

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4244	1	12

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

STRUCTURE
SUBSURFACE INVESTIGATION

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PROJ. REFERENCE NO. B-4244 F.A. PROJ. BRZ-2215(1)
COUNTY RANDOLPH
PROJECT DESCRIPTION BRIDGE #140 ON SR 2215 OVER UT TO
GABRIELS CREEK
(-L- STATION 18+10)
SITE DESCRIPTION _____

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

J.K. STICKNEY

C.L. SMITH

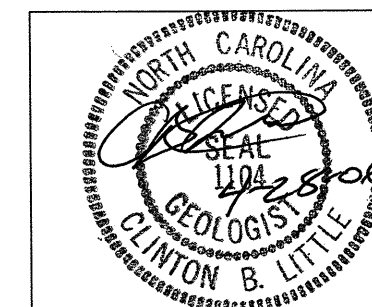
K. WISE

INVESTIGATED BY J.E. BEVERLY

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE APRIL 2006



PROJECT: 33587.1.1 ID: B-4244

DRAWN BY: J.E. BEVERLY

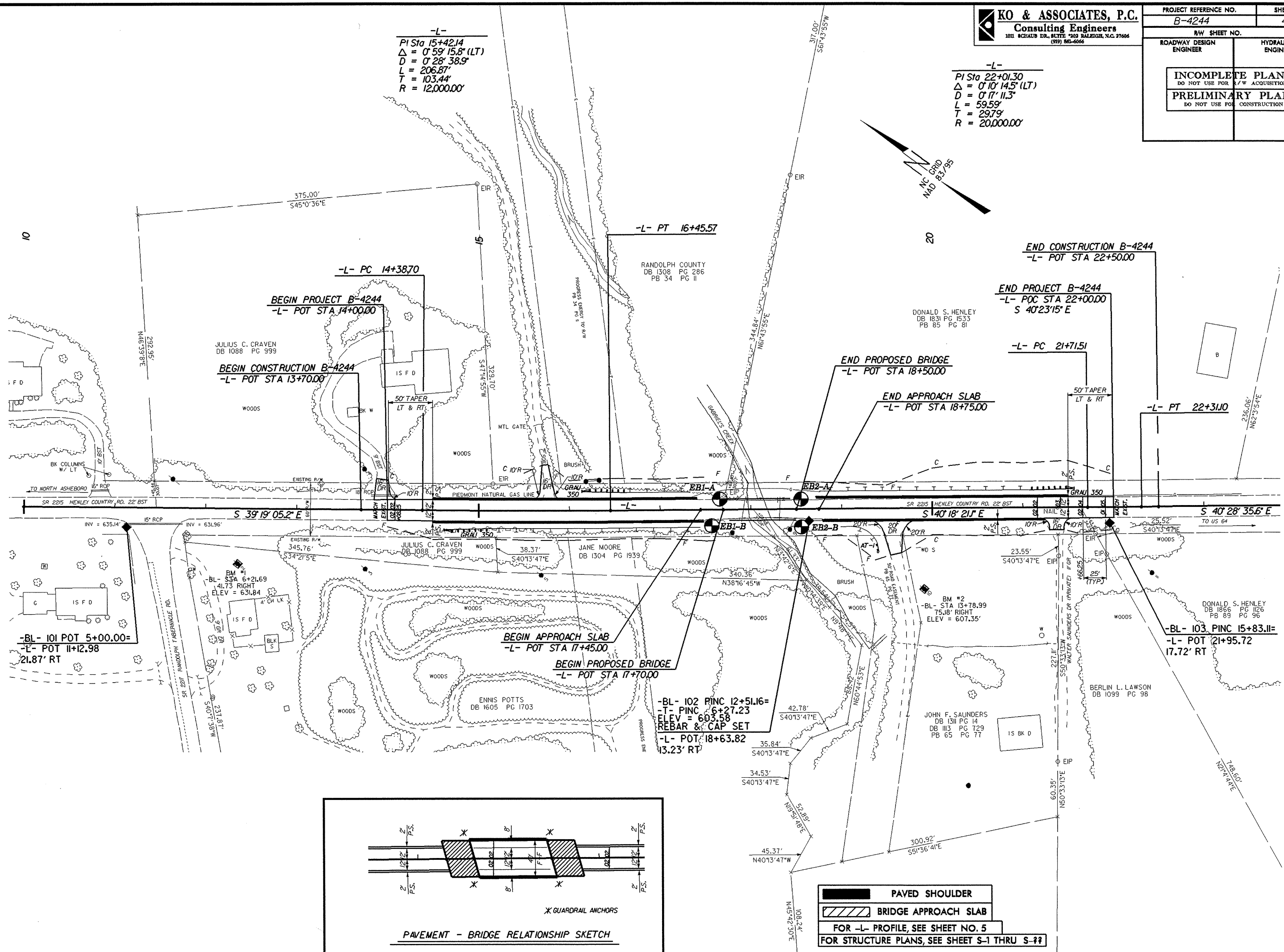
NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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. B-4244		SHEET NO. 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 15+42.14
 $\Delta = 0^{\circ} 59' 15.8" (LT)$
 $D = 0^{\circ} 28' 38.9"$
 $L = 206.87'$
 $T = 103.44'$
 $R = 12,000.00'$

-L-
 PI Sta 22+01.30
 $\Delta = 0^{\circ} 10' 14.5" (LT)$
 $D = 0^{\circ} 17' 11.3"$
 $L = 59.59'$
 $T = 29.79'$
 $R = 20,000.00'$



-BL- 101 POT 5+00.00=
 -L- POT 11+12.98
 21.87' RT

BEGIN PROJECT B-4244
 -L- POT STA 14+00.00

BEGIN CONSTRUCTION B-4244
 -L- POT STA 13+70.00

-L- PC 14+38.70

-L- PT 16+45.57

END CONSTRUCTION B-4244
 -L- POT STA 22+50.00

END PROJECT B-4244
 -L- POC STA 22+00.00
 S 40°23'15" E

-L- PC 21+71.51

END PROPOSED BRIDGE
 -L- POT STA 18+50.00

END APPROACH SLAB
 -L- POT STA 18+75.00

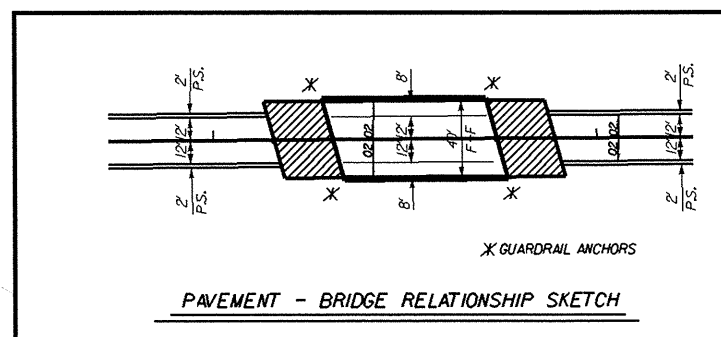
-L- PT 22+31.10

BEGIN APPROACH SLAB
 -L- POT STA 17+45.00

BEGIN PROPOSED BRIDGE
 -L- POT STA 17+70.00

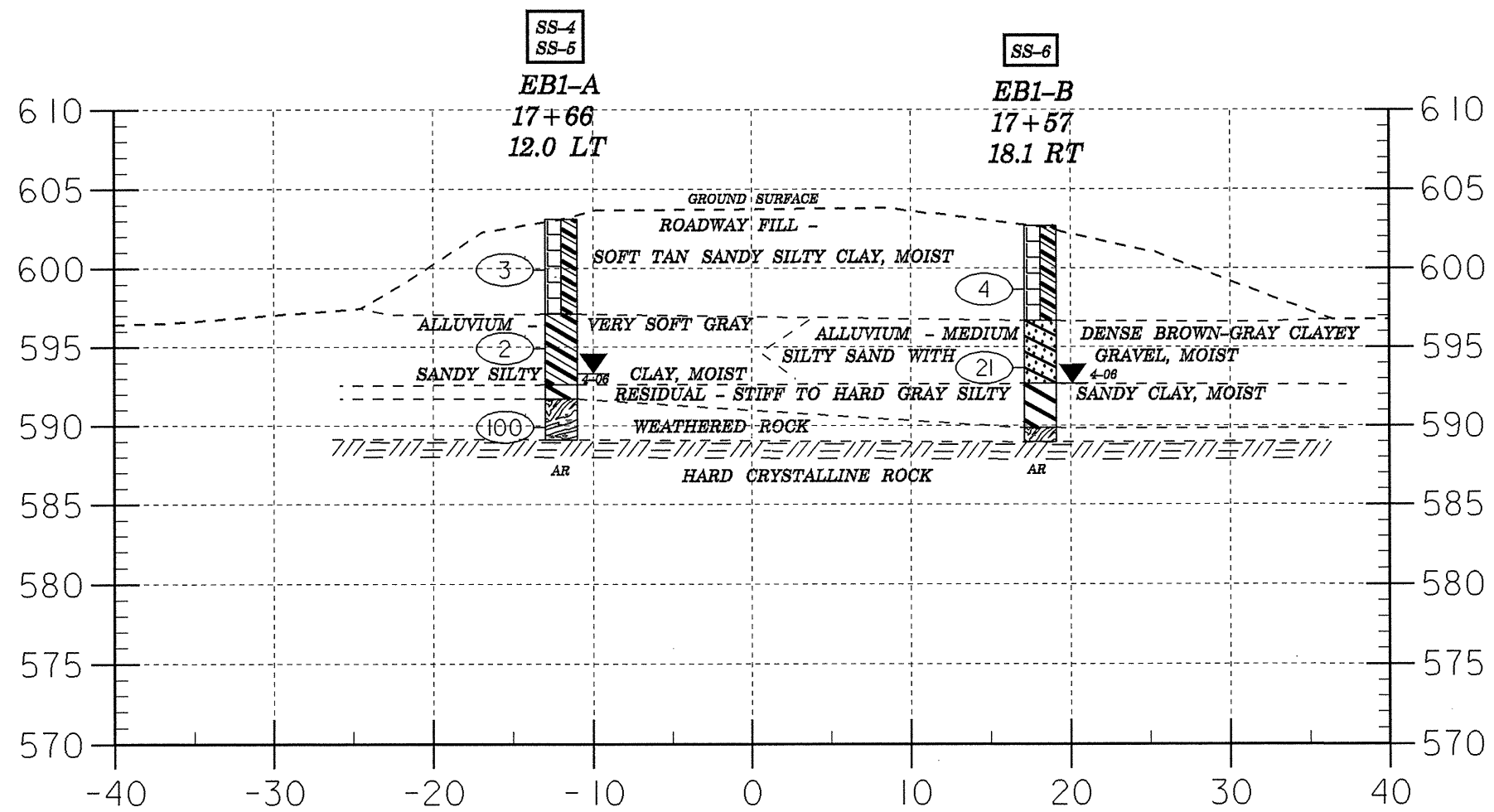
-BL- 102 PINC 12+51.16=
 -T- PINC 6+27.23
 ELEV = 603.58
 REBAR & CAP SET
 -L- POT 18+63.82
 13.23' RT

-BL- 103 PINC 15+83.11=
 -L- POT 21+95.72
 17.72' RT

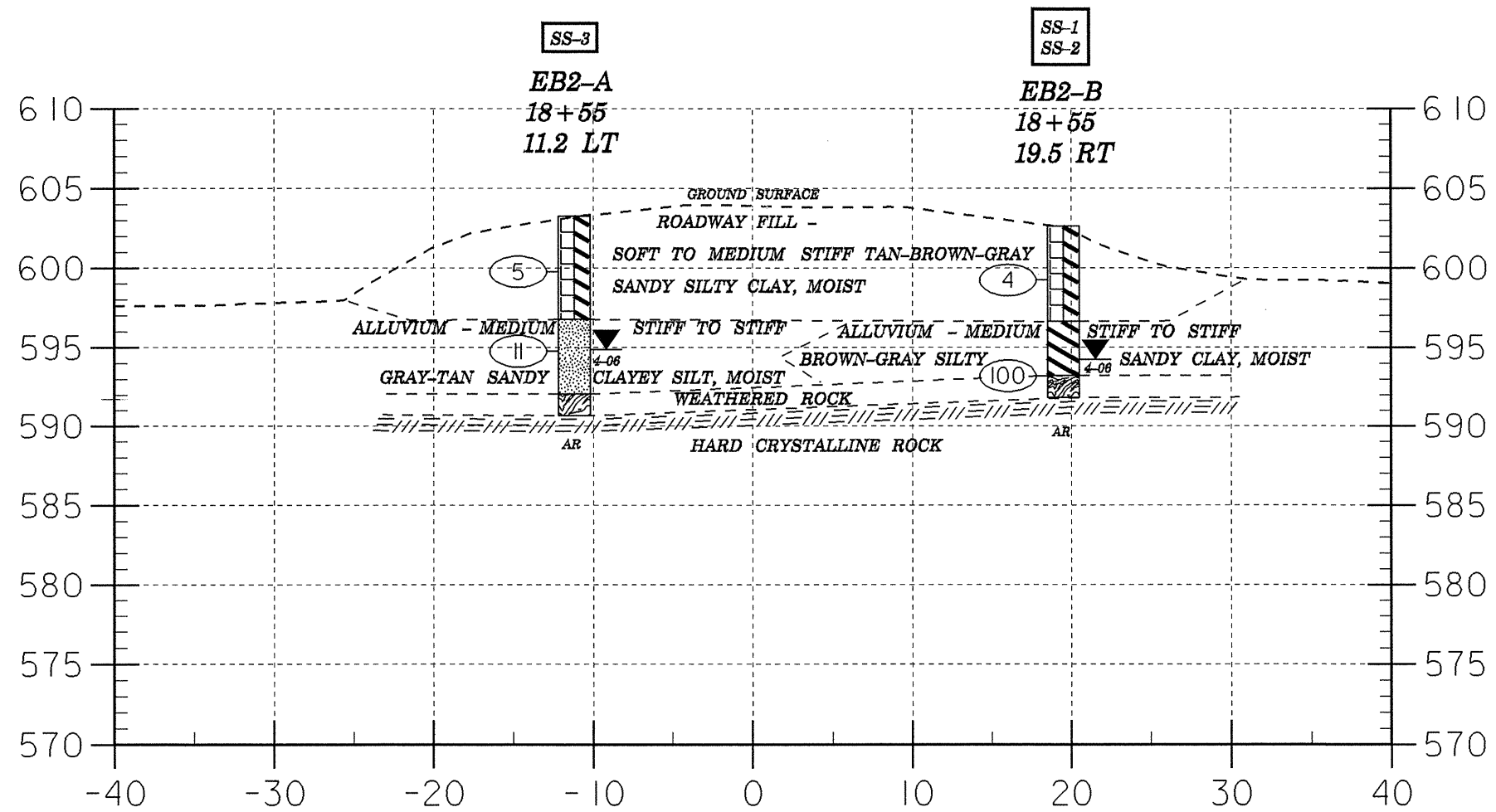


PAVED SHOULDER
BRIDGE APPROACH SLAB
 FOR -L- PROFILE, SEE SHEET NO. 5
 FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-??

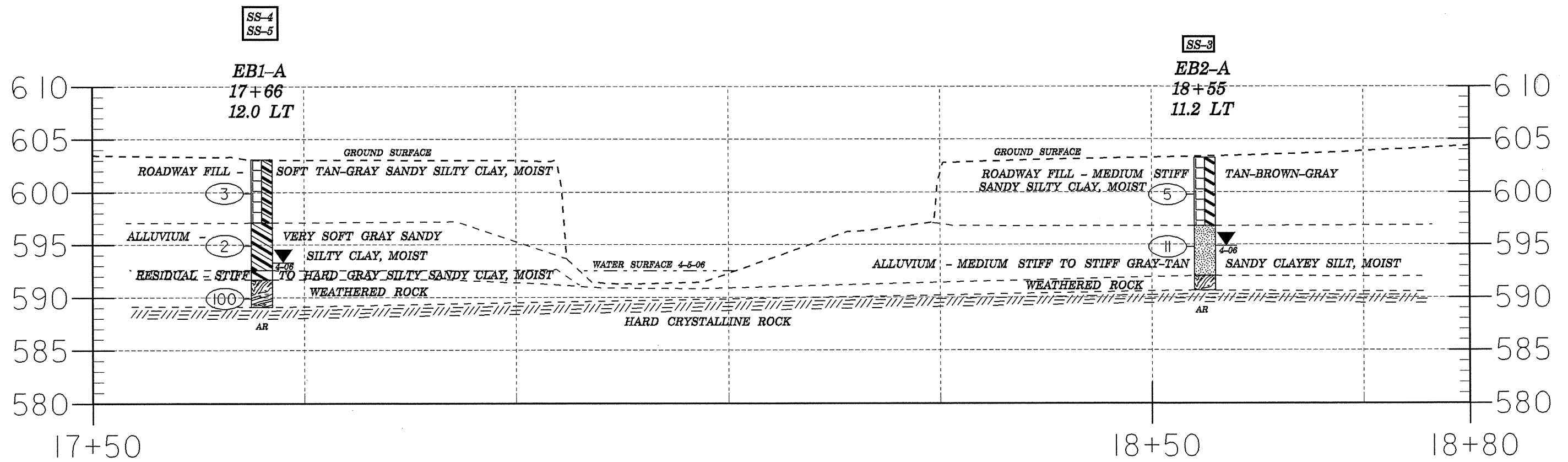
SECTION THROUGH EB1-A AND EB1-B



SECTION THROUGH EB2-A AND EB2-B



PROFILE 12 FEET LEFT OF -L-



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33587.1.1		ID B-4244		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY								
SITE DESCRIPTION BRIDGE #140 ON SR 2215 OVER UT TO GABRIELS CREEK							GND WATER							
BORING NO EB1-A		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT L		BORING LOCATION 17+66.000		OFFSET 12.00ft LT		24 HR 9.80ft								
COLLAR ELEV 603.11ft		TOTAL DEPTH 14.00ft		START DATE 4/05/06		COMPLETION DATE 04/05/06								
DRILL MACHINE CME-550X			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK 14.00ft			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				
603.11														Ground Surface
600.00	3.20	0	1	2	1.0							SS-4	MOIST	ROADWAY FILL - SOFT TAN-GRAY SANDY SILTY CLAY
	8.20	1	1	1	1.0							SS-5	MOIST	ALLUVIUM - VERY SOFT GRAY SANDY SILTY CLAY
590.00 589.11	13.20	34	74		0.7									RESIDUAL - STIFF TO HARD GRAY SILTY SANDY CLAY
														WEATHERED ROCK
														ALGER REFUSAL ON CRYSTALLINE ROCK AT ELEVATION 589.11 FEET

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33587.1.1		ID B-4244		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY								
SITE DESCRIPTION BRIDGE #140 ON SR 2215 OVER UT TO GABRIELS CREEK							GND WATER							
BORING NO EB1-B		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT L		BORING LOCATION 17+57.000		OFFSET 18.10ft RT		24 HR 10.00ft								
COLLAR ELEV 602.66ft		TOTAL DEPTH 13.70ft		START DATE 4/05/06		COMPLETION DATE 04/05/06								
DRILL MACHINE CME-550X			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK 13.70ft			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				
602.66														Ground Surface
600.00	4.00	1	2	2	1.0								MOIST	ROADWAY FILL - SOFT TAN SANDY SILTY CLAY
	9.00	6	13	8	1.0							SS-6		ALLUVIUM - MEDIUM DENSE BROWN-GRAY CLAYEY SILTY SAND WITH GRAVEL
590.00 588.96														RESIDUAL - STIFF TO HARD GRAY SILTY SANDY CLAY
														WEATHERED ROCK
														ALGER REFUSAL ON CRYSTALLINE ROCK AT ELEVATION 588.96 FEET

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33587.1.1		ID B-4244		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY								
SITE DESCRIPTION BRIDGE #140 ON SR 2215 OVER UT TO GABRIELS CREEK							GND WATER							
BORING NO EB2-A		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT L		BORING LOCATION 18+55.000		OFFSET 11.20ft LT		24 HR 8.40ft								
COLLAR ELEV 603.26ft		TOTAL DEPTH 12.60ft		START DATE 4/05/06		COMPLETION DATE 04/05/06								
DRILL MACHINE CME-550X			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK 12.60ft			Log EB2-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				
603.26														Ground Surface
600.00	3.50	3	2	3	1.0									ROADWAY FILL - MEDIUM STIFF TAN-BROWN-GRAY SANDY SILTY CLAY
	8.50	3	4	7	1.0									ALLUVIUM - MEDIUM STIFF TO STIFF GRAY-TAN SANDY CLAYEY SILT
590.66														WEATHERED ROCK
AUGER REFUSAL ON CRYSTALLINE ROCK AT ELEVATION 590.66 FEET														

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33587.1.1		ID B-4244		COUNTY RANDOLPH		GEOLOGIST J.K. STICKNEY								
SITE DESCRIPTION BRIDGE #140 ON SR 2215 OVER UT TO GABRIELS CREEK							GND WATER							
BORING NO EB2-B		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT L		BORING LOCATION 18+55.000		OFFSET 19.50ft RT		24 HR 8.40ft								
COLLAR ELEV 602.62ft		TOTAL DEPTH 10.80ft		START DATE 4/05/06		COMPLETION DATE 04/05/06								
DRILL MACHINE CME-550X			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH N/A			DEPTH TO ROCK 10.80ft			Log EB2-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				
602.62														Ground Surface
600.00	3.40	2	2	2	1.0									ROADWAY FILL - SOFT TAN-BROWN-GRAY SANDY SILTY CLAY
	8.40	6	7	93	0.8									ALLUVIUM - MEDIUM STIFF TO STIFF BROWN-GRAY SILTY SANDY CLAY
591.82														WEATHERED ROCK
AUGER REFUSAL ON CRYSTALLINE ROCK AT ELEVATION 591.82 FEET														

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

T. I. P. No. B 4244

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 33587.1.1 **County** RANDOLPH **Owner** _____
Date: Sampled _____ **Received** 4/12/06 **Reported** 4/17/06
Sampled from BRIDGE **By** J E BEVERLY
Submitted by N WAINAINA 1995 Standard Specifications

729188 TO 729193
4/19/06

TEST RESULTS

Proj. Sample No.	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Lab. Sample No.	729188	729189	729190	729191	729192	729193
Retained #4 Sieve %	4	19	-	-	-	41
Passing #10 Sieve %	94	67	100	99	100	48
Passing #40 Sieve %	86	50	99	90	100	34
Passing #200 Sieve %	81	39	83	76	83	22

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	10.4	30.2	3.3	12.7	2.7	38.6
Fine Sand Ret - #270 %	5.7	14.7	21.0	15.7	20.4	20.4
Silt 0.05 - 0.005 mm %	45.1	22.4	47.1	36.9	48.4	22.7
Clay < 0.005 mm %	38.8	32.7	28.6	34.7	28.6	18.4
Passing #40 Sieve %	-	-	-	-	-	-
LOCATION	EB2-B	EB2-B	EB2-A	EB1-A	EB1-A	EB1-B

L. L.	42	45	29	38	33	34
P. I.	16	18	9	14	11	16
AASHTO Classification	A-7-6(14)	A-7-6(3)	A-4(6)	A-6(10)	A-6(9)	A-2-6(0)
Station	18+55	18+55	18+55	17+66	17+66	17+57
	19.5 RT	19.5 RT	11.2 LT	12 LT	12 LT	18.1RT
Hole No.	L	L	L	L	L	L
Depth (Ft)	3.90	8.40	9.00	3.70	8.70	9.50
to	4.90	9.40	10.00	4.70	9.70	10.50

cc: J E BEVERLY
Soils File

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 33587.1.1 TIP NO.: B-4244 COUNTY: Randolph

DESCRIPTION(1): Bridge #140 on SR 2215 over UT to Gabriels Creek

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

COUNTY BRIDGE NO. 140 BRIDGE LENGTH 36 NO. BENTS 3 NO. BENTS IN: CHANNEL 2 FLOODPLAIN 3

FOUNDATION TYPE: Concrete encased timber piles and timber caps

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: None

INTERIOR BENTS: None

CHANNEL BED: None

CHANNEL BANKS: Undermined at meanders in creek, banks steep and stable

◆ **EXISTING SCOUR PROTECTION:**

TYPE(3): Old asphalt placed on EB1-A

EXTENT(4): Fill slope to floodplain

EFFECTIVENESS(5): good

OBSTRUCTIONS(6) (DAMS, DEBRIS, ETC.): None

◆ **DESIGN INFORMATION**

CHANNEL BED MATERIAL(7) (Sample Results Attached): Silty coarse sand with rocks

CHANNEL BANK MATERIAL(8) (Sample Results Attached): Silty clay (A-7-6) (ref SS-1)

CHANNEL BANK COVER(10): Mature trees and grass

FLOOD PLAIN WIDTH(11): appx. 300' (16+00 to 19+00)

FLOOD PLAIN COVER(12): Mature trees and shrubs

STREAM IS: DEGRADING AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS:

◆

◆

◆ **DESIGN INFORMATION CONT.**

CHANNEL MIGRATION TENDENCY(14): moderate to high

GEOTECHNICAL ADJUSTED SCOUR ELEVATIONS (15):

NCDOT Hydro Report places 500 year maximum channel scour at elevation 591 feet. Proposed bridge is a larger single span design. No End Bent scour is anticipated.

REPORTED BY: JKS / JEB DATE: April 2006

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.

◆

33587.1.1 (B-4244)
RANDOLPH COUNTY
BRIDGE # 140 ON SR 2215 OVER UT TO GABRIELS CREEK

SITE PHOTOS



Looking NW (down station)



Looking downstream (North)