STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2719A	1	7

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34501.1.1 (R-2719A) F.A. PROJ. STP-0224(3)

COUNTY LENOIR

PROJECT DESCRIPTION CRESCENT RD. IN KINSTON FROM US 70 TO US 258

SITE DESCRIPTION STRUCTURE NO. 1 ON -L- OVER -Y1- AT -L- STA. 51+64.57

ID: R-2719A

PROJECT: 34501.1.1

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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

CMW

TCB

JRS

WNC

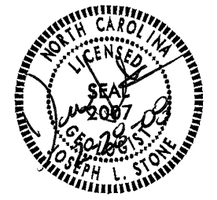
RES

INVESTIGATED BY JL STONE

CHECKED BY DN ARGENBRIGHT

SUBMITTED BY DN ARGENBRIGHT

DATE FEBRURARY 2008



DRAWN BY: JLS

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

PROJECT REFERENCE NO.	SHEET NO.
(R-2719A)	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS 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 #40 #200	50 MX 30 MX 15 MX		51 MN 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		
	- 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
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, 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

EQUIPMENT USED ON SUBJECT PROJECT

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

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

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

BENCH MARK: BL-4 -L- STA. 58+74.51, 0.18' RT

ELEVATION: 51.36 FT.

NOTES:

REVISED 02/23/06

PROJECT REFERENCE NO.	SHEET
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SITE PLAN

0 100
FEET

NAD 83

-YILPC- SC Sta.14+34.42=
YI POC Sta.67+22.95 (47' RT)

-YILPC- TS Sta. 0+00.00=
L POT Sta.50+30.88 (59' LT)

TO US 70

EBI BENT LINE

BI BENT LINE

EB2 BENT LINE

-YI-

TO US 258

55

-L-

96° 12' 37"

70

BEGIN STATE PROJECT
R-2719A -L- Sta.50+30.88

-L- POT Sta.51+64.57 =
-YI- POC Sta.69+39.10

SKEW = 96° 12' 37"

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	4 OF 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STRUCTURE 1
PROFILE THROUGH BORINGS PROJECTED ALONG -L-

EB1-B
50+59
47' LT

B1-A
51+73
78' LT

EB2-B
52+84
47' LT

LOOSE TO MEDIUM DENSE BROWN SAND AND GRAVEL, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)

LOOSE TO VERY DENSE GRAY GREEN SAND, SAT. (PEEDEE FORMATION)

LOOSE TO VERY DENSE GRAY GREEN SAND, SAT. (PEEDEE FORMATION)

NOTE: GROUNDLINE PROFILE OF -L- TAKEN FROM ROADWAY PLANS DATED 12/19/07

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

Ⓐ SOFT TO MEDIUM HARD GREEN CALCAREOUS SANDSTONE (PEEDEE FORMATION)

VE = 5

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jlstone

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION STRUCTURE NO. 1 ON -L- OVER -Y1-			**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 50+59	**OFFSET** 47ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 50.8 ft	**TOTAL DEPTH** 69.9 ft	**NORTHING** 554,128	**EASTING** 2,395,185	**24 HR.** 3.9
DRILL MACHINE CME-45B	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic	
START DATE 02/06/08	**COMP. DATE** 02/06/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.0 ft	

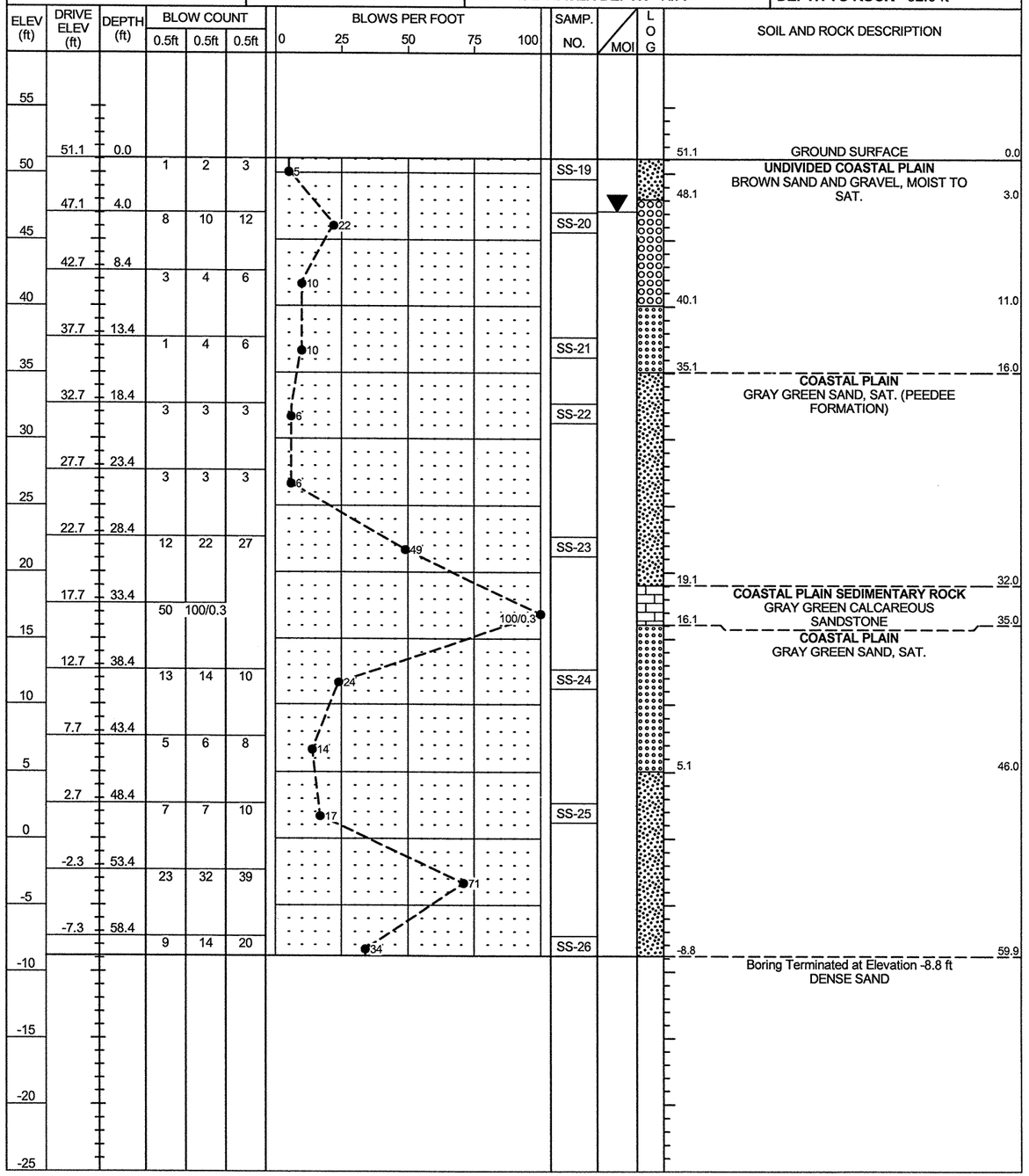
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
										50.8 GROUND SURFACE	0.0
	50.8	0.0	1	2	2	4	SS-1			**UNDIVIDED COASTAL PLAIN** BROWN SAND AND GRAVEL, MOIST TO SAT.	
	46.8	4.0	2	3	4	7					
	42.4	8.4	2	3	3	6	SS-2			44.8	6.0
	37.4	13.4	5	5	6	11					
	32.4	18.4	4	5	4	9	SS-3			34.8 **COASTAL PLAIN** GRAY GREEN SAND, SAT. (PEEDEE FORMATION)	16.0
	27.4	23.4	3	4	5	9					
	22.4	28.4	3	4	9	13	SS-4				
	17.4	33.4	6	8	12	20					
	12.4	38.4	5	100/0.3		100/0.3	SS-5			12.8 **COASTAL PLAIN SEDIMENTARY ROCK** GRAY GREEN CALCAREOUS SANDSTONE	38.0
	7.4	43.4	8	10	18	28	SS-6			10.8 **COASTAL PLAIN** GRAY GREEN SAND, SAT.	40.0
	2.4	48.4	7	17	22	39					
	-2.6	53.4	8	19	34	53	SS-7			-1.2	52.0
	-7.6	58.4	70	100/0.2		100/0.2				-7.2 **COASTAL PLAIN SEDIMENTARY ROCK** GRAY GREEN CALCAREOUS SANDSTONE	58.0
	-12.6	63.4	16	21	79/0.4	100/0.9	SS-8				
	-17.6	68.4	18	45	30	75				-16.2 **COASTAL PLAIN** GRAY GREEN SAND, SAT.	67.0
										-19.1 Boring Terminated at Elevation -19.1 ft VERY DENSE SAND	69.9

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION STRUCTURE NO. 1 ON -L- OVER -Y1-			**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 51+73	**OFFSET** 78ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 50.8 ft	**TOTAL DEPTH** 64.8 ft	**NORTHING** 554,242	**EASTING** 2,395,153	**24 HR.** 3.7
DRILL MACHINE CME-45B	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic	
START DATE 02/07/08	**COMP. DATE** 02/07/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.0 ft	

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)
										50.8 GROUND SURFACE	0.0
	50.8	0.0	2	2	2	4	SS-9			**UNDIVIDED COASTAL PLAIN** BROWN SAND AND GRAVEL, MOIST TO SAT.	
	46.8	4.0	1	2	3	5	SS-10				
	42.5	8.3	4	4	6	10				44.8	6.0
	37.5	13.3	7	6	5	11	SS-11				
	32.5	18.3	4	2	3	5				39.8	11.0
	27.5	23.3	3	3	3	6	SS-12				
	22.5	28.3	9	13	20	33				34.8 **COASTAL PLAIN** GRAY GREEN SAND, SAT. (PEEDEE FORMATION)	16.0
	17.5	33.3	6	11	18	29	SS-13				
	12.5	38.3	70	100/0.2		100/0.2					
	7.5	43.3	7	9	14	23	SS-14			23.8	27.0
	2.5	48.3	8	13	18	31					
	-2.5	53.3	14	12	17	29	SS-15			12.8 **COASTAL PLAIN SEDIMENTARY ROCK** GRAY GREEN CALCAREOUS SANDSTONE	38.0
	-7.5	58.3	79	100/0.2		100/0.2				10.8 **COASTAL PLAIN** GRAY GREEN SAND, SAT.	40.0
	-12.5	63.3	9	18	19	37	SS-16				
							SS-17			-7.2 **COASTAL PLAIN SEDIMENTARY ROCK** GRAY GREEN CALCAREOUS SANDSTONE	58.0
							SS-18			-11.2 **COASTAL PLAIN** GRAY GREEN SAND, SAT.	62.0
										-14.0 Boring Terminated at Elevation -14.0 ft DENSE SAND	64.8

NCDOT BORE DOUBLE R2719A_GEO_BRDGE001.GPJ NC_DOT.GDT 02/28/08

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION STRUCTURE NO. 1 ON -L- OVER -Y1-			**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 52+84	**OFFSET** 47ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 51.1 ft	**TOTAL DEPTH** 59.9 ft	**NORTHING** 554,353	**EASTING** 2,395,184	**24 HR.** 3.9
DRILL MACHINE CME-45B	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
START DATE 02/07/08	**COMP. DATE** 02/08/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 32.0 ft



STRUCTURE 1 ON -L- OVER -Y1-

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	ORG.	MOI.
EB1-B	SS-1	100	90	26	28.1	51.3	10.5	10.1	15	NP	A-2-4(0)	1.00-1.50		
	SS-2	90	26	2	92.5	5.8	1.7	0.0	10	NP	A-1-b(0)	8.40-9.90		
	SS-3	100	89	13	37.1	52.6	4.3	6.0	18	NP	A-2-4(0)	18.40-19.90		
	SS-4	100	61	12	71.0	18.7	4.3	6.0	21	NP	A-2-4(0)	28.40-29.90		
	SS-5	76	48	11	68.4	18.9	4.7	8.0	20	NP	A-1-b(0)	38.40-39.20		
	SS-6	90	58	10	70.6	19.5	1.9	8.0	18	NP	A-3(0)	43.40-44.90		
	SS-7	95	69	11	51.2	38.5	4.3	6.0	20	NP	A-2-4(0)	53.40-54.90		
	SS-8	100	99	23	2.0	83.5	6.5	8.0	25	NP	A-2-4(0)	63.40-64.80		
B1-A	SS-9	100	92	35	22.7	49.3	13.9	14.0	18	NP	A-2-4(0)	1.00-1.50		
	SS-10	98	92	35	21.1	49.1	11.7	18.1	21	3	A-2-4(0)	4.00-5.50		
	SS-11	100	76	3	67.6	30.5	1.9	0.0	13	NP	A-3(0)	8.30-9.80		
	SS-12	94	20	5	89.9	6.2	1.9	2.0	17	NP	A-1-b(0)	13.30-14.80		
	SS-13	100	93	15	27.5	59.8	2.7	10.0	23	NP	A-2-4(0)	18.30-19.80		
	SS-14	100	68	10	79.6	11.2	3.1	6.0	10	NP	A-3(0)	28.30-29.80		
	SS-15	98	45	13	74.4	14.4	7.1	4.0	16	NP	A-1-b(0)	38.30-39.00		
	SS-16	98	67	16	71.2	14	4.7	10.0	24	NP	A-2-4(0)	48.30-49.80		
	SS-17	100	90	8	48.5	45.3	2.1	4.0	11	NP	A-3(0)	58.30-59.00		
	SS-18	100	99	28	2.2	79.2	6.5	12.0	21	NP	A-2-4(0)	63.30-64.80		
EB2-B	SS-19	100	90	22	29.3	52.8	9.9	8.0	16	NP	A-2-4(0)	1.00-1.50		
	SS-20	97	32	5	86.7	9.2	2.1	2.0	22	NP	A-1-b(0)	4.00-5.50		
	SS-21	89	64	6	55.2	40.1	2.7	2.0	16	NP	A-3(0)	13.40-14.90		
	SS-22	100	57	11	78.2	12.4	1.3	8.0	23	NP	A-2-4(0)	18.40-19.90		
	SS-23	100	96	18	17.7	67.0	11.3	4.0	15	NP	A-2-4(0)	28.40-29.90		
	SS-24	100	53	8	78.6	14.4	2.9	4.0	16	NP	A-3(0)	38.40-39.90		
	SS-25	86	71	24	52.8	21.5	9.7	16.0	33	9	A-2-4(0)	48.40-49.90		
	SS-26	99	98	23	2.2	82.4	7.3	8.0	26	NP	A-2-4(0)	58.40-59.90		

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34501.1.1	1	35

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34501.1.1 F.A. PROJ. STP-0224(3)

COUNTY LENOIR

PROJECT DESCRIPTION CRESCENT ROAD IN KINSTON FROM US HIGHWAY 70 TO US HIGHWAY 258

SITE DESCRIPTION BRIDGE No. 192 AND BRIDGE No. 193 ON -L- OVER NCRR

ID: R-2719A

PROJECT: 34501.1.1

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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.

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.

For Letting

PERSONNEL

S. JOHNSON

L. RAUP

N. BRADLEY

J. WHITE

S. HARDEE

P. PHELPS

T. PEREZ

INVESTIGATED BY S&ME, INC.

CHECKED BY A.F. RIGGS, JR.

SUBMITTED BY S&ME, INC.

DATE MARCH 26, 2008

NORTH CAROLINA PROFESSIONAL SEAL 14155 ENGINEER ALVER F RIGGS, JR.

SEAL

SIGNATURE

DRAWN BY: T. PEREZ

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

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	34501.1.1	2	35

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING # 10	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		N.P.	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
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 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE
UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT- CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 - DIP/DIP DIRECTION OF ROCK STRUCTURES
- ● - SOUNDING ROD
- WATER LOSS
- SPT / DPT / VST / DMT / PMT - TEST BORING
- CPT TEST BORING
- AUGER BORING
- CORE BORING
- MW - MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- SPT TEST SAMPLE

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

ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

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

ADVANCING TOOLS:
- ☐ DRAG BITS _____
- ☐ 6" CONTINUOUS FLIGHT AUGER
- ☐ 8" HOLLOW AUGERS
- ☐ HARD FACED FINGER BITS
- ☐ TUNG.-CARBIDE INSERTS
- ☐ CASING ☐ W/ ADVANCER
- ☒ TRICONE 2-7/8" STEEL TEETH
- ☐ TRICONE _____" TUNG.-CARB.
- ☐ CORE BIT
- ☒ OTHER 3-1/4" H.S.A.

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

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

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

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

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.

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

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

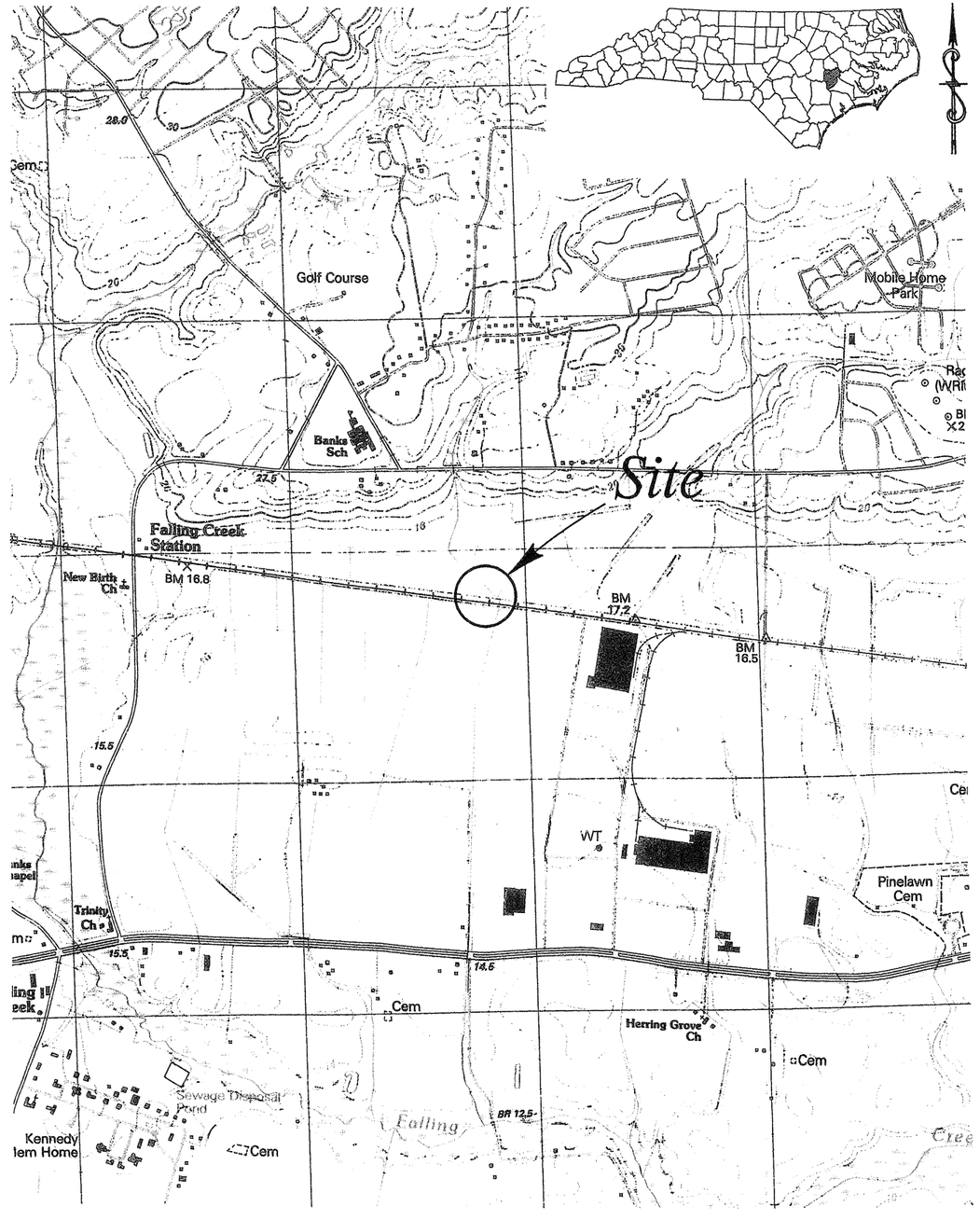
TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: "BM-B" - RR Spike in 18" Twin Oak
Located at Station -BL- 56+79.17, 252.58 RT.
ELEVATION: 53.43'

NOTES:

REVISED 09/15/00

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	3450I.I.I	3	35



S:PROJECTS/2008/08-048/GEOTECH/CADD/R-2719A -SITEVIC 192 LL

SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	MARCH 2008
JOB NO.	1051-08-048

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ENVIRONMENTAL SERVICES
ENGINEERING •TESTING

SITE VICINITY MAP

BRIDGE No. 192 (LEFT LANE)
ON -L- OVER NCRR
STATE PROJECT NO. 3450 I. I. I TIP NO. R-2719A
FEDERAL I.D. NO. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

POT Sta. 28+47.16

MATCH LINE -L- STA. 82+00 - SEE SHEET 6

-SVRD5- N 83° 51' 32.5" W

EB1-A LL

EB1-AA LL

B1-A LL

B1-AA LL

B2-A LL

B2-AA LL

EB2-A LL

25

Y2 POT Sta. 10+00.00

NORTH CAROLINA RAILROAD

-Y2- S 83° 51' 32.5" E

50

-BL-7 PINC & -BY20 301 PINC
-L- 86+04.32 (42.41' LT)

MATCH LINE SEE SHEET 7A

-L- POC STA. 85+98.30 =
-Y2- POT STA. 13+41.91
Δ = 60° 20' 23.0"

90

-L-

-L- POC STA. 84+27.98 =
-SVRD5- POT STA. 24+82.25
Δ = 63° 07' 40.7"

SOIL

-BL- STA. 56+19.17
252.58' RIGHT
ELEV. 53.43'

Y2 POT Sta. 16+00.00

-BY2-40 PINC
-SVRD5- 20+27.91 (186.37' RT)

NORTH CAROLINA RAILROAD

20

MATCH LINE -SVRD5- STA. 19+00
SEE SHEET 35

-L- ST Sta. 94+31.63

N 46° 26' 50.0" E

-BL-8 PINC 63+58.59

MATCH LINE -L- STA. 95+00 - SEE SHEET 8

0 100 200

SCALE IN FEET

BENCHMARK:
"BM-B" - RR SPIKE IN 18" TWIN OAK
LOCATED AT STATION -BL- 56+79.17, 252.58' RT.
ELEV. 53.43'

SKEW ANGLE FOR END BENT No. 1 64°55'58"
AND ALL OTHERS AT 90°00'00" (Tan to Curve)

NC GRID NAD 83

SCALE:	1" = 100'
DATE:	MARCH 2008
JOB NO.	105 I-08-048
APPROVED BY:	AFR
DRAWN BY:	TRP
SHEET	4 OF 35

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ENGINEERING TESTING

BORING LOCATION PLAN

BRIDGE No. 192 (LEFT LANE)
ON -L- OVER NCRR (-Y2-)
TIP No. R-2719A STATE PROJECT No. 3450 I.I.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

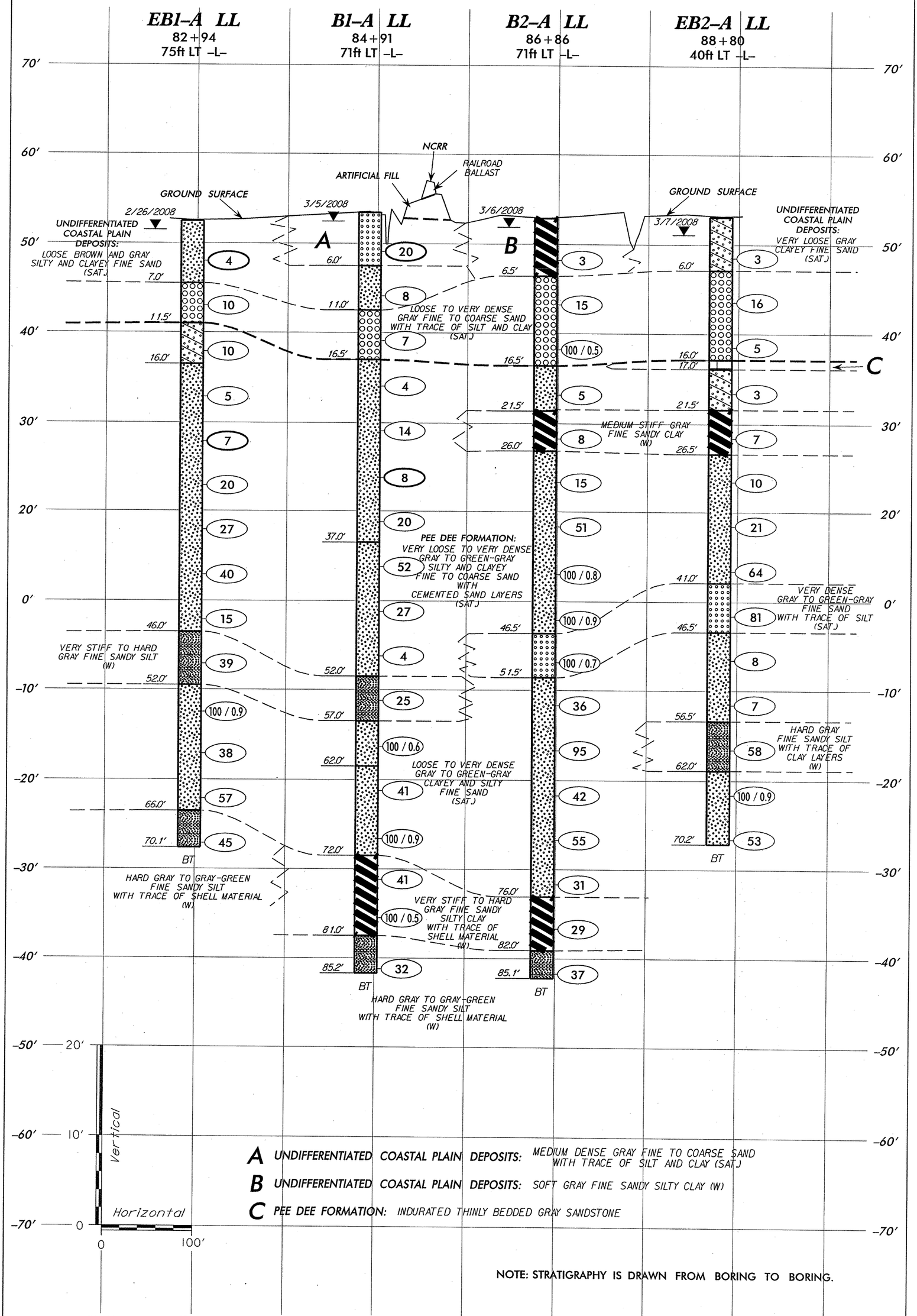
S:\PROJECTS\2008\08-048\GEOTECH\CADD\R-2719A SITE PLAN BRIDGE 192 LL.DGN

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

TO EXISTING US 70

GENERALIZED SUBSURFACE PROFILE 71' LEFT OF -L-

TO S.R. 1546



A UNDIFFERENTIATED COASTAL PLAIN DEPOSITS: MEDIUM DENSE GRAY FINE TO COARSE SAND WITH TRACE OF SILT AND CLAY (SAT.)

B UNDIFFERENTIATED COASTAL PLAIN DEPOSITS: SOFT GRAY FINE SANDY SILTY CLAY (W)

C PEE DEE FORMATION: INDURATED THINLY BEDDED GRAY SANDSTONE

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE 71' LEFT OF -L-

BRIDGE No. 192
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 3450 1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

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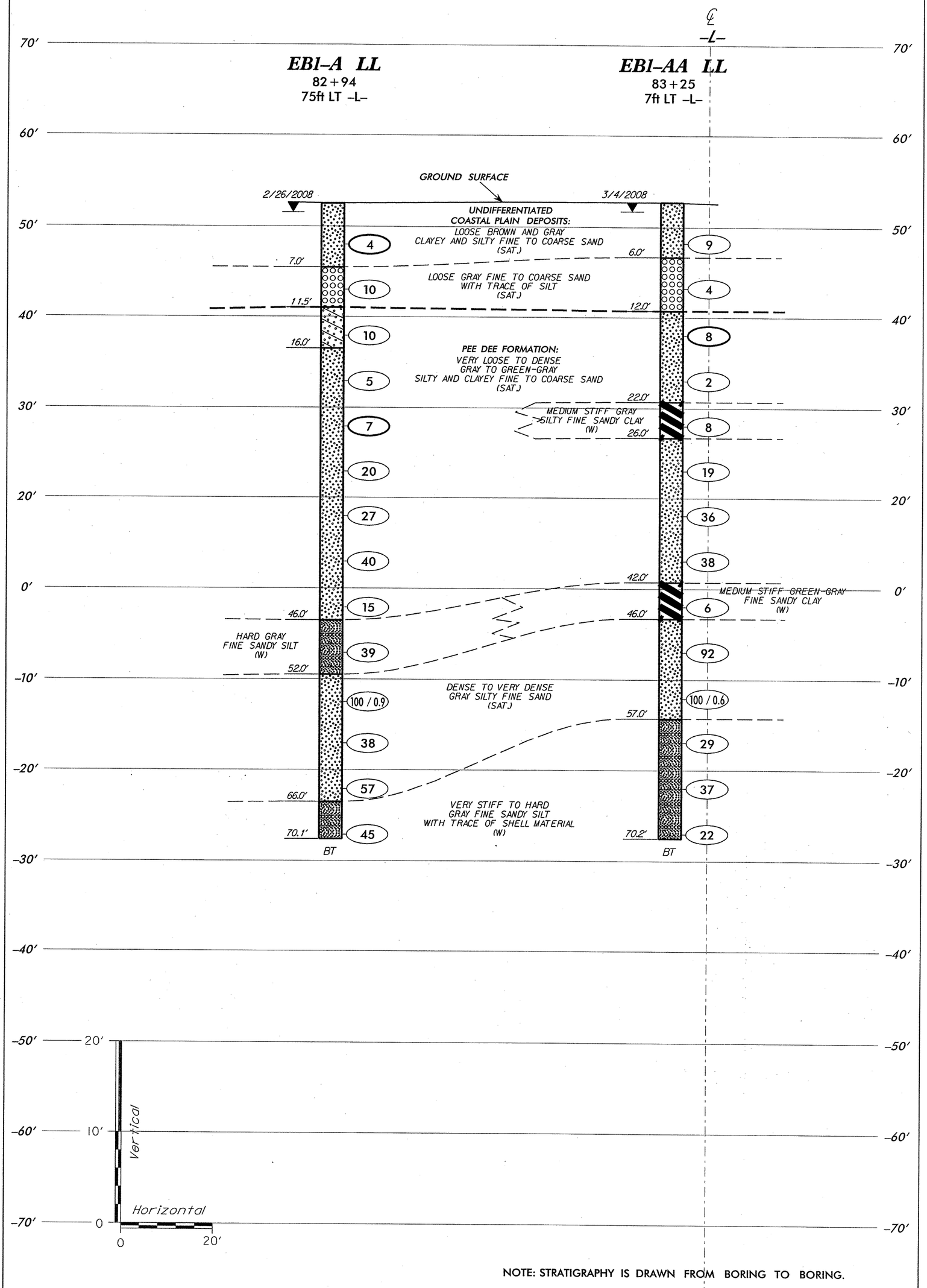
SCALE:	(V) 1" = 10' (H) 1" = 100'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-048	SHEET	5 OF 35

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 1 (LEFT LANE)



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 1 (LEFT LANE)
BRIDGE No. 192
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 3450 1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

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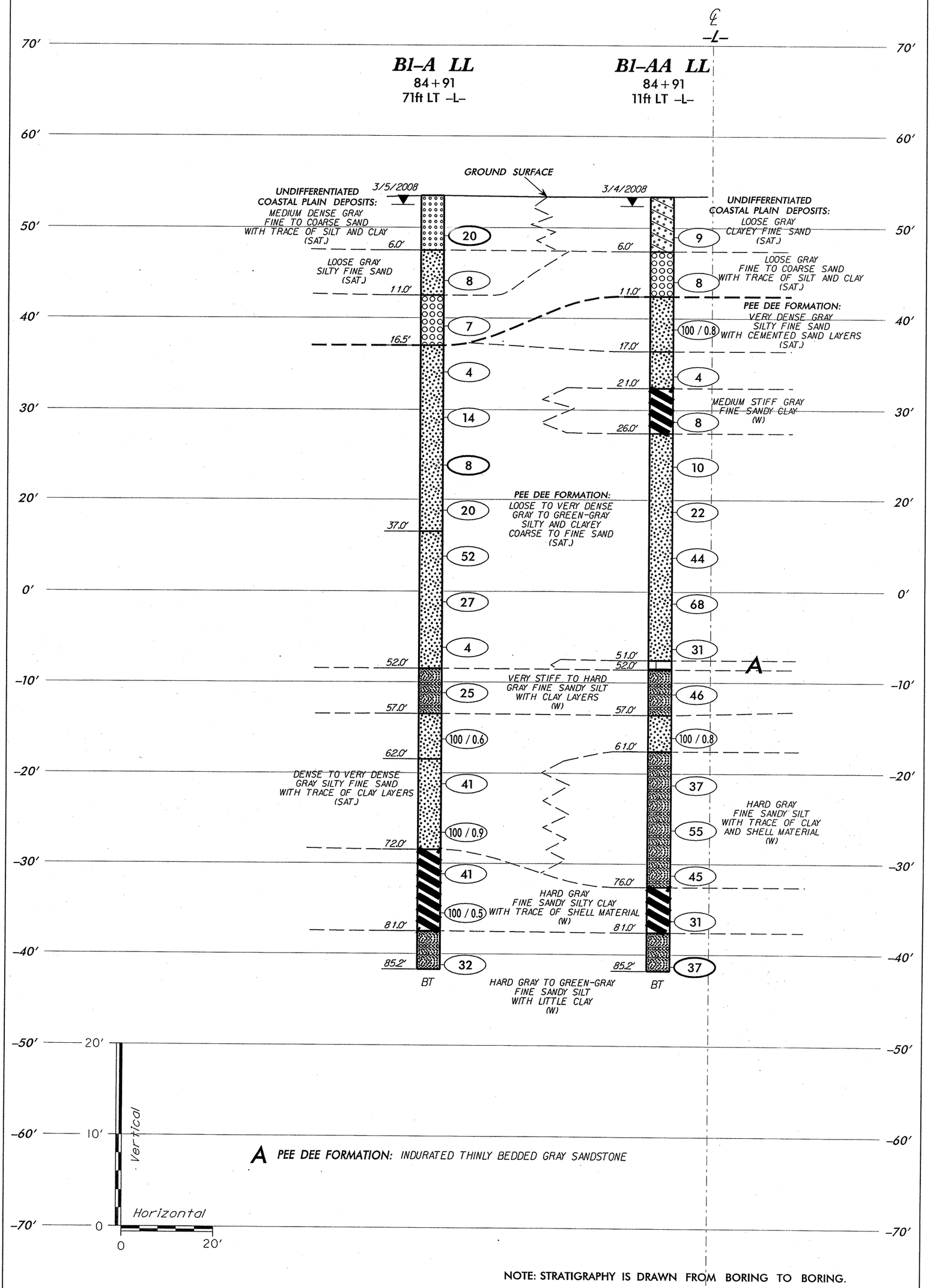
SCALE:	(V) 1" = 10′ (H) 1" = 20′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	105 1-08-048	SHEET	6 OF 35

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No. 1 (LEFT LANE)



A PEE DEE FORMATION: INDURATED THINLY BEDDED GRAY SANDSTONE

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION
THROUGH INTERIOR BENT No. 1 (LEFT LANE)
BRIDGE No. 192
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 3450 1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

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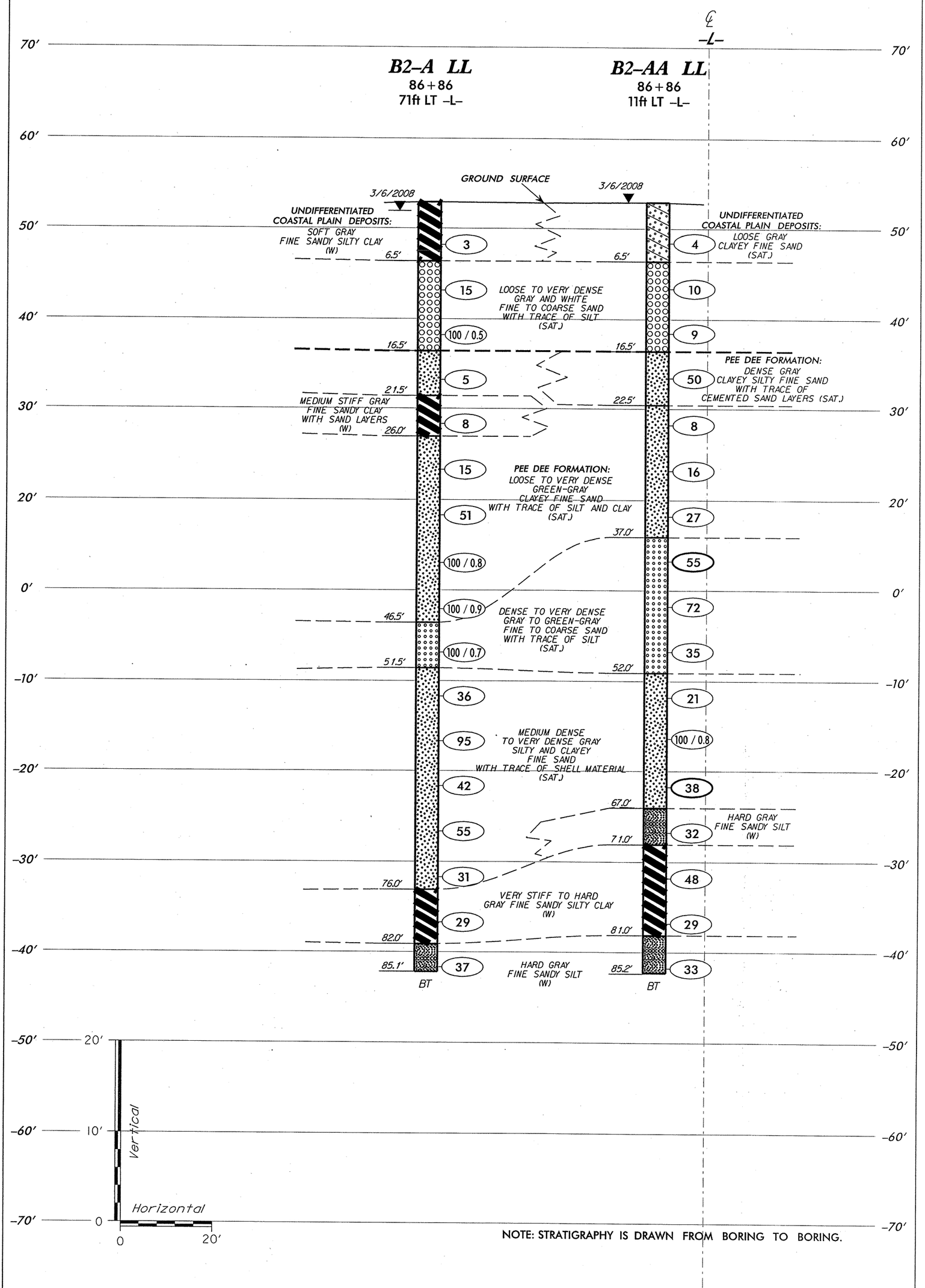
SCALE:	(V) 1" = 10′ (H) 1" = 20′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	105 1-08-048	SHEET	7 OF 35

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No. 2 (LEFT LANE)



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION
THROUGH INTERIOR BENT No. 2 (LEFT LANE)
BRIDGE No. 192
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

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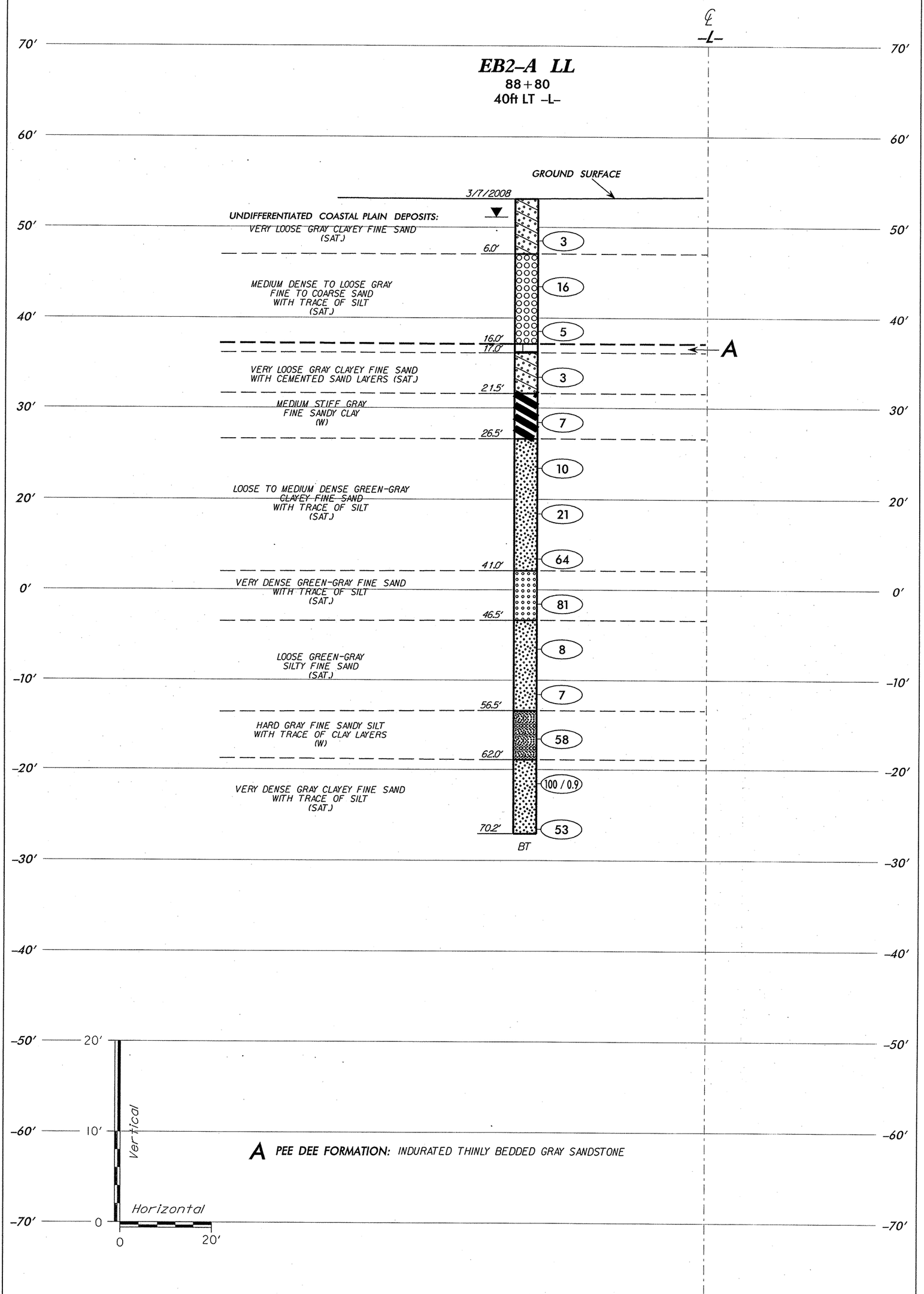
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-048	SHEET	8 OF 35

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No.1 (LEFT LANE)



GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 2 (LEFT LANE)
BRIDGE No. 192
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 3450.1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	105 1-08-048	SHEET	9 OF 35

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 82+94	**OFFSET** 75ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 52.6 ft	**TOTAL DEPTH** 70.1 ft	**NORTHING** 557,312	**EASTING** 2,395,660	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 02/21/08	**COMP. DATE** 02/25/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
55										
										52.6 / 0.0 GROUND SURFACE
50	49.1	3.5								**Undifferentiated Coastal Plain Deposits:** Loose Brown Clayey Fine to Coarse SAND (A-2-4) With Trace of Silt
45	44.1	8.5	1	2	2	4	SS-1	Sat.		45.6 / 7.0
			WOH	4	6	10		Sat.		Loose Gray Fine to Coarse SAND (A-1-b) With Trace of Silt
40	39.0	13.6								41.1 / 11.5 **Pee Dee Formation** Loose Gray Clayey Fine SAND (A-2-6)
35	34.0	18.6	1	3	7	10		Sat.		36.6 / 16.0 Loose to Dense Green-Gray Clayey Fine to Coarse SAND (A-2-4) with Trace of Silt
30	29.0	23.6	2	2	3	5		Sat.		
25	24.0	28.6	3	3	4	7	SS-2	Sat.		
20	19.0	33.6	7	7	13	20		Sat.		
15	14.0	38.6	9	14	13	27		Sat.		
10	9.0	43.6	11	16	24	40		Sat.		
5	4.0	48.6	3	7	8	15		Sat.		
0	-1.0	53.6	26	22	17	39		W		6.6 / 46.0 Hard Gray Fine Sandy SILT (A-4)
-5	-6.0	58.6	33	47	53/0.4	100/0.9		Sat.		0.6 / 52.0 Dense to Very Dense Gray Silty Fine SAND (A-2-4)
-10	-11.0	63.6	9	14	24	38		Sat.		
-15	-16.0	68.6	30	25	32	57		Sat.		-13.4 / 66.0 Hard Gray Fine Sandy SILT (A-4) With Trace of Shell Material
-20			10	14	31	45		W		-17.5 / 70.1 Boring Terminated at Elevation -17.5 ft In Hard Fine Sandy Silt.
-25										1) Advanced 3-1/4" HSA to 8.5 feet. 2) Advanced 2-7/8" Tricone to 68.6 feet. 3) Creek water with quickgel added used as drilling fluid.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 82+94	**OFFSET** 75ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 52.6 ft	**TOTAL DEPTH** 70.1 ft	**NORTHING** 557,312	**EASTING** 2,395,660	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 02/21/08	**COMP. DATE** 02/25/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-25					Match Line				
-30										4) Approximate drilling fluid denisty 62.4 pcf. 5) No loss of drilling fluid observed.
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

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PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB1-AA LL	**STATION** 83+25	**OFFSET** 7ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 52.8 ft	**TOTAL DEPTH** 70.2 ft	**NORTHING** 557,304	**EASTING** 2,395,734	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/03/08	**COMP. DATE** 03/03/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
	55									GROUND SURFACE	52.8	0.0
50	49.3	3.5	2	3	6	9		Sat.		**Undifferentiated Coastal Plain Deposits:** Loose Gray Silty Fine SAND (A-2-4)	46.8	6.0
45	44.3	8.5	2	2	2	4		Sat.		Loose Gray Fine to Coarse SAND (A-1-b) with Trace of Silt	40.8	12.0
40	39.1	13.7	2	3	5	8	SS-3	Sat.		**Pee Dee Formation** Loose to Very Loose Gray-Green Clayey Fine to Coarse SAND (A-2-4) With Trace of Shell Material	30.8	22.0
35	34.1	18.7	2	1	1	2		Sat.		Medium Stiff Gray Silty Fine Sandy CLAY (A-7-5)	26.8	26.0
30	29.1	23.7	3	3	5	8		W		Medium Dense to Dense Green-Gray Silty Fine SAND (A-2-4)	10.8	42.0
25	24.1	28.7	7	9	10	19		Sat.		Medium Stiff Green-Gray Fine Sandy CLAY (A-7-6)	6.8	46.0
20	19.1	33.7	9	15	21	36		Sat.		Very Dense Gray Silty Fine SAND (A-2-4)	-4.2	57.0
15	14.1	38.7	16	17	21	38		Sat.		Very Stiff to Hard Gray Fine Sandy SILT (A-4) With Trace of Shell Material	-17.4	70.2
10	9.1	43.7	3	2	4	6		W		Boring Terminated at Elevation -17.4 ft In Very Stiff Gray Fine Sandy Silt.		
5	4.1	48.7	38	51	41	92		Sat.		1) Advanced 3-1/4" HSA to 13.7 feet. 2) Advanced 2-7/8" Tricone to 68.7 feet. 3) Creek water with quickgel added used as drilling fluid.		
0	-0.9	53.7	17	58	42/0.1	100/0.6		Sat.				
-5	-5.9	58.7	6	9	20	29		W				
-10	-10.9	63.7	10	13	24	37		W				
-15	-15.9	68.7	7	9	13	22		W				
-20												
-25												

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PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB1-AA LL	**STATION** 83+25	**OFFSET** 7ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 52.8 ft	**TOTAL DEPTH** 70.2 ft	**NORTHING** 557,304	**EASTING** 2,395,734	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/03/08	**COMP. DATE** 03/03/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-25					Match Line				4) Approximate drilling fluid denisty 62.4 pcf. 5) No loss of drilling fluid observed.
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

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PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. B1-A LL	**STATION** 84+91	**OFFSET** 71ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.6 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 557,480	**EASTING** 2,395,771	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/03/08	**COMP. DATE** 03/04/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
	55									GROUND SURFACE	53.6	0.0
50	50.2	3.4	2	9	11	20	SS-4	Sat.		**Undifferentiated Coastal Plain Deposits:** Medium Dense Gray Fine to Coarse SAND (A-3) with Trace of Silt and Clay		
45	45.2	8.4	9	4	4	8		Sat.		Loose Gray Silty Fine SAND (A-2-4)	47.6	6.0
40	40.2	13.4	2	4	3	7		Sat.		Loose Gray Fine to Coarse SAND (A-1-b) with Trace of Silt and Clay	42.6	11.0
35	35.2	18.4	2	2	2	4		Sat.		**Pee Dee Formation:** Loose to Medium Dense Green-Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	37.1	16.5
30	30.2	23.4	3	5	9	14		Sat.				
25	24.9	28.7	3	3	5	8	SS-5	Sat.				
20	19.9	33.7	9	12	8	20		Sat.			16.6	37.0
15	14.9	38.7	15	22	30	52		Sat.		Very Dense to Loose Green-Gray Silty Fine SAND (A-2-4)		
10	9.9	43.7	8	13	14	27		Sat.				
5	4.9	48.7	3	2	2	4		Sat.			1.6	52.0
0	-0.1	53.7	8	11	14	25		W		Very Stiff Gray Fine Sandy SILT (A-4)		
-5	-5.1	58.7	6	50	50/0.1	100/0.6		Sat.		Very Dense Gray Silty Fine SAND (A-2-4) With Trace of Clayey Layers	-3.4	57.0
-10	-10.1	63.7	13	20	21	41		Sat.		Dense to Very Dense Gray Silty Fine SAND (A-2-4)	-8.4	62.0
-15	-15.1	68.7	16	57	43/0.4	100/0.9		Sat.				
-20	-20.1	73.7	10	23	18	41		W		Hard Fine Sandy SIlty CLAY (A-7-6) With Trace of Shell Material	-18.4	72.0

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PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. B1-A LL	**STATION** 84+91	**OFFSET** 71ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.6 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 557,480	**EASTING** 2,395,771	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/03/08	**COMP. DATE** 03/04/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
-25			100/0.5			Match Line / 100/0.5		W			-27.4	81.0
-30	-30.1	83.7	8	11	21	32		W		Hard Gray-Green Fine Sandy SILT (A-4)	-31.6	85.2
-35										Boring Terminated at Elevation -31.6 ft In Hard Gray-Green Fine Sandy Silt.		
-40										1) Advanced 3-1/4" HSA to 23.4 feet. 2) Advanced 2-7/8" Tricone to 83.7 feet. 3) Creek water with quickgel added used as drilling fluid. 4) Approximate drilling fluid denisty 62.4 pcf. 5) No loss of drilling fluid observed.		
-45												
-50												
-55												
-60												
-65												
-70												
-75												
-80												
-85												
-90												
-95												
-100												
-105												

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PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. B1-AA LL	**STATION** 84+91	**OFFSET** 11ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.5 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 557,446	**EASTING** 2,395,821	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/03/08	**COMP. DATE** 03/03/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** 51.0 ft

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)
	55									53.5 GROUND SURFACE	0.0
50	50.1	3.4						Sat.		**Undifferentiated Coastal Plain Deposits:** Loose Gray Clayey Fine SAND (A-2-6)	
45	45.1	8.4	2	3	6	9				47.5	6.0
40	40.1	13.4	4	4	4	8		Sat.		Loose Gray Fine to Coarse SAND (A-1-b) with Trace of Silt	
35	34.8	18.7	3	3	97/0.3	100/0.8		Sat.		42.5	11.0
30	29.8	23.7	3	2	2	4		Sat.		**Pee Dee Formation:** Very Dense Gray Silty Fine SAND (A-2-4) With Cemented Sand Layers	
25	24.8	28.7	3	3	5	8		W		36.5	17.0
20	19.8	33.7	4	4	6	10		Sat.		Loose Green-Gray Silty Fine SAND (A-2-4)	
15	14.8	38.7	4	11	11	22		Sat.		32.5	21.0
10	9.8	43.7	12	18	26	44		Sat.		Medium Stiff Gray Fine Sandy CLAY (A-7-5)	
5	4.8	48.7	20	35	33	68		Sat.		27.5	26.0
0	-0.2	53.7	17	16	15	31		Sat.		Loose to Very Dense Green-Gray Clayey Fine SAND (A-2-4) with Trace of Silt	
-5	-5.2	58.7	12	18	28	46		W		2.5	51.0
-10	-10.2	63.7	36	64/0.3		100/0.8		Sat.		1.5 Indurated Thinly Bedded Gray Sandstone	52.0
-15	-15.2	68.7	15	17	20	37		W		Hard Gray Fine Sandy SILT (A-4) With Clay Layers	
-20	-20.2	73.7	17	20	35	55		W		-3.5	57.0
-25	-25.2	78.7	11	24	21	45		W		Very Dense Gray Silty Fine SAND (A-2-4)	
										-7.5	61.0
										Hard Gray Fine Sandy SILT (A-4) With Trace of Clay and Shell Material	
										-22.5	76.0

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. B1-AA LL	**STATION** 84+91	**OFFSET** 11ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.5 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 557,446	**EASTING** 2,395,821	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/03/08	**COMP. DATE** 03/03/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** 51.0 ft

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
-25						Match Line				
-30	-30.2	83.7	9	14	17	31		W		Hard Gray Fine Sandy Silty CLAY (A-7-6) -27.5 81.0
			9	15	22	37	SS-6	35%		With Trace of Shell Material *(continued)* Hard Gray Fine Sandy SILT (A-4) with Little Clay -31.7 85.2
-35										Boring Terminated at Elevation -31.7 ft In Hard Gray Fine Sandy Silt.
-40										1) Advanced 3-1/4" HSA to 18.7 feet. 2) Advanced 2-7/8" Tricone to 83.7 feet. 3) Creek water with quickgel added used as drilling fluid. 4) Approximate drilling fluid denisty 62.4 pcf. 5) No loss of drilling fluid observed.
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

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PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. B2-A LL	**STATION** 86+86	**OFFSET** 71ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.0 ft	**TOTAL DEPTH** 85.1 ft	**NORTHING** 557,641	**EASTING** 2,395,887	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/05/08	**COMP. DATE** 03/05/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
	55									GROUND SURFACE	53.0	0.0
50	49.3	3.7						W		**Undifferentiated Coastal Plain Deposits:** Soft Gray Fine Sandy Silty CLAY (A-7-6)	46.5	6.5
45	44.3	8.7	2	2	1	3						
40	39.3	13.7	4	8	7	15		Sat.		Medium Dense to Very Dense Gray Fine to Coarse SAND (A-1-b)	36.5	16.5
35	34.3	18.7	3	2	98/0.0	100/0.5		Sat.		**Pee Dee Formation:** Loose Gray Clayey Fine SAND (A-2-4) with Trace of Silt	31.5	21.5
30	29.4	23.6	2	2	3	5		Sat.				
25	24.4	28.6	3	3	5	8		W		Medium Stiff Gray Fine Sandy CLAY (A-7-6) With Sand Layers	27.0	26.0
20	19.4	33.6	4	7	8	15		Sat.		Medium Dense to Very Dense Green-Gray Clayey Fine SAND (A-2-4) with Trace of Silt		
15	14.4	38.6	10	20	31	51		Sat.				
10	9.4	43.6	24	55	45/0.3	100/0.8		Sat.				
5	4.4	48.6	44	43	57/0.4	100/0.9		Sat.				
0	-0.6	53.6	39	56	44/0.2	100/0.7		Sat.			6.5	46.5
-5	-5.6	58.6	7	13	23	36		Sat.		Very Dense Gray Fine SAND (A-3)		
-10	-10.6	63.6	30	38	57	95		Sat.			1.5	51.5
-15	-15.6	68.6	11	15	27	42		Sat.		Dense to Very Dense Gray Silty Fine SAND (A-2-4) With Trace of Shell Material and Clay Layers		
-20	-20.6	73.6	8	16	39	55		Sat.				
-25			6	12	19	31		Sat.			-23.0	76.0
										Very Stiff Gray Fine Sandy Silty CLAY (A-7-5)		

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PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. B2-A LL	**STATION** 86+86	**OFFSET** 71ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.0 ft	**TOTAL DEPTH** 85.1 ft	**NORTHING** 557,641	**EASTING** 2,395,887	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/05/08	**COMP. DATE** 03/05/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-25						Match Line				
	-25.6	78.6	10	12	17	29		W		Very Stiff Gray Fine Sandy Silty CLAY (A-7-5) *(continued)*
-30	-30.6	83.6	10	14	23	37		W		Hard Gray Fine Sandy SILT (A-4)
-35										Boring Terminated at Elevation -32.1 ft In Hard Gray Fine Sandy Silt.
-40										1) Advanced 3-1/4" HSA to 18.7 feet.
-45										2) Advanced 2-7/8" Tricone to 83.6 feet.
-50										3) Creek water with quickgel added used as drilling fluid.
-55										4) Approximate drilling fluid denisty 62.4 pcf.
-60										5) No loss of drilling fluid observed.
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

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PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR			**GROUND WTR (ft)**
BORING NO. B2-AA LL	**STATION** 86+86	**OFFSET** 11ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 53.0 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 557,605	**EASTING** 2,395,935 — **24 HR.** 0.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/05/08	**COMP. DATE** 03/05/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft) / DEPTH (ft)
	55									53.0 / 0.0 GROUND SURFACE
50	49.5	3.5	1	2	2	4		Sat.		**Undifferentiated Coastal Plain Deposits:** Loose Gray Clayey Fine SAND (A-2-6)
45	44.5	8.5	6	5	5	10		Sat.		46.5 / 6.5 Medium Dense to Loose White Fine to Coarse SAND (A-1-b) with Trace of Silt
40	39.5	13.5	5	4	5	9		Sat.		36.5 / 16.5 **Pee Dee Formation:** Dense Gray Clayey Silty Fine SAND (A-2-4) with Trace of Cemented Sand Layers
35	34.5	18.5	4	4	46	50		Sat.		30.5 / 22.5 Loose to Medium Dense Green-Gray Clayey Fine SAND (A-2-4) with Trace of Silt
30	29.3	23.7	3	4	4	8		Sat.		
25	24.3	28.7	5	7	9	16		Sat.		
20	19.3	33.7	5	10	17	27		Sat.		16.0 / 37.0 Very Dense to Dense Green-Gray Fine to Coarse SAND (A-3) with Trace of Silt and Clay
15	14.3	38.7	10	22	33	55	SS-7	Sat.		
10	9.3	43.7	26	37	35	72		Sat.		
5	4.3	48.7	5	15	20	35		Sat.		1.0 / 52.0 Medium Dense to Dense Gray Clayey Fine SAND (A-2-4) with Trace of Silt
0	-0.7	53.7	5	9	12	21		Sat.		
-5	-5.7	58.7	38	62/0.3		100/0.8		Sat.		
-10	-10.7	63.7	8	13	25	38	SS-8	Sat.		-14.0 / 67.0 Hard Gray Fine Sandy SILT (A-4)
-15	-15.7	68.7	10	14	18	32		W		-18.0 / 71.0 Hard Gray Fine Sandy Silty CLAY (A-7-6)
-20	-20.7	73.7	7	22	26	48		W		
-25										

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR			**GROUND WTR (ft)**
BORING NO. B2-AA LL	**STATION** 86+86	**OFFSET** 11ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 53.0 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 557,605	**EASTING** 2,395,935 — **24 HR.** 0.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/05/08	**COMP. DATE** 03/05/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-25	-25.7	78.7	7	12	17	Match Line 29		W		Hard Gray Fine Sandy Silty CLAY (A-7-6) *(continued)*
-30	-30.7	83.7	9	15	18	33		W		-28.0 / 81.0 Hard Gray Fine Sandy SILT (A-4)
-35										-32.2 / 85.2 Boring Terminated at Elevation -32.2 ft In Hard Gray Fine Sandy Silt.
-40										1) Advanced 3-1/4" HSA to 18.5 feet. 2) Advanced 2-7/8" Tricone to 83.7 feet. 3) Creek water with quickgel added used as drilling fluid. 4) Approximate drilling fluid denisty 62.4 pcf. 5) No loss of drilling fluid observed.
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

NCDOT BORE DOUBLE 048.GPJ NC_DOT.GDT 3/25/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 88+80	**OFFSET** 40ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.2 ft	**TOTAL DEPTH** 70.2 ft	**NORTHING** 557,775	**EASTING** 2,396,035	**24 HR.** 2.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/06/08	**COMP. DATE** 03/06/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 16.0 ft	

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
	55									ELEV. (ft) DEPTH (ft)
										53.2 GROUND SURFACE 0.0
50	49.6	3.6								**Undifferentiated Coastal Plain Deposits:** Very Loose Gray Clayey Fine SAND (A-2-6)
			1	1	2	3		Sat.		
45	44.6	8.6								47.2 6.0
			4	9	7	16		Sat.		Medium Dense to Loose Gray Fine to Coarse SAND (A-1-b) with Trace of Silt
40	39.6	13.6								
			2	1	4	5		Sat.		
35	34.5	18.7								37.2 16.0
			1	1	2	3		Sat.		36.2 17.0 **Pee Dee Formation:** Indurated Thinly Bedded Gray Sandstone
30	29.5	23.7								**Pee Dee Formation:** Very Loose Gray Clayey Fine SAND (A-2-6)
			3	3	4	7		W		31.7 21.5
25	24.5	28.7								Medium Stiff Gray Fine Sandy CLAY (A-7-5)
			3	3	7	10		Sat.		26.7 26.5
20	19.5	33.7								Loose to Medium Dense Green-Gray Clayey Fine SAND (A-2-4) with Trace of Silt
			6	8	13	21		Sat.		
15	14.5	38.7								
			15	26	38	64		Sat.		12.2 41.0
10	9.5	43.7								Very Dense Green-Gray Fine SAND (A-3) With Trace of Silt
			37	31	50	81		Sat.		6.7 46.5
5	4.5	48.7								Loose Green-Gray Silty Fine SAND (A-2-4)
			4	5	3	8		Sat.		
0	-0.5	53.7								
			3	4	3	7		Sat.		-3.3 56.5
-5	-5.5	58.7								Hard Gray Fine Sandy SILT (A-4) With Trace of Clay Layers
			12	35	23	58		W		-8.8 62.0
-10	-10.5	63.7								Very Dense Gray Clayey Fine SAND (A-2-4) with Trace of Silt
			46	54/0.4		100/0.9		Sat.		
-15	-15.5	68.7								-17.0 70.2
			16	23	30	53		Sat.		Boring Terminated at Elevation -17.0 ft In Very Dense Clayey Fine Sand.
-20										1) Advanced 3-1/4" HSA to 13.6 feet. 2) Advanced 2-7/8" Tricone to 68.7 feet. 3) Creek water with quickgel added used as drilling fluid.
-25										

NCDOT BORE DOUBLE 048.GPJ NC_DOT.GDT 3/27/08

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 88+80	**OFFSET** 40ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.2 ft	**TOTAL DEPTH** 70.2 ft	**NORTHING** 557,775	**EASTING** 2,396,035	**24 HR.** 2.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/06/08	**COMP. DATE** 03/06/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 16.0 ft	

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
-25						Match Line				4) Approximate drilling fluid denisty 62.4 pcf. 5) No loss of drilling fluid observed.
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME Project #:	**1051-08-048**			Test Date(s):	3/3 - 3/7/08
State Project No.:	34501.1.1	County:	Lenoir	Report Date:	3/10/2008
Federal ID No.:	STP-0224(3)	TIP No.:	R-2719A		
Project Name:	**Bridge No. 192 (Left Lane) on -L- over NCRR**				
Client Name:	NCDOT				
Client Address:	Raleigh, NC				

Boring No.	Sample No.	Sample Depth (Feet)	AASHTO Classification	Total % Passing Sieve #					Total Mortar Fraction				LL	PL	PI	Moisture Content %
				10	40	60	200	270	Coarse Sand	Fine Sand	Silt	Clay				
EB1-A LL	SS-1	3.5	A-2-4 (0)	100	77	58	26	24	42	34	7	17	22	16	6	ND
EB1-A LL	SS-2	23.6	A-2-4 (0)	100	83	55	24	21	45	34	7	14	30	20	10	ND
EB1-AA LL	SS-3	13.7	A-2-4 (0)	97	84	57	20	18	41	40	3	16	27	20	7	ND
B1-A LL	SS-4	3.4	A-3 (0)	99	76	48	10	9	51	40	4	5	17	NP	NP	ND
B1-A LL	SS-5	28.7	A-2-4 (0)	100	92	64	12	11	36	53	3	8	22	21	1	ND
B1-AA LL	SS-6	83.7	A-4 (0)	100	100	99	45	19	1	80	6	13	32	28	4	34.5
B2-AA LL	SS-7	38.7	A-3 (0)	100	81	32	10	9	69	22	3	6	20	NP	NP	ND
B2-AA LL	SS-8	63.7	A-2-4 (0)	100	99	98	24	15	2	83	6	9	30	NP	NP	ND

Notes: ND=Not Determined, N.P.=Nonplastic

Technical Responsibility: B. Riggs

Signature

Geotechnical Engineer

Position

Photograph No. 1:
This photograph was taken from the southwest approach, left of the -L- alignment, looking northeast.

Photograph No. 2:
This photograph was taken from the -L- alignment, looking west, across proposed End Bent No. 1.

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

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

Photograph No. 5:
This photograph was taken from the left side of the -L- alignment, looking southeast, across proposed Interior Bent No. 1.

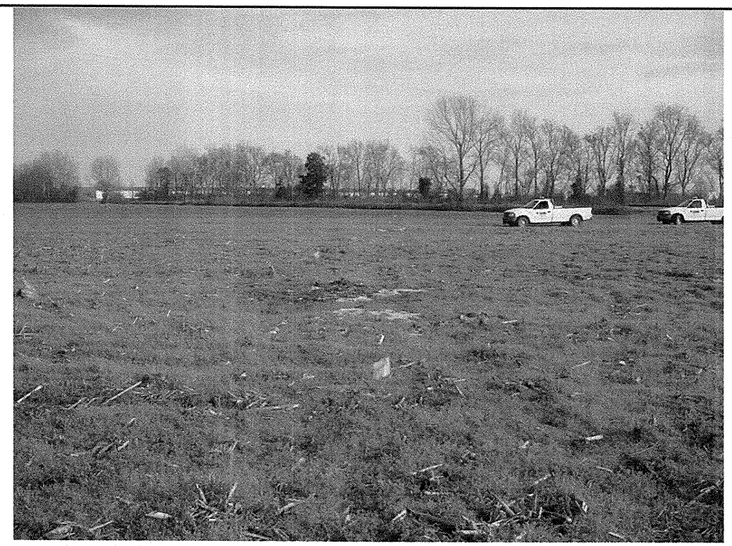
Photograph No. 7:
This photograph was taken from the -L- alignment, looking east, along NCRR (-Y2-).

Photograph No. 6:
This photograph was taken from the -L- alignment, looking west, along NCRR (-Y2-).

Photograph No. 8:
This photograph was taken from the -L- alignment, looking northwest, across proposed Interior Bent No. 2.

Photograph No. 9:
This photograph was taken from the left side of the -L- alignment, looking southeast, across proposed Interior Bent No. 2.

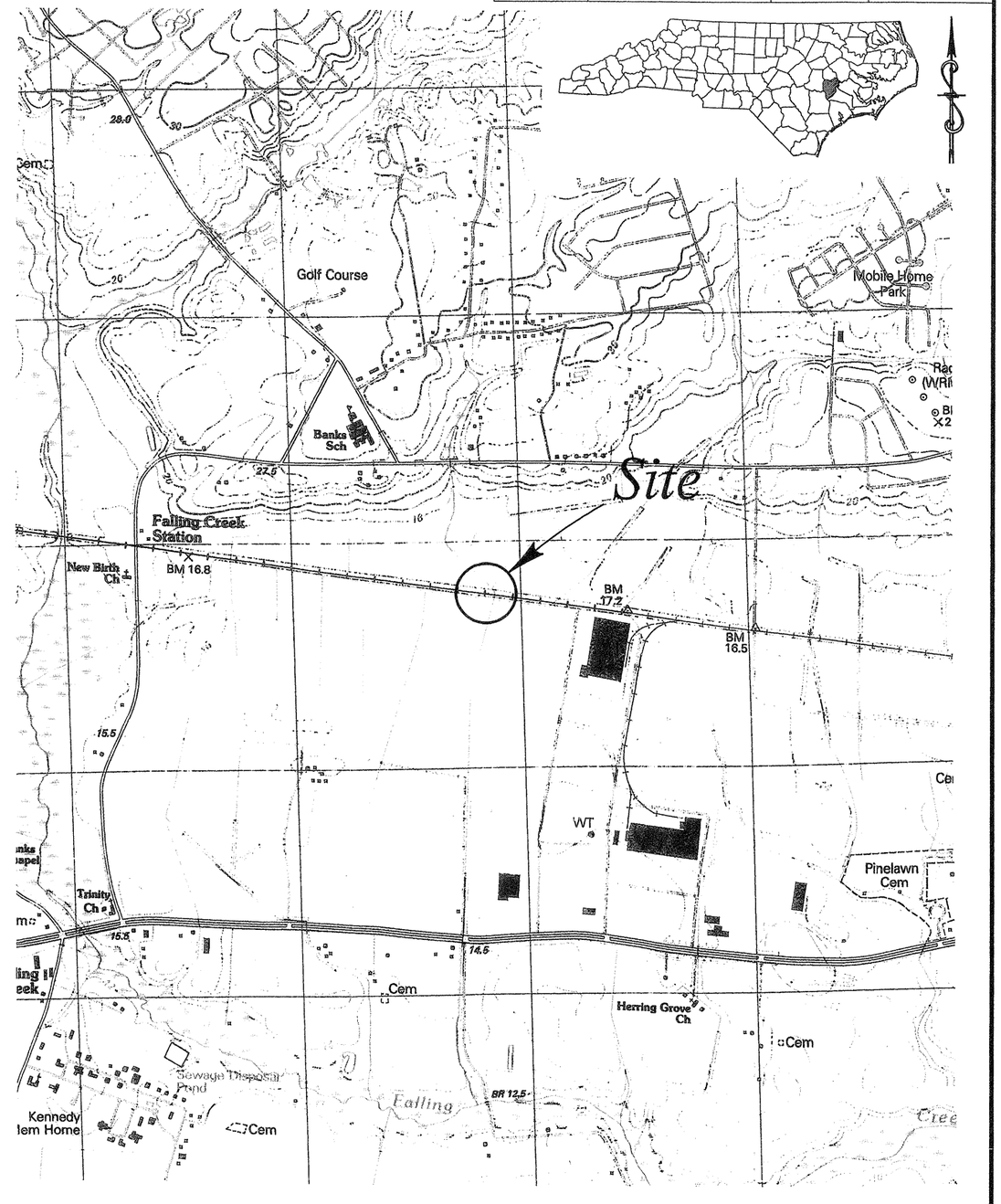
Photograph No. 10:
This photograph was taken from the -L- alignment, looking northwest, across proposed End Bent No. 2.



Photograph No. 11:
This photograph was taken from the left side of the -L- alignment, looking southeast, across proposed End Bent No. 2.

Photograph No. 12:
This photograph was taken from the northeast approach, left of the -L- alignment, looking southwest.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	3450I.I.I	2I	35



S:PROJECTS/2008/08-048/GEOTECH/CADD/R-2719A -SITEVIC 193 RL

SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	MARCH 2008
JOB NO.	1051-08-048

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING •TESTING

SITE VICINITY MAP

BRIDGE No. 193 (RIGHT LANE)
ON -L- OVER NCRR
STATE PROJECT NO. 3450I.I.I TIP NO. R-2719A
FEDERAL I.D. NO. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

POT Sta. 28+47.16

MATCH LINE -L- STA.82+00 - SEE SHEET 6

-SVRD5- N 83° 51' 32.5" W

Y2 POT Sta. 10+00.00

NORTH CAROLINA RAILROAD

-Y2- S 83° 51' 32.5" E

-BL-7 PINC & -BY20 301 PINC
-L- 86+04.32 (42.41' LT)

MATCH LINE SEE SHEET 7A

-L- POC STA.85+98.30 =
-Y2- POT STA.13+41.91
Δ = 60° 20' 23.0"

EB1-B RL

B1-B RL

B2-B RL

EB2-B RL

-L- POC STA.84+27.98 =
-SVRD5- POT STA.24+82.25
Δ = 63° 07' 40.7"

-L- ST Sta. 94+31.63

Y2 POT Sta. 16+00.00

-BL- STA. 56+79.17
252.58' RIGHT
ELEV. 53.43'

-BY2-40 PINC
-SVRD5- 20+27.91 (186.37' RT)

NORTH CAROLINA RAILROAD

N 46° 26' 59.0" E

-BL-8 PINC 63+58.59

MATCH LINE -L- STA.95+00 - SEE SHEET 8

MATCH LINE -SVRD5- STA.19+00
SEE SHEET 35

BENCHMARK:
"BM-B" - RR SPIKE IN 18" TWIN OAK
LOCATED AT STATION -BL- 56+79.17, 252.58' RT.
ELEV. 53.43'

SKEW ANGLE FOR END BENT No. 1 64° 17'04"
AND ALL OTHERS AT 90° 00'00" (Tan to Curve)

0 100 200
SCALE IN FEET

NC GRID
NAD 83

SCALE:	1" = 100'
DATE:	MARCH 2008
JOB NO.	1051-08-048
APPROVED BY:	AFR
DRAWN BY:	TRP
SHEET	22 OF 35

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

BORING LOCATION PLAN

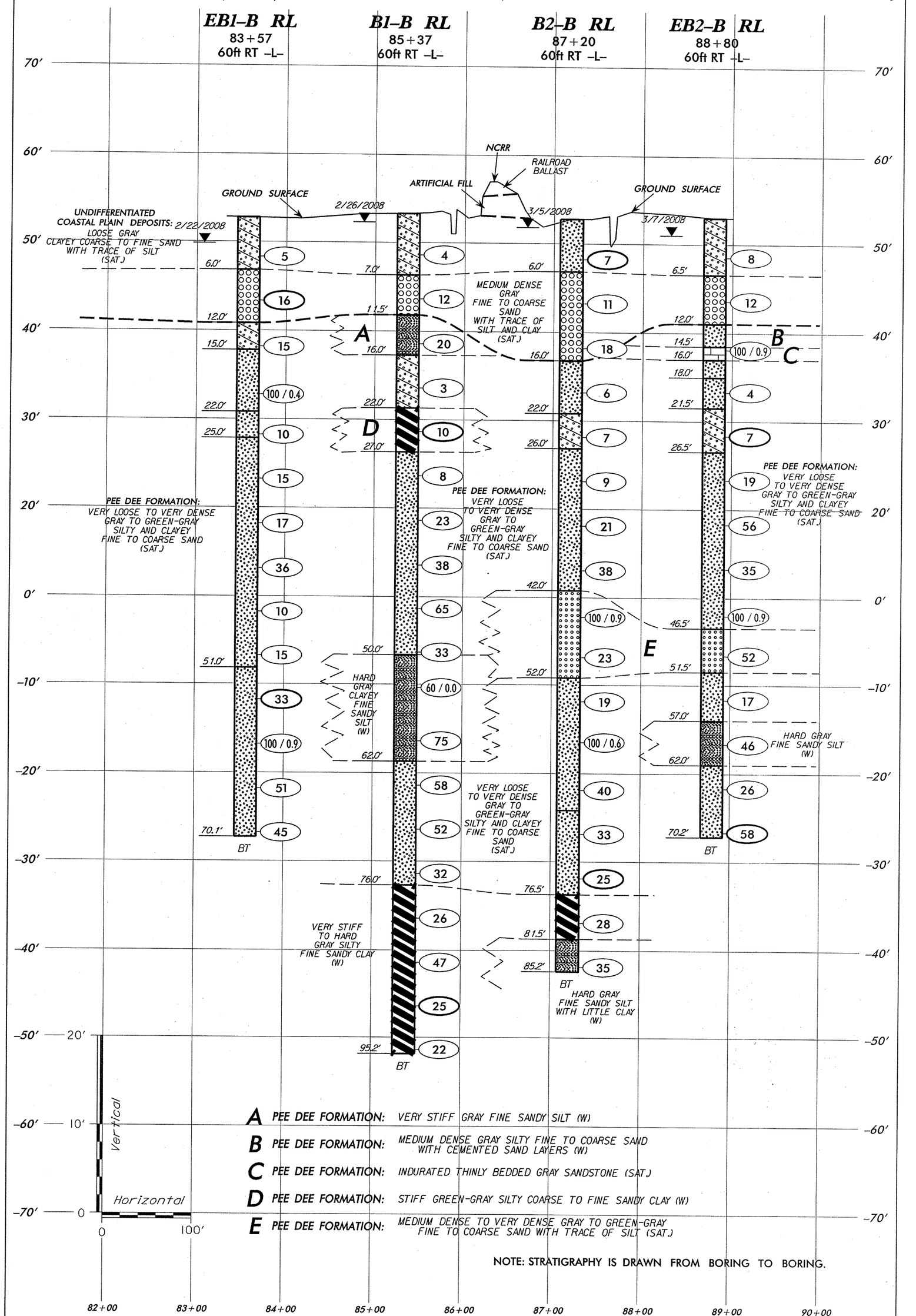
BRIDGE No. 193 (RIGHT LANE)
ON -L- OVER NCRR (-Y2-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S:\PROJECTS\2008\08-048\GEOTECH\CADD\R-2719A SITE PLAN BRIDGE 193 RL.DGN

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE PROFILE 60' RIGHT OF -L-

TO EXISTING US 70 ← → TO S.R. 1546



A PEE DEE FORMATION: VERY STIFF GRAY FINE SANDY SILT (W)

B PEE DEE FORMATION: MEDIUM DENSE GRAY SILTY FINE TO COARSE SAND WITH CEMENTED SAND LAYERS (W)

C PEE DEE FORMATION: INDURATED THINLY BEDDED GRAY SANDSTONE (SAT.)

D PEE DEE FORMATION: STIFF GREEN-GRAY SILTY COARSE TO FINE SANDY CLAY (W)

E PEE DEE FORMATION: MEDIUM DENSE TO VERY DENSE GRAY TO GREEN-GRAY FINE TO COARSE SAND WITH TRACE OF SILT (SAT.)

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE 60' RIGHT OF -L-

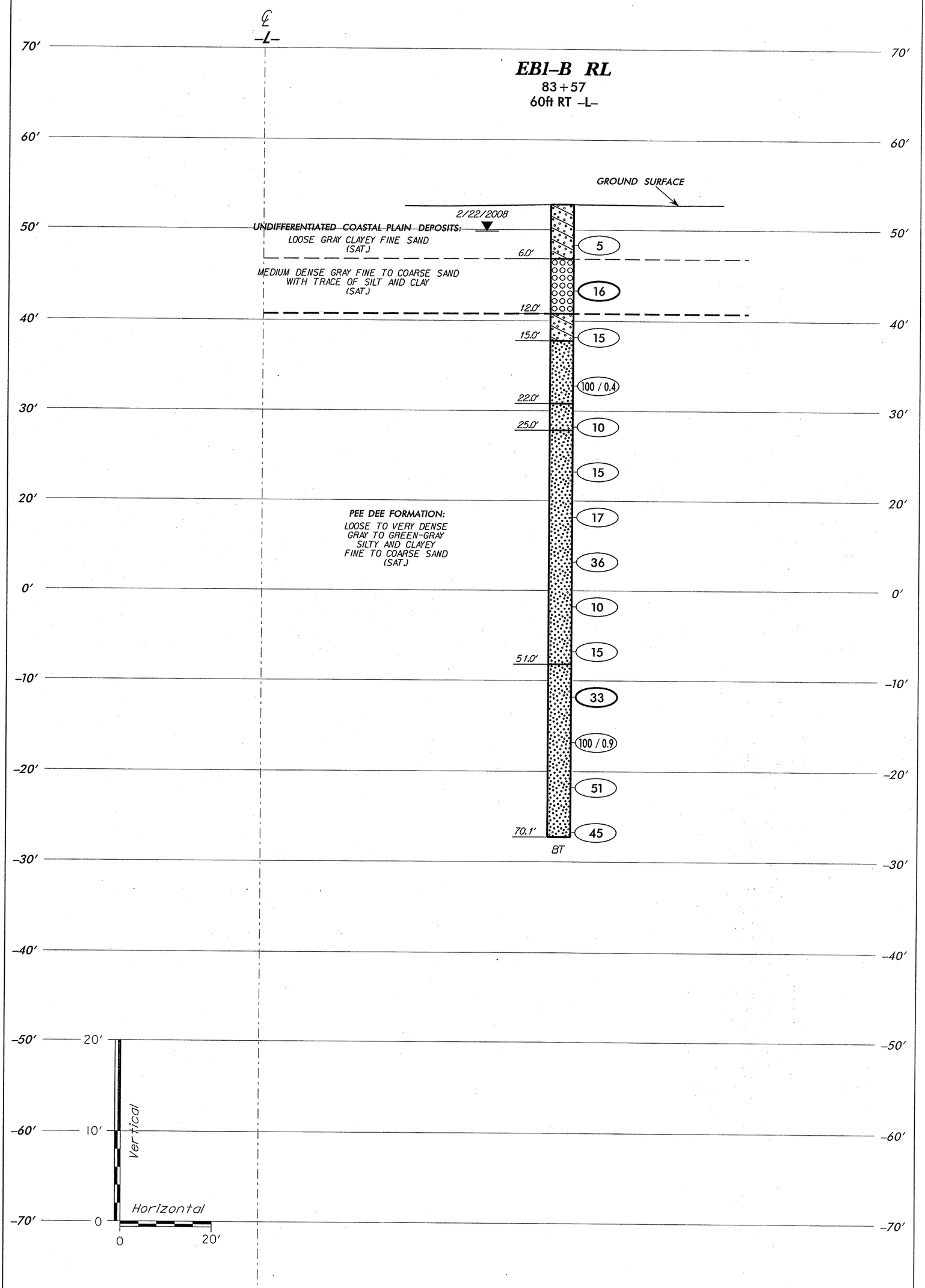
BRIDGE No. 193
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 3450I.I.I FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 100'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-048	SHEET	23 OF 35

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 1 (RIGHT LANE)



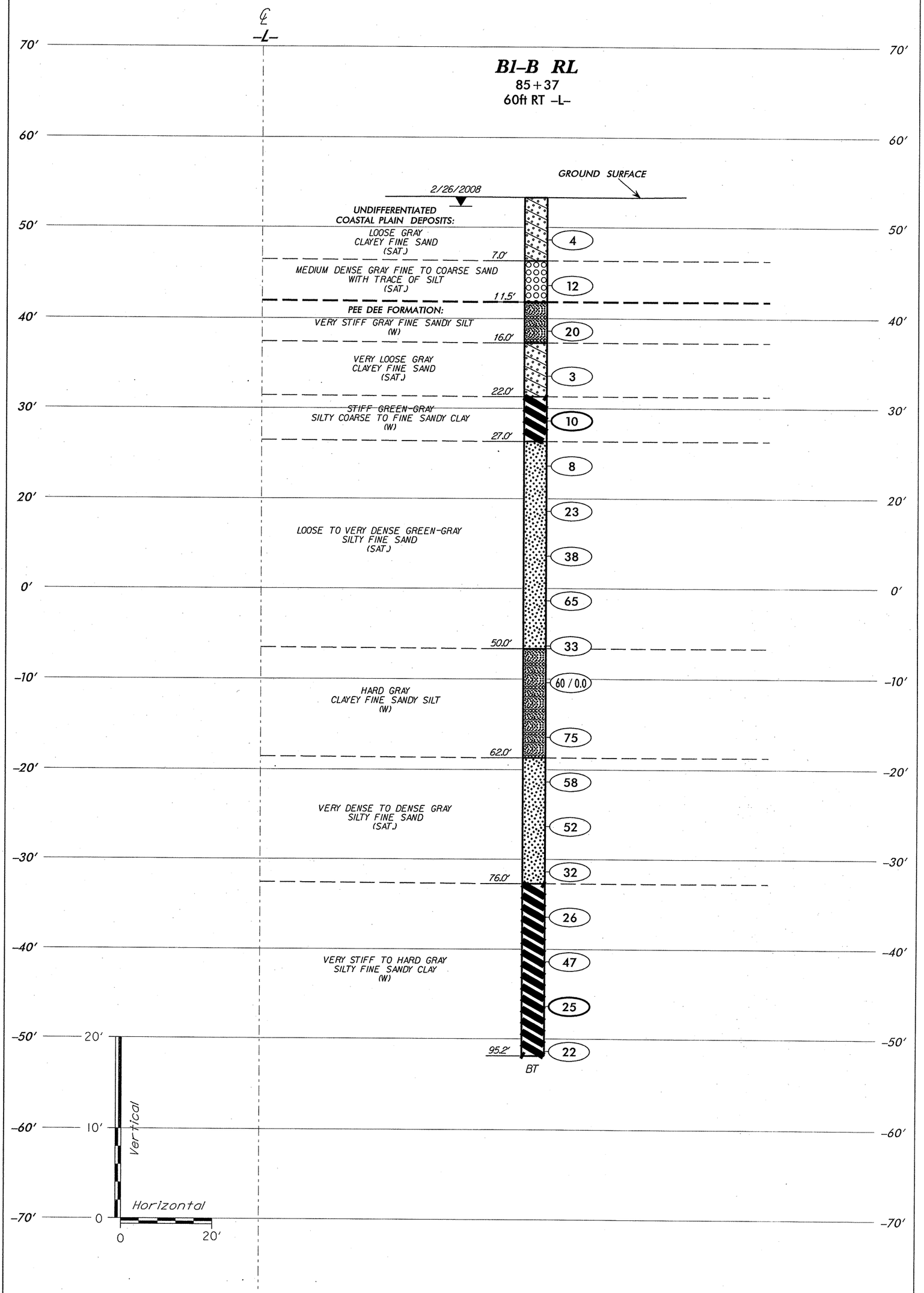
GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 1 (RIGHT LANE)
BRIDGE No. 193
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10′ (H) 1" = 20′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-048	SHEET	24 OF 35

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No. 1 (RIGHT LANE)



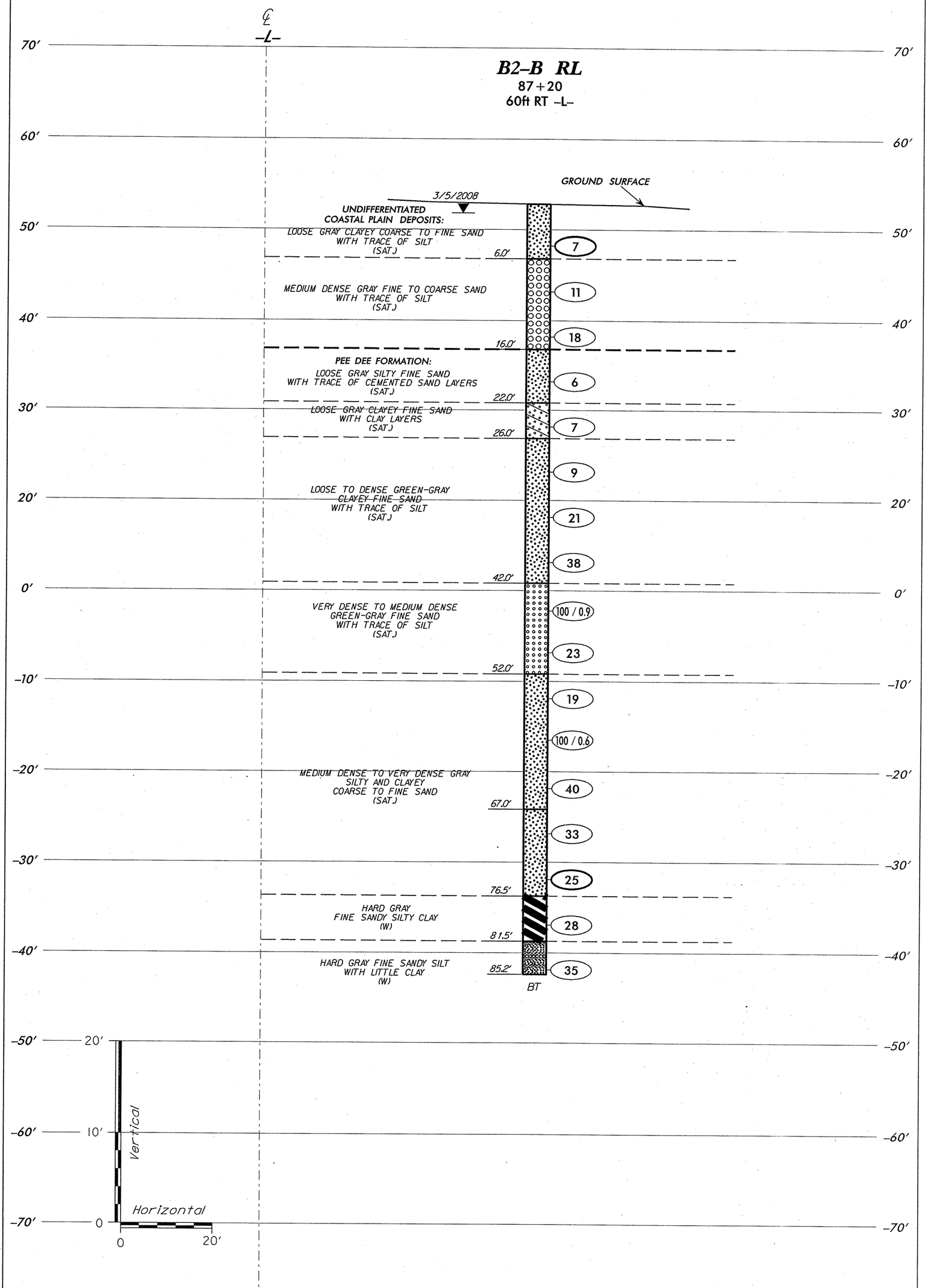
GENERALIZED SUBSURFACE CROSS SECTION
THROUGH INTERIOR BENT No. 1 (RIGHT LANE)
BRIDGE No. 193
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 3450 1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	105 1-08-048	SHEET	25 OF 35

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No. 2 (RIGHT LANE)



GENERALIZED SUBSURFACE CROSS SECTION

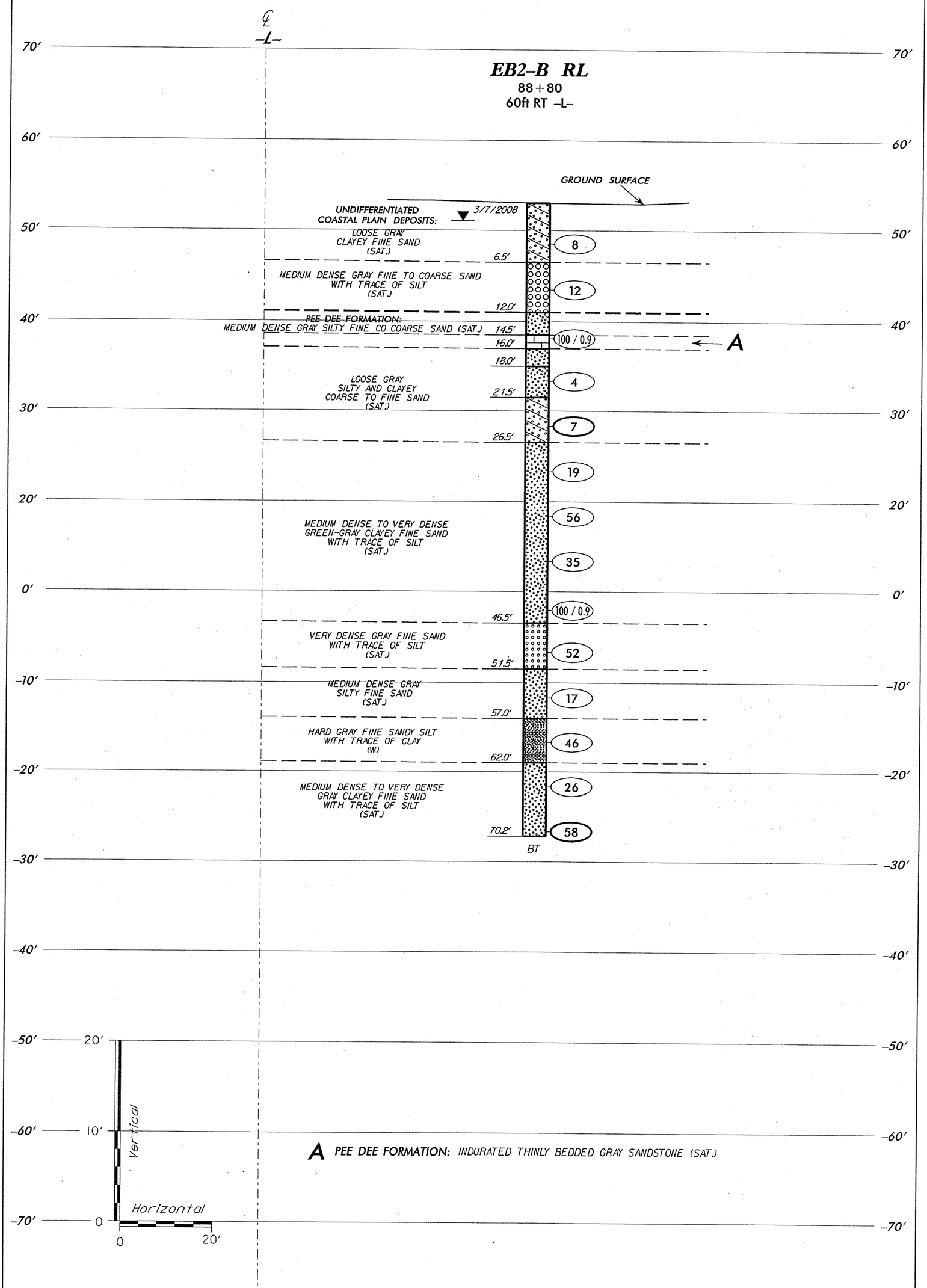
THROUGH INTERIOR BENT No. 2 (RIGHT LANE)
BRIDGE No. 193
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-048	SHEET	26 OF 35

S:PROJECTS/2008/08-048/GEOTECH DOT/CADD/R-2719A 192-193 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2 (RIGHT LANE)



A **PEE DEE FORMATION:** *INDURATED THINLY BEDDED GRAY SANDSTONE (SAT.)*

GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 2 (RIGHT LANE)
BRIDGE No. 193
ON -L- OVER N.C. RAILROAD (-Y2-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-048	SHEET	27 OF 35

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 83+57	**OFFSET** 60ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 52.9 ft	**TOTAL DEPTH** 70.1 ft	**NORTHING** 557,297	**EASTING** 2,395,807	**24 HR.** 3.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 02/21/08	**COMP. DATE** 02/21/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
	55									
										52.9 / 0.0 GROUND SURFACE
50	49.4	3.5								**Undifferentiated Coastal Plain Deposits:** Loose Gray Clayey Fine SAND (A-2-6)
45	44.4	8.5	3	2	3	5		Sat.		46.9 / 6.0 Medium Dense Gray Fine to Coarse SAND (A-1-b) With Trace of Silt and Clay
40	39.3	13.6	3	6	10	16	SS-9	Sat.		40.9 / 12.0 **Pee Dee Formation** Medium Dense Gray Clayey Fine SAND (A-2-6)
35	34.3	18.6	9	8	7	15		Sat.		37.9 / 15.0 Very Dense Green-Gray Silty Fine SAND (A-2-4)
30	29.3	23.6	4	5	100/0.4	100/0.4		Sat.		30.9 / 22.0 Loose Green-Gray Silty Fine SAND (A-2-4) With Trace of Silt Seams
25	24.3	28.6	3	4	6	10		Sat.		27.9 / 25.0 Medium Dense to Dense Green-Gray Silty Fine to Coarse SAND (A-2-4)
20	19.3	33.6	5	7	8	15		Sat.		
15	14.3	38.6	4	7	10	17		Sat.		
10	9.3	43.6	12	15	21	36		Sat.		
5	4.3	48.6	10	5	5	10		Sat.		
0	-0.7	53.6	3	5	10	15		Sat.		1.9 / 51.0 Dense to Very Dense Gray Silty Fine SAND (A-2-4) with Trace of Clay
-5	-5.7	58.6	7	13	20	33	SS-10	Sat.		
-10	-10.7	63.6	57	43/0.4		100/0.9		Sat.		
-15	-15.7	68.6	24	27	24	51		Sat.		
-20			16	20	25	45		Sat.		-17.2 / 70.1 Boring Terminated at Elevation -17.2 ft In Dense Silty Fine Sand.

1) Advanced 3-1/4" HSA to 8.5 feet.
2) Advanced 2-7/8" Tricone to 68.6 feet.
3) Creek water with quickgel added used as drilling fluid.
4) Approximate drilling fluid denisty 62.4 pcf.
5) No loss of drilling fluid observed.

NCDOT BORE DOUBLE 048.GPJ NC_DOT.GDT 3/25/08

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 83+57	**OFFSET** 60ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 52.9 ft	**TOTAL DEPTH** 70.1 ft	**NORTHING** 557,297	**EASTING** 2,395,807	**24 HR.** 3.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 02/21/08	**COMP. DATE** 02/21/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-25					Match Line				
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR			**GROUND WTR (ft)**
BORING NO. B1-B RL	**STATION** 85+37	**OFFSET** 60ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 53.4 ft	**TOTAL DEPTH** 95.2 ft	**NORTHING** 557,443	**EASTING** 2,395,905 — **24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 02/25/08	**COMP. DATE** 02/25/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft) / DEPTH (ft)
	55									53.4 / 0.0 GROUND SURFACE
50	49.7	3.7	WOH	2	2	4		Sat.		**Undifferentiated Coastal Plain Deposits:** Loose Gray Clayey Fine SAND (A-2-6)
45	44.7	8.7	WOH	5	7	12		Sat.		46.4 / 7.0 Medium Dense Gray Fine to Coarse SAND (A-1-b) With Trace of Silt
40	39.7	13.7	2	2	18	20		W		41.9 / 11.5 **Pee Dee Formation:** Very Stiff Gray Fine Sandy SILT (A-4)
35	34.7	18.7	2	1	2	3		Sat.		37.4 / 16.0 Very Loose Gray Clayey Fine SAND (A-2-6)
30	29.7	23.7	4	4	6	10	SS-11	37%		31.4 / 22.0 Stiff Green-Gray Silty Coarse to Fine Sandy CLAY (A-7-5)
25	24.7	28.7	2	4	4	8		Sat.		26.4 / 27.0 Loose to Very Dense Green-Gray Silty Fine SAND (A-2-4)
20	19.7	33.7	6	9	14	23		Sat.		
15	14.7	38.7	9	17	21	38		Sat.		
10	9.7	43.7	17	31	34	65		Sat.		
5	4.7	48.7	14	17	16	33		Sat.		3.4 / 50.0 Hard Gray Clayey Fine Sandy SILT (A-4)
0	-0.3	53.7	60/0.0			60/0.0		W		
-5	-5.3	58.7	18	25	50	75		W		-8.6 / 62.0 Very Dense to Dense Gray Silty Fine SAND (A-2-4)
-10	-10.3	63.7	10	24	34	58		Sat.		
-15	-15.3	68.7	6	20	32	52		Sat.		
-20	-20.3	73.7	7	11	21	32		Sat.		-22.6 / 76.0
-25										

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR			**GROUND WTR (ft)**
BORING NO. B1-B RL	**STATION** 85+37	**OFFSET** 60ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 53.4 ft	**TOTAL DEPTH** 95.2 ft	**NORTHING** 557,443	**EASTING** 2,395,905 — **24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 02/25/08	**COMP. DATE** 02/25/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-25					Match Line				
	-25.3	78.7	8	11	15	26		W		Very Stiff to Hard Gray Silty Fine Sandy CLAY (A-7-6) *(continued)*
-30	-30.3	83.7	10	18	29	47		W		
-35	-35.3	88.7	9	10	15	25	SS-12	38%		
-40	-40.3	93.7	7	9	13	22		W		-41.8 / 95.2 Boring Terminated at Elevation -41.8 ft In Very Stiff Fine Sandy Clay.
-45										1) Advanced 3-1/4" HSA to 8.7 feet. 2) Advanced 2-7/8" Tricone to 93.7 feet. 3) Creek water with quickgel added used as drilling fluid. 4) Approximate drilling fluid denisty 62.4 pcf. 5) No loss of drilling fluid observed.
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

NCDOT BORE DOUBLE 048.GPJ NC_DOT.GDT 3/25/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. B2-B RL	**STATION** 87+20	**OFFSET** 60ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 52.9 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 557,588	**EASTING** 2,396,011	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/04/08	**COMP. DATE** 03/04/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
	55									GROUND SURFACE	52.9	0.0
50	49.3	3.6						Sat.		**Undifferentiated Coastal Plain Deposits:** Loose Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	46.9	6.0
45	44.3	8.6	3	3	4	7	SS-13	Sat.		Medium Dense Gray Fine to Coarse SAND (A-1-b) with Trace of Silt	36.9	16.0
40	39.3	13.6	6	5	6	11		Sat.		**Pee Dee Formation:** Loose Gray Silty Fine SAND (A-2-4) With Trace of Cemented Sand Layers	30.9	22.0
35	34.3	18.6	3	4	14	18		Sat.		Loose Gray Clayey Fine SAND (A-2-6) With Clay Layers	26.9	26.0
30	29.2	23.7	8	3	3	6		Sat.		Loose to Dense Green-Gray Clayey Fine SAND (A-2-4) with trace of Silt	10.9	42.0
25	24.2	28.7	3	3	4	7		Sat.		Very Dense to Medium Dense Green-Gray Fine SAND (A-3) With Trace of Silt	0.9	52.0
20	19.2	33.7	3	3	6	9		Sat.		Medium Dense to Very Dense Gray Silty Fine SAND (A-2-4)	-14.1	67.0
15	14.2	38.7	5	8	13	21		Sat.		Dense to Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	-23.6	76.5
10	9.2	43.7	7	17	21	38		Sat.				
5	4.2	48.7	22	51	49/0.4	100/0.9		Sat.				
0	-0.8	53.7	7	10	13	23		Sat.				
-5	-5.8	58.7	3	7	12	19		Sat.				
-10	-10.8	63.7	69	31/0.1		100/0.6		Sat.				
-15	-15.8	68.7	9	15	25	40		Sat.				
-20	-20.8	73.7	10	14	19	33		Sat.				
-25			5	7	18	25	SS-14	Sat.				

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. B2-B RL	**STATION** 87+20	**OFFSET** 60ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 52.9 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 557,588	**EASTING** 2,396,011	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/04/08	**COMP. DATE** 03/04/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-25	-25.8	78.7	7	11	17	28		W		Hard Gray Fine Sandy Silty CLAY (A-7-6) *(continued)*
-30	-30.8	83.7	8	14	21	35		W		Hard Gray Fine Sandy SILT (A-4) with Little Clay
-35										Boring Terminated at Elevation -32.3 ft In Hard Gray Fine Sandy Silt.
-40										1) Advanced 3-1/4" HSA to 18.6 feet.
-45										2) Advance 2-7/8" Tricone to 83.7 feet.
-50										3) Creek water with quickgel added used as drilling fluid.
-55										4) Approximate drilling fluid denisty 62.4 pcf.
-60										5) No loss of drilling fluid observed.
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

Match Line

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 88+80	**OFFSET** 60ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.1 ft	**TOTAL DEPTH** 70.2 ft	**NORTHING** 557,710	**EASTING** 2,396,111	**24 HR.** 2.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/06/08	**COMP. DATE** 03/06/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** 14.5 ft

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)
	55											
										GROUND SURFACE	53.1	0.0
50	49.6	3.5								**Undifferentiated Coastal Plain Deposits** Loose Gray Clayey Fine SAND (A-2-6)		
45	44.6	8.5	2	4	4	8		Sat.				
40	39.6	13.5	4	5	7	12		Sat.		Medium Dense Gray Fine to Coarse SAND (A-1-b) with Trace of Silt	46.6	6.5
35	34.4	18.7	2	3	97/0.4	100/0.9		Sat.		**Pee Dee Formation** Medium Dense Gray Silty Fine to Coarse SAND (A-2-4)	41.1	12.0
30	29.4	23.7	1	2	2	4		Sat.		Indurated Thinly Bedded Gray Sandstone	38.6	14.5
25	24.4	28.7	2	3	4	7	SS-15	Sat.		Loose Gray Silty Fine to Coarse Sand (A-2-4)	37.1	16.0
20	19.4	33.7	4	6	13	19		Sat.		Loose Gray Silty Fine SAND (A-2-4)	35.1	18.0
15	14.4	38.7	12	26	30	56		Sat.		Loose Gray Clayey Coarse to Fine SAND (A-2-6) with Trace of Silt	31.6	21.5
10	9.4	43.7	18	19	16	35		Sat.		Medium Dense to Very Dense Green-Gray Clayey Fine SAND (A-2-4) with Trace of Silt	26.6	26.5
5	4.4	48.7	14	44	56/0.4	100/0.9		Sat.				
0	-0.6	53.7	11	20	32	52		Sat.		Very Dense Gray Fine SAND (A-3) with Trace of Silt	6.6	46.5
-5	-5.6	58.7	2	5	12	17		Sat.		Medium Dense Gray Silty Fine SAND (A-2-4)	1.6	51.5
-10	-10.6	63.7	8	20	26	46		W		Hard Gray Fine Sandy SILT (A-4) With Trace of Clay	-3.9	57.0
-15	-15.6	68.7	25	15	11	26		Sat.		Medium Dense to Very Dense Gray Clayey Fine SAND (A-2-4) with Trace of Silt	-8.9	62.0
-20			8	23	35	58	SS-16	Sat.			-17.1	70.2
-25										Boring Terminated at Elevation -17.1 ft In Very Dense Clayey Fine Sand. 1) Advanced 3-1/4" to 13.5 feet. 2) Advanced 2-7/8" Tricone to 68.7 feet. 3) Creek water with quickgel added used as drilling fluid.		

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 192 & Bridge No. 193 on -L- over NCRR				**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 88+80	**OFFSET** 60ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 53.1 ft	**TOTAL DEPTH** 70.2 ft	**NORTHING** 557,710	**EASTING** 2,396,111	**24 HR.** 2.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/06/08	**COMP. DATE** 03/06/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** 14.5 ft

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
	-25					Match Line				4) Approximate drilling fluid denisty 62.4 pcf. 5) No loss of drilling fluid observed.
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										
-90										
-95										
-100										
-105										

NCDOT BORE DOUBLE 048.GPJ NC_DOT.GDT 3/25/08

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME Project #:	**1051-08-048**			Test Date(s):	3/3 - 3/7/08
State Project No.:	34501.1.1	County:	Lenoir	Report Date:	3/10/2008
Federal ID No.:	STP-0224(3)	TIP No.:	R-2719A		
Project Name:	**Bridge No. 193 (Right Lane) on -L- over NCRR**				
Client Name:	NCDOT				
Client Address:	Raleigh, NC				

Boring No.	Sample No.	Sample Depth (Feet)	AASHTO Classification	Total % Passing Sieve #					Total Mortar Fraction				LL	PL	PI	Moisture Content %
				10	40	60	200	270	Coarse Sand	Fine Sand	Silt	Clay				
EB1-B RL	SS-9	8.5	A-1-b (0)	84	27	7	2	2	91	6	2	1	22	N.P.	N.P.	ND
EB1-B RL	SS-10	53.6	A-2-4 (0)	100	100	99	30	16	1	83	9	7	26	25	1	ND
B1-B RL	SS-11	23.7	A-7-5 (21)	100	96	88	68	61	12	27	21	40	64	35	29	37.4
B1-B RL	SS-12	88.7	A-7-6 (49)	100	100	99	87	73	1	26	25	48	73	22	51	37.9
B2-B RL	SS-13	3.6	A-2-4 (0)	100	89	74	27	24	27	49	7	17	19	17	2	ND
B2-B RL	SS-14	73.8	A-2-4 (0)	100	87	80	33	22	20	58	8	14	31	28	3	ND
EB2-B RL	SS-15	23.7	A-2-6 (0)	100	87	64	28	23	37	41	7	15	31	19	12	ND
EB2-B RL	SS-16	68.7	A-2-4 (0)	100	100	99	28	19	1	80	6	13	28	26	2	ND

Notes: ND=Not Determined, N.P.=Nonplastic

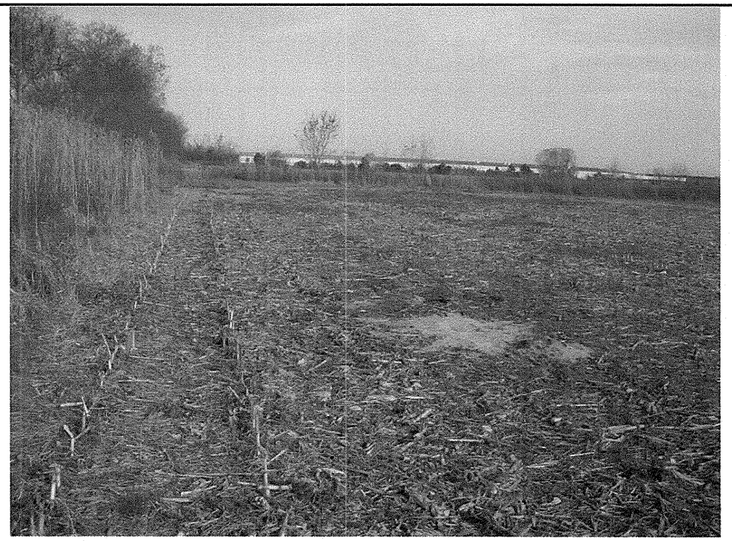
Technical Responsibility: B. Riggs — *Signature* — Geotechnical Engineer — *Position*

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

Photograph No. 2:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed End Bent No. 1.

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

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

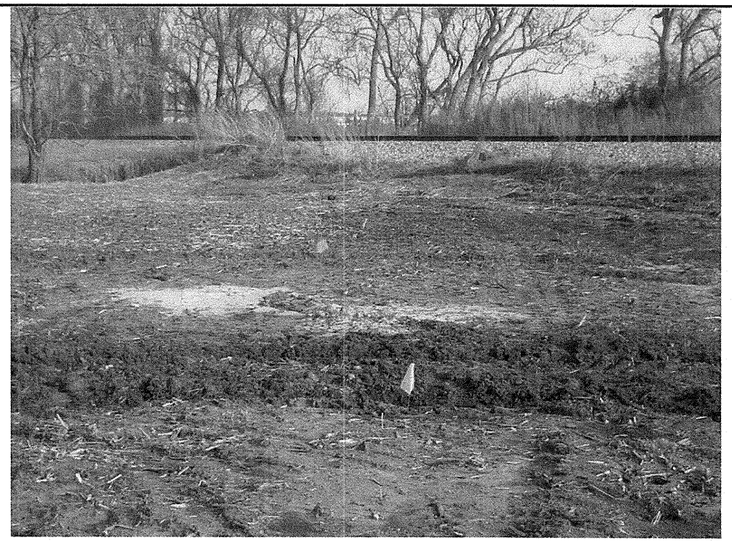


Photograph No. 5:
This photograph was taken from the -L- alignment, looking east, across proposed Interior Bent No. 1.

Photograph No. 6:
This photograph was taken from the -L- alignment, looking west, along NCRR (-Y2-).

Photograph No. 7:
This photograph was taken from the -L- alignment, looking east, along NCRR (-Y2-).

Photograph No. 8:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 2.



Photograph No. 9:
This photograph was taken from the -L- alignment, looking east, across proposed Interior Bent No. 2.

Photograph No. 10:
This photograph was taken from the right side of the -L- alignment, looking northwest, across proposed End Bent No. 2.

Photograph No. 11:
This photograph was taken from the -L- alignment, looking southeast, across proposed End Bent No. 2.

Photograph No. 12:
This photograph was taken from the northeast approach, right of the -L- alignment, looking southwest.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34501.1.1	1	41

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34501.1.1 F.A. PROJ. STP-0224(3)

COUNTY LENOIR

PROJECT DESCRIPTION CRESCENT ROAD IN KINSTON FROM US HIGHWAY 70 TO US HIGHWAY 258

SITE DESCRIPTION BRIDGE STRUCTURES No. 4 AND No. 5 ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)

ID: R-2719A

PROJECT: 34501.1.1

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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.

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.

For Letting

PERSONNEL

S. JOHNSON

L. RAUP

N. BRADLEY

J. WHITE

S. HARDEE

P. PHELPS

T. PEREZ

INVESTIGATED BY S&ME, INC.

CHECKED BY A.F. RIGGS, JR.

SUBMITTED BY S&ME, INC.

DATE MARCH 28, 2008

DRAWN BY: T. PEREZ

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.

NORTH CAROLINA PROFESSIONAL SEAL 14155 ENGINEER ALBERT F RIGGS, JR 4/30/08

SEAL

SIGNATURE

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	34501.1.1	2	41

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		51 MN 50 MX 25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT PLASTIC INDEX	6 MX		N.P.	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE
UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT-CLAY SOILS	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
- HC — HOLE CAVE
- SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP/DIP DIRECTION OF ROCK STRUCTURES
- ● - SOUNDING ROD
- WATER LOSS
- SPT / CPT / VST — DMT / PMT — TEST BORING
- CPT TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- SPT TEST SAMPLE

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

ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

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

ADVANCING TOOLS:
- ☐ DRAG BITS _____
- ☐ 6" CONTINUOUS FLIGHT AUGER
- ☐ 8" HOLLOW AUGERS
- ☐ HARD FACED FINGER BITS
- ☐ TUNG.-CARBIDE INSERTS
- ☐ CASING ☐ W/ ADVANCER
- ☒ TRICONE 2-7/8" * STEEL TEETH
- ☐ TRICONE _____" * TUNG.-CARB.
- ☐ CORE BIT
- ☒ OTHER 3-1/4" H.S.A.

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

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

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

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

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.

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

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

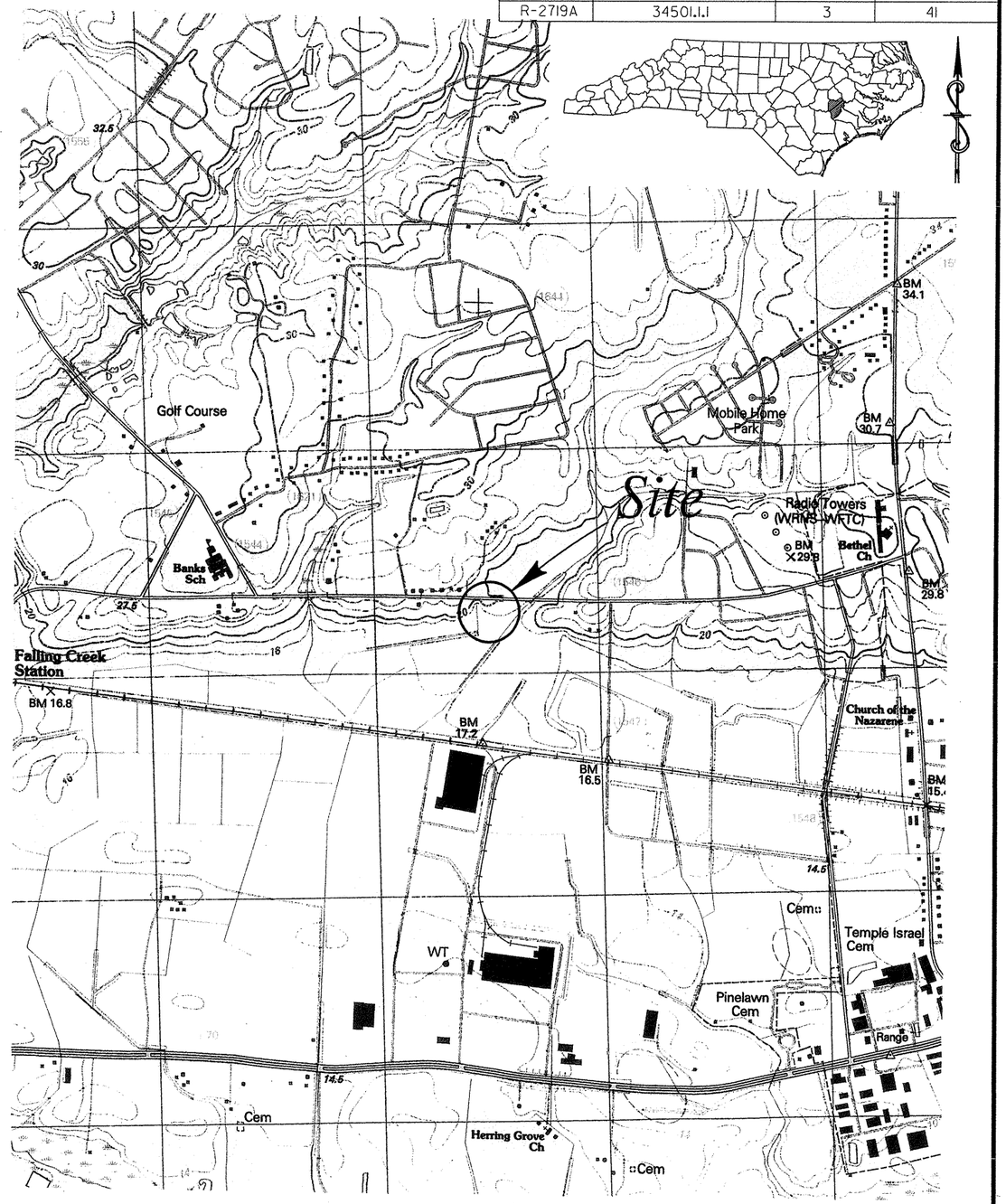
TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: NCDOT REBAR AND CAP STAMPED "BL-10"
Located at Station -BL- 82+39.88
ELEVATION: 68.42'

NOTES:

REVISED 09/15/00

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	34501.1.1	3	41



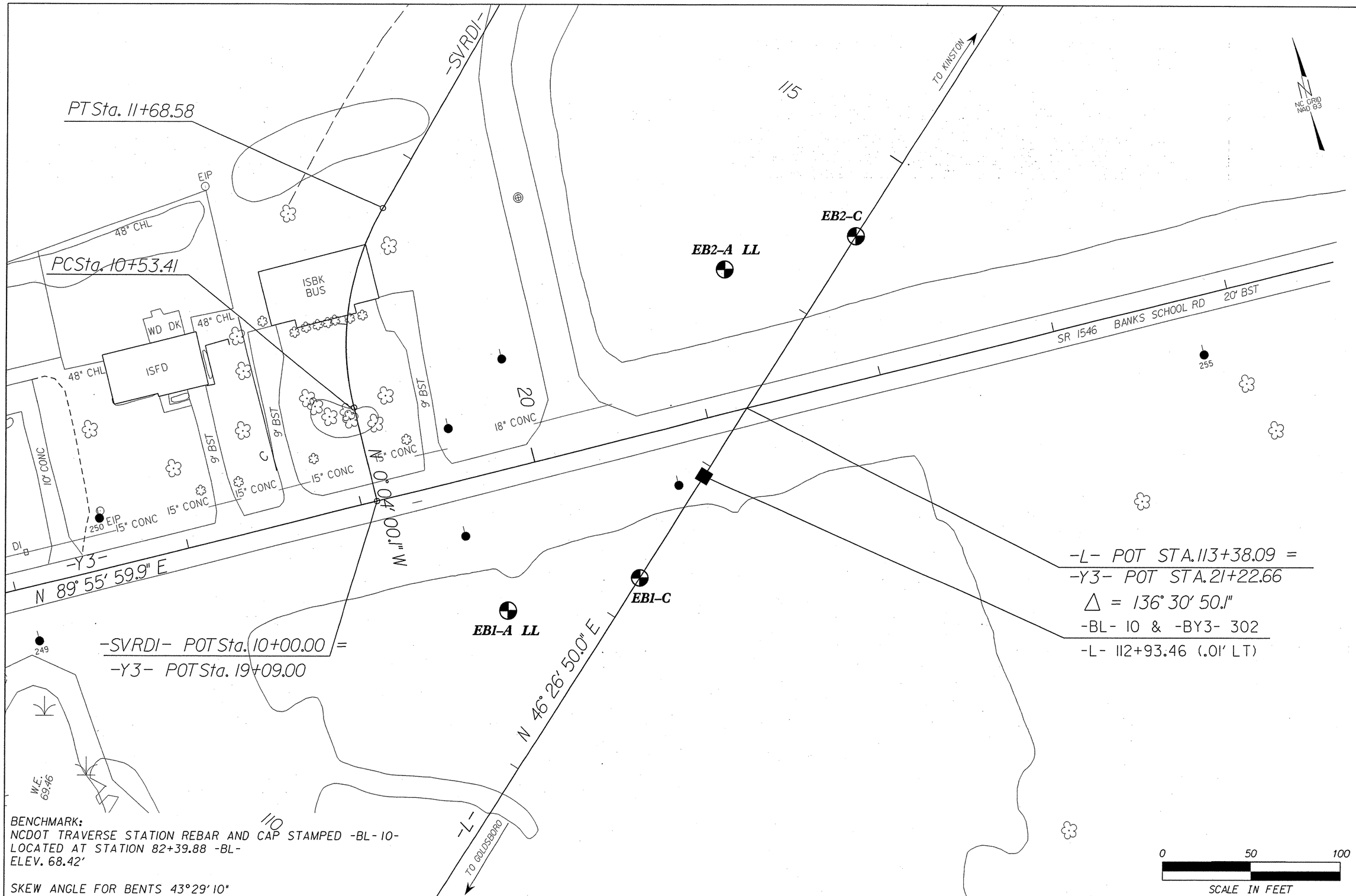
SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	MARCH 2008
JOB NO.	1051-08-073

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING •TESTING

SITE VICINITY MAP

BRIDGE STRUCTURE No. 4 (LEFT LANE)
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
STATE PROJECT NO. 34501.1.1 TIP NO. R-2719A
FEDERAL I.D. NO. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S:\PROJECTS\2008\08-073\GEOTECH\CADD\R-2719A -SITEVIC 4 LL



BENCHMARK:
NCDOT TRAVERSE STATION REBAR AND CAP STAMPED -BL-10-
LOCATED AT STATION 82+39.88 -BL-
ELEV. 68.42'

SKEW ANGLE FOR BENTS 43°29' 10"

S:PROJECTS/2008/08-073/GEOTECH/CADD/R-2719A SITE PLAN BRIDGE 4 LL.DGN

APPROVED BY:	AFR
DRAWN BY:	TRP
SHEET	4 OF 41
SCALE:	1" = 50'
DATE:	MARCH 2008
JOB NO.	1051-08-073

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

BORING LOCATION PLAN

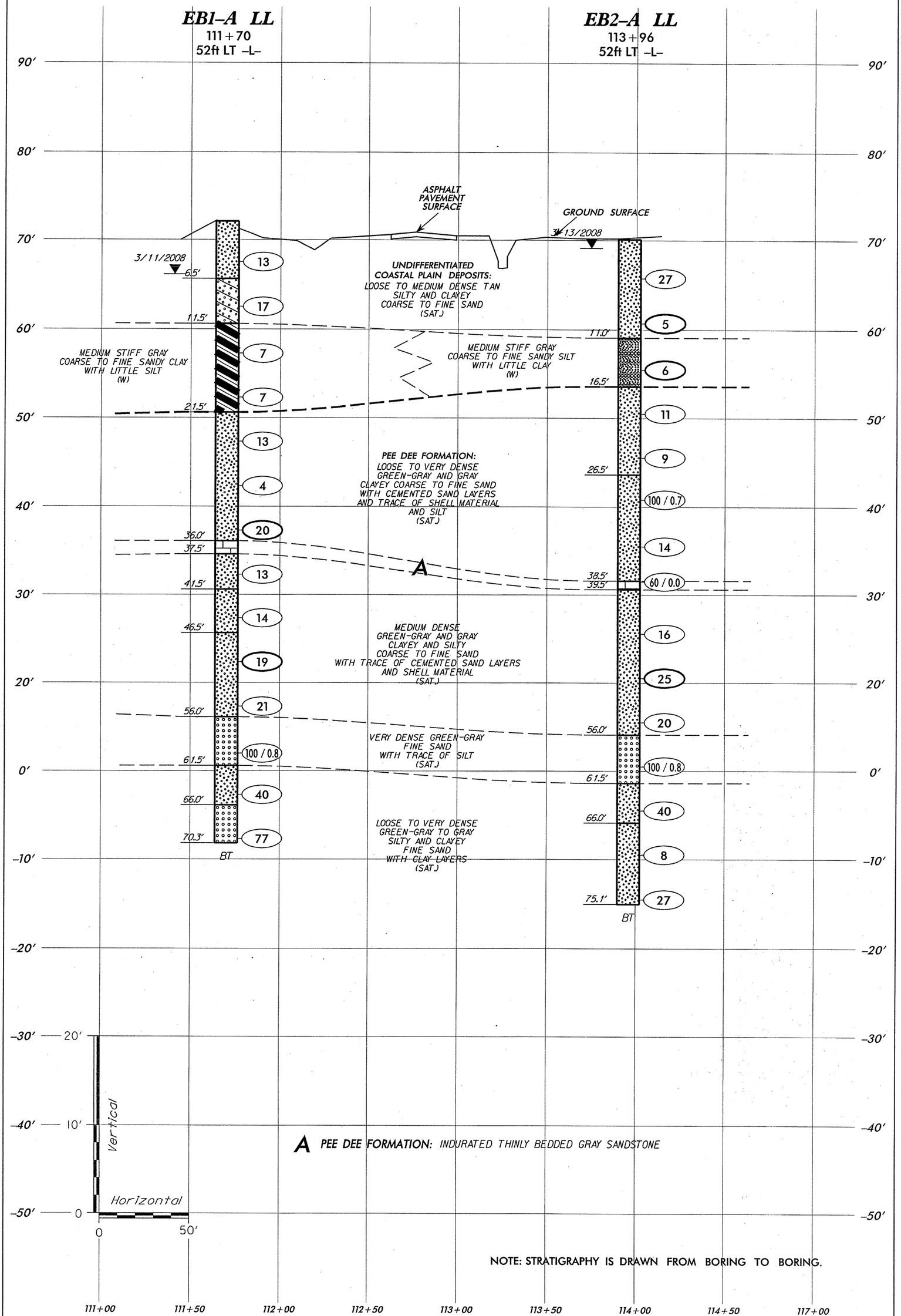
BRIDGE STRUCTURE No. 4 (LEFT LANE)
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S:PROJECTS/2008/08-073/GEOTECH DOT/CADD/R-2719A 4-5-RW PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE PROFILE 59' LEFT OF -L-

TO KINSTON

TO GOLDSBORO



A PEE DEE FORMATION: INDURATED THINLY BEDDED GRAY SANDSTONE

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE 59' LEFT OF -L-

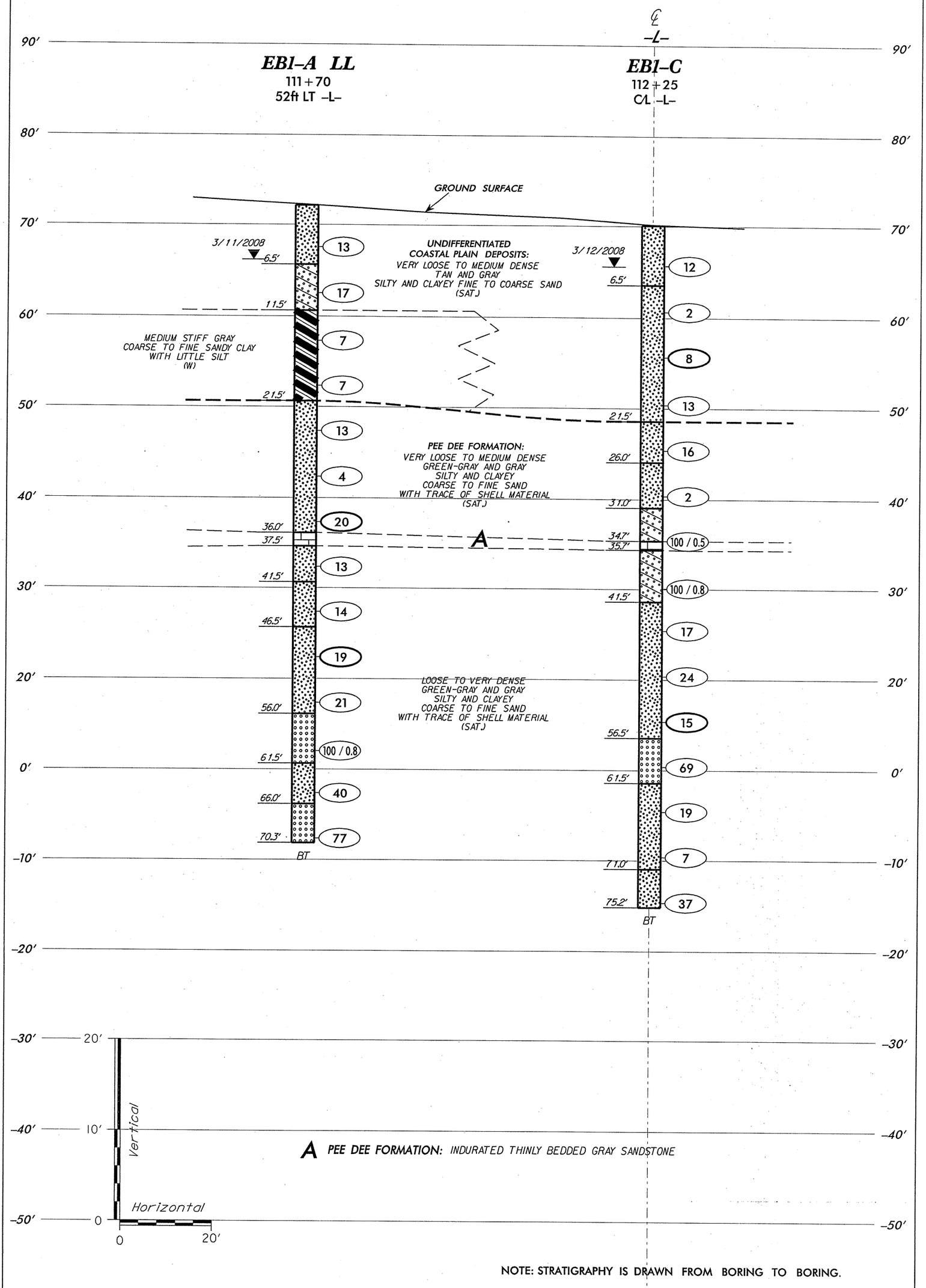
BRIDGE STRUCTURE No. 4
ON CRESECENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10′ (H) 1" = 50′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-073	SHEET	5 OF 41

S:PROJECTS/2008/08-073/GEOTECH DOT/CADD/R-2719A 4-5-RW PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 1 (LEFT LANE)



A **PEE DEE FORMATION:** *INDURATED THINLY BEDDED GRAY SANDSTONE*

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION

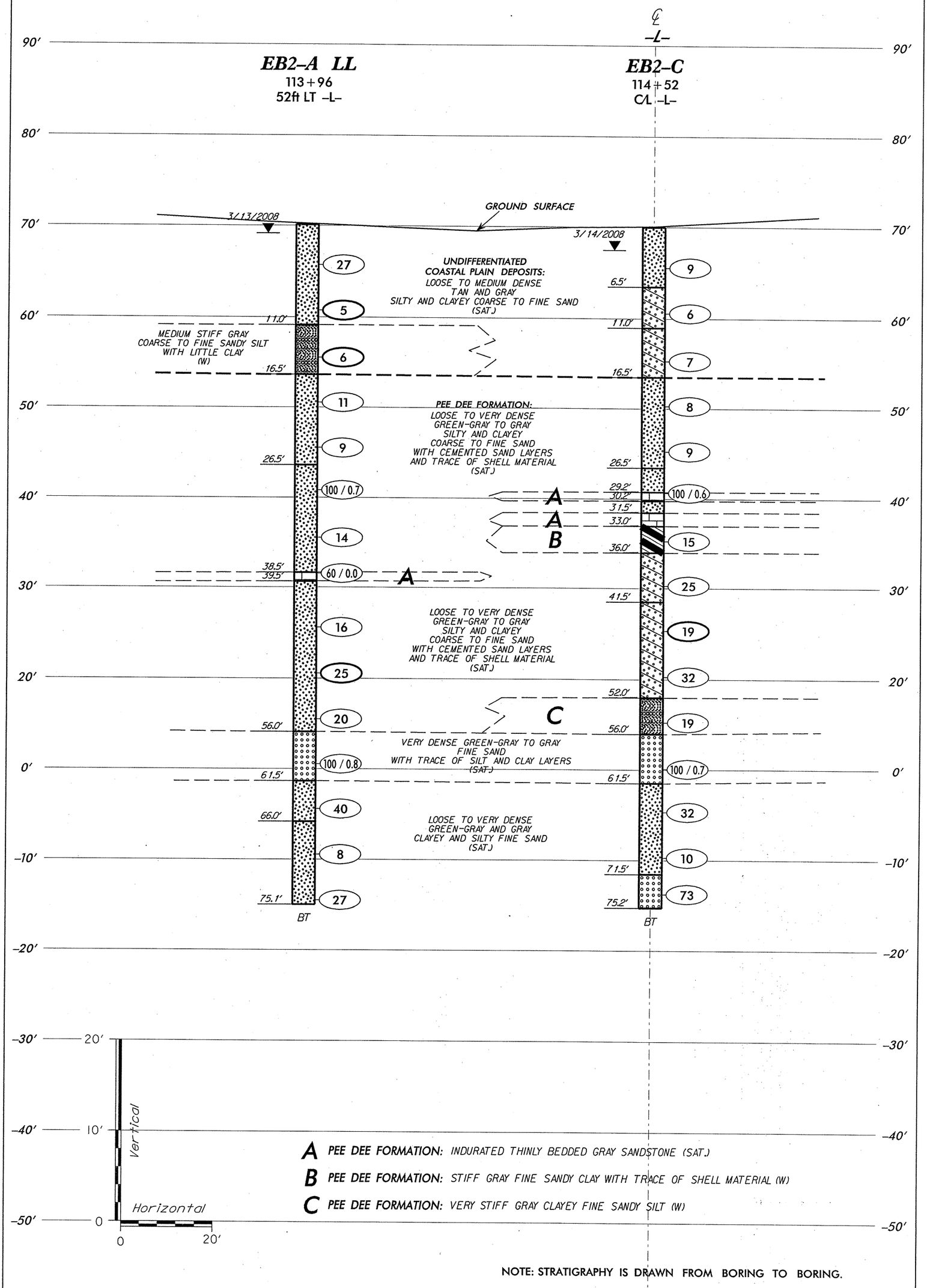
THROUGH END BENT No. 1 (LEFT LANE)
BRIDGE STRUCTURE No. 4
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-073	SHEET	6 OF 41

S:PROJECTS/2008/08-073/GEOTECH DOT/CADD/R-2719A 4-5-RW PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2 (LEFT LANE)



A PEE DEE FORMATION: *INDURATED THINLY BEDDED GRAY SANDSTONE (SAT.)*

B PEE DEE FORMATION: *STIFF GRAY FINE SANDY CLAY WITH TRACE OF SHELL MATERIAL (W)*

C PEE DEE FORMATION: *VERY STIFF GRAY CLAYEY FINE SANDY SILT (W)*

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 2 (LEFT LANE)
BRIDGE STRUCTURE No. 4
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10′ (H) 1" = 20′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-073	SHEET	7 OF 41

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 111+70	**OFFSET** 52ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 72.2 ft	**TOTAL DEPTH** 70.3 ft	**NORTHING** 559,380	**EASTING** 2,397,674 — **24 HR.** 6.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/10/08	**COMP. DATE** 03/10/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 36.0 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
75	75										
										72.2 GROUND SURFACE	0.0
70	68.6	3.6								**Undifferentiated Coastal Plain Deposits:** Medium Dense Tan Silty Fine SAND (A-2-4)	
65	63.6	8.6	4	5	8	13		Sat.		65.7	6.5
60	58.4	13.8	5	9	8	17		Sat.		Medium Dense Tan Clayey Fine SAND (A-2-6)	
55	53.4	18.8	2	3	4	7		W		60.7 Medium Stiff Gray Coarse to Fine Sandy CLAY (A-6) with Little Silt	11.5
50	48.4	23.8	2	3	4	7		Sat.		50.7	21.5
45	43.4	28.8	4	6	7	13		Sat.		**Pee Dee Formation:** Loose to Medium Dense Green-Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	
40	38.4	33.8	2	2	2	4		Sat.			
35	33.4	38.8	8	7	13	20	SS-1	Sat.		36.2	36.0
30	28.4	43.8	4	6	7	13		Sat.		Indurated Thinly Bedded Gray Sandstone	
25	23.4	48.8	4	6	8	14		Sat.		34.7 Medium Dense Gray Clayey Coarse to Fine Sand (A-2-4) with Trace of Silt	37.5
20	18.4	53.8	4	7	12	19	SS-2	Sat.		30.7 Medium Dense Green-Gray Silty Fine SAND (A-2-4)	41.5
15	13.4	58.8	6	8	13	21		Sat.		25.7 Medium Dense Gray Clayey Fine to Coarse Sand (A-2-4) with Trace of Silt	46.5
10	8.4	63.8	28	47	53/0.3	100/0.8		Sat.		16.2 Very Dense Green-Gray Fine SAND (A-3)	56.0
5	3.4	68.8	18	22	18	40		Sat.		10.7 Dense Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers	61.5
0			8	36	41	77		Sat.		6.2 Very Dense Green-Gray Fine SAND (A-3)	66.0
-5										1.9 Boring Terminated at Elevation 1.9 ft in Very Dense Green-Gray Fine Sand.	70.3

1) Advanced 3-1/4" HSA to 8.6 feet.
2) Advanced 2-7/8" Tricone to 68.8 feet.
3) Creek water and Quickgel used as drilling fluid.
4) Approximate drilling fluid density 62.4 pcf.
5) No loss of drilling fluid observed.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 111+70	**OFFSET** 52ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 72.2 ft	**TOTAL DEPTH** 70.3 ft	**NORTHING** 559,380	**EASTING** 2,397,674 — **24 HR.** 6.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/10/08	**COMP. DATE** 03/10/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 36.0 ft

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				
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 112+25	**OFFSET** CL	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,380	**EASTING** 2,397,750 — **24 HR.** 4.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/11/08	**COMP. DATE** 03/11/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 34.7 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
70	75									70.2 GROUND SURFACE	0.0
	66.8	3.4								**Undifferentiated Coastal Plain Deposits:** Medium Dense Tan Silty Fine SAND (A-2-4)	
65			5	7	5	12		M		63.7	6.5
	61.8	8.4								Very Loose to Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	
60			WOH	1	1	2		Sat.			
	56.8	13.4									
55			3	4	4	8	SS-3	Sat.			
	51.5	18.7									
50			3	6	7	13		Sat.			
	46.5	23.7								48.7	21.5
45			5	6	10	18		Sat.		**Pee Dee Formation:** Medium Dense Green-Gray Silty Fine SAND (A-2-4)	
	41.5	28.7								44.2	26.0
40			1	1	1	2		Sat.		Very Loose Gray Silty Fine SAND (A-2-4)	
	36.5	33.7								39.2	31.0
35			7	14	86/0.0	100/0.5		Sat.		Medium Dense Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material	
	31.5	38.7								35.5	34.7
30			5	5	95/0.3	100/0.8		Sat.		34.5 Indurated Thinly Bedded Gray Sandstone	35.7
	26.5	43.7								Medium Dense to Very Dense Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material	
25			6	6	11	17		Sat.		28.7	41.5
	21.5	48.7								Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	
20			5	9	15	24		Sat.			
	16.5	53.7									
15			5	6	9	15	SS-4	W			
	11.5	58.7								13.7	56.5
10			30	35	34	69		Sat.		Very Dense Green-Gray Fine SAND (A-3) with Trace of Silt	
	6.5	63.7								8.7	61.5
5			7	8	11	19		Sat.		Medium Dense to Loose Green-Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers	
	1.5	68.7									
0			3	3	4	7		Sat.		-0.8	71.0
	-3.5	73.7								Dense Gray Silty Fine SAND (A-2-4)	
-5			8	13	24	37		W		-5.0	75.2

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 112+25	**OFFSET** CL	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,380	**EASTING** 2,397,750 — **24 HR.** 4.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/11/08	**COMP. DATE** 03/11/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 34.7 ft

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				Boring Terminated at Elevation -5.0 ft in Dense Gray Silty Fine Sand. 1) Advanced 3-1/4" HSA to 13.4 feet. 2) Advanced 2-7/8" Tricone to 73.7 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 113+96	**OFFSET** 52ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 559,536	**EASTING** 2,397,838 — **24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/12/08	**COMP. DATE** 03/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
70	75									70.2 GROUND SURFACE	0.0
65	66.8	3.4	4	8	19	27		Sat.		**Undifferentiated Coastal Plain Deposits:** Medium Dense to Loose Tan Clayey Coarse toFine SAND (A-2-4) with Trace of Silt	
60	61.8	8.4	2	2	3	5	SS-5	Sat.		59.2	11.0
55	56.6	13.6	2	3	3	6	SS-6	W		Medium Stiff Gray Coarse to Fine Sandy SILT (A-4) with Little Clay	
50	51.6	18.6	3	4	7	11		Sat.		53.7	16.5
45	46.6	23.6	2	5	4	9		Sat.		**Pee Dee Formation:** Medium Dense to Loose Green-Gray Clayey Fine SAND (A-2-4) with Trace of Silt	
40	41.6	28.6	4	96/0.2		100/0.7		Sat.		43.7	26.5
35	36.6	33.6	5	5	9	14		Sat.		Very Dense to Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) With Trace of Shell Material, Silt and Cemented Sand Layers	
30	31.6	38.6	60/0.0			60/0.0		Sat.		31.7	38.5
25	26.6	43.6	5	7	9	16		Sat.		30.7 Indurated Thinly Bedded Gray Sandstone	39.5
20	21.6	48.6	6	10	15	25	SS-7	Sat.		Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) With Trace of Shell Material, Silt and Cemented Sand Layers	
15	16.6	53.6	5	8	12	20		Sat.		14.2	56.0
10	11.6	58.6	31	51	49/0.3	100/0.8		Sat.		Very Dense Green-Gray Fine SAND (A-3) With Trace of Silt	
5	6.6	63.6	10	21	19	40		Sat.		8.7	61.5
0	1.6	68.6	3	4	4	8		Sat.		Dense Green-Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers	
-5	-3.4	73.6	16	11	16	27		Sat.		4.2	66.0
										Loose to Medium Dense Gray Clayey Silty Fine SAND (A-2-4)	
										-4.9	75.1

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 113+96	**OFFSET** 52ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 559,536	**EASTING** 2,397,838 — **24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/12/08	**COMP. DATE** 03/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.5 ft

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				Boring Terminated at Elevation -4.9 ft in Medium Dense Gray Silty Fine Sand. 1) Advanced 3-1/4" HSA to 8.4 feet. 2) Advanced 2-7/8" Tricone to 73.6 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximately drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed. 6) Hard Layer at 33.0 to 33.6 feet.
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 114+52	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 70.1 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,536	**EASTING** 2,397,914	**24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 29.2 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
70	75									70.1 GROUND SURFACE	0.0
65	66.7	3.4	1	3	6	9		Sat.		**Undifferentiated Coastal Plain Deposits:** Loose Gray Silty Fine SAND (A-2-4) With Trace of Organic Matter	
60	61.7	8.4	2	2	4	6		Sat.		63.6 Loose Tan Clayey Fine SAND (A-2-6)	6.5
55	56.4	13.7	2	3	4	7		Sat.		59.1 Loose Dark Gray Clayey Fine SAND (A-2-6)	11.0
50	51.4	18.7	4	4	4	8		Sat.		53.6 **Pee Dee Formation** Loose Green-Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers	16.5
45	46.4	23.7	4	4	5	9		Sat.		43.6 Loose Gray Silty Fine SAND (A-2-4)	26.5
40	41.4	28.7	8	92/0.1		100/0.6		Sat.		40.9 With Trace of Shell Material	29.2
										39.9 Indurated Thinly Bedded Gray Sandstone	30.2
										38.6 Medium Dense Gray Silty Fine SAND	31.5
35	36.4	33.7	6	6	9	15		W		37.1 (A-2-4)	33.0
										Indurated Thinly Bedded Gray Sandstone	
										34.1 Stiff Gray Fine Sandy CLAY (A-6) With Trace of Shell Material	36.0
30	31.4	38.7	20	12	13	25		W		Medium Dense Gray Clayey Fine SAND (A-2-6)	
25	26.4	43.7	5	8	11	19	SS-8	Sat.		28.6 With Trace of Shell Material	41.5
20	21.4	48.7	7	13	19	32		Sat.		Medium Dense to Dense Green-Gray Clayey Fine to Coarse SAND (A-2-6) with Trace of Silt	
15	16.4	53.7	6	7	12	19		Sat.		18.1 Very Stiff Gray Clayey Fine Sandy SILT (A-4)	52.0
10	11.4	58.7	19	52	48/0.2	100/0.7		Sat.		14.1 Very Dense Green-Gray Fine SAND (A-3) with Trace of Clay Layers	56.0
5	6.4	63.7	7	13	19	32		Sat.		8.6 Dense to Loose Green-Gray Silty Fine SAND (A-2-4)	61.5
0	1.4	68.7	5	4	6	10		Sat.		-1.4 Very Dense Gray Fine SAND (A-3) With Trace of Silt	71.5
-5	-3.6	73.7	23	35	38	73		Sat.		-5.1	75.2

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 114+52	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 70.1 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,536	**EASTING** 2,397,914	**24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 29.2 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-5				Match Line				Boring Terminated at Elevation -5.1 ft in Very Dense Gray Fine Sand. 1) Advanced 3-1/4" HSA to 8.4 feet. 2) Advanced 2-7/8" Tricone to 73.7 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximately drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.
-10								
-15								
-20								
-25								
-30								
-35								
-40								
-45								
-50								
-55								
-60								
-65								
-70								
-75								
-80								
-85								

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME Project #:	**1051-08-073**			Test Date(s):	3/19 - 3/21/08
State Project No.:	34501.1.1	County:	Lenoir	Report Date:	3/21/2008
Federal ID No.:	STP-0224(3)	TIP No.:	R-2719A		
Project Name:	**Bridge Structure No. 4 (Left Lane) on -L- Over SR 1546**				
Client Name:	NCDOT				
Client Address:	Raleigh, NC				

Boring No.	Sample No.	Sample Depth (ft.)	AASHTO Classification	Total % Passing Sieve #					Total Mortar Fraction				LL	PL	PI	Moisture Content %
				10	40	60	200	270	Coarse Sand	Fine Sand	Silt	Clay				
EB1-ALL	SS-1	33.8	A-2-4 (0)	100	97	93	21	18	8	74	8	10	26	N.P.	N.P.	ND
EB1-A LL	SS-2	48.8	A-2-4 (0)	100	95	78	15	14	22	65	5	8	24	N.P.	N.P.	ND
EB1-C	SS-3	13.4	A-2-4 (0)	100	97	91	31	24	10	66	8	16	25	24	1	ND
EB1-C	SS-4	53.7	A-2-4 (0)	100	91	71	27	25	29	46	7	18	31	22	9	ND
EB2-A LL	SS-5	8.4	A-2-4 (0)	99	93	74	31	25	26	49	7	18	32	23	9	ND
EB2-A LL	SS-6	13.6	A-4 (0)	100	94	89	37	28	11	61	10	18	34	24	10	31.5
EB2-A LL	SS-7	48.6	A-2-4 (0)	100	92	64	14	12	37	51	4	8	23	N.P.	N.P.	ND
EB2-C	SS-8	43.7	A-2-6 (1)	99	69	39	25	23	61	15	6	18	36	19	17	ND

Notes: NP=Nonplastic. ND=Not Determined

Technical Responsibility: B. Riggs *Signature* Geotechnical Engineer *Position*

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

Photograph No. 2:
This photograph was taken from the -L- alignment, looking west, across proposed End Bent No. 1.

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

Photograph No. 4:
This photograph was taken from the -L- alignment, looking west, along Banks School Road (-Y3-).

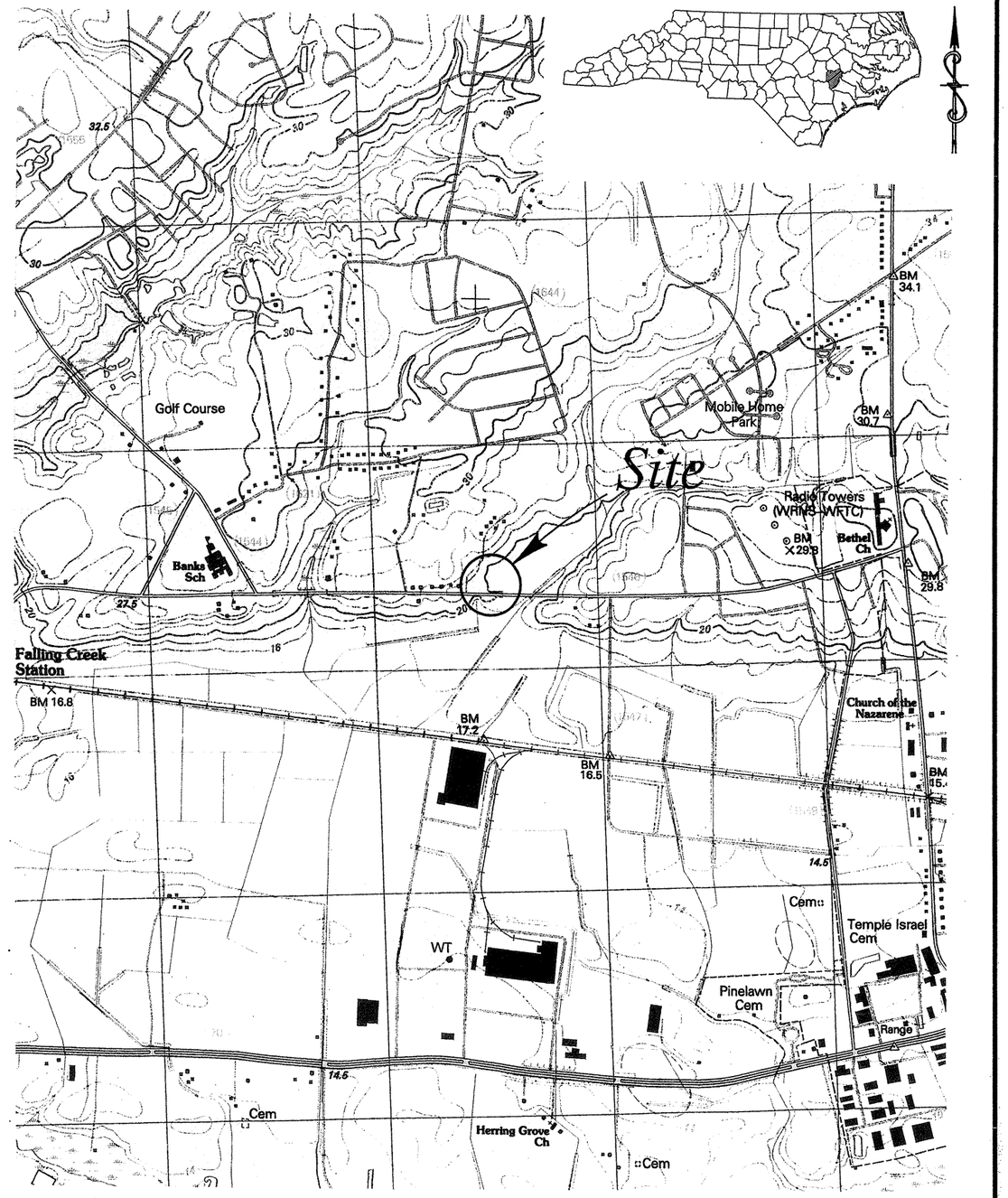
Photograph No. 5:
This photograph was taken from the -L- alignment, looking east, along Banks School Road (-Y3-).

Photograph No. 6:
This photograph was taken from the -L- alignment, looking west, across proposed End Bent No. 2.

Photograph No. 7:
This photograph was taken from the left side of the -L- alignment, looking east, across proposed End Bent No. 2.

Photograph No. 8:
This photograph was taken from the north approach, left of the -L- alignment, looking southwest.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	3450I.I.I	15	41



S:PROJECTS/2008/08-073/GEOTECH/CADD/R-2719A -SITEVIC 5 RL

SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	MARCH 2008
JOB NO.	1051-08-073

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING •TESTING

SITE VICINITY MAP

BRIDGE STRUCTURE No. 5 (RIGHT LANE)
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
STATE PROJECT NO. 3450I.I.I TIP NO. R-2719A
FEDERAL I.D. NO. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

PT Sta. 11+68.58

-SVRDI-

115

TO KINSTON

NC GRID NAD 83

EIP

48" CHL

PC Sta. 10+53.41

ISBK BUS

WD DK

48" CHL

48" CHL

ISFD

9' BST

9' BST

9' BST

20

18" CONC

24" CONC

10' CONC

15" CONC

15" CONC

15" CONC

15" CONC

250 EIP

DI

-Y3-

N 89° 55' 59.9" E

N 00° 04' 00.1" W

EB2-B RL

EB2-C

255

SR 1546 BANKS SCHOOL RD 20' BST

EB1-B RL

EB1-C

-L- POT STA. 113+38.09 =
-Y3- POT STA. 21+22.66
△ = 136° 30' 50.1"
-BL- 10 & -BY3- 302
-L- 112+93.46 (.01' LT)

-SVRDI- POT Sta. 10+00.00 =
-Y3- POT Sta. 19+09.00

249

W.E. 69.46

110

N 46° 26' 50.0" E

-L-

TO GOLDSBORO

BENCHMARK:
NCDOT TRAVERSE STATION REBAR AND CAP STAMPED -BL-10-
LOCATED AT STATION 82+39.88 -BL-
ELEV. 68.42'

SKEW ANGLE FOR BENTS 43°29' 10"

0 50 100

SCALE IN FEET

SCALE:	1" = 50'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	10511-08-073	SHEET	16 OF 41

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ENVIRONMENTAL SERVICES
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BORING LOCATION PLAN

BRIDGE STRUCTURE No. 5 (RIGHT LANE)
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

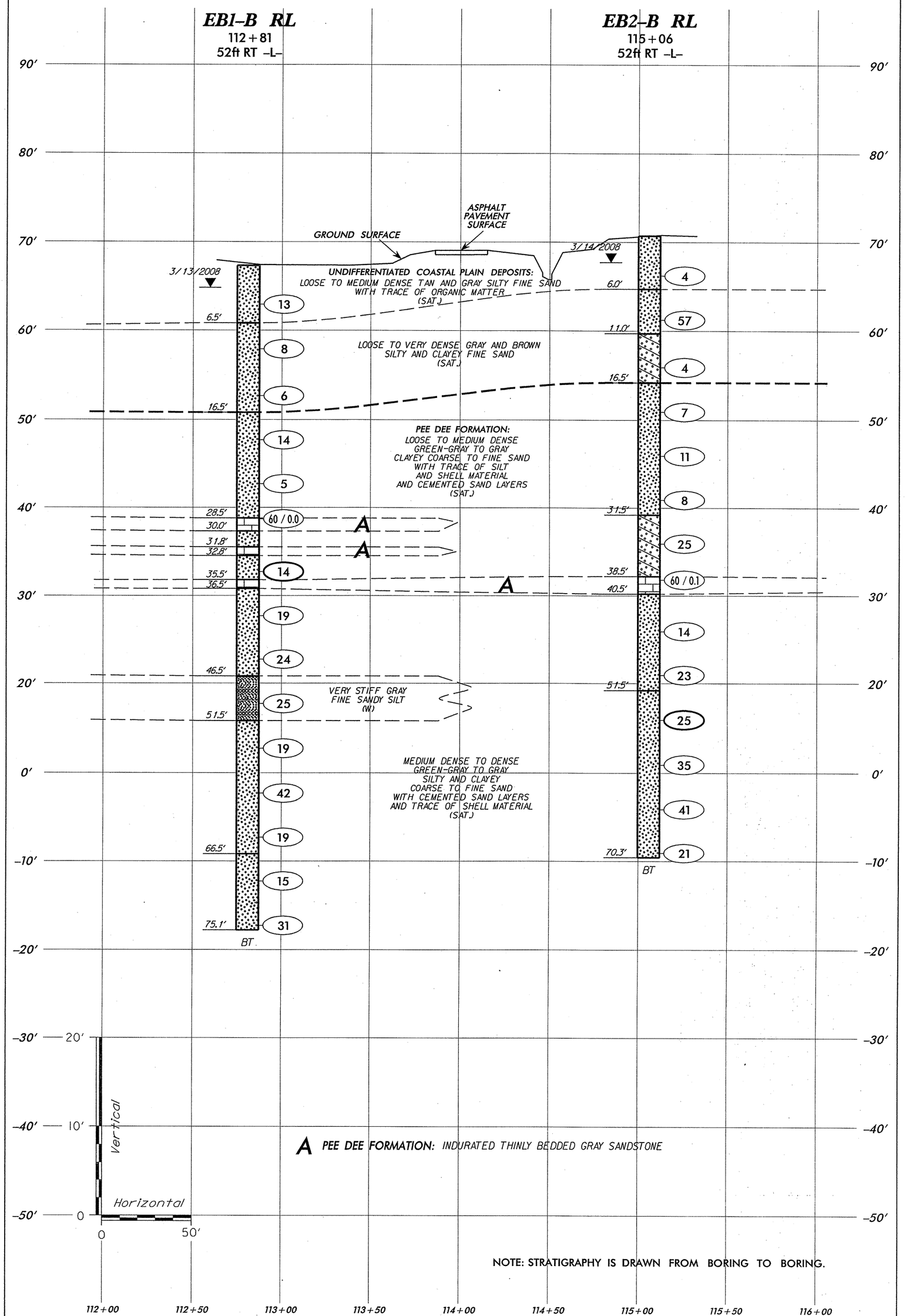
S:PROJECTS/2008/08-073/GEOTECH/CADD/R-2719A SITE PLAN BRIDGE 5 RL.DGN

S:PROJECTS/2008/08-073/GEOTECH DOT/CADD/R-2719A 4-5-RW PROFILE-XSEC.DGN

TO KINSTON

GENERALIZED SUBSURFACE PROFILE 59' RIGHT OF -L-

TO GOLDSBORO



A PEE DEE FORMATION: INDURATED THINLY BEDDED GRAY SANDSTONE

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE 59' RIGHT OF -L-

BRIDGE STRUCTURE No. 5
ON CRESECENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

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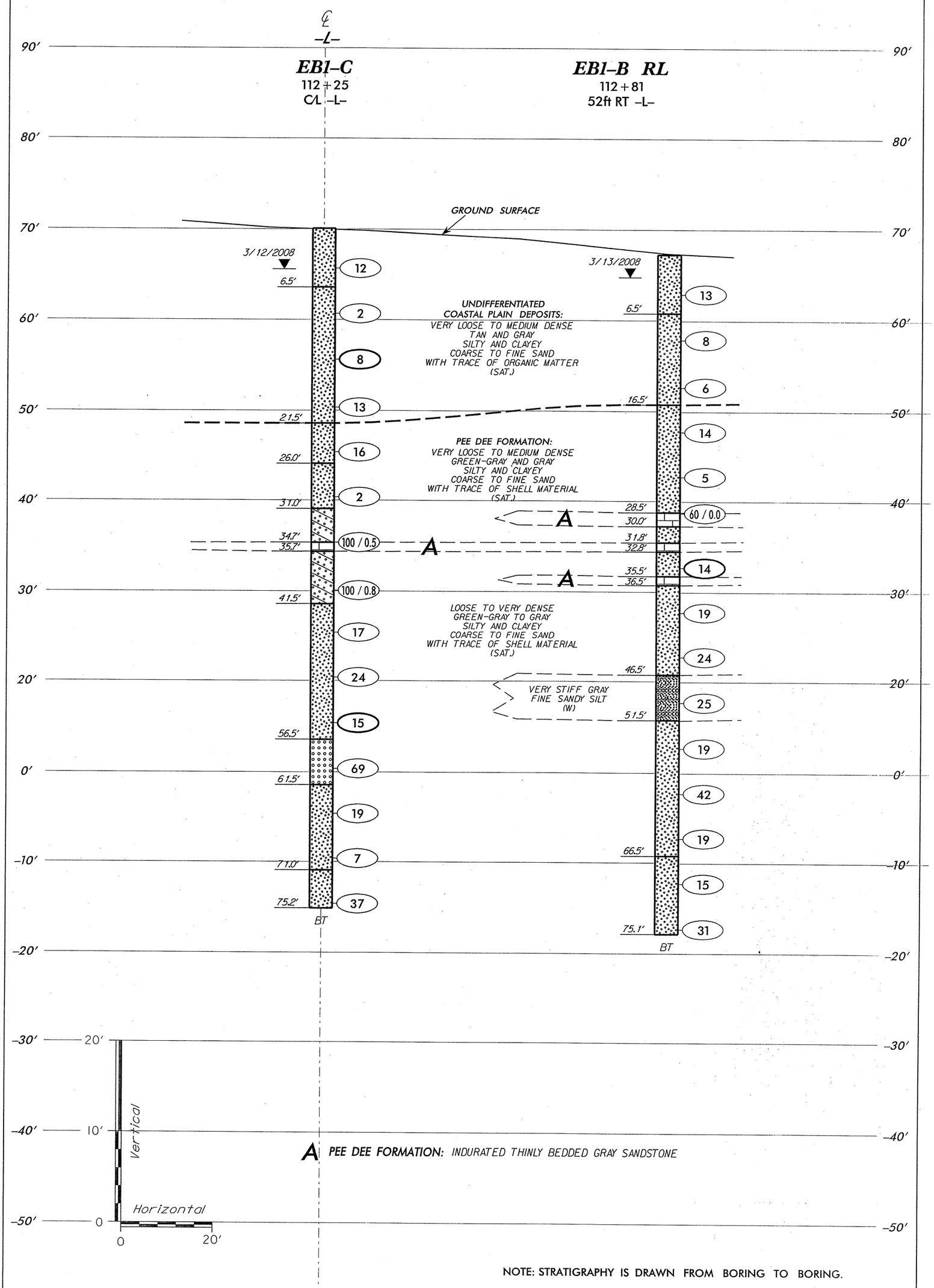
SCALE:	(V) 1" = 10' (H) 1" = 50'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-073	SHEET	17 OF 41

S:PROJECTS/2008/08-073/GEOTECH DOT/CADD/R-2719A 4-5-RW PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 1 (RIGHT LANE)



A PEE DEE FORMATION: INDURATED THINLY BEDDED GRAY SANDSTONE

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 1 (RIGHT LANE)
BRIDGE STRUCTURE No. 5
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 3450 I. I. I FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

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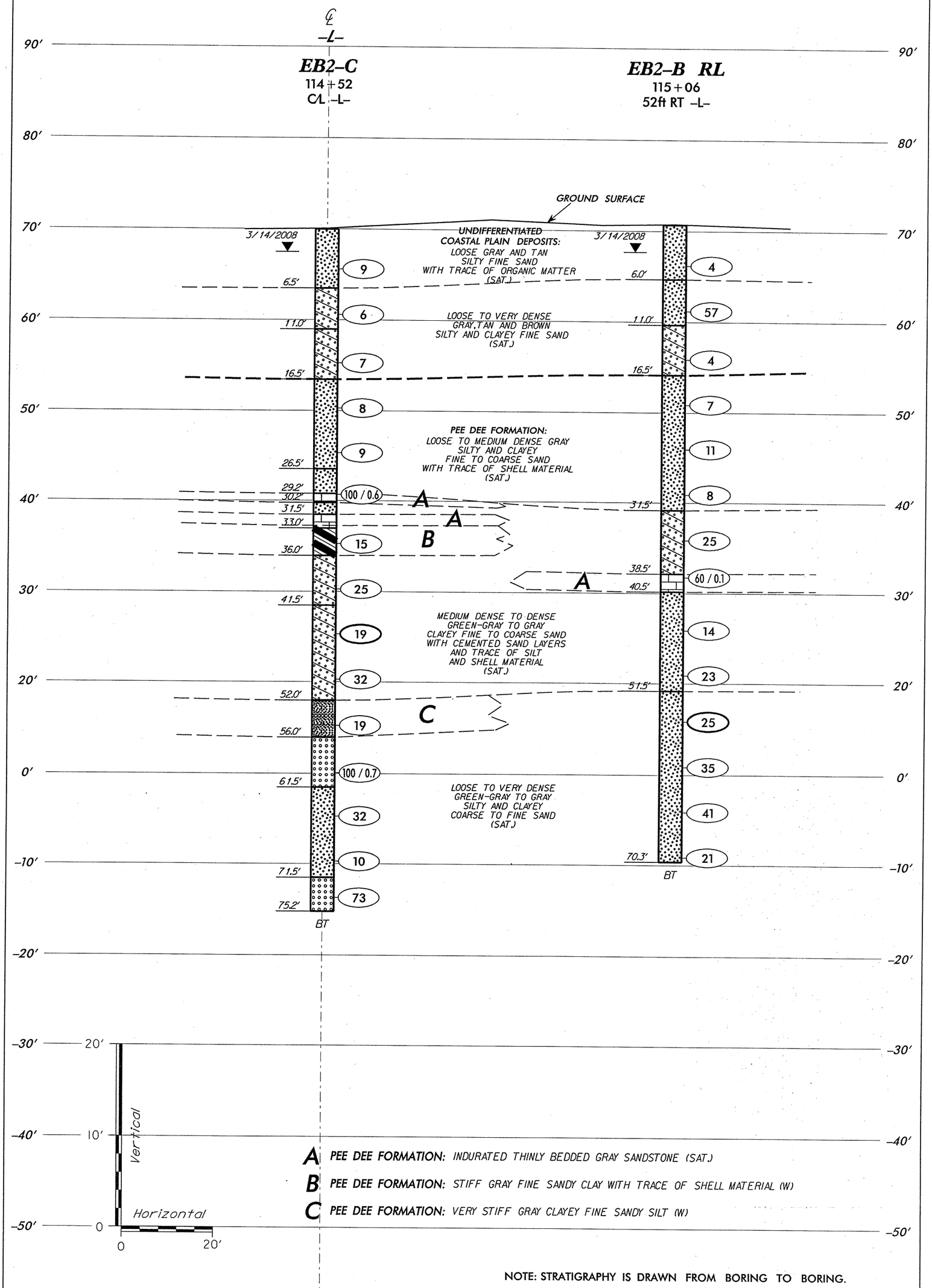
SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	105 I-08-073	SHEET	18 OF 41

S:PROJECTS/2008/08-073/GEOTECH DOT/CADD/R-2719A 4-5-RW PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2 (RIGHT LANE)



A **PEE DEE FORMATION:** *INDURATED THINLY BEDDED GRAY SANDSTONE (SAT.)*

B **PEE DEE FORMATION:** *STIFF GRAY FINE SANDY CLAY WITH TRACE OF SHELL MATERIAL (W)*

C **PEE DEE FORMATION:** *VERY STIFF GRAY CLAYEY FINE SANDY SILT (W)*

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION

THROUGH END BENT No. 2 (RIGHT LANE)
BRIDGE STRUCTURE No. 5
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-073	SHEET	19 OF 41

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 112+25	**OFFSET** CL	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,380	**EASTING** 2,397,750 — **24 HR.** 4.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/11/08	**COMP. DATE** 03/11/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 34.7 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
	75										
70										70.2 GROUND SURFACE	0.0
	66.8	3.4								**Undifferentiated Coastal Plain Deposits:** Medium Dense Tan Silty Fine SAND (A-2-4)	
65			5	7	5	12		M			
	61.8	8.4								63.7	6.5
60			WOH	1	1	2		Sat.		Very Loose to Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	
	56.8	13.4									
55			3	4	4	8	SS-3	Sat.			
	51.5	18.7									
50			3	6	7	13		Sat.			
	46.5	23.7								48.7	21.5
45			5	6	10	16		Sat.		**Pee Dee Formation:** Medium Dense Green-Gray Silty Fine SAND (A-2-4)	
	41.5	28.7								44.2	26.0
40			1	1	1	2		Sat.		Very Loose Gray Silty Fine SAND (A-2-4)	
	36.5	33.7								39.2	31.0
35			7	14	86/0.0	100/0.5		Sat.		Medium Dense Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material	
	31.5	38.7								35.5	34.7
30			5	5	95/0.3	100/0.8		Sat.		34.5 Indurated Thinly Bedded Gray Sandstone	35.7
	26.5	43.7								Medium Dense to Very Dense Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material	
25			6	6	11	17		Sat.		28.7	41.5
	21.5	48.7								Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	
20			5	9	15	24		Sat.			
	16.5	53.7									
15			5	6	9	15	SS-4	W			
	11.5	58.7								13.7	56.5
10			30	35	34	69		Sat.		Very Dense Green-Gray Fine SAND (A-3) with Trace of Silt	
	6.5	63.7								8.7	61.5
5			7	8	11	19		Sat.		Medium Dense to Loose Green-Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers	
	1.5	68.7									
0			3	3	4	7		Sat.		-0.8	71.0
	-3.5	73.7								Dense Gray Silty Fine SAND (A-2-4)	
-5			8	13	24	37		W		-5.0	75.2

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 112+25	**OFFSET** CL	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,380	**EASTING** 2,397,750 — **24 HR.** 4.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/11/08	**COMP. DATE** 03/11/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 34.7 ft

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				
-10										Boring Terminated at Elevation -5.0 ft in Dense Gray Silty Fine Sand.
-15										1) Advanced 3-1/4" HSA to 13.4 feet.
-20										2) Advanced 2-7/8" Tricone to 73.7 feet.
-25										3) Creek water and Quickgel used as drilling fluid.
-30										4) Approximate drilling fluid density 62.4 pcf.
-35										5) No loss of drilling fluid observed.
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 112+81	**OFFSET** 52ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 67.4 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 559,381	**EASTING** 2,397,826 — **24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/12/08	**COMP. DATE** 03/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 28.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
	70										
										67.4 GROUND SURFACE	0.0
65	64.0	3.4								**Undifferentiated Coastal Plain Deposits:** Medium Dense Gray Silty Fine SAND (A-2-4) With Trace of Organic Matter	
60	59.0	8.4	3	5	8	13		Sat.		60.9	6.5
55	53.8	13.6	2	4	4	8		Sat.		Loose Gray Clayey Fine SAND (A-2-4) with Trace of Silt	
50	48.8	18.6	2	2	4	6		Sat.		50.9	16.5
45	43.8	23.6	5	6	8	14		Sat.		**Pee Dee Formation:** Medium Dense to Loose Green-Gray Clayey Coarse to Fine SAND (A-2-4) With Trace of Shell Material and Silt	
40	38.8	28.6	4	2	3	5		Sat.		38.9	28.5
35	33.8	33.6	60/0.0			60/0.0		Sat.		Indurated Thinly Bedded Gray Sandstone	30.0
30	28.8	38.6	5	6	8	14	SS-9	Sat.		Medium Dense Green-Gray Clayey Coarse to Fine Sand (A-2-4) with Trace of Silt	31.8
25	23.8	43.6	5	7	12	19		Sat.		Indurated Thinly Bedded Gray Sandstone	32.8
20	18.8	48.6	7	10	14	24		Sat.		Medium Dense Green-Gray Clayey Coarse to Fine Sand (A-2-4) with Trace of Silt	35.5
15	13.8	53.6	6	9	16	25		W		Indurated Thinly Bedded Gray Sandstone	36.5
10	8.8	58.6	5	7	12	19		Sat.		Medium Dense Green-Gray Clayey Coarse to Fine Sand (A-2-4) with Trace of Silt	
5	3.8	63.6	13	12	30	42		Sat.		20.9	46.5
0	-1.2	68.6	6	8	11	19		Sat.		Very Stiff Gray Fine Sandy Silt (A-4)	
-5	-6.2	73.6	4	4	11	15		W		15.9	51.5
-10			12	15	16	31		Sat.		Medium Dense to Dense Gray Clayey Fine SAND (A-2-4) With Trace of Silt	
										0.9	66.5
										Medium Dense to Dense Gray Silty Fine SAND (A-2-4)	
										-7.7	75.1
										Boring Terminated at Elevation -7.7 ft in Dense Gray Silty Fine Sand.	

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 112+81	**OFFSET** 52ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 67.4 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 559,381	**EASTING** 2,397,826 — **24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/12/08	**COMP. DATE** 03/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 28.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-10			Match Line				
-15								1) Advanced 3-1/4" HSA to 8.4 feet. 2) Advanced 2-7/8" Tricone to 73.6 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.
-20								
-25								
-30								
-35								
-40								
-45								
-50								
-55								
-60								
-65								
-70								
-75								
-80								
-85								
-90								

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)				**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 114+52	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 70.1 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,536	**EASTING** 2,397,914	**24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 29.2 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
70	75									70.1 GROUND SURFACE	0.0
65	66.7	3.4	1	3	6	9		Sat.		**Undifferentiated Coastal Plain Deposits:** Loose Gray Silty Fine SAND (A-2-4) With Trace of Organic Matter	
60	61.7	8.4	2	2	4	6		Sat.		63.6 Loose Tan Clayey Fine SAND (A-2-6)	6.5
55	56.4	13.7	2	3	4	7		Sat.		59.1 Loose Dark Gray Clayey Fine SAND (A-2-6)	11.0
50	51.4	18.7	4	4	4	8		Sat.		53.6 **Pee Dee Formation** Loose Green-Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers	16.5
45	46.4	23.7	4	4	5	9		Sat.		43.6 Loose Gray Silty Fine SAND (A-2-4)	26.5
40	41.4	28.7	8	92/0.1		100/0.6		Sat.		40.9 With Trace of Shell Material 39.9 Indurated Thinly Bedded Gray Sandstone 38.6 Medium Dense Gray Silty Fine SAND (A-2-4) 37.1 Indurated Thinly Bedded Gray Sandstone	29.2 30.2 31.5 33.0
35	36.4	33.7	6	6	9	15		W		34.1 Stiff Gray Fine Sandy CLAY (A-6) With Trace of Shell Material	36.0
30	31.4	38.7	20	12	13	25		W		Medium Dense Gray Clayey Fine SAND (A-2-6)	
25	26.4	43.7	5	8	11	19	SS-8	Sat.		28.6 With Trace of Shell Material Medium Dense to Dense Green-Gray Clayey Fine to Coarse SAND (A-2-6) with Trace of Silt	41.5
20	21.4	48.7	7	13	19	32		Sat.			
15	16.4	53.7	6	7	12	19		Sat.		18.1 Very Stiff Gray Clayey Fine Sandy SILT (A-4)	52.0
10	11.4	58.7	19	52	48/0.2	100/0.7		Sat.		14.1 Very Dense Green-Gray Fine SAND (A-3) with Trace of Clay Layers	56.0
5	6.4	63.7	7	13	19	32		Sat.		8.6 Dense to Loose Green-Gray Silty Fine SAND (A-2-4)	61.5
0	1.4	68.7	5	4	6	10		Sat.		-1.4	71.5
-5	-3.6	73.7	23	35	38	73		Sat.		-5.1 Very Dense Gray Fine SAND (A-3) With Trace of Silt	75.2

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)				**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 114+52	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 70.1 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,536	**EASTING** 2,397,914	**24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 29.2 ft	

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				Boring Terminated at Elevation -5.1 ft in Very Dense Gray Fine Sand. 1) Advanced 3-1/4" HSA to 8.4 feet. 2) Advanced 2-7/8" Tricone to 73.7 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximately drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 115+06	**OFFSET** 52ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.8 ft	**TOTAL DEPTH** 70.3 ft	**NORTHING** 559,536	**EASTING** 2,397,989 — **24 HR.** 3.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
	75										
70										70.8 GROUND SURFACE	0.0
	67.3	3.5								Loose Tan Silty Fine SAND (A-2-4) with Trace of Organic Matter	
65			3	3	1	4		Sat.		64.8	6.0
	62.3	8.5								Very Dense Brown Silty Fine SAND (A-2-4)	
60			30	33	24	57		W		59.8	11.0
	57.0	13.8								Loose Gray Clayey Fine SAND (A-2-6)	
55			1	2	2	4		Sat.		54.3	16.5
	52.0	18.8								**Pee Dee Formation:** Loose to Medium Dense Green-Gray Clayey Fine to Coarse SAND (A-2-4) with Trace of Silt	
50			2	3	4	7		Sat.			
	47.0	23.8									
45			3	4	7	11		Sat.			
	42.0	28.8									
40			1	3	5	8		Sat.		39.3	31.5
	37.0	33.8								Medium Dense Gray Silty Clayey Fine SAND (A-2-6) With Cemented Sand Layers and Trace of Shell Material	
35			33	9	16	25		Sat.		32.3	38.5
	32.0	38.8								Indurated Thinly Bedded Gray Sandstone	
30			60/0.1			60/0.1		Sat.		30.3	40.5
	27.0	43.8								Medium Dense Gray to Green-Gray Silty Clayey Fine SAND (A-2-6) With Cemented Sand Layers and Trace of Shell Material	
25			5	5	9	14		Sat.			
	22.0	48.8									
20			5	8	15	23		Sat.		19.3	51.5
	17.0	53.8								Medium Dense to Dense Green-Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	
15			6	9	16	25	SS-10	Sat.			
	12.0	58.8									
10			6	7	28	35		Sat.			
	7.0	63.8									
5			11	17	24	41		Sat.			
	2.0	68.8									
0			8	9	12	21		Sat.		0.5	70.3
										Boring Terminated at Elevation 0.5 ft in Medium Dense Green-Gray Clayey Fine Sand.	
-5										1) Advanced 3-1/4" HSA to 8.5 feet.	

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 115+06	**OFFSET** 52ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.8 ft	**TOTAL DEPTH** 70.3 ft	**NORTHING** 559,536	**EASTING** 2,397,989 — **24 HR.** 3.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.5 ft

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				2) Advanced 2-7/8" Tricone to 68.8 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME Project #:	**1051-08-073**			Test Date(s):	3/19 - 3/21/08
State Project No.:	34501.1.1	County:	Lenoir	Report Date:	3/21/2008
Federal ID No.:	STP-0224(3)	TIP No.:	R-2719A		
Project Name:	**Bridge Structure No. 5 (Right Lane) on -L- Over SR 1546**				
Client Name:	NCDOT				
Client Address:	Raleigh, NC				

Boring No.	Sample No.	Sample Depth (ft.)	AASHTO Classification		Total % Passing Sieve #					Total Mortar Fraction				LL	PL	PI	Moisture Content %
					10	40	60	200	270	Coarse Sand	Fine Sand	Silt	Clay				
EB1-C	SS-3	13.4	A-2-4	(0)	100	97	91	31	24	10	66	8	16	25	24	1	ND
EB1-C	SS-4	53.7	A-2-4	(0)	100	91	71	27	25	29	46	7	18	31	22	9	ND
EB1-B RL	SS-4	13.4	A-2-4	(0)	100	97	91	31	24	10	66	8	16	25	24	1	ND
EB2-C	SS-8	43.7	A-2-6	(1)	99	69	39	25	23	61	15	6	18	36	19	17	ND
EB1-B RL	SS-9	33.6	A-2-4	(0)	99	89	77	26	22	22	57	7	14	24	21	3	ND
EB2-B RL	SS-10	53.8	A-2-4	(0)	100	94	79	23	20	21	59	6	14	29	N.P.	N.P.	ND

Notes: NP=Nonplastic. ND=Not Determined

Technical Responsibility: B. Riggs *Signature* Geotechnical Engineer *Position*

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

Photograph No. 2:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed End Bent No. 1.

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

Photograph No. 4:
This photograph was taken from the -L- alignment, looking west, along Banks School Road (-Y3-).

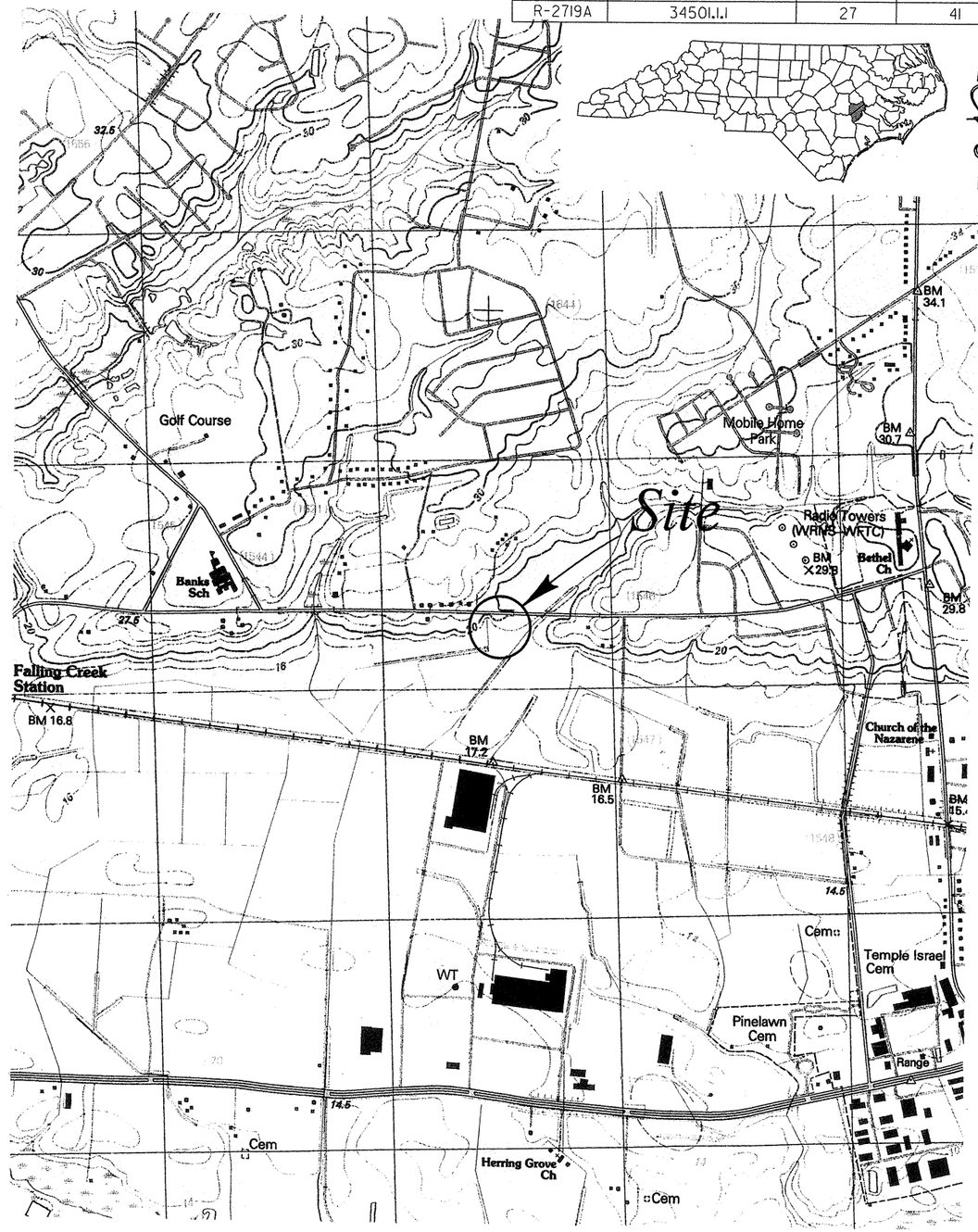
Photograph No. 5:
This photograph was taken from the -L- alignment, looking east, along Banks School Road (-Y3-).

Photograph No. 7:
This photograph was taken from the -L- alignment, looking east, across proposed End Bent No. 2.

Photograph No. 6:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed End Bent No. 2.

Photograph No. 8:
This photograph was taken from the north approach, right of the -L- alignment, looking southwest.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	3450I.I.I	27	41



S:\PROJECTS\2008\08-073\GEOTECH\CADD\R-2719A -SITEVIC RW

SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	MARCH 2008
JOB NO.	1051-08-073

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING

SITE VICINITY MAP

RETAINING WALLS FOR BRIDGE STRUCTURES No. 4 AND No. 5
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
STATE PROJECT NO. 3450 I. I. I TIP NO. R-2719A
FEDERAL I.D. NO. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

PT Sta. 11+68.58

PC Sta. 10+53.41

-SVRDI-

-Y3-

N 89° 55' 59.9" E

N 0° 04' 00.1" W

N 46° 26' 50.0" E

TO KINSTON

TO GOLDSBORO

SR 1546 BANKS SCHOOL RD 20' BST

115

110

EIP

48" CHL

WD DK

ISFD

ISBK BUS

9' BST

18" CONC

15" CONC

10' CONC

250 EIP

255

249

W.E. 69.46

RW-1

RW-2

RW-3

RW-4

EB1-A LL

EB1-B RL

EB1-C

EB2-A LL

EB2-B RL

EB2-C

-SVRDI- POT Sta. 10+00.00 =
-Y3- POT Sta. 19+09.00

-L- POT STA. 113+38.09 =
-Y3- POT STA. 21+22.66
△ = 136° 30' 50.1"
-BL- 10 & -BY3- 302
-L- 112+93.46 (.01' LT)

BENCHMARK:
NCDOT TRAVERSE STATION REBAR AND CAP STAMPED -BL-10-
LOCATED AT STATION 82+39.88 -BL-
ELEV. 68.42'

SKEW ANGLE FOR BENTS 43°29' 10"

NC GRID NAD 83

0 50 100
SCALE IN FEET

SCALE: 1" = 50'	APPROVED BY: AFR	
DATE: MARCH 2008	DRAWN BY: TRP	
JOB NO. 105 I-08-073	SHEET 28 OF 41	

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

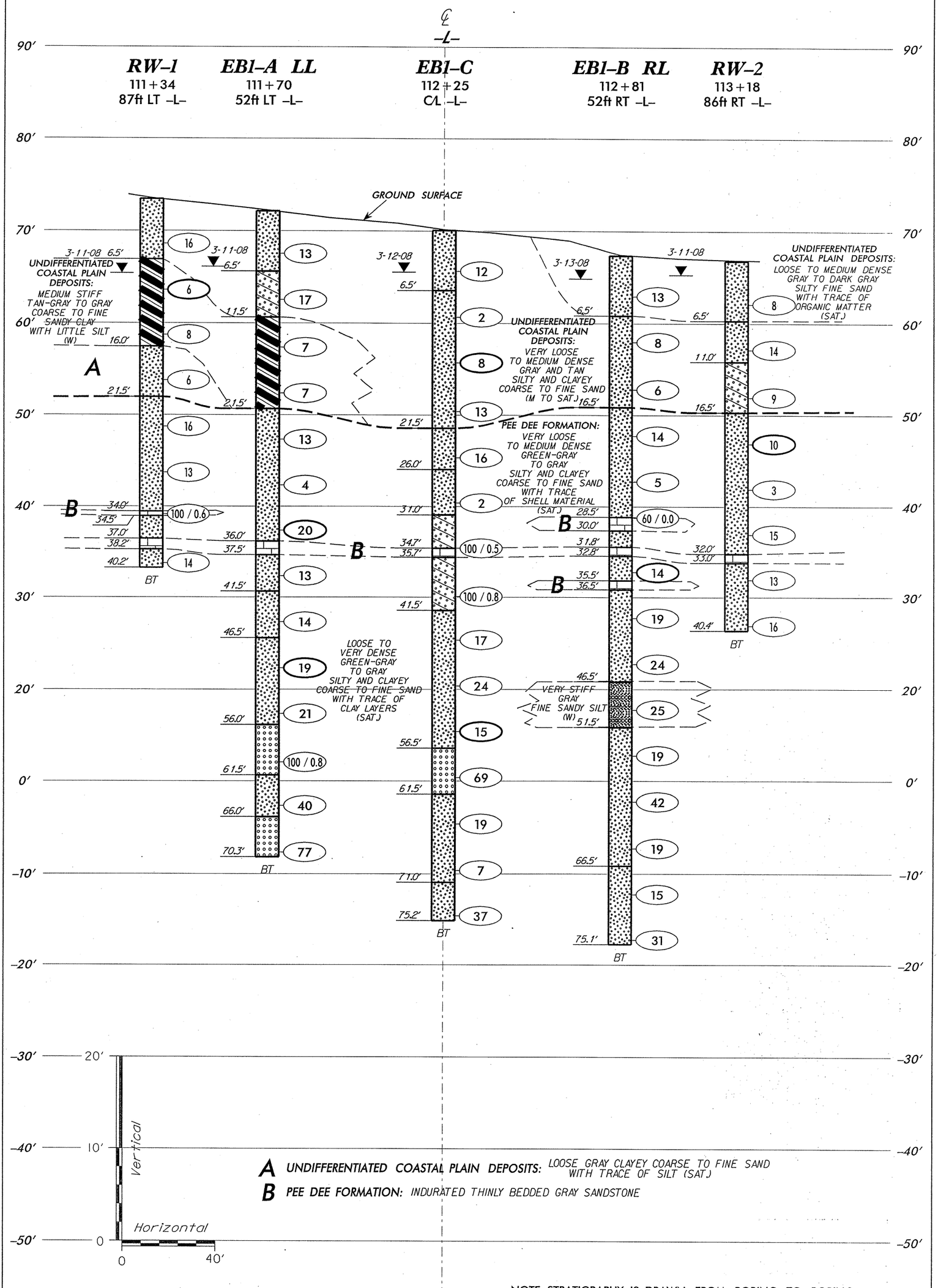
BORING LOCATION PLAN

RETAINING WALLS FOR BRIDGE STRUCTURES No. 4 AND No. 5
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 3450111.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S:\PROJECTS\2008\08-0123\GEOTECH\CADD\R-2719A SITE PLAN RETAINING WALLS.DGN

S:PROJECTS/2008/08-073/GEOTECH DOT/CADD/R-2719A 4-5-RW PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE PROFILE ALONG RETAINING WALL A AT END BENT No. 1



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

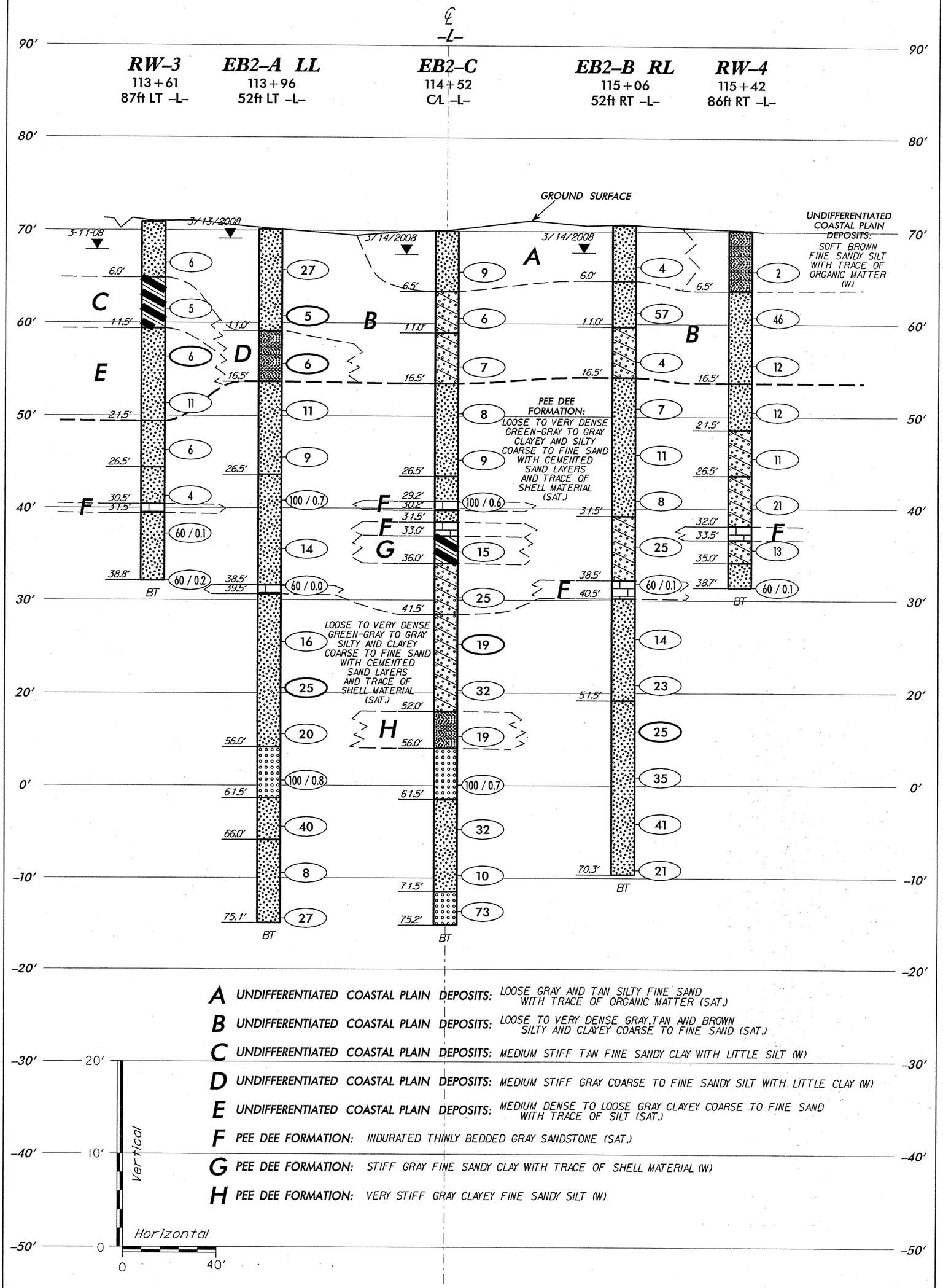
GENERALIZED SUBSURFACE PROFILE
ALONG RETAINING WALL A AT END BENT No. 1
RETAINING WALLS FOR BRIDGE STRUCTURES No. 4 AND No. 5
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 3450.1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10' (H) 1" = 40'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-073	SHEET	29 OF 41

S:PROJECTS/2008/08-073/GEOTECH DOT/CADD/R-2719A 4-5-RW PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE PROFILE ALONG RETAINING WALL B AT END BENT No. 2



A UNDIFFERENTIATED COASTAL PLAIN DEPOSITS: LOOSE GRAY AND TAN SILTY FINE SAND WITH TRACE OF ORGANIC MATTER (SAT.)

B UNDIFFERENTIATED COASTAL PLAIN DEPOSITS: LOOSE TO VERY DENSE GRAY, TAN AND BROWN SILTY AND CLAYEY COARSE TO FINE SAND (SAT.)

C UNDIFFERENTIATED COASTAL PLAIN DEPOSITS: MEDIUM STIFF TAN FINE SANDY CLAY WITH LITTLE SILT (W)

D UNDIFFERENTIATED COASTAL PLAIN DEPOSITS: MEDIUM STIFF GRAY COARSE TO FINE SANDY SILT WITH LITTLE CLAY (W)

E UNDIFFERENTIATED COASTAL PLAIN DEPOSITS: MEDIUM DENSE TO LOOSE GRAY CLAYEY COARSE TO FINE SAND WITH TRACE OF SILT (SAT.)

F PEE DEE FORMATION: INDURATED THINLY BEDDED GRAY SANDSTONE (SAT.)

G PEE DEE FORMATION: STIFF GRAY FINE SANDY CLAY WITH TRACE OF SHELL MATERIAL (W)

H PEE DEE FORMATION: VERY STIFF GRAY CLAYEY FINE SANDY SILT (W)

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE
ALONG RETAINING WALL B AT END BENT No. 2
RETAINING WALLS FOR BRIDGE STRUCTURES No. 4 AND No. 5
ON CRESCENT ROAD (-L-) OVER BANKS SCHOOL ROAD (-Y3-)
TIP No. R-2719A STATE PROJECT No. 3450.1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10′ (H) 1" = 40′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-073	SHEET	30 OF 41

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)				**GROUND WTR (ft)**
BORING NO. RW-1	**STATION** 111+34	**OFFSET** 87ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 73.5 ft	**TOTAL DEPTH** 40.2 ft	**NORTHING** 559,380	**EASTING** 2,397,624	**24 HR.** 8.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/10/08	**COMP. DATE** 03/10/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 34.0 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
	75									73.5 GROUND SURFACE 0.0
70	69.7	3.8								Medium Dense Tan Silty Fine SAND (A-2-4)
65	64.7	8.8	3	5	11	16		W		67.0 6.5
60	59.8	13.7	2	3	3	6	SS-11	W		Medium Stiff Tan-Gray Coarse to Fine Sandy CLAY (A-6) with Little Silt
55	54.8	18.7	3	3	5	8		W		57.5 16.0
50	49.8	23.7	2	3	3	6	SS-12	Sat.		Loose Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt
45	44.8	28.7	4	6	10	16		Sat.		52.0 21.5 **Pee Dee Formation** Medium Dense Green-Gray Silty Fine SAND (A-2-4)
40	39.8	33.7	6	7	6	13		Sat.		
35	34.8	38.7	2	98/0.1		100/0.6		Sat.		39.5 34.0 39.0 Indurated Thinly Bedded Gray Sandstone 34.5 Medium Dense Gray Clayey Fine SAND (A-2-4) with Trace Silt 36.5 37.0 35.3 38.2 Indurated Thinly Bedded Gray Sandstone 33.3 40.2 Medium Dense Gray Clayey Fine SAND (A-2-4) With Trace of Silt
30			5	6	8	14		Sat.		Boring Terminated at Elevation 33.3 ft in Medium Dense Gray Clayey Fine Sand.
25										
20										1) Advanced 3-1/4" HSA to 8.8 feet.
15										2) Advanced 2-7/8" Tricone to 38.7 feet.
10										3) Creek water and Quickgel used as drilling fluid.
5										4) Approximate drilling fluid density 62.4 pcf.
0										5) No loss of drilling fluid observed.
-5										

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 111+70	**OFFSET** 52ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 72.2 ft	**TOTAL DEPTH** 70.3 ft	**NORTHING** 559,380	**EASTING** 2,397,674 — **24 HR.** 6.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/10/08	**COMP. DATE** 03/10/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 36.0 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
	75										
70										72.2 GROUND SURFACE	0.0
	68.6	3.6								**Undifferentiated Coastal Plain Deposits:** Medium Dense Tan Silty Fine SAND (A-2-4)	
65	63.6	8.6	4	5	8	13		Sat.		65.7	6.5
60	58.4	13.8	5	9	8	17		Sat.		Medium Dense Tan Clayey Fine SAND (A-2-6) 60.7	11.5
55	53.4	18.8	2	3	4	7		W		Medium Stiff Gray Coarse to Fine Sandy CLAY (A-6) with Little Silt	
50	48.4	23.8	2	3	4	7		Sat.		50.7	21.5
45	43.4	28.8	4	6	7	13		Sat.		**Pee Dee Formation:** Loose to Medium Dense Green-Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	
40	38.4	33.8	2	2	2	4		Sat.			
35	33.4	38.8	8	7	13	20	SS-1	Sat.		36.2	36.0
30	28.4	43.8	4	6	7	13		Sat.		Indurated Thinly Bedded Gray Sandstone 34.7	37.5
25	23.4	48.8	4	6	8	14		Sat.		Medium Dense Gray Clayey Coarse to Fine Sand (A-2-4) with Trace of Silt 30.7	41.5
20	18.4	53.8	4	7	12	19	SS-2	Sat.		Medium Dense Green-Gray Silty Fine SAND (A-2-4) 25.7	46.5
15	13.4	58.8	6	8	13	21		Sat.		Medium Dense Gray Clayey Fine to Coarse Sand (A-2-4) with Trace of Silt 16.2	56.0
10	8.4	63.8	28	47	53/0.3	100/0.8		Sat.		Very Dense Green-Gray Fine SAND (A-3) 10.7	61.5
5	3.4	68.8	18	22	18	40		Sat.		Dense Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers 6.2	66.0
0			8	36	41	77		Sat.		Very Dense Green-Gray Fine SAND (A-3) 1.9	70.3
-5										Boring Terminated at Elevation 1.9 ft in Very Dense Green-Gray Fine Sand.	

1) Advanced 3-1/4" HSA to 8.6 feet.
2) Advanced 2-7/8" Tricone to 68.8 feet.
3) Creek water and Quickgel used as drilling fluid.
4) Approximate drilling fluid density 62.4 pcf.
5) No loss of drilling fluid observed.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 111+70	**OFFSET** 52ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 72.2 ft	**TOTAL DEPTH** 70.3 ft	**NORTHING** 559,380	**EASTING** 2,397,674 — **24 HR.** 6.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/10/08	**COMP. DATE** 03/10/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 36.0 ft

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				
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 112+25	**OFFSET** CL	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,380	**EASTING** 2,397,750 — **24 HR.** 4.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/11/08	**COMP. DATE** 03/11/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 34.7 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
70	75									70.2 GROUND SURFACE	0.0
65	66.8	3.4	5	7	5	12		M		**Undifferentiated Coastal Plain Deposits:** Medium Dense Tan Silty Fine SAND (A-2-4)	
60	61.8	8.4	WOH	1	1	2		Sat.		63.7 Very Loose to Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	6.5
55	56.8	13.4	3	4	4	8	SS-3	Sat.			
50	51.5	18.7	3	6	7	13		Sat.		48.7 **Pee Dee Formation:** Medium Dense Green-Gray Silty Fine SAND (A-2-4)	21.5
45	46.5	23.7	5	6	10	16		Sat.		44.2 Very Loose Gray Silty Fine SAND (A-2-4)	26.0
40	41.5	28.7	1	1	1	2		Sat.		39.2 Medium Dense Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material	31.0
35	36.5	33.7	7	14	86/0.0	100/0.5		Sat.		35.5	34.7
30	31.5	38.7	5	5	95/0.3	100/0.8		Sat.		34.5 Indurated Thinly Bedded Gray Sandstone	35.7
25	26.5	43.7	6	6	11	17		Sat.		Medium Dense to Very Dense Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material	
20	21.5	48.7	5	9	15	24		Sat.		28.7 Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	41.5
15	16.5	53.7	5	6	9	15	SS-4	W			
10	11.5	58.7	30	35	34	69		Sat.		13.7 Very Dense Green-Gray Fine SAND (A-3) with Trace of Silt	56.5
5	6.5	63.7	7	8	11	19		Sat.		8.7 Medium Dense to Loose Green-Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers	61.5
0	1.5	68.7	3	3	4	7		Sat.		-0.8 Dense Gray Silty Fine SAND (A-2-4)	71.0
-5	-3.5	73.7	8	13	24	37		W		-5.0	75.2

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 112+25	**OFFSET** CL	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,380	**EASTING** 2,397,750 — **24 HR.** 4.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/11/08	**COMP. DATE** 03/11/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 34.7 ft

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				Boring Terminated at Elevation -5.0 ft in Dense Gray Silty Fine Sand. 1) Advanced 3-1/4" HSA to 13.4 feet. 2) Advanced 2-7/8" Tricone to 73.7 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 112+81	**OFFSET** 52ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 67.4 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 559,381	**EASTING** 2,397,826 — **24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/12/08	**COMP. DATE** 03/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 28.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
	70										
										67.4 GROUND SURFACE	0.0
65	64.0	3.4								**Undifferentiated Coastal Plain Deposits:** Medium Dense Gray Silty Fine SAND (A-2-4) With Trace of Organic Matter	
60	59.0	8.4	3	5	8	13		Sat.		60.9	6.5
55	53.8	13.6	2	4	4	8		Sat.		Loose Gray Clayey Fine SAND (A-2-4) with Trace of Silt	
50	48.8	18.6	2	2	4	6		Sat.		50.9	16.5
45	43.8	23.6	5	6	8	14		Sat.		**Pee Dee Formation**: Medium Dense to Loose Green-Gray Clayey Coarse to Fine SAND (A-2-4) With Trace of Shell Material and Silt	
40	38.8	28.6	4	2	3	5		Sat.		38.9	28.5
35	33.8	33.6	60/0.0			60/0.0		Sat.		Indurated Thinly Bedded Gray Sandstone	30.0
30	28.8	38.6	5	6	8	14	SS-9	Sat.		37.4 Medium Dense Green-Gray Clayey Coarse to Fine Sand (A-2-4) with Trace of Silt	31.8
25	23.8	43.6	5	7	12	19		Sat.		35.6 Indurated Thinly Bedded Gray Sandstone	32.8
20	18.8	48.6	7	10	14	24		Sat.		34.6 Medium Dense Green-Gray Clayey Coarse to Fine Sand (A-2-4) with Trace of Silt	35.5
15	13.8	53.6	6	9	16	25		W		31.9 Indurated Thinly Bedded Gray Sandstone	36.5
10	8.8	58.6	5	7	12	19		Sat.		30.9 Medium Dense Green-Gray Clayey Coarse to Fine Sand (A-2-4) with Trace of Silt	
5	3.8	63.6	13	12	30	42		Sat.		20.9	46.5
0	-1.2	68.6	6	8	11	19		Sat.		Very Stiff Gray Fine Sandy Silt (A-4)	
-5	-6.2	73.6	4	4	11	15		W		15.9	51.5
-10			12	15	16	31		Sat.		Medium Dense to Dense Gray Clayey Fine SAND (A-2-4) With Trace of Silt	
										0.9	66.5
										Medium Dense to Dense Gray Silty Fine SAND (A-2-4)	
										-7.7	75.1
										Boring Terminated at Elevation -7.7 ft in Dense Gray Silty Fine Sand.	

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 112+81	**OFFSET** 52ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 67.4 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 559,381	**EASTING** 2,397,826 — **24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/12/08	**COMP. DATE** 03/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 28.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	-10			Match Line				
-15								1) Advanced 3-1/4" HSA to 8.4 feet. 2) Advanced 2-7/8" Tricone to 73.6 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.
-20								
-25								
-30								
-35								
-40								
-45								
-50								
-55								
-60								
-65								
-70								
-75								
-80								
-85								
-90								

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. RW-2	**STATION** 113+18	**OFFSET** 86ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 66.9 ft	**TOTAL DEPTH** 40.4 ft	**NORTHING** 559,381	**EASTING** 2,397,876	**24 HR.** 1.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/10/08	**COMP. DATE** 03/10/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 32.0 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
70										
										66.9 GROUND SURFACE 0.0
65	63.2	3.7								**Undifferentiated Coastal Plain Deposits**: Loose Dark Gray Silty Fine SAND (A-2-4) With Trace of Organic Matter
60	58.2	8.7	2	2	6	8		Sat.		60.4 6.5
55	53.0	13.9	3	6	8	14		Sat.		Medium Dense Gray Silty Fine SAND (A-2-4)
50	48.0	18.9	1	3	6	9		Sat.		55.9 11.0
45	43.0	23.9	4	5	5	10	SS-13	Sat.		Loose Gray Clayey Fine SAND (A-2-6)
40	38.0	28.9	2	1	2	3		Sat.		50.4 16.5
35	33.0	33.9	5	6	9	15		Sat.		**Pee Dee Formation**: Very Loose to Medium Dense Green-Gray Clayey Fine to Coarse SAND (A-2-4) with Trace of Silt
30	28.0	38.9	5	5	8	13		Sat.		34.9 32.0
25			5	7	9	16		Sat.		33.9 Indurated Thinly Bedded Gray Sandstone 33.0
20										Medium Dense Gray Clayey Fine SAND (A-2-4) with Trace of Silt
15										26.5 40.4
10										Boring Terminated at Elevation 26.5 ft in Medium Dense Gray Clayey Fine Sand.
5										1) Advanced 3-1/4" HSA to 8.7 feet. 2) Advanced 2-7/8" Tricone to 38.9 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.
0										
-5										
-10										

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. RW-3	**STATION** 113+61	**OFFSET** 87ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 71.0 ft	**TOTAL DEPTH** 38.8 ft	**NORTHING** 559,536	**EASTING** 2,397,788	**24 HR.** 3.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/12/08	**COMP. DATE** 03/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 30.5 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
	75										71.0	
										GROUND SURFACE		0.0
70										**Undifferentiated Coastal Plain Deposits:** Loose Gray Silty Fine SAND (A-2-4) With Trace of Organic Matter		
	67.6	3.4						Sat.			65.0	6.0
65			2	3	3	6				Medium Stiff Tan Fine Sandy CLAY (A-6) with Little Silt		
	62.6	8.4						W			59.5	11.5
60			3	2	3	5				Loose to Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt		
	57.4	13.6										
55			2	3	3	6	SS-14	Sat.				
	52.4	18.6						Sat.			49.5	21.5
50			3	5	6	11				**Pee Dee Formation:** Loose Green-Gray Clayey Fine SAND (A-2-4) With Trace of Silt		
	47.4	23.6									44.5	26.5
45			3	1	5	6		Sat.		Loose Gray Silty Fine SAND (A-2-4)		
	42.4	28.6									40.5	30.5
40			2	2	2	4		Sat.		Indurated Thinly Bedded Gray Sandstone	39.5	31.5
	37.4	33.6	60/0.1			60/0.1				Very Dense Gray Silty Fine SAND (A-2-4) With Cemented Sand Layers		
35								Sat.				
	32.4	38.6	60/0.2			60/0.2		Sat.			32.2	38.8
30										Boring Terminated at Elevation 32.2 ft in Very Dense Gray Silty Fine Sand.		
25										1) Advanced 3-1/4" HSA to 8.4 feet. 2) Advanced 2-7/8" Tricone to 38.6 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximate drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.		
20												
15												
10												
5												
0												
-5												

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 4/30/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 113+96	**OFFSET** 52ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 559,536	**EASTING** 2,397,838	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/12/08	**COMP. DATE** 03/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.5 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	75									ELEV. (ft) DEPTH (ft)
70										70.2 GROUND SURFACE 0.0
	66.8	3.4								**Undifferentiated Coastal Plain Deposits:** Medium Dense to Loose Tan Clayey Coarse toFine SAND (A-2-4) with Trace of Silt
65			4	8	19	27		Sat.		
	61.8	8.4								
60			2	2	3	5	SS-5	Sat.		
	56.6	13.6								59.2 11.0 Medium Stiff Gray Coarse to Fine Sandy SILT (A-4) with Little Clay
55			2	3	3	6	SS-6	W		53.7 16.5
	51.6	18.6								**Pee Dee Formation:** Medium Dense to Loose Green-Gray Clayey Fine SAND (A-2-4) with Trace of Silt
50			3	4	7	11		Sat.		
	46.6	23.6								
45			2	5	4	9		Sat.		
	41.6	28.6								43.7 26.5 Very Dense to Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) With Trace of Shell Material, Silt and Cemented Sand Layers
40			4	96/0.2		100/0.7		Sat.		
	36.6	33.6								
35			5	5	9	14		Sat.		
	31.6	38.6								31.7 38.5
30			60/0.0			60/0.0		Sat.		30.7 Indurated Thinly Bedded Gray Sandstone 39.5
	26.6	43.6								Medium Dense Gray Clayey Coarse to Fine SAND (A-2-4) With Trace of Shell Material, Silt and Cemented Sand Layers
25			5	7	9	16		Sat.		
	21.6	48.6								
20			6	10	15	25	SS-7	Sat.		
	16.6	53.6								
15			5	8	12	20		Sat.		14.2 56.0
	11.6	58.6								Very Dense Green-Gray Fine SAND (A-3) With Trace of Silt
10			31	51	49/0.3	100/0.8		Sat.		8.7 61.5
	6.6	63.6								Dense Green-Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers
5			10	21	19	40		Sat.		4.2 66.0
	1.6	68.6								Loose to Medium Dense Gray Clayey Silty Fine SAND (A-2-4)
0			3	4	4	8		Sat.		
	-3.4	73.6								
-5			16	11	16	27		Sat.		-4.9 75.1

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 113+96	**OFFSET** 52ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 559,536	**EASTING** 2,397,838	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/12/08	**COMP. DATE** 03/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.5 ft	

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
-10										Boring Terminated at Elevation -4.9 ft in Medium Dense Gray Silty Fine Sand. 1) Advanced 3-1/4" HSA to 8.4 feet. 2) Advanced 2-7/8" Tricone to 73.6 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximately drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed. 6) Hard Layer at 33.0 to 33.6 feet.
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 114+52	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 70.1 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,536	**EASTING** 2,397,914	**24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 29.2 ft	

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
70	75									ELEV. (ft) DEPTH (ft)
										70.1 GROUND SURFACE 0.0
	66.7	3.4								**Undifferentiated Coastal Plain Deposits:** Loose Gray Silty Fine SAND (A-2-4) With Trace of Organic Matter
65			1	3	6	9		Sat.		
	61.7	8.4								63.6 6.5 Loose Tan Clayey Fine SAND (A-2-6)
60			2	2	4	6		Sat.		
	56.4	13.7								59.1 11.0 Loose Dark Gray Clayey Fine SAND (A-2-6)
55			2	3	4	7		Sat.		
	51.4	18.7								53.6 16.5 **Pee Dee Formation** Loose Green-Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers
50			4	4	4	8		Sat.		
	46.4	23.7								
45			4	4	5	9		Sat.		43.6 26.5 Loose Gray Silty Fine SAND (A-2-4) With Trace of Shell Material
	41.4	28.7								40.9 29.2 Indurated Thinly Bedded Gray Sandstone 39.9 30.2 Medium Dense Gray Silty Fine SAND (A-2-4) 38.6 31.5 Indurated Thinly Bedded Gray Sandstone 37.1 33.0 Stiff Gray Fine Sandy CLAY (A-6) With Trace of Shell Material 34.1 36.0 Medium Dense Gray Clayey Fine SAND (A-2-6) With Trace of Shell Material 28.6 41.5 Medium Dense to Dense Green-Gray Clayey Fine to Coarse SAND (A-2-6) with Trace of Silt
40			8	92/0.1		100/0.6		Sat.		
	36.4	33.7								
35			6	6	9	15		W		
	31.4	38.7								
30			20	12	13	25		W		
	26.4	43.7								
25			5	8	11	19	SS-8	Sat.		
	21.4	48.7								
20			7	13	19	32		Sat.		
	16.4	53.7								18.1 52.0 Very Stiff Gray Clayey Fine Sandy SILT (A-4)
15			6	7	12	19		Sat.		
	11.4	58.7								14.1 56.0 Very Dense Green-Gray Fine SAND (A-3) with Trace of Clay Layers
10			19	52	48/0.2	100/0.7		Sat.		
	6.4	63.7								8.6 61.5 Dense to Loose Green-Gray Silty Fine SAND (A-2-4)
5			7	13	19	32		Sat.		
	1.4	68.7								
0			5	4	6	10		Sat.		
	-3.6	73.7								-1.4 71.5 Very Dense Gray Fine SAND (A-3) With Trace of Silt
-5			23	35	38	73		Sat.		-5.1 75.2

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 114+52	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 70.1 ft	**TOTAL DEPTH** 75.2 ft	**NORTHING** 559,536	**EASTING** 2,397,914	**24 HR.** 2.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 29.2 ft	

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				
-10										Boring Terminated at Elevation -5.1 ft in Very Dense Gray Fine Sand. 1) Advanced 3-1/4" HSA to 8.4 feet. 2) Advanced 2-7/8" Tricone to 73.7 feet. 3) Creek water and Quickgel used as drilling fluid. 4) Approximately drilling fluid density 62.4 pcf. 5) No loss of drilling fluid observed.
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 115+06	**OFFSET** 52ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.8 ft	**TOTAL DEPTH** 70.3 ft	**NORTHING** 559,536	**EASTING** 2,397,989 — **24 HR.** 3.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
75	75										
70										70.8 GROUND SURFACE	0.0
	67.3	3.5								Loose Tan Silty Fine SAND (A-2-4) with Trace of Organic Matter	
65			3	3	1	4		Sat.		64.8	6.0
	62.3	8.5								Very Dense Brown Silty Fine SAND (A-2-4)	
60			30	33	24	57		W		59.8	11.0
	57.0	13.8								Loose Gray Clayey Fine SAND (A-2-6)	
55			1	2	2	4		Sat.		54.3	16.5
	52.0	18.8								**Pee Dee Formation:** Loose to Medium Dense Green-Gray Clayey Fine to Coarse SAND (A-2-4) with Trace of Silt	
50			2	3	4	7		Sat.			
	47.0	23.8									
45			3	4	7	11		Sat.			
	42.0	28.8									
40			1	3	5	8		Sat.		39.3	31.5
	37.0	33.8								Medium Dense Gray Silty Clayey Fine SAND (A-2-6) With Cemented Sand Layers and Trace of Shell Material	
35			33	9	16	25		Sat.			
	32.0	38.8								32.3	38.5
30			60/0.1			60/0.1		Sat.		Indurated Thinly Bedded Gray Sandstone	
	27.0	43.8								30.3	40.5
25			5	5	9	14		Sat.		Medium Dense Gray to Green-Gray Silty Clayey Fine SAND (A-2-6) With Cemented Sand Layers and Trace of Shell Material	
	22.0	48.8									
20			5	8	15	23		Sat.		19.3	51.5
	17.0	53.8								Medium Dense to Dense Green-Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	
15			6	9	16	25	SS-10	Sat.			
	12.0	58.8									
10			6	7	28	35		Sat.			
	7.0	63.8									
5			11	17	24	41		Sat.			
	2.0	68.8									
0			8	9	12	21		Sat.		0.5	70.3
-5										Boring Terminated at Elevation 0.5 ft in Medium Dense Green-Gray Clayey Fine Sand.	

1) Advanced 3-1/4" HSA to 8.5 feet.
2) Advanced 2-7/8" Tricone to 68.8 feet.
3) Creek water and Quickgel used as drilling fluid.
4) Approximate drilling fluid density 62.4 pcf.
5) No loss of drilling fluid observed.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)			**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 115+06	**OFFSET** 52ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 70.8 ft	**TOTAL DEPTH** 70.3 ft	**NORTHING** 559,536	**EASTING** 2,397,989 — **24 HR.** 3.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 38.5 ft

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				
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/28/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge Structures No. 4 & No. 5 on -L- over S.R.1546 (Banks School Road)				**GROUND WTR (ft)**
BORING NO. RW-4	**STATION** 115+42	**OFFSET** 86ft RT	**ALIGNMENT** -L-	**0 HR.** N/M
COLLAR ELEV. 70.2 ft	**TOTAL DEPTH** 38.7 ft	**NORTHING** 559,536	**EASTING** 2,398,039	**24 HR.** 3.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/ 2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 03/13/08	**COMP. DATE** 03/18/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 32.0 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
70	75									70.2 GROUND SURFACE 0.0
	66.8	3.4								**Undifferentiated Coastal Plain Deposits:** Soft Brown Fine Sandy SILT (A-4) With Trace of Organic Matter
65			4	1	1	2		Sat.		63.7 6.5
	61.8	8.4								Dense to Medium Dense Brown Silty Fine SAND (A-2-4)
60			8	20	26	46		W		
	56.6	13.6								
55			3	3	9	12		Sat.		53.7 16.5
	51.6	18.6								**Pee Dee Formation:** Medium Dense Gray Clayey Fine to Coarse SAND (A-2-4)
50			5	7	5	12		Sat.		with Trace of Silt 48.7 21.5
	46.6	23.6								Medium Dense Gray Clayey Fine SAND (A-2-6)
45			5	5	6	11		Sat.		43.7 26.5
	41.6	28.6								Medium Dense Gray Clayey Silty Fine SAND (A-2-6)
40			6	9	12	21		Sat.		
	36.6	33.6								38.2 32.0
35			5	6	7	13		Sat.		Indurated Thinly Bedded Gray Sandstone 36.7 33.5
	31.6	38.6								Medium Dense Gray Clayey Silty Fine SAND (A-2-6) 34.2 36.0
30			60/0.1			60/0.1				Very Dense Gray Silty Fine SAND (A-2-4) With Cemented Sand Layers 31.5 38.7
25										Boring Terminated at Elevation 31.5 ft in Very Dense Silty Fine Sand.
20										1) Advanced 3-1/4" HSA to 38.6 feet.
15										
10										
5										
0										
-5										

NCDOT BORE DOUBLE 073.GPJ NC_DOT.GDT 3/26/08

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME Project #:	**1051-08-073**			Test Date(s):	3/19 - 3/21/08
State Project No.:	34501.1.1	County:	Lenoir	Report Date:	3/21/2008
Federal ID No.:	STP-0224(3)	TIP No.:	R-2719A		
Project Name:	**Retaining Walls A and B For Structures No. 4 and No. 5 on -L- over SR 1546**				
Client Name:	NCDOT				
Client Address:	Raleigh, NC				

Boring No.	Sample No.	Sample Depth (ft.)	AASHTO Classification		Total % Passing Sieve # 10	40	60	200	270	Total Mortar Fraction: Coarse Sand	Fine Sand	Silt	Clay	LL	PL	PI	Moisture Content %
RW-1	SS-11	8.8	A-6	(3)	100	95	96	46	39	14	47	14	25	34	20	14	28.1
RW-1	SS-12	18.7	A-2-4	(0)	98	79	70	25	18	28	54	8	10	24	N.P.	N.P.	ND
RW-2	SS-13	18.9	A-2-4	(0)	100	93	53	18	16	48	36	4	12	22	N.P.	N.P.	ND
RW-3	SS-14	13.6	A-2-4	(0)	100	95	89	33	26	11	63	10	16	28	24	4	ND

Notes: NP=Nonplastic. ND=Not Determined

Technical Responsibility: B. Riggs

Signature

Geotechnical Engineer

Position

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34501.1.1	1	22

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34501.1.1 F.A. PROJ. STP-0224(3)

COUNTY LENOIR

PROJECT DESCRIPTION CRESCENT ROAD IN KINSTON FROM US HIGHWAY 70 TO US HIGHWAY 258

SITE DESCRIPTION BRIDGE No. 196 AND BRIDGE No. 197 ON -L- OVER PAUL'S PATH ROAD - SR1001 (-Y5-)

ID: R-2719A

PROJECT: 34501.1.1

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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.

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

S. JOHNSON

L. RAUP

N. BRADLEY

J. WHITE

S. HARDEE

P. PHELPS

T. PEREZ

INVESTIGATED BY S&ME, INC.

CHECKED BY A.F. RIGGS, JR.

SUBMITTED BY S&ME, INC.

DATE APRIL 18, 2008

For Letting

NORTH CAROLINA PROFESSIONAL SEAL 14155 ENGINEER ABNER F. RIGGS, JR. 4/25/08 SEAL

SIGNATURE

DRAWN BY: T. PEREZ

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.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	34501.1.1	2	22

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT PLASTIC INDEX	6 MX		N.P.	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE
UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT- CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

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

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
- STATIC WATER LEVEL AFTER 24 HOURS.
- PW — PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA
- HC — HOLE CAVE
- SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP/DIP DIRECTION OF ROCK STRUCTURES
- ● - SOUNDING ROD
- WATER LOSS
- SPT DPT VST DMT PMT — TEST BORING
- CPT TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- SPT TEST SAMPLE

SAMPLE DESIGNATIONS

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

ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

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

ADVANCING TOOLS:
- ☐ DRAG BITS _____
- ☐ 6" CONTINUOUS FLIGHT AUGER
- ☐ 8" HOLLOW AUGERS
- ☐ HARD FACED FINGER BITS
- ☐ TUNG.-CARBIDE INSERTS
- ☐ CASING ☐ W/ ADVANCER
- ☒ TRICONE 2-7/8" STEEL TEETH
- ☐ TRICONE _____" TUNG.-CARB.
- ☐ CORE BIT
- ☒ OTHER 3-1/4" H.S.A.

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

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

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

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

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.

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

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

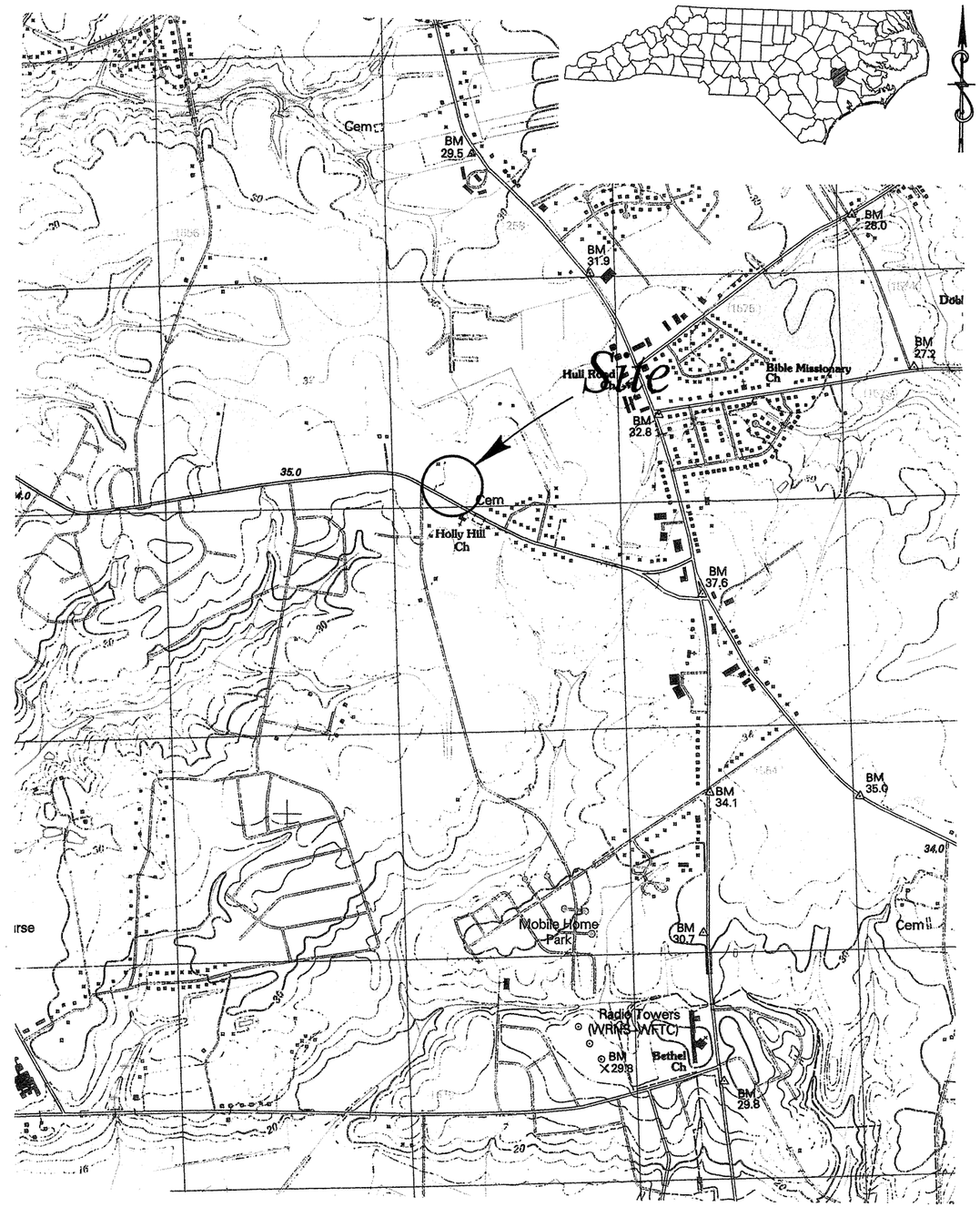
TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: NCDOT Traverse Station Rebar & Cap Stamped "-BL-27-"
Located at Station 181+57.17 -BL-
ELEVATION: 115.76'

NOTES:

REVISED 09/15/00

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	3450I.I.I	3	22



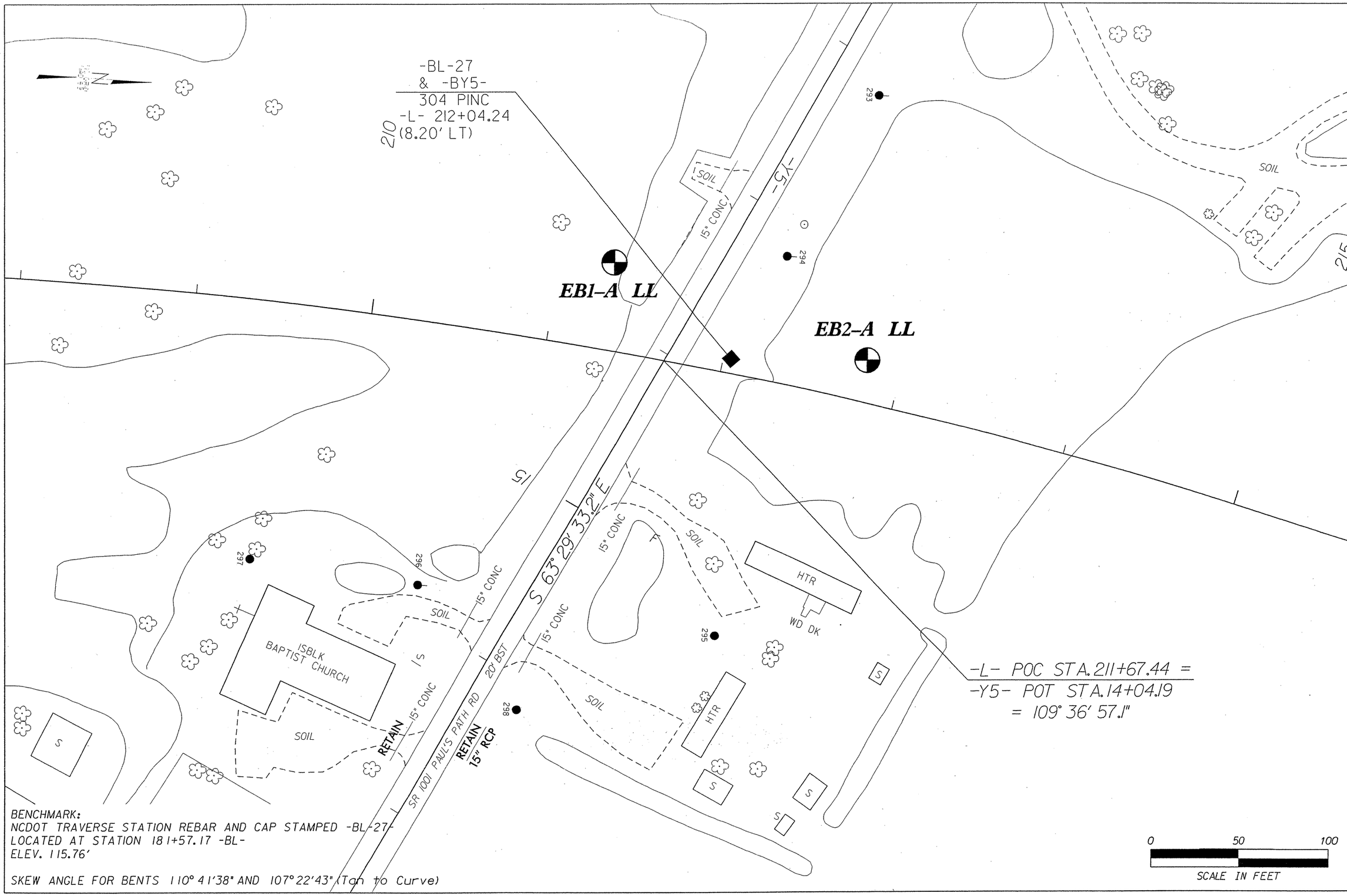
S:PROJECTS/2008/08-074/GEOTECH/CADD/R-2719A -SITEVIC 196 LL

SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	APRIL 2008
JOB NO.	1051-08-074

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING •TESTING

SITE VICINITY MAP

BRIDGE No. 196 (LEFT LANE)
ON -L- OVER PAULS PATH ROAD - SR1001 (-Y5-)
STATE PROJECT NO. 3450I.I.I TIP NO. R-2719A
FEDERAL I.D. NO. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA



BENCHMARK:
NCDOT TRAVERSE STATION REBAR AND CAP STAMPED -BL-27-
LOCATED AT STATION 181+57.17 -BL-
ELEV. 115.76'

SKEW ANGLE FOR BENTS 110° 41'38" AND 107° 22'43" (Tan to Curve)

S:PROJECTS/2008/08-074/GEOTECH/CADD/R-2719A SITE PLAN BRIDGE 196 LL.DGN

SCALE:	1" = 50'
DATE:	APRIL 2008
JOB NO.	1051-08-074
APPROVED BY:	AFR
DRAWN BY:	TRP
SHEET	4 OF 22

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

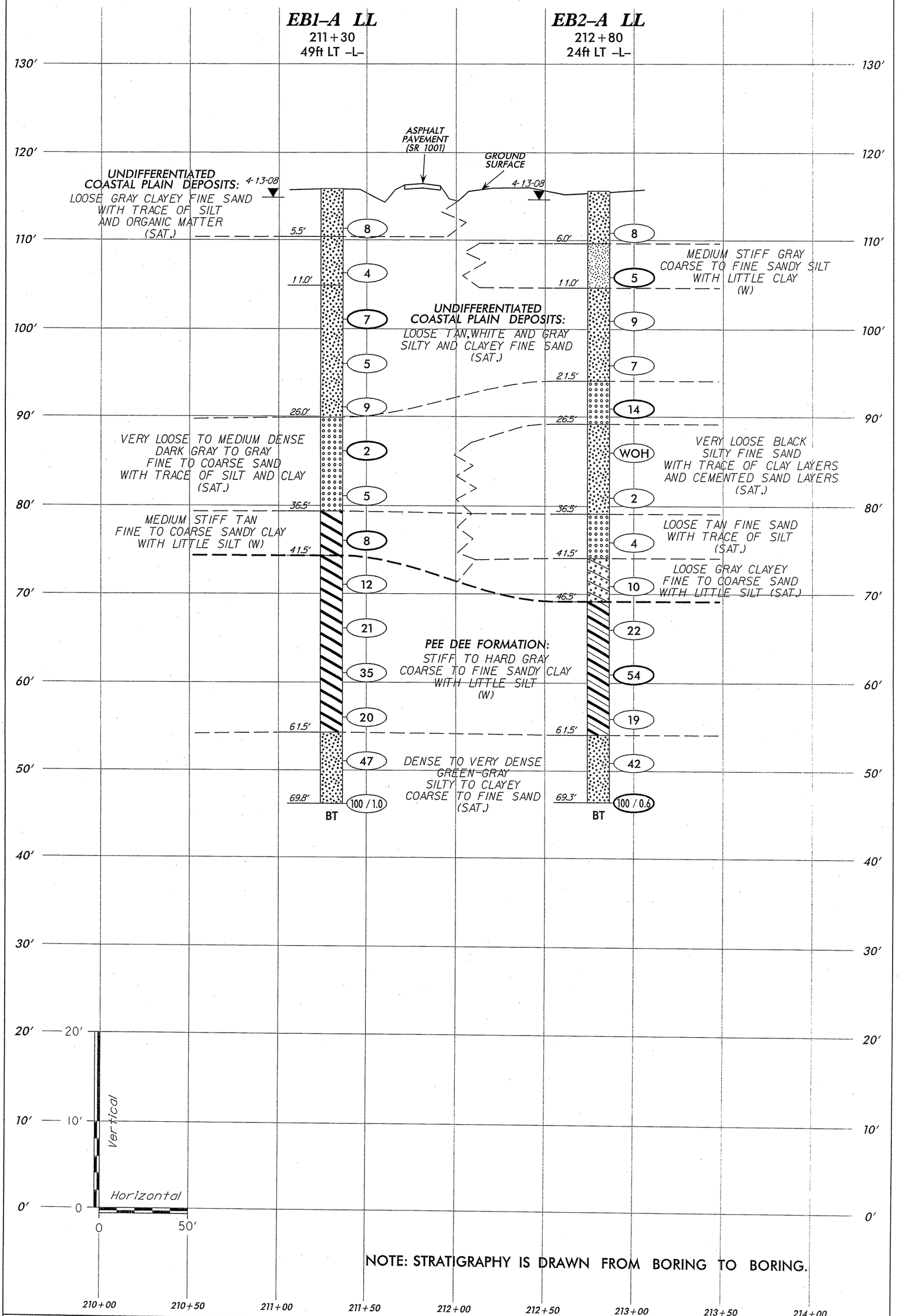
BORING LOCATION PLAN

BRIDGE No. 196 (LEFT LANE)
ON -L- OVER PAUL'S PATH ROAD - SR1001 (-Y5-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S:PROJECTS/2008/08-074/GEOTECH DOT/CADD/R-2719A 196-197 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE PROFILE 35' LEFT OF -L-

TO SR 1554 ← → TO US 258



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE 35' LEFT OF -L-

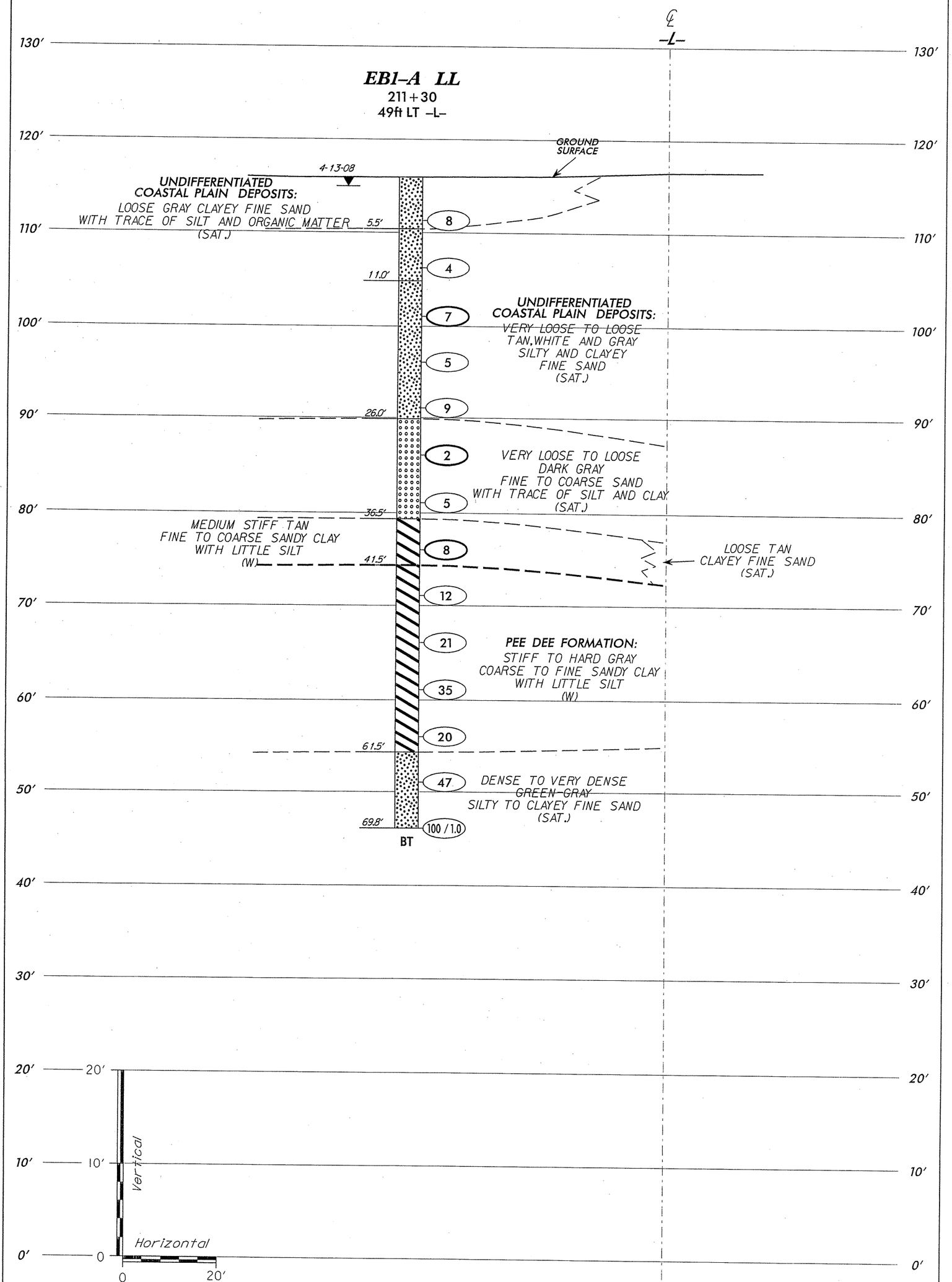
BRIDGE No. 196 (LEFT LANE)
ON -L- OVER PAUL'S PATH ROAD - SR1001 (-Y5-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10' (H) 1" = 50'	APPROVED BY:	AFR
DATE:	APRIL 2008	DRAWN BY:	TRP
JOB NO.	1051-08-074	SHEET	5 OF 22

S:PROJECTS/2008/08-074/GEOTECH DOT/CADD/R-2719A 196-197 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 1 (LEFT LANE)



GENERALIZED SUBSURFACE CROSS SECTION

THROUGH END BENT No. 1 (LEFT LANE)
BRIDGE No. 196 (LEFT LANE)
ON -L- OVER PAUL'S PATH ROAD - SR1001 (-Y5-)
TIP No. R-2719A STATE PROJECT No. 3450.1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

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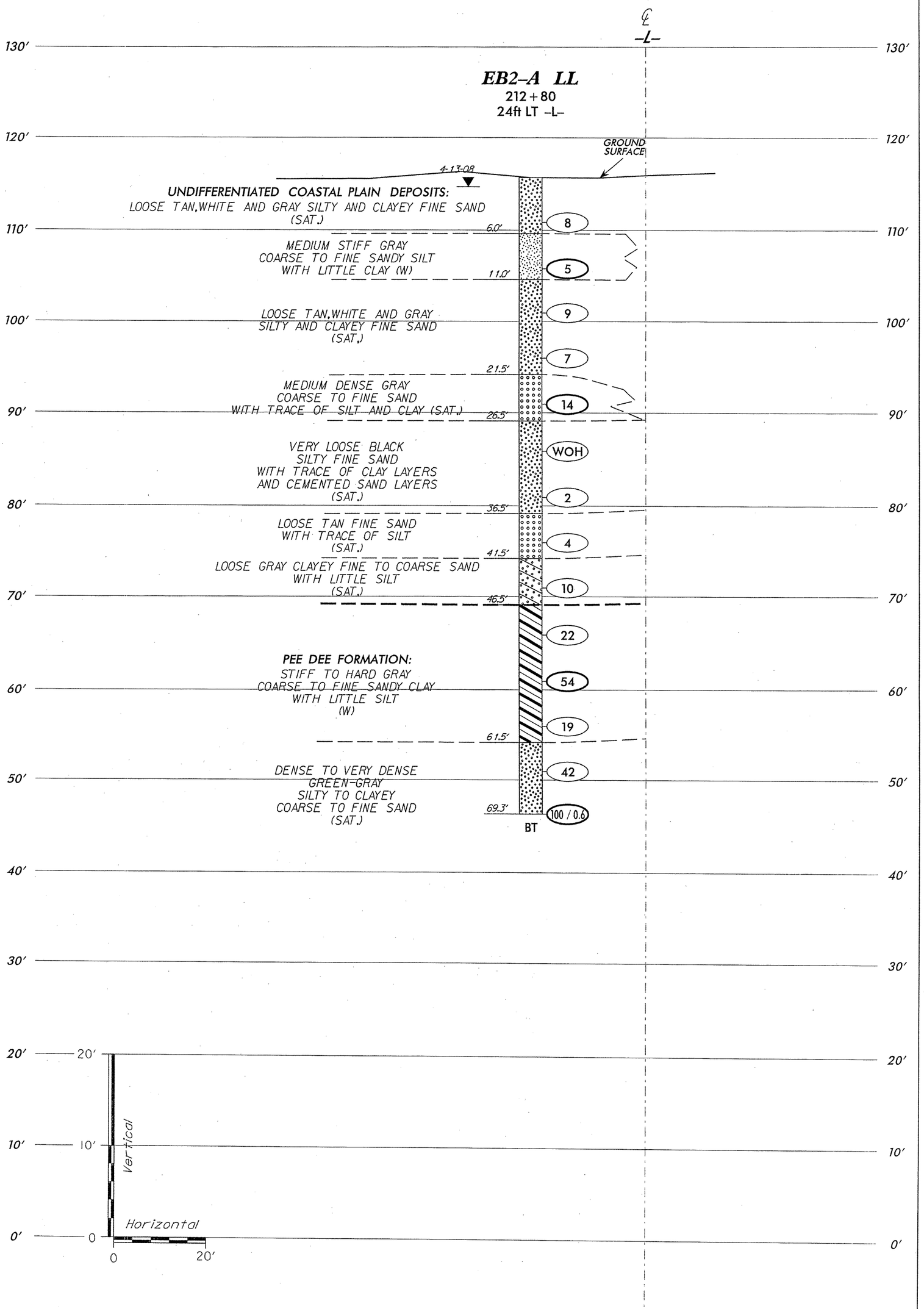
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	APRIL 2008	DRAWN BY:	TRP
JOB NO.	1051-08-074	SHEET	6 OF 22

S:PROJECTS/2008/08-074/GEOTECH DOT/CADD/R-2719A 196-197 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2 (LEFT LANE)



GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 2 (LEFT LANE)
BRIDGE No. 196 (LEFT LANE)
ON -L- OVER PAUL'S PATH ROAD - SR1001 (-Y5-)
TIP No. R-2719A STATE PROJECT No. 3450I.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	APRIL 2008	DRAWN BY:	TRP
JOB NO.	1051-08-074	SHEET	7 OF 22

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Dual Bridges No. 196 and No. 197 on -L- over S.R. 1001				**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 211+30	**OFFSET** 49ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 115.9 ft	**TOTAL DEPTH** 69.8 ft	**NORTHING** 568,351	**EASTING** 2,400,120	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 03/17/08	**COMP. DATE** 03/17/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
120											
115										115.9 GROUND SURFACE	0.0
	112.3	3.6								**Undifferentiated Coastal Plain Deposits** Loose Gray Clayey Fine SAND (A-2-4) With Trace of Silt and Trace of Organic Matter	
110			2	3	5	8		Sat.		110.4	5.5
	107.3	8.6								Loose Tan Silty Fine SAND (A-2-4)	
105			6	2	2	4		Sat.		104.9	11.0
	102.1	13.8								Loose Tan Clayey Fine SAND (A-2-4) With Trace of Silt	
100			5	3	4	7	SS-1	Sat.			
	97.1	18.8									
95			1	3	2	5		Sat.			
	92.1	23.8									
90			4	4	5	9		Sat.		89.9	26.0
	87.1	28.8								Very Loose to Loose Dark Gray Fine to Coarse SAND (A-3) With Trace of Silt and Clay	
85			1	1	1	2	SS-2	Sat.			
	82.1	33.8									
80			1	2	3	5		Sat.		79.4	36.5
	77.1	38.8								Medium Stiff Tan Fine to Coarse Sandy CLAY (A-7-5) With Little Silt	
75			2	2	6	8	SS-3	44.0%		74.4	41.5
	72.1	43.8								**Pee Dee Formation** Stiff to Hard Gray Fine Sandy CLAY (A-7-6)	
70			6	4	8	12		W			
	67.1	48.8									
65			8	9	12	21		W			
	62.1	53.8									
60			24	14	21	35		W			
	57.1	58.8									
55			7	9	11	20		W		54.4	61.5
	52.1	63.8								Dense to Very Dense Green-Gray Silty Fine SAND (A-2-4)	
50			7	18	29	47		Sat.			
	47.1	68.8									
45			38	62/0.5		100/1.0		Sat.		46.1	69.8
40										Boring Terminated at Elevation 46.1 ft in Very Dense Green-Gray Silty Fine Sand.	

1) Advanced 3-1/4" HSA to 8.6 feet.
2) Advanced 2-7/8" Tricone to 68.8 feet.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Dual Bridges No. 196 and No. 197 on -L- over S.R. 1001				**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 211+30	**OFFSET** 49ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 115.9 ft	**TOTAL DEPTH** 69.8 ft	**NORTHING** 568,351	**EASTING** 2,400,120	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 03/17/08	**COMP. DATE** 03/17/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	40					Match Line				
35										3) Creek water with Quickgel added used as drilling fluid.
30										4) Approximate drilling fluid density 62.4 pcf.
25										5) No loss of drilling fluid observed.
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Dual Bridges No. 196 and No. 197 on -L- over S.R. 1001				**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 212+80	**OFFSET** 24ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 115.6 ft	**TOTAL DEPTH** 69.3 ft	**NORTHING** 568,498	**EASTING** 2,400,165	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 03/14/08	**COMP. DATE** 03/14/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
	120										
115										115.6 GROUND SURFACE	0.0
	111.8	3.8								**Undifferentiated Coastal Plain Deposits**: Loose Gray Silty Fine SAND (A-2-4)	
110			4	3	5	8		Sat.		109.6	6.0
	106.8	8.8								Medium Stiff Gray Coarse to Fine Sandy SILT (A-4) with Little Clay	
105			3	1	4	5	SS-4	17.1%		104.6	11.0
	101.9	13.7								Loose White and Tan Silty Fine SAND (A-2-4)	
100			4	5	4	9		Sat.			
	96.9	18.7									
95			3	3	4	7		Sat.		94.1	21.5
	91.9	23.7								Medium Dense Gray Coarse to Fine SAND (A-3) With Trace of Silt and Clay	
90			4	6	8	14	SS-5	Sat.		89.1	26.5
	86.9	28.7								Very Loose Black Silty Fine SAND (A-2-4) With Trace of Clay Layers and Cemented Sand Layers	
85			1	WOH	WOH	WOH		Sat.			
	81.9	33.7									
80			1	1	1	2		Sat.		79.1	36.5
	76.9	38.7								Loose Tan Fine SAND (A-3) With Trace of Silt	
75			1	2	2	4		Sat.		74.1	41.5
	71.9	43.7								Loose Gray Clayey Fine SAND (A-2-6)	
70			4	5	5	10		Sat.		69.1	46.5
	66.9	48.7								**Pee Dee Formation**: Very Stiff to Hard Gray Coarse to Fine Sandy CLAY (A-6) With Little Silt	
65			6	9	13	22		W			
	61.9	53.7									
60			15	32	22	54	SS-6	28.9%			
	56.9	58.7									
55			6	8	11	19		W		54.1	61.5
	51.9	63.7								Dense to Very Dense Green-Gray Clayey Coarse to Fine SAND (A-2-4) with Trace of Silt	
50			11	14	28	42		Sat.			
	46.9	68.7								46.3	69.3
45			75	25/0.1		100/0.6	SS-7	Sat.		Boring Terminated at Elevation 46.3 ft in Very Dense Green-Gray Clayey Fine Sand.	
40										1) Advanced 3-1/4" HSA to 8.8 Feet. 2) Advanced 2-7/8" Tricone Roller to 68.7 Feet.	

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Dual Bridges No. 196 and No. 197 on -L- over S.R. 1001				**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 212+80	**OFFSET** 24ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 115.6 ft	**TOTAL DEPTH** 69.3 ft	**NORTHING** 568,498	**EASTING** 2,400,165	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 03/14/08	**COMP. DATE** 03/14/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	40					Match Line				3) Creek Water with Quickgel added used as Drilling Fluid. 4) Approximate Drilling Fluid Density 62.4 pcf. 5) No Loss of Drilling Fluid Observed.
35										
30										
25										
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										

NCDOT BORE DOUBLE 074.GPJ NC_DOT.GDT 4/18/08

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME Project #:	**1051-08-074**	Test Date(s):	4/12/2008
State Project No.:	34501.1.1 County: Lenior	Report Date:	4/10 - 4/12/08
Federal ID No.:	STP-0224(3) TIP No. R-2719A		
Project Name:	**Bridges No. 196 and No. 197 on -L- Over S.R. 1001**		
Client Name:	NCDOT		
Client Address:	Raleigh, North Carolina		

Boring No.	Sample No.	Sample Depth (Feet)	AASHTO Classification	Total % Passing Sieve #					Total Mortar Fraction				LL	PL	PI	Moisture Content %
				10	40	60	200	270	Coarse Sand	Fine Sand	Silt	Clay				
EB1-A LL	SS-1	13.8-15.3	A-2-4 (0)	100	100	99	20	17	1	82	4	13	18	N.P.	N.P.	
EB1-A LL	SS-2	28.8-30.3	A-3 (0)	99	84	27	7	7	73	20	3	4	19	N.P.	N.P.	
EB1-A LL	SS-3	38.8-40.3	A-7-5 (5)	97	69	59	49	46	39	13	23	25	46	30	16	44.0
EB2-A LL	SS-4	8.8-10.3	A-4 (0)	100	99	98	38	29	2	69	11	18	18	16	2	17.1
EB2-A LL	SS-5	23.7-25.2	A-3 (0)	99	80	59	10	6	41	53	3	3	18	N.P.	N.P.	
EB2-A LL	SS-6	53.7-55.2	A-6 (7)	99	95	90	58	45	10	45	17	28	37	21	16	28.9
EB2-A LL	SS-7	68.7-69.3	A-2-4 (0)	100	99	96	15	11	4	85	5	6	19	N.P.	N.P.	

Notes: NP=Nonplastic

Technical Responsibility: B. Riggs *Signature* Geotechnical Engineer *Position*

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

Photograph No. 2:
This photograph was taken from the left side of the -L- alignment, looking southeast, across proposed End Bent No. 1.

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

Photograph No. 4:
This photograph was taken from the -L- alignment, looking northwest, along Paul's Path Road – SR 1001 (-Y5-).

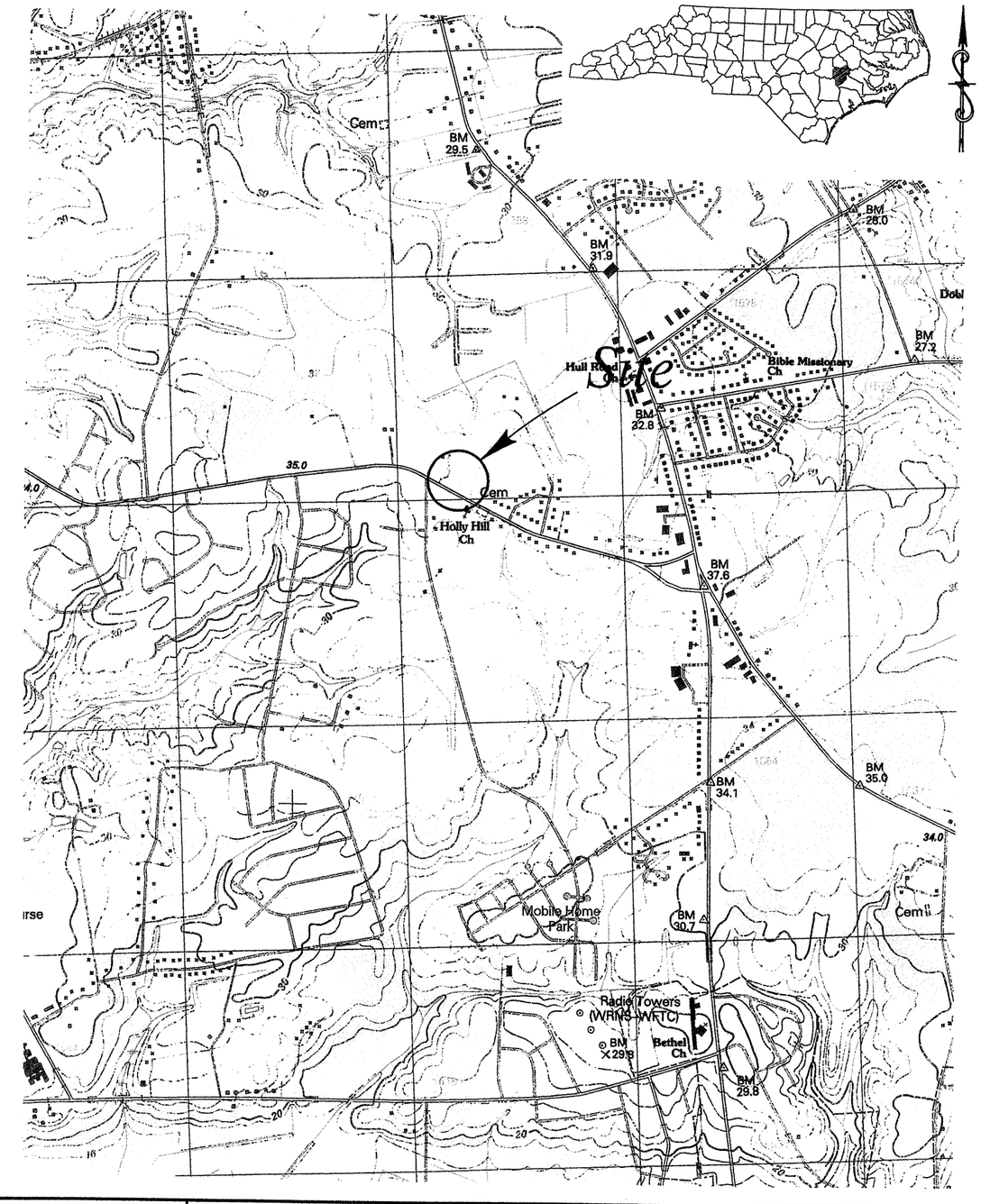
Photograph No. 5:
This photograph was taken from the -L- alignment, looking southeast, along Paul's Path Road – SR 1001 (-Y5-).

Photograph No. 6:
This photograph was taken from the -L- alignment, looking northwest across proposed End Bent No. 2.

Photograph No. 7:
This photograph was taken from the left side of the -L- alignment, looking southeast, across proposed End Bent No. 2.

Photograph No. 8:
This photograph was taken from the north approach, left of the -L- alignment, looking south.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	3450I.1.1	13	22



S:PROJECTS/2008/08-074/GEOTECH/CADD/R-2719A -SITEVIC 197 RL

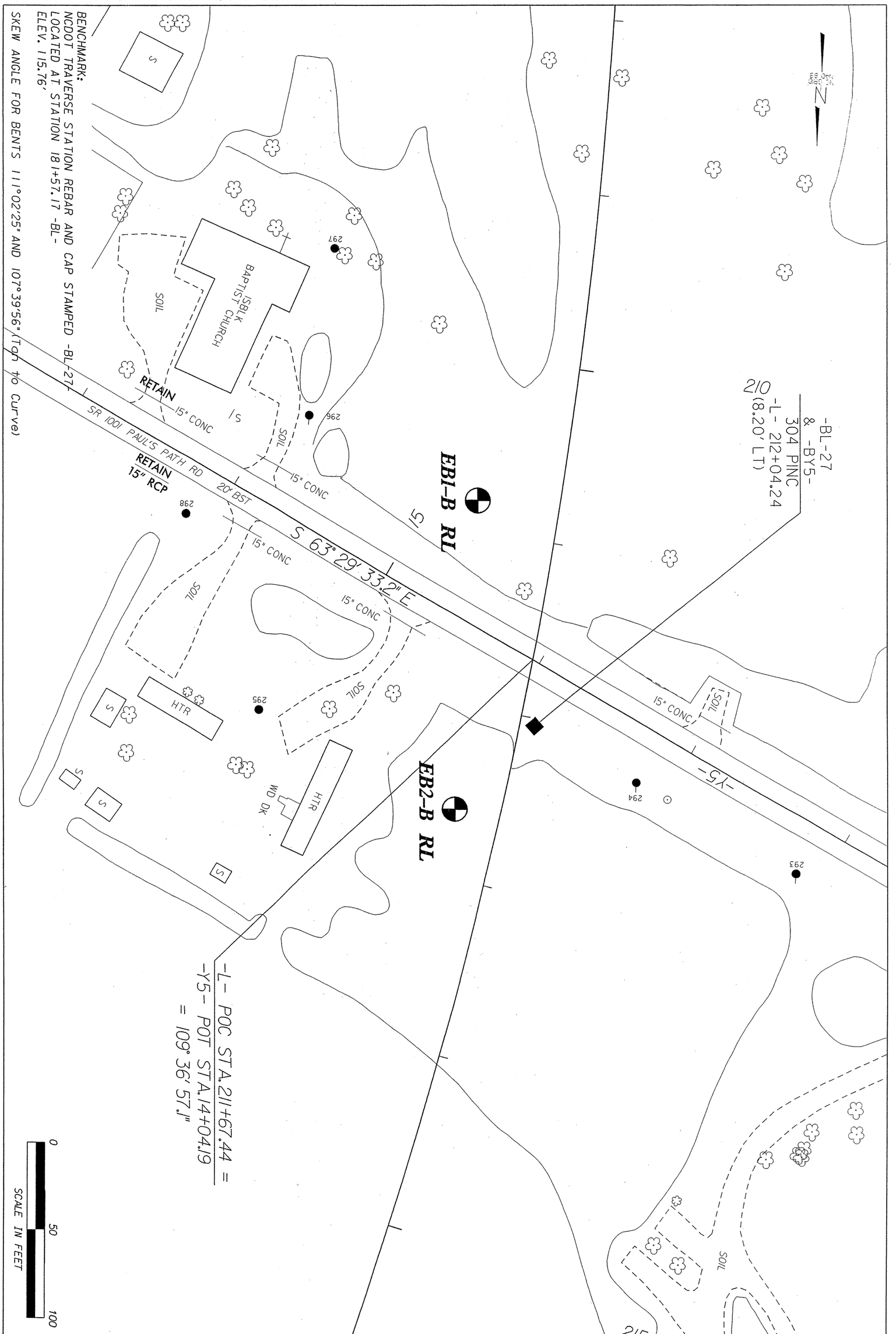
SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	APRIL 2008
JOB NO.	1051-08-074

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING •TESTING

SITE VICINITY MAP

BRIDGE No. 197 (RIGHT LANE)
ON -L- OVER PAULS PATH ROAD - SR1001 (-Y5-)
STATE PROJECT NO. 3450I.1.1 TIP NO. R-2719A
FEDERAL I.D. NO. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S:PROJECTS/2008/08-074/GEOTECH/CADD/R-2719A SITE PLAN BRIDGE 197 RL.DGN



BORING LOCATION PLAN

BRIDGE No. 197 (RIGHT LANE)
ON -L- OVER PAUL'S PATH ROAD - SR1001 (-Y5-)
TIP No. R-2719A STATE PROJECT No. 3450.1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

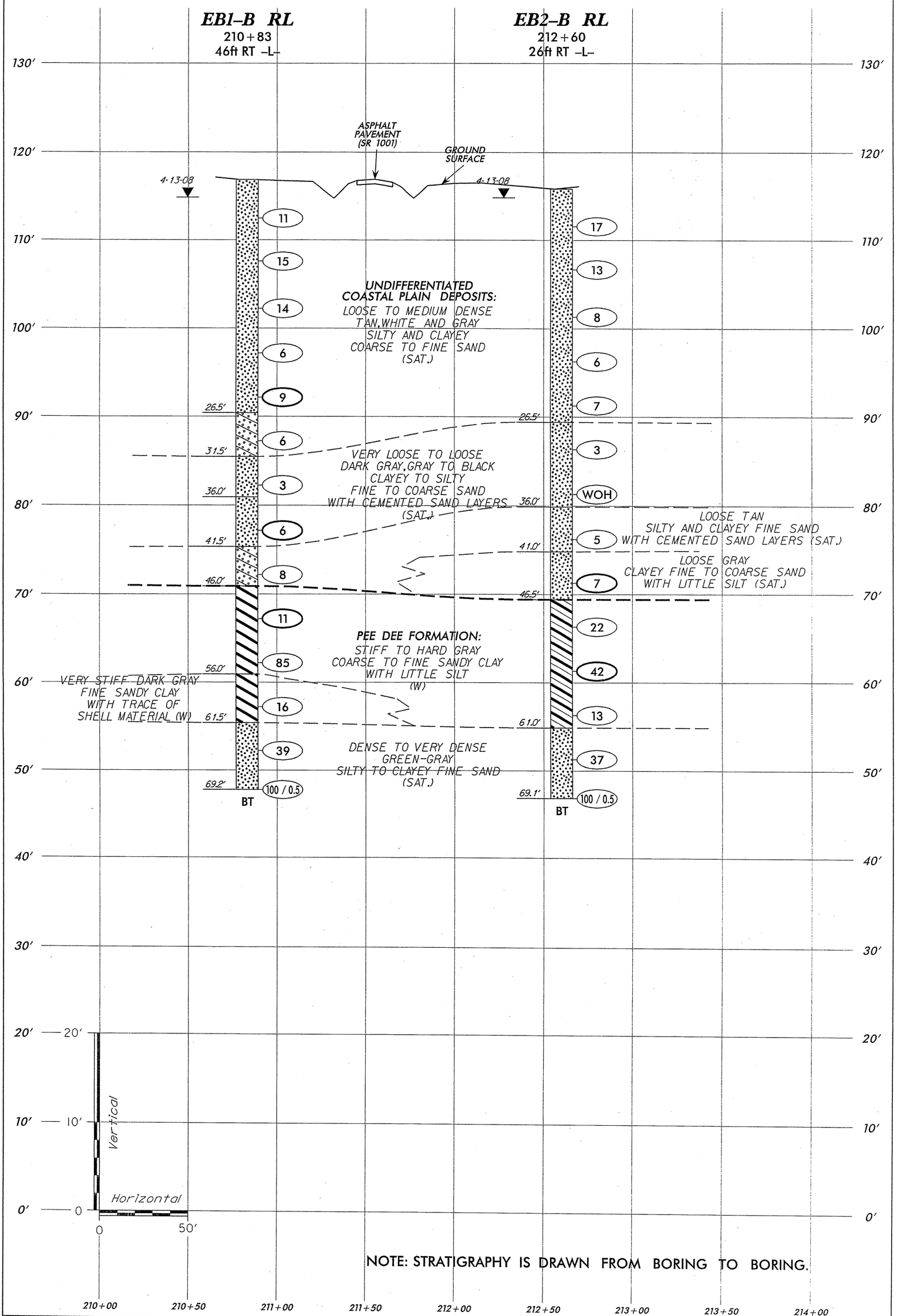
SCALE:	1" = 50'	APPROVED BY:	AFR
DATE:	APRIL 2008	DRAWN BY:	TRP
JOB NO.	1051-08-074	SHEET	14 OF 22

S:PROJECTS/2008/08-074/GEOTECH DOT/CADD/R-2719A 196-197 PROFILE-XSEC.DGN

TO SR 1554

GENERALIZED SUBSURFACE PROFILE 38' RIGHT OF -L-

TO US 258



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE 38.0' RIGHT OF -L-

BRIDGE No. 197 (RIGHT LANE)
ON -L- OVER PAUL'S PATH ROAD - SR1001 (-Y5-)
TIP No. R-2719A STATE PROJECT No. 3450.1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
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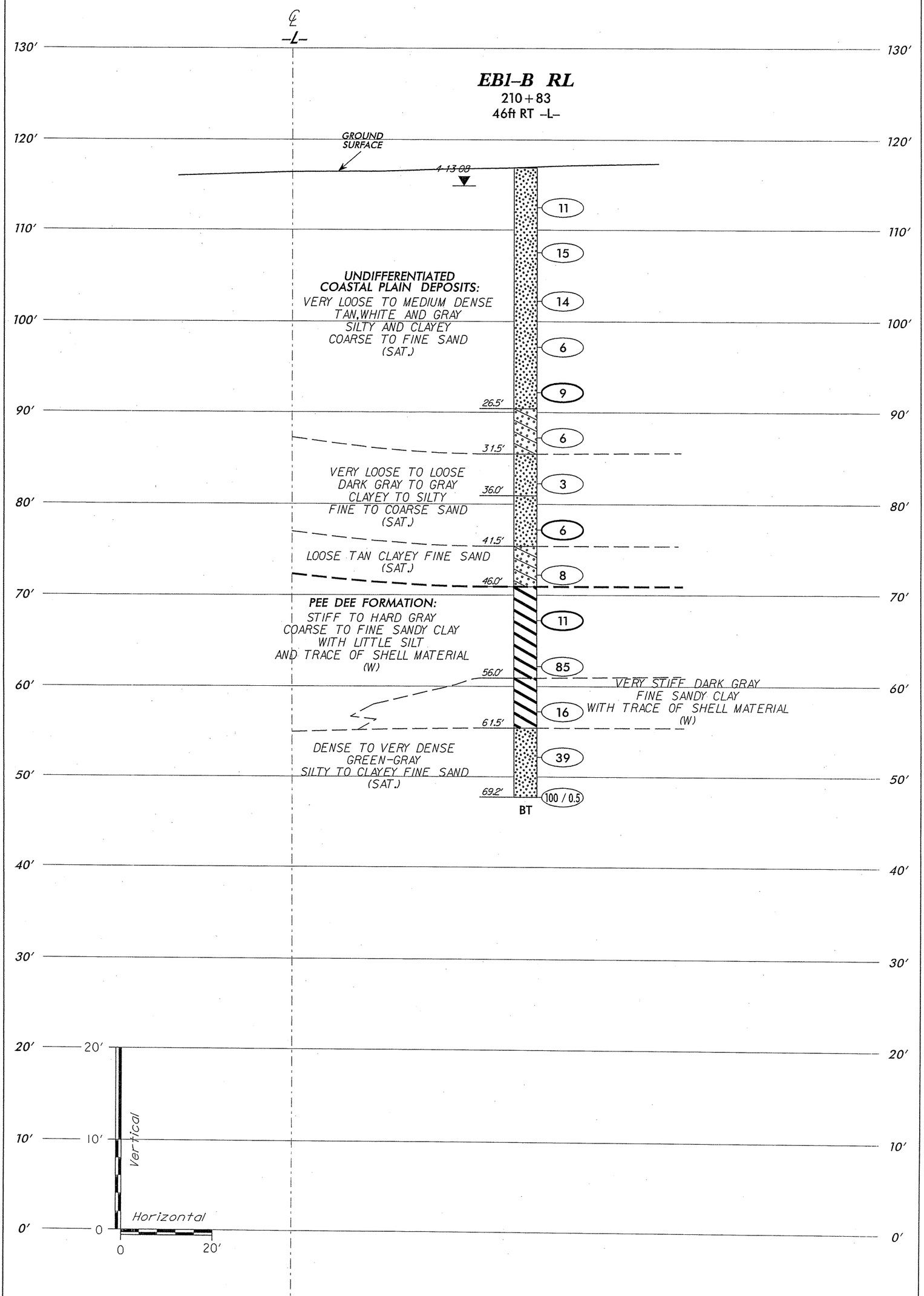
SCALE:	(V) 1" = 10' (H) 1" = 30'	APPROVED BY:	AFR
DATE:	APRIL 2008	DRAWN BY:	TRP
JOB NO.	1051-08-074	SHEET	15 OF 22

S:PROJECTS/2008/08-074/GEOTECH DOT/CADD/R-2719A 196-197 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 1 (RIGHT LANE)



GENERALIZED SUBSURFACE CROSS SECTION

THROUGH END BENT No. 1 (RIGHT LANE)
BRIDGE No. 197 (RIGHT LANE)
ON -L- OVER PAUL'S PATH ROAD - SR 1001 (-Y5-)
TIP No. R-2719A STATE PROJECT No. 3450 1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
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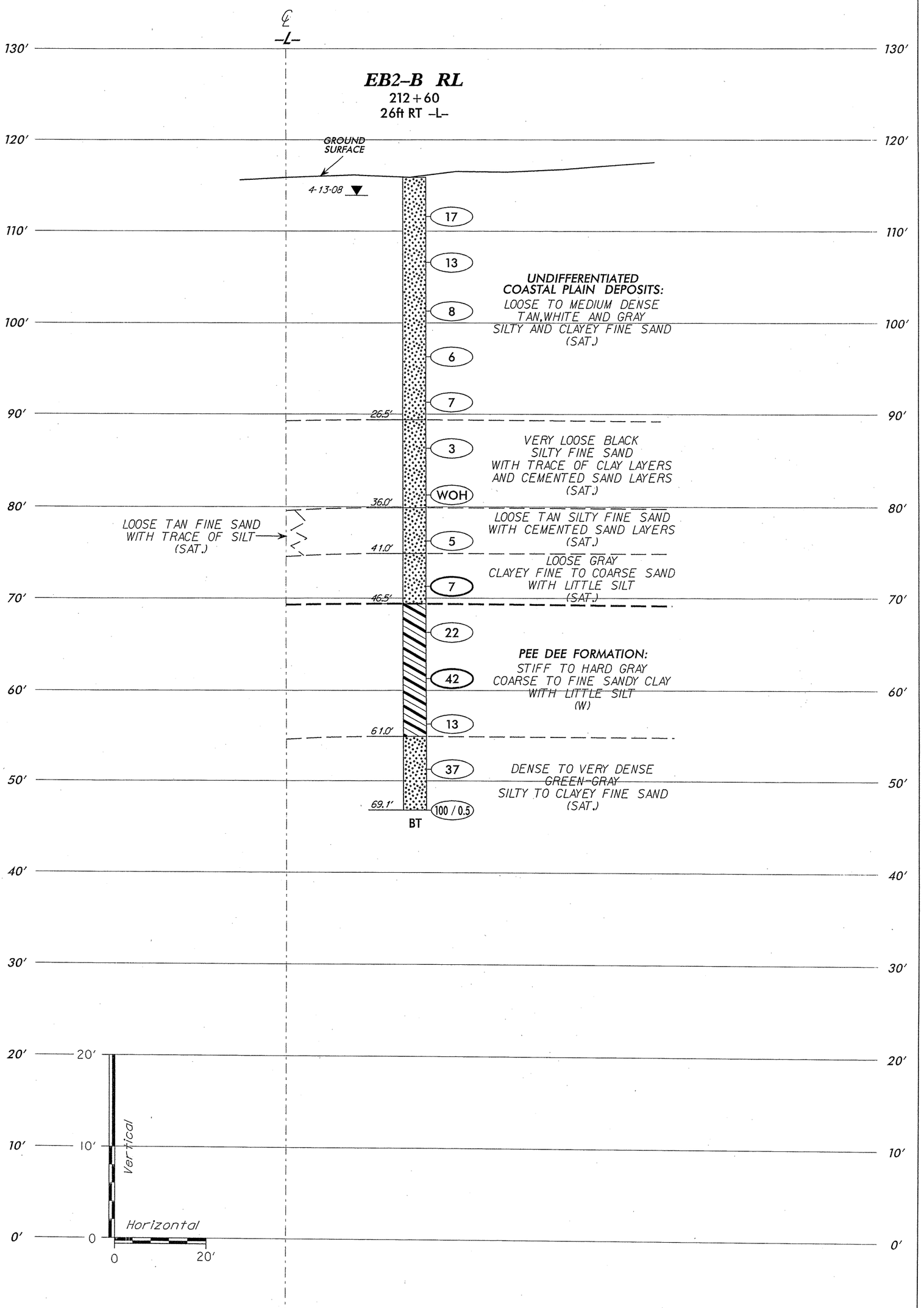
SCALE:	(V) 1" = 10′ (H) 1" = 20′	APPROVED BY:	AFR
DATE:	APRIL 2008	DRAWN BY:	TRP
JOB NO.	1051-08-074	SHEET	16 OF 22

S:PROJECTS/2008/08-074/GEOTECH DOT/CADD/R-2719A 196-197 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2 (RIGHT LANE)



GENERALIZED SUBSURFACE CROSS SECTION

THROUGH END BENT No. 2 (RIGHT LANE)
BRIDGE No. 197 (RIGHT LANE)
ON -L- OVER PAUL'S PATH ROAD - SR1001 (-Y5-)
TIP No. R-2719A STATE PROJECT No. 3450.1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	APRIL 2008	DRAWN BY:	TRP
JOB NO.	1051-08-074	SHEET	17 OF 22

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Dual Bridges No. 196 and No. 197 on -L- over S.R. 1001				**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 210+83	**OFFSET** 46ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 116.9 ft	**TOTAL DEPTH** 69.2 ft	**NORTHING** 568,295	**EASTING** 2,400,210	**24 HR.** 2.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 03/17/08	**COMP. DATE** 03/17/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
120										
115	113.5	3.4								116.9 / 0.0 GROUND SURFACE **Undifferentiated Coastal Plain Deposits** Medium Dense to Loose Light Gray to Tan Clayey Coarse to Fine SAND (A-2-4) With Trace of Silt
			5	5	6	11		M		
110	108.5	8.4								
			3	5	10	15		M		
105	103.2	13.7								
			7	7	7	14		Sat.		
100	98.2	18.7								
			4	2	4	6		Sat.		
95	93.2	23.7								
			4	4	5	9	SS-8	Sat.		
90	88.2	28.7								90.4 / 26.5 Loose Tan Clayey Fine SAND (A-2-6)
			5	4	2	6		Sat.		
85	83.2	33.7								85.4 / 31.5 Very Loose Dark Gray Silty Fine to Coarse SAND (A-2-4)
			1	1	2	3		Sat.		
80	78.2	38.7								80.9 / 36.0 Loose Gray Clayey Fine to Coarse SAND (A-2-4) With Trace of Silt
			2	2	4	6	SS-9	Sat.		
75	73.2	43.7								75.4 / 41.5 Loose Tan Clayey Fine SAND (A-2-6)
			1	2	6	8		Sat.		
70	68.2	48.7								70.9 / 46.0 **Pee Dee Formation** Stiff to Hard Dark Gray Coarse to Fine Sandy CLAY (A-7-6) With Little Silt
			3	4	7	11	SS-10	34.1%		
65	63.2	53.7								
			14	28	57	85		W		
60	58.2	58.7								60.9 / 56.0 Very Stiff Dark Gray Fine Sandy CLAY (A-7-6) With Trace of Shell Material
			6	7	9	16		W		
55	53.2	63.7								55.4 / 61.5 Dense to Very Dense Green-Gray Silty Fine SAND (A-2-4)
			16	14	25	39		Sat.		
50	48.2	68.7								
			87	13/0.0		100/0.5		Sat.		47.7 / 69.2 Boring Terminated at Elevation 47.7 ft in Very Dense Gray-Green Silty Fine Sand.
45										
40										

1) Advanced 3-1/4" HSA to 8.4 feet.
2) Advanced 2-7/8" Tricone to 68.7 feet.
3) Creek water with Quickgel added used as drilling fluid.
4) Approximate drilling fluid density 62.4 pcf.
5) No loss of drilling fluid observed.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Dual Bridges No. 196 and No. 197 on -L- over S.R. 1001				**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 210+83	**OFFSET** 46ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 116.9 ft	**TOTAL DEPTH** 69.2 ft	**NORTHING** 568,295	**EASTING** 2,400,210	**24 HR.** 2.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 03/17/08	**COMP. DATE** 03/17/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	40					Match Line				
35										
30										
25										
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										

4) Approximate drilling fluid density 62.4 pcf.
5) No loss of drilling fluid observed.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Dual Bridges No. 196 and No. 197 on -L- over S.R. 1001				**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 212+60	**OFFSET** 26ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 115.9 ft	**TOTAL DEPTH** 69.1 ft	**NORTHING** 568,471	**EASTING** 2,400,211	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 03/14/08	**COMP. DATE** 03/14/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	120									ELEV. (ft) 115.9 GROUND SURFACE — DEPTH (ft) 0.0
115	112.6	3.3								**Undifferentiated Coastal Plain Deposits** Medium Dense to Loose Tan Silty Fine SAND (A-2-4)
110	107.6	8.3	6	7	10	17		Sat.		
105	102.3	13.6	2	6	7	13		Sat.		
100	97.3	18.6	5	5	3	8		Sat.		
95	92.3	23.6	4	3	3	6		Sat.		
90	87.3	28.6		3		7		Sat.		ELEV. (ft) 89.4 — DEPTH (ft) 26.5
85	82.3	33.6	1	1	2	3		Sat.		Very Loose Black Silty Fine SAND (A-2-4)
80	77.3	38.6	1	WOH	WOH	WOH		Sat.		ELEV. (ft) 79.9 — DEPTH (ft) 36.0
75	72.3	43.6	2	3	2	5		Sat.		Loose Tan Silty Fine SAND (A-2-4) with Cemented Sand Layers
70	67.3	48.6	4	3	4	7	SS-11	Sat.		ELEV. (ft) 74.9 — DEPTH (ft) 41.0
65	62.3	53.6	7	10	12	22		W		Loose Gray Clayey Fine to Coarse SAND (A-2-4) With Little Silt
60	57.3	58.6	8	19	23	42	SS-12	25.0%		ELEV. (ft) 69.4 — DEPTH (ft) 46.5
55	52.3	63.6	6	6	7	13		W		**Pee Dee Formation**: Stiff to Hard Gray Coarse to Fine Sandy CLAY (A-6) With Little Silt
50	47.3	68.6	9	17	20	37		Sat.		ELEV. (ft) 54.9 — DEPTH (ft) 61.0
45			100/0.5			100/0.5		Sat.		Dense to Very Dense Green-Gray Silty Fine SAND (A-2-4) With Trace of Clay Layers
40										ELEV. (ft) 46.8 — DEPTH (ft) 69.1 Boring Terminated at Elevation 46.8 ft in Very Dense Green-Gray Silty Fine Sand.

1) Advanced 3-1/4" HSA to 8.3 Feet.
2) Advanced 2-7/8" Tricone to 68.6 Feet.
3) Creek Water with Quickgel added used as Drilling Fluid.
4) Approximate Drilling Fluid Density 62.4 pcf.
5) No Loss of Drilling Fluid Observed.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Dual Bridges No. 196 and No. 197 on -L- over S.R. 1001				**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 212+60	**OFFSET** 26ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 115.9 ft	**TOTAL DEPTH** 69.1 ft	**NORTHING** 568,471	**EASTING** 2,400,211	**24 HR.** 1.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA/Rotary Wash w/2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 03/14/08	**COMP. DATE** 03/14/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	40					Match Line				
35										
30										
25										
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										

NCDOT BORE DOUBLE 074.GPJ NC_DOT.GDT 4/18/08

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME Project #:	**1051-08-074**		Test Date(s):	4/12/2008
State Project No.:	34501.1.1	County: Lenior	Report Date:	4/10 - 4/12/08
Federal ID No.:	STP-0224(3)	TIP No. R-2719A		
Project Name:	**Bridges No. 196 and No. 197 on -L- Over S.R. 1001**			
Client Name:	NCDOT			
Client Address:	Raleigh, North Carolina			

Boring No.	Sample No.	Sample Depth (Feet)	AASHTO Classification		Total % Passing Sieve #					Total Mortar Fraction				LL	PL	PI	Moisture Content %
					10	40	60	200	270	Coarse Sand	Fine Sand	Silt	Clay				
EB1-B RL	SS-8	23.7-25.2	A-2-4	(0)	100	96	91	14	12	9	80	4	7	20	N.P.	N.P.	
EB1-B RL	SS-9	38.7-40.2	A-2-4	(0)	94	58	37	23	22	61	16	9	14	34	24	10	
EB1-B RL	SS-10	48.7-50.2	A-7-6	(13)	100	95	86	56	49	15	36	18	31	49	21	28	34.1
EB2-B RL	SS-11	43.6-45.1	A-2-4	(0)	100	89	64	34	27	37	36	11	16	32	22	10	
EB2-B RL	SS-12	53.6-55.1	A-6	(8)	100	96	91	59	45	9	46	16	29	37	20	17	25.0

Notes: NP=Nonplastic

Technical Responsibility: B. Riggs *Signature* Geotechnical Engineer *Position*

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

Photograph No. 2:
This photograph was taken from the right side of the -L- alignment, looking northwest, across proposed End Bent No. 1.

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

Photograph No. 4:
This photograph was taken from the -L- alignment, looking northwest, along Paul's Path Road – SR 1001 (-Y5-).

Photograph No. 5:
This photograph was taken from the -L- alignment, looking southeast, along Paul's Path Road – SR 1001 (-Y5-).

Photograph No. 6:
This photograph was taken from the -L- alignment, looking southeast, across proposed End Bent No. 2.

Photograph No. 7:
This photograph was taken from the right side of the -L- alignment, looking northwest, across proposed End Bent No. 2.

Photograph No. 8:
This photograph was taken from the north approach, right of the -L- alignment, looking south.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34501.1.1	1	26

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34501.1.1 F.A. PROJ. STP-0224(3)

COUNTY LENOIR

PROJECT DESCRIPTION CRESCENT ROAD IN KINSTON FROM US HIGHWAY 70 TO US HIGHWAY 258

SITE DESCRIPTION BRIDGE No. 198 AND BRIDGE No. 199 ON -L- OVER US HIGHWAY 258

ID: R-2719A

PROJECT: 34501.1.1

CONTENTS

Title Sheet	Sheet 1
NCDOT Geotechnical Engineering Unit Soil and Rock Classification Sheet	Sheet 2
Site Vicinity Map - Bridge 198 (Left Lane)	Sheet 3
Boring Location Plan - Bridge 198 (Left Lane)	Sheet 4
Generalized Subsurface Profile 70.0' LT. of -L-	Sheet 5
Generalized Subsurface Cross Sections	
Cross Section Along End Bent No. 1 Bridge 198 (Left Lane)	Sheet 6
Cross Section Along End Bent No. 1 Bridge 198 (Left Lane)	Sheet 7
Test Boring Logs - Bridge 198 (Left Lane)	Sheets 8 - 11
Summary of Laboratory Test Data Bridge 198 (Left Lane)	Sheet 12
Site Photographs - Bridge 198 (Left Lane)	Sheets 13 & 14
Site Vicinity Map - Bridge 199 (Right Lane)	Sheet 15
Boring Location Plan - Bridge 199 (Right Lane)	Sheet 16
Generalized Subsurface Profile 70.0' RT. of -L-	Sheet 17
Generalized Subsurface Cross Sections	
Cross Section Along End Bent No. 1 Bridge 199 (Right Lane)	Sheet 18
Cross Section Along End Bent No. 1 Bridge 199 (Right Lane)	Sheet 19
Test Boring Logs - Bridge 199 (Right Lane)	Sheets 20 - 23
Summary of Laboratory Test Data Bridge 199 (Right Lane)	Sheet 24
Site Photographs - Bridge 199 (Right Lane)	Sheets 25 & 26

CAUTION NOTICE

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

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

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

PERSONNEL

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T. PEREZ

INVESTIGATED BY S&ME, INC.

CHECKED BY A.F. RIGGS, JR.

SUBMITTED BY S&ME, INC.

DATE MARCH 17, 2008

For Letting

NORTH CAROLINA PROFESSIONAL SEAL 14155 ENGINEER ABNER F. RIGGS, JR. SEAL

SIGNATURE

DRAWN BY: T. PEREZ

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.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	34501.1.1	2	26

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT	6 MX		N.P.	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
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 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE
UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT- CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

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

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
- STATIC WATER LEVEL AFTER 24 HOURS.
- PW — PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA
- HC — HOLE CAVE
- SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP/DIP DIRECTION OF ROCK STRUCTURES
- ● - SOUNDING ROD
- WATER LOSS
- SPT / DMT / PMT — TEST BORING
- CPT TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- SPT TEST SAMPLE

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

ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

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

ADVANCING TOOLS:
- ☐ DRAG BITS _____
- ☐ 6" CONTINUOUS FLIGHT AUGER
- ☐ 8" HOLLOW AUGERS
- ☐ HARD FACED FINGER BITS
- ☐ TUNG.-CARBIDE INSERTS
- ☒ CASING ☐ W/ ADVANCER
- ☒ TRICONE 2-7/8" STEEL TEETH
- ☐ TRICONE _____" TUNG.-CARB.
- ☐ CORE BIT
- ☒ OTHER 3-1/4" H.S.A.

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

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

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

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

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.

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

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

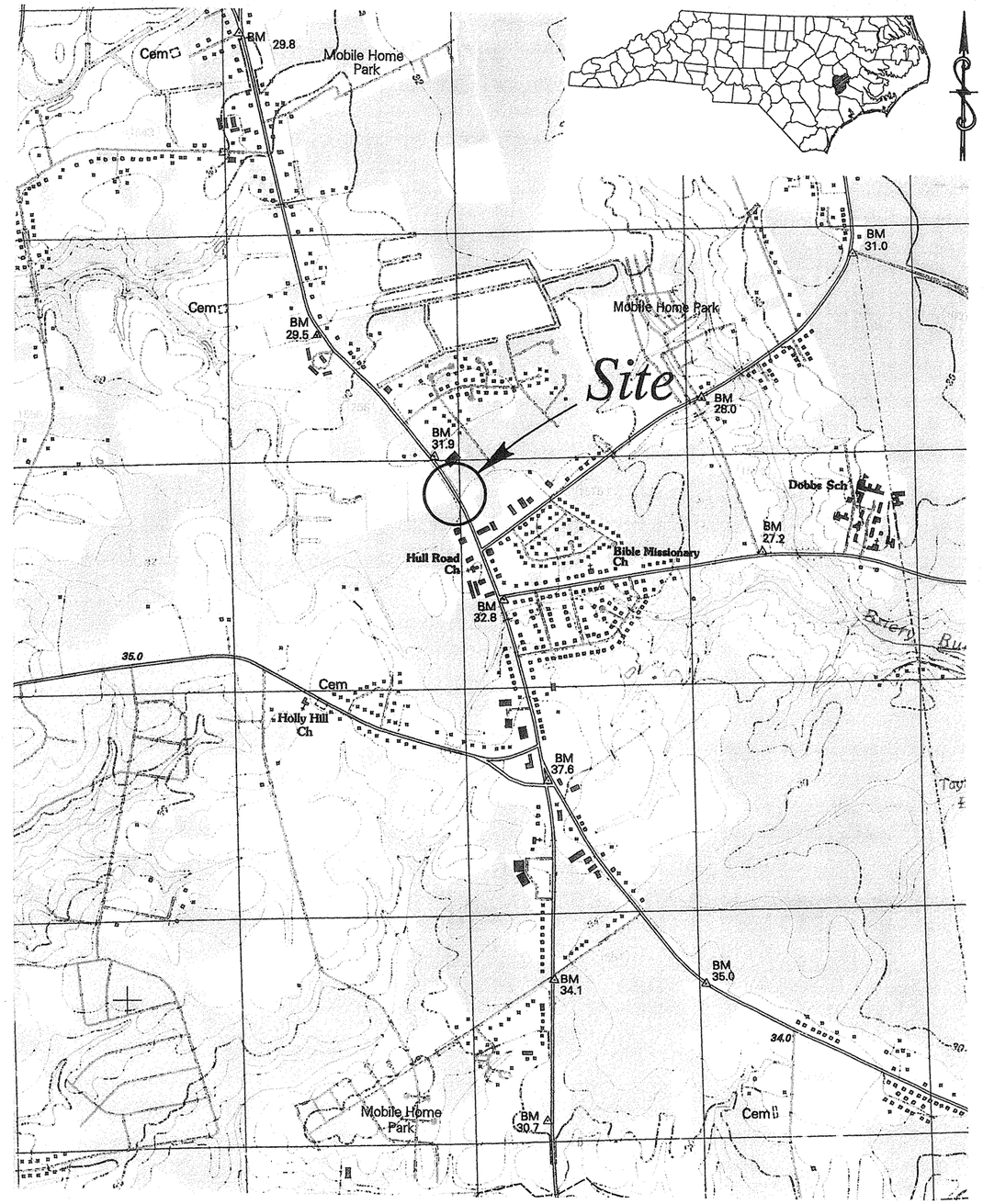
TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: NCDOT Traverse Station Rebar & Cap Stamped '-BL-32-'
Located at Station 217+59.17 -BL-
ELEVATION: 102.90'

NOTES:

REVISED 09/15/00

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	3450I.I.I	3	26



SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	MARCH 2008
JOB NO.	1051-08-049

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING

SITE VICINITY MAP

BRIDGE No. 198 (LEFT LANE)
ON -L- OVER US 258
STATE PROJECT NO. 3450 I. I. I TIP NO. R-2719A
FEDERAL I.D. NO. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S:\PROJECTS\2008\08-049\GEOTECH\CADD\R-2719A -SITEVIC 198 LL

NC GRID 83

TO SR 1001

-BL- 32 POT & -BY24- 305 PINC
-L- 248+05.94 (1.76' RT)

EB1-C

EB1-A LL

-Y24-

US 258 BST

40

362

361

359

360

318

EIP

-L- POT Sta. 248+68.10 =
-Y24- POC Sta. 39+75.47

EB2-C

N 64° 02' 45.2" E

TO SR 1574

250

CRESCENT ROAD (R-2719BA)
24' BST

CRESCENT ROAD (R-2719BA)
24' BST

EB2-A LL

0 30 60
SCALE IN FEET

BENCHMARK:
NCDOT TRAVERSE STATION REBAR AND CAP STAMPED -BL-32-
LOCATED AT STATION 217+59.17 -BL-
ELEV. 102.90'

SKEW ANGLE FOR BENTS 89° 12'44" (Tan to Curve)

S:\PROJECTS\2008\08-049\GEOTECH\CADD\R-2719A SITE PLAN BRIDGE 198 LL.DGN

SCALE:	1" = 30'
DATE:	MARCH 2008
JOB NO.	105 I-08-049
APPROVED BY:	AFR
DRAWN BY:	TRP
SHEET	4 OF 26

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

BORING LOCATION PLAN

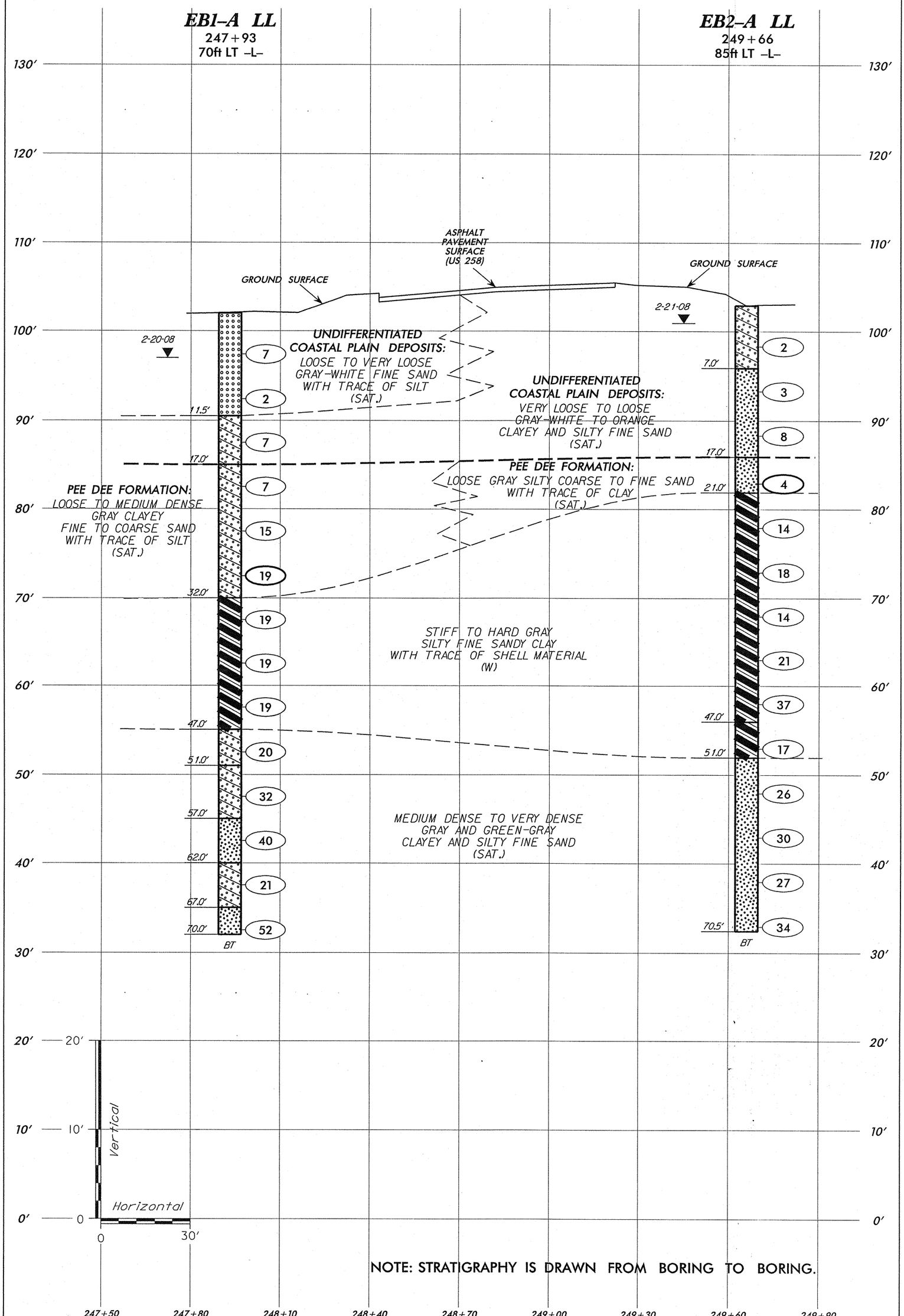
BRIDGE No. 198 (LEFT LANE)
ON -L- OVER US 258 (-Y24-)
STATE PROJECT No. 3450111 FEDERAL I.D. STP-0224(3)
TIP No. R-2719A LENOIR COUNTY, NORTH CAROLINA

S:PROJECTS/2008/08-049/GEOTECH DOT/CADD/R-2719A I98-I99 PROFILE-XSEC.DGN

TO S.R. 1001

GENERALIZED SUBSURFACE PROFILE 70' LEFT OF -L-

TO S.R. 1574



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE 70' LEFT OF -L-

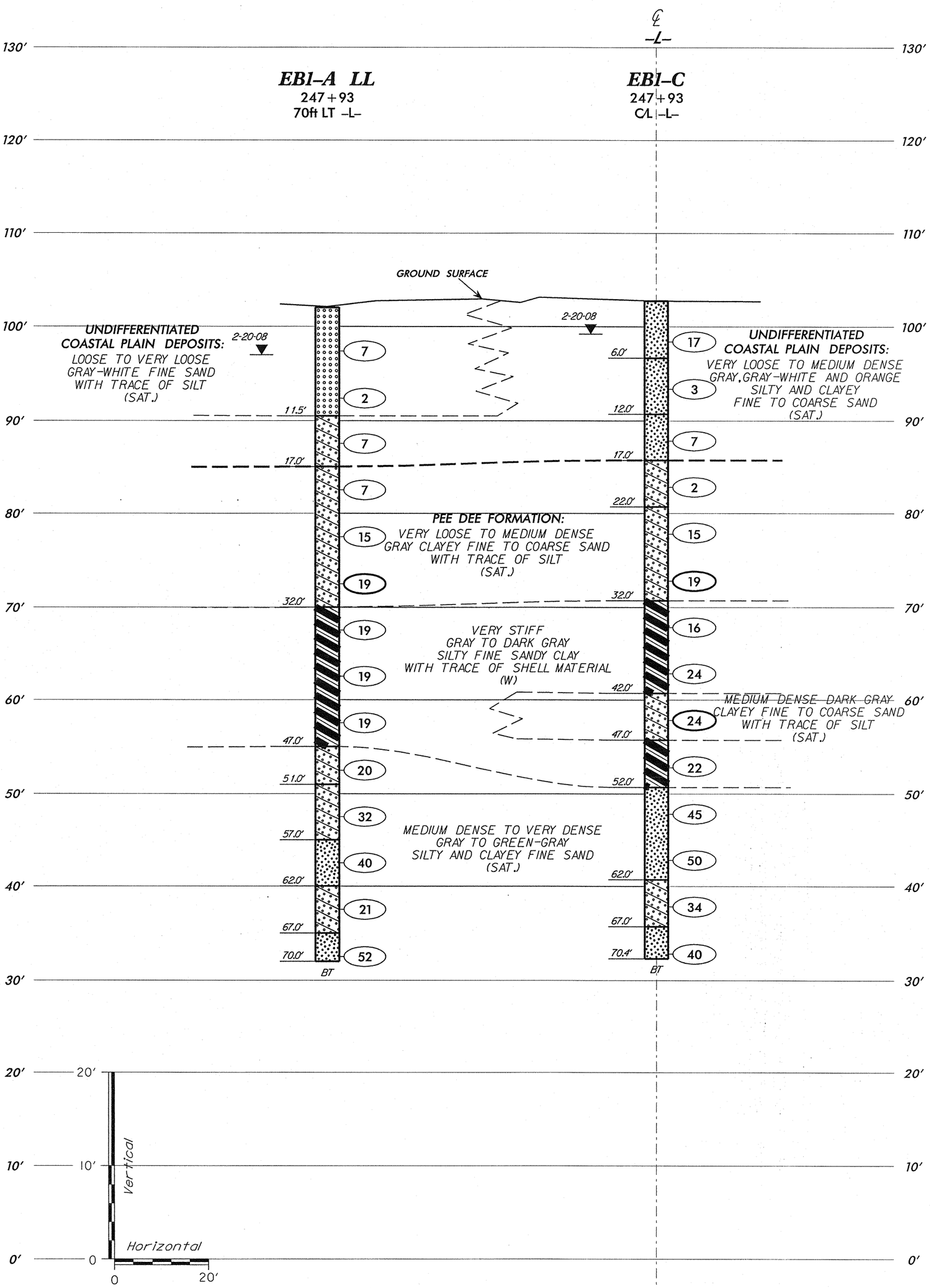
BRIDGE No. 198 (LEFT LANE)
ON -L- OVER US HIGHWAY 258 (-Y24-)
TIP No. R-2719A STATE PROJECT No. 3450I.I.I FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10' (H) 1" = 30'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-049	SHEET	5 OF 26

S:PROJECTS/2008/08-049/GEOTECH DOT/CADD/R-2719A 198-199 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 1 (LEFT LANE)



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

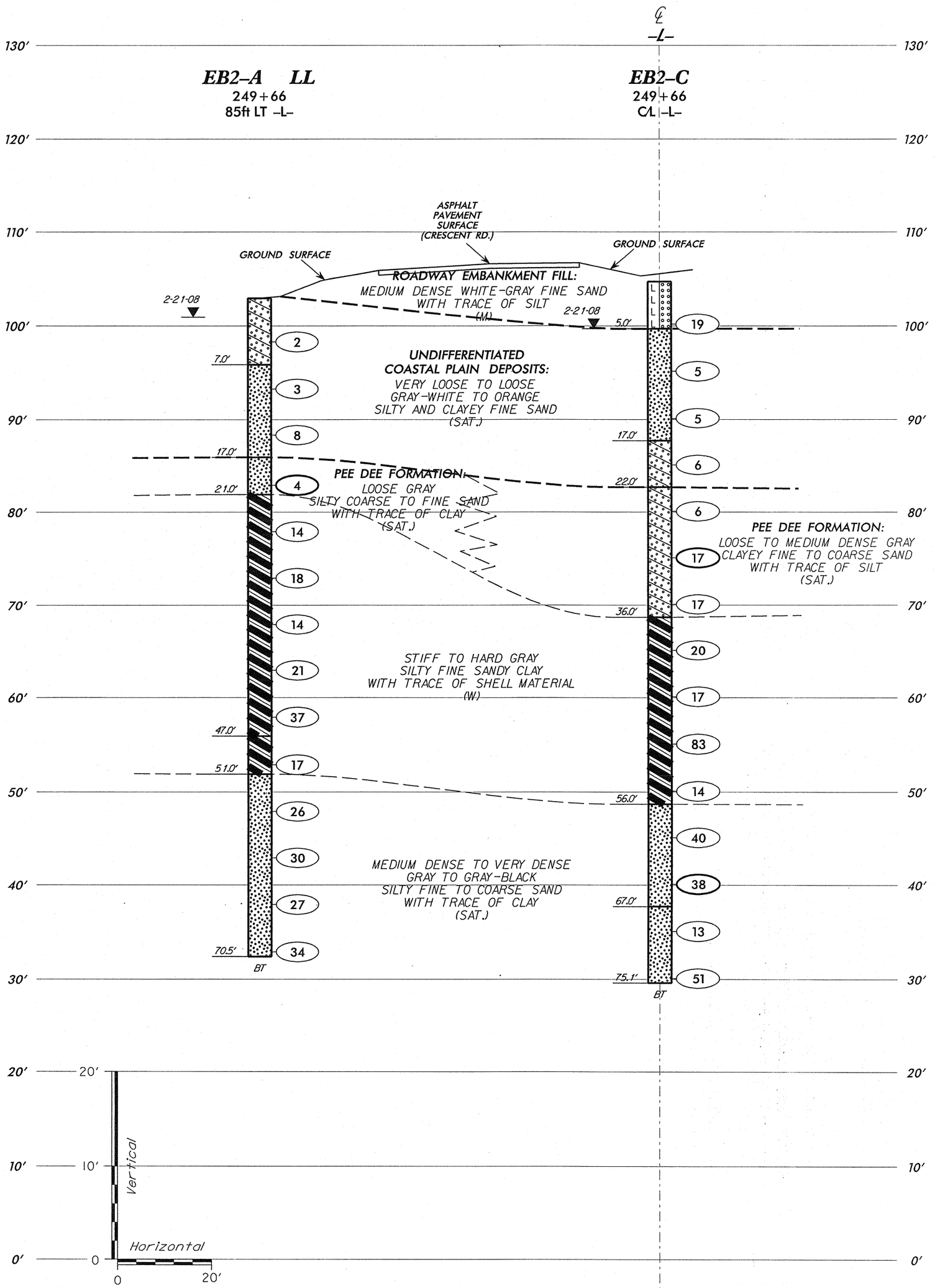
GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 1 (LEFT LANE)
BRIDGE No. 198 (LEFT LANE)
ON -L- OVER US HIGHWAY 258 (-Y24-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10′ (H) 1" = 20′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-049	SHEET	6 OF 26

S:PROJECTS/2008/08-049/GEOTECH DOT/CADD/R-2719A 198-199 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2 (LEFT LANE)



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 2 (LEFT LANE)
BRIDGE No. 198 (LEFT LANE)
ON -L- OVER US HIGHWAY 258 (-Y24-)
TIP No. R-2719A STATE PROJECT No. 3450 1.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10′ (H) 1" = 20′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-049	SHEET	7 OF 26

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258			**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 247+93	**OFFSET** 70ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 102.1 ft	**TOTAL DEPTH** 70.0 ft	**NORTHING** 571,027	**EASTING** 2,402,410 — **24 HR.** 5.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic
START DATE 02/19/08	**COMP. DATE** 02/19/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
	105									
										102.1 / 0.0 GROUND SURFACE
100	98.5	3.6								**UNDIFFERENTIATED COASTAL PLAIN DEPOSITS** LOOSE TO VERY LOOSE GRAY-WHITE FINE SAND (A-3) WITH TRACE OF SILT
95	93.5	8.6	3	3	4	7		Sat.		
90	88.6	13.5	3	1	1	2		Sat.		90.6 / 11.5 LOOSE ORANGE CLAYEY FINE SAND (A-2-6) WITH TRACE OF CLAY LAYERS
85	83.6	18.5	4	4	3	7		Sat.		85.1 / 17.0 **PEE DEE FORMATION**: LOOSE TO MEDIUM DENSE GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT
80	78.6	23.5	1	2	5	7		Sat.		
75	73.6	28.5	6	6	9	15		Sat.		
70	68.6	33.5	8	8	11	19	SS-1	Sat.		70.1 / 32.0 VERY STIFF GRAY SILTY FINE SANDY CLAY (A-6)
65	63.6	38.5	6	8	11	19		W		
60	58.6	43.5	6	7	12	19		W		
55	53.6	48.5	7	8	11	19		W		55.1 / 47.0 MEDIUM DENSE GRAY CLAYEY FINE SAND (A-2-6)
50	48.6	53.5	7	8	12	20		Sat.		51.1 / 51.0 DENSE GREEN-GRAY CLAYEY FINE SAND (A-2-6)
45	43.6	58.5	8	16	16	32		Sat.		45.1 / 57.0 DENSE GREEN-GRAY SILTY FINE SAND (A-2-4)
40	38.6	63.5	12	17	23	40		Sat.		40.1 / 62.0 MEDIUM DENSE GRAY CLAYEY FINE SAND (A-2-6)
35	33.6	68.5	10	8	13	21		Sat.		35.1 / 67.0 VERY DENSE GRAY SILTY FINE SAND (A-2-4)
30			15	24	28	52		Sat.		32.1 / 70.0 Boring Terminated at Elevation 32.1 ft In Very Dense Silty Fine Sand.
25										1) ADVANCED 3-1/4" HSA TO 8.6 FEET. 2) ADVANCED 2-7/8" TRICONE ROLLER TO 68.5 FEET.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258			**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 247+93	**OFFSET** 70ft LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 102.1 ft	**TOTAL DEPTH** 70.0 ft	**NORTHING** 571,027	**EASTING** 2,402,410 — **24 HR.** 5.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic
START DATE 02/19/08	**COMP. DATE** 02/19/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	25					Match Line				3) SURFACE WATER WITH QUICK GELL ADDED USED AS DRILLING FLUID. 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 5) NO LOSS OF DRILLING FLUID OBSERVED.
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										

NCDOT BORE DOUBLE 049.GPJ NC_DOT.GDT 3/17/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258			**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 247+93	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 102.8 ft	**TOTAL DEPTH** 70.4 ft	**NORTHING** 570,964	**EASTING** 2,402,441	**24 HR.** 3.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/19/08	**COMP. DATE** 02/19/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft) / DEPTH (ft)
	105									102.8 / 0.0 GROUND SURFACE
100	99.5	3.3								**UNDIFFERENTIATED COASTAL PLAIN DEPOSITS** MEDIUM DENSE GRAY SILTY FINE SAND (A-2-4)
	94.5	8.3	4	7	10	17		Sat.		96.8 / 6.0 VERY LOOSE GRAY-WHITE SILTY FINE SAND (A-2-4)
90	88.9	13.9	2	2	1	3		Sat.		90.8 / 12.0 LOOSE ORANGE SILTY FINE TO COARSE SAND (A-2-4)
85	83.9	18.9	5	2	5	7		Sat.		85.8 / 17.0 **PEE DEE FORMATION:** VERY LOOSE GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT
80	78.9	23.9	1	1	1	2		Sat.		80.8 / 22.0 MEDIUM DENSE GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT
75	73.9	28.9	4	6	9	15		Sat.		
70	68.9	33.9	7	8	11	19	SS-3	Sat.		70.8 / 32.0 VERY STIFF DARK GRAY SILTY FINE SANDY CLAY (A-6)
65	63.9	38.9	5	7	9	16		W		
60	58.9	43.9	7	10	14	24		Sat.		60.8 / 42.0 MEDIUM DENSE DARK GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT
55	53.9	48.9	8	10	14	24	SS-4	Sat.		55.8 / 47.0 VERY STIFF DARK GRAY SILTY FINE SANDY CLAY (A-6) WITH TRACE OF SHELL MATERIAL
50	48.9	53.9	6	9	13	22		W		50.8 / 52.0 DENSE GREEN-GRAY SILTY FINE SAND (A-2-4)
45	43.9	58.9	9	17	28	45		Sat.		
40	38.9	63.9	12	17	33	50		Sat.		40.8 / 62.0 DENSE GRAY CLAYEY FINE SAND (A-2-6) WITH TRACE OF SHELL MATERIAL
35	33.9	68.9	12	16	18	34		Sat.		35.8 / 67.0 DENSE GRAY SILTY FINE SAND (A-2-4)
30			13	18	22	40		Sat.		32.4 / 70.4 Boring Terminated at Elevation 32.4 ft In Dense Silty Fine Sand.
25										1) ADVANCED 3-1/4" HSA TO 8.3 FEET. 2) ADVANCED 2-7/8" TRICONE ROLLER TO 68.9 FEET. 3) SURFACE WATER WITH QUICK GELL ADDED USED AS DRILLING FLUID. 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 5) NO LOSS OF DRILLING FLUID OBSERVED. 6) AUGER PROBED DOWN TO 18.0 FEET AND PUSED SHELBY TUBE FROM 18.0 TO 20.0 FEET.

Other Samples:
ST-1 (18.0 - 20.0)

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258			**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 247+93	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 102.8 ft	**TOTAL DEPTH** 70.4 ft	**NORTHING** 570,964	**EASTING** 2,402,441	**24 HR.** 3.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/19/08	**COMP. DATE** 02/19/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	25					Match Line				
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 249+66	**OFFSET** 85ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 103.0 ft	**TOTAL DEPTH** 70.5 ft	**NORTHING** 571,116	**EASTING** 2,402,559	**24 HR.** 2.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/20/08	**COMP. DATE** 02/20/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
	105									103.0 GROUND SURFACE 0.0
100	99.4	3.6	1	1	1	2		Sat.		**UNDIFFERENTIATED COASTAL PLAIN DEPOSITS** VERY LOOSE GRAY CLAYEY FINE SAND (A-2-6)
95	94.4	8.6	1	2	1	3		Sat.		96.0 7.0 VERY LOOSE TO LOOSE GRAY-WHITE TO ORANGE SILTY FINE SAND (A-2-4)
90	89.4	13.6	2	4	4	8		Sat.		
85	84.0	19.0	1	2	2	4	SS-2	Sat.		86.0 17.0 **PEE DEE FORMATION** LOOSE GRAY SILTY COARSE TO FINE SAND (A-2-4) WITH TRACE OF CLAY
80	79.0	24.0	5	5	9	14		W		82.0 21.0 STIFF TO HARD GRAY SILTY FINE SANDY CLAY (A-6)
75	74.0	29.0	5	7	11	18		W		
70	69.0	34.0	5	6	8	14		W		
65	64.0	39.0	6	8	13	21		W		
60	59.0	44.0	7	11	26	37		W		56.0 47.0 VERY STIFF GRAY SILTY FINE SANDY CLAY (A-6) WITH TRACE OF SHELL MATERIAL
55	54.0	49.0	6	8	9	17		W		52.0 51.0 MEDIUM DENSE TO DENSE GRAY SILTY FINE SAND (A-2-4)
50	49.0	54.0	7	10	16	26		Sat.		
45	44.0	59.0	7	10	20	30		Sat.		
40	39.0	64.0	13	13	14	27		Sat.		
35	34.0	69.0	8	16	18	34		Sat.		32.5 70.5 Boring Terminated at Elevation 32.5 ft In Dense Silty Fine Sand.
30										1) ADVANCED 3-1/4" HSA TO 13.6 FEET. 2) ADVANCED 2-7/8" TRICONE ROLLER TO 69.0 FEET. 3) SURFACE WATER WITH QUICK GELL ADDED USED AS DRILLING FLUID. 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 5) NO LOSS OF DRILLING FLUID OBSERVED.
25										

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 249+66	**OFFSET** 85ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 103.0 ft	**TOTAL DEPTH** 70.5 ft	**NORTHING** 571,116	**EASTING** 2,402,559	**24 HR.** 2.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/20/08	**COMP. DATE** 02/20/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	25					Match Line				
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										

NCDOT BORE DOUBLE 049.GPJ NC_DOT.GDT 3/17/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 249+66	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 104.7 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 571,040	**EASTING** 2,402,596	**24 HR.** 5.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/20/08	**COMP. DATE** 02/20/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. ft / DEPTH ft)
	105									104.7 GROUND SURFACE 0.0
	101.2	3.5						M		**ROADWAY EMBANKMENT FILL** MEDIUM DENSE WHITE-GRAY FINE SAND (A-3) WITH TRACE OF SILT — 99.7 / 5.0
100	96.2	8.5	4	8	11	19				**UNDIFFERENTIATED COASTAL PLAIN DEPOSITS** LOOSE GRAY-WHITE SILTY FINE SAND (A-2-4)
95	91.1	13.6	7	3	2	5		Sat.		
90	86.1	18.6	2	2	3	5		Sat.		
85	81.1	23.6	3	4	2	6		Sat.		LOOSE ORANGE CLAYEY FINE SAND (A-2-6) — 87.7 / 17.0
80	76.1	28.6	2	2	4	6		Sat.		**PEE DEE FORMATION:** LOOSE TO MEDIUM DENSE GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT — 82.7 / 22.0
75	71.1	33.6	7	8	9	17	SS-5	Sat.		
70	66.1	38.6	6	8	9	17		Sat.		
65	61.1	43.6	5	9	11	20		W		
60	56.1	48.6	6	7	10	17		W		
55	51.1	53.6	6	8	75	83		W		
50	46.1	58.6	5	6	8	14		W		STIFF TO HARD GRAY SILTY FINE SANDY CLAY (A-6) — 68.7 / 36.0
45	41.1	63.6	19	16	24	40		Sat.		DENSE GRAY-BLACK COARSE TO FINE SAND (A-2-4) WITH TRACE OF SILT AND CLAY — 48.7 / 56.0
40	36.1	68.6	12	16	22	38	SS-6	Sat.		MEDIUM DENSE TO VERY DENSE GRAY-BLACK SILTY FINE SAND (A-2-4) — 37.7 / 67.0
35	31.1	73.6	6	5	8	13		Sat.		
30			10	13	38	51		Sat.		Boring Terminated at Elevation 29.6 ft In Very Dense Silty Fine Sand. — 29.6 / 75.1
25										1) ADVANCED 3-1/4" HSA TO 8.5 FEET.

2) ADVANCED 2-7/8" TRICONE ROLLER TO 73.6 FEET.
3) SURFACE WATER WITH QUICK GELL ADDED USED AS DRILLING FLUID.
4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF.
5) NO LOSS OF DRILLING FLUID OBSERVED.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 249+66	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 104.7 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 571,040	**EASTING** 2,402,596	**24 HR.** 5.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/20/08	**COMP. DATE** 02/20/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	25					Match Line				
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										

NCDOT BORE DOUBLE 049.GPJ NC_DOT.GDT 3/17/08

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME Project #:	**1051-08-049**			Test Date(s):	2/26 - 3/1/08
State Project No.:	34501.1.1	County:	Lenoir	Report Date:	3/1/2008
Federal ID No.:	STP-0224(3)	TIP No.:	R-2719A		
Project Name:	**Bridge No. 198 on -L- Over US 258 (Left Lane)**				
Client Name:	NCDOT				
Client Address:	Raleigh, NC				

Boring No.	Sample No.	Sample Depth (Feet)	AASHTO Classification	Total % Passing Sieve #					Total Mortar Fraction				LL	PL	PI	Moisture Content %
				10	40	60	200	270	Coarse Sand	Fine Sand	Silt	Clay				
EB1-A LL	SS-1	28.5	A-2-6 (0)	99	78	39	29.5	28	38	34	7	21	27	16	11	ND
EB2-A LL	SS-2	19.0	A-2-4 (0)	90	86	81	15.4	13	11	75	10	4	24	21	3	ND
EB1-C	ST-1	18-20	A-2-6 (0)	79	49	28	19.7	18	64	13	7	16	31	16	15	ND
EB1-C	SS-3	28.9	A-2-6 (0)	99	80	64	33.2	32	36	33	6	25	28	14	14	ND
EB1-C	SS-4	43.9	A-2-6 (0)	100	75	55	26.1	24	45	31	8	16	36	18	18	ND
EB2-C	SS-5	28.6	A-2-6 (0)	99	73	53	26.3	25	47	28	5	20	30	15	15	ND
EB2-C	SS-6	63.6	A-2-4 (0)	100	94	58	12.5	11	42	47	4	7	18	N.P.	N.P.	ND

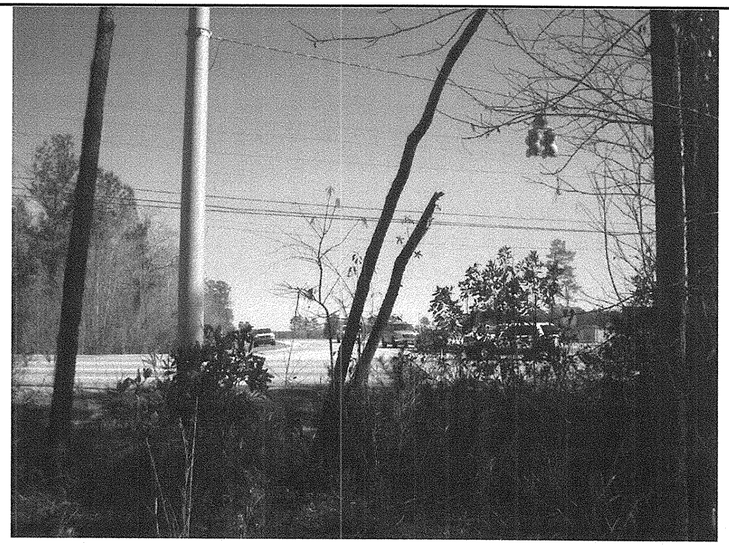
Notes: ND=Not Determined, N.P.=Nonplastic

Technical Responsibility: B. Riggs

Signature

Geotechnical Engineer

Position

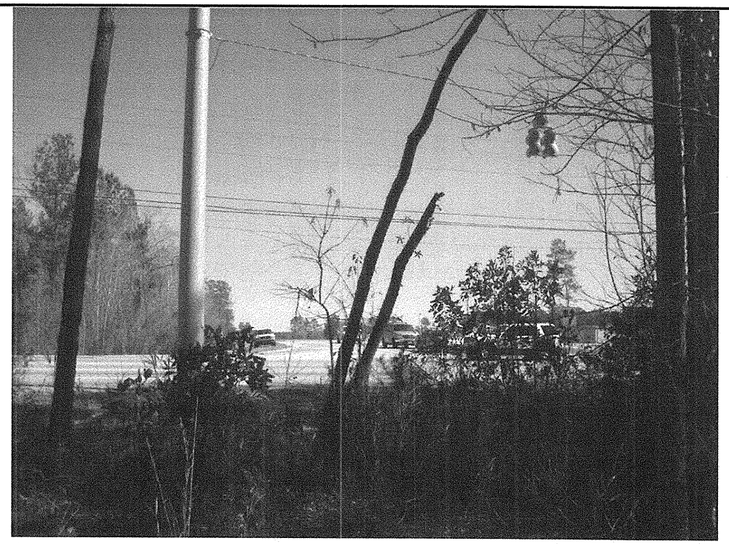


Photograph No. 1:
This photograph was taken from the west approach, left of the -L- alignment, looking east.

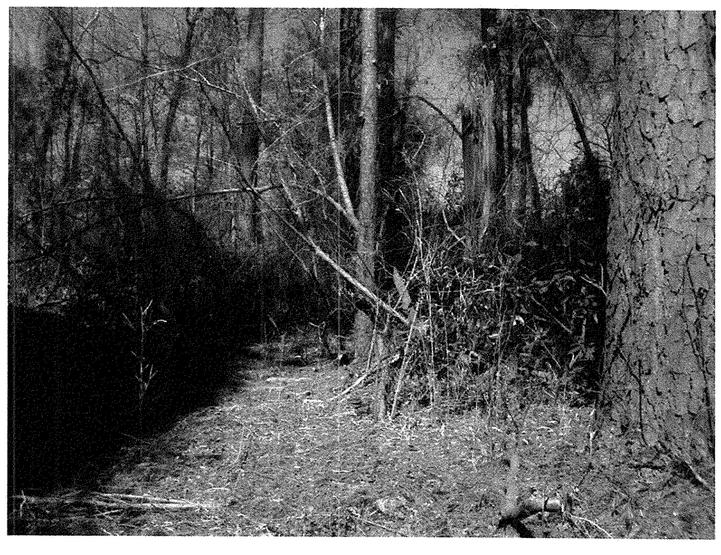
Photograph No. 2:
This photograph was taken from the -L- alignment, looking north, across proposed End Bent No. 1.

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

Photograph No. 4:
This photograph was taken from the -L- alignment, looking north along US Highway 258 (-Y24-).



Photograph No. 1:
This photograph was taken from the west approach, left of the -L- alignment, looking east.

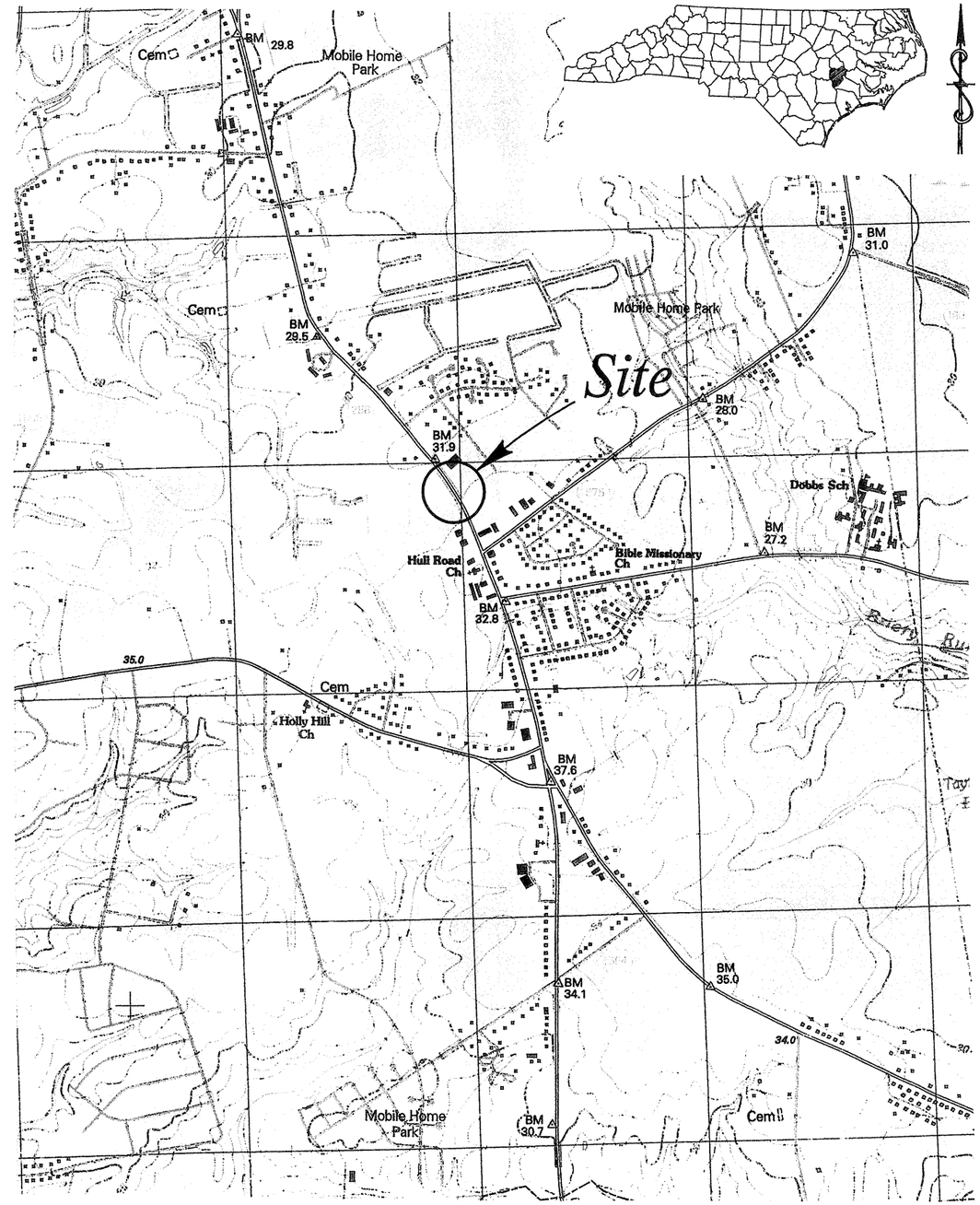


Photograph No. 2:
This photograph was taken from the -L- alignment, looking north, across proposed End Bent No. 1.

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

Photograph No. 4:
This photograph was taken from the -L- alignment, looking north along US Highway 258 (-Y24-).

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2719A	3450I.1.1	15	26



SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	MARCH 2008
JOB NO.	1051-08-049

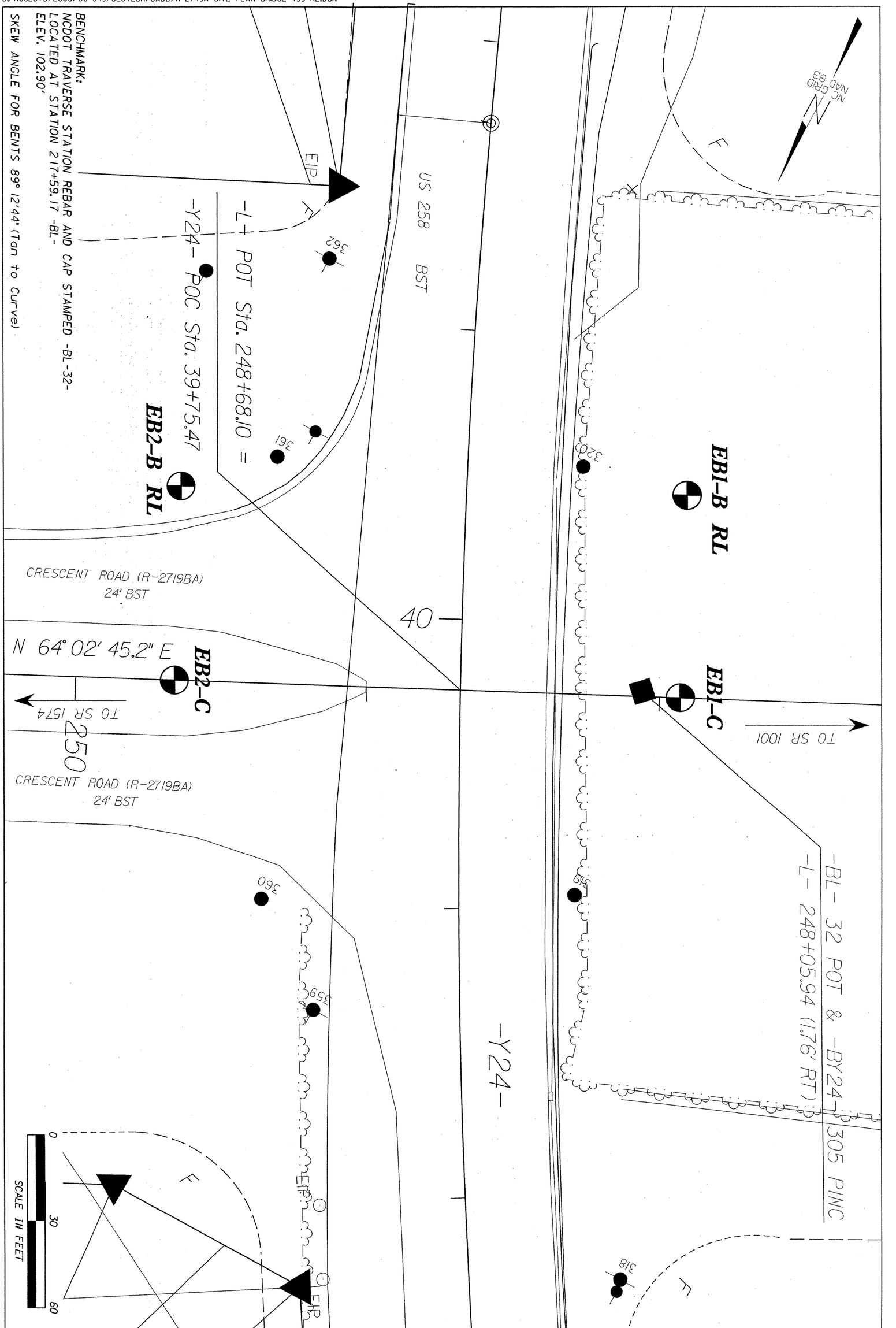
S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING

SITE VICINITY MAP

BRIDGE No. 199 (RIGHT LANE)
ON -L- OVER US 258
STATE PROJECT NO. 3450 I. 1. 1 TIP NO. R-2719A
FEDERAL I.D. NO. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S:PROJECTS/2008/08-049/GEOTECH/CADD/R-2719A -SITEVIC 199 RL

S:PROJECTS/2008/08-049/GEOTECH/CADD/R-2719A SITE PLAN BRIDGE 199 RL.DGN



BORING LOCATION PLAN

BRIDGE No. 199 (RIGHT LANE)
ON -L- OVER US 258 (-Y24-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

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ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

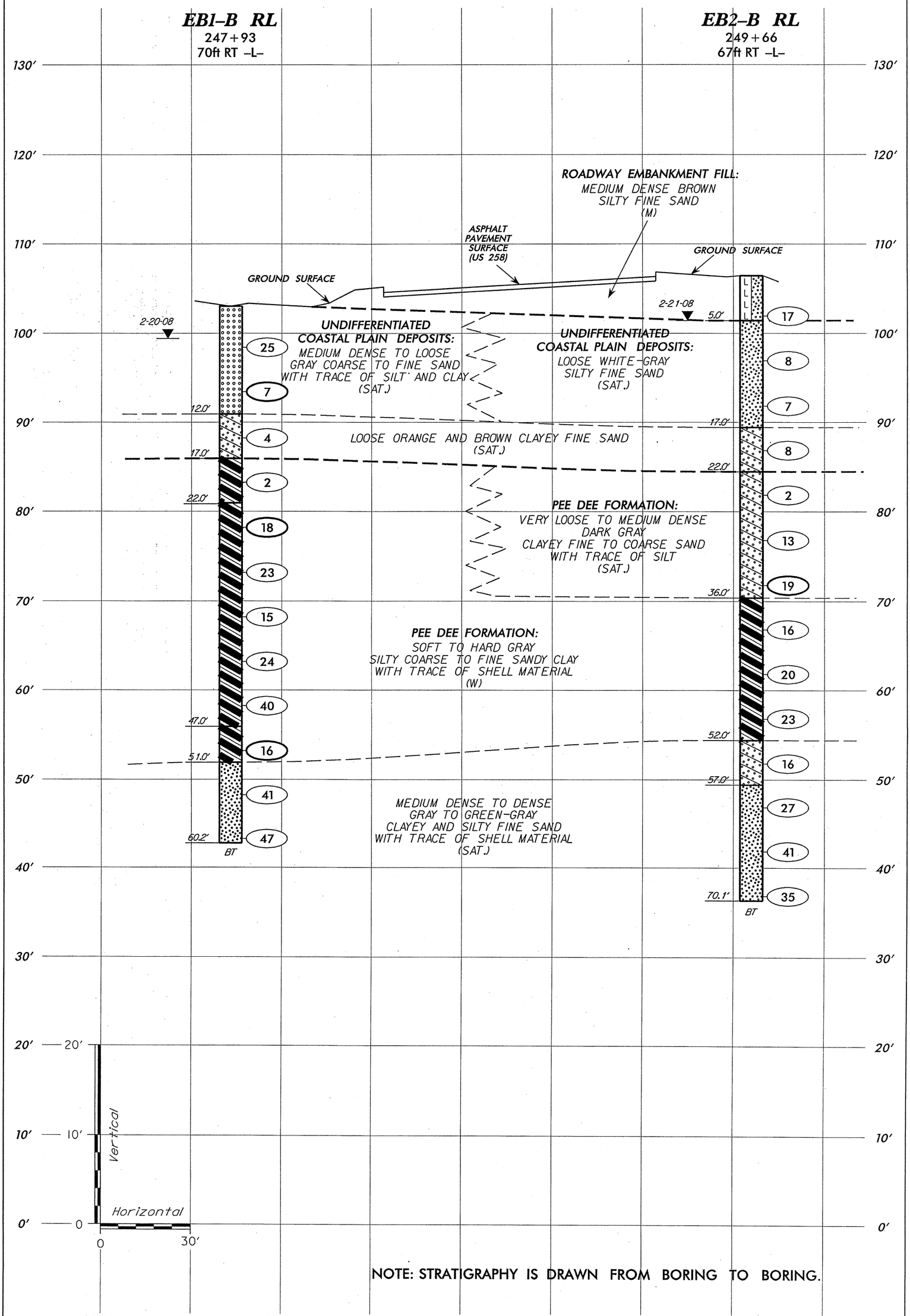
SCALE:	1" = 30'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-049	SHEET	16 OF 26

S:PROJECTS/2008/08-049/GEOTECH DOT/CADD/R-2719A 198-199 PROFILE-XSEC.DGN

TO S.R. 1001

GENERALIZED SUBSURFACE PROFILE 70' RIGHT OF -L-

TO S.R. 1574



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE 70' RIGHT OF -L-

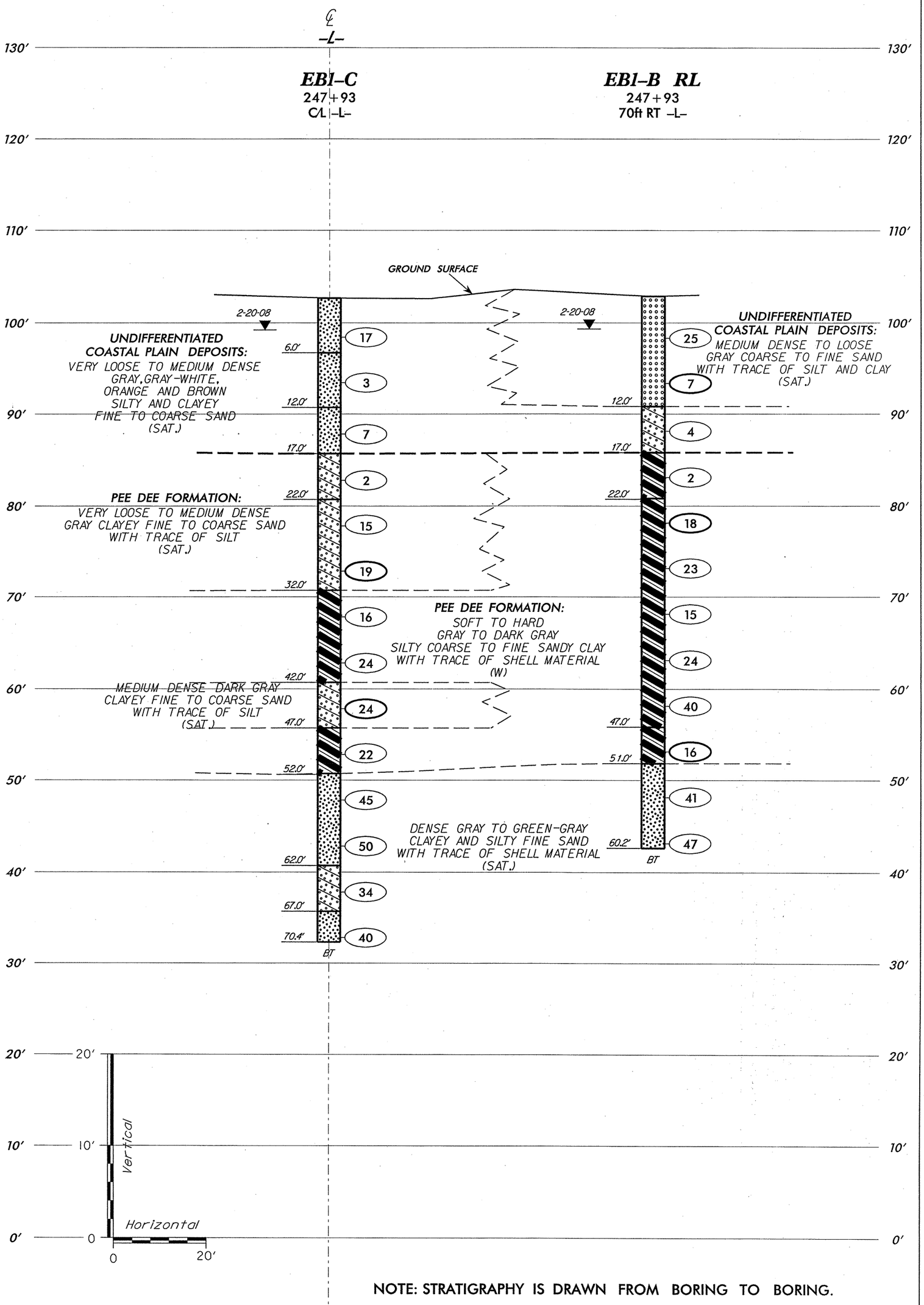
BRIDGE No. 199 (RIGHT LANE)
ON -L- OVER US HIGHWAY 258 (-Y24-)
TIP No. R-2719A STATE PROJECT No. 3450 I. I. I FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10' (H) 1" = 30'	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-049	SHEET	17 OF 26

S:PROJECTS/2008/08-049/GEOTECH DOT/CADD/R-2719A 198-199 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 1 (RIGHT LANE)



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

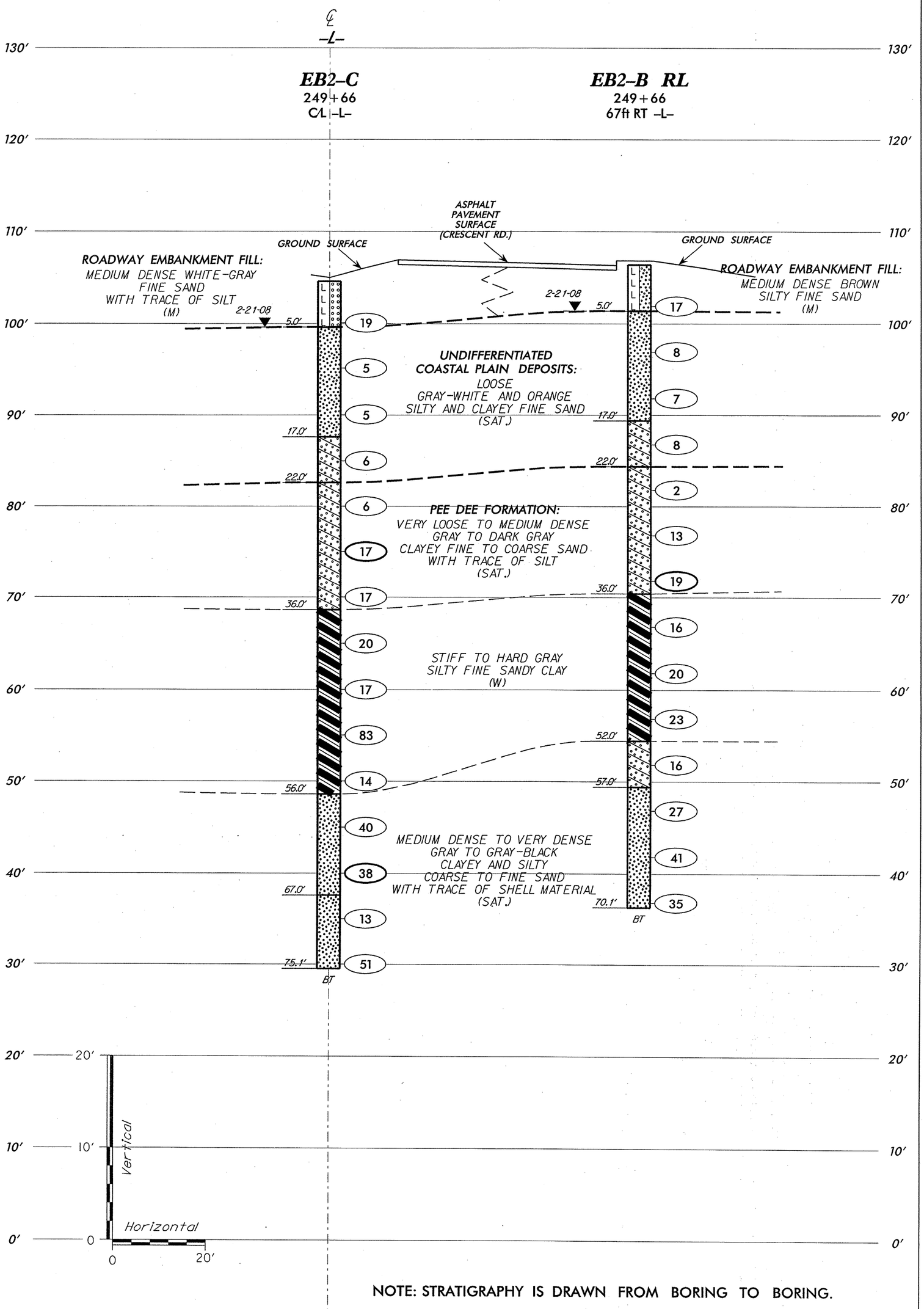
GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 1 (RIGHT LANE)
BRIDGE No. 199 (RIGHT LANE)
ON -L- OVER US HIGHWAY 258 (-Y24-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

SCALE:	(V) 1" = 10′ (H) 1" = 20′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-049	SHEET	18 OF 26

S:PROJECTS/2008/08-049/GEOTECH DOT/CADD/R-2719A 198-199 PROFILE-XSEC.DGN

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2 (RIGHT LANE)



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION
THROUGH END BENT No. 2 (RIGHT LANE)
BRIDGE No. 199 (RIGHT LANE)
ON -L- OVER US HIGHWAY 258 (-Y24-)
TIP No. R-2719A STATE PROJECT No. 34501.1.1 FEDERAL I.D. STP-0224(3)
LENOIR COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10′ (H) 1" = 20′	APPROVED BY:	AFR
DATE:	MARCH 2008	DRAWN BY:	TRP
JOB NO.	1051-08-049	SHEET	19 OF 26

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 247+93	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 102.8 ft	**TOTAL DEPTH** 70.4 ft	**NORTHING** 570,964	**EASTING** 2,402,441	**24 HR.** 3.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/19/08	**COMP. DATE** 02/19/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft) / DEPTH (ft)
	105									102.8 / 0.0 GROUND SURFACE
100	99.5	3.3	4	7	10	17		Sat.		**UNDIFFERENTIATED COASTAL PLAIN DEPOSITS** MEDIUM DENSE GRAY SILTY FINE SAND (A-2-4)
95	94.5	8.3	2	2	1	3		Sat.		96.8 / 6.0 VERY LOOSE GRAY-WHITE SILTY FINE SAND (A-2-4)
90	88.9	13.9	5	2	5	7		Sat.		90.8 / 12.0 LOOSE ORANGE SILTY FINE TO COARSE SAND (A-2-4)
85	83.9	18.9	1	1	1	2		Sat.		85.8 / 17.0 **PEE DEE FORMATION:** VERY LOOSE GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT
80	78.9	23.9	4	6	9	15		Sat.		80.8 / 22.0 MEDIUM DENSE GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT
75	73.9	28.9	7	8	11	19	SS-3	Sat.		
70	68.9	33.9	5	7	9	16		W		70.8 / 32.0 VERY STIFF DARK GRAY SILTY FINE SANDY CLAY (A-6)
65	63.9	38.9	7	10	14	24		Sat.		
60	58.9	43.9	8	10	14	24	SS-4	Sat.		60.8 / 42.0 MEDIUM DENSE DARK GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT
55	53.9	48.9	6	9	13	22		W		55.8 / 47.0 VERY STIFF DARK GRAY SILTY FINE SANDY CLAY (A-6) WITH TRACE OF SHELL MATERIAL
50	48.9	53.9	9	17	28	45		Sat.		50.8 / 52.0 DENSE GREEN-GRAY SILTY FINE SAND (A-2-4)
45	43.9	58.9	12	17	33	50		Sat.		
40	38.9	63.9	12	16	18	34		Sat.		40.8 / 62.0 DENSE GRAY CLAYEY FINE SAND (A-2-6) WITH TRACE OF SHELL MATERIAL
35	33.9	68.9	13	18	22	40		Sat.		35.8 / 67.0 DENSE GRAY SILTY FINE SAND (A-2-4)
30								Sat.		32.4 / 70.4 Boring Terminated at Elevation 32.4 ft In Dense Silty Fine Sand.
25										1) ADVANCED 3-1/4" HSA TO 8.3 FEET. 2) ADVANCED 2-7/8" TRICONE ROLLER TO 68.9 FEET. 3) SURFACE WATER WITH QUICK GELL ADDED USED AS DRILLING FLUID. 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 5) NO LOSS OF DRILLING FLUID OBSERVED. 6) AUGER PROBED DOWN TO 18.0 FEET AND PUSED SHELBY TUBE FROM 18.0 TO 20.0 FEET.

Other Samples:
ST-1 (18.0 - 20.0)

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley	
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 247+93	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 102.8 ft	**TOTAL DEPTH** 70.4 ft	**NORTHING** 570,964	**EASTING** 2,402,441	**24 HR.** 3.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/19/08	**COMP. DATE** 02/19/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	25			Match Line				
20								
15								
10								
5								
0								
-5								
-10								
-15								
-20								
-25								
-30								
-35								
-40								
-45								
-50								
-55								

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir	**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258			**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 247+93	**OFFSET** 70ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 103.0 ft	**TOTAL DEPTH** 60.2 ft	**NORTHING** 570,901	**EASTING** 2,402,471	**24 HR.** 3.5
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/19/08	**COMP. DATE** 02/19/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
	105									103.0 GROUND SURFACE 0.0
100	99.5	3.5								**UNDIFFERENTIATED COASTAL PLAIN DEPOSIT:** MEDIUM DENSE TO LOOSE GRAY COARSE TO FINE SAND (A-3) WITH TRACE OF SILT AND CLAY
95	94.5	8.5	8	11	14	25		Sat.		
90	89.3	13.7	2	3	4	7	SS-7	Sat.		91.0 12.0
85	84.3	18.7	1	2	2	4		Sat.		LOOSE BROWN CLAYEY FINE SAND (A-2-6)
80	79.3	23.7	2	1	1	2		Sat.		86.0 17.0
75	74.3	28.7	4	7	11	18	SS-8	24.6%		**PEE DEE FORMATION:** SOFT GRAY SILTY FINE SANDY CLAY (A-6)
70	69.3	33.7	5	10	13	23		Sat.		81.0 22.0
65	64.3	38.7	5	6	9	15		Sat.		STIFF TO HARD GRAY SILTY COARSE TO FINE SANDY CLAY (A-6)
60	59.3	43.7	6	10	14	24		Sat.		
55	54.3	48.7	18	17	23	40		Sat.		56.0 47.0
50	49.3	53.7	5	7	9	16	SS-9	25.6%		VERY STIFF GRAY SILTY COARSE TO FINE SANDY CLAY (A-6) WITH TRACE OF SHELL MATERIAL
45	44.3	58.7	8	16	25	41		Sat.		52.0 51.0 DENSE GREEN-GRAY CLAYEY SILTY FINE SAND (A-2-4)
40			12	18	29	47		Sat.		42.8 60.2
35										Boring Terminated at Elevation 42.8 ft In Dense Silty Fine Sand.
30										1) ADVANCED 3-1/4" HSA TO 8.5 FEET. 2) ADVANCED 2-7/8" TRICONE ROLLER TO 58.7 FEET. 3) SURFACE WATER WITH QUICK GELL ADDED USED AS DRILLING FLUID. 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 5) NO LOSS OF DRILLING FLUID OBSERVED.
25										

NCDOT BORE DOUBLE 049.GPJ NC_DOT.GDT 3/17/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 249+66	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 104.7 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 571,040	**EASTING** 2,402,596	**24 HR.** 5.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/20/08	**COMP. DATE** 02/20/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
	105									104.7 / 0.0 GROUND SURFACE
	101.2	3.5						M		**ROADWAY EMBANKMENT FILL** MEDIUM DENSE WHITE-GRAY FINE SAND (A-3) WITH TRACE OF SILT
100			4	8	11	19				99.7 / 5.0
	96.2	8.5								**UNDIFFERENTIATED COASTAL PLAIN DEPOSITS** LOOSE GRAY-WHITE SILTY FINE SAND (A-2-4)
95			7	3	2	5		Sat.		
	91.1	13.6								
90			2	2	3	5		Sat.		
	86.1	18.6								87.7 / 17.0 LOOSE ORANGE CLAYEY FINE SAND (A-2-6)
85			3	4	2	6		Sat.		
	81.1	23.6								82.7 / 22.0 **PEE DEE FORMATION:** LOOSE TO MEDIUM DENSE GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT
80			2	2	4	6		Sat.		
	76.1	28.6								
75			7	8	9	17	SS-5	Sat.		
	71.1	33.6								
70			6	8	9	17		Sat.		
	66.1	38.6								68.7 / 36.0 STIFF TO HARD GRAY SILTY FINE SANDY CLAY (A-6)
65			5	9	11	20		W		
	61.1	43.6								
60			6	7	10	17		W		
	56.1	48.6								
55			6	8	75	83		W		
	51.1	53.6								
50			5	6	8	14		W		48.7 / 56.0
	46.1	58.6								DENSE GRAY-BLACK COARSE TO FINE SAND (A-2-4) WITH TRACE OF SILT AND CLAY
45			19	16	24	40		Sat.		
	41.1	63.6								
40			12	16	22	38	SS-6	Sat.		
	36.1	68.6								37.7 / 67.0 MEDIUM DENSE TO VERY DENSE GRAY-BLACK SILTY FINE SAND (A-2-4)
35			6	5	8	13		Sat.		
	31.1	73.6								
30			10	13	38	51		Sat.		29.6 / 75.1 Boring Terminated at Elevation 29.6 ft In Very Dense Silty Fine Sand.
25										1) ADVANCED 3-1/4" HSA TO 8.5 FEET.

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 249+66	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 104.7 ft	**TOTAL DEPTH** 75.1 ft	**NORTHING** 571,040	**EASTING** 2,402,596	**24 HR.** 5.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/20/08	**COMP. DATE** 02/20/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	25					Match Line				2) ADVANCED 2-7/8" TRICONE ROLLER TO 73.6 FEET. 3) SURFACE WATER WITH QUICK GELL ADDED USED AS DRILLING FLUID. 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 5) NO LOSS OF DRILLING FLUID OBSERVED.
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										
-55										

NCDOT BORE DOUBLE 049.GPJ NC_DOT.GDT 3/17/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

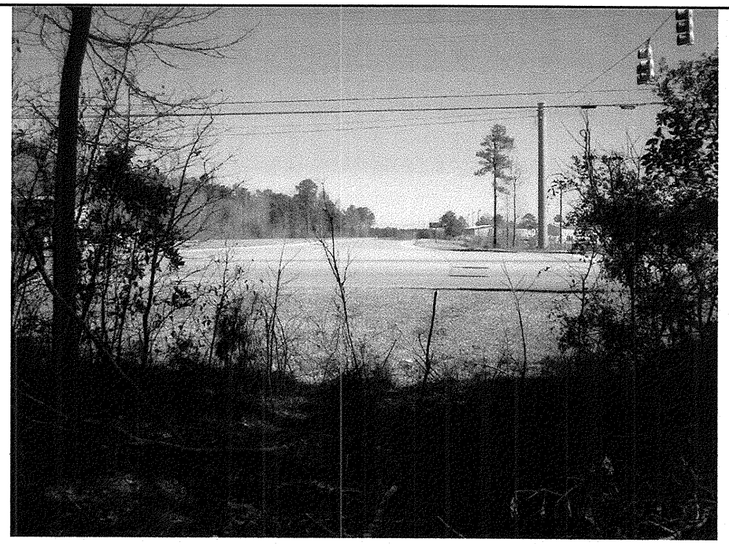
PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 249+66	**OFFSET** 67ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 106.5 ft	**TOTAL DEPTH** 70.1 ft	**NORTHING** 570,980	**EASTING** 2,402,625	**24 HR.** 5.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/20/08	**COMP. DATE** 02/20/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
	110									
105										106.5 / 0.0 GROUND SURFACE
	103.0	3.5								**ROADWAY EMBANKMENT FILL** MEDIUM DENSE BROWN SILTY FINE SAND (A-2-4)
100			7	6	11	17		M		101.5 / 5.0
	98.0	8.5								**UNDIFFERENTIATED COASTAL PLAIN DEPOSITS** LOOSE WHITE-GRAY SILTY FINE SAND (A-2-4)
95			5	4	4	8		Sat.		
	92.9	13.6								
90			2	4	3	7		Sat.		
	87.9	18.6								89.5 / 17.0 LOOSE ORANGE CLAYEY FINE SAND (A-2-6)
85			4	5	3	8		Sat.		
	82.9	23.6								84.5 / 22.0 **PEE DEE FORMATION:** VERY LOOSE TO MEDIUM-DENSE DARK GRAY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE OF SILT
80			1	1	1			Sat.		
	77.9	28.6								
75			5	6	7	13		Sat.		
	72.9	33.6								
70			6	9	10	19	SS-10	Sat.		
	67.9	38.6								70.5 / 36.0 VERY STIFF GRAY SILTY FINE SANDY CLAY (A-6)
65			5	7	9	16		W		
	62.9	43.6								
60			6	9	11	20		W		
	57.9	48.6								
55			10	10	13	23		W		
	52.9	53.6								54.5 / 52.0 MEDIUM DENSE GRAY CLAYEY FINE SAND (A-2-6) WITH TRACE SHELL MATERIAL
50			5	7	9	16		Sat.		49.5 / 57.0
	47.9	58.6								MEDIUM DENSE TO DENSE GRAY SILTY FINE SAND (A-2-4) WITH CLAY LAYERS
45			8	12	15	27		Sat.		
	42.9	63.6								
40			17	23	18	41		Sat.		
	37.9	68.6								
35			11	16	19	35		Sat.		36.4 / 70.1 Boring Terminated at Elevation 36.4 ft In Dense Silty Fine Sand.
30										1) ADVANCED 3-1/4" HSA TO 8.5 FEET. 2) ADVANCED 2-7/8" TRICONE ROLLER TO 68.6 FEET.

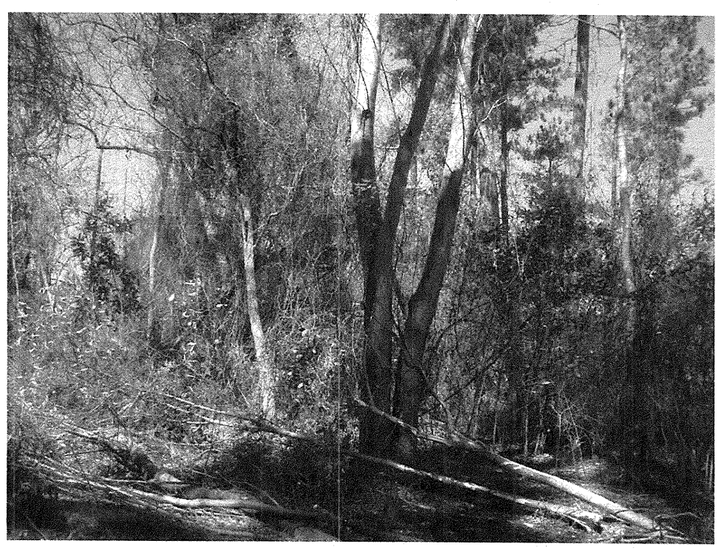
NCDOT BORE DOUBLE 049.GPJ NC_DOT.GDT 3/17/08

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** Lenoir		**GEOLOGIST** N. Bradley
SITE DESCRIPTION Bridge No. 198 and Bridge No. 199 on -L- over U.S. 258				**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 249+66	**OFFSET** 67ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 106.5 ft	**TOTAL DEPTH** 70.1 ft	**NORTHING** 570,980	**EASTING** 2,402,625	**24 HR.** 5.0
DRILL MACHINE CME-750	**DRILL METHOD** 3-1/4" HSA / Rotary Wash With 2-7/8" Tricone Roller		**HAMMER TYPE** Automatic	
START DATE 02/20/08	**COMP. DATE** 02/20/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	30					Match Line				3) SURFACE WATER WITH QUICK GELL ADDED USED AS DRILLING FLUID. 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 5) NO LOSS OF DRILLING FLUID OBSERVED.
25										
20										
15										
10										
5										
0										
-5										
-10										
-15										
-20										
-25										
-30										
-35										
-40										
-45										
-50										



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



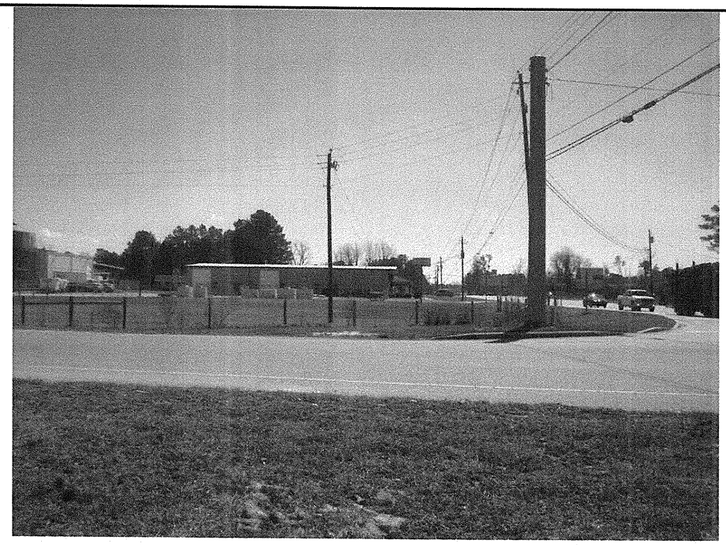
Photograph No. 2:
This photograph was taken from the right side of the -L- alignment, looking north, across proposed End Bent No. 1.

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

Photograph No. 4:
This photograph was taken from the -L- alignment, looking north along US Highway 258 (-Y24-).

Photograph No. 5:
This photograph was taken from the -L- alignment, looking south along US Highway 258 (-Y24-).

Photograph No. 6:
This photograph was taken from the right side of the -L- alignment, looking north, across proposed End Bent No. 2.



Photograph No. 7:
This photograph was taken from the -L- alignment, looking south, across proposed End Bent No. 2.

Photograph No. 8:
This photograph was taken from the east approach, right of the -L- alignment, looking west.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2719A	1	7

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34501.1.1 (R-2719A) F.A. PROJ. STP-0224(3)

COUNTY LENOIR

PROJECT DESCRIPTION CRESCENT RD. IN KINSTON FROM US 70 TO US 258

SITE DESCRIPTION STRUCTURE NO. 10 ON -YIRPCA- OVER -YI- AT -YIRPCA- STA. 28+99.24

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-6	BORE LOGS
7	SOIL TEST RESULTS

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

CMW

TCB

JRS

WNC

RES

INVESTIGATED BY JL STONE

CHECKED BY DN ARGENBRIGHT

SUBMITTED BY DN ARGENBRIGHT

DATE MARCH 2008

PROJECT: 34501.1.1

ID: R-2719A

DRAWN BY: JLS

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-2719A	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS 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
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

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

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR 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
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, 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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-__
- [ ] BK-51
- [X] CME-45B
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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: BL-4 -L- STA. 58+74.51, 0.18' RT

ELEVATION: 51.36 FT.

NOTES:
-

REVISED 02/23/06

PROJECT REFERENCE NO.	SHEET
R-2719A	3 of 7

SITE PLAN

0 100
FEET

NAD 83

TO SR 2001

-Y1-

-Y1- POC Sta.75+51.12 =
-YIRPCA- POC Sta.28+99.24

30

B1-A

EB2-A

EB1-C

79° 18' 14"

-YIRPCA-

TO US 258

TO US 70

EB1 BENT LINE

75

B1 BENT LINE

EB2 BENT LINE

TO SR 1546

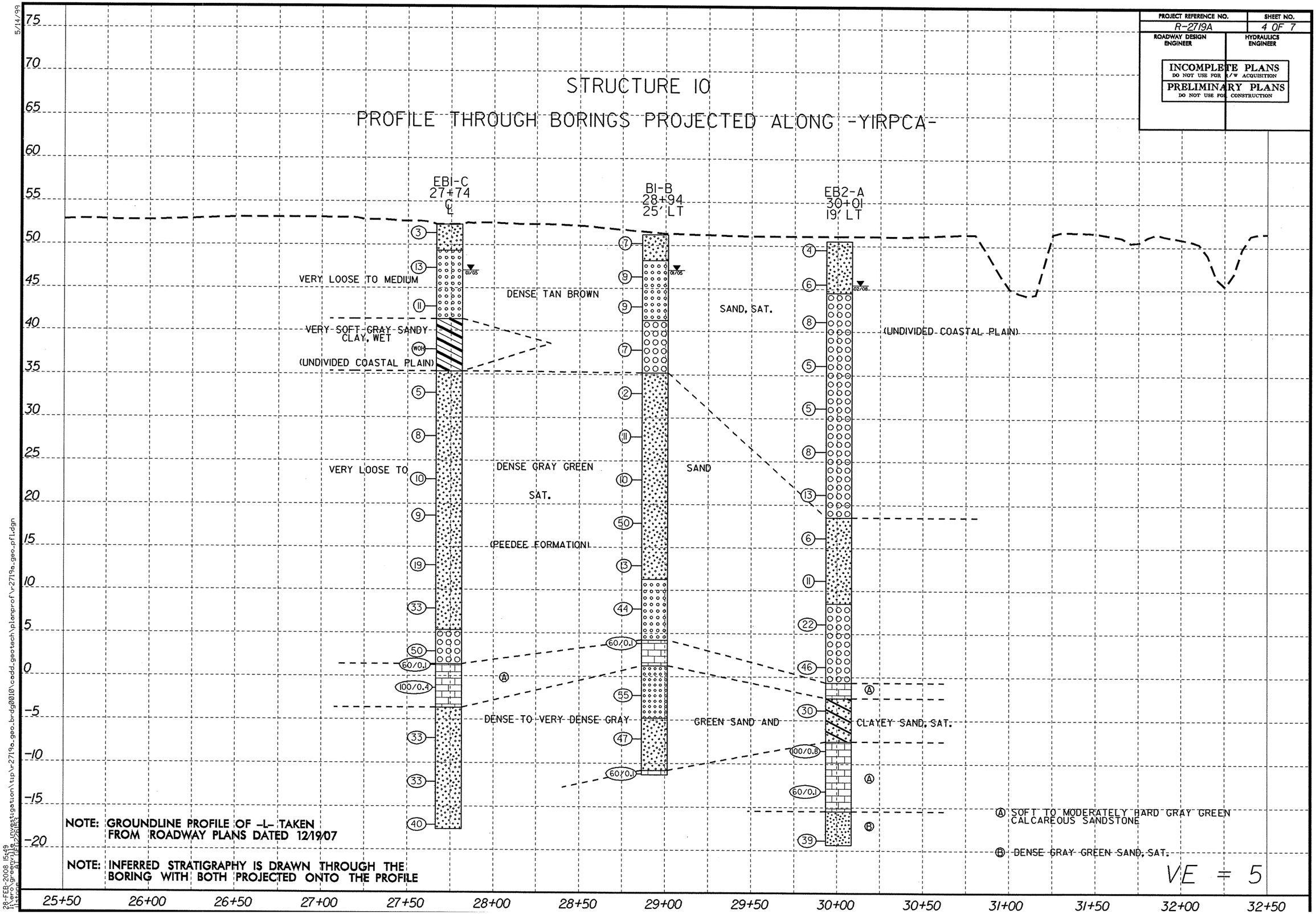
EB1 SKEW = 84° 49' 20"
B1 SKEW = 79° 18' 14"
EB2 SKEW = 73° 33' 54"

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	4 OF 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

STRUCTURE 10

PROFILE THROUGH BORINGS PROJECTED ALONG -YIRPCA-



NOTE: GROUNDLINE PROFILE OF -L- TAKEN FROM ROADWAY PLANS DATED 12/19/07

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

5/14/99

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NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** LENOIR	**GEOLOGIST** Quick, K. B.	
SITE DESCRIPTION STRUCTURE NO. 10 ON -Y1RPCA- OVER -Y1				**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 27+74	**OFFSET** CL	**ALIGNMENT** -Y1RPCA-	**0 HR.** N/A
COLLAR ELEV. 52.4 ft	**TOTAL DEPTH** 70.0 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** 5.3
DRILL MACHINE CME-45B	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic	
START DATE 01/03/05	**COMP. DATE** 01/03/05	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 51.0 ft	

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)
	52.4	0.0								52.4 GROUND SURFACE	0.0
			WOH	1	2	3				UNDIVIDED COASTAL PLAIN	
	48.4	4.0								TAN BROWN SAND AND GRAVEL, MOIST TO SAT.	
			4	6	7	13	SS-40			49.4	3.0
	43.9	8.5								UNDIVIDED COASTAL PLAIN	
			4	4	7	11				GRAY SANDY CLAY, WET	
	38.9	13.5								41.4	11.0
			WOH	WOH	WOH	0	SS-41	64%		COASTAL PLAIN	
	33.9	18.5								GRAY GREEN SAND, SAT. (PEEDEE FORMATION)	
			WOH	2	3	5	SS-42			35.4	17.0
	28.9	23.5									
			4	4	4	8	SS-43	32%			
	23.9	28.5									
			4	4	6	10	SS-44				
	19.7	32.7									
			5	4	5	9					
	13.9	38.5									
			5	7	12	19	SS-45				
	8.9	43.5									
			9	15	18	33					
	3.9	48.5								5.4	47.0
			15	20	30	50	SS-46				
	1.4	51.0	60/0.1			60/0.1				1.4	51.0
	-1.1	53.5								COASTAL PLAIN SEDIMENTARY ROCK	
			100/0.4			100/0.4				GRAY GREEN CALCAREOUS SANDSTONE	
										-3.7	56.1
	-6.1	58.5								COASTAL PLAIN	
			11	12	21	33	SS-47	36%		GRAY GREEN SAND, SAT.	
	-11.1	63.5									
			14	12	21	33					
	-16.1	68.5									
			8	18	22	40				-17.6	70.0
										Boring Terminated at Elevation -17.6 ft IN DENSE SAND	

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** LENOIR	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION STRUCTURE NO. 10 ON -Y1RPCA- OVER -Y1				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 28+94	**OFFSET** 25ft LT	**ALIGNMENT** -Y1RPCA-	**0 HR.** N/A
COLLAR ELEV. 51.3 ft	**TOTAL DEPTH** 62.5 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** 4.1
DRILL MACHINE CME-550	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic	
START DATE 02/11/08	**COMP. DATE** 02/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 46.8 ft	

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
	51.3	0.0								51.3 GROUND SURFACE 0.0
			1	2	5	7	SS-11			UNDIVIDED COASTAL PLAIN
	47.4	3.9								TAN BROWN SAND AND GRAVEL, MOIST TO SAT.
			3	4	5	9	SS-12			48.3 3.0
	43.9	7.4								
			3	4	5	9				41.3 10.0
	38.9	12.4								
			3	3	4	7	SS-13			
	33.9	17.4								
			2	1	1	2	SS-14			35.3 16.0
	28.9	22.4								COASTAL PLAIN
			4	4	7	11				GRAY GREEN SAND, SAT. (PEEDEE FORMATION)
	23.9	27.4								
			4	5	5	10	SS-15			
	18.9	32.4								
			2	37	13	50				
	13.9	37.4								
			4	5	8	13	SS-16			11.3 40.0
	8.9	42.4								
			12	20	24	44	SS-17			
	3.9	47.4								4.5 46.8
			60/0.1			60/0.1				COASTAL PLAIN SEDIMENTARY ROCK
										GRAY GREEN CALCAREOUS SANDSTONE
										2.3 49.0
	-1.1	52.4								COASTAL PLAIN
			13	24	31	55	SS-18			GRAY GREEN SAND, SAT.
	-6.1	57.4								-4.7 56.0
			13	17	30	47	SS-19			
	-11.1	62.4								-10.7 62.0
			60/0.1			60/0.1				-11.2 62.5
										COASTAL PLAIN SEDIMENTARY ROCK
										GRAY GREEN CALCAREOUS SANDSTONE
										Boring Terminated at Elevation -11.2 ft IN MODERATELY HARD CALCAREOUS SANDSTONE

NCDOT BORE DOUBLE BORELOGS.GPJ NC_DOT.GDT 03/04/08

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** LENOIR	**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION STRUCTURE NO. 10 ON -Y1RPCA- OVER -Y1			**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 30+01	**OFFSET** 19ft LT	**ALIGNMENT** -Y1RPCA-	**0 HR.** N/A
COLLAR ELEV. 50.6 ft	**TOTAL DEPTH** 69.9 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** 5.1
DRILL MACHINE CME-45B	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
START DATE 02/10/08	**COMP. DATE** 02/10/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 51.2 ft

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
55										
50	50.6	0.0								50.6 GROUND SURFACE 0.0
	46.6	4.0	1	2	2	4	SS-1			**UNDIVIDED COASTAL PLAIN** TAN BROWN SAND AND GRAVEL, MOIST TO SAT.
45	42.2	8.4	3	3	3	6	SS-2	▼		44.6 6.0
40	37.2	13.4	3	4	4	8	SS-3			
35	32.2	18.4	2	2	3	5				
30	27.2	23.4	2	2	3	5	SS-4			
25	22.2	28.4	3	3	5	8				
20	17.2	33.4	2	5	8	13	SS-5			18.6 32.0 **COASTAL PLAIN** GRAY GREEN SAND, SAT. (PEEDEE FORMATION)
15	12.2	38.4	2	3	3	6	SS-6			
10	7.2	43.4	5	6	5	11				
5	2.2	48.4	6	10	12	22	SS-7			8.6 42.0
0	-2.8	53.4	13	24	22	46				-0.6 51.2 **COASTAL PLAIN SEDIMENTARY ROCK** GRAY GREEN CALCAREOUS SANDSTONE -2.4 53.0 **COASTAL PLAIN** GRAY GREEN CLAYEY SAND, SAT.
-5	-7.8	58.4	6	11	19	30	SS-8			
-10	-12.8	63.4	25	39	61/0.3	100/0.8				-7.4 58.0 **COASTAL PLAIN SEDIMENTARY ROCK** GRAY GREEN CALCAREOUS SANDSTONE
-15	-17.8	68.4	68	100/0.1		100/0.1	SS-9			
-20			8	18	21	39	SS-10			-15.4 66.0 **COASTAL PLAIN** GRAY GREEN SAND, SAT. -19.3 69.9 Boring Terminated at Elevation -19.3 ft IN DENSE SAND
-25										

STRUCTURE NO. 10 ON -Y1RPCA- OVER -Y1-

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST.	ORG.
EB2-A	SS-1	99	89	28	27.9	48.4	18.1	5.6	17	NP	A-2-4(0)	1.00-1.50		
	SS-2	98	76	11	51.6	39.2	5.6	3.6	15	NP	A-2-4(0)	4.00-5.50		
	SS-3	94	47	2	76.3	22.7	1.0	0.0	13	NP	A-1-b(0)	8.40-9.90		
	SS-4	95	26	1	93.8	5.4	0.8	0.0	19	NP	A-1-b(0)	18.40-19.90		
	SS-5	99	44	3	86.1	11.2	1.0	1.6	19	NP	A-1-b(0)	28.40-29.90		
	SS-6	100	81	22	45.0	37.8	7.6	9.6	24	6	A-2-4(0)	33.40-34.90		
	SS-7	95	40	8	81.7	11.4	5.2	1.6	17	NP	A-1-b(0)	43.40-44.90		
	SS-8	99	67	20	63.1	18.1	9.2	9.6	30	11	A-2-6(0)	53.40-54.90		
	SS-9	99	73	6	57.4	37.3	3.6	1.6	16	NP	A-3(0)	63.40-64.00		
	SS-10	100	99	24	1.2	81.9	9.2	7.6	27	NP	A-2-4(0)	68.40-69.90		
B1-B	SS-11	100	88	23	36.3	44.0	12.0	7.6	20	NP	A-2-4(0)	1.00-1.50		
	SS-12	100	65	3	76.9	20.5	1.0	1.6	18	NP	A-3(0)	3.90-5.40		
	SS-13	99	37	1	93.4	6.0	0.6	0.0	18	NP	A-1-b(0)	12.40-13.90		
	SS-14	100	80	15	57.6	29.1	3.6	9.6	19	NP	A-2-4(0)	17.40-18.90		
	SS-15	100	98	20	11.4	74.5	6.4	7.6	22	NP	A-2-4(0)	27.40-28.90		
	SS-16	100	66	11	75.3	14.9	4.2	5.6	17	NP	A-2-4(0)	37.40-38.90		
	SS-17	100	52	6	81.1	14.1	2.8	2.0	16	NP	A-3(0)	42.40-43.90		
	SS-18	99	67	6	75.1	20.3	3.4	1.2	15	NP	A-3(0)	52.40-53.90		
	SS-19	100	88	11	44.8	45.6	4.4	5.2	21	NP	A-2-4(0)	57.40-58.90		
EB1-C	SS-40	99	76	10	65.3	25.7	0.0	9.0	22	NP	A-3(0)	4.00-5.50		
	SS-41	100	97	76	7.4	21.3	25.1	46.2	40	25	A-6(17)	13.50-15.00	64.3	
	SS-42	100	78	18	59.5	23.5	0.9	16.1	20	NP	A-2-4(0)	18.50-20.00		
	SS-43	100	97	24	9.3	71.4	2.2	17.1	29	NP	A-2-4(0)	23.50-25.00	32.0	
	SS-44	100	78	18	57.2	26.7	0.0	16.1	24	NP	A-2-4(0)	32.70-34.20		
	SS-45	100	52	11	75.1	14.9	0.0	10.0	21	NP	A-2-4(0)	38.50-40.00		
	SS-46	99	25	6	88.0	6.4	0.6	5.0	20	NP	A-1-b(0)	48.50-50.00		
	SS-47	100	98	23	4.6	76.7	3.6	15.1	30	NP	A-2-4(0)	58.50-60.00	35.6	

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2719A	1	10

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34501.1.1 (R-2719A) F.A. PROJ. STP-0224(3)

COUNTY LENOIR

PROJECT DESCRIPTION CRESCENT RD. IN KINSTON FROM US 70 TO US 258

SITE DESCRIPTION STRUCTURE NO. 11 AND NO. 12 ON -Y1- OVER -Y9- (SR 2003) AT -Y1- STA. 97+26.78

ID: R-2719A

PROJECT: 34501.1.1

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	PROFILES
6-7	CROSS SECTIONS
8-9	BORELOGS
10	SOIL TEST RESULTS

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

CMW

TCB

JRS

WNC

RES

INVESTIGATED BY JL STONE

CHECKED BY DN ARGENBRIGHT

SUBMITTED BY DN ARGENBRIGHT

DATE MARCH 2008

DRAWN BY: JLS, CMW

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PROJECT REFERENCE NO.	SHEET NO.
R-2719A	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS 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/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	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
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT TEST BORING
- AUGER BORING
- CORE BORING
- MW MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF SPT REFUSAL

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, 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

EQUIPMENT USED ON SUBJECT PROJECT

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

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: BYI-55 -YI- STA. 97+05.41, 2.15' RT

ELEVATION: 51.55 FT.

NOTES:

REVISED 02/23/06

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SITE PLAN

0 100
FEET

NAD 83

EB1 BENT LINE

EB2 BENT LINE

EB1-A
LEFT LANE

EB2-A
LEFT LANE

95

100

← TO SR 1519

-Y1-

TO US 258 →

58° 42' 00"

EB1-B
RIGHT LANE

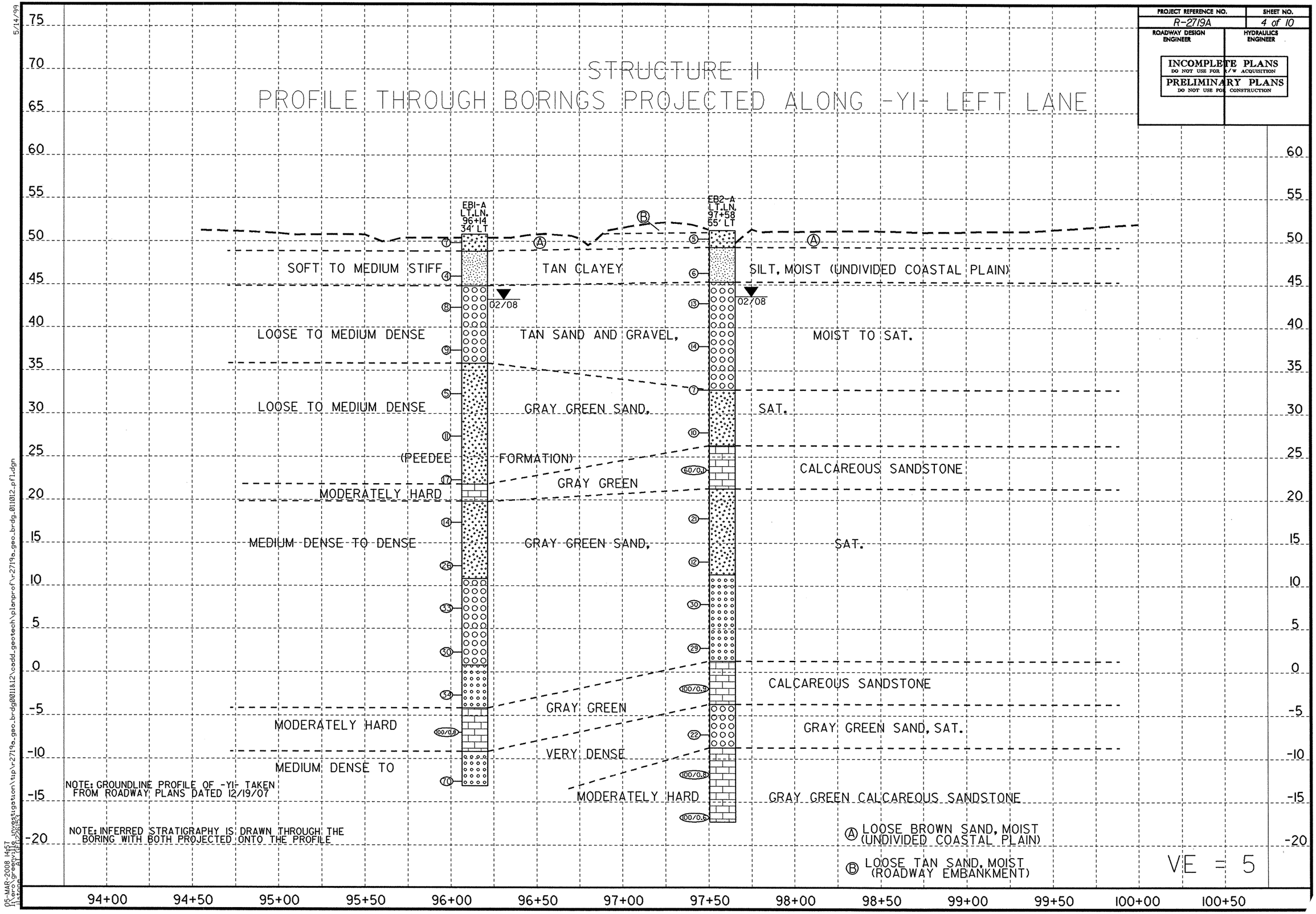
EB2-B
RIGHT LANE

15

-Y1- POT STA 97+26.78 =
-Y9- POT STA 15+65.89

-Y9-

TO EXISTING US 70



PROJECT REFERENCE NO.
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ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STRUCTURE II
PROFILE THROUGH BORINGS PROJECTED ALONG -Y1- LEFT LANE
EB1-A
LT.LN.
96+14
34' LT
EB2-A
LT.LN.
97+58
55' LT
SOFT TO MEDIUM STIFF
TAN CLAYEY
SILT, MOIST (UNDIVIDED COASTAL PLAIN)
02/08
LOOSE TO MEDIUM DENSE
TAN SAND AND GRAVEL,
MOIST TO SAT.
LOOSE TO MEDIUM DENSE
GRAY GREEN SAND,
SAT.
(PEEDEE FORMATION)
CALCAREOUS SANDSTONE
GRAY GREEN
MODERATELY HARD
MEDIUM DENSE TO DENSE
GRAY GREEN SAND,
SAT.
CALCAREOUS SANDSTONE
GRAY GREEN
MODERATELY HARD
GRAY GREEN SAND, SAT.
VERY DENSE
MEDIUM DENSE TO
MODERATELY HARD
GRAY GREEN CALCAREOUS SANDSTONE
NOTE: GROUNDLINE PROFILE OF -Y1- TAKEN FROM ROADWAY PLANS DATED 12/19/07
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE PROFILE
Ⓐ LOOSE BROWN SAND, MOIST (UNDIVIDED COASTAL PLAIN)
Ⓑ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)
VE = 5
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
-10
-15
-20
94+00
94+50
95+00
95+50
96+00
96+50
97+00
97+50
98+00
98+50
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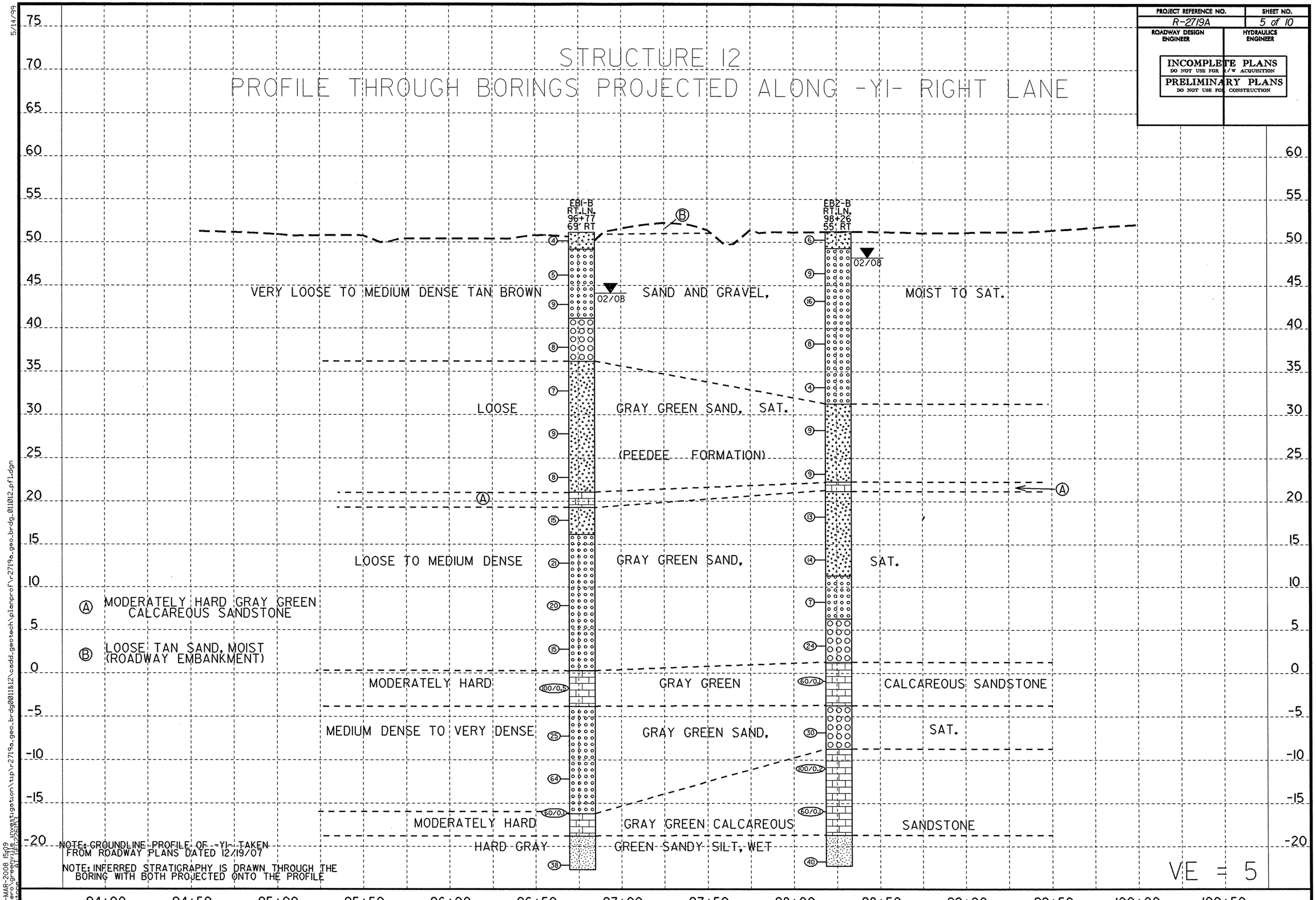
100+50
5/14/99
05-MAR-2008 14:57



PROJECT REFERENCE NO.
R-2719A
SHEET NO.
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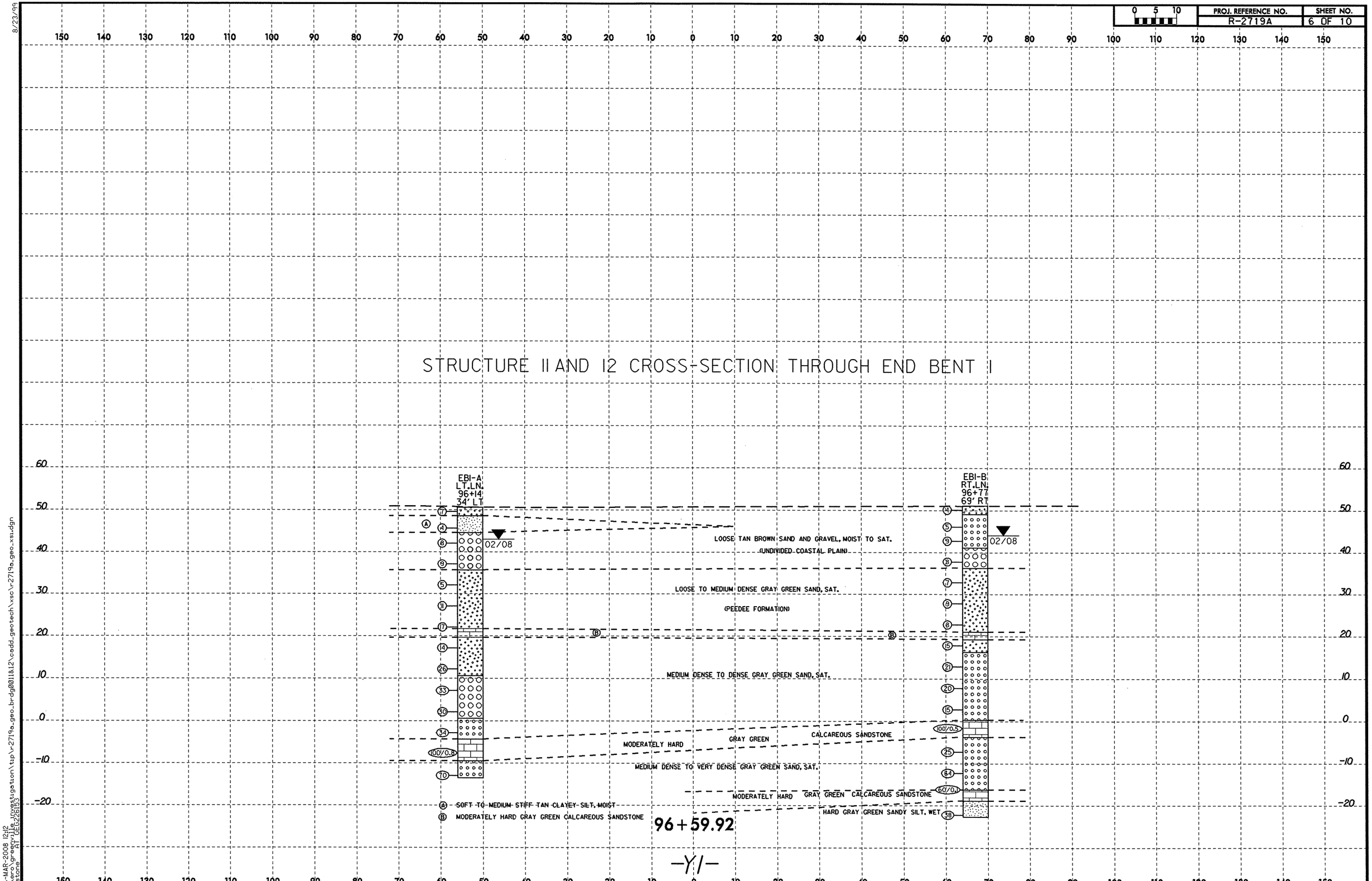
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STRUCTURE 12
PROFILE THROUGH BORINGS PROJECTED ALONG -Y1- RIGHT LANE
EB1-B
RT.LN.
96+77
69' RT
EB2-B
RT.LN.
98+26
55' RT
02/08
VERY LOOSE TO MEDIUM DENSE TAN BROWN SAND AND GRAVEL, MOIST TO SAT.
LOOSE GRAY GREEN SAND, SAT.
(PEEDEE FORMATION)
LOOSE TO MEDIUM DENSE GRAY GREEN SAND, SAT.
MODERATELY HARD GRAY GREEN CALCAREOUS SANDSTONE
MEDIUM DENSE TO VERY DENSE GRAY GREEN SAND, SAT.
MODERATELY HARD GRAY GREEN CALCAREOUS SANDSTONE
HARD GRAY GREEN SANDY SILT, WET
Ⓐ MODERATELY HARD GRAY GREEN CALCAREOUS SANDSTONE
Ⓑ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)
NOTE: GROUNDLINE PROFILE OF -Y1- TAKEN FROM ROADWAY PLANS DATED 12/19/07
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE PROFILE
VE = 5
94+00
94+50
95+00
95+50
96+00
96+50
97+00
97+50
98+00
98+50
99+00
99+50
100+00
100+50

PROJ. REFERENCE NO. R-2719A
SHEET NO. 6 OF 10



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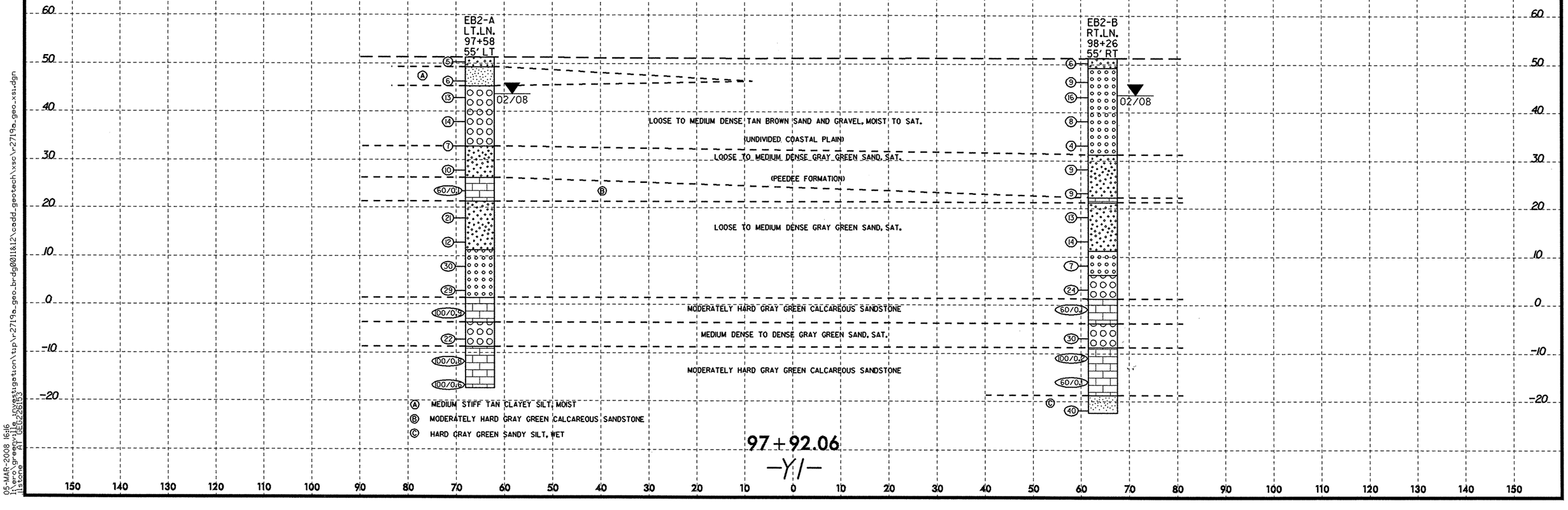
PROJ. REFERENCE NO. R-2719A
SHEET NO. 7 of 10

STRUCTURE 11 AND 12 CROSS-SECTION THROUGH END BENT 2



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NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** LENOIR	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION STRUCTURE NO. 11 ON -Y1- OVER -Y9-				**GROUND WTR (ft)**
BORING NO. EB1-A LT. LN.	**STATION** 96+14	**OFFSET** 34ft LT	**ALIGNMENT** -Y1-	**0 HR.** N/A
COLLAR ELEV. 50.6 ft	**TOTAL DEPTH** 64.0 ft	**NORTHING** 2,397,671	**EASTING** 553,200	**24 HR.** 7.6
DRILL MACHINE CME-550	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic	
START DATE 02/14/08	**COMP. DATE** 02/14/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 29.0 ft	

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	50.6	0.0
	50.6	0.0	2	3	4	7	SS-1			BROWN SILTY SAND, MOIST (UNDIVIDED COASTAL PLAIN)	48.6	2.0
	46.7	3.9	3	2	2	4	SS-2			TAN CLAYEY SILT, MOIST (UNDIVIDED COASTAL PLAIN)	44.6	6.0
	43.1	7.5	5	4	4	8	SS-3			TAN SAND AND GRAVEL, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)	35.6	15.0
	38.1	12.5	3	4	5	9				COASTAL PLAIN GRAY GREEN SAND, SAT. (PEEDEE FORMATION)		
	33.1	17.5	2	2	3	5	SS-4					
	28.1	22.5	5	5	6	11						
	23.1	27.5	4	5	12	17	SS-5					
	18.1	32.5	6	7	7	14	SS-6					
	13.1	37.5	10	11	15	26						
	8.1	42.5	17	16	17	33	SS-7					
	3.1	47.5	11	14	16	30						
	-1.9	52.5	25	21	13	34	SS-8					
	-6.9	57.5	26	65	35/0.3	100/0.8						
	-11.9	62.5	18	27	43	70	SS-9					
										COASTAL PLAIN SEDIMENTARY ROCK GRAY GREEN CALCAREOUS SANDSTONE	21.6	29.0
										COASTAL PLAIN GRAY GREEN SAND, SAT.	19.6	31.0
											10.6	40.0
											0.6	50.0
										COASTAL PLAIN SEDIMENTARY ROCK GRAY GREEN CALCAREOUS SANDSTONE	-4.4	55.0
										COASTAL PLAIN GRAY GREEN SAND, SAT.	-9.4	60.0
										Boring Terminated at Elevation -13.4 ft IN VERY DENSE SAND	-13.4	64.0

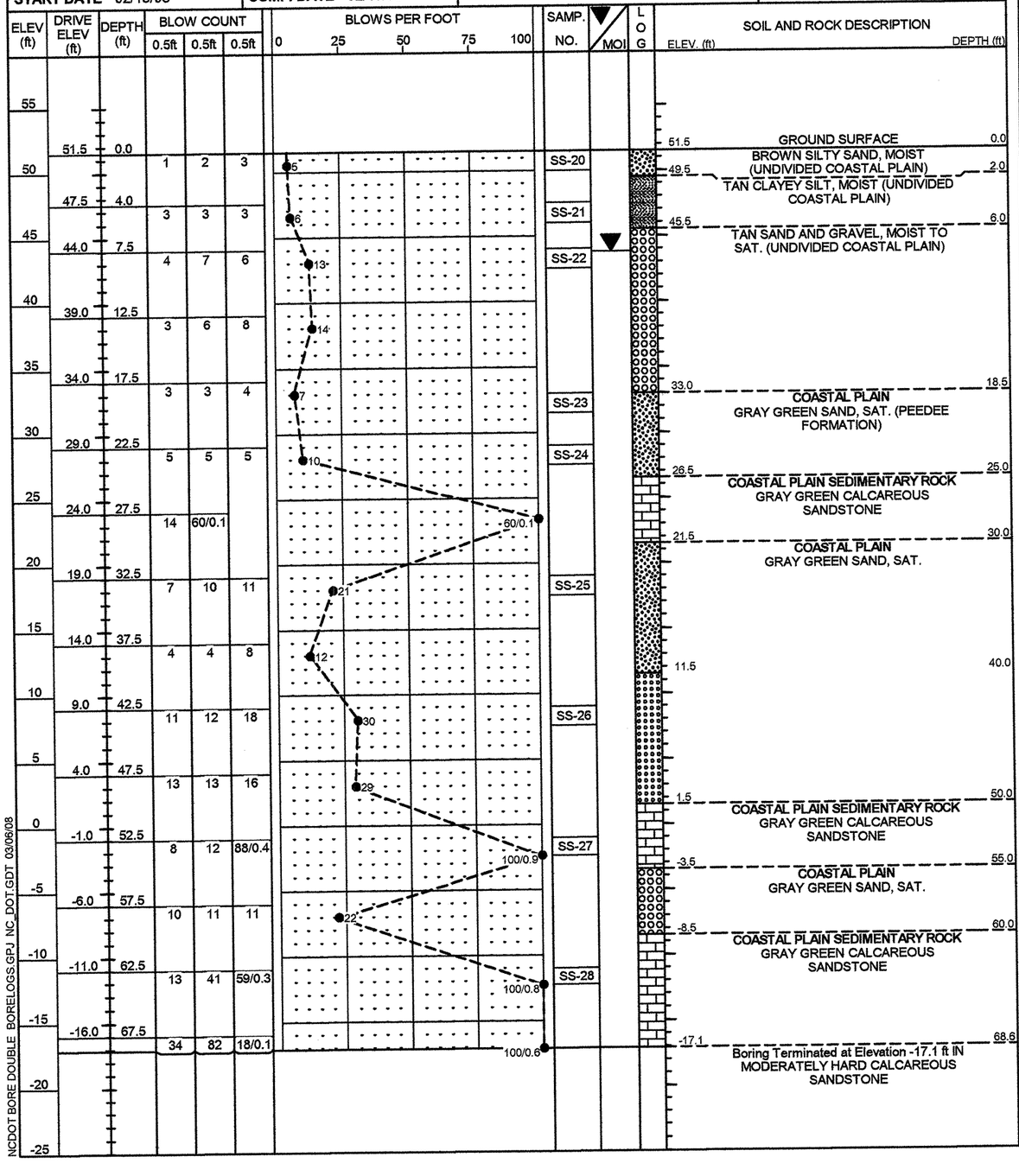
PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** LENOIR	**GEOLOGIST** Wrike, C. M.	
SITE DESCRIPTION STRUCTURE NO. 12 ON -Y1- OVER -Y9-				**GROUND WTR (ft)**
BORING NO. EB1-B RT. LN.	**STATION** 96+77	**OFFSET** 69ft RT	**ALIGNMENT** -Y1-	**0 HR.** N/A
COLLAR ELEV. 51.1 ft	**TOTAL DEPTH** 73.9 ft	**NORTHING** 2,397,669	**EASTING** 553,079	**24 HR.** 7.1
DRILL MACHINE CME-550	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic	
START DATE 02/15/08	**COMP. DATE** 02/15/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 30.1 ft	

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
										GROUND SURFACE 51.1 0.0
	51.1	0.0	3	3	1	4	SS-10			TAN BROWN SAND AND GRAVEL, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN) 49.1 2.0
	47.1	4.0	2	3	2	5	SS-11			
	43.7	7.4	4	4	5	9				41.1 10.0
	38.7	12.4	3	4	4	8	SS-12			
	33.7	17.4	2	3	4	7	SS-13			
	28.7	22.4	2	4	5	9				
	23.7	27.4	4	4	4	8	SS-14			
	18.7	32.4	8	7	8	15				
	13.7	37.4	7	10	11	21	SS-15			
	8.7	42.4	10	11	9	20				
	3.7	47.4	4	7	8	15	SS-16			
	-1.3	52.4	21	100/0.5		100/0.5	SS-17			
	-6.3	57.4	15	16	9	25				
	-11.3	62.4	11	30	34	64	SS-18			
	-16.3	67.4	60/0.1			60/0.1				
	-21.3	72.4	7	14	24	38	SS-19			
										COASTAL PLAIN SEDIMENTARY ROCK GRAY GREEN CALCAREOUS SANDSTONE 21.0 30.1
										COASTAL PLAIN GRAY GREEN SAND, SAT. 19.2 31.9
										16.1 35.0
										COASTAL PLAIN SEDIMENTARY ROCK GRAY GREEN CALCAREOUS SANDSTONE 0.2 50.9
										COASTAL PLAIN GRAY GREEN SAND, SAT. -3.9 55.0
										COASTAL PLAIN SEDIMENTARY ROCK GRAY GREEN CALCAREOUS SANDSTONE -16.3 67.4
										COASTAL PLAIN GRAY GREEN SANDY SILT, WET -18.8 69.9
										Boring Terminated at Elevation -22.8 ft IN HARD SANDY SILT -22.8 73.9

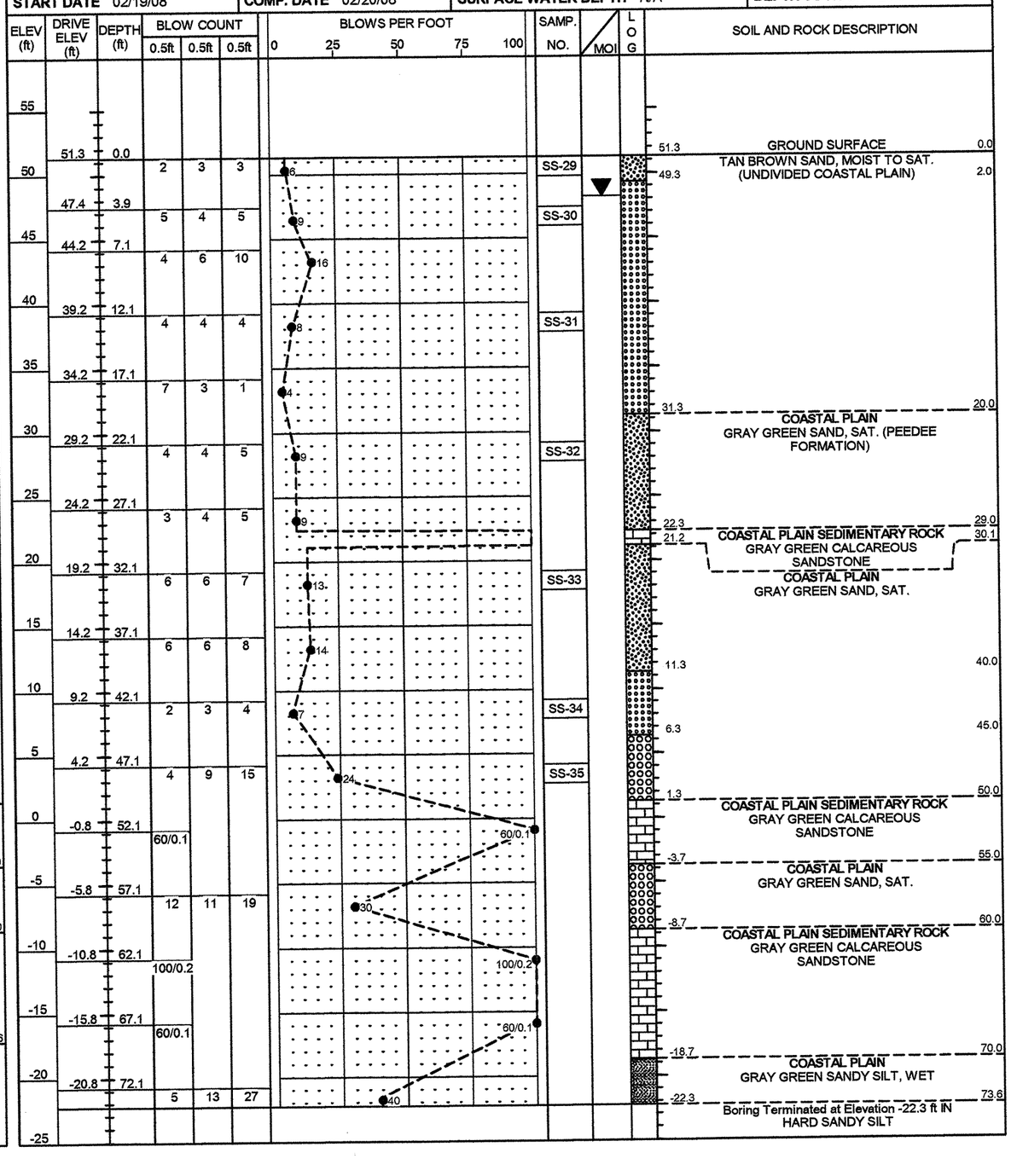
NCDOT BORE DOUBLE BORELOGS.GPJ NC_DOT.GDT 03/06/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** LENOIR		**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION STRUCTURE NO. 11 ON -Y1- OVER -Y9-				**GROUND WTR (ft)**
BORING NO. EB2-A LT. LN.	**STATION** 97+58	**OFFSET** 55ft LT	**ALIGNMENT** -Y1-	**0 HR.** N/A
COLLAR ELEV. 51.5 ft	**TOTAL DEPTH** 68.6 ft	**NORTHING** 2,397,804	**EASTING** 553,141	**24 HR.** 7.7
DRILL MACHINE CME-550	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic	
START DATE 02/19/08	**COMP. DATE** 02/19/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 25.0 ft	



PROJECT NO. 34501.1.1	**ID.** R-2719A	**COUNTY** LENOIR		**GEOLOGIST** Wrike, C. M.
SITE DESCRIPTION STRUCTURE NO. 12 ON -Y1- OVER -Y9-				**GROUND WTR (ft)**
BORING NO. EB2-B RT. LN.	**STATION** 98+26	**OFFSET** 55ft RT	**ALIGNMENT** -Y1-	**0 HR.** N/A
COLLAR ELEV. 51.3 ft	**TOTAL DEPTH** 73.6 ft	**NORTHING** 2,397,803	**EASTING** 553,012	**24 HR.** 3.1
DRILL MACHINE CME-550	**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic	
START DATE 02/19/08	**COMP. DATE** 02/20/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 29.0 ft	



NCDOT BORE DOUBLE BORELOGS.GPJ NC_DOT.GDT 03/06/08

STRUCTURE NO. 11 AND NO. 12 ON -Y1- OVER -Y9-

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST.	ORG.
EB1-A	SS-1	98	73	16	59.4	26.8	6.6	7.2	16	NP	A-2-4(0)	1.00-1.50		
LT. LN.	SS-2	100	93	51	21.7	35.4	17.5	25.4	24	10	A-4(2)	3.90-5.40		
	SS-3	92	46	6	72.2	21.7	2.8	3.2	17	NP	A-1-b(0)	7.50-9.00		
	SS-4	100	92	16	36.4	50.7	3.6	9.3	18	NP	A-2-4(0)	17.50-19.00		
	SS-5	100	97	30	17.7	61.2	7.8	13.3	23	2	A-2-4(0)	27.50-29.00		
	SS-6	100	90	15	67.4	19.3	6.0	7.2	17	NP	A-2-4(0)	32.50-34.00		
	SS-7	99	45	8	78.5	15.3	5.0	1.2	15	NP	A-1-b(0)	42.50-44.00		
	SS-8	100	64	5	78.5	17.3	3.0	1.2	14	NP	A-3(0)	52.50-54.00		
	SS-9	100	55	9	77.7	14.7	4.4	3.2	16	NP	A-3(0)	62.50-64.00		
EB1-B	SS-10	99	72	12	66.6	22.5	5.6	5.2	16	NP	A-2-4(0)	1.00-1.50		
RT. LN.	SS-11	100	74	8	70.0	22.7	4.0	3.2	14	NP	A-3(0)	4.00-5.50		
	SS-12	99	42	2	92.2	6.4	0.2	1.2	17	NP	A-1-b(0)	12.40-13.90		
	SS-13	100	91	17	39.0	46.5	5.2	9.3	22	NP	A-2-4(0)	17.40-18.90		
	SS-14	100	97	25	13.1	68.8	6.8	11.3	25	3	A-2-4(0)	27.40-28.90		
	SS-15	100	66	10	62.4	28.8	3.6	5.2	20	NP	A-3(0)	37.40-38.90		
	SS-16	99	52	4	83.7	12.9	2.2	1.2	15	NP	A-3(0)	47.40-48.90		
	SS-17	98	74	7	67.8	27.0	0.8	4.4	15	NP	A-3(0)	52.40-53.40		
	SS-18	100	65	9	70.4	21.1	0.0	8.5	17	NP	A-3(0)	62.40-63.90		
	SS-19	100	99	49	3.2	73.8	8.5	14.5	29	NP	A-4(0)	72.40-73.90		
EB2-A	SS-20	100	78	17	59.8	25.6	8.2	6.4	17	NP	A-2-4(0)	1.00-1.50		
LT. LN.	SS-21	100	88	39	38.2	28.8	8.5	24.5	23	7	A-4(0)	4.00-5.50		
	SS-22	90	48	6	69.0	24.9	1.6	4.4	17	NP	A-1-b(0)	7.50-9.00		
	SS-23	98	78	12	42.1	47.3	0.2	10.5	16	NP	A-2-4(0)	17.50-19.00		
	SS-24	100	99	18	12.7	73.0	1.8	12.5	19	NP	A-2-4(0)	22.50-24.00		
	SS-25	100	84	14	70.8	16.3	2.4	10.5	17	NP	A-2-4(0)	32.50-34.00		
	SS-26	99	58	7	74.6	19.1	1.8	4.4	17	NP	A-3(0)	42.50-44.00		
	SS-27	97	47	4	82.5	14.1	2.6	0.8	15	NP	A-1-b(0)	52.50-53.90		
	SS-28	99	77	10	66.4	25.8	2.0	4.8	12	NP	A-3(0)	62.50-63.80		
EB2-B	SS-29	100	74	16	63.0	22.9	9.3	4.8	17	NP	A-2-4(0)	1.00-1.50		
RT. LN.	SS-30	100	65	8	76.3	16.9	4.0	2.8	18	NP	A-3(0)	3.90-5.40		
	SS-31	95	53	3	66.0	31.8	1.4	0.8	19	NP	A-3(0)	12.10-13.60		
	SS-32	100	98	19	12.3	73.8	5.0	8.9	23	NP	A-2-4(0)	22.10-23.60		
	SS-33	100	77	11	75.7	14.9	4.6	4.8	21	NP	A-2-4(0)	32.10-33.60		
	SS-34	96	66	10	62.2	28.4	6.6	2.8	18	NP	A-3(0)	42.10-43.60		
	SS-35	97	47	5	81.5	13.9	3.8	0.8	19	NP	A-1-b(0)	47.10-48.60		

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34501.1.1 (R2719A)	1	11

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34501.1.1	STP-0224 (3)	P.E.
		R/W & UTIL.

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34501.1.1 (R-2719A) F.A. PROJ. STP-0224 (3)

COUNTY PITT

PROJECT DESCRIPTION CRESENT ROAD IN KINSTON FROM US 70 TO US 258

SITE DESCRIPTION NOISE WALL 1 LEFT OF -L- STA. 114+50, AND NOISE WALL 2 RIGHT OF -L- STA. 139+00

NOISE WALL INVENTORY

ID: R-2719A

PROJECT:

CONTENTS:

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3-7	TEST SITE PLAN
8-11	PROFILE(S)

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

TJB

JRS

WNC

RES

TJW

LWD

INVESTIGATED BY J.L. STONE

CHECKED BY D.N. ARGENBIRGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE JANUARY 2007

DRAWN BY: J.L. STONE

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.

NORTH CAROLINA LICENSED SEAL 2007 GEOLOGIST JOSEPH L. STONE 1-3-07

PROJECT REFERENCE NO.	SHEET NO.
34501.1.1	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS 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 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT	6 MX		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 SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, 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

EQUIPMENT USED ON SUBJECT PROJECT

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

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 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
- [X] 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.

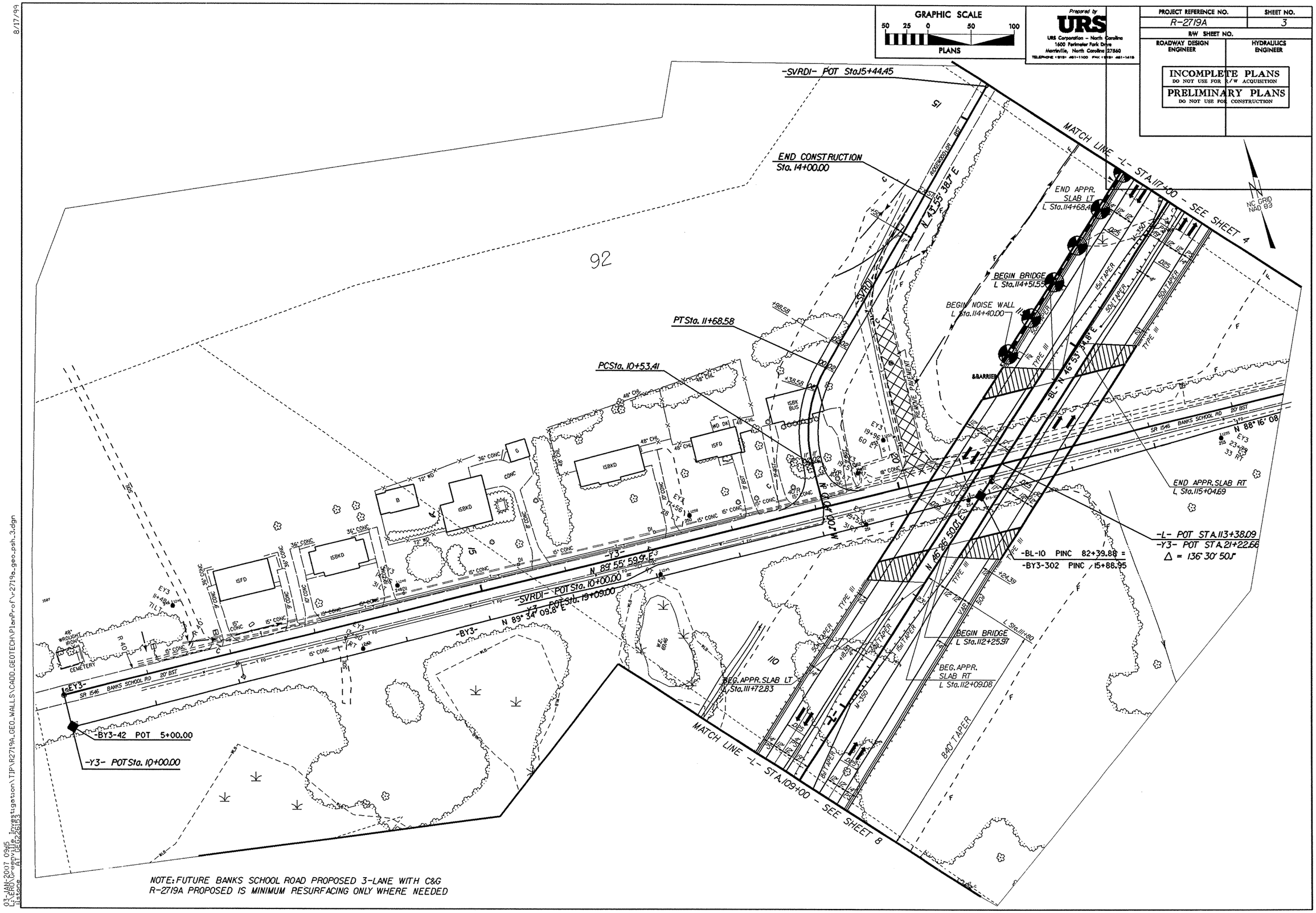
TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION: FT.

NOTES:

REVISED 02/23/06



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GRAPHIC SCALE
50 25 0 50 100
PLANS

Prepared by
URS
URS Corporation – North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NCGRID NAD 83

REVISIONS
8/17/99

MATCH LINE -L- STA.117+00 - SEE SHEET 3

MATCH LINE -L- STA.131+00 - SEE SHEET 5

RIDGEWOOD DR

ISBKD ISFD BST

BM "D"
-BL- STA 93+58.31
186.94 LEFT
ELEV. 78.12'

-BL-11 PINC 88+53.32

-BL-12 PINC 93+86.07

-L- TS Sta. 127+73.78

-L- SC Sta. 130+23.78

-BL- N 45° 52' 13.4" E

-L-
N 46° 26' 50.0" E

-BL- N 46° 37' 28.2" E

8d TAPER

50d TAPER

50' TYP.

93

94

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Bentone AT GE0226153

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

GRAPHIC SCALE
50 25 0 50 100
PLANS

Prepared by
URS
URS Corporation – North Carolina
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Morrisville, North Carolina 27560
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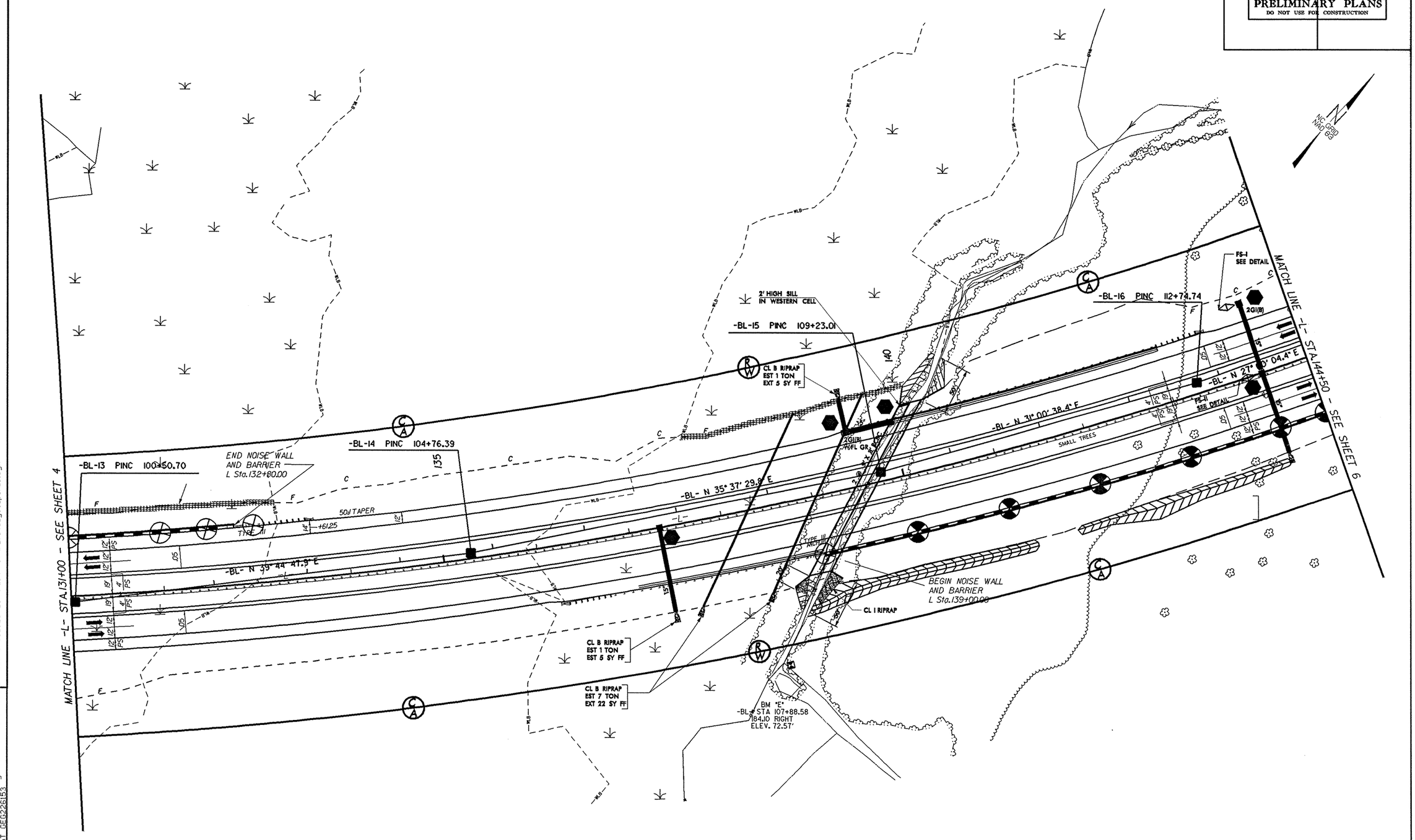

REVISIONS

DATE: 61406 – PARCEL 48 & 51; REVISED TEMPORARY DRAINAGE EASEMENT

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2719A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE
50 25 0 50 100
PLANS

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Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415

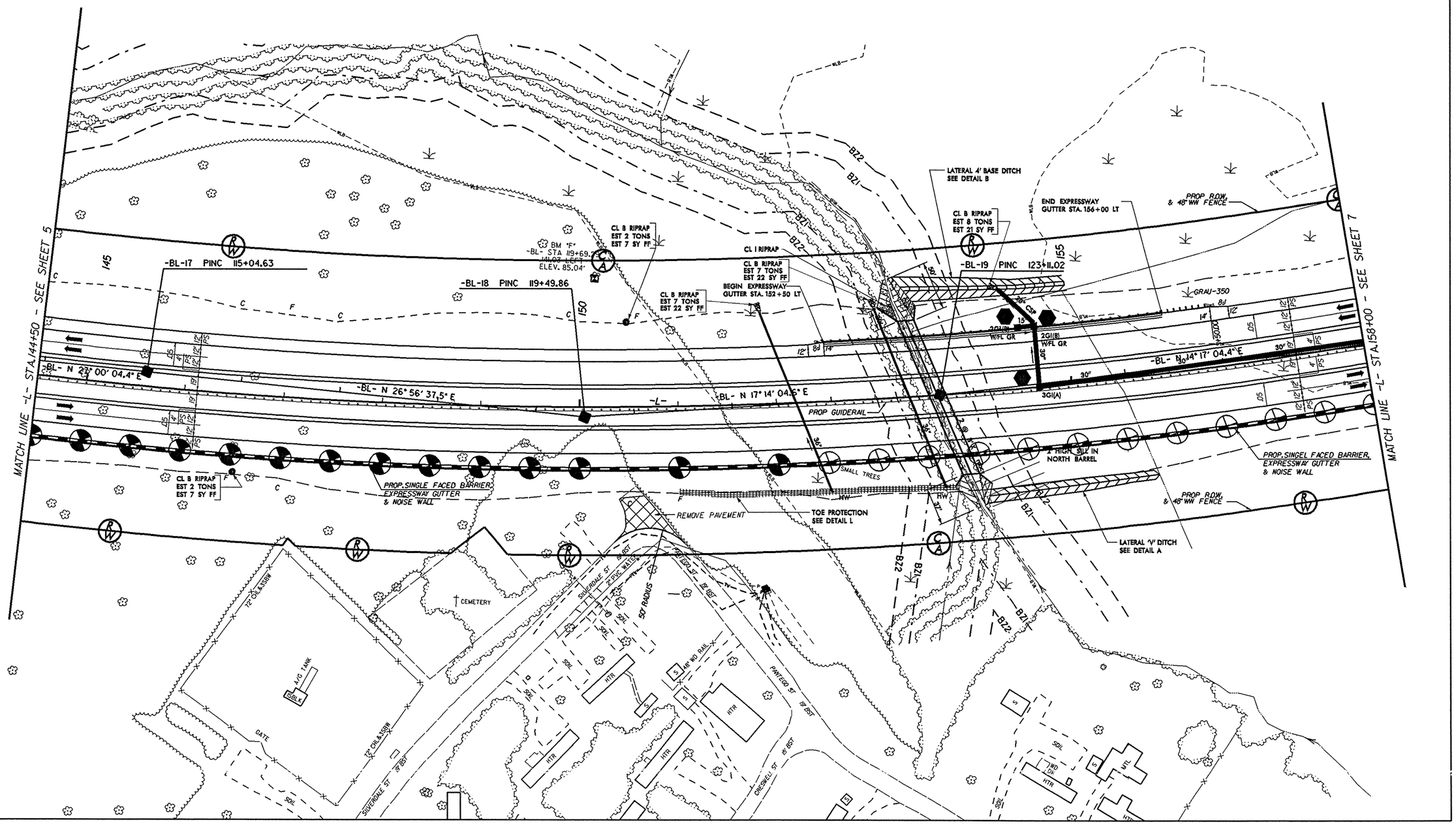
NC GRID NAD 83

-L- CURVE DATA
PI Sta 151+30.46
Δ = 47° 50' 08.7" (LT)
D = 1° 12' 22.4"
L = 3,965.73'
T = 2106.68'
R = 4,750.00'
e = 5%

NOTE: FOR -L- PROFILE, SEE SHEET 41

SEE SHEET 2-L FOR DRAINAGE DITCH DETAILS
SEE SHEET 2-M FOR CULVERT CHANNEL DETAILS

MILLED RUMBLE STRIPS SHALL BE PLACED ON -L- ACCORDING TO NCDOT STANDARD DRAWING No.665.01



REVISIONS

8/17/99

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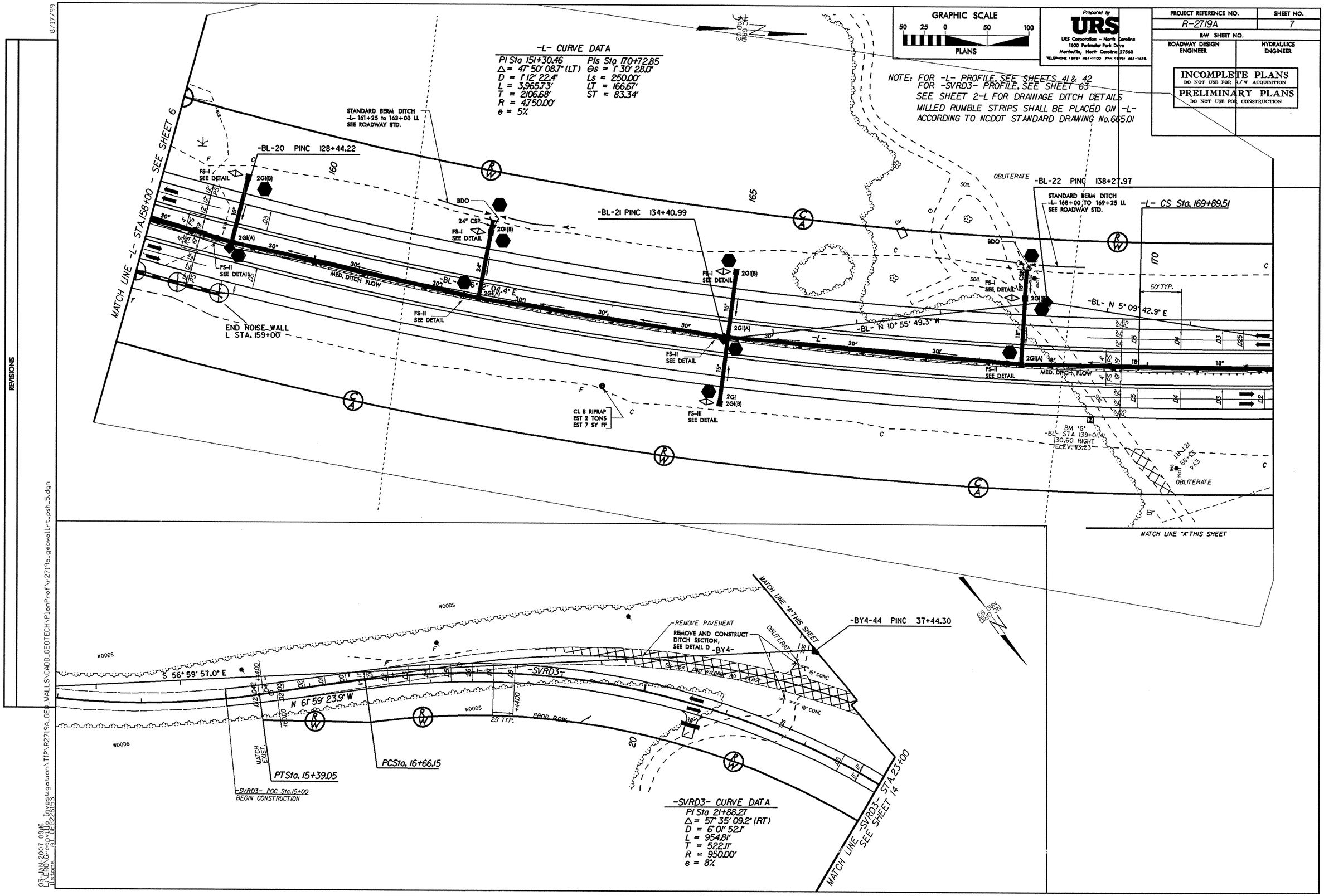


GRAPHIC SCALE
50 25 0 50 100
PLANS
Prepared by
URS
URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
PROJECT REFERENCE NO.
R-2719A
SHEET NO.
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L- CURVE DATA
PI Sta 151+30.46
Δ = 47° 50' 08.7" (LT)
D = 1° 12' 22.4"
L = 3,965.73'
T = 2106.68'
R = 4,750.00'
e = 5%
PIs Sta 170+72.85
Θs = 1° 30' 28.0"
Ls = 250.00'
LT = 166.67'
ST = 83.34'
NOTE: FOR -L- PROFILE, SEE SHEETS 41 & 42
FOR -SVRD3- PROFILE, SEE SHEET 63
SEE SHEET 2-L FOR DRAINAGE DITCH DETAILS
MILLED RUMBLE STRIPS SHALL BE PLACED ON -L-
ACCORDING TO NCDOT STANDARD DRAWING No. 665.01
STANDARD BERM DITCH
-L- 161+25 to 163+00 LL
SEE ROADWAY STD.
-BL-20 PINC 128+44.22
-BL-21 PINC 134+40.99
-BL-22 PINC 138+27.97
STANDARD BERM DITCH
-L- 168+00 TO 169+25 LL
SEE ROADWAY STD.
-L- CS Sta. 169+89.51
MATCH LINE -L- STA.158+00 - SEE SHEET 6
END NOISE WALL
L STA. 159+00
MED. DITCH FLOW
-BL- N 10° 55' 49.3" W
-BL- N 5° 09' 42.9" E
CL B RIPRAP
EST 2 TONS
EST 7 SY FF
BM "G"
-BL- STA 139+01.41
30.60 RIGHT
ELEV. 113.23
OBLITERATE
MATCH LINE "A" THIS SHEET
-BY4-44 PINC 37+44.30
REMOVE PAVEMENT
REMOVE AND CONSTRUCT
DITCH SECTION,
SEE DETAIL D -BY4-
S 56° 59' 57.0" E
N 61° 59' 23.9" W
-SVRD3-
PT Sta. 15+39.05
PC Sta. 16+66.15
-SVRD3- POC Sta.15+00
BEGIN CONSTRUCTION
MATCH EXIST.
PROP. R/W
25' TYP.
-SVRD3- CURVE DATA
PI Sta 21+88.27
Δ = 57° 35' 09.2" (RT)
D = 6° 01' 52.1"
L = 954.81'
T = 522.11'
R = 950.00'
e = 8%
MATCH LINE -SVRD3- STA.23+00
SEE SHEET 14
WOODS
REVISIONS
8/17/99
03-JAN-2007 09:16

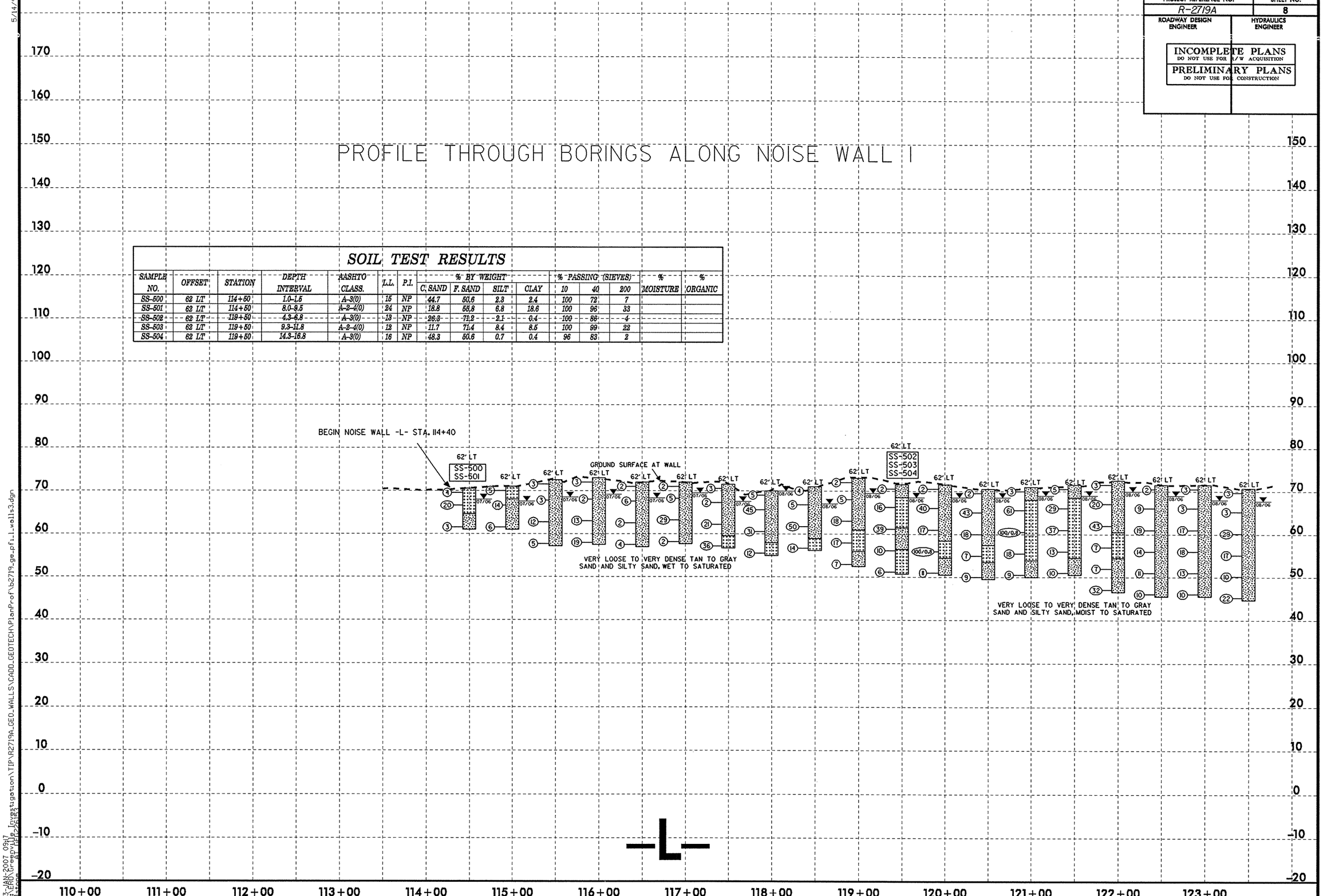
PROJECT REFERENCE NO.	SHEET NO.
R-2719A	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PROFILE THROUGH BORINGS ALONG NOISE WALL 1

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-500	62 LT	114+50	1.0-1.5	A-3(0)	15	NP	44.7	50.6	2.3	2.4	100	72	7		
SS-501	62 LT	114+50	8.0-9.5	A-2-4(0)	24	NP	18.8	55.8	6.8	18.6	100	96	33		
SS-502	62 LT	119+50	4.3-6.8	A-3(0)	13	NP	26.3	71.2	2.1	0.4	100	86	4		
SS-503	62 LT	119+50	9.3-11.8	A-2-4(0)	12	NP	11.7	71.4	8.4	8.5	100	99	22		
SS-504	62 LT	119+50	14.3-16.8	A-3(0)	16	NP	48.3	50.6	0.7	0.4	96	83	2		



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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

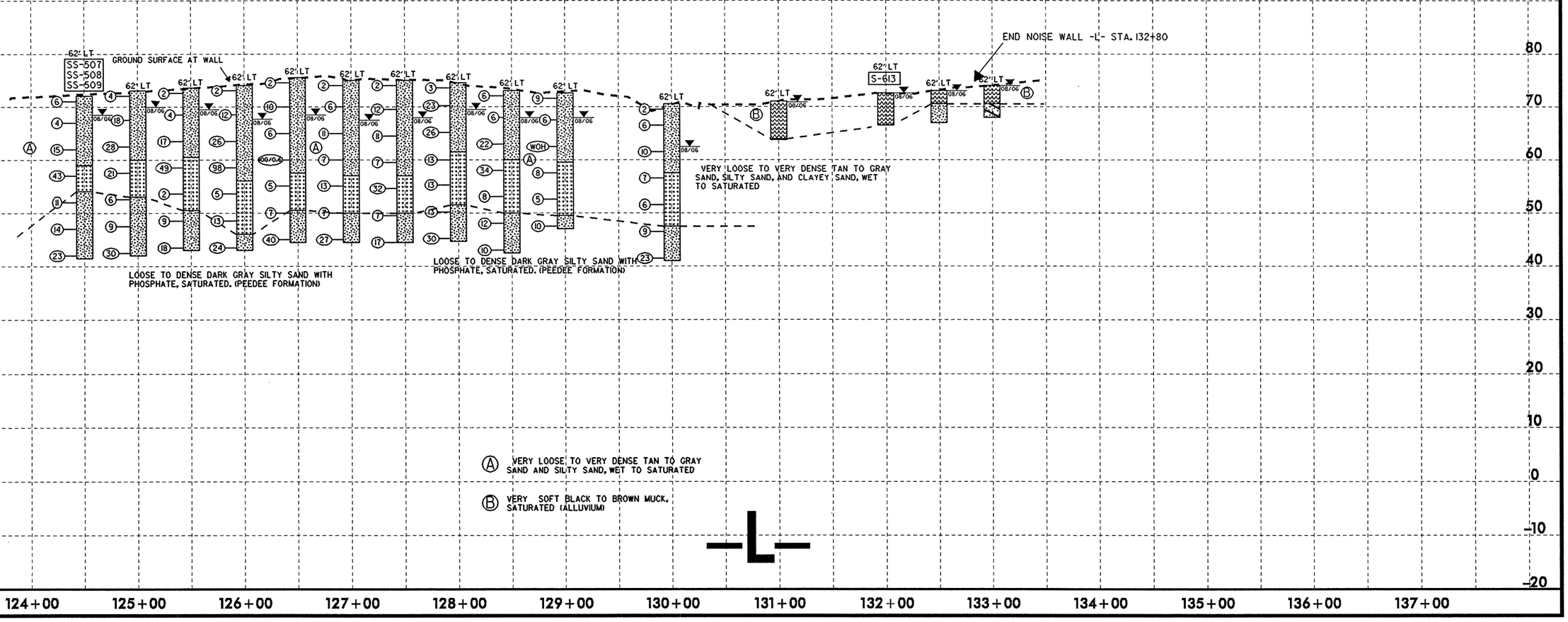
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROFILE THROUGH BORINGS ALONG NOISE WALL 1

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-507	62 LT	124+60	4.0-5.5	A-2-4(0)	13	NP	12.5	74.4	4.6	8.5	100	95	17		
SS-508	62 LT	124+60	14.0-15.5	A-3(0)	12	NP	56.6	38.4	4.6	0.4	100	75	7		
SS-509	62 LT	124+60	19.0-20.5	A-2-4(0)	22	NP	18.0	63.1	8.4	10.5	100	91	27		
S-613	62 LT	132+00	1.0-3.0	NOT ENOUGH SAMPLE										52.5	42.9



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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

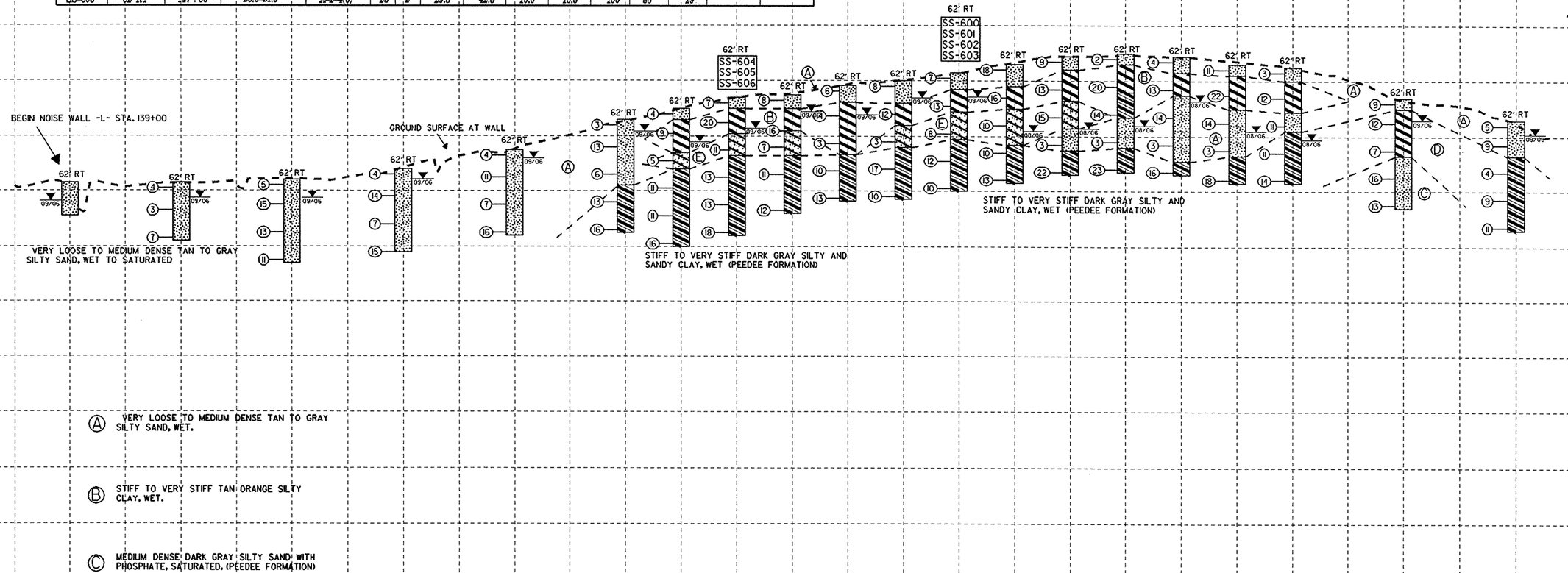
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROFILE THROUGH BORINGS ALONG NOISE WALL 2

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-604	62 RT	145+00	3.5-5.0	A-7-6(11)	44	17	16.4	19.8	21.0	42.8	100	91	66		
SS-605	62 RT	145+00	8.5-10.0	A-2-6(1)	33	15	43.8	26.0	9.4	20.8	98	75	31		
SS-606	62 RT	145+00	13.5-15.0	A-2-4(0)	22	NP	32.6	42.0	10.6	14.8	100	84	27		
SS-600	62 RT	147+00	5.0-6.5	A-7-5(20)	58	20	7.4	13.8	28.0	50.8	100	97	82		
SS-601	62 RT	147+00	10.0-11.5	A-2-6(0)	35	13	64.8	16.6	5.8	12.8	84	44	18		
SS-602	62 RT	147+00	15.0-16.5	A-2-4(0)	26	5	36.2	30.6	12.4	20.8	98	81	34		
SS-603	62 RT	147+00	20.0-21.5	A-2-4(0)	23	2	29.8	42.8	10.6	16.8	100	85	29		



Ⓐ VERY LOOSE TO MEDIUM DENSE TAN TO GRAY SILTY SAND, WET.

Ⓑ STIFF TO VERY STIFF TAN ORANGE SILTY CLAY, WET.

Ⓒ MEDIUM DENSE DARK GRAY SILTY SAND WITH PHOSPHATE, SATURATED. (PEEDEE FORMATION)

Ⓓ STIFF TO VERY STIFF DARK GRAY SILTY AND SANDY CLAY, WET. (PEEDEE FORMATION)

Ⓔ VERY LOOSE TO MEDIUM DENSE TAN CLAYEY SAND, SATURATED.

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PROJECT REFERENCE NO.	SHEET NO.
R-2719A	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

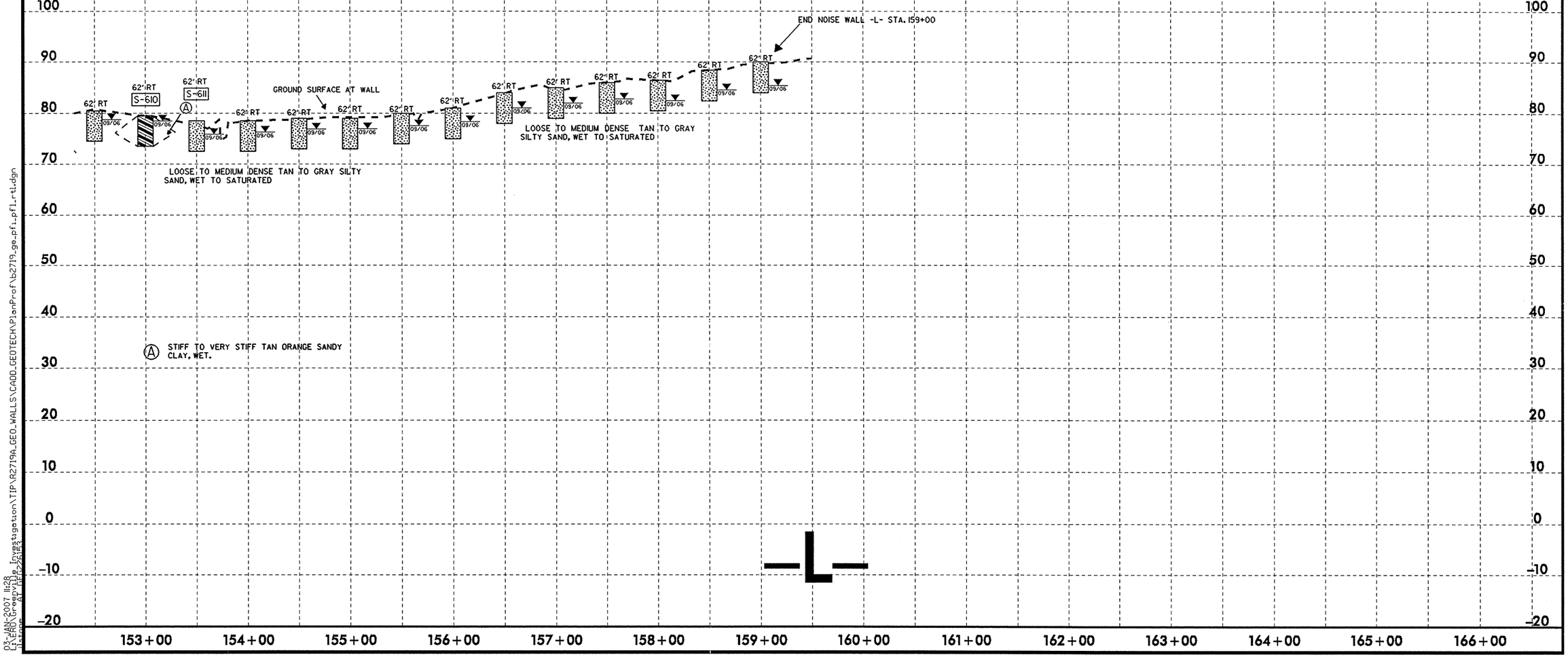
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROFILE THROUGH BORINGS ALONG NOISE WALL 2

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-610	62 RT	153+00	1.0-6.0	A-7-5(20)	58	20	7.4	13.8	28.0	50.8	100	97	82		
S-611	62 RT	153+50	1.0-6.0	A-2-6(0)	35	13	64.8	16.6	5.8	12.8	84	44	16		



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