

REFERENCE: B-5410

PROJECT: 46125

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY JACKSON
PROJECT DESCRIPTION REPLACE BRIDGE NO. 221 ON
SR 1367 OVER LITTLE SAVANNAH CREEK

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	CROSS SECTIONS
6-7	BORE LOGS
8	SOIL TEST RESULTS
9	SITE PHOTOGRAPHS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5410	1	9

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) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

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

PERSONNEL

W. S. HUNSBERGER

SOIL DRILLING SERVICES

INVESTIGATED BY WSH

DRAWN BY WSH

CHECKED BY J. R. HAMM

SUBMITTED BY FALCON

DATE JUNE 2015



Designed by
W. Scott Hunsberger

EA39AB9EDF5845A...

7/28/2015

SIGNATURE

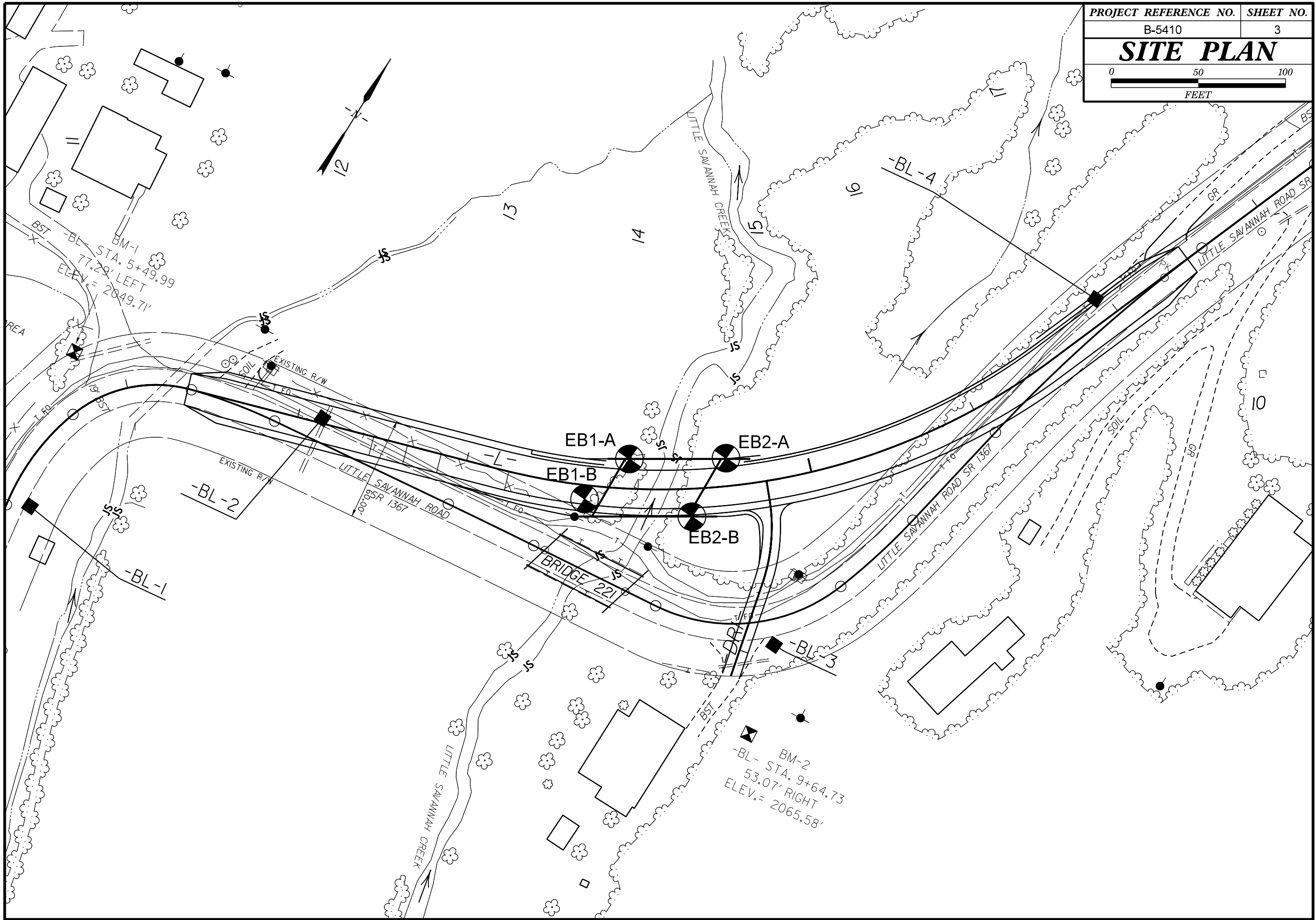
DATE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

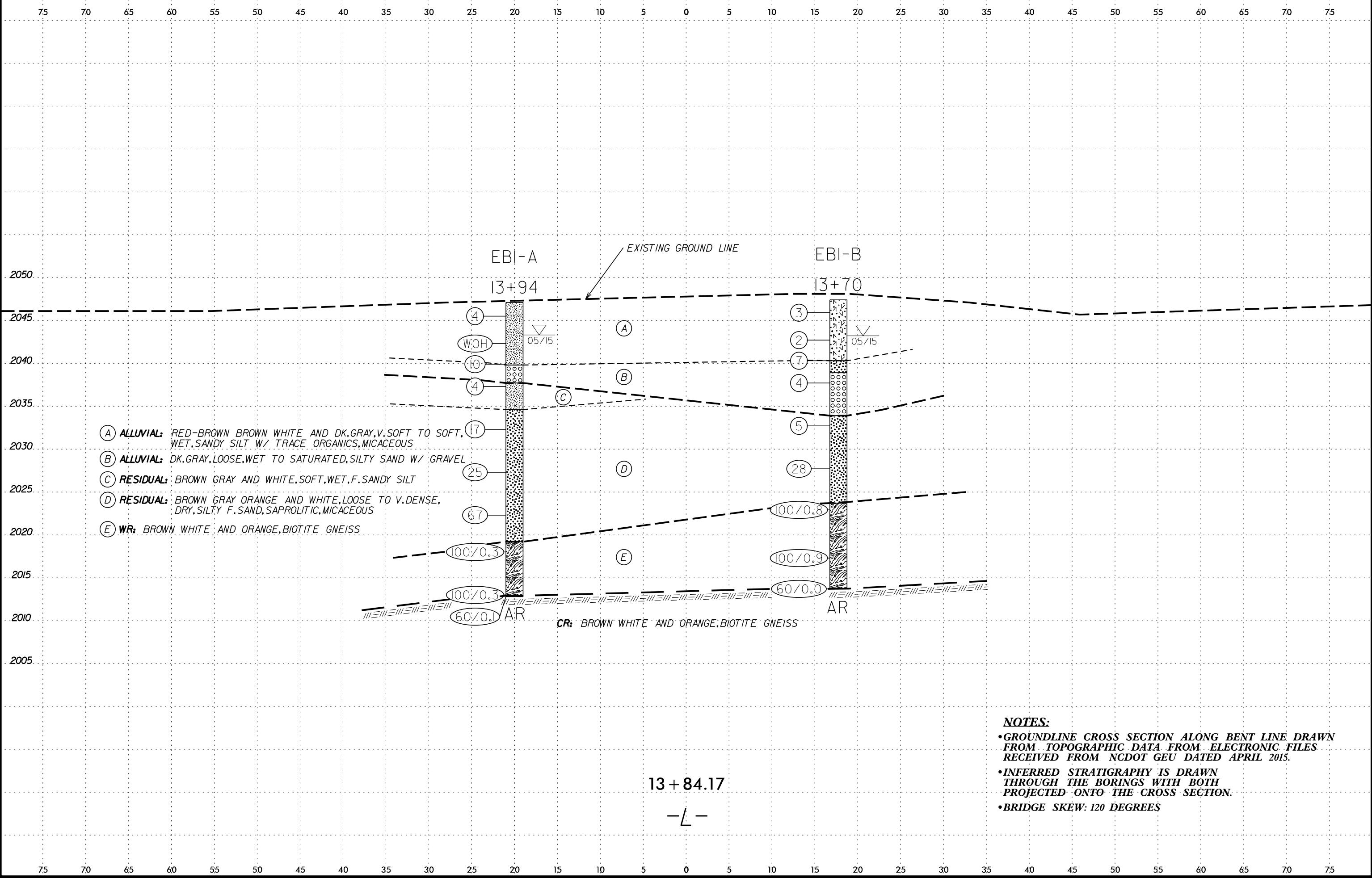
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. It contains detailed technical specifications, legends, and definitions for geotechnical engineering.



8/23/99



- (A) ALLUVIAL: RED-BROWN BROWN WHITE AND DK.GRAY,V.SOFT TO SOFT, WET,SANDY SILT W/ TRACE ORGANICS,MICACEOUS
- (B) ALLUVIAL: DK.GRAY,LOOSE,WET TO SATURATED,SILTY SAND W/ GRAVEL
- (C) RESIDUAL: BROWN GRAY AND WHITE,SOFT,WET,F.SANDY SILT
- (D) RESIDUAL: BROWN GRAY ORANGE AND WHITE,LOOSE TO V.DENSE, DRY,SILTY F.SAND,SAPROLITIC,MICACEOUS
- (E) WR: BROWN WHITE AND ORANGE,BIOTITE GNEISS

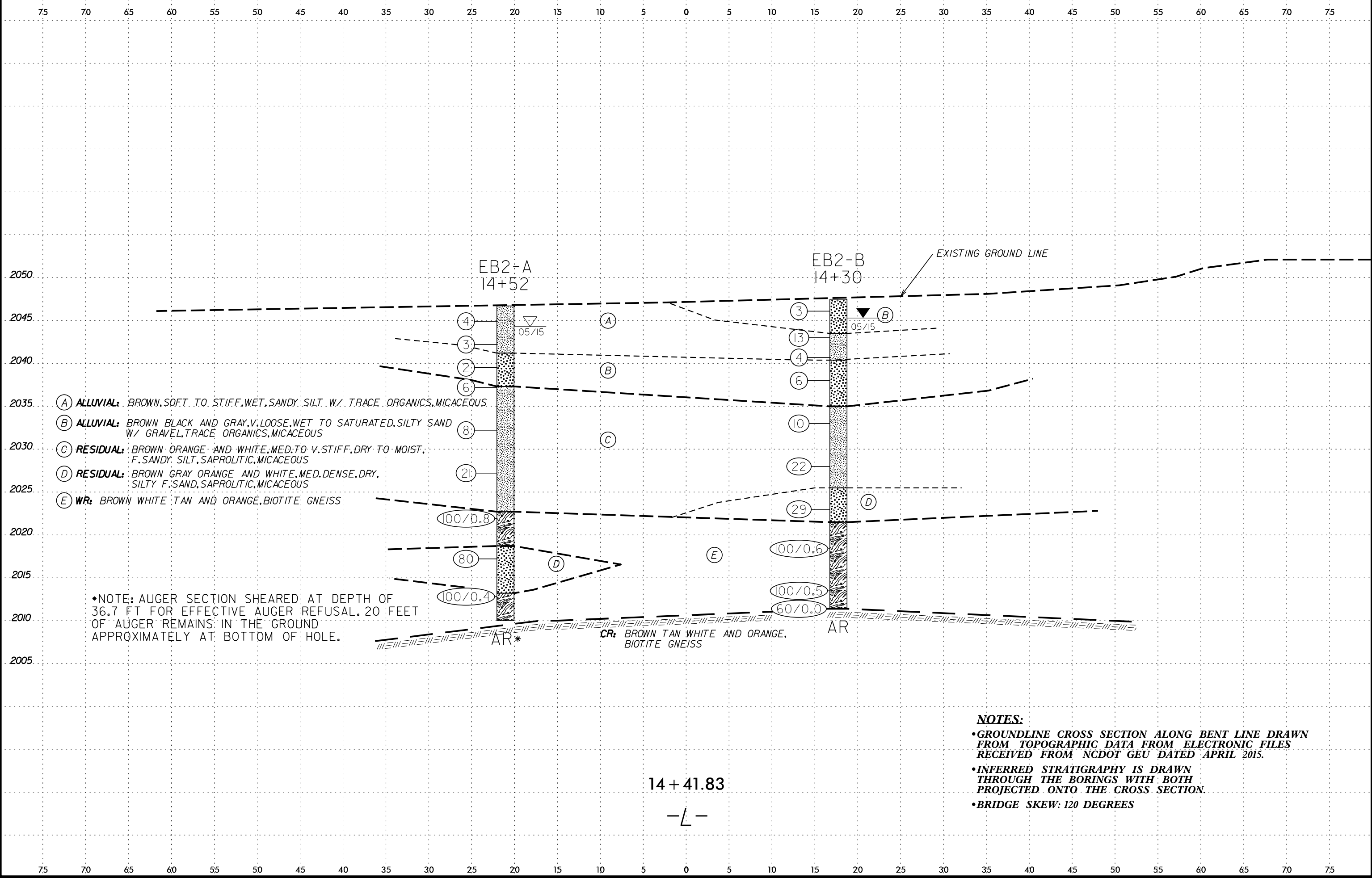
CR: BROWN WHITE AND ORANGE,BIOTITE GNEISS

NOTES:

- GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU DATED APRIL 2015.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
- BRIDGE SKEW: 120 DEGREES

13+84.17
-L-

8/23/99



NOTES:

- GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU DATED APRIL 2015.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
- BRIDGE SKEW: 120 DEGREES

14 + 41.83
-L-

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46125.1.1		TIP B-5410		COUNTY JACKSON		GEOLOGIST Hunsberger, W. S.										
SITE DESCRIPTION BRIDGE 221 ON 1367 OVER LITTLE SAVANNAH CREEK						GROUND WTR (ft)										
BORING NO. EB1-A		STATION 13+94		OFFSET 17 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 2,047.0 ft		TOTAL DEPTH 34.3 ft		NORTHING 602,888		EASTING 737,936										
DRILL RIG/HAMMER EFF./DATE SDS1873 CME-550X 87% 09/05/2014		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 05/01/15		COMP. DATE 05/01/15		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2050																
2045	2,046.4	0.6	1	2	2							W		0.3' TOPSOIL	0.0	
2040	2,043.2	3.8	WOH	WOH	WOH							SS-1	41%	ALLUVIAL BROWN AND DK. GRAY, SANDY SILT (A-4) W/ TRACE ORGANICS, SLI. MICA.		
2035	2,040.8	6.2	WOH									W		DK. GRAY, SILTY CSE. SAND (A-1-b) W/ GRAVEL	7.3	
2030	2,038.2	8.8	4	2	2							W		RESIDUAL BROWN GRAY AND WHITE, F. SANDY SILT (A-4)	9.4	
2025	2,033.2	13.8	6	8	9							D		BROWN GRAY WHITE AND ORANGE, SILTY F. SAND (A-2-4) SAP., MICA.	12.5	
2020	2,028.2	18.8	5	12	13							D				
2015	2,023.2	23.8	16	24	43							D				
	2,018.2	28.8	100/0.3											WEATHERED ROCK BLACK WHITE AND ORANGE, BIOTITE GNEISS	27.9	
	2,013.2	33.8	100/0.3											CRYSTALLINE ROCK BLACK WHITE AND ORANGE, BIOTITE GNEISS	34.2	
	2,012.8	34.2	60/0.1											Boring Terminated with Standard Penetration Test Refusal at Elevation 2,012.7 ft in CR: BIOTITE GNEISS	34.3	

WBS 46125.1.1		TIP B-5410		COUNTY JACKSON		GEOLOGIST Hunsberger, W. S.										
SITE DESCRIPTION BRIDGE 221 ON 1367 OVER LITTLE SAVANNAH CREEK						GROUND WTR (ft)										
BORING NO. EB1-B		STATION 13+70		OFFSET 8 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 2,047.3 ft		TOTAL DEPTH 33.7 ft		NORTHING 602,854		EASTING 737,929										
DRILL RIG/HAMMER EFF./DATE SDS1873 CME-550X 87% 09/05/2014		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 05/01/15		COMP. DATE 05/01/15		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2050																
2045	2,046.8	0.5	2	1	2							M		0.2' TOPSOIL	0.0	
2040	2,043.6	3.7	1	1	1							SS-2	45%	ALLUVIAL RED-BROWN AND DK. GRAY, F. SANDY SILT (A-5) W/ TRACE ORGANICS, MICA.		
2035	2,041.2	6.1	WOH									W		DK. GRAY, SILTY SAND (A-2-4) W/ GRAVEL	7.1	
2030	2,038.6	8.7	5	2	2							Sat.		DK. GRAY, SILTY SAND (A-1-b) W/ GRAVEL	8.5	
2025	2,033.6	13.7	1	3	2							Sat.		LOW RECOVERY FROM 13.7'-15.2'	13.5	
2020	2,028.6	18.7	6	12	16							D		RESIDUAL BROWN AND ORANGE, SILTY F. SAND (A-2-4) SAP., MICA.		
2015	2,023.6	23.7	38	62/0.3										WEATHERED ROCK BROWN WHITE AND ORANGE, BIOTITE GNEISS	23.7	
	2,018.6	28.7	30	47	53/0.4											
	2,013.6	33.7	60/0.0											Boring Terminated with Standard Penetration Test Refusal at Elevation 2,013.6 ft on CR: BIOTITE GNEISS	33.7	

NCDOT BORE DOUBLE B5410_GEO_BORINGS.GPJ NC_DOT_GDT 6/22/15

GEOTECHNICAL BORING REPORT BORE LOG

WBS 46125.1.1		TIP B-5410		COUNTY JACKSON		GEOLOGIST Hunsberger, W. S.										
SITE DESCRIPTION BRIDGE 221 ON 1367 OVER LITTLE SAVANNAH CREEK						GROUND WTR (ft)										
BORING NO. EB2-A		STATION 14+52		OFFSET 16 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 2,047.0 ft		TOTAL DEPTH 36.7 ft		NORTHING 602,919		EASTING 737,981										
DRILL RIG/HAMMER EFF./DATE SDS1873 CME-550X 87% 09/05/2014		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 04/30/15		COMP. DATE 05/01/15		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2050																
2045	2,046.2	0.8	1	2	2									2,047.0	0.2' TOPSOIL	0.0
	2,043.5	3.5	WOH	1	2										ALLUVIAL LT. AND DK. BROWN, F. SANDY SILT (A-4) W/ TRACE ORGANICS, MICA.	
2040	2,040.8	6.2	WOH	WOH	2									2,041.5	BLACK, SILTY F. SAND (A-2-5) W/ TRACE ORGANICS, WOOD PIECES AND GRAVEL, MICA.	5.5
	2,038.5	8.5		4	3	3								2,037.6	GRAVEL LAYER AT 9.2'	9.4
2035	2,033.5	13.5		2	3	5									RESIDUAL ORANGE AND BROWN, F. SANDY SILT (A-4) MICA., SAP.	
2030	2,028.5	18.5		11	9	12										
2025	2,023.5	23.5		22	45	55/0.3								2,023.0	WEATHERED ROCK TAN AND WHITE, BIOTITE GNEISS	24.0
2020	2,018.5	28.5		22	23	57								2,019.0	RESIDUAL TAN BROWN AND WHITE, SILTY SAND (A-2-4) SAP.	28.0
2015	2,013.5	33.5												2,013.5	WEATHERED ROCK BROWN AND TAN, BIOTITE GNEISS	33.5
														2,010.3	Boring Terminated by Auger Refusal at Elevation 2,010.3 ft on CR: BIOTITE GNEISS	36.7
NOTE: AUGER SECTION SHEARED AT DEPTH OF 36.7 FT FOR EFFECTIVE AUGER REFUSAL. 20 FEET OF AUGER REMAINS IN THE GROUND APPROXIMATELY AT BOTTOM OF HOLE.																

WBS 46125.1.1		TIP B-5410		COUNTY JACKSON		GEOLOGIST Hunsberger, W. S.										
SITE DESCRIPTION BRIDGE 221 ON 1367 OVER LITTLE SAVANNAH CREEK						GROUND WTR (ft)										
BORING NO. EB2-B		STATION 14+30		OFFSET 16 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 2,047.7 ft		TOTAL DEPTH 36.1 ft		NORTHING 602,881		EASTING 737,985										
DRILL RIG/HAMMER EFF./DATE SDS1873 CME-550X 87% 09/05/2014		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 04/30/15		COMP. DATE 04/30/15		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2050																
2045	2,047.3	0.4	1	2	1									2,047.7	0.3' TOPSOIL	0.0
	2,044.2	3.5		5	6	7								2,043.7	ALLUVIAL BROWN, SILTY F. SAND (A-2-4) W/ TRACE ROOTS, MICA.	4.0
2040	2,041.9	5.8		2	2	2								2,040.6	BROWN, F. SANDY SILT (A-4) W/ TRACE MICA	7.1
	2,039.2	8.5		1	3	3									DK. BROWN AND GRAY, SILTY SAND (A-2-4) W/ TRACE ORGANICS, W/ GRAVEL, MICA.	
2035	2,034.2	13.5		2	4	6								2,035.2	RESIDUAL BROWN ORANGE AND WHITE, F. SANDY SILT (A-4) SAP., MICA.	12.5
2030	2,029.2	18.5		4	7	15										
2025	2,024.2	23.5		6	11	18								2,025.7	BROWN ORANGE AND WHITE, SILTY F. SAND (A-2-4) W/ TRACE MICA, SAP.	22.0
2020	2,019.2	28.5												2,021.7	WEATHERED ROCK BROWN ORANGE AND WHITE, BIOTITE GNEISS	26.0
2015	2,014.2	33.5												2,011.6	Boring Terminated with Standard Penetration Test Refusal at Elevation 2,011.6 ft on CR: BIOTITE GNEISS	36.1

NCDOT BORE DOUBLE B5410_GEO_BORINGS.GPJ NC_DOT.GDT 6/22/15

AASHTO SOIL CLASSIFICATION AND GRADATION SHEET

BRIDGE NO. 221 ON SR 1367 OVER LITTLE SAVANNAH CREEK

WBS NO.: 46125.1.1, TIP NO.: B-5410

JACKSON COUNTY, NORTH CAROLINA
FALCON ENGINEERING, INC. PROJECT NO: G15013.00

BORING		SAMPLE	TOTAL SAMPLE			Atterberg Limit Test Results			Natural Moisture Content
AASHTO Classification			PERCENT PASSING			LL	PL	PI	%
STATION	OFFSET (FEET)	DEPTH (FEET)	#10	#40	#200				
EB1A		SS-1	100	97	51	33	NP	NP	40.6
A-4									
13+94	17 ft LT	3.8-5.3							
EB1-B		SS-2	100	96	57	42	NP	NP	45.0
A-5									
13+70	8 ft RT	3.7-5.2							
EB2-A		SS-3	75	59	22	51	NP	NP	-
A-2-5									
14+52	16 ft LT	6.2-7.7							
EB2-B		SS-4	100	98	46	33	NP	NP	36.5
A-4									
14+30	16 ft RT	0.4-1.9							

SIGNATURE



105-03-0803

Notes: LL = Liquid limit
 PL = Plastic limit
 PI = Plasticity index = LL - PL



LOOKING FORWARD EB2-A FROM EB2-B



LOOKING DOWNSTATION FORWARD END BENT ONE FROM END BENT TWO



LOOKING UPSTATION FROM EXISTING ROADWAY TOWARD END BENT ONE



DRILL RIG SET UP ON EB1-A



FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
RALEIGH, NC 27607
PHONE: 919.871.0800
FAX: 919.871.0803

SITE PHOTOGRAPHS

REPLACE BRIDGE NO. 221 ON SR 1367
OVER LITTLE SAVANNAH CREEK
JACKSON COUNTY, NC
WBS NO.:46125.1.1 TIP NO.: B-5410