	31	51	SS-15				
30											
	25.4	67.6	11	24	30	54					
25											
	20.4	72.6									
										82.0	11.0
										ALLUVIAL	
										BROWN SAND WITH TRACE ORGANIC MATERIAL (2.2% ORGANIC)	
										77.0	16.0
										ALLUVIAL	
										GRAY SAND, SATURATED	
										72.0	21.0
										COASTAL PLAIN	
										GRAY AND GREEN SANDY SILT, WET	
										(BLACK CREEK FORMATION)	
										57.0	36.0
										COASTAL PLAIN	
										GRAY AND GREEN SANDY CLAY, WET	
										(BLACK CREEK FORMATION)	
										47.0	46.0
										COASTAL PLAIN	
										GRAY AND GREEN SAND, SATURATED	
										(BLACK CREEK FORMATION)	
										32.0	61.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B1-B EBL	**STATION** 1306+28	**OFFSET** 51 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.0 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 453,212	**EASTING** 2,185,502	**24 HR.** ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/06/11	**COMP. DATE** 07/06/11	**SURFACE WATER DEPTH** 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
20						Match Line				
			15	30	24	54				
15	15.4	77.6					SS-16			
			6	9	9	18				
10	10.4	82.6								
			7	14	26	40				
5	5.4	87.6					SS-17			
			24	31	24	55				
0	0.4	92.6								
			13	19	25	44				
										17.0 76.0
										COASTAL PLAIN
										GRAY AND GREEN SAND, SATURATED
										(BLACK CREEK FORMATION)
										7.0 86.0
										-1.1 94.1
										Boring Terminated at Elevation -1.1 ft in Dense Sand
										93.3' - Approximate Elevation of Artesian Head

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B2-B WBL	**STATION** 1307+33	**OFFSET** 14 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 84.9 ft	**TOTAL DEPTH** 92.2 ft	**NORTHING** 453,289	**EASTING** 2,185,594	**24 HR.** 0.8
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/19/11	**COMP. DATE** 09/19/11	**SURFACE WATER DEPTH** 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	ELEV. (ft)	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
85										84.9	GROUND SURFACE	0.0
	84.9	0.0	WOH	WOH	WOH	0					**ALLUVIAL** BROWN MUCK, WET	
80	79.2	5.7	3	4	6	10				80.9	**ALLUVIAL** GRAY SAND, SATURATED	4.0
75	74.2	10.7	3	4	3	7				73.2	**COASTAL PLAIN** GRAY AND GREEN SANDY SILT, WET (BLACK CREEK FORMATION)	11.7
70	69.2	15.7	6	11	12	23						
65	64.2	20.7	7	10	13	23				60.9	**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	24.0
60	59.2	25.7	9	14	14	28						
55	54.2	30.7	7	10	12	22				50.9	**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	34.0
50	49.2	35.7	5	7	9	16						
45	44.2	40.7	4	6	10	16						
40	39.2	45.7	4	6	10	16						
35	34.2	50.7	3	6	15	21				35.9	**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	49.0
30	29.2	55.7	8	16	20	36						
25	24.2	60.7	7	11	11	22						
20	19.2	65.7	13	22	31	53						
15	14.2	70.7	7	8	11	19						
10	9.1	75.7	7	9	10	19				10.9	**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	74.0
5												

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B2-B WBL	**STATION** 1307+33	**OFFSET** 14 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 84.9 ft	**TOTAL DEPTH** 92.2 ft	**NORTHING** 453,289	**EASTING** 2,185,594	**24 HR.** 0.8
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/19/11	**COMP. DATE** 09/19/11	**SURFACE WATER DEPTH** 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						Match Line				
0	4.1	80.7	7	10	11	21				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
-5	-0.9	85.7	6	9	10	19				
	-5.9	90.7	6	11	11	22				-7.4 92.2 Boring Terminated at Elevation -7.4 ft in Very Stiff Clay

NCDOT BORE DOUBLE R-2303D_GEO_BRDG_42.GPJ NC_DOT.GDT 10/17/11

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B2-B EBL	**STATION** 1307+33	**OFFSET** 51 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.5 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 453,233	**EASTING** 2,185,605	**24 HR.** 3.4 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/07/11	**COMP. DATE** 07/07/11	**SURFACE WATER DEPTH** 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)
95										
	93.5	0.0								93.5 GROUND SURFACE 0.0
			3	5	7	12	SS-18			**ROADWAY EMBANKMENT** TAN AND BROWN SAND, MOIST TO SATURATED
90	90.8	2.7								
			2	2	2	4				
	87.5	6.0								
85	85.8	7.7	1	2	2	4	SS-19			
										82.5 11.0
80	80.8	12.7	1	1	1	2	SS-20	80%		**ALLUVIAL** BROWN SANDY CLAY WITH LITTLE ORGANIC MATERIAL (8.7% ORGANIC), WET
75	75.8	17.7	1	1	1	2				
	72.5	21.0								
70	70.8	22.7	6	11	16	27	SS-21			**COASTAL PLAIN** GRAY AND GREEN SANDY SILT, WET (BLACK CREEK FORMATION)
65	65.8	27.7	12	16	21	37				
60	60.8	32.7	11	14	17	31				
55	55.8	37.7	13	19	40	59				
	52.5	41.0								
50	50.8	42.7	5	6	11	17	SS-22			**COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)
45	45.8	47.7	5	7	13	20				
40	40.8	52.7	5	7	17	24				
	37.5	56.0								
35	35.8	57.7	3	11	27	38	SS-23			**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
30	30.8	62.7	12	15	22	37				
25	25.8	67.7	11	16	24	40				
	22.5	71.0								
20	20.8	72.7	9	13	20	33	SS-24			**COASTAL PLAIN** GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)
	17.5	76.0								
15	15.8	77.7								

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B2-B EBL	**STATION** 1307+33	**OFFSET** 51 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.5 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 453,233	**EASTING** 2,185,605	**24 HR.** 3.4 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/07/11	**COMP. DATE** 07/07/11	**SURFACE WATER DEPTH** 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
15						Match Line				
	10.8	82.7	2	10	17	27	SS-25			**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION) *(continued)*
10			7	13	23	36	SS-26			12.5 81.0
	5.8	87.7								**COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)
5			11	17	31	48				
	0.8	92.7								
0			17	32	55	87				-0.7 94.2
										Boring Terminated at Elevation -0.7 ft in Hard Clay 90.1' - Approximate Elevation of Artesian Head

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Swartley, J. R.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B3-B WBL	**STATION** 1308+69	**OFFSET** 31 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 85.6 ft	**TOTAL DEPTH** 82.5 ft	**NORTHING** 453,341	**EASTING** 2,185,722	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 09/15/11	**COMP. DATE** 09/15/11	**SURFACE WATER DEPTH** 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)
85	85.6	0.0	WOH	WOH	WOH	0				85.6 GROUND SURFACE 0.0
	82.6	3.0	1	0	4	4				**ALLUVIAL** BROWN MUCK, MOIST TO WET
80	79.6	6.0	2	4	5	9				80.6 5.0 **ALLUVIAL** TAN SAND, SATURATED
75	74.6	11.0	3	4	5	9				
70	69.6	16.0	6	10	12	22				71.6 14.0 **COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)
65	64.6	21.0	2	6	10	16				
60	59.6	26.0	4	7	8	15				61.6 24.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
55	54.6	31.0	4	6	11	17				
50	49.6	36.0	4	6	9	15				
45	44.6	41.0	4	7	8	15				
40	39.6	46.0	8	8	14	22				41.6 44.0 **COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)
35	34.6	51.0	5	11	15	26				36.6 49.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
30	29.6	56.0	7	7	13	20				
25	24.6	61.0	5	5	10	15				28.6 57.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
20	19.6	66.0	6	11	19	30				
15	14.6	71.0	4	7	8	15				
10										

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Swartley, J. R.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B3-B WBL	**STATION** 1308+69	**OFFSET** 31 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 85.6 ft	**TOTAL DEPTH** 82.5 ft	**NORTHING** 453,341	**EASTING** 2,185,722	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 09/15/11	**COMP. DATE** 09/15/11	**SURFACE WATER DEPTH** 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
10	9.6	76.0	5	8	13	Match Line 21				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5	4.6	81.0	5	7	10	17				3.1 82.5 Boring Terminated at Elevation 3.1 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B3-B EBL	**STATION** 1308+38	**OFFSET** 51 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.5 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 453,254	**EASTING** 2,185,708	**24 HR.** 3.2 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/08/11	**COMP. DATE** 07/08/11	**SURFACE WATER DEPTH** 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))
95	93.5	0.0	4	4	5	9	SS-27			93.5 GROUND SURFACE 0.0 **ROADWAY EMBANKMENT** TAN SAND, MOIST TO SATURATED
90	90.8	2.7	2	1	2	3				
85	85.8	7.7	2	1	2	3				
80	80.8	12.7	3	3	3	6				82.5 11.0 **ALLUVIAL** BROWN ORGANIC SAND, SATURATED
75	75.8	17.7	3	7	8	15	SS-28			77.5 16.0 **ALLUVIAL** GRAY SAND, SATURATED
70	70.8	22.7	6	10	14	24	SS-29			72.5 21.0 **COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)
65	65.8	27.7	8	10	15	25				
60	60.8	32.7	9	11	12	23				
55	55.8	37.7	4	8	12	20				
50	50.8	42.7	6	9	10	19	SS-30			52.5 41.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
45	45.8	47.7	6	8	11	19				
40	40.8	52.7	9	12	19	31	SS-31			42.5 51.0 **COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)
35	35.8	57.7	8	15	22	37				
30	30.8	62.7	5	24	32	56	SS-32			32.5 61.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
25	25.8	67.7	9	10	13	23	SS-33			27.5 66.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
20	20.8	72.7	9	11	15	26				
15	15.8	77.7								17.5 76.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B3-B EBL	**STATION** 1308+38	**OFFSET** 51 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.5 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 453,254	**EASTING** 2,185,708	**24 HR.** 3.2 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/08/11	**COMP. DATE** 07/08/11	**SURFACE WATER DEPTH** 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
15			2	7	12	Match Line	SS-34			**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION) *(continued)* 12.5 81.0
10	10.8	82.7	7	10	20	30	SS-35			**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
5	5.8	87.7	7	10	13	23				
0	0.8	92.7	8	11	15	26				-0.7 94.2 Boring Terminated at Elevation -0.7 ft in Very Stiff Clay 90.3' - Approximate Elevation of Artesian Head

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Swartley, J. R.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B4-A WBL	**STATION** 1309+44	**OFFSET** 55 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 85.2 ft	**TOTAL DEPTH** 82.6 ft	**NORTHING** 453,379	**EASTING** 2,185,791	**24 HR.** 0.7
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 09/14/11	**COMP. DATE** 09/15/11	**SURFACE WATER DEPTH** 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)
90											
85	85.2	0.0	WOH	WOH	WOH	0				85.2 GROUND SURFACE	0.0
	82.1	3.1	1	6	4	10				82.2 **ALLUVIAL** BROWN MUCK, MOIST TO SATURATED	3.0
80	79.1	6.1	2	4	6	10				**ALLUVIAL** BROWN AND TAN SAND, SATURATED	
75	74.1	11.1	3	3	5	8				76.2 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	9.0
70	69.1	16.1	3	5	6	11				71.2 **COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)	14.0
65	64.1	21.1	5	9	12	21					
60	59.1	26.1	4	7	10	17					
55	54.1	31.1	3	5	9	14				56.2 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	29.0
50	49.1	36.1	4	6	7	13					
45	44.1	41.1	5	8	11	19					
40	39.1	46.1	4	5	6	11					
35	34.1	51.1	7	10	11	21				33.1 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	52.1
30	29.1	56.1	6	8	13	21					
25	24.1	61.1	6	14	19	33					
20	19.1	66.1	8	11	12	23				18.1 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	67.1
15	14.1	71.1	6	7	8	15					
10											

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Swartley, J. R.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B4-A WBL	**STATION** 1309+44	**OFFSET** 55 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 85.2 ft	**TOTAL DEPTH** 82.6 ft	**NORTHING** 453,379	**EASTING** 2,185,791	**24 HR.** 0.7
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 09/14/11	**COMP. DATE** 09/15/11	**SURFACE WATER DEPTH** 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
10						Match Line				
	9.1	76.1	5	7	10	17				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5	4.1	81.1	5	7	10	17				2.6 Boring Terminated at Elevation 2.6 ft in Very Stiff Clay 82.6

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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B4-B EBL	**STATION** 1309+43	**OFFSET** 55 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.4 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 453,271	**EASTING** 2,185,812	**24 HR.** 2.0 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/12/11	**COMP. DATE** 07/12/11	**SURFACE WATER DEPTH** 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)
95											
	93.4	0.0								93.4 GROUND SURFACE	0.0
			10	5	3	8	SS-36	▼		**ROADWAY EMBANKMENT** TAN SAND, MOIST TO SATURATED	
90	90.7	2.7	1	2	3	5					
85	85.7	7.7	1	1	2	3					
80	80.7	12.7	1	1	2	3	SS-37			82.4 **ALLUVIAL** BROWN MUCK (13.8% ORGANIC), SATURATED	11.0
75	75.7	17.7	6	5	5	10	SS-38			77.4 **ALLUVIAL** BROWN SAND, SATURATED	16.0
70	70.7	22.7	5	6	10	16	SS-39			72.4 **COASTAL PLAIN** GRAY AND GREEN SANDY SILT, WET (BLACK CREEK FORMATION)	21.0
65	65.7	27.7	7	11	15	26					
60	60.7	32.7	11	10	15	25					
55	55.7	37.7	8	8	11	19	SS-40			57.4 **COASTAL PLAIN** GRAY AND GREEN CLAYEY SAND, SATURATED (BLACK CREEK FORMATION)	36.0
50	50.7	42.7	9	11	13	24					
45	45.7	47.7	5	6	12	18					
40	40.7	52.7	11	13	18	31	SS-41			42.4 **COASTAL PLAIN** GRAY AND GREEN SANDY SILT, WET (BLACK CREEK FORMATION)	51.0
35	35.7	57.7	10	15	27	42					
30	30.7	62.7	16	21	23	44					
25	25.7	67.7	10	17	19	36	SS-42			27.4 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	66.0
20	20.7	72.7	10	14	15	29					
15	15.7	77.7								17.4	76.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B4-B EBL	**STATION** 1309+43	**OFFSET** 55 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.4 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 453,271	**EASTING** 2,185,812	**24 HR.** 2.0 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/12/11	**COMP. DATE** 07/12/11	**SURFACE WATER DEPTH** 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
15						Match Line				
			5	8	10	18	SS-43			**COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION) *(continued)*
10	10.7	82.7	5	7	10	17				
5	5.7	87.7	7	10	16	26				
0	0.7	92.7	8	10	15	25				-0.8 94.2
										Boring Terminated at Elevation -0.8 ft in Very Stiff Clay
										91.4' - Approximate Elevation of Artesian Head

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Swartley, J. R.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B5-A WBL	**STATION** 1310+49	**OFFSET** 43 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 84.4 ft	**TOTAL DEPTH** 77.8 ft	**NORTHING** 453,389	**EASTING** 2,185,896	**24 HR.** 0.3
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/13/11	**COMP. DATE** 09/14/11	**SURFACE WATER DEPTH** 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)
90											
85	84.4	0.0	WOH	1	0	1				84.4 GROUND SURFACE	0.0
										ALLUVIAL BROWN MUCK, MOIST TO WET	
80	81.1	3.3	WOH	1	3	4				80.1	4.3
	78.1	6.3								**ALLUVIAL** GRAY SAND, SATURATED	
75			3	5	6	11				75.4	9.0
	73.1	11.3								**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	
70			3	3	4	7				70.4	14.0
	68.1	16.3								**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	
65			5	6	9	15					
	63.1	21.3									
60			5	11	10	21				60.4	24.0
	58.1	26.3								**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	
55			3	5	10	15				57.0	27.4
	53.1	31.3								**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	
50			8	8	14	22				50.4	34.0
	48.1	36.3								**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	
45			5	5	9	14					
	43.1	41.3									
40			7	9	13	22					
	38.1	46.3									
35			5	5	10	15				35.4	49.0
	33.1	51.3								**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	
30			4	7	13	20					
	28.1	56.3									
25			7	16	16	32					
	23.1	61.3									
20			6	8	12	20					
	18.1	66.3									
15			8	10	12	22				15.4	69.0
	13.1	71.3								**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	
10			5	7	8	15					

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Swartley, J. R.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B5-A WBL	**STATION** 1310+49	**OFFSET** 43 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 84.4 ft	**TOTAL DEPTH** 77.8 ft	**NORTHING** 453,389	**EASTING** 2,185,896	**24 HR.** 0.3
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/13/11	**COMP. DATE** 09/14/11	**SURFACE WATER DEPTH** 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
10						Match Line				
	8.1	76.3	6	8	9	17				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)* 77.8
										6.6 Boring Terminated at Elevation 6.6 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B5-B EBL	**STATION** 1310+48	**OFFSET** 42 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 94.8 ft	**TOTAL DEPTH** 94.5 ft	**NORTHING** 453,305	**EASTING** 2,185,912	**24 HR.** 1.0 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/13/11	**COMP. DATE** 07/13/11	**SURFACE WATER DEPTH** 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)
95										94.8 GROUND SURFACE	0.0
	93.6	1.2								93.6 PAVEMENT	1.2
90			8	7	5	12	SS-44			**ROADWAY EMBANKMENT** TAN SAND, MOIST TO SATURATED	
	89.6	5.2	2	2	2	4				86.8 **ALLUVIAL** BROWN SANDY SILT WITH LITTLE ORGANIC MATERIAL (6.8% ORGANIC)	8.0
85	84.6	10.2									
	81.8	13.0	2	1	1	2	SS-45	72%			
80			3	11	13	24	SS-46			82.3 **ALLUVIAL** BROWN AND GRAY SAND, SATURATED	12.5
	76.8	18.0									
75			4	7	9	16					
	71.8	23.0	4	4	5	9	SS-47			73.8 **COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)	21.0
70											
	66.8	28.0	7	13	20	33	SS-48			68.8 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	26.0
65											
	61.8	33.0	4	11	11	22					
60											
	56.8	38.0	6	13	12	25					
55											
	51.8	43.0	6	12	11	23	SS-49			53.8 **COASTAL PLAIN** GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)	41.0
50											
	46.8	48.0	6	8	10	18					
45											
	41.8	53.0	8	13	16	29					
40											
	36.8	58.0	3	7	15	22	SS-50			38.8 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	56.0
35											
	31.8	63.0	6	10	17	27					
30											
	26.8	68.0	6	9	14	23					
25											
	21.8	73.0	6	11	20	31	SS-51				
20											
	16.8	78.0	5	12	17	29					
15											

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B5-B EBL	**STATION** 1310+48	**OFFSET** 42 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 94.8 ft	**TOTAL DEPTH** 94.5 ft	**NORTHING** 453,305	**EASTING** 2,185,912	**24 HR.** 1.0 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/13/11	**COMP. DATE** 07/13/11	**SURFACE WATER DEPTH** 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
15						Match Line				13.8 **COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION) 81.0
	11.8	83.0	5	9	11	20	SS-52			
10										
	6.8	88.0	6	10	13	23				
5										
	1.8	93.0	6	11	13	24				0.3 Boring Terminated at Elevation 0.3 ft in Very Stiff Clay 94.5
										93.8' - Approximate Elevation of Artesian Head

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B6-B WBL	**STATION** 1311+54	**OFFSET** 26 ft LT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 86.5 ft	**TOTAL DEPTH** 83.5 ft	**NORTHING** 453,393	**EASTING** 2,186,002 — **24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/13/11	**COMP. DATE** 09/13/11	**SURFACE WATER DEPTH** 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)
90											
	86.5	0.0	1	0	1	1				86.5 GROUND SURFACE	0.0
85										**ALLUVIAL** BROWN CLAY WITH ORGANIC MATERIAL, MOIST TO WET	
	82.5	4.0	WOH	1	0	1				83.5	3.0
80										**ALLUVIAL** BROWN MUCK, WET	
	79.5	7.0	WOH	1	1	2				79.0	7.5
75										**ALLUVIAL** GRAY SAND, SATURATED	
	74.5	12.0	1	1	1	2				76.5	10.0
70										**ALLUVIAL** BROWN MUCK, WET	
	69.5	17.0	1	3	4	7				73.5	13.0
65										**ALLUVIAL** GRAY SAND, SATURATED	
	64.5	22.0	7	11	11	22				71.5	15.0
60										**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	
	59.5	27.0	4	7	11	18				66.5	20.0
55										**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	
	54.5	32.0	6	10	13	23					
50											
	49.5	37.0	4	6	9	15					
45											
	44.5	42.0	6	10	12	22					
40											
	39.5	47.0	3	6	7	13					
35											
	34.5	52.0	3	10	14	24					
30											
	29.5	57.0	7	12	16	28					
25											
	24.5	62.0	5	7	10	17					
20											
	19.5	67.0	6	9	15	24					
15											
	14.5	72.0	7	10	16	26				51.5	35.0
10										**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	
										46.5	40.0
										COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	
										41.5	45.0
										COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	
										36.5	50.0
										COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	
										11.5	75.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B6-B WBL	**STATION** 1311+54	**OFFSET** 26 ft LT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 86.5 ft	**TOTAL DEPTH** 83.5 ft	**NORTHING** 453,393	**EASTING** 2,186,002 — **24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/13/11	**COMP. DATE** 09/13/11	**SURFACE WATER DEPTH** 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
10						Match Line				
	9.5	77.0	5	7	9	16				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5										
	4.5	82.0	5	7	9	16				3.0 83.5
										Boring Terminated at Elevation 3.0 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B6-B EBL	**STATION** 1311+66	**OFFSET** 42 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 85.5 ft	**TOTAL DEPTH** 93.2 ft	**NORTHING** 453,329	**EASTING** 2,186,028	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/19/11	**COMP. DATE** 07/20/11	**SURFACE WATER DEPTH** 0.8ft	

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))
90										
85	85.5	0.0	WOH	1	1	2 2	SS-79			WATER SURFACE (07/19/11) 85.5 GROUND SURFACE 0.0 **ALLUVIAL** BROWN MODERATELY ORGANIC SAND (5.4% ORGANIC), SATURATED
80	82.7	2.8	1	1	1					80.5 5.0
	78.0	7.5	10	11	11	22	SS-80			**ALLUVIAL** GRAY SAND, SATURATED
75	73.8	11.7								75.5 10.0
70	68.8	16.7	3	4	5	9	SS-81			**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
			3	6	7	13	SS-82			70.5 15.0
65	63.8	21.7								**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
60	58.8	26.7	4	6	7	13				
55	53.8	31.7	9	11	14	25				
50	48.8	36.7	10	11	12	23	SS-83			
45	43.8	41.7	8	10	15	25				
40	38.8	46.7	9	13	15	28				
35	33.8	51.7	8	16	21	37	SS-84			
30	28.8	56.7	8	14	15	29				
25	23.8	61.7	9	11	18	29	SS-85			
20	18.8	66.7	7	9	16	25				
15	13.8	71.7	9	12	15	27				
10			8	11	13	24				
										55.5 30.0 **COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)
										40.5 45.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
										10.5 75.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B6-B EBL	**STATION** 1311+66	**OFFSET** 42 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 85.5 ft	**TOTAL DEPTH** 93.2 ft	**NORTHING** 453,329	**EASTING** 2,186,028	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/19/11	**COMP. DATE** 07/20/11	**SURFACE WATER DEPTH** 0.8ft	

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
10						Match Line				
	8.8	76.7	6	9	12	21	SS-86			**COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5	3.8	81.7	9	10	13	23				
0	-1.2	86.7	8	10	11	21				
-5	-6.2	91.7	7	10	12	22				-7.7 93.2 Boring Terminated at Elevation -7.7 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B7-B WBL	**STATION** 1312+76	**OFFSET** 4 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 85.0 ft	**TOTAL DEPTH** 92.3 ft	**NORTHING** 453,388	**EASTING** 2,186,128	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/09/11	**COMP. DATE** 09/09/11	**SURFACE WATER DEPTH** 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)
85	85.0	0.0	WOH	WOH	WOH	0				GROUND SURFACE	0.0
	81.7	3.3	WOH	WOH	WOH	0				**ALLUVIAL** BROWN MUCK, MOIST TO WET	
80	79.2	5.8	1	1	2	3				80.0 **ALLUVIAL** BROWN SILT WITH LITTLE ORGANIC MATERIAL, WET	5.0
75	74.2	10.8	3	4	6	10				76.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	9.0
70	69.2	15.8	3	3	6	9					
65	64.2	20.8	3	3	4	7				66.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	19.0
60	59.2	25.8	3	5	8	13					
55	54.2	30.8	6	15	17	32					
50	49.2	35.8	6	13	16	29				51.0 **COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)	34.0
45	44.2	40.8	6	9	11	20					
40	39.2	45.8	4	11	7	18				41.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	44.0
35	34.2	50.8	6	8	13	21				36.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	49.0
30	29.2	55.8	7	8	13	21					
25	24.2	60.8	6	10	14	24					
20	19.2	65.8	5	11	13	24					
15	14.2	70.8	9	10	15	25					
10										11.0	74.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B7-B WBL	**STATION** 1312+76	**OFFSET** 4 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 85.0 ft	**TOTAL DEPTH** 92.3 ft	**NORTHING** 453,388	**EASTING** 2,186,128	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/09/11	**COMP. DATE** 09/09/11	**SURFACE WATER DEPTH** 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
10						Match Line				
	9.2	75.8	5	8	12	20				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5	4.2	80.8	7	10	9	19				
0	-0.8	85.8	6	10	13	23				
-5	-5.8	90.8	6	8	9	17				-7.3 92.3 Boring Terminated at Elevation -7.3 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B7-B EBL	**STATION** 1312+53	**OFFSET** 42 ft RT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 84.0 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 453,346	**EASTING** 2,186,113 — **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/21/11	**COMP. DATE** 07/21/11	**SURFACE WATER DEPTH** 0.0ft

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)
85										
	84.0	0.0	WOH	WOH	WOH	0	SS-87			84.0 WATER SURFACE (07/21/11) 0.0 **ALLUVIAL** BROWN MODERATELY ORGANIC SANDY SILT (12.6% ORGANIC), WET
80	79.2	4.8	WOH	WOH	WOH	0				
	76.4	7.6	3	1	3	4	SS-88			77.5 6.5 **ALLUVIAL** GRAY SAND, SATURATED
75										
	71.4	12.6	3	3	5	8	SS-89			73.0 11.0 **COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)
70										
	66.4	17.6	3	6	10	16				
65										
	61.4	22.6	5	9	9	18				63.0 21.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
60										
	56.4	27.6	6	9	16	25				
55										
	51.4	32.6	7	9	13	22				53.0 31.0 **COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)
50										
	46.4	37.6	7	9	14	23				
45										
	41.4	42.6	7	9	11	20				
40										
	36.4	47.6	5	11	15	26				38.0 46.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
35										
	31.4	52.6	1	3	11	14				
30										
	26.4	57.6	7	13	15	28				
25										
	21.4	62.6	10	10	14	24				
20										
	16.4	67.6	5	10	13	23				
15										
	11.4	72.6	6	11	17	28				
10										
	6.4	77.6	10	14	16	30				
5										

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B7-B EBL	**STATION** 1312+53	**OFFSET** 42 ft RT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 84.0 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 453,346	**EASTING** 2,186,113 — **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/21/11	**COMP. DATE** 07/21/11	**SURFACE WATER DEPTH** 0.0ft

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						Match Line				
0	1.4	82.6	7	9	13	22				3.0 81.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
-5	-3.6	87.6	7	10	13	23				
-10	-8.6	92.6	7	11	13	24				-10.1 94.1 Boring Terminated at Elevation -10.1 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B8-B WBL	**STATION** 1313+52	**OFFSET** 11 ft LT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 86.6 ft	**TOTAL DEPTH** 92.8 ft	**NORTHING** 453,418	**EASTING** 2,186,199 — **24 HR.** 0.1
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/08/11	**COMP. DATE** 09/09/11	**SURFACE WATER DEPTH** 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)
90										
	86.6	0.0	WOH	WOH	WOH	0				86.6 GROUND SURFACE 0.0
85										**ALLUVIAL** BROWN MUCK, MOIST TO WET
	83.6	3.0	WOH	WOH	WOH	0				81.6 5.0
80	80.3	6.3								**ALLUVIAL** GRAY SAND, SATURATED
			WOH	3	5	8				77.6 9.0
75	75.3	11.3								**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
			3	3	5	8				
70	70.3	16.3								
			3	4	5	9				67.6 19.0
65	65.3	21.3								**COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)
			3	5	6	11				
60	60.3	26.3								
			4	5	8	13				57.6 29.0
55	55.3	31.3								**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
			5	6	13	19				
50	50.3	36.3								
			14	22	21	43				
45	45.3	41.3								
			6	11	14	25				42.6 44.0
40	40.3	46.3								**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
			4	6	7	13				
35	35.3	51.3								
			5	6	8	14				32.6 54.0
30	30.3	56.3								**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
			5	10	10	20				
25	25.3	61.3								
			4	9	14	23				
20	20.3	66.3								
			8	16	22	38				
15	15.3	71.3								
			7	13	18	31				
10	10.3	76.3								

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. B8-B WBL	**STATION** 1313+52	**OFFSET** 11 ft LT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 86.6 ft	**TOTAL DEPTH** 92.8 ft	**NORTHING** 453,418	**EASTING** 2,186,199 — **24 HR.** 0.1
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/08/11	**COMP. DATE** 09/09/11	**SURFACE WATER DEPTH** 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
10						Match Line				
	5.3	81.3	7	10	10	20				7.6 79.0
5										**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
	0.3	86.3	5	11	12	23				
0										
	-4.7	91.3	6	10	10	20				
-5										
			7	7	11	18				-6.2 92.8
										Boring Terminated at Elevation -6.2 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B8-B EBL	**STATION** 1313+38	**OFFSET** 43 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 94.6 ft	**TOTAL DEPTH** 94.3 ft	**NORTHING** 453,362	**EASTING** 2,186,196	**24 HR.** 4.7 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/22/11	**COMP. DATE** 07/27/11	**SURFACE WATER DEPTH** 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)
95										94.6 / 0.0 GROUND SURFACE
	93.5	1.1								93.5 / 1.1 PAVEMENT
	91.8	2.8	40	15	15	30				ROADWAY EMBANKMENT TAN SAND, MOIST TO SATURATED
90			5	4	4	8				
	86.8	7.8								87.6 / 7.0 ALLUVIAL BROWN SAND WITH LITTLE ORGANIC MATERIAL, SATURATED
85			2	3	3	6				
	81.8	12.8								83.6 / 11.0 ALLUVIAL BROWN MODERATELY ORGANIC SILT, WET
80			1	1	1	2				
	76.8	17.8								76.3 / 18.3 ALLUVIAL GRAY SAND, SATURATED
75			5	5	6	11				75.7 / 18.9 COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
	71.8	22.8								
70			3	4	5	9				
	66.8	27.8								68.6 / 26.0 COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
65			2	4	8	12				
	61.8	32.8								
60			5	6	10	16				
	56.8	37.8								
55			11	15	15	30				
	51.8	42.8								53.6 / 41.0 COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
50			7	9	11	20				
	46.8	47.8								
45			6	10	12	22				
	41.8	52.8								
40			7	10	11	21				
	36.8	57.8								
35			6	7	10	17				
	31.8	62.8								
30			5	9	10	19				
	26.8	67.8								28.6 / 66.0 COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
25			4	6	7	13				
	21.8	72.8								
20			10	13	16	29				
	16.8	77.8								
15			14	14	17	31				

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B8-B EBL	**STATION** 1313+38	**OFFSET** 43 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 94.6 ft	**TOTAL DEPTH** 94.3 ft	**NORTHING** 453,362	**EASTING** 2,186,196	**24 HR.** 4.7 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/22/11	**COMP. DATE** 07/27/11	**SURFACE WATER DEPTH** 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
15						Match Line				
	11.8	82.8	13	20	37	57				COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION) *(continued)*
10										8.6 / 86.0 COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
	6.8	87.8	11	12	13	25				
5										
	1.8	92.8	9	11	11	22				0.3 / 94.3 Boring Terminated at Elevation 0.3 ft in Very Stiff Clay 89.9' - Approximate Elevation of Artesian Head

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B9-B WBL	**STATION** 1314+43	**OFFSET** 13 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 86.2 ft	**TOTAL DEPTH** 92.7 ft	**NORTHING** 453,428	**EASTING** 2,186,290	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 09/08/11	**COMP. DATE** 09/08/11	**SURFACE WATER DEPTH** 0.0ft	

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)
90										
85	86.2	0.0	WOH	WOH	WOH	0				86.2 WATER SURFACE (09/08/11) 0.0 ALLUVIAL BROWN MUCK, WET
80	80.0	6.2	WOH	WOH	1	1				77.2 9.0 COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
75	75.0	11.2	3	3	3	6				
70	70.0	16.2	3	4	6	10				
65	65.0	21.2	3	5	7	12				
60	60.0	26.2	4	6	9	15				
55	55.0	31.2	7	10	13	23				
50	50.0	36.2	5	8	10	18				
45	45.0	41.2	6	8	11	19				
40	40.0	46.2	4	7	6	13				
35	35.0	51.2	4	6	7	13				
30	30.0	56.2	3	10	16	26				
25	25.0	61.2	6	13	16	29				
20	20.0	66.2	6	10	18	28				
15	15.0	71.2	7	9	16	25				57.2 29.0 COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
10	10.0	76.2								52.2 34.0 COASTAL PLAIN GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)
										42.2 44.0 COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
										32.2 54.0 COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B9-B WBL	**STATION** 1314+43	**OFFSET** 13 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 86.2 ft	**TOTAL DEPTH** 92.7 ft	**NORTHING** 453,428	**EASTING** 2,186,290	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 09/08/11	**COMP. DATE** 09/08/11	**SURFACE WATER DEPTH** 0.0ft	

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
10						Match Line				
5	5.0	81.2	7	11	13	24				COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION) *(continued)*
0	0.0	86.2	9	14	12	26				
-5	-5.0	91.2	5	10	13	23				-2.8 89.0 COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
			5	8	10	18				-6.5 92.7 Boring Terminated at Elevation -6.5 ft in Very Stiff Clay

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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B9-B EBL	**STATION** 1314+43	**OFFSET** 46 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 94.4 ft	**TOTAL DEPTH** 94.5 ft	**NORTHING** 453,380	**EASTING** 2,186,300	**24 HR.** 7.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/28/11	**COMP. DATE** 07/28/11	**SURFACE WATER DEPTH** 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)
95										94.4 0.0 GROUND SURFACE
	93.6	0.8								93.6 0.8 PAVEMENT
	91.4	3.0	10	14	16	30				**ROADWAY EMBANKMENT** TAN SAND, MOIST TO SATURATED
90			6	7	7	14				
	86.4	8.0								85.4 9.0
85			1	1	2	3				**ALLUVIAL** GRAY CLAY WITH LITTLE ORGANIC MATERIAL, WET
	81.4	13.0								
80			WOH	WOH	1	1				
	76.4	18.0								78.4 16.0 **ALLUVIAL** GRAY SAND, SATURATED
75			8	11	11	22				
	71.4	23.0								73.4 21.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
70			3	4	6	10				
	66.4	28.0								68.4 26.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
65			4	5	7	12				
	61.4	33.0								
60			8	12	17	29				
	56.4	38.0								
55			9	12	21	33				
	51.4	43.0								53.4 41.0 **COASTAL PLAIN** GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)
50			8	10	18	28				
	46.4	48.0								
45			9	10	13	23				
	41.4	53.0								43.4 51.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
40			3	7	7	14				
	36.4	58.0								
35			5	10	15	25				
	31.4	63.0								
30			8	14	17	31				
	26.4	68.0								
25			9	13	17	30				
	21.4	73.0								
20			9	14	19	33				
	16.4	78.0								
15			10	13	23	36				

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B9-B EBL	**STATION** 1314+43	**OFFSET** 46 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 94.4 ft	**TOTAL DEPTH** 94.5 ft	**NORTHING** 453,380	**EASTING** 2,186,300	**24 HR.** 7.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/28/11	**COMP. DATE** 07/28/11	**SURFACE WATER DEPTH** 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
15						Match Line				
10	11.4	83.0	11	15	22	37				**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION) *(continued)*
5	6.4	88.0	10	12	13	25				8.4 86.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
0	1.4	93.0	10	10	11	21				-0.1 94.5 Boring Terminated at Elevation -0.1 ft in Very Stiff Clay

NCDOT BORE DOUBLE R-2303D_GEO_BRDG_42.GPJ NC_DOT.GDT 10/17/11

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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B10-A WBL	**STATION** 1315+48	**OFFSET** 51 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 86.3 ft	**TOTAL DEPTH** 92.5 ft	**NORTHING** 453,497	**EASTING** 2,186,383	**24 HR.** 0.9
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 09/06/11	**COMP. DATE** 09/06/11	**SURFACE WATER DEPTH** 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)
90										
	86.3	0.0	3	1	1	2		▼		86.3 GROUND SURFACE 0.0 **ALLUVIAL** BROWN CLAY, MOIST TO WET
85										82.3 4.0
	80.3	6.0	4	5	7	12				**ALLUVIAL** GRAY SAND, SATURATED
80										77.3 9.0
	75.3	11.0	2	3	4	7				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
75										
	70.3	16.0	2	4	5	9				
70										
	65.3	21.0	4	6	8	14				
65										
	60.3	26.0	4	5	8	13				
60										
	55.3	31.0	7	11	14	25				
55										
	50.3	36.0	6	8	8	16				
50										
	45.3	41.0	3	5	7	12				
45										
	40.3	46.0	7	10	13	23				
40										
	35.3	51.0	9	20	23	43				
35										
	30.3	56.0	8	17	24	41				
30										
	25.3	61.0	16	18	25	43				
25										
	20.3	66.0	9	12	12	24				
20										
	15.3	71.0	13	13	19	32				
15										
	10.3	76.0								52.3 34.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
10										47.3 39.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
										42.3 44.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
										12.3 74.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B10-A WBL	**STATION** 1315+48	**OFFSET** 51 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 86.3 ft	**TOTAL DEPTH** 92.5 ft	**NORTHING** 453,497	**EASTING** 2,186,383	**24 HR.** 0.9
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 09/06/11	**COMP. DATE** 09/06/11	**SURFACE WATER DEPTH** 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
10			8	10	11	Match Line				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5	5.3	81.0	6	9	9	18				
0	0.3	86.0	5	10	12	22				
-5	-4.8	91.0	6	9	10	19				-6.3 92.5 Boring Terminated at Elevation -6.3 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B10-B EBL	**STATION** 1315+48	**OFFSET** 52 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.6 ft	**TOTAL DEPTH** 94.3 ft	**NORTHING** 453,396	**EASTING** 2,186,404	**24 HR.** 9.6
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/14/11	**COMP. DATE** 07/14/11	**SURFACE WATER DEPTH** 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))
95	93.6	0.0								93.6 / 0.0 GROUND SURFACE
			6	9	5	14	SS-53			**ROADWAY EMBANKMENT** TAN SAND, MOIST
90	90.8	2.8	2	2	2	4				86.6 / 7.0 **ALLUVIAL** GRAY SAND, MOIST TO SATURATED
	85.8	7.8	1	1	2	3	SS-54			82.6 / 11.0 **ALLUVIAL** GRAY SANDY CLAY WITH LITTLE ORGANIC MATERIAL, WET
85										
80	80.8	12.8	1	2	7	9	SS-55	42%		
75	75.8	17.8	4	4	4	8				74.8 / 18.8 **COASTAL PLAIN** GRAY AND GREEN CLAYEY SAND AND SAND, SATURATED (BLACK CREEK FORMATION)
70	70.8	22.8	2	4	5	9	SS-56			
65	65.8	27.8	6	8	9	17				
60	60.8	32.8	6	18	21	39	SS-57			
55	55.8	37.8	9	18	31	49				
50	50.8	42.8	11	11	19	30	SS-58			62.6 / 31.0
45	45.8	47.8	7	11	12	23	SS-59			52.6 / 41.0 **COASTAL PLAIN** GRAY AND GREEN SANDY AND SILTY CLAY, WET (BLACK CREEK FORMATION)
40	40.8	52.8	3	8	11	19	SS-60			42.6 / 51.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
35	35.8	57.8	8	17	27	44				
30	30.8	62.8	12	18	28	46				
25	25.8	67.8	16	19	30	49				
20	20.8	72.8	17	23	25	48	SS-61			
15	15.8	77.8	18	26	35					

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B10-B EBL	**STATION** 1315+48	**OFFSET** 52 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.6 ft	**TOTAL DEPTH** 94.3 ft	**NORTHING** 453,396	**EASTING** 2,186,404	**24 HR.** 9.6
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/14/11	**COMP. DATE** 07/14/11	**SURFACE WATER DEPTH** 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
15						Match Line				
10	10.8	82.8	20	41	41	61 / 82				**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION) *(continued)*
5	5.8	87.8	12	23	21	44				7.6 / 86.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
0	0.8	92.8	11	19	20	39				-0.7 / 94.3 Boring Terminated at Elevation -0.7 ft in Hard Clay

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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B11-B WBL	**STATION** 1316+58	**OFFSET** 31 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 87.3 ft	**TOTAL DEPTH** 92.6 ft	**NORTHING** 453,499	**EASTING** 2,186,495	**24 HR.** ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 08/31/11	**COMP. DATE** 09/01/11	**SURFACE WATER DEPTH** 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)
90											
	87.3	0.0	WOH	WOH	WOH	0				87.3 GROUND SURFACE	0.0
85	84.7	2.6	5	5	6	11				**ALLUVIAL** ORANGE CLAY, WET	
	81.2	6.1	4	4	5	9				85.3 **ALLUVIAL** GRAY SAND, SATURATED	2.0
80											
	76.2	11.1	2	2	3	5				76.3 **ALLUVIAL** GRAY CLAY, WET	11.0
75										73.3 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	14.0
	71.2	16.1	3	4	3	7					
70											
	66.2	21.1	4	7	10	17					
65											
	61.2	26.1	4	5	6	11					
60											
	56.2	31.1	4	5	7	12					
55											
	51.2	36.1	4	6	7	13					
50											
	46.2	41.1	3	4	7	11					
45											
	41.2	46.1	5	10	16	26					
40											
	36.2	51.1	2	8	8	16					
35											
	31.2	56.1	2	7	9	16					
30											
	26.2	61.1	8	9	12	21					
25											
	21.2	66.1	5	10	13	23					
20											
	16.2	71.1	12	24	26	50					
15											
	11.2	76.1	5	11	9	20				43.3 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	44.0
10										13.3 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	74.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B11-B WBL	**STATION** 1316+58	**OFFSET** 31 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 87.3 ft	**TOTAL DEPTH** 92.6 ft	**NORTHING** 453,499	**EASTING** 2,186,495	**24 HR.** ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 08/31/11	**COMP. DATE** 09/01/11	**SURFACE WATER DEPTH** 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
10						Match Line				
	6.2	81.1	5	9	9	18				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5										
	1.2	86.1	6	10	12	22				
0										
	-3.8	91.1	5	11	10	21				-5.3 92.6
-5										Boring Terminated at Elevation -5.3 ft in Very Stiff Clay

93.7' - Approximate Elevation of Artesian Head

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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B11-B EBL	**STATION** 1316+58	**OFFSET** 50 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.9 ft	**TOTAL DEPTH** 94.3 ft	**NORTHING** 453,420	**EASTING** 2,186,511	**24 HR.** 3.4 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/15/11	**COMP. DATE** 07/15/11	**SURFACE WATER DEPTH** 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)
95	93.9	0.0	7	9	10	19	SS-62			93.9 GROUND SURFACE 0.0 **ROADWAY EMBANKMENT** TAN SAND, MOIST TO SATURATED
90	91.1	2.8	1	1	2	3				
	86.1	7.8	WOH	1	1	2	SS-63			86.9 7.0 **ALLUVIAL** GRAY SAND, SATURATED
85	81.1	12.8	6	6	8	14				
80	76.1	17.8	4	4	4	8	SS-64			75.6 18.3 **COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)
75	71.1	22.8	5	6	10	16	SS-65			71.9 22.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
70	66.1	27.8	6	7	11	18				
65	61.1	32.8	7	13	16	29	SS-66			62.9 31.0 **COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)
60	56.1	37.8	7	12	15	27				
55	51.1	42.8	6	11	13	24				
50	46.1	47.8	6	13	16	29				
45	41.1	52.8	12	21	25	46	SS-67			42.9 51.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
40	36.1	57.8	14	19	23	42				
35	31.1	62.8	10	18	20	38				
30	26.1	67.8	13	20	19	39	SS-68			
25	21.1	72.8	15	14	18	32				
20	16.1	77.8	12	15	17	32				
15										

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. B11-B EBL	**STATION** 1316+58	**OFFSET** 50 ft RT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 93.9 ft	**TOTAL DEPTH** 94.3 ft	**NORTHING** 453,420	**EASTING** 2,186,511	**24 HR.** 3.4 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 07/15/11	**COMP. DATE** 07/15/11	**SURFACE WATER DEPTH** 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
15						Match Line				
10	11.1	82.8	12	19	20	39	SS-69			12.9 81.0 **COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)
5	6.1	87.8	6	9	11	20				
0	1.1	92.8	10	13	15	28				-0.4 94.3 Boring Terminated at Elevation -0.4 ft in Very Stiff Clay 90.5' - Approximate Elevation of Artesian Head

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. EB2-B WBL	**STATION** 1317+58	**OFFSET** 35 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 87.5 ft	**TOTAL DEPTH** 87.8 ft	**NORTHING** 453,523	**EASTING** 2,186,592	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/01/11	**COMP. DATE** 09/02/11	**SURFACE WATER DEPTH** 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)
90											
	87.5	0.0	WOH	1	1	2	SS-90			87.5 GROUND SURFACE	0.0
85										ALLUVIAL GRAY AND BROWN SANDY CLAY, MOIST TO WET	
	81.2	6.3	2	3	5	8	SS-91			83.5	4.0
80										ALLUVIAL GRAY SAND, SATURATED	
	76.2	11.3	3	3	4	7	SS-92			78.5	9.0
75										COASTAL PLAIN GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)	
	71.2	16.3	3	3	5	8					
70										68.5	19.0
	66.2	21.3	2	9	10	19	SS-93			COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	
65											
	61.2	26.3	7	8	11	19					
60											
	56.2	31.3	5	8	9	17	SS-94				
55											
	51.2	36.3	7	8	10	18	SS-95				
50											
	46.2	41.3	4	7	7	14	SS-96				
45											
	41.2	46.3	3	6	7	13					
40											
	36.2	51.3	7	16	21	37	SS-97				
35											
	31.2	56.3	19	29	30	59					
30											
	26.2	61.3	7	12	13	25					
25											
	21.2	66.3	14	25	47	72	SS-98				
20											
	16.2	71.3	12	21	28	49					
15											
	11.2	76.3	11	9	10	19	SS-99			58.5 COASTAL PLAIN GRAY AND GREEN SANDY AND SILTY CLAY, WET (BLACK CREEK FORMATION)	29.0
10										38.5 COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	49.0
										13.5 COASTAL PLAIN GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)	74.0

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK				**GROUND WTR (ft)**
BORING NO. EB2-B WBL	**STATION** 1317+58	**OFFSET** 35 ft LT	**ALIGNMENT** -LREV-	**0 HR.** N/A
COLLAR ELEV. 87.5 ft	**TOTAL DEPTH** 87.8 ft	**NORTHING** 453,523	**EASTING** 2,186,592	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/01/11	**COMP. DATE** 09/02/11	**SURFACE WATER DEPTH** 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
10						Match Line				
5	6.2	81.3	7	8	10	18				COASTAL PLAIN GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION) *(continued)*
0	1.2	86.3	6	7	9	16				-0.3 87.8 Boring Terminated at Elevation -0.3 ft in Very Stiff Clay

Other Samples:
ST-7 (1.5 - 2.3)
ST-1 (12.8 - 14.1)
ST-2 (17.8 - 18.9)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. EB2-B EBL	**STATION** 1317+58	**OFFSET** 50 ft RT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 94.2 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 453,440	**EASTING** 2,186,609 — **24 HR.** 3.2 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/18/11	**COMP. DATE** 07/18/11	**SURFACE WATER DEPTH** 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)
95	94.2	0.0								94.2 / 0.0 GROUND SURFACE
			7	8	8	16	SS-70			ROADWAY EMBANKMENT TAN SAND, MOIST TO SATURATED
90	91.5	2.7	2	1	3	4				
	86.5	7.7	1	1	1	2	SS-71			88.2 / 6.0 ALLUVIAL GRAY SANDY SILT, WET
85										
	81.5	12.7	8	8	10	18	SS-72			83.2 / 11.0 ALLUVIAL GRAY SAND, SATURATED
80										
	76.5	17.7	4	6	6	12	SS-73			78.2 / 16.0 COASTAL PLAIN GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)
75										
	71.5	22.7	4	5	6	11				
70										
	66.5	27.7	7	8	9	17	SS-74			68.2 / 26.0 COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
65										
	61.5	32.7	6	7	8	15				
60										
	56.5	37.7	8	14	14	28	SS-75			58.2 / 36.0
55										
	51.5	42.7	7	9	11	20				
50										
	46.5	47.7	4	7	8	15				43.2 / 51.0
45										
	41.5	52.7	4	7	12	19	SS-76			
40										
	36.5	57.7	12	23	27	50				
35										
	31.5	62.7	13	16	23	39				28.2 / 66.0
30										
	26.5	67.7	12	17	20	37	SS-77			
25										
	21.5	72.7	10	16	19	35				
20										
	16.5	77.7	7	11	12	23				
15										

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK			**GROUND WTR (ft)**
BORING NO. EB2-B EBL	**STATION** 1317+58	**OFFSET** 50 ft RT	**ALIGNMENT** -LREV- — **0 HR.** N/A
COLLAR ELEV. 94.2 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 453,440	**EASTING** 2,186,609 — **24 HR.** 3.2 ART.
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/18/11	**COMP. DATE** 07/18/11	**SURFACE WATER DEPTH** 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
15						Match Line				
	11.5	82.7	7	10	12	22	SS-78			13.2 / 81.0 COASTAL PLAIN GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)
10										
	6.5	87.7	11	13	33	46				
5										
	1.5	92.7	10	11	13	24				0.0 / 94.2 Boring Terminated at Elevation 0.0 ft in Very Stiff Clay 91.0' - Approximate Elevation of Artesian Head

34416.1.1
(R-2303D)

PROJECT REFERENCE NO.	SHEET
R-2303D	45 OF 46

BRIDGE NO. 42 ON NC 24 OVER GREAT COHARIE CREEK AT -LREV- STA. 1311+58

EB1-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	46 RT	1305+58	0.7-2.2	A-2-4(0)	17	NP	61.3	24.1	4.5	10.1	93	56	15	-	-
SS-2	46 RT	1305+58	12.4-13.9	A-7-5(7)	46	15	10.1	36.5	20.9	32.5	100	96	57	66.2	10.3
SS-3	46 RT	1305+58	17.4-18.9	A-7-5(73)	102	60	1.2	2.0	25.8	71.0	100	99	97	84.9	10.3
SS-4	46 RT	1305+58	22.4-23.9	A-2-4(0)	26	NP	33.2	48.8	7.9	10.1	100	88	23	-	-
SS-5	46 RT	1305+58	37.4-38.9	A-7-6(46)	73	50	3.9	19.3	30.2	46.7	100	99	85	-	-
SS-6	46 RT	1305+58	52.4-53.9	A-2-4(0)	25	NP	33.1	48.4	6.4	12.2	100	86	23	-	-
SS-7	46 RT	1305+58	72.4-73.9	A-7-5(57)	85	55	1.8	9.5	19.7	69.0	100	99	90	-	-
SS-8	46 RT	1305+58	82.4-83.9	A-1-b(0)	29	4	71.4	16.7	5.8	6.1	94	36	14	-	-

B1-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-9	51 RT	1306+28	0.0-1.5	A-1-b(0)	19	NP	66.2	23.7	5.0	5.1	78	43	9	-	-
SS-10	51 RT	1306+28	12.6-14.1	A-2-4(0)	25	6	8.2	61.0	10.5	20.3	95	94	34	-	2.2
SS-11	51 RT	1306+28	17.6-19.1	A-3(0)	21	NP	69.2	26.6	2.2	2.0	100	83	5	-	-
SS-12	51 RT	1306+28	22.6-24.1	A-4(0)	26	NP	0.9	75.3	16.7	7.1	100	100	36	-	-
SS-13	51 RT	1306+28	37.6-39.1	A-7-6(19)	47	26	3.9	36.1	29.6	30.4	100	99	74	-	-
SS-14	51 RT	1306+28	47.6-49.1	A-2-4(0)	23	NP	18.8	70.8	5.4	5.1	100	98	12	-	-
SS-15	51 RT	1306+28	62.6-64.1	A-3(0)	21	NP	49.3	43.2	4.5	3.0	100	89	9	-	-
SS-16	51 RT	1306+28	77.6-79.1	A-2-7(1)	43	19	64.5	11.1	10.2	14.2	98	48	26	-	-
SS-17	51 RT	1306+28	87.6-89.1	A-2-4(0)	27	NP	0.9	80.7	10.2	8.1	100	100	22	-	-

B2-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-18	51 RT	1307+33	0.0-1.5	A-1-b(0)	16	NP	74.5	18.9	3.5	3.0	89	45	7	-	-
SS-19	51 RT	1307+33	7.7-9.2	A-2-4(0)	22	3	16.5	57.9	7.3	18.3	100	95	29	-	-
SS-20	51 RT	1307+33	12.7-14.2	A-7-6(8)	41	18	3.0	43.0	25.6	28.4	96	95	58	80.0	8.7
SS-21	51 RT	1307+33	22.7-24.2	A-4(0)	29	NP	0.8	71.8	13.2	14.2	100	100	39	-	-
SS-22	51 RT	1307+33	42.7-44.2	A-7-6(48)	71	47	0.8	17.0	31.4	50.7	100	100	91	-	-
SS-23	51 RT	1307+33	57.7-59.2	A-2-4(0)	19	NP	49.4	41.3	5.3	4.1	100	85	12	-	-
SS-24	51 RT	1307+33	72.7-74.2	A-6(4)	34	12	4.6	47.9	15.1	32.5	100	100	53	-	-
SS-25	51 RT	1307+33	77.7-79.2	A-1-b(0)	21	NP	89.0	5.6	2.3	3.0	96	31	6	-	-
SS-26	51 RT	1307+33	82.7-84.2	A-7-6(49)	75	51	4.3	13.4	23.5	58.8	100	98	87	-	-

B3-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-27	51 RT	1308+38	0.0-1.5	A-2-4(0)	15	NP	62.2	22.5	7.2	8.1	89	61	17	-	-
SS-28	51 RT	1308+38	17.7-19.2	A-3(0)	21	NP	75.5	21.6	1.9	1.0	98	66	4	-	-
SS-29	51 RT	1308+38	22.7-24.2	A-4(1)	33	7	8.9	53.0	20.8	17.2	100	98	50	-	-
SS-30	51 RT	1308+38	42.7-44.2	A-7-6(40)	66	40	1.4	19.3	32.7	46.7	100	99	89	-	-
SS-31	51 RT	1308+38	52.7-54.2	A-4(1)	33	6	3.9	60.4	17.4	18.3	100	99	46	-	-
SS-32	51 RT	1308+38	62.7-64.2	A-3(0)	19	NP	53.5	39.4	4.1	3.0	100	89	9	-	-
SS-33	51 RT	1308+38	67.7-69.2	A-7-6(65)	91	66	2.2	12.2	16.6	69.0	100	99	88	-	-
SS-34	51 RT	1308+38	77.7-79.2	A-1-b(0)	66	NP	91.9	4.6	1.5	2.0	97	19	4	-	-
SS-35	51 RT	1308+38	82.7-84.2	A-7-6(71)	93	65	3.0	5.5	22.5	69.0	100	98	94	-	-

B4-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-36	55RT	1309+43	0.0-1.5	A-2-4(0)	15	NP	61.3	24.6	6.0	8.1	90	56	15	-	-
SS-37	55RT	1309+43	12.7-14.2	A-2-5(0)	50	NP	17.3	50.6	24.1	8.1	95	87	33	-	13.8
SS-38	55RT	1309+43	17.7-19.2	A-2-4(0)	23	NP	5.4	86.6	4.9	3.0	100	99	11	-	-
SS-39	55RT	1309+43	22.7-24.2	A-4(4)	36	10	9.1	47.7	21.0	22.2	100	98	57	-	-
SS-40	55RT	1309+43	37.7-39.2	A-2-7(4)	43	28	48.1	18.7	12.0	21.1	100	69	35	-	-
SS-41	55RT	1309+43	52.7-54.2	A-4(0)	28	5	10.0	61.0	15.9	13.1	100	97	38	-	-
SS-42	55RT	1309+43	67.7-69.2	A-2-4(0)	26	3	5.7	69.6	9.6	15.1	100	99	26	-	-
SS-43	55RT	1309+43	77.7-79.2	A-7-6(66)	88	59	1.6	7.7	28.3	62.4	100	99	95	-	-

B5-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-44	42RT	1310+48	1.2-2.7	A-2-4(0)	18	2	58.0	24.8	7.2	10.1	84	53	16	-	-
SS-45	42RT	1310+48	10.2-11.7	A-4(0)	30	5	5.6	60.8	21.5	12.1	100	99	39	71.9	6.8
SS-46	42RT	1310+48	13.0-14.5	A-3(0)	23	NP	27.0	66.0	4.0	3.0	100	94	9	-	0.9
SS-47	42RT	1310+48	23.0-24.5	A-7-5(58)	90	48	2.4	2.8	24.3	70.5	100	98	96	55.2	-
SS-48	42RT	1310+48	28.0-29.5	A-2-4(0)	27	NP	1.0	80.9	11.1	7.0	100	100	29	-	-
SS-49	42RT	1310+48	43.0-44.5	A-7-6(19)	54	36	30.6	11.5	21.7	36.3	100	82	61	-	-
SS-50	42RT	1310+48	58.0-59.5	A-2-4(0)	26	NP	46.7	37.3	6.9	9.1	99	86	18	-	-
SS-51	42RT	1310+48	73.0-74.5	A-2-4(0)	30	7	13.0	60.9	8.0	18.1	98	94	27	-	-
SS-52	42RT	1310+48	83.0-84.5	A-7-5(56)	82	50	2.0	6.6	26.9	64.5	100	99	94	-	-

B6-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-79	42 RT	1311+66	0.0-1.5	A-2-4(0)	33	NP	10.6	76.0	7.3	6.1	99	95	16	-	5.4
SS-80	42 RT	1311+66	8.9-10.4	A-3(0)	23	NP	39.4	54.8	3.7	2.0	100	89	7	-	-
SS-81	42 RT	1311+66	11.7-13.2	A-7-5(73)	103	59	1.4	1.4	17.6	79.5	100	99	98	-	-
SS-82	42 RT	1311+66	16.7-18.2	A-2-4(0)	30	6	49.8	25.1	10.9	14.2	94	75	27	-	-
SS-83	42 RT	1311+66	31.7-33.2	A-7-6(39)	65	43	6.5	16.0	32.8	44.7	100	97	84	-	-
SS-84	42 RT	1311+66	46.7-48.2	A-2-4(0)	24	NP	47.1	42.7	5.1	5.1	100	86	11	-	-
SS-85	42 RT	1311+66	56.7-58.2	A-2-4(0)	26	2	29.8	46.3	9.6	14.2	99	86	25	-	-
SS-86	42 RT	1311+66	76.7-78.2	A-7-6(57)	76	56	1.8	9.7	25.5	62.9	100	99	92	-	-

B7-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-87	42 RT	1312+53	0.0-1.5	A-5(2)	42	7	4.1	50.8	31.0	14.2	100	99	51	-	12.6
SS-88	42 RT	1312+53	7.6-9.1	A-3(0)	23	NP	72.4	26.7	0.9	0.0	100	72	1	-	-
SS-89	42 RT	1312+53	12.6-14.1	A-7-5(77)	100	65	1.6	1.2	24.1	73.1	100	99	98	-	-

B10-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-53	52RT	1315+48	0.0-1.5	A-2-4(0)	20	2	47.3	33.2	9.4	10.1	91	66	20	-	-
SS-54	52RT	1315+48	7.8-9.3	A-2-4(0)	34	NP	32.0	57.0	6.9	4.0	100	84	14	-	1.1
SS-55	52RT	1315+48	12.8-14.3	A-6(9)	36	15	2.0	34.4	25.3	38.3	100	99	71	42.3	-
SS-56	52RT	1315+48	22.8-24.3	A-2-6(1)	36	17	43.8	25.4	8.7	22.2	100	85	32	-	-
SS-57	52RT	1315+48	32.8-34.3	A-2-4(0)	31	6	54.3	28.1	8.6	9.1	100	56	20	-	-
SS-58	52RT	1315+48	42.8-44.3	A-7-6(9)	43	14	1.8	48.3	27.7	22.2	100	99	69	-	-
SS-59	52RT	1315+48	47.8-49.3	A-7-6(36)	61	41	1.2	23.8	26.7	48.3	100	100	83	-	-
SS-60	52RT	1315+48	52.8-54.3	A-2-4(0)	21	NP	72.9	15.5	2.5	9.1	98	62	12	-	-
SS-61	52RT	1315+48	72.8-74.3	A-2-4(0)	20	NP	37.1	52.3	5.6	5.0	100	90	12	-	-

B11-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-62	50RT	1316+58	0.0-1.5	A-2-4(0)	17	1	55.3	26.9	7.8	10.1	97	64	20	-	-
SS-63	50RT	1316+58	7.8-9.3	A-2-4(0)	21	NP	2.4	73.9	17.6	6.0	100	100	33	-	-
SS-64	50RT	1316+58	18.3-19.3	A-7-6(61)	87	59	2.8	9.9	24.9	62.4	100	98	90	-	-
SS-65	50RT	1316+58	22.8-24.3	A-2-4(0)	24	5	53.1	23.8	9.1	14.1	100	86	25	-	-
SS-66	50RT	1316+58	32.8-34.3	A-7-6(64)	90	64	2.8	10.1	22.7	64.5	100	98	89	-	-
SS-67	50RT	1316+58	52.8-54.3	A-3(0)	25	NP	29.8	62.1	5.0	3.0	100	98	9	-	-
SS-68	50RT	1316+58	67.8-69.3	A-3(0)	21	NP	53.6	40.5	2.9	3.0	100	91	7	-	-
SS-69	50RT	1316+58	82.8-84.3	A-7-6(57)	78	53	2.0	6.4	27.1	64.5	100	99	94	-	-

EB2-B WBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-90	35 LT	1317+58	0.0-1.5	A-6(3)	30	13	2.4	50.9	12.1	34.6	100	99	48	-	-
SS-91	35 LT	1317+58	6.3-7.8	A-3(0)	23	NP	55.5	40.7	1.7	2.0	98	72	5	-	-
SS-92	35 LT	1317+58	11.3-12.8	A-7-5(53)	82	50	3.9	9.4	23.7	63.1	99	96	90	-	-
SS-93	35 LT	1317+58	21.3-22.8	A-2-4(0)	22	NP	40.5	48.0	3.4	8.1	100	95	13	-	-
SS-94	35 LT	1317+58	31.3-32.8	A-7-5(63)	89	59	1.0	11.4	22.5	65.1	100	99	92	-	-
SS-95	35 LT	1317+58	36.3-37.8	A-7-6(7)	51	34	41.3	22.2	8.0	28.5	100	67	40	-	-
SS-96	35 LT	1317+58	41.3-42.8	A-7-6(27)	55	39	6.7	22.8	19.6	50.9	100	97	73	-	-
SS-97	35 LT	1317+58	51.3-52.8	A-2-4(0)	27	NP	2.6	81.8	5.4	10.2	100	99	31	-	-
SS-98	35 LT	1317+58	66.3-67.8	A-2-4(0)	26	NP	13.0	74.9	1.9	10.2	100	99	19	-	-
SS-99	35 LT	1317+58	76.3-77.8	A-7-6(45)	74	51	3.3	18.1	15.6	63.1	100	98	82	-	-

EB2-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-70	50 RT	1317+58	0.0-1.5	A-2-6(1)	32	17	60.1	17.6	4.1	18.3	94	58	23	-	-
SS-71	50 RT	1317+58	7.7-9.2	A-4(1)	25	9	4.3	56.4	14.9	24.4	100	98	43	-	-
SS-72	50 RT	1317+58	12.7-14.2	A-3(0)	26	NP	43.1	54.2	1.6	1.0	100	87	4	-	-
SS-73	50 RT	1317+58	17.7-19.2	A-7-6(54)	76	53	2.0	10.2	24.9	62.9	100	99	91	-	-
SS-74	50 RT	1317+58	27.7-29.2	A-2-4(0)	22	NP	52.8	26.8	6.2	14.2	99	82	22	-	-
SS-75	50 RT	1317+58	37.7-39.2	A-2-5(0)	43	10	66.3	15.6	6.9	11.2	97	40	20	-	-
SS-76	50 RT	1317+58	52.7-54.2	A-3(0)	24	NP	72.7	24.3	2.0	1.0	100	90	4	-	-
SS-77	50 RT	1317+58	67.7-69.2	A-2-4(0)	24	NP	1.9	77.7	8.2	12.2	100	100	25	-	-
SS-78	50 RT	1317+58	82.7-84.2	A-7-6(23)	53	32	0.8	28.4	22.0	48.7	100	100	74	-	-

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

FIELD SCOUR REPORT

WBS: 34416.1.1 TIP: R-2303D COUNTY: SAMPSON

DESCRIPTION(1): BRIDGE NO. 42 ON -LREV- (NC 24) OVER GREAT COHARIE CREEK

EXISTING BRIDGE

Information from: Field Inspection X Microfilm ____ (reel ____ pos: ____)
Other (explain) ____

Bridge No.: 42 Length: 142' Total Bents: 4 Bents in Channel: 2 Bents in Floodplain: 2
Foundation Type: CONCRETE PILES

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: NONE NOTED

Interior Bents: NONE NOTED

Channel Bed: NONE NOTED

Channel Bank: NONE NOTED

EXISTING SCOUR PROTECTION

Type(3): CONCRETE END WALLS

Extent(4): 10-15' OUTSIDE EDGE OF BRIDGE

Effectiveness(5): EFFECTIVE

Obstructions(6): NONE NOTED

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): MUCK, ORGANIC SAND - SILT - CLAY, SAND, AND CLAY

Channel Bank Material(8): MUCK AND ORGANIC SAND AND SILT

Channel Bank Cover(9): TREES AND SHRUBS

Floodplain Width(10): 500' (±)

Floodplain Cover(11): TREES AND SHRUBS

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

Channel Migration Tendency(13): SLIGHT TENDENCY TO MIGRATE WEST TOWARD END BENT 1

Observations and Other Comments: ____

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK ____ ____

See Sheet 45
"Soil Test Results",
for samples:
(CHANNEL BED) SS-79, SS-80, SS-81, SS-87
(CHANNEL BANK) SS-79, SS-87

Comparison of DSE to Hydraulics Unit theoretical scour:
The Geotechnical Engineering Unit agrees with the Hydraulic Unit's 100 year theoretical scour elevations proposed in the Bridge Survey and Hydraulic Report dated 3/23/11.

DESIGN SCOUR ELEVATIONS(14) Feet X Meters

BENTS		BENTS				
BENT 1 EBL	82.0	BENT 8 EBL	83.5			
BENT 1 WBL	82.7	BENT 8 WBL	81.7			
BENT 2 EBL	81.6	BENT 9 EBL	82.8			
BENT 2 WBL	82.5	BENT 9 WBL	83.0			
BENT 3 EBL	81.1	BENT 10 EBL	83.0			
BENT 3 WBL	82.2	BENT 10 WBL	83.0			
BENT 4 EBL	82.9	BENT 11 EBL	83.5			
BENT 4 WBL	82.5	BENT 11 WBL	84.0			
BENT 5 EBL	83.2					
BENT 5 WBL	82.4					
BENT 6 EBL	82.2					
BENT 6 WBL	82.9					
BENT 7 EBL	80.5					
BENT 7 WBL	75.0					

Template Revised 02/07/06

Reported by: Tyler C. Bottoms **Date:** 10/17/2011

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2303D	1	19

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34416.1.1 (R-2303D) F.A. PROJ. STPNHF-F-8-2(17)

COUNTY SAMPSON

PROJECT DESCRIPTION BRIDGE NO. 51 ON NC 24 OVER GREAT COHARIE SWAMP OVERFLOW AT -L- STA. 1326+94

PROJECT: 34416.1.1

ID: R-2303D

CONTENTS

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

C.M. WRIKE

CATLIN, INC.

MID ATLANTIC

INVESTIGATED BY T.C. BOTTOMS

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE OCTOBER 2011

NORTH CAROLINA LICENSED SEAL 2240 GEOLOGIST TYLER C. BOTTOMS

10/10/11

DRAWN BY: C.P. TURNER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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.
R-2303D	2 OF 19

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 THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. 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	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		NP	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

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
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 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	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	2.00	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		
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM — 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, YELLOW-BROWN, 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 IS 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 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 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	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	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 SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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, FRACTURES
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

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [ ] CME-550
- [ ] PORTABLE HOIST
- [X] DIEDRICH TRACK
- [X] DIEDRICH D-50

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [X] TRICONE 2 15/16 " STEEL TEETH
- [ ] TRICONE_____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF 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)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
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 ROCK 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 GEOLOGIST'S 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 GEOLOGIST'S 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 GEOLOGIST'S 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 THAT 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 THAT 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 (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

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 (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - 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 THAT 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, THAT 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 BPF) 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 PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BM-109: RR SPIKE AT BASE OF 20" PINE AT -BL- STATION 1326+52, 179' LT

ELEVATION: 95.88 FT.

NOTES:

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET
R-2303D	3 OF 19

SITE PLAN

0 50 100
FEET

SKEW = 90°

N

1325

1328

WLB

F

-LREV-

-L-

NC 24 (ROSEBORO HIGHWAY)

EXISTING BRIDGE 51

EBI-A WBL

BI-A WBL

B2-A WBL

EB2-A WBL

EBI-B EBL

BI-B EBL

B2-B EBL

EB2-B EBL

JS NEU

EBI BENT LINE

BI BENT LINE

B2 BENT LINE

EB2 BENT LINE

EQUATION:
-LREV- Sta 1325+54.08 BK =
-L- Sta 1325+51.33 AH

5/14/99

PROFILE THROUGH WBL BORINGS PROJECTED ALONG ℄ OF -WBL-

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	4 OF 19

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

VE = 2.0

EB1-A WBL
1326+03
21' LT

B1-A WBL
1326+52
27' LT

B2-A WBL
1327+21
26' LT

EB2-A WBL
1327+83
41' LT

WATER SURFACE

ST-6

ST-5

ST-1

SOFT TO VERY STIFF GRAY AND MEDIUM DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)

MOIST TO WET (BLACK CREEK FORMATION)

MEDIUM DENSE TO VERY DENSE GRAY AND GREEN SAND.

SATURATED (BLACK CREEK FORMATION)

VERY STIFF TO HARD GRAY AND GREEN SANDY CLAY.

WET (BLACK CREEK FORMATION)

GREEN SANDY AND SILTY CLAY.

Ⓐ VERY SOFT BROWN MUCK. MOIST TO WET (ALLUVIAL)

Ⓑ VERY LOOSE TO MEDIUM DENSE GRAY AND BROWN SAND, SATURATED (ALLUVIAL)

NOTE: GROUNDLINE PROFILE ALONG -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED MARCH 23, 2011.

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

1325+00 1326+00 1327+00 1328+00 1329+00

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	5 OF 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROFILE THROUGH EBL BORINGS PROJECTED ALONG ℄ OF -EBL-

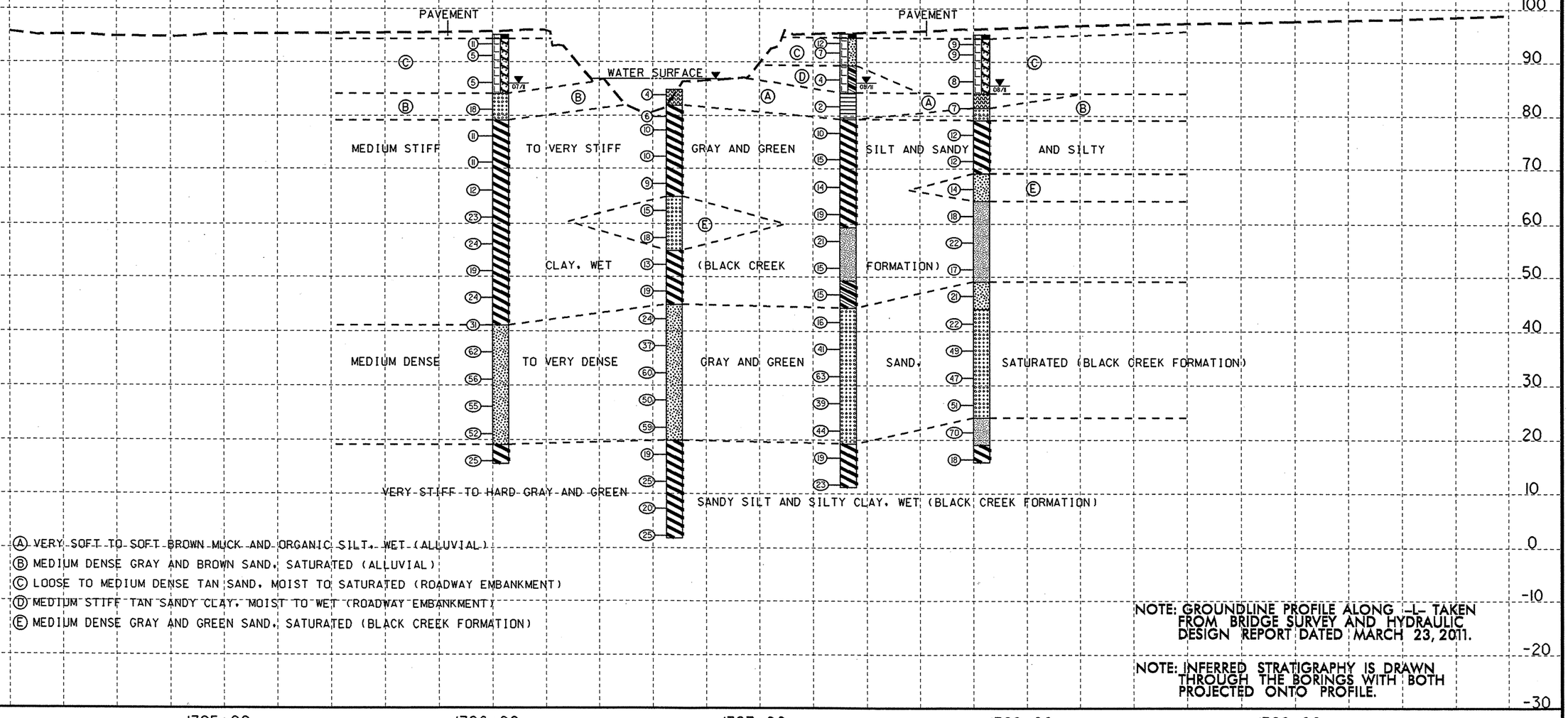
VE = 2.0

EB1-B EBL
1326+03
31' RT

B1-B EBL
1326+68
32' RT

B2-B EBL
1327+33
31' RT

EB2-B EBL
1327+83
32' RT



170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10 -20 -30

1325+00 1326+00 1327+00 1328+00 1329+00

Ⓐ VERY SOFT TO SOFT BROWN MUCK AND ORGANIC SILT, WET (ALLUVIAL)
Ⓑ MEDIUM DENSE GRAY AND BROWN SAND, SATURATED (ALLUVIAL)
Ⓒ LOOSE TO MEDIUM DENSE TAN SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)
Ⓓ MEDIUM STIFF TAN SANDY CLAY, MOIST TO WET (ROADWAY EMBANKMENT)
Ⓔ MEDIUM DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)

NOTE: GROUNDLINE PROFILE ALONG -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED MARCH 23, 2011.

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

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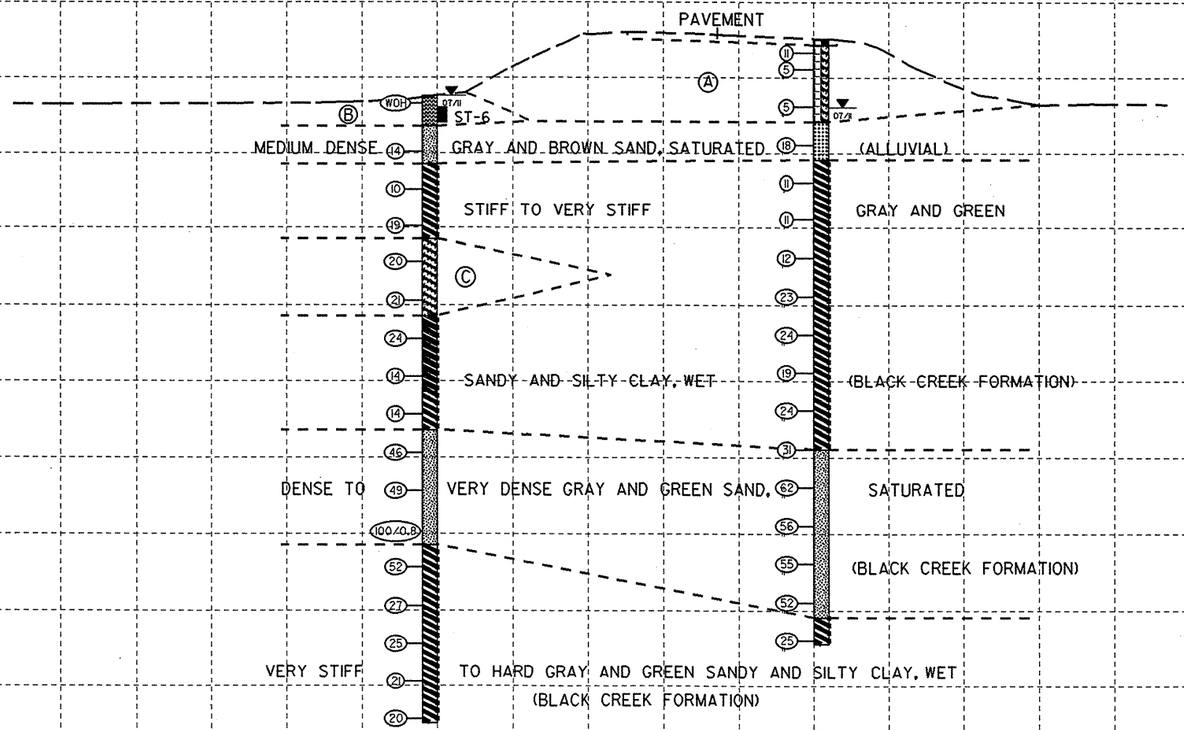
Options
8.11.2 (2527.28)

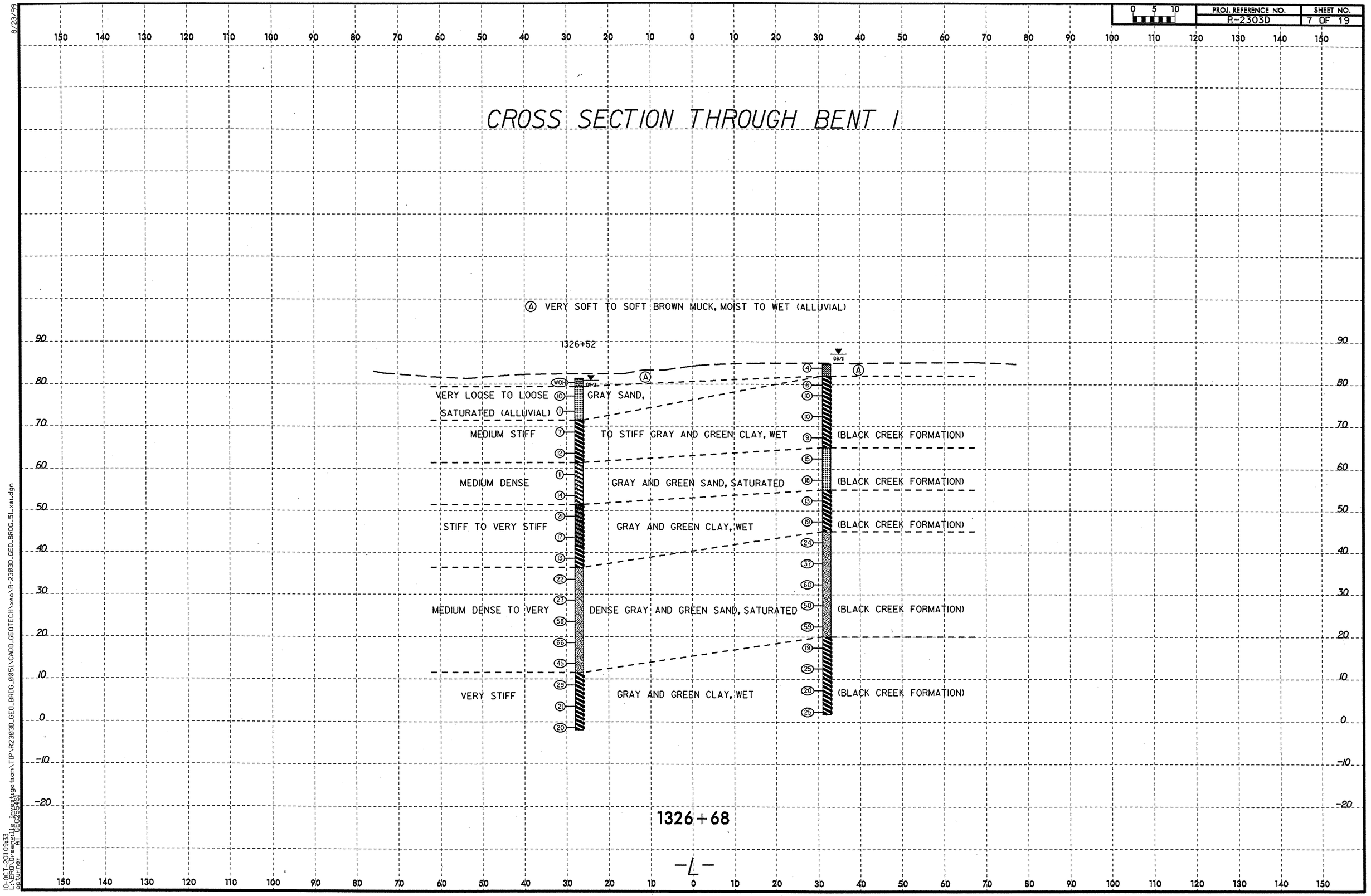
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	6 OF 19

CROSS SECTION THROUGH END BENT 1

Ⓐ LOOSE TO MEDIUM DENSE, TAN SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)
Ⓑ VERY SOFT BROWN MUCK, WET (ALLUVIAL)
Ⓒ MEDIUM DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)



CROSS SECTION THROUGH BENT 1

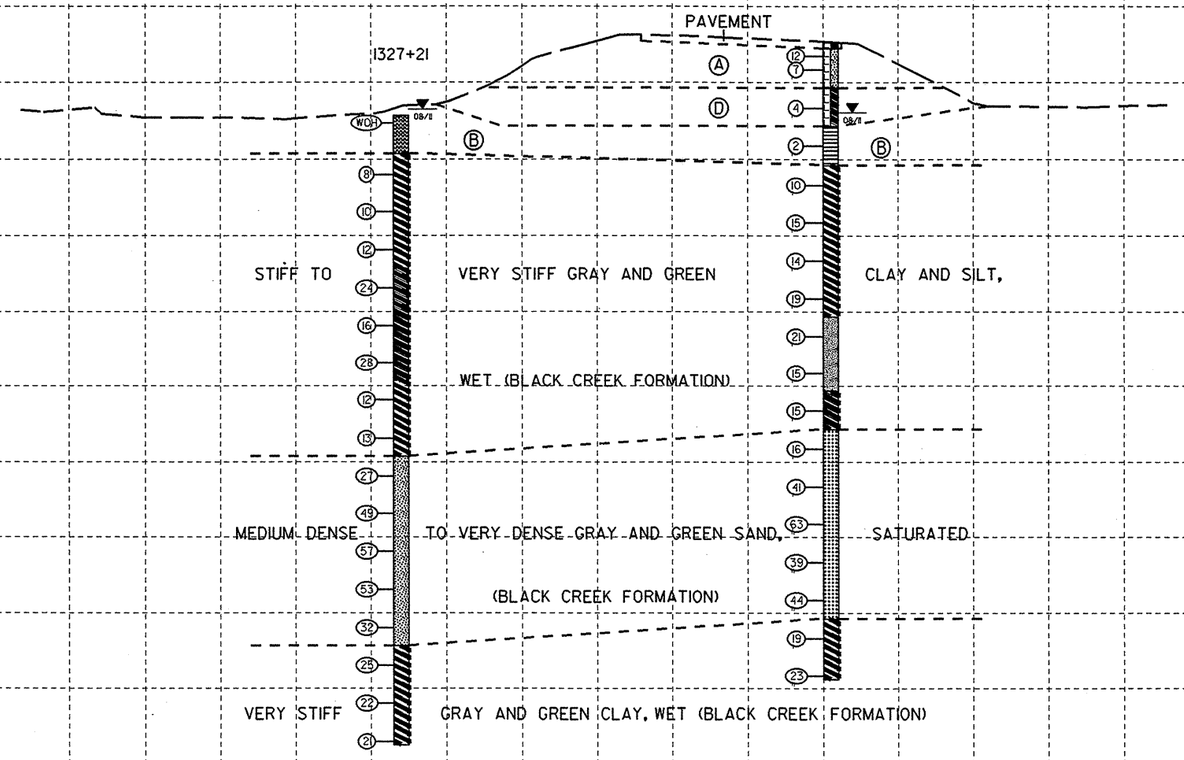


CROSS SECTION THROUGH BENT 2

Ⓐ LOOSE TO MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

Ⓑ VERY SOFT BROWN MUCK AND ORGANIC SILT, WET (ALLUVIAL)

Ⓓ MEDIUM STIFF TAN SANDY CLAY, MOIST TO WET (ROADWAY EMBANKMENT)

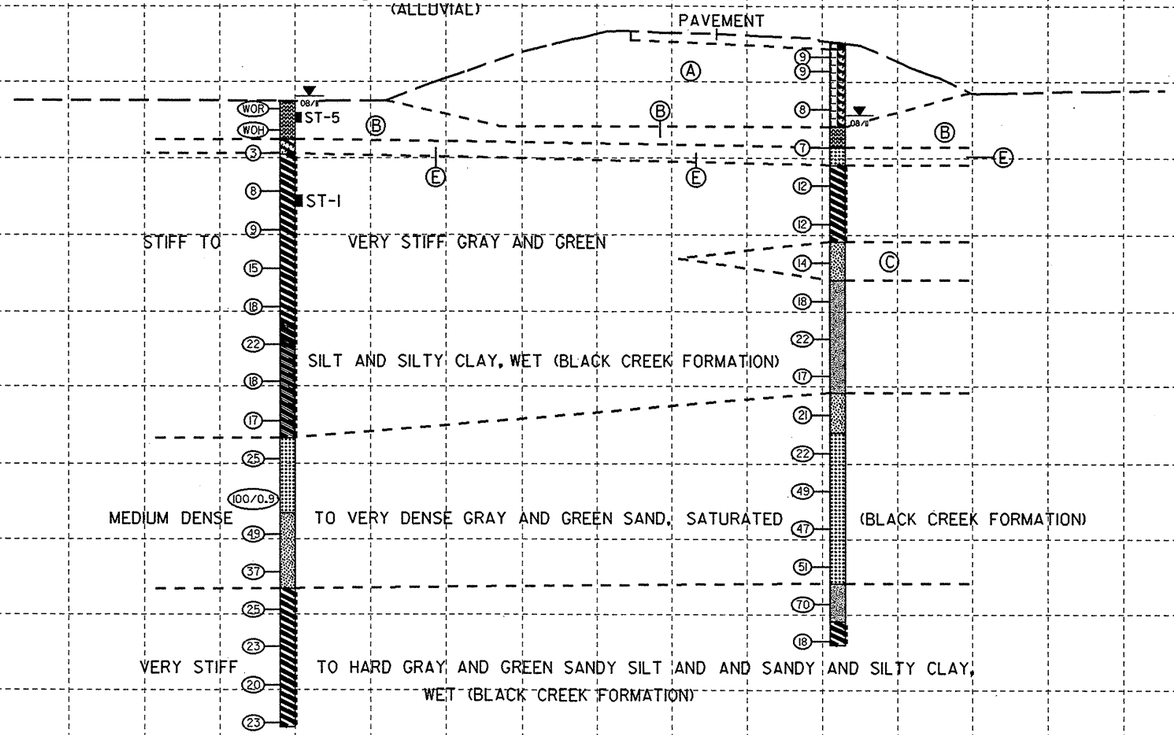


1327+33

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2303D	9 OF 19

CROSS SECTION THROUGH END BENT 2

Ⓐ LOOSE TAN SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)
Ⓑ VERY SOFT BROWN MUCK, WET (ALLUVIAL)
Ⓒ MEDIUM DENSE GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
Ⓔ LOOSE TAN AND GRAY SAND, SATURATED (ALLUVIAL)



1327+83

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NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. EB1-A WBL	**STATION** 1326+03	**OFFSET** 21 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 87.5 ft	**TOTAL DEPTH** 82.4 ft	**NORTHING** 453,560	**EASTING** 2,187,443	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/20/11	**COMP. DATE** 08/20/11	**SURFACE WATER DEPTH** 0.0ft	

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)
90												
	87.5	0.0								WATER SURFACE (08/20/11)	87.5	0.0
85			1	WOH	WOH	0	SS-30			**ALLUVIAL** BROWN MUCK, WET		
	81.2	6.3								**ALLUVIAL** BROWN SAND, SATURATED	83.5	4.0
80			1	4	10	14	SS-31					
	76.2	11.3								**COASTAL PLAIN** GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)	78.5	9.0
75			2	5	5	10	SS-32					
70	71.2	16.3	4	8	11	19						
	66.6	20.9								**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	68.5	19.0
65			5	10	10	20	SS-33					
60	61.6	25.9	6	10	11	21						
	56.6	30.9								**COASTAL PLAIN** GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)	58.5	29.0
55			6	10	14	24	SS-34					
50	51.6	35.9	7	5	9	14						
	46.6	40.9									48.5	39.0
45			4	6	8	14	SS-35					
	41.6	45.9								**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	43.5	44.0
40			7	19	27	46	SS-36					
35	36.6	50.9	17	19	30	49						
	31.6	55.9										
30			25	48	52/0.3	100/0.8						
	26.6	60.9								**COASTAL PLAIN** GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)	28.5	59.0
25			13	23	29	52	SS-37					
20	21.6	65.9	9	13	14	27						
	16.6	70.9										
15			8	10	15	25						
	11.6	75.9										
10			6	9	12	21						

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. EB1-A WBL	**STATION** 1326+03	**OFFSET** 21 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 87.5 ft	**TOTAL DEPTH** 82.4 ft	**NORTHING** 453,560	**EASTING** 2,187,443	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/20/11	**COMP. DATE** 08/20/11	**SURFACE WATER DEPTH** 0.0ft	

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						Match Line						
	6.6	80.9	6	9	11	20				**COASTAL PLAIN** GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION) *(continued)*	5.1	82.4

Boring Terminated at Elevation 5.1 ft in Very Stiff Sandy Clay

Other Samples:
ST-6 (1.5 - 3.5)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. EB1-B EBL	**STATION** 1326+03	**OFFSET** 31 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 95.1 ft	**TOTAL DEPTH** 79.5 ft	**NORTHING** 453,508	**EASTING** 2,187,443	**24 HR.** 9.1
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/29/11	**COMP. DATE** 07/29/11	**SURFACE WATER DEPTH** 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)
										95.1 GROUND SURFACE	0.0
	94.3	0.8								94.3 PAVEMENT	0.8
	92.1	3.0	6	6	5	11	SS-1			ROADWAY EMBANKMENT TAN SAND, MOIST TO SATURATED	
90			2	2	3	5					
	87.1	8.0	1	2	3	5					
85										84.1 ALLUVIAL	11.0
	82.1	13.0	6	8	10	18	SS-2			GRAY SAND, SATURATED	
80										79.1 COASTAL PLAIN	16.0
	77.1	18.0	4	4	7	11	SS-3			GRAY AND GREEN SANDY AND SILTY CLAY, WET (BLACK CREEK FORMATION)	
75											
	72.1	23.0	4	4	7	11					
70											
	67.1	28.0	3	5	7	12					
65											
	62.1	33.0	8	11	12	23	SS-4				
60											
	57.1	38.0	10	10	14	24					
55											
	52.1	43.0	5	7	12	19					
50											
	47.1	48.0	11	12	12	24					
45											
	42.1	53.0	5	12	19	31					
40											
	37.1	58.0	17	28	34	62	SS-5				
35											
	32.1	63.0	32	29	27	56					
30											
	27.1	68.0	16	21	34	55					
25											
	22.1	73.0	20	30	22	52				41.1 COASTAL PLAIN	54.0
20										GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. EB1-B EBL	**STATION** 1326+03	**OFFSET** 31 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 95.1 ft	**TOTAL DEPTH** 79.5 ft	**NORTHING** 453,508	**EASTING** 2,187,443	**24 HR.** 9.1
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 07/29/11	**COMP. DATE** 07/29/11	**SURFACE WATER DEPTH** 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
20						Match Line				19.1 COASTAL PLAIN 76.0
	17.1	78.0	7	9	16	25	SS-6			GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)
										15.6 79.5
										Boring Terminated at Elevation 15.6 ft in Very Stiff Silty Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. B1-A WBL	**STATION** 1326+52	**OFFSET** 27 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 81.4 ft	**TOTAL DEPTH** 83.3 ft	**NORTHING** 453,565	**EASTING** 2,187,492	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 08/30/11	**COMP. DATE** 08/30/11	**SURFACE WATER DEPTH** 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)
85												
	81.4	0.0	WOH	WOH	WOH	0				GROUND SURFACE	81.4	0.0
80										**ALLUVIAL** BROWN MUCK, MOIST TO WET	79.4	2.0
	78.2	3.2	1	3	7	10				**ALLUVIAL** GRAY SAND, SATURATED		
75	74.6	6.8	WOH	WOH	1	1						
70	69.6	11.8	3	3	4	7					71.4	10.0
65	64.6	16.8	3	7	5	12				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)		
60	59.6	21.8	3	5	6	11					61.4	20.0
55	54.6	26.8	3	5	9	14				**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)		
50	49.6	31.8	7	9	12	21					51.4	30.0
45	44.6	36.8	7	8	9	17				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)		
40	39.6	41.8	4	4	9	13					41.4	40.0
35	34.6	46.8	5	9	13	22						
30	29.6	51.8	11	11	16	27					36.4	45.0
25	24.6	56.8	21	25	33	58				**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)		
20	19.6	61.8	20	27	39	66						
15	14.6	66.8	17	23	22	45						
10	9.6	71.8	5	10	19	29					11.4	70.0
5										**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION0		

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. B1-A WBL	**STATION** 1326+52	**OFFSET** 27 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 81.4 ft	**TOTAL DEPTH** 83.3 ft	**NORTHING** 453,565	**EASTING** 2,187,492	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 08/30/11	**COMP. DATE** 08/30/11	**SURFACE WATER DEPTH** 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						Match Line				
	4.6	76.8	6	10	11	21				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION0 *(continued)*
0	-0.4	81.8	5	9	11	20				-1.9 83.3 Boring Terminated at Elevation -1.9 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. B1-B EBL	**STATION** 1326+68	**OFFSET** 32 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 85.1 ft	**TOTAL DEPTH** 83.1 ft	**NORTHING** 453,506	**EASTING** 2,187,507	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/02/11	**COMP. DATE** 08/02/11	**SURFACE WATER DEPTH** 2.2ft	

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)
90										WATER SURFACE (08/02/11)
85	85.1	0.0	WOH	1	3	4				85.1 GROUND SURFACE 0.0 **ALLUVIAL** BROWN MUCK, WET
	81.0	4.1								82.1 3.0
80	78.5	6.6	1	2	4	6				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
			3	4	6	10				
75	73.5	11.6	4	4	6	10				
70	68.5	16.6	3	3	6	9				
65	63.5	21.6	4	6	9	15				65.1 20.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
60	58.5	26.6	4	7	11	18				
55	53.5	31.6	5	6	7	13				55.1 30.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
50	48.5	36.6	4	6	13	19				
45	43.5	41.6	7	10	14	24				45.1 40.0 **COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
40	38.5	46.6	10	15	22	37				
35	33.5	51.6	20	26	34	60				
30	28.5	56.6	12	31	19	50				
25	23.5	61.6	12	16	43	59				
20	18.5	66.6	6	9	10	19				20.1 65.0 **COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
15	13.5	71.6	9	11	14	25				
10										

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. B1-B EBL	**STATION** 1326+68	**OFFSET** 32 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 85.1 ft	**TOTAL DEPTH** 83.1 ft	**NORTHING** 453,506	**EASTING** 2,187,507	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/02/11	**COMP. DATE** 08/02/11	**SURFACE WATER DEPTH** 2.2ft	

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
10						Match Line				
	8.5	76.6	8	9	11	20				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5	3.5	81.6	9	11	14	25				2.0 83.1 Boring Terminated at Elevation 2.0 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. B2-A WBL	**STATION** 1327+21	**OFFSET** 26 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 85.7 ft	**TOTAL DEPTH** 83.1 ft	**NORTHING** 453,562	**EASTING** 2,187,562	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/24/11	**COMP. DATE** 08/25/11	**SURFACE WATER DEPTH** 0.8ft	

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)
90										
85	85.7	0.0	WOH	WOH	WOH	0				WATER SURFACE (08/24/11) GROUND SURFACE 85.7 0.0 **ALLUVIAL** BROWN MUCK, WET
	80.7	5.0								
80	79.1	6.6	2	3	5	8				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
75	74.1	11.6	3	5	5	10				
70	69.1	16.6	4	6	6	12				
65	65.7	20.0								
	64.1	21.6	6	13	11	24				
60	59.1	26.6	4	8	8	16				
55	54.1	31.6	5	14	14	28				
50	50.7	35.0								
	49.1	36.6	5	7	5	12				
45	44.1	41.6	5	7	6	13				
40	40.7	45.0								**COASTAL PLAIN** GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
	39.1	46.6	5	13	14	27				
35	34.1	51.6	14	24	25	49				
30	29.1	56.6	17	21	36	57				
25	24.1	61.6	17	22	31	53				
20	19.1	66.6	6	15	17	32				
15	15.7	70.0								**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)
	14.1	71.6	7	12	13	25				
10										

NCDOT BORE DOUBLE R-2303D_GEO_BRDG_51.GPJ NC_DOT.GDT 10/10/11

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. B2-A WBL	**STATION** 1327+21	**OFFSET** 26 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 85.7 ft	**TOTAL DEPTH** 83.1 ft	**NORTHING** 453,562	**EASTING** 2,187,562	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/24/11	**COMP. DATE** 08/25/11	**SURFACE WATER DEPTH** 0.8ft	

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
10						Match Line				
	9.1	76.6	6	11	11	22				**COASTAL PLAIN** GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) *(continued)*
5	4.1	81.6	6	10	11	21				
	2.6	83.1								Boring Terminated at Elevation 2.6 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. B2-B EBL	**STATION** 1327+33	**OFFSET** 31 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 95.3 ft	**TOTAL DEPTH** 84.1 ft	**NORTHING** 453,505	**EASTING** 2,187,572	**24 HR.** 9.2
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/01/11	**COMP. DATE** 08/01/11	**SURFACE WATER DEPTH** 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)
100											
95	94.5	0.8	9	7	5	12				95.3 GROUND SURFACE	0.0
	92.7	2.6	2	3	4	7				94.5 PAVEMENT	0.8
90										ROADWAY EMBANKMENT TAN SAND, MOIST	
	87.7	7.6	1	2	2	4				89.3	6.0
85										ROADWAY EMBANKMENT TAN SANDY CLAY, MOIST TO WET	
	82.7	12.6	1	1	1	2				84.3	11.0
80										ALLUVIAL BROWN ORGANIC SILT, WET	
	77.7	17.6	2	4	6	10				79.3	16.0
75										COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	
	72.7	22.6	6	7	8	15					
70											
	67.7	27.6	4	6	8	14					
65											
	62.7	32.6	6	8	11	19					
60											
	57.7	37.6	8	8	13	21				59.3	36.0
55										COASTAL PLAIN GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)	
	52.7	42.6	5	6	9	15					
50										49.3	46.0
	47.7	47.6	5	6	9	15				COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION)	
45											
	42.7	52.6	4	7	9	16				44.3	51.0
40										COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	
	37.7	57.6	9	10	31	41					
35											
	32.7	62.6	16	22	41	63					
30											
	27.7	67.6	15	17	22	39					
25											
	22.7	72.6	11	13	31	44					
20											

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. B2-B EBL	**STATION** 1327+33	**OFFSET** 31 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 95.3 ft	**TOTAL DEPTH** 84.1 ft	**NORTHING** 453,505	**EASTING** 2,187,572	**24 HR.** 9.2
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/01/11	**COMP. DATE** 08/01/11	**SURFACE WATER DEPTH** 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
20						Match Line				
	17.7	77.6	6	8	11	19				19.3 COASTAL PLAIN GRAY AND GREEN CLAY, WET (BLACK CREEK FORMATION) 76.0
15										
	12.7	82.6	8	10	13	23				11.2 84.1 Boring Terminated at Elevation 11.2 ft in Very Stiff Clay

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. EB2-A WBL	**STATION** 1327+83	**OFFSET** 41 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 87.4 ft	**TOTAL DEPTH** 82.3 ft	**NORTHING** 453,575	**EASTING** 2,187,624	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/29/11	**COMP. DATE** 08/29/11	**SURFACE WATER DEPTH** 0.7ft	

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
90										WATER SURFACE (08/29/11)
	87.4	0.0	WOR	WOR	WOR	0				GROUND SURFACE 0.0
85	84.6	2.8	WOH	WOH	WOH	0	SS-38			ALLUVIAL BROWN MUCK (20.5% ORGANIC), WET
	81.6	5.8	1	1	2	3				82.4 5.0
80	76.6	10.8	2	4	4	8	SS-39			ALLUVIAL 80.5 GRAY SAND, SATURATED 6.9
75	71.6	15.8	3	4	5	9	SS-40			COASTAL PLAIN GRAY AND GREEN SANDY AND SILTY CLAY, WET (BLACK CREEK FORMATION)
70	66.6	20.8	5	5	10	15	SS-41			
65	61.6	25.8	5	8	10	18				
60	56.6	30.8	7	9	13	22	SS-42			
55	51.6	35.8	6	6	12	18				
50	46.6	40.8	8	7	10	17				
45	41.6	45.8	7	9	16	25	SS-43			58.4 29.0
40	36.6	50.8	16	30	70/0.4	100/0.9				COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)
35	31.6	55.8	10	18	31	49	SS-44			43.4 44.0
30	26.6	60.8	12	17	20	37				
25	21.6	65.8	10	12	13	25	SS-45			33.4 54.0
20	16.6	70.8	7	10	13	23				
15	11.6	75.8	6	9	11	20				23.4 64.0
10										UNDIVIDED COASTAL PLAIN GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION)

NCDOT BORE DOUBLE R-2303D_GEO_BRDG_51.GPJ NC_DOT.GDT 10/12/11

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. EB2-A WBL	**STATION** 1327+83	**OFFSET** 41 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 87.4 ft	**TOTAL DEPTH** 82.3 ft	**NORTHING** 453,575	**EASTING** 2,187,624	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 08/29/11	**COMP. DATE** 08/29/11	**SURFACE WATER DEPTH** 0.7ft	

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
10						Match Line				UNDIVIDED COASTAL PLAIN GRAY AND GREEN SANDY CLAY, WET (BLACK CREEK FORMATION) *(continued)*
	6.6	80.8	5	11	12	23				5.1 82.3
										Boring Terminated at Elevation 5.1 ft in Very Stiff Sandy Clay

Other Samples:
ST-5 (1.5 - 2.8)
ST-1 (12.3 - 13.8)

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WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. EB2-B EBL	**STATION** 1327+83	**OFFSET** 32 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 95.1 ft	**TOTAL DEPTH** 79.2 ft	**NORTHING** 453,502	**EASTING** 2,187,622	**24 HR.** 9.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 08/03/11	**COMP. DATE** 08/03/11	**SURFACE WATER DEPTH** 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)
										GROUND SURFACE	95.1	0.0
	94.3	0.8								PAVEMENT	94.3	0.8
	92.4	2.7	4	4	5	9	SS-23			ROADWAY EMBANKMENT TAN SAND, MOIST TO SATURATED		
			2	3	6	9						
	87.4	7.7	3	4	4	8					84.1	11.0
	82.4	12.7	1	1	6	7	SS-24			ALLUVIAL BROWN MUCK, WET	81.4	13.7
	77.4	17.7	4	6	6	12	SS-25			ALLUVIAL TAN SAND, SATURATED	79.1	16.0
	72.4	22.7	4	5	7	12				COASTAL PLAIN GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION)		
	67.4	27.7	6	7	7	14	SS-26				69.1	26.0
	62.4	32.7	6	8	10	18				COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	64.1	31.0
	57.4	37.7	6	9	13	22				COASTAL PLAIN GRAY AND GREEN SILT, WET (BLACK CREEK FORMATION)		
	52.4	42.7	3	6	11	17						
	47.4	47.7	6	8	13	21					49.1	46.0
	42.4	52.7	3	10	12	22	SS-27			COASTAL PLAIN GRAY AND GREEN SAND, SATURATED (BLACK CREEK FORMATION)	44.1	51.0
	37.4	57.7	13	21	28	49						
	32.4	62.7	17	21	26	47						
	27.4	67.7	16	22	29	51					24.1	71.0
	22.4	72.7	21	27	43	70	SS-28			COASTAL PLAIN GRAY AND GREEN SANDY SILT, WET (BLACK CREEK FORMATION)		

WBS 34416.1.1	**TIP** R-2303D	**COUNTY** SAMPSON	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW				**GROUND WTR (ft)**
BORING NO. EB2-B EBL	**STATION** 1327+83	**OFFSET** 32 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 95.1 ft	**TOTAL DEPTH** 79.2 ft	**NORTHING** 453,502	**EASTING** 2,187,622	**24 HR.** 9.5
DRILL RIG/HAMMER EFF./DATE CAT1519 DIEDRICH D-50 98% 04/07/2010		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 08/03/11	**COMP. DATE** 08/03/11	**SURFACE WATER DEPTH** 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
20						Match Line				
	17.4	77.7	6	8	10	18	SS-29			19.1 — 76.0 COASTAL PLAIN GRAY AND GREEN SILTY CLAY, WET (BLACK CREEK FORMATION) 15.9 — 79.2 Boring Terminated at Elevation 15.9 ft in Very Stiff Silty Clay

NCDOT BORE DOUBLE R-2303D_GEO_BRDG_51.GPJ NC_DOT.GDT 10/12/11

PROJECT REFERENCE NO.	SHEET
R-2303D	18 OF 19

34416.1.1

(R-2303D)

BRIDGE NO. 51 ON NC 24 OVER GREAT COHARIE SWAMP OVERFLOW AT -L- STA. 1326+94

EB1-A WBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-30	21 LT	1326+03	0.0-1.5	A-6(3)	38	14	10.0	50.1	13.5	26.4	100	95	44	-	-
SS-31	21 LT	1326+03	6.3-7.8	A-2-4(0)	20	2	21.4	54.3	8.0	16.3	99	61	30	-	-
SS-32	21 LT	1326+03	11.3-12.8	A-7-6(53)	74	51	4.5	7.5	20.9	67.1	100	96	92	-	-
SS-33	21 LT	1326+03	20.9-22.4	A-2-6(0)	28	13	65.5	18.7	5.6	10.2	98	51	17	-	-
SS-34	21 LT	1326+03	30.9-32.4	A-6(9)	36	16	1.8	42.5	21.1	34.6	100	99	69	-	-
SS-35	21 LT	1326+03	40.9-42.4	A-7-6(47)	72	51	1.4	21.4	18.2	59.0	100	99	85	-	-
SS-36	21 LT	1326+03	45.9-47.4	A-2-4(0)	20	NP	63.5	27.3	5.2	4.1	98	94	11	-	-
SS-37	21 LT	1326+03	60.9-62.4	A-7-6(22)	44	26	2.4	42.1	16.8	38.7	100	99	84	-	-

EB1-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	31 RT	1326+03	0.8-2.3	A-2-6(1)	30	15	53.1	22.1	6.4	18.4	97	65	26	-	-
SS-2	31 RT	1326+03	13.0-14.5	A-3(0)	25	NP	31.0	66.3	0.6	2.0	100	91	4	-	-
SS-3	31 RT	1326+03	18.0-19.5	A-7-6(65)	84	58	0.8	4.7	27.1	67.3	100	99	97	-	-
SS-4	31 RT	1326+03	33.0-34.5	A-7-6(12)	54	34	34.7	21.8	19.0	24.5	100	73	50	-	-
SS-5	31 RT	1326+03	58.0-59.5	A-2-4(0)	24	NP	26.0	58.8	9.1	6.1	99	97	25	-	-
SS-6	31 RT	1326+03	78.0-79.5	A-7-6(30)	56	37	1.8	24.3	24.9	49.0	100	99	79	-	-

EB2-A WBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-38	41 LT	1327+83	0.0-1.5	A-7-5(8)	57	17	25.2	21.8	22.5	30.5	100	85	54	-	20.5
SS-39	41 LT	1327+83	5.8-6.9	A-2-6(0)	34	19	66.5	15.5	7.8	10.2	90	44	17	-	-
SS-40	41 LT	1327+83	10.8-12.3	A-7-6(66)	85	61	1.0	9.2	22.7	67.1	100	99	95	-	-
SS-41	41 LT	1327+83	20.8-22.3	A-7-6(27)	63	45	22.0	15.3	18.0	44.8	100	90	65	-	-
SS-42	41 LT	1327+83	30.8-32.3	A-6(2)	36	12	10.2	59.8	11.7	18.3	100	95	45	-	-
SS-43	41 LT	1327+83	45.8-47.3	A-3(0)	18	NP	59.4	32.8	3.8	4.1	100	89	10	-	-
SS-44	41 LT	1327+83	55.8-57.3	A-2-4(0)	21	NP	54.1	36.4	5.4	4.1	97	91	11	-	-
SS-45	41 LT	1327+83	65.8-67.3	A-7-6(22)	52	35	2.6	39.3	15.4	42.7	100	99	68	-	-

EB2-B EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-23	32 RT	1327+83	0.0-1.5	A-2-6(1)	32	18	55.1	20.0	6.5	18.4	95	63	25	-	-
SS-24	32 RT	1327+83	12.7-13.7	A-2-5(0)	67	NP	56.7	17.6	17.6	8.2	96	57	26	-	-
SS-25	32 RT	1327+83	17.7-19.2	A-7-6(75)	92	67	0.8	4.9	26.9	67.3	100	100	97	-	-
SS-26	32 RT	1327+83	27.7-29.2	A-2-4(0)	27	8	39.7	33.3	12.8	14.3	100	89	31	-	-
SS-27	32 RT	1327+83	52.7-54.2	A-3(0)	21	NP	78.8	18.1	1.1	2.0	100	93	4	-	-
SS-28	32 RT	1327+83	72.7-74.2	A-4(0)	27	NP	10.2	56.7	16.7	16.3	100	98	44	-	-
SS-29	32 RT	1327+83	77.7-79.2	A-7-6(40)	67	46	4.9	17.1	22.9	55.1	100	98	82	-	-

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

FIELD SCOUR REPORT

WBS: 34416.1.1 TIP: R-2303D COUNTY: SAMPSON

DESCRIPTION(1): BRIDGE NO. 51 ON -L- (NC 24) OVER GREAT COHARIE CREEK OVERFLOW

EXISTING BRIDGE

Information from: Field Inspection X Microfilm ____ (reel ____ pos: ____)
Other (explain) ____

Bridge No.: 51 Length: 90' Total Bents: 4 Bents in Channel: 2 Bents in Floodplain: 2
Foundation Type: CONCRETE PILES

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: NONE NOTED

Interior Bents: NONE NOTED

Channel Bed: NONE NOTED

Channel Bank: NONE NOTED

EXISTING SCOUR PROTECTION

Type(3): CONCRETE END WALLS

Extent(4): 10-15' OUTSIDE EDGE OF BRIDGE

Effectiveness(5): EFFECTIVE

Obstructions(6): NONE NOTED

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): MUCK, SAND, AND CLAY

Channel Bank Material(8): MUCK

Channel Bank Cover(9): TREES AND SHRUBS

Floodplain Width(10): 500' (±)

Floodplain Cover(11): TREES AND SHRUBS

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

Channel Migration Tendency(13): SLIGHT TENDENCY TO MIGRATE WEST TOWARD END BENT 1

Observations and Other Comments: ____

DESIGN SCOUR ELEVATIONS(14) Feet X Meters ____

BENTS										
B1 EBL	B1 WBL	B2 EBL	B2 WBL							
81.0	81.8	84.2	85.8							

Comparison of DSE to Hydraulics Unit theoretical scour:
The Geotechnical Engineering Unit agrees with the Hydraulic Unit's 100 year theoretical scour elevations proposed in the Bridge Survey and Hydraulic Report dated 3/23/11.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank							
Sample No.							
Retained #4							
Passed #10							
Passed #40							
Passed #200							
Coarse Sand							
Fine Sand							
Silt							
Clay							
LL							
PI							
AASHTO							
Station							
Offset							
Depth							

See Sheet 18
"Soil Test Results",
for samples:
(CHANNEL BED) SS-2, SS-3
(CHANNEL BANK) SS-38

Reported by: Tyler C. Bottoms **Date:** 10/10/2011