

CONTRACT: ID: B-4245

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 33588.1.1 I.D. NO. B-4245

F.A. PROJECT _____

COUNTY RANDOLPH

PROJECT DESCRIPTION BRIDGE NO. 257
ON SR 2824 OVER RICHLAND CREEK

SITE DESCRIPTION BRIDGE NO. 257
ON SR 2824 OVER RICHLAND CREEK

CONTENTS:

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	REPORT
4	SITE PLAN
5-6	CROSS SECTIONS
7	PROFILE
8-9	BORE LOGS
10	SOIL TEST RESULTS
11	SCOUR REPORT
12	SITE PHOTOS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4245	1	12
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
		P.E.	
		CONST.	

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS 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.

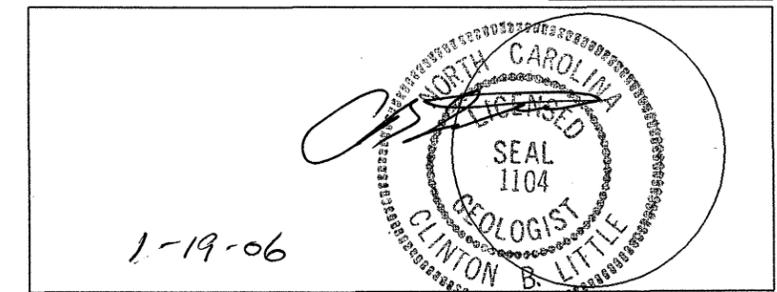
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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.

INVESTIGATED BY J.E. BEVERLY PERSONNEL J.K. STICKNEY
 CHECKED BY C.B. LITTLE C.L. SMITH
 SUBMITTED BY C.B. LITTLE K. WISE
 DATE JANUARY 2006

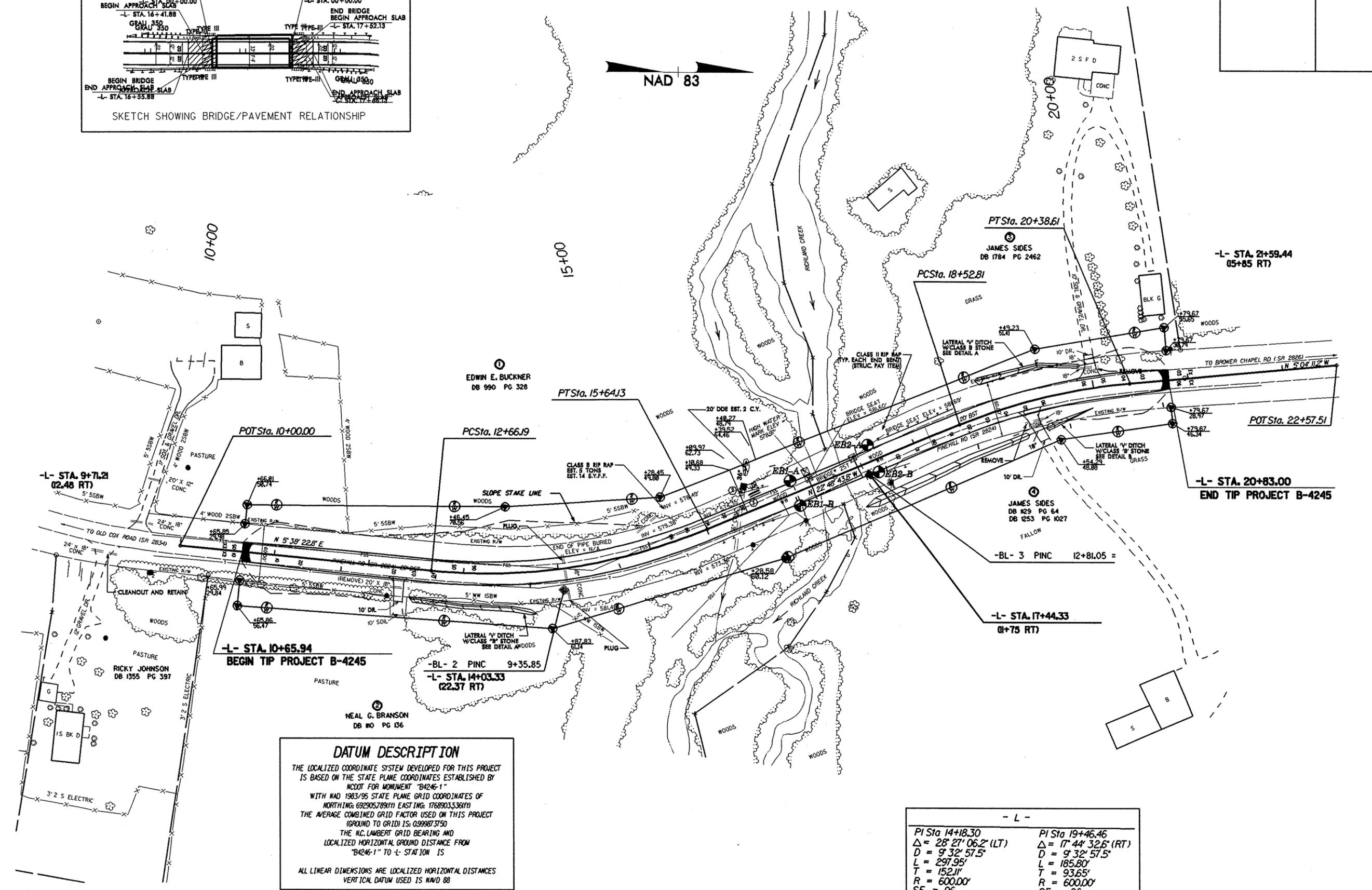
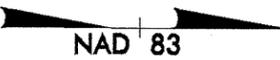
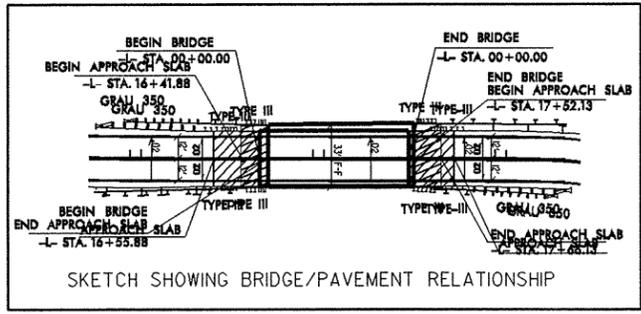
DRAWN BY: J.E. BEVERLY

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.
B-4245	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY MCDOT FOR MONUMENT "B4246-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 692905789(1) EASTING: 1768903536(1) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999873750 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4246-1" TO L- STATION IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

- L -

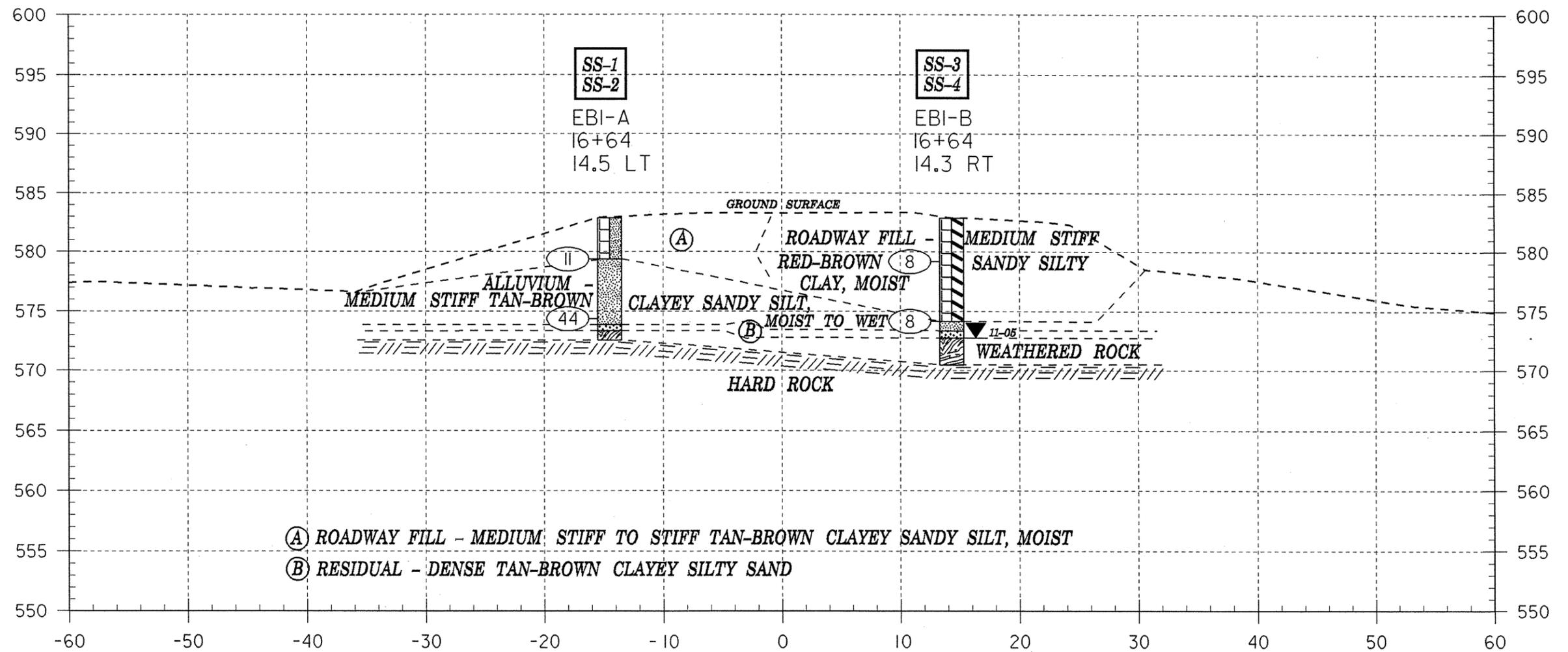
PI Sta 14+18.30	PI Sta 19+46.46
$\Delta = 28' 27" 06.2' (LT)$	$\Delta = 17' 44" 32.6' (RT)$
$D = 9' 32" 57.5'$	$D = 9' 32" 57.5'$
$L = 297.95'$	$L = 185.80'$
$T = 152.11'$	$T = 93.65'$
$R = 600.00'$	$R = 600.00'$
$SE = 06'$	$SE = 06'$
$VDes = 40 MPH$	$VDes = 40 MPH$

REVISIONS

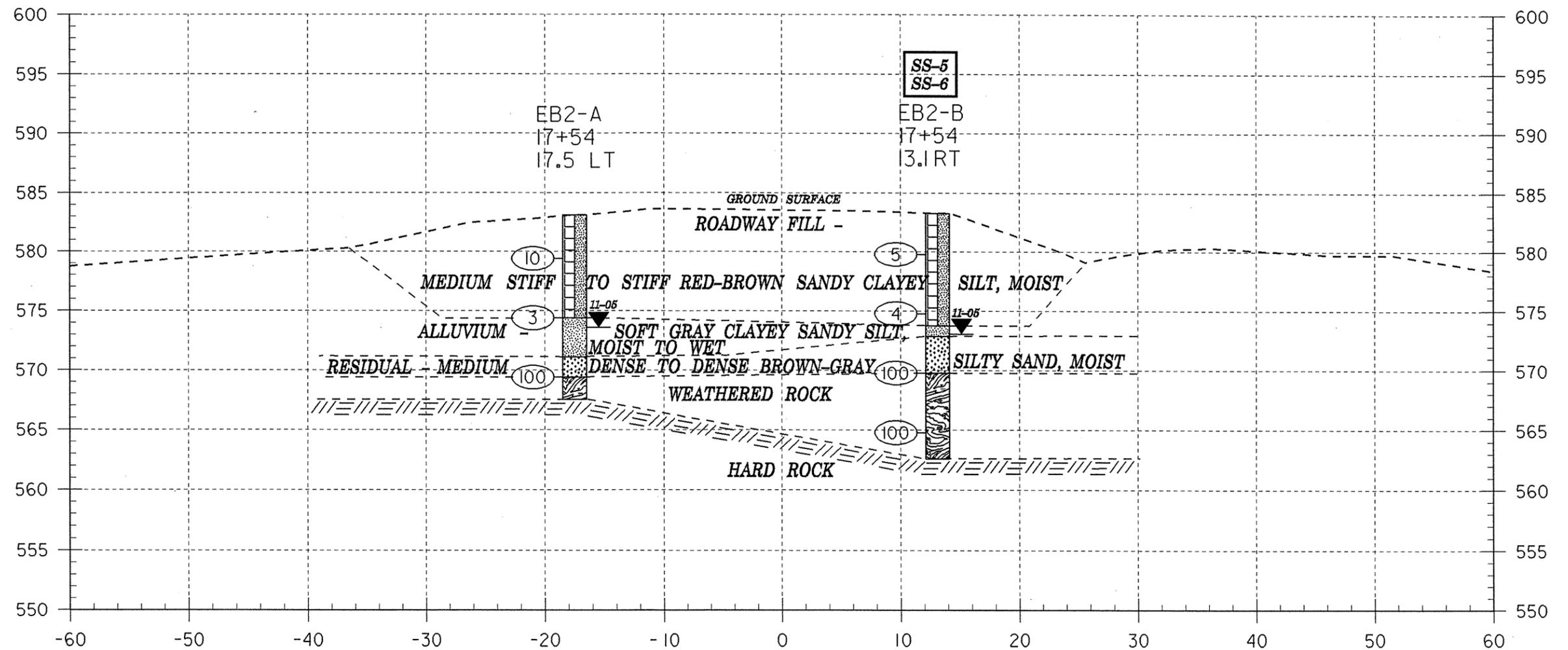
8/17/99

FILE NAME: C:\PROJECTS\B4245\B4245-04.dwg PLOT DATE: 8/17/99 11:25:33

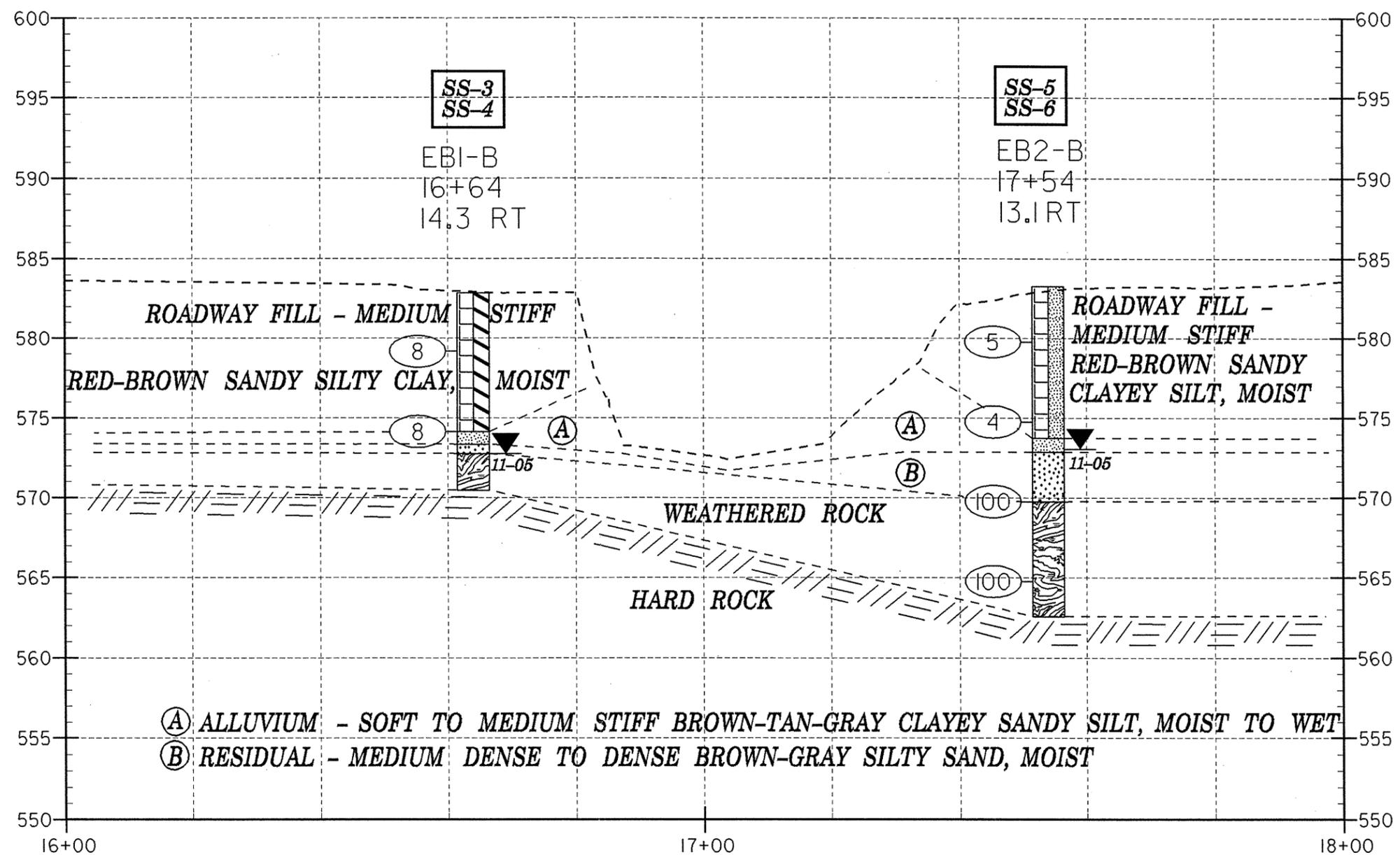
SECTION THROUGH EB I-A AND EB I-B



SECTION THROUGH EB2-A AND EB2-B



PROFILE 14 FEET RT OF -L-



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33588.1.1		ID B-4245		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY							
SITE DESCRIPTION BRIDGE NO. 257 ON SR 2824 OVER RICHLAND CREEK							GND WATER						
BORING NO EB1-A		NORTHING 0.00		EASTING 0.00		0 HR N/A							
ALIGNMENT L		BORING LOCATION 16+64.000		OFFSET 14.50ft LT		24 HR N/A							
COLLAR ELEV 582.86ft		TOTAL DEPTH 10.30ft		START DATE 11/17/05		COMPLETION DATE 11/17/05							
DRILL MACHINE CME-550X			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH			DEPTH TO ROCK 10.30ft			Log EB1-A, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN	BLOWS PER FOOT		SAMPLE	LOG	SOIL AND ROCK DESCRIPTION			
		6in	6in	6in	(ft)	0	25	50	75	100	NO	MOI	
582.86													Ground Surface
580.00	3.50	3	6	5	1.0						SS-1	MOIST	ROADWAY FILL - STIFF TAN-BROWN CLAYEY SANDY SILT
	8.50	10	20	24	1.0						SS-2	MOIST	ALLUVIUM - STIFF TAN-BROWN CLAYEY SANDY SILT
572.56													RESIDUAL - DENSE TAN-BROWN CLAYEY SILTY SAND
													WEATHERED ROCK
													AUGER REFUSAL ON HARD ROCK AT ELEVATION 572.56 FEET

PROJECT NO 33588.1.1		ID B-4245		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY							
SITE DESCRIPTION BRIDGE NO. 257 ON SR 2824 OVER RICHLAND CREEK							GND WATER						
BORING NO EB1-B		NORTHING 0.00		EASTING 0.00		0 HR N/A							
ALIGNMENT L		BORING LOCATION 16+64.000		OFFSET 14.30ft RT		24 HR 10.10ft							
COLLAR ELEV 582.86ft		TOTAL DEPTH 12.40ft		START DATE 11/17/05		COMPLETION DATE 11/17/05							
DRILL MACHINE CME-550X			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH			DEPTH TO ROCK 12.40ft			Log EB1-B, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN	BLOWS PER FOOT		SAMPLE	LOG	SOIL AND ROCK DESCRIPTION			
		6in	6in	6in	(ft)	0	25	50	75	100	NO	MOI	
582.86													Ground Surface
580.00	3.70	1	3	5	1.0						SS-3	MOIST	ROADWAY FILL - MEDIUM STIFF RED-BROWN SANDY SILTY CLAY
	8.70	2	3	5	1.0						SS-4	MWV	ALLUVIUM - MEDIUM STIFF BROWN-TAN-GRAY CLAYEY SANDY SILT
570.46													RESIDUAL - DENSE TAN-BROWN CLAYEY SILTY SAND
													WEATHERED ROCK
													AUGER REFUSAL ON HARD ROCK AT ELEVATION 570.46 FEET

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33588.1.1		ID B-4245		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY								
SITE DESCRIPTION BRIDGE NO. 257 ON SR 2824 OVER RICHLAND CREEK							GND WATER							
BORING NO EB2-A		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT L		BORING LOCATION 17+54.000		OFFSET 17.50ft LT		24 HR 9.50ft								
COLLAR ELEV 583.09ft		TOTAL DEPTH 15.60ft		START DATE 11/17/05		COMPLETION DATE 11/17/05								
DRILL MACHINE CME-550X			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK 15.60ft			Log EB2-A, Page 1 of 1								
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION	
		6in	6in	6in		0	25	50	75					100
583.09														Ground Surface
580.00	3.70	3	4	6	1.0									ROADWAY FILL - STIFF RED-BROWN SANDY CLAYEY SILT
	8.70	2	1	2	1.0									ALLUVIUM - SOFT GRAY SANDY SILTY CLAY
570.00	13.70	39	61		0.7									RESIDUAL - DENSE BROWN-GRAY SILTY SAND
567.49														WEATHERED ROCK
AUGER REFUSAL AT ELEVATION 567.49 FEET ON HARD ROCK														

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33588.1.1		ID B-4245		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY								
SITE DESCRIPTION BRIDGE NO. 257 ON SR 2824 OVER RICHLAND CREEK							GND WATER							
BORING NO EB2-B		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT L		BORING LOCATION 17+54.000		OFFSET 13.10ft RT		24 HR 10.20ft								
COLLAR ELEV 583.27ft		TOTAL DEPTH 20.70ft		START DATE 11/17/05		COMPLETION DATE 11/17/05								
DRILL MACHINE CME-550X			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH N/A			DEPTH TO ROCK 20.70ft			Log EB2-B, Page 1 of 1								
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION	
		6in	6in	6in		0	25	50	75					100
583.27														Ground Surface
580.00	3.50	1	3	2	1.0									ROADWAY FILL - MEDIUM STIFF RED-BROWN SANDY CLAYEY SILT
	8.50	1	3	1	1.0									ALLUVIUM - SOFT GRAY SANDY CLAYEY SILT
570.00	13.50	20	50	50	0.8									RESIDUAL - MEDIUM DENSE TO DENSE BROWN-GRAY SILTY SAND
	18.50	41	39	61	1.0									WEATHERED ROCK
562.57														WEATHERED ROCK
AUGER REFUSAL AT ELEVATION 562.57 FEET ON HARD ROCK														

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

T. I. P. No. B-4245

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 33588.1.1 County RANDOLPH Owner _____
 Date: Sampled _____ Received 11/21/05 Reported 11/23/2005
 Sampled from BRIDGE By J E BEVERLY
 Submitted by N WAINAINA _____ 1995 Standard Specifications

727192 TO 727197
1/11/06

TEST RESULTS

Proj. Sample No.	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Lab. Sample No.	727192	727193	727194	727195	727196	727197
Retained #4 Sieve %	-	20	8	-	-	-
Passing #10 Sieve %	100	70	86	99	97	98
Passing #40 Sieve %	97	49	78	87	91	92
Passing #200 Sieve %	79	34	71	59	78	83

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	7.0	38.4	11.8	22.5	8.8	8.6
Fine Sand Ret - #270 %	21.1	17.5	7.8	23.1	16.5	11.6
Silt 0.05 - 0.005 mm %	57.8	28.1	22.1	36.3	46.6	57.6
Clay < 0.005 mm %	14.1	16.1	58.2	18.1	28.1	22.1
Passing #40 Sieve %	-	-	-	-	-	-
LOCATION	FB1-A	FB1-A	FB1-B	FB1-B	FB2-B	FB2-B

L. L.	24	26	63	28	31	34
P. I.	3	7	32	8	10	10
AASHTO Classification	A-4(1)	A-2-4(0)	A-7-5(24)	A-4(2)	A-4(7)	A-4(8)
Station	16+64	16+64	16+64	16+64	17+54	17+54
OFFSET	14.5 LT	14.5 LT	14.3 RT	10.3 RT	13.1 RT	13.1 RT
ALIGNMENT	L	L	L	L	L	L
Depth (Ft)	4.00	9.00	4.20	9.20	4.00	9.00
to	5.00	10.00	5.20	10.20	5.00	10.00

cc: J E BEVERLY
Soils File

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 33588.1.1 TIP NO.: B-4245 COUNTY: Randolph

DESCRIPTION(1): Bridge #188 on SR 1137 over Waxhaw Creek

◆ **INFORMATION ON EXISTING BRIDGES** Information obtained from Field Inspection
 Microfilm (Reel: Position:)
 Other

COUNTY BRIDGE NO. 257 BRIDGE LENGTH 54' NO. BENTS 4 NO. BENTS IN: CHANNEL 2 FLOODPLAIN 4

FOUNDATION TYPE: Timber deck bridge on timber piles built in 1960

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: None

INTERIOR BENTS: None

CHANNEL BED: None

CHANNEL BANKS: None

◆ **EXISTING SCOUR PROTECTION:**

TYPE(3): None

EXTENT(4): N/A

EFFECTIVENESS(5): N/A

OBSTRUCTIONS(6) (DAMS, DEBRIS, ETC.): Debris noted at interior bents on upstream side (tree limbs, and logs)

◆ **DESIGN INFORMATION**

CHANNEL BED MATERIAL(7) (Sample Results Attached): Rock outcrops, boulders and sand

CHANNEL BANK MATERIAL(8) (Sample Results Attached): sandy silt (SS-1)

CHANNEL BANK COVER(10): Mature trees and grasses

FLOOD PLAIN WIDTH(11): approximately 100' (16+60 - 17+60)

FLOOD PLAIN COVER(12): Mature trees and grass

STREAM IS: DEGRADING AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS:

◆
◆
◆ **DESIGN INFORMATION CONT.**

CHANNEL MIGRATION TENDENCY(14): slight to none

GEOTECHNICAL ADJUSTED SCOUR ELEVATIONS (15):

The NCDOT Hydraulics Report predicts 100 year theoretical scour at elevation 571' and 500 year scour at 570' in the creek channel.

Scour should not be a problem for the proposed structure since it is a single span design with end bents outside of the critical scour zone.

REPORTED BY: JKS/JEB DATE: December 2005

INSTRUCTIONS

- (1) GIVE THE DESCRIPTION OF THE SPECIFIC SITE GIVING ROUTE NUMBER AND BODY OF WATER CROSSED.
- (2) NOTE ANY EVIDENCE OF SCOUR AT THE EXISTING END BENTS OR ABUTMENTS (UNDERMINING, SLOUGHING, SCOUR LOCATIONS DEGRADATIONS, ETC.)
- (3) NOTE ANY EXISTING SCOUR PROTECTION (RIPRAP, ETC.)
- (4) DESCRIBE THE EXTENT OF ANY EXISTING SCOUR PROTECTION.
- (5) DESCRIBE WHETHER OR NOT THE SCOUR PROTECTION APPEARS TO BE WORKING.
- (6) NOTE ANY DAMS, FALLEN TREES, DEBRIS AT BENTS, ETC.
- (7) DESCRIBE THE CHANNEL BED MATERIAL; A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (8) DESCRIBE THE CHANNEL BANK MATERIAL; A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (9) DESCRIBE THE FOUNDATION BEARING MATERIAL
- (10) DESCRIBE THE BANK COVERING (GRASS, TREES, RIPRAP, NONE, ETC.)
- (11) GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE).
- (12) DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.)
- (13) CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING.
- (14) DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE Laterally DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS).
- (15) GIVE THE GEOTECHNICAL ADJUSTED SCOUR ELEVATION EXPECTED OVER THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS). THIS CAN BE GIVEN AS AN ELEVATION RANGE ACROSS THE SITE, OR ON A BENT BY BENT BASIS WHERE VARIATIONS EXIST. DISCUSS RELATIONSHIP BETWEEN THE HYDRAULICS THEORETICAL SCOUR AND THE GEOTECHNICAL ADJUSTED SCOUR ELEVATION. IF THE GEOTECHNICAL ADJUSTED SCOUR ELEVATION IS DEPENDENT ON SCOUR COUNTER MEASURES, EXPLAIN. (RIPRAP ARMORING ON SLOPES, ETC.) THE GEOTECHNICAL ADJUSTED SCOUR ELEVATION IS BASED ON THE ERODABILITY OF MATERIALS WITH CONSIDERATION FOR JOINTING, FOLIATION, BEDDING ORIENTATION AND FREQUENCY; CORE RECOVERY PERCENTAGE; PERCENT RQD; DIFFERENTIAL WEATHERING; SHEAR STRENGTH; OBSERVATIONS AT EXISTING STRUCTURES; OTHER TESTS DEEMED APPROPRIATE; AND OVERALL GEOLOGIC CONDITIONS AT THE SITE.

33588.1.1 (B-4245)
RANDOLPH COUNTY
BRIDGE # 257 ON SR 2824 OVER RICHLAND CREEK

SITE PHOTOS



Looking East (looking downstream)



Looking West (looking upstream)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4246	1	16

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. B-4246 F.A. PROJ. BRZ-2834(1)
COUNTY RANDOLPH
PROJECT DESCRIPTION BRIDGE #228 ON SR 2834 OVER RICHLAND CREEK (-L- STATION 16+42.5)

SITE DESCRIPTION _____

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	GEOTECHNICAL REPORT
4	SITE PLAN
5	PROFILE
6-9	CROSS SECTIONS
10-13	BORE LOGS
14	SOIL TEST RESULTS
15	SCOUR REPORT
16	SITE PHOTOS

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.

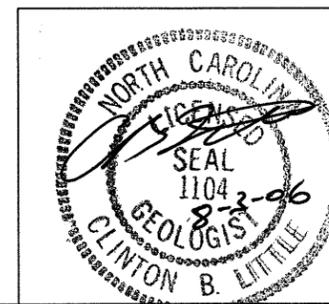
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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.

PROJECT: 33589.1.1 ID: B-4246

PERSONNEL
J.K. STICKNEY
C.L. SMITH
K. WISE

INVESTIGATED BY J.E. BEVERLY
CHECKED BY C.B. LITTLE
SUBMITTED BY C.B. LITTLE
DATE JULY 2006



DRAWN BY: J.E. BEVERLY

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT 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 DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. B-4246	SHEET NO. 2
---------------------------------	----------------

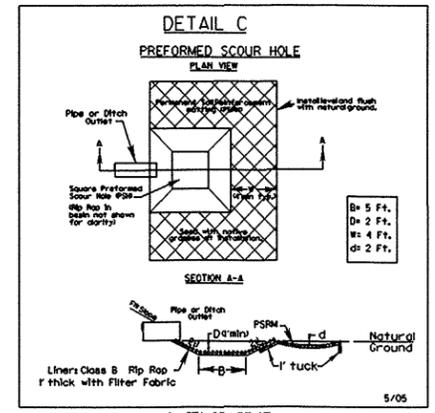
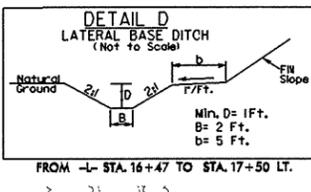
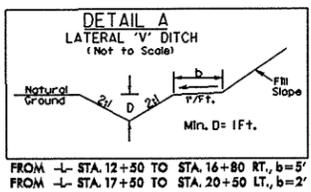
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

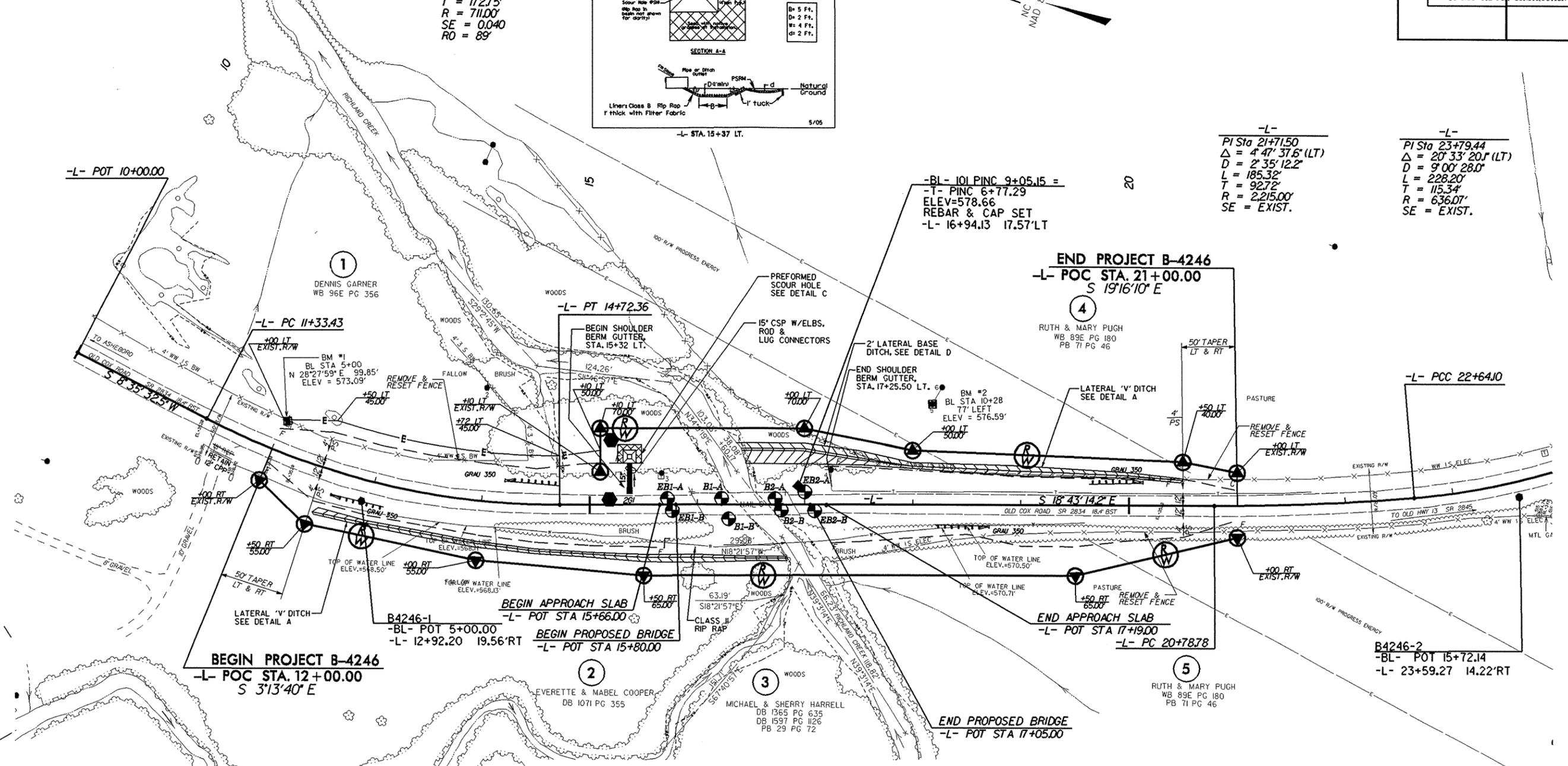
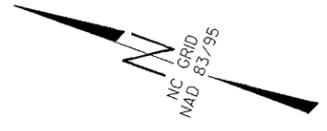
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T208, 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: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>	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. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	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 YIELD 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.	ALLOUVIUM (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 DISLOGGED 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 - A FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN 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 (IN 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 (SCREC) - 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.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	WEATHERING	
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) 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 (SL.) 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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> 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. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i> 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. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i> 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.	
GROUP CLASS. A-1, A-1-b, A-3, A-2, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-3, A-4, A-5, A-6, A-7	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE	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	
SYMBOL	ANGULARITY OF GRAINS	GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP	
% PASSING # 10, # 40, # 200	MINERALOGICAL COMPOSITION	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 DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD	
LIQUID LIMIT, PLASTIC INDEX, GROUP INDEX	PERCENTAGE OF MATERIAL	SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL	
USUAL TYPES OF MAJOR MATERIALS	GROUND WATER	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	
GEN. RATING AS A SUBGRADE	COMPRESSIBILITY	ABBREVIATIONS AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DNT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS	
PI OF A-7-5 SUBGROUP IS <= LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30	PERCENTAGE OF MATERIAL	MO - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT Wd - DRY UNIT WEIGHT	
CONSISTENCY OR DENSENESS	TEXTURE OR GRAIN SIZE	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B-51, BK-51, CME-45C, CME-550, PORTABLE HOIST ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE STEEL TEETH, TRICONE TUNG-CARB., CORE BIT	
PRIMARY SOIL TYPE, COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE), RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)	U.S. STD. SIEVE SIZE OPENING (MM), BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE, SD), FINE SAND (F SD), SILT (SL.), CLAY (CL.)	FRACURE SPACING TERM, SPACING VERY WIDE, WIDE, MODERATELY CLOSE, CLOSE, VERY CLOSE	
GENERAL GRANULAR MATERIAL (NON-COHESIVE), GENERAL SILT-CLAY MATERIAL (COHESIVE)	GRAIN SIZE MM, IN.	BEDDING TERM, THICKNESS VERY THICKLY BEDDED, THICKLY BEDDED, THINLY BEDDED, VERY THINLY BEDDED, THICKLY LAMINATED, THINLY LAMINATED	
VERY SOFT, SOFT, MEDIUM STIFF, STIFF, VERY STIFF, HARD	SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION	INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE, MODERATELY INDURATED, INDURATED, EXTREMELY INDURATED	
VERY LOOSE, LOOSE, MEDIUM DENSE, DENSE, VERY DENSE	PLASTICITY INDEX (PI), DRY STRENGTH	NOTES:	
VERY SOFT, SOFT, MEDIUM STIFF, STIFF, VERY STIFF, HARD	NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY		
TEXTURE OR GRAIN SIZE	COLOR		
U.S. STD. SIEVE SIZE OPENING (MM)	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.		

8/17/99
 20-JUL-2006 08:50
 d:\projects\4246\4246_gso-br-dg0223\cadd-geotech\3:te&sub\4246_geo-map-struct\0226.dgn
 sheet: 1 of 1

PROJECT REFERENCE NO.	SHEET NO.
B-4246	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

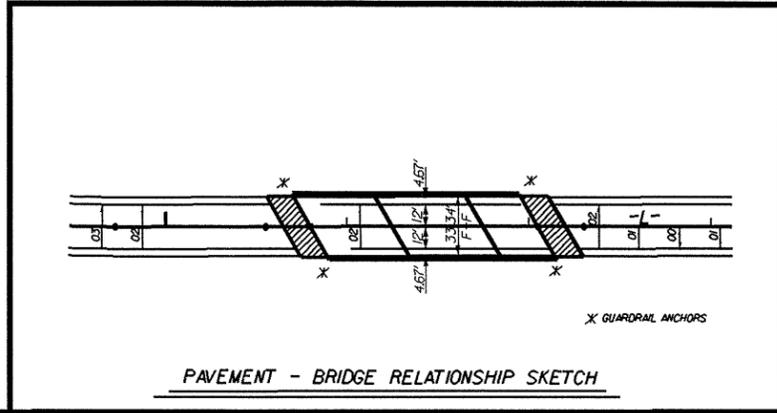


-L-
 PI Sta 13+06.18
 $\Delta = 27' 18'' 46.7''$ (LT)
 $D = 8' 03'' 30.5''$
 $L = 338.93'$
 $T = 172.75'$
 $R = 711.00'$
 $SE = 0.040$
 $RO = 89'$

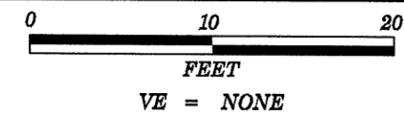


-L-
 PI Sta 21+71.50
 $\Delta = 4' 47'' 37.6''$ (LT)
 $D = 2' 35'' 12.2''$
 $L = 185.32'$
 $T = 92.72'$
 $R = 2215.00'$
 $SE = EXIST.$

-L-
 PI Sta 23+79.44
 $\Delta = 20' 33'' 20.1''$ (LT)
 $D = 9' 00'' 28.0''$
 $L = 228.20'$
 $T = 115.34'$
 $R = 636.07'$
 $SE = EXIST.$

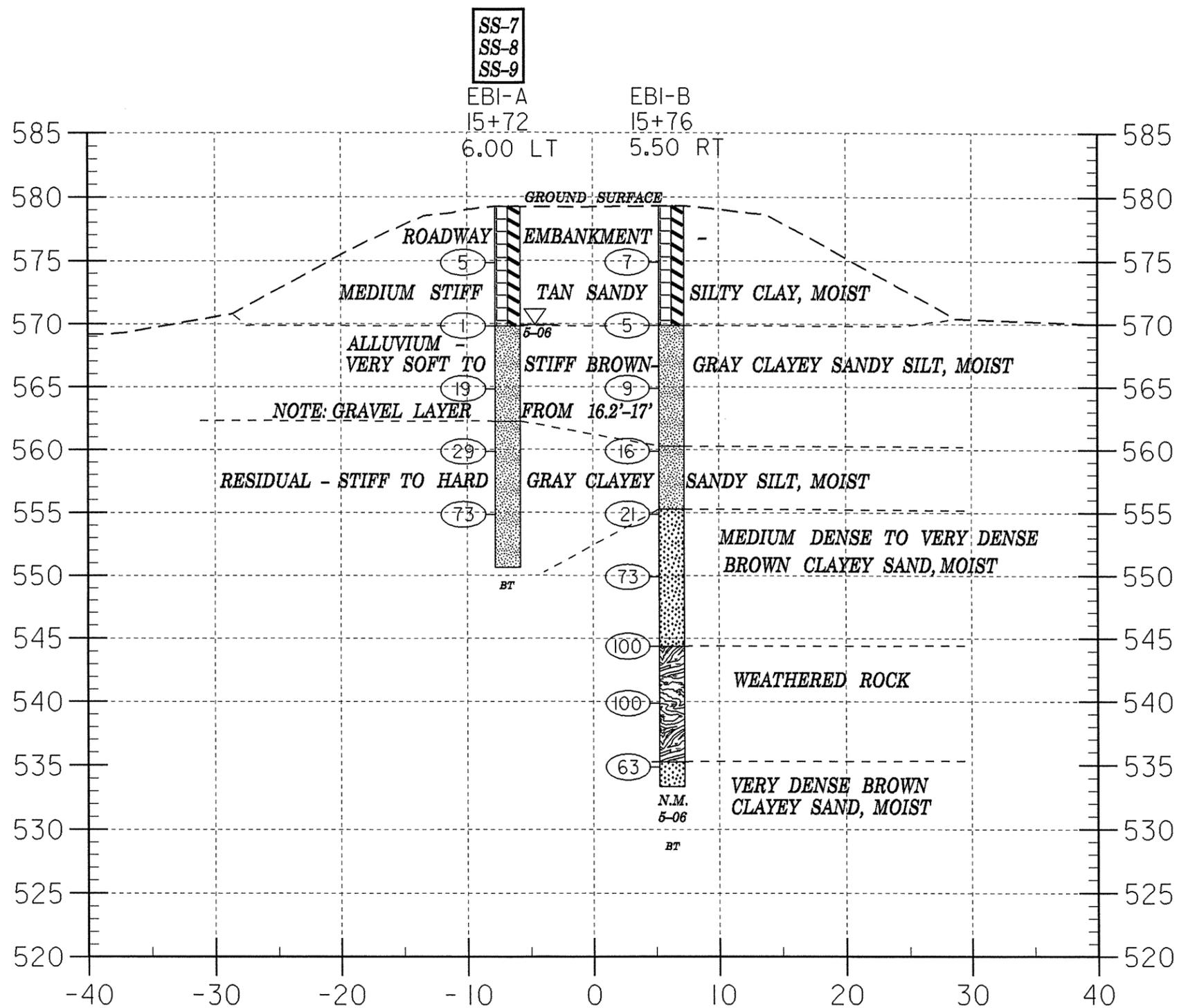


■ PAVED SHOULDER
 ▨ BRIDGE APPROACH SLAB
 FOR -L- PROFILE, SEE SHEET NO. 5
 FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-11

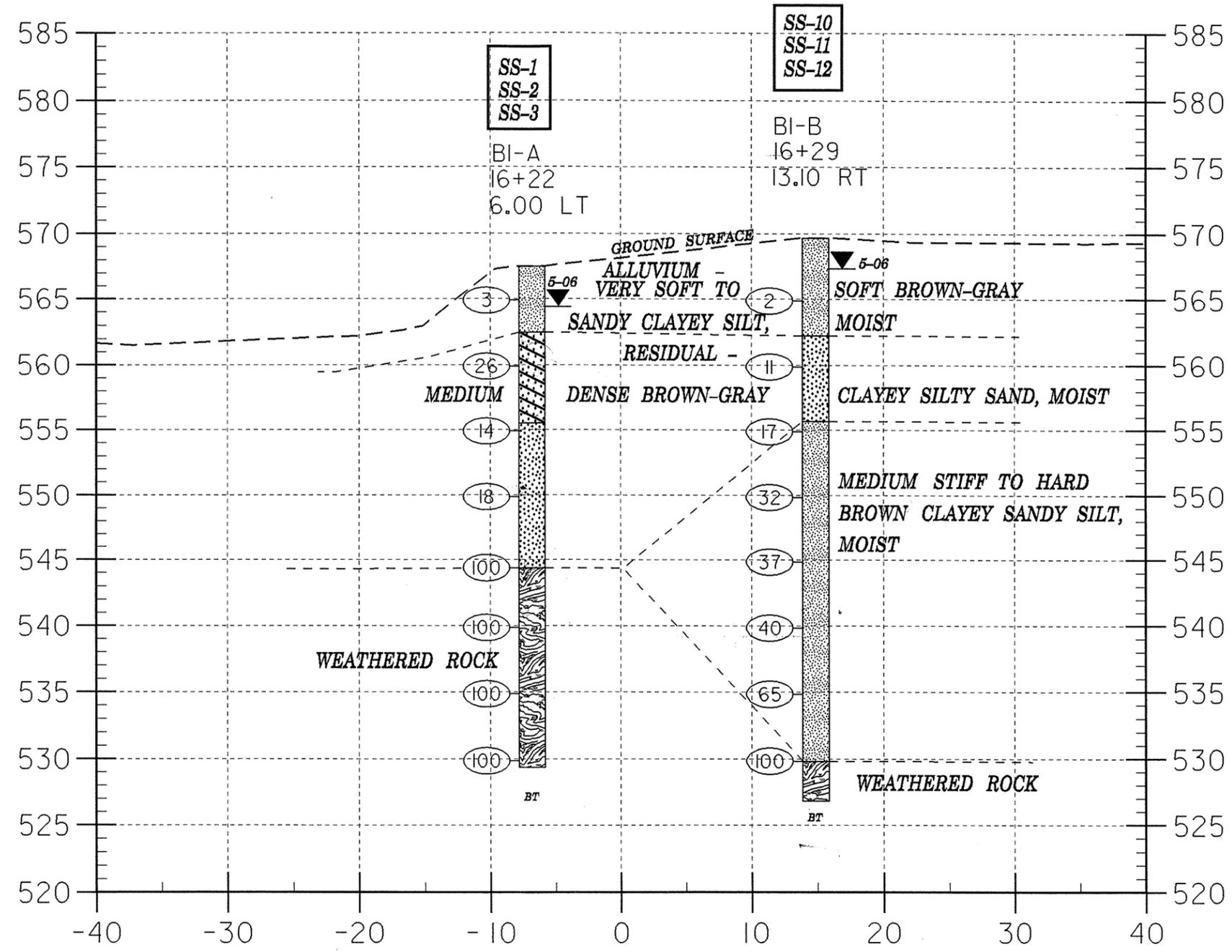


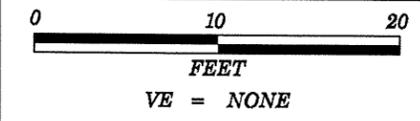
PROJECT REFERENCE NO.	SHEET
B-4246	6
SKEW=60 Deg.	

SECTION THROUGH EB1-A AND EB1-B



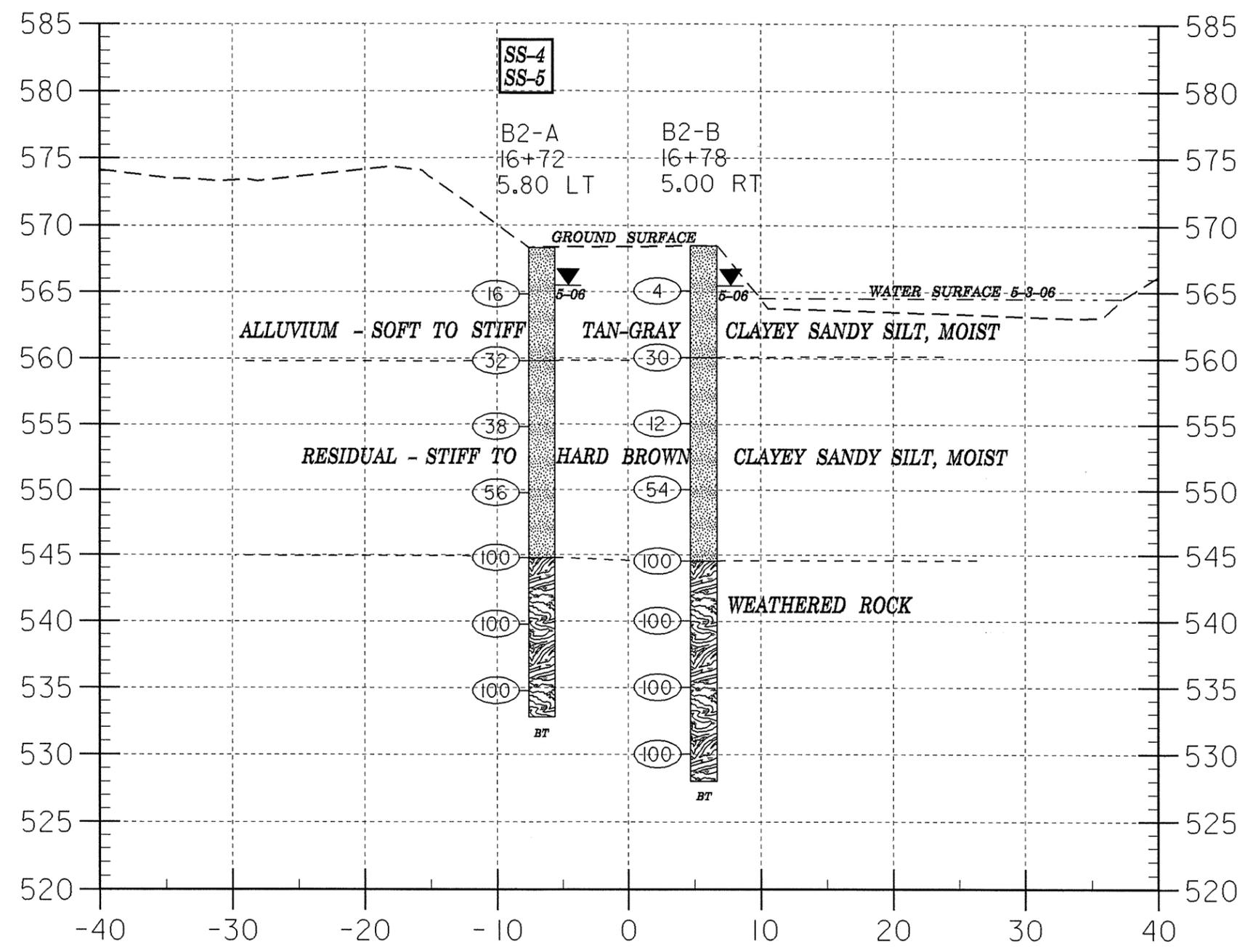
SECTION THROUGH B1-A AND B1-B



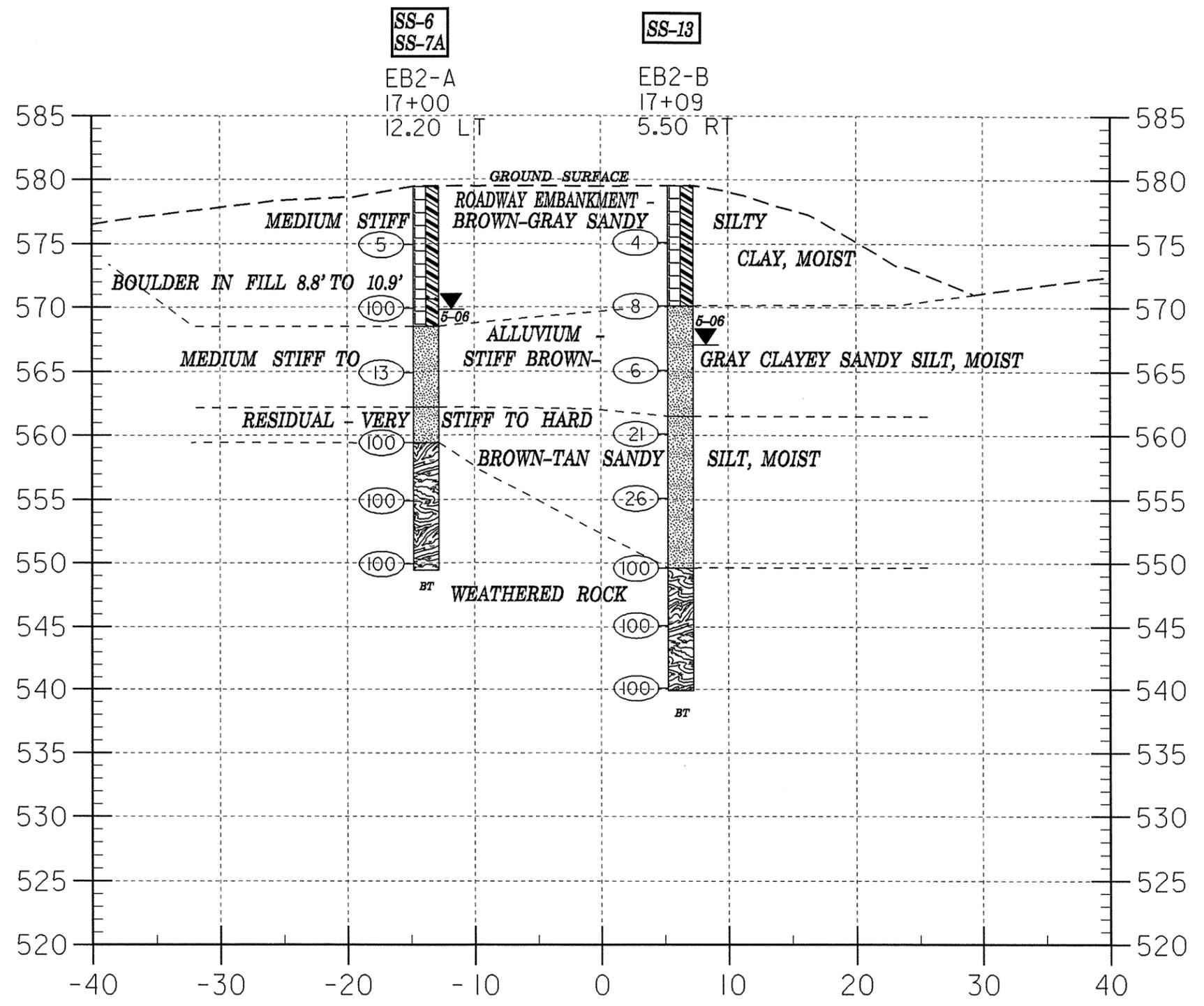


PROJECT REFERENCE NO.	SHEET
B-4246	8
SKEW=60 Deg.	

SECTION THROUGH B2-A AND B2-B



SECTION THROUGH EB2-A AND EB2-B



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33589.1.1		ID B-4246		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY							
SITE DESCRIPTION BRIDGE # 228 ON SR 2834 OVER RICHLAND CREEK							GND WATER						
BORING NO EB1-A		NORTHING 692638.68		EASTING 1768996.41		0 HR 9.30ft							
ALIGNMENT L		BORING LOCATION 15+72.000		OFFSET 6.00ft LT		24 HR N/A							
COLLAR ELEV 579.22ft		TOTAL DEPTH 28.60ft		START DATE 5/01/06		COMPLETION DATE 05/01/06							
DRILL MACHINE CME-550X			DRILL METHOD NW CASING			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log EB1-A, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION	
		6in	6in	6in		0	25	50	75				100
579.22													Ground Surface
	4.40	2	2	3	1.0							SS-7	MOIST ROADWAY EMBANKMENT - MEDIUM STIFF TAN SANDY SILTY CLAY
	9.40	1	0	1	1.0								ALLUVIUM - VERY SOFT TO VERY STIFF BROWN-GRAY CLAYEY SANDY SILT - NOTE: GRAVEL LAYER FROM 16.2'-17'
	14.40	8	10	9	1.0							SS-8	MOIST
	19.40	10	14	15	1.0							SS-9	MOIST RESIDUAL - VERY STIFF TO HARD GRAY SANDY SILT
	24.40	16	33	40	1.0								
550.62													BORING ABANDONED DUE TO PROBLEMS AT ELEVATION 550.62 FEET IN VERY HARD RESIDUAL SILT (A-4)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33589.1.1		ID B-4246		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY							
SITE DESCRIPTION BRIDGE # 228 ON SR 2834 OVER RICHLAND CREEK							GND WATER						
BORING NO EB1-B		NORTHING 692630.73		EASTING 1768986.97		0 HR N/A							
ALIGNMENT L		BORING LOCATION 15+76.500		OFFSET 5.50ft RT		24 HR N/A							
COLLAR ELEV 579.28ft		TOTAL DEPTH 45.90ft		START DATE 5/03/06		COMPLETION DATE 05/03/06							
DRILL MACHINE CME-550X			DRILL METHOD NW CASING			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH N/A			DEPTH TO ROCK N/A			Log EB1-B, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION	
		6in	6in	6in		0	25	50	75				100
579.28													Ground Surface
	4.40	2	3	4	1.0								MOIST ROADWAY EMBANKMENT - MEDIUM STIFF GRAY SANDY SILTY CLAY
	9.40	1	2	3	1.0								ALLUVIUM - MEDIUM STIFF TO STIFF BROWN-GRAY CLAYEY SANDY SILT - NOTE: GRAVEL LAYER FROM 16.9'-18.1'
	14.40	2	4	5	1.0								MOIST
	19.40	8	7	9	1.0								MOIST RESIDUAL - STIFF GRAY CLAYEY SANDY SILT
	24.40	11	9	12	1.0								
	29.40	15	38	35	1.0								MOIST MEDIUM DENSE TO VERY DENSE BROWN CLAYEY SAND
	34.40	38	50	50	0.8								
	39.40	77	23		0.6								WEATHERED ROCK
	44.40	25	38	25	1.0								MOIST RESIDUAL - VERY DENSE BROWN CLAYEY SAND
533.38													BORING TERMINATED AT ELEVATION 533.38 FEET IN VERY DENSE SAND (A-2.4)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33589.1.1		ID B-4246		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY								
SITE DESCRIPTION BRIDGE # 228 ON SR 2834 OVER RICHLAND CREEK							GND WATER							
BORING NO B1-A		NORTHING 692590.85		EASTING 1769012.62		0 HR 0.00ft	24 HR 3.07ft							
ALIGNMENT L		BORING LOCATION 16+22.500		OFFSET 6.00ft LT										
COLLAR ELEV 567.47ft		TOTAL DEPTH 38.10ft		START DATE 4/28/06		COMPLETION DATE 04/28/06								
DRILL MACHINE CME-550X			DRILL METHOD NW CASING			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B1-A, Page 1 of 1								
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION	
		6in	6in	6in		0	25	50	75					100
567.47														
	2.60	1	2	1	1.0				3				SS-1	MOIST ALLUVIUM - SOFT BROWN-GRAY SANDY CLAYEY SILT
	7.60	14	13	13	1.0				26				SS-2	MOIST RESIDUAL - MEDIUM DENSE BROWN-GRAY CLAYEY SILTY SAND
	12.60	7	9	5	1.0				14				SS-3	MOIST MEDIUM DENSE BROWN-GRAY CLAYEY SAND
	17.60	6	9	9	1.0				18					MOIST
	22.60	14	55	45	1.0				100					
	27.60	30	70		1.0				100					WEATHERED ROCK
	32.60	43	57		0.8				100					
	37.60	100			0.5				100					
														BORING TERMINATED AT ELEVATION 529.37 FEET IN WEATHERED ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33589.1.1		ID B-4246		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY								
SITE DESCRIPTION BRIDGE # 228 ON SR 2834 OVER RICHLAND CREEK							GND WATER							
BORING NO B1-B		NORTHING 692578.57		EASTING 1768996.62		0 HR 2.10ft	24 HR 2.30ft							
ALIGNMENT L		BORING LOCATION 16+29.000		OFFSET 13.10ft RT										
COLLAR ELEV 569.65ft		TOTAL DEPTH 42.80ft		START DATE 5/02/06		COMPLETION DATE 05/02/06								
DRILL MACHINE CME-550X			DRILL METHOD NW CASING			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B1-B, Page 1 of 1								
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION	
		6in	6in	6in		0	25	50	75					100
569.65														
	4.80	0	0	2	1.0				2				SS-10	MOIST ALLUVIUM - VERY SOFT BROWN-GRAY SANDY CLAYEY SILT
	9.80	4	5	6	1.0				11				SS-11	MOIST RESIDUAL - MEDIUM DENSE BROWN-GRAY CLAYEY SILTY SAND
	14.80	5	7	10	1.0				7				SS-12	MOIST MEDIUM STIFF TO HARD BROWN CLAYEY SANDY SILT
	19.80	7	15	17	1.0				32					MOIST
	24.80	14	19	18	1.0				37					
	29.80	11	17	23	1.0				40					
	34.80	17	25	40	1.0				65					
	39.80	55	45		0.7				100					
														WEATHERED ROCK
														BORING TERMINATED AT ELEVATION 526.85 FEET IN WEATHERED ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33589.1.1		ID B-4246		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY							
SITE DESCRIPTION BRIDGE # 228 ON SR 2834 OVER RICHLAND CREEK							GND WATER						
BORING NO B2-A		NORTHING 692543.43		EASTING 1769028.48		0 HR 0.00ft							
ALIGNMENT L		BORING LOCATION 16+72.500		OFFSET 5.80ft LT		24 HR 2.85ft							
COLLAR ELEV 568.29ft		TOTAL DEPTH 35.50ft		START DATE 4/20/06		COMPLETION DATE 04/20/06							
DRILL MACHINE CME-550X			DRILL METHOD NW CASING			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B2-A, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
		6in	6in	6in		0	25	50	75				
568.29													Ground Surface
	3.50	2	6	10	1.0		16				SS-4	MOIST	ALLUVIUM - SOFT TO STIFF TAN-GRAY CLAYEY SANDY SILT
560.00	8.50	18	17	15	1.0		32				SS-5	MOIST	RESIDUAL - HARD TAN-BROWN-GRAY CLAYEY SANDY SILT
	13.50	14	15	23	1.0		38						
550.00	18.50	18	29	27	1.0		56					MOIST	
	23.50	42	58		0.9				100				WEATHERED ROCK
	28.50	51	49		0.9				100				
	33.50	100			0.4				100				
532.79													BORING TERMINATED AT ELEVATION 532.79 FEET IN WEATHERED ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33589.1.1		ID B-4246		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY							
SITE DESCRIPTION BRIDGE # 228 ON SR 2834 OVER RICHLAND CREEK							GND WATER						
BORING NO B2-B		NORTHING 692534.76		EASTING 1769020.02		0 HR 0.00ft							
ALIGNMENT L		BORING LOCATION 16+78.000		OFFSET 5.00ft RT		24 HR 3.00ft							
COLLAR ELEV 568.45ft		TOTAL DEPTH 40.40ft		START DATE 5/02/06		COMPLETION DATE 05/02/06							
DRILL MACHINE CME-550X			DRILL METHOD NW CASING			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH N/A			DEPTH TO ROCK N/A			Log B2-B, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
		6in	6in	6in		0	25	50	75				
568.45													Ground Surface
	3.40	1	2	2	1.0		4					MOIST	ALLUVIUM - SOFT TAN-GRAY CLAYEY SANDY SILT
560.00	8.40	9	15	15	1.0		30						RESIDUAL - STIFF TO HARD BROWN CLAYEY SANDY SILT
	13.40	6	6	6	1.0		12					MOIST	
550.00	18.40	12	22	32	1.0		54						
	23.40	39	61		0.9				100				WEATHERED ROCK
540.00	28.40	67	33		0.8				100				
	33.40	100			0.4				100				
	38.40	100			0.2				100				
528.05													BORING TERMINATED AT ELEVATION 528.05 FEET IN WEATHERED ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33589.1.1		ID B-4246		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY										
SITE DESCRIPTION BRIDGE # 228 ON SR 2834 OVER RICHLAND CREEK							GND WATER									
BORING NO EB2-A		NORTHING 692519.44		EASTING 1769040.37		0 HR 9.40ft	24 HR 9.60ft									
ALIGNMENT L		BORING LOCATION 17+00.000		OFFSET 12.20ft LT												
COLLAR ELEV 579.41ft		TOTAL DEPTH 30.00ft		START DATE 5/01/06		COMPLETION DATE 05/01/06										
DRILL MACHINE CME-550X			DRILL METHOD NW CASING			HAMMER TYPE AUTOMATIC										
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log EB2-A, Page 1 of 1										
ELEV	DEPTH	BLOW CT			PEN	BLOWS PER FOOT				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION			
		6in	6in	6in	(ft)	0	25	50	75	100						
579.41						Ground Surface										
	4.50	2	2	3	1.0						5	SS-6	MOIST	ROADWAY EMBANKMENT - MEDIUM STIFF BROWN-GRAY SANDY SILTY CLAY		
	9.50	66	34		0.6						100			BOULDER IN FILL TO 10.9'		
	14.50	6	6	7	1.0						13	SS-7A	MOIST	ALLUVIUM - MEDIUM STIFF TO STIFF BROWN-GRAY CLAYEY SANDY SILT		
	19.50	15	51	49	0.8						100			RESIDUAL - HARD BROWN-TAN SANDY SILT		
	24.50	63	37		0.8						100			WEATHERED ROCK		
	29.50	90	10		0.5						100			WEATHERED ROCK		
						BORING TERMINATED AT ELEVATION 549.41 FEET IN WEATHERED ROCK										

PROJECT NO 33589.1.1		ID B-4246		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY										
SITE DESCRIPTION BRIDGE # 228 ON SR 2834 OVER RICHLAND CREEK							GND WATER									
BORING NO EB2-B		NORTHING 692505.24		EASTING 1769029.49		0 HR 8.70ft	24 HR 12.40ft									
ALIGNMENT L		BORING LOCATION 17+09.000		OFFSET 5.50ft RT												
COLLAR ELEV 579.50ft		TOTAL DEPTH 39.60ft		START DATE 5/02/06		COMPLETION DATE 05/02/06										
DRILL MACHINE CME-550X			DRILL METHOD NW CASING			HAMMER TYPE AUTOMATIC										
SURFACE WATER DEPTH N/A			DEPTH TO ROCK N/A			Log EB2-B, Page 1 of 1										
ELEV	DEPTH	BLOW CT			PEN	BLOWS PER FOOT				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION			
		6in	6in	6in	(ft)	0	25	50	75	100						
579.50						Ground Surface										
	4.40	1	2	2	1.0						4		MOIST	ROADWAY EMBANKMENT - MEDIUM STIFF BROWN-GRAY SANDY SILTY CLAY		
	9.40	1	2	6	1.0						8	SS-13	MOIST	ALLUVIUM - MEDIUM STIFF BROWN-GRAY SANDY CLAYEY SILT		
	14.40	4	3	3	1.0						6			RESIDUAL - MEDIUM STIFF TO STIFF BROWN-GRAY CLAYEY SANDY SILT		
	19.40	7	10	11	1.0						21		MOIST	RESIDUAL - VERY STIFF TO HARD BROWN-TAN SANDY SILT		
	24.40	7	9	17	1.0						26			RESIDUAL - VERY STIFF TO HARD BROWN-TAN SANDY SILT		
	29.40	15	57	43	0.8						100			WEATHERED ROCK		
	34.40	40	60		0.9						100			WEATHERED ROCK		
	39.40	100			0.2						100			WEATHERED ROCK		
						BORING TERMINATED AT ELEVATION 539.9 FEET IN WEATHERED ROCK										

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

T. I. P. No. B-4246

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 33589.1.1 County RANDOLPH Owner _____
 Date: Sampled 4/28/06 Received 5/5/06 Reported 5/9/2006
 Sampled from BRIDGE By J E BEVERLY
 Submitted by N WAINAINA _____ 1995 Standard Specifications

729589 TO 729602
8/2/06

TEST RESULTS

Proj. Sample No.	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-7A	SS-8	SS-9	SS-10	SS-11	SS-12	SS-13
Lab. Sample No.	729589	729590	729591	729592	729593	729594								
Retained #4 Sieve %	-	2	6	-	-	2	3	-	-	1	-	-	-	-
Passing #10 Sieve %	100	87	69	100	98	91	92	100	99	98	100	98	100	100
Passing #40 Sieve %	99	56	39	94	68	82	84	97	97	84	95	85	91	99
Passing #200 Sieve %	91	28	18	58	37	66	74	74	77	41	82	31	39	91

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%														
Coarse Sand Ret - #60 %	3.2	47.6	55.7	17.0	42.6	13.0	12.4	9.3	5.9	29.2	8.7	35.1	26.4	2.2
Fine Sand Ret - #270 %	11.3	24.9	22.5	33.8	24.9	19.5	10.3	27.4	23.5	35.9	14.0	39.3	42.2	12.2
Silt 0.05 - 0.005 mm %	63.1	15.3	9.6	35.0	20.4	31.1	36.8	47.1	52.4	24.8	46.9	13.5	21.3	61.3
Clay < 0.005 mm %	22.3	12.2	12.2	14.2	12.2	36.5	40.5	16.2	18.2	10.1	30.4	12.2	10.1	24.3
Passing #40 Sieve %	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LOCATION	B1-A	B1-A	B1-A	B2-A	B2-A	EB2-A	EB1-A	EB2-A	EB1-A	EB1-A	B1-B	B1-B	B1-B	EB2-B

L. L.	33	43	30	23	32	37	55	25	24	33	29	39	37	29
P. I.	8	14	8	3	7	19	27	4	4	4	8	10	9	6
AASHTO Classification	A-4(8)	A-2-7(1)	A-2-4(0)	A-4(0)	A-4(0)	A-6(10)	A-7-6(21)	A-4(1)	A-4(1)	A-4(0)	A-4(5)	A-2-4(0)	A-4(1)	A-4(5)
Station	16+22.5	16+22.5	16+22.5	16+72.5	16+72.5	17+00	15+72	17+00	15+72	15+72	16+29	16+29	16+29	17+09
OFFSET	6.0 LT	6.0 LT	6.0 LT	5.8LT	5.8LT	12.2 LT	6.0 LT	12.2 LT	6.0 LT	6.0 LT	13.1 RT	13.1 RT	13.1 RT	5.5 RT
ALIGNMENT	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Depth (Ft)	3.10	8.10	13.10	4.00	9.00	5.00	4.90	15.00	14.90	19.90	5.30	10.30	15.30	9.90
to	4.10	9.10	14.10	5.00	10.00	6.00	5.90	16.00	15.90	20.90	6.30	11.30	16.30	10.90

cc: J E BEVERLY
Soils File

Soils Engineer

Soils Engineer



**FIELD
 SCOUR REPORT**

WBS: 33589.1.1 TIP: B-4246 COUNTY: Randolph

DESCRIPTION(1): Bridge #228 on SR 2834 over Richland Creek

EXISTING BRIDGE

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

Bridge No.: 228 Length: 93' Total Bents: 4 Bents in Channel: 1 Bents in Floodplain: 4
 Foundation Type: Timber piles on concrete caps

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: At EB2 1 to 2 feet of timber pile is visible under concrete cap

Interior Bents: None noted - Rip Rap around B2 obscures view

Channel Bed: Muddy water and rip rap made it impossible to see

Channel Bank: Scour along slope between B2 and EB2

EXISTING SCOUR PROTECTION

Type(3): Rip Rap, boulders, concrete slope protection

Extent(4): Between B2 and EB2

Effectiveness(5): Poor

Obstructions(6): Trees, stumps, limbs around both interior bents

INSTRUCTIONS

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

DESIGN INFORMATION

Channel Bed Material(7): silt, sand and gravel

Channel Bank Material(8): Silt (A-4) - ref. SS-10

Channel Bank Cover(9): mature trees and shrubs

Floodplain Width(10): appx. 300'

Floodplain Cover(11): Mature trees and shrubs

Stream is(12): Aggrading _____ Degrading _____ Undetermined

Channel Migration Tendency(13): Good

Observations and Other Comments: NCDOT Hydro report puts Q500 scour at elevation 563' for B1 and 562.5' for B2. Soil at these elevations is alluvial silt (A-4)

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

BENTS

	B1	B2	B3	B4						
	559	558								

Comparison of DSE to Hydraulics Unit theoretical scour:

Lowered B1 scour from 563' to 559'. This places DSE scour elevation in residual sand as opposed to alluvial silt.
 Lowered B2 scour from 562.5' to 558'. This places DSE scour elevation in residual silt as opposed to alluvial silt.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

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

See Sheet # 14 for "Soil Test Results"

Reported by: JKS / JEB

Date: 5/3/2006

33589.1.1 (B-4246)
RANDOLPH COUNTY
BRIDGE #223 ON OLD COX RD (SR 2834) OVER RICHLAND CREEK

SITE PHOTOS



Looking South along Old Cox Rd (Creek flow right to left)



Looking East (downstream)