

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

DEAN ARGENBRIGHT  
 GREENVILLE REGIONAL  
 ENGINEERING GEOLOGIST

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33735.1.1 (B-4504)	1	9

**CONTENTS**

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-7	BORE LOGS
8	SOIL TEST RESULTS
9	SCOUR REPORT

**STRUCTURE  
 SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 33735.1.1 (B-4504) F.A. PROJ. BRZ-1505 (3)  
 COUNTY EDGECOMBE  
 PROJECT DESCRIPTION BRIDGE NO. 52 ON SR 1505  
OVER DEEP CREEK AT -L- STATION 20+46.5

-REVISED-

**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.R. SWARTLEY

W.N. CHERRY

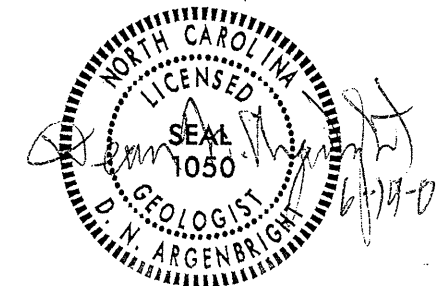
R.E. SMITH

INVESTIGATED BY F.M. WESCOTT III

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

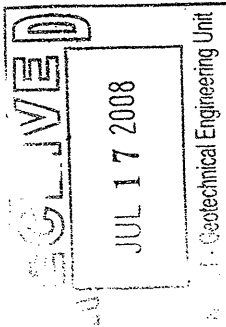
DATE JUNE, 2008



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.

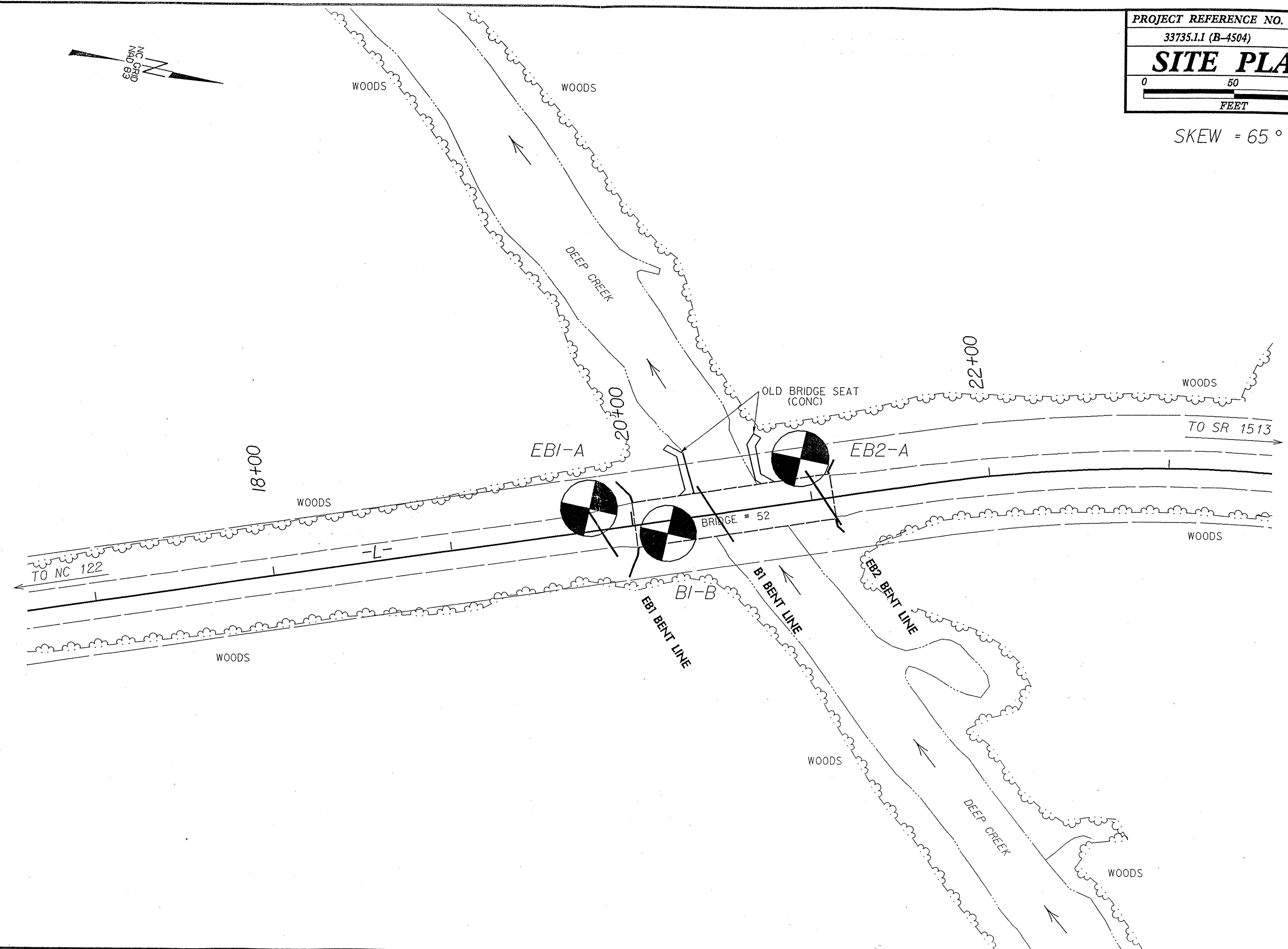
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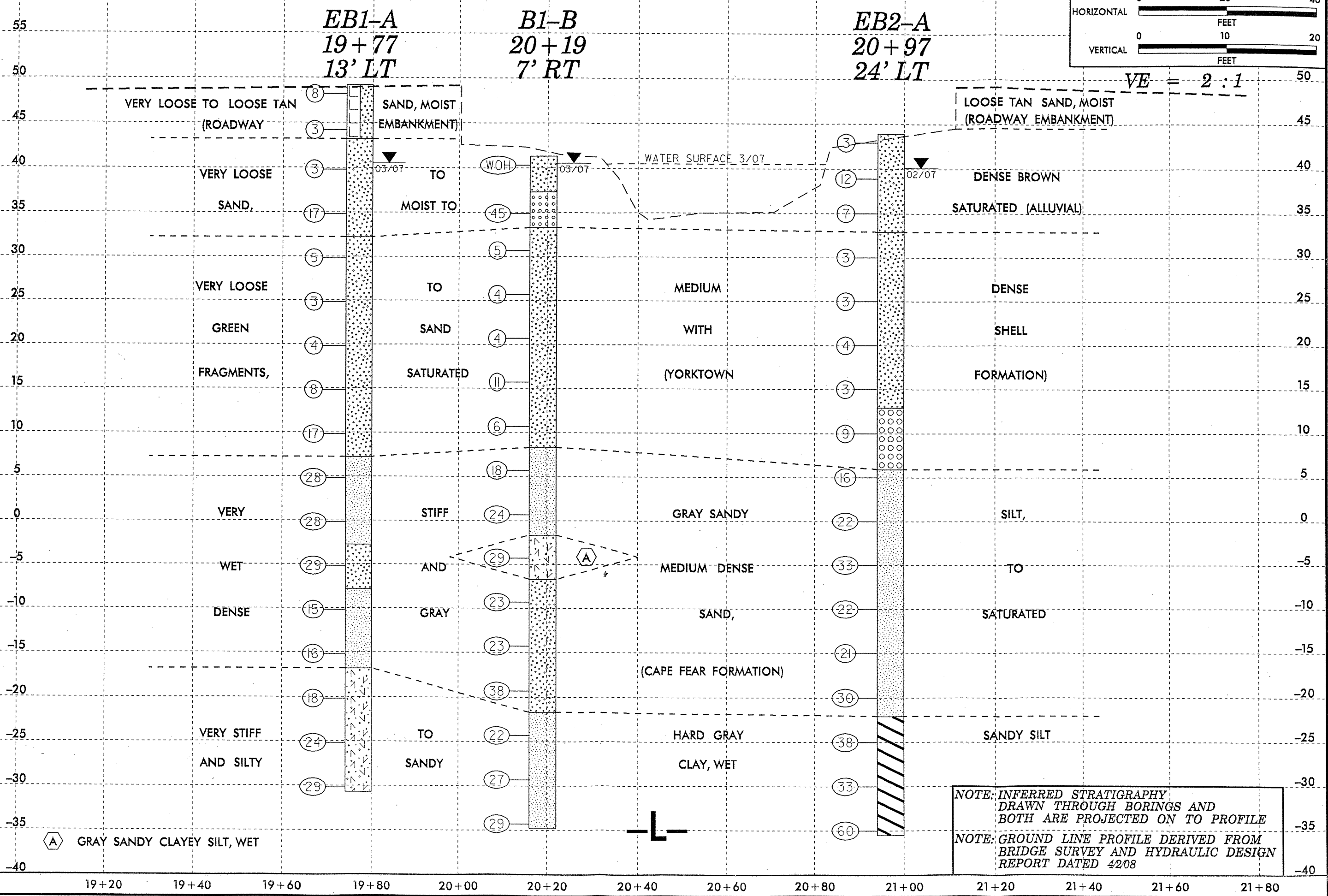
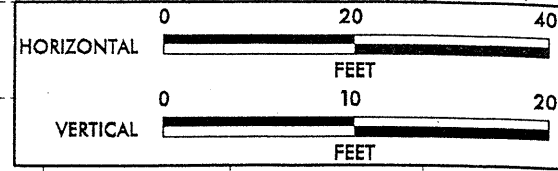
PROJECT: 33735.1.1 ID: B-4504



SKEW = 65°



PROFILE BORINGS PROJECTED ALONG -L-



NOTE: INFERRED STRATIGRAPHY DRAWN THROUGH BORINGS AND BOTH ARE PROJECTED ON TO PROFILE

NOTE: GROUND LINE PROFILE DERIVED FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 4/2008

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 User: geotech



PROJECT NO. 33735.1.1	ID. B-4504	COUNTY Edgecombe	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE 52 ON SR 1505 OVER DEEP CREEK			GROUND WTR (ft)
BORING NO. EB1-A	STATION 19+77	OFFSET 13ft LT	ALIGNMENT -L-
COLLAR ELEV. 49.2 ft	TOTAL DEPTH 79.9 ft	NORTHING 803,198	EASTING 2,451,208
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/01/07	COMP. DATE 03/02/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

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ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
50	49.2	0.0											GROUND SURFACE TAN SAND, MOIST (ROADWAY EMBANKMENT)	0.0
45	45.2	4.0	4	3	5						SS-15		BROWN SAND, MOIST TO SATURATED (ALLUVIAL)	6.0
40	40.8	8.4	1	2	1									
35	35.8	13.4	8	8	9									
30	30.8	18.4	2	2	3						SS-16		GREEN SAND WITH SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)	17.0
25	25.8	23.4	2	1	2									
20	20.8	28.4	1	2	2									
15	15.8	33.4	3	3	5						SS-17			
10	10.8	38.4	4	9	8									
5	5.8	43.4	7	13	15						SS-18		GRAY SANDY SILT, WET (CAPE FEAR FORMATION)	42.0
0	0.8	48.4	7	11	17									
-5	-4.2	53.4	7	11	18						SS-19		GRAY SAND, SATURATED	52.0
-10	-9.2	58.4	3	6	9						SS-20		GRAY SANDY SILT, WET	57.0
-15	-14.2	63.4	6	9	7									
-20	-19.2	68.4	9	8	10						SS-21		GRAY SANDY SILT, WET	66.0
-25	-24.2	73.4	8	9	15									
-29.2	-29.2	78.4												

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
-30			11	14	15								Match Line	
-35														
-40														
-45														
-50														
-55														
-60														
-65														
-70														
-75														
-80														
-85														
-90														
-95														
-100														
-105														

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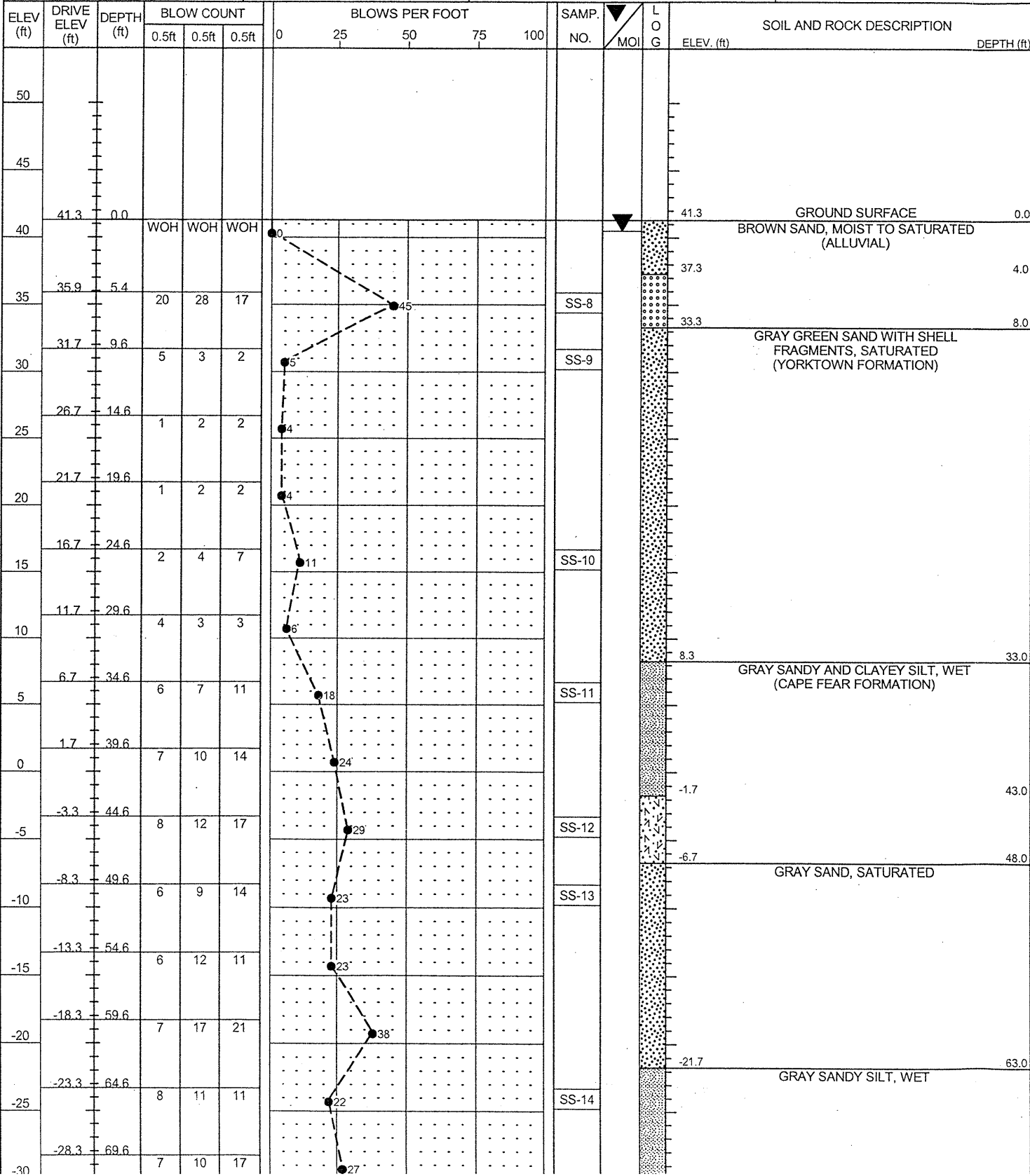
Boring Terminated at Elevation -30.7 ft in very stiff silt



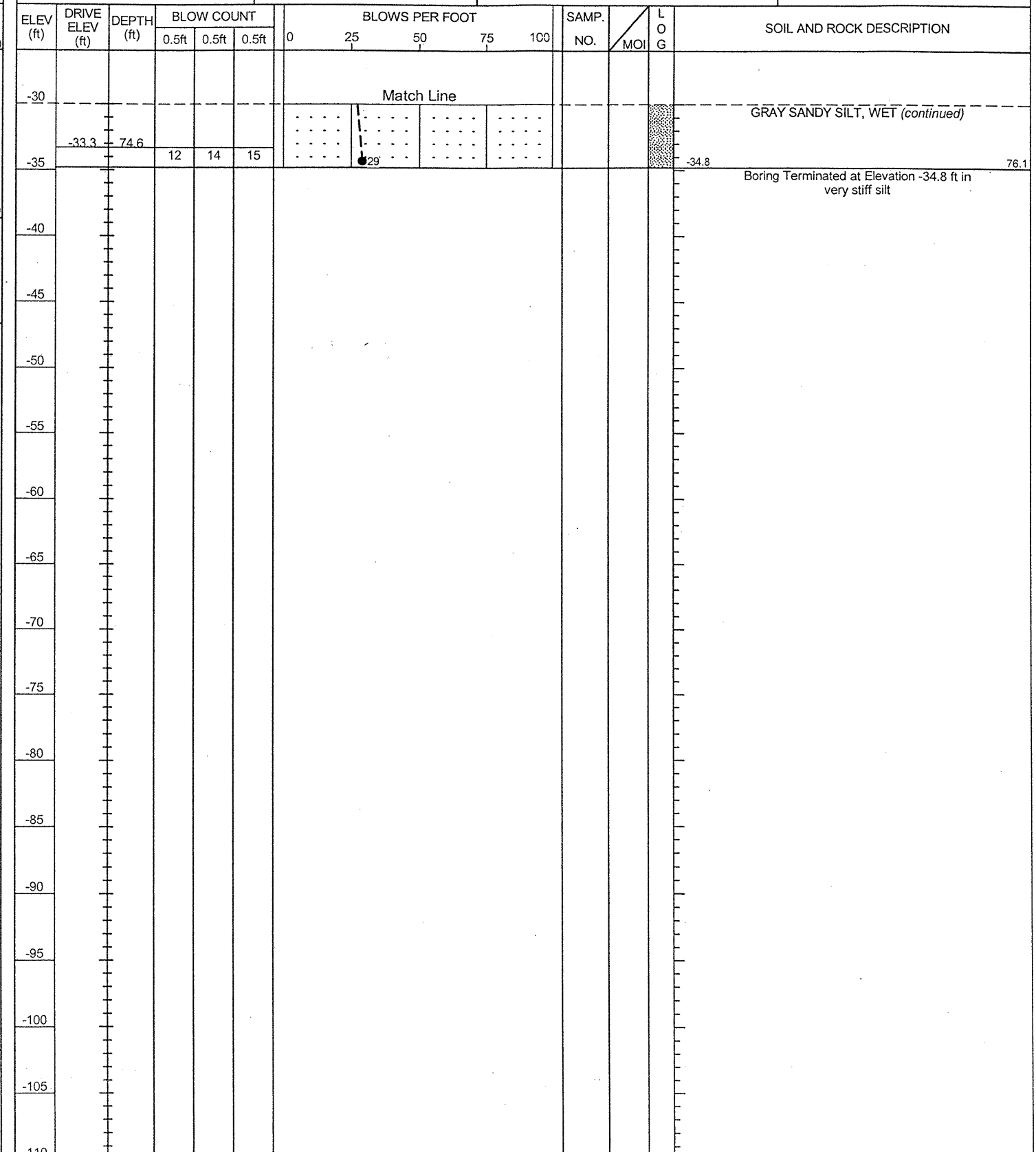
# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

PROJECT NO. 33735.1.1	ID. B-4504	COUNTY Edgecombe	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE 52 ON SR 1505 OVER DEEP CREEK			GROUND WTR (ft)
BORING NO. B1-B	STATION 20+19	OFFSET 7ft RT	ALIGNMENT -L-
COLLAR ELEV. 41.3 ft	TOTAL DEPTH 76.1 ft	NORTHING 803,244	EASTING 2,451,212
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 02/28/07	COMP. DATE 03/01/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



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NCDOT BORE DOUBLE B4504 GEO. BRDG.GPJ NC\_DOT.GDT 06/20/08





# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

PROJECT NO. 33735.1.1	ID. B-4504	COUNTY Edgecombe	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE 52 ON SR 1505 OVER DEEP CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 20+97	OFFSET 24ft LT	ALIGNMENT -L-
COLLAR ELEV. 43.9 ft	TOTAL DEPTH 79.4 ft	NORTHING 803,306	EASTING 2,451,155
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 02/27/07	COMP. DATE 02/27/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

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DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 02/27/07	COMP. DATE 02/27/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 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					
45	43.9	0.0												GROUND SURFACE	0.0
			WOH	1	2									BROWN GRAY SAND, SATURATED (ALLUVIAL)	
40	39.9	4.0	2	5	7										
35	36.0	7.9	4	4	3										
30	31.0	12.9	7	1	2									GREEN SAND WITH SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)	11.0
25	26.0	17.9	2	1	2										
20	21.0	22.9	1	2	2										
15	16.0	27.9	1	1	2										
10	11.0	32.9	3	4	5										
5	6.0	37.9	6	7	9										
0	1.0	42.9	6	10	12										
-5	-4.0	47.9	8	13	20										
-10	-9.0	52.9	5	6	16										
-15	-14.0	57.9	4	9	12										
-20	-19.0	62.9	9	13	17										
-25	-24.0	67.9	7	16	22										
-30	-29.0	72.9	12	16	17										
-34.0	-34.0	77.9													

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					
-35														Match Line	60
														Boring Terminated at Elevation -35.5 ft in hard clay	79.4
-40															
-45															
-50															
-55															
-60															
-65															
-70															
-75															
-80															
-85															
-90															
-95															
-100															
-105															
-110															

DOT BORE DOUBLE B4504 GEO\_BRDG.GPJ NC\_DOT.GDT 06/20/08

**B-4504**  
**Bridge No. 52 on SR 1505 over Deep Creek**

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST.	ORG.
EB2-A	SS-1	100	82	15	34.4	52.7	11.0	2.0	19	NP	A-2-4(0)	1.0-1.5		
	SS-2	100	87	27	30.4	44.0	17.6	8.0	20	NP	A-2-4(0)	12.9-14.4		
	SS-3	100	87	13	25.7	61.9	12.4	0.0	19	NP	A-2-4(0)	22.9-24.4		
	SS-4	100	36	9	81.7	10.2	8.0	0.0	20	NP	A-1-b(0)	32.9-34.4		
	SS-5	100	97	63	8.8	39.2	42.0	10.0	38	NP	A-4(1)	37.9-39.4		
	SS-6	100	97	54	5.6	53.6	20.7	20.1	33	10	A-4(3)	52.9-54.4		
	SS-7	100	88	52	21.1	39.4	29.5	10.0	44	13	A-7-5(5)	67.9-69.4		
B1-B	SS-8	100	92	9	39.2	54.4	6.4	0.0	17	NP	A-3(0)	5.4-6.9		
	SS-9	100	94	27	21.5	52.4	16.1	10.0	21	NP	A-2-4(0)	9.6-11.1		
	SS-10	100	90	12	47.6	41.6	8.8	2.0	20	NP	A-2-4(0)	24.6-26.1		
	SS-11	100	99	84	2.6	24.9	48.4	24.1	13	NP	A-4(0)	34.6-36.1		
	SS-12	100	99	72	3.0	36.5	38.4	22.1	45	NP	A-5(3)	44.6-46.1		
	SS-13	100	100	26	5.0	71.1	11.8	12.0	16	NP	A-2-4(0)	49.6-51.1		
	SS-14	100	86	51	23.7	40.2	26.1	10.0	37	NP	A-4(0)	64.6-66.1		
EB1-A	SS-15	100	93	31	14.9	60.8	16.3	8.0	17	NP	A-2-4(0)	4.0-5.5		
	SS-16	100	85	32	40.2	39.6	10.2	10.0	25	NP	A-2-4(0)	18.4-19.9		
	SS-17	100	84	13	50.8	37.8	9.4	2.0	22	NP	A-2-4(0)	33.4-34.9		
	SS-18	100	98	63	3.8	42.6	37.5	16.1	36	NP	A-4(0)	43.4-44.9		
	SS-19	100	100	31	8.0	63.3	10.6	18.1	29	4	A-2-4(0)	53.4-54.9		
	SS-20	100	96	66	9.0	35.6	37.3	18.1	28	5	A-4(2)	58.4-59.9		
	SS-21	100	84	60	22.6	29.4	38.0	10.0	41	9	A-5(5)	68.4-69.9		





**FIELD  
 SCOUR REPORT**

WBS: 33735.1.1 TIP: B-4504 COUNTY: Edgecombe

DESCRIPTION(1): Bridge No. 52 on SR 1505 over Deep Creek

**EXISTING BRIDGE**

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

Bridge No.: 52 Length: 110.5 Total Bents: 4 Bents in Channel: 2 Bents in Floodplain: 2  
 Foundation Type: Timber piles

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: None noted

Interior Bents: 3-5 foot scour pocket at Bent 1

Channel Bed: None noted

Channel Bank: 3-5 feet of scour under bridge on south bank

**EXISTING SCOUR PROTECTION**

Type(3): Wooden wing walls

Extent(4): 10'-15' from outside edge of bridge

Effectiveness(5): Appears satisfactory

Obstructions(6): Old concrete bridge foundation west and underneath bridge

**INSTRUCTIONS**

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit 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): Loose to dense sand (SS-8)

Channel Bank Material(8): Very loose to medium dense sand (SS-1)

Channel Bank Cover(9): Wooded

Floodplain Width(10): 500+/- feet

Floodplain Cover(11): Wooded

Stream is(12): Aggrading \_\_\_\_\_ Degrading  Static \_\_\_\_\_

Channel Migration Tendency(13): Not likely but may migrate southeast toward End Bent 1

Observations and Other Comments: Old roadway embankment present near old concrete bridge foundation

**DESIGN SCOUR ELEVATIONS(14)**

Feet  Meters \_\_\_\_\_

**BENTS**

B1														
23														

Comparison of DSE to Hydraulics Unit theoretical scour:  
 Design Scour Elevation agrees with the Hydraulics Unit's over topping theoretical scour

**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 9,  
 "Soil Test Results",  
 for samples:  
 SS-8 Channel bed  
 SS-1 Channel bank

Reported by: \_\_\_\_\_ Date: 4/18/2007