

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4533	1	8

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33752.1.1 (B-4533) F.A. PROJ. BRZ-1432(3)
COUNTY GREENE / LENOIR
PROJECT DESCRIPTION BRIDGE NO. 48 ON SR 1432 AND SR 1705
OVER WHEAT SWAMP CREEK AT -L- STA. 17+00

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-6	BORE LOGS
7	SOIL TEST RESULTS
8	SCOUR REPORT

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

R.E. SMITH

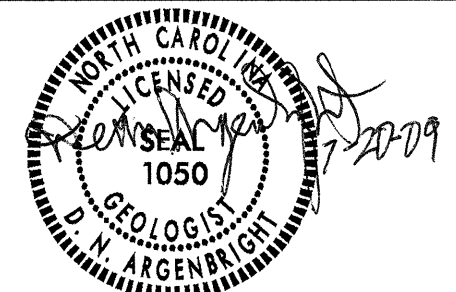
J.M. EDMONDSON

INVESTIGATED BY T.C. BOTTOMS

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE JULY 2009



PROJECT: 33752.1.1 ID: B-4533

DRAWN BY: C.P. TURNER

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

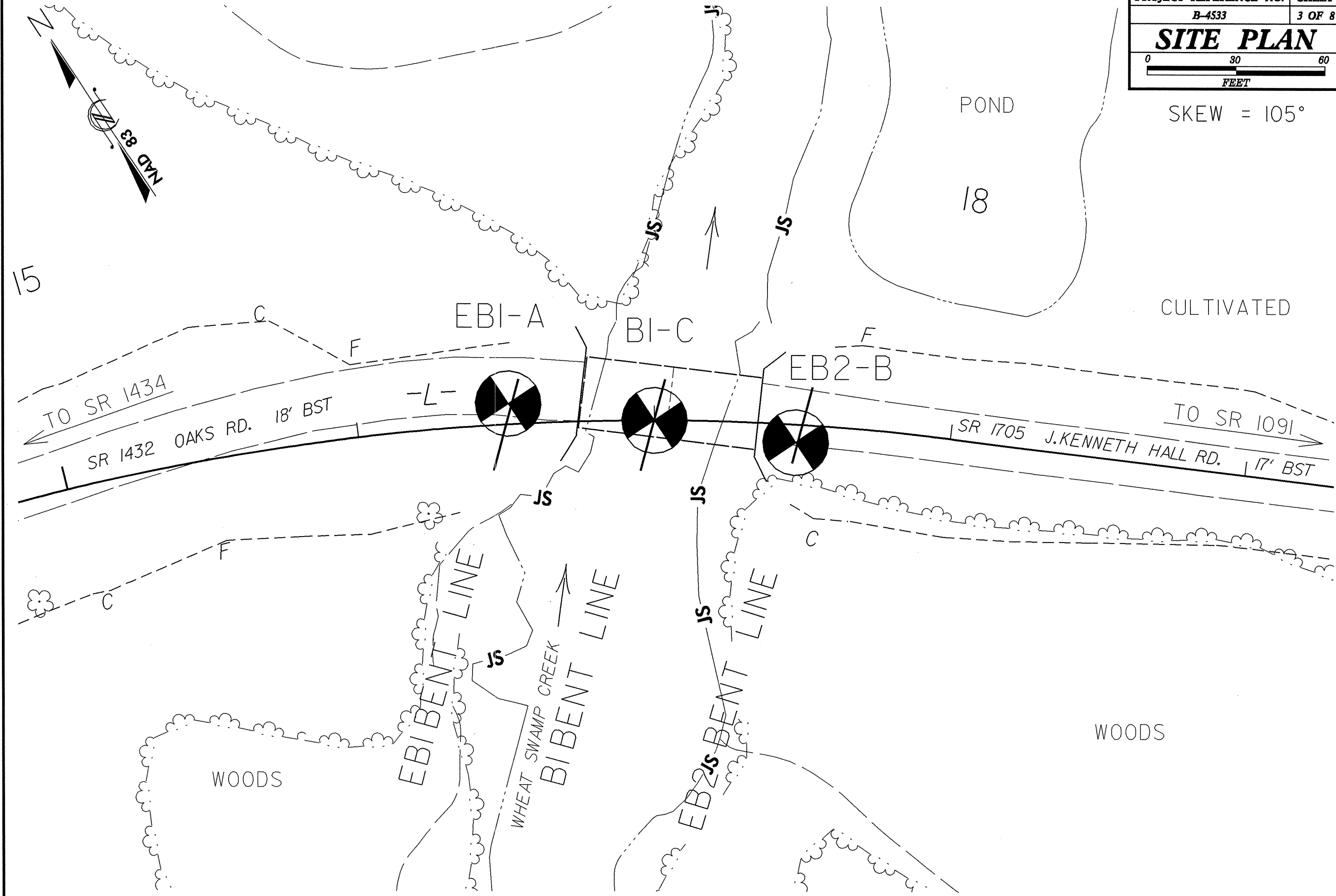
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSION, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, INDURATION, PLASTICITY, COLOR.

SKEW = 105°

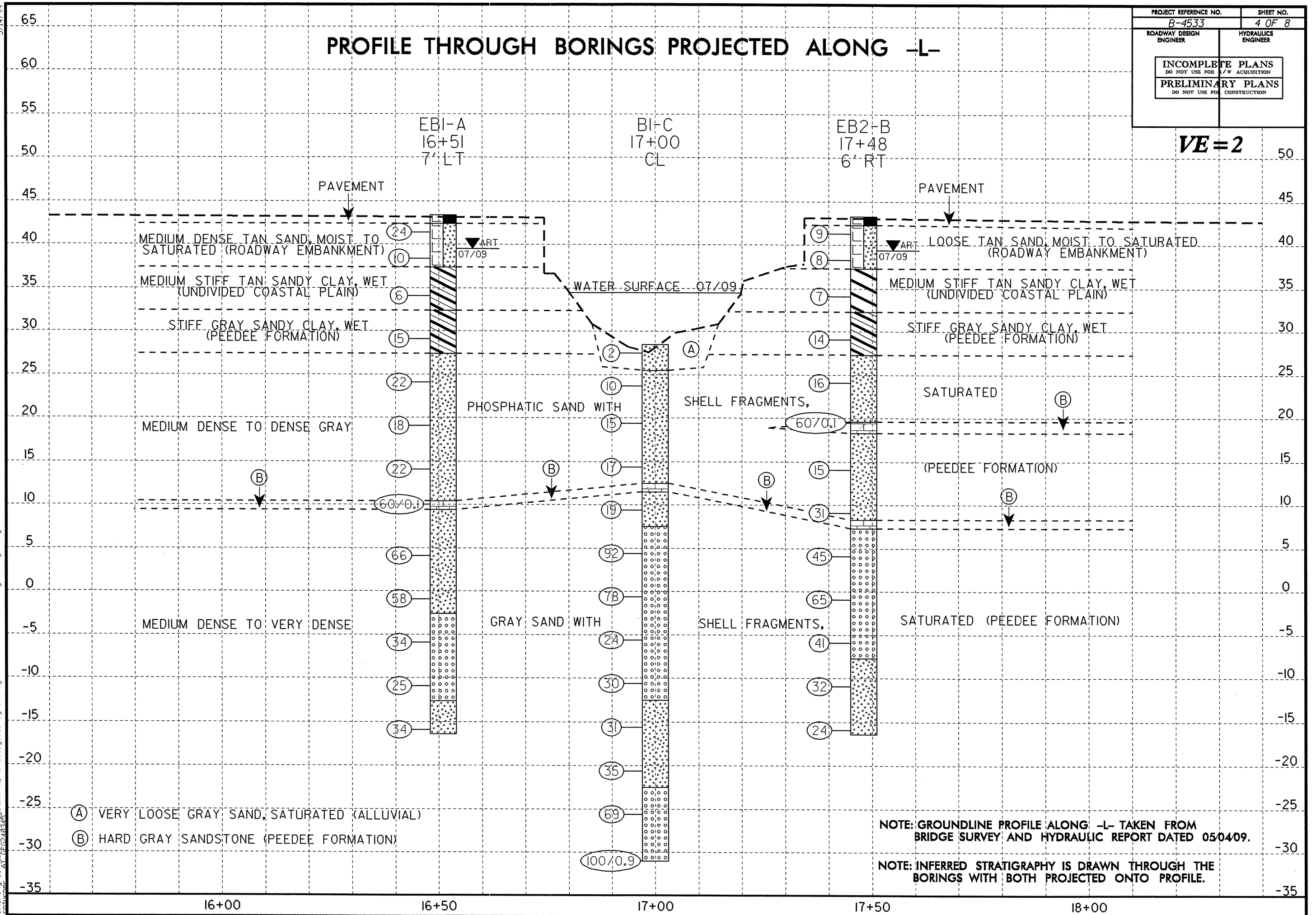


5/14/99

PROJECT REFERENCE NO. B-4533	SHEET NO. 4 OF 8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PROFILE THROUGH BORINGS PROJECTED ALONG -L-

VE = 2



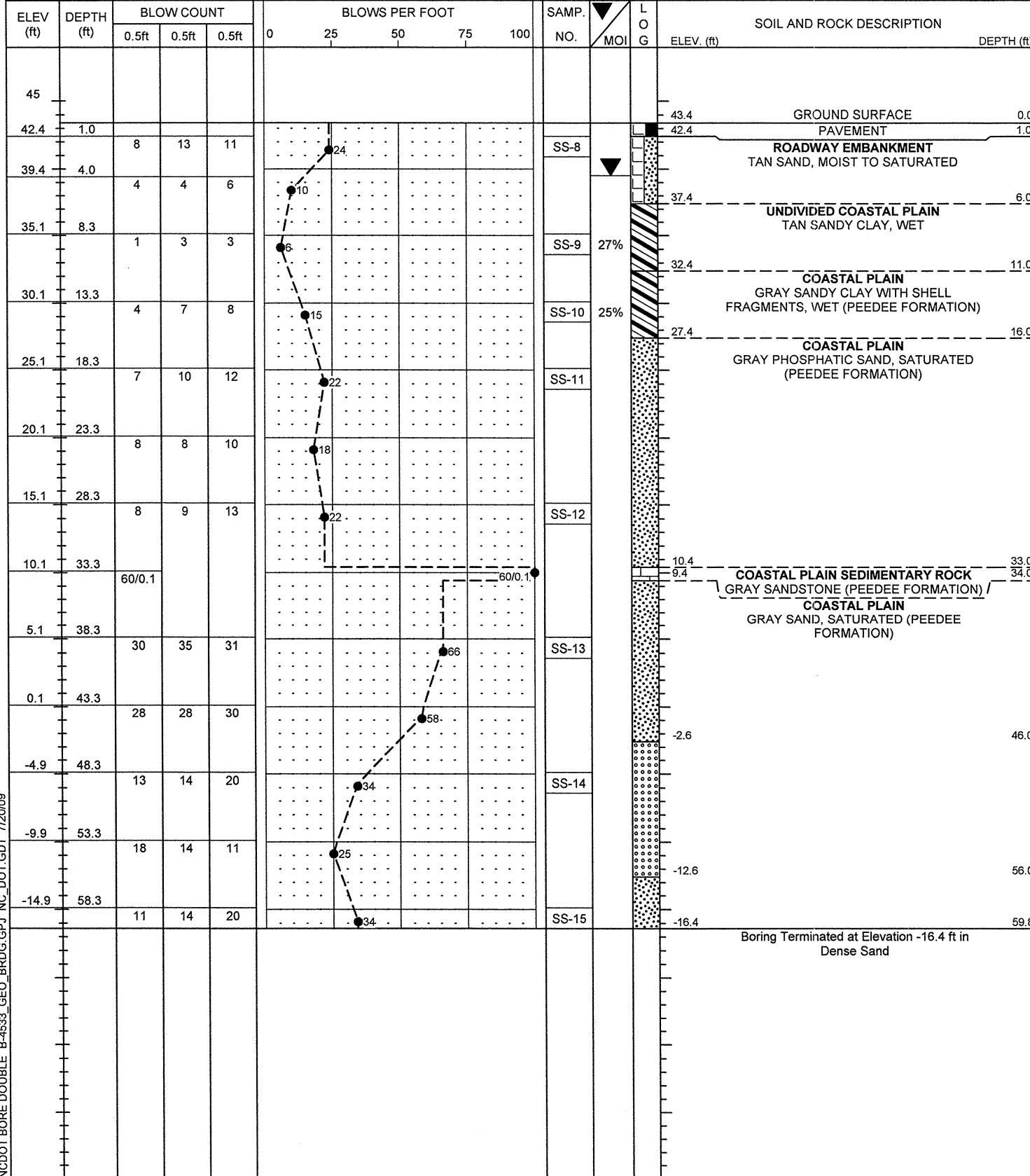
- (A) VERY LOOSE GRAY SAND, SATURATED (ALLUVIAL)
- (B) HARD GRAY SANDSTONE (PEEDEE FORMATION)

NOTE: GROUNDLINE PROFILE ALONG -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC REPORT DATED 05/04/09.

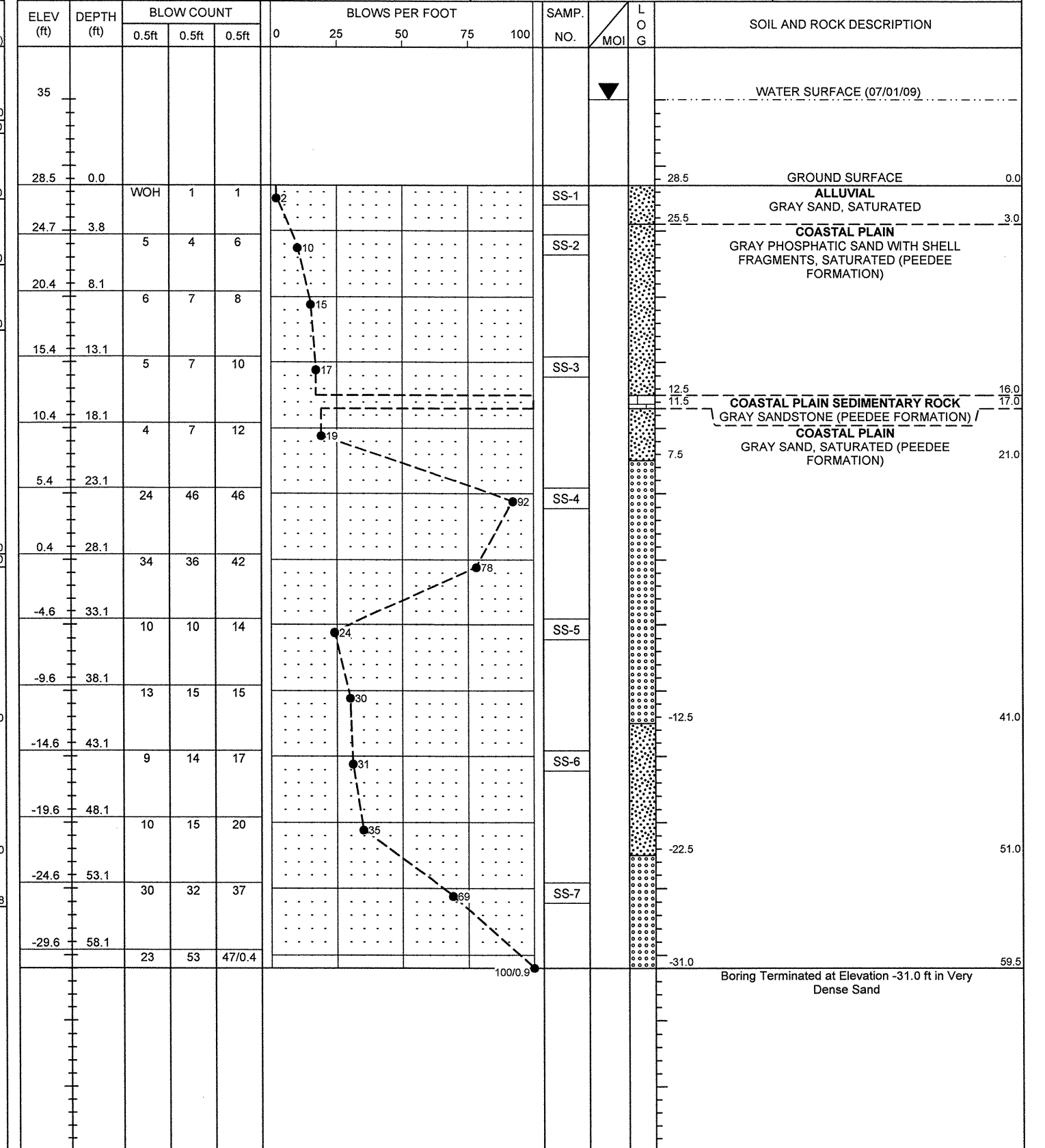
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

20-Jul-2009 09:10
 I:\proj\greenville\5714\action\tp\4533-geo-br-dg\cadd-geotech\st\te&sub\4533-geo-br-dg-48.dgn

PROJECT NO. 33752.1.1	ID. B-4533	COUNTY GREENE/LENOIR	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 48 ON -L- (SR 1432 AND SR 1705) OVER WHEAT SWAMP CREEK			GROUND WTR (ft)
BORING NO. EB1-A	STATION 16+51	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. 43.4 ft	TOTAL DEPTH 59.8 ft	NORTHING 598,627	EASTING 2,427,583
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 07/01/09	COMP. DATE 07/07/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 33.0 ft



PROJECT NO. 33752.1.1	ID. B-4533	COUNTY GREENE/LENOIR	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 48 ON -L- (SR 1432 AND SR 1705) OVER WHEAT SWAMP CREEK			GROUND WTR (ft)
BORING NO. B1-C	STATION 17+00	OFFSET CL	ALIGNMENT -L-
COLLAR ELEV. 28.5 ft	TOTAL DEPTH 59.5 ft	NORTHING 598,595	EASTING 2,427,621
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 07/01/09	COMP. DATE 07/01/09	SURFACE WATER DEPTH 6.5ft	DEPTH TO ROCK 16.0 ft



NCDOT BORE DOUBLE B-4533_GEO_BRDG.GPJ NC_DOT_GDT_7/20/09

PROJECT NO. 33752.1.1	ID. B-4533	COUNTY GREENE/ LENOIR	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 48 ON -L- (SR 1432 AND SR 1705) OVER WHEAT SWAMP CREEK			GROUND WTR (ft)
BORING NO. EB2-B	STATION 17+48	OFFSET 6ft RT	ALIGNMENT -L-
COLLAR ELEV. 43.3 ft	TOTAL DEPTH 59.7 ft	NORTHING 598,563	EASTING 2,427,657
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 07/07/09	COMP. DATE 07/07/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 23.7 ft

ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
		0.5ft	0.5ft	0.5ft	0	25	50	75	100				
45													
42.3	1.0	3	4	5						SS-16		GROUND SURFACE 43.3 0.0 PAVEMENT 42.3 1.0	
39.3	4.0	3	4	4								ROADWAY EMBANKMENT TAN SAND, MOIST TO SATURATED	
35.1	8.2	2	3	4						SS-17		UNDIVIDED COASTAL PLAIN TAN SANDY CLAY, WET	
30.1	13.2	4	6	8						SS-18	24%	COASTAL PLAIN GRAY SANDY CLAY, WET (PEEDEE FORMATION)	
25.1	18.2	6	8	8						SS-19		COASTAL PLAIN GRAY SAND WITH SHELL FRAGMENTS, SATURATED (PEEDEE FORMATION)	
20.1	23.2	45	60/0.1									COASTAL PLAIN SEDIMENTARY ROCK GRAY SANDSTONE (PEEDEE FORMATION)	
15.1	28.2	5	7	8						SS-20		COASTAL PLAIN GRAY SAND, SATURATED (PEEDEE FORMATION)	
10.1	33.2	6	6	25								COASTAL PLAIN SEDIMENTARY ROCK GRAY SANDSTONE (PEEDEE FORMATION)	
5.1	38.2	13	21	24						SS-21		COASTAL PLAIN GRAY SAND, SATURATED (PEEDEE FORMATION)	
0.1	43.2	30	35	30						SS-22			
-4.9	48.2	14	21	20									
-9.9	53.2	15	15	17						SS-23			
-14.9	58.2	8	12	12									
													Boring Terminated at Elevation -16.4 ft in Medium Dense Sand

NCDOT BORE DOUBLE B-4533_GEO_BRDG.GPJ NC_DOT.GDT 7/20/09

BRIDGE NO. 48 ON SR 1432 AND SR 1705 OVER WHEAT SWAMP CREEK AT -L- STA. 17+00

EB1-A

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS- 8	7' LT	16+51	1.0-2.5	A-2-4(0)	19	NP	8.7	71.9	6.3	13.1	100	97	24	-	-
SS- 9	7' LT	16+51	8.3-9.8	A-6(2)	33	15	18.6	46.0	13.2	22.2	100	94	40	27.0	-
SS- 10	7' LT	16+51	13.3-14.8	A-6(2)	33	14	19.2	48.6	10.0	22.2	100	90	41	25.0	-
SS- 11	7' LT	16+51	18.3-19.8	A-2-4(0)	21	NP	43.2	45.6	3.1	8.1	100	88	13	-	-
SS- 12	7' LT	16+51	28.3-29.8	A-2-4(0)	22	NP	14.5	68.4	4.9	12.1	97	90	20	-	-
SS- 13	7' LT	16+51	38.3-39.8	A-2-4(0)	22	NP	15.5	75.3	1.1	8.1	100	98	11	-	-
SS- 14	7' LT	16+51	48.3-49.8	A-3(0)	19	NP	68.7	23.4	1.8	6.1	100	67	9	-	-
SS- 15	7' LT	16+51	58.3-59.8	A-2-4(0)	22	NP	26.0	63.2	2.7	8.1	100	94	12	-	-

B1-C

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS- 1	CL	17+00	1.0-1.5	A-2-4(0)	26	8	39.4	39.4	7.2	14.1	98	81	24	-	-
SS- 2	CL	17+00	3.8-5.3	A-2-4(0)	19	NP	43.4	43.8	4.7	8.1	100	90	15	-	-
SS- 3	CL	17+00	13.1-14.6	A-2-4(0)	23	NP	5.4	76.1	6.4	12.1	100	98	23	-	-
SS- 4	CL	17+00	23.1-24.6	A-3(0)	24	NP	17.0	76.8	2.2	4.0	100	99	7	-	-
SS- 5	CL	17+00	33.1-34.6	A-3(0)	18	NP	70.5	21.9	2.5	5.0	100	61	8	-	-
SS- 6	CL	17+00	43.1-44.6	A-2-4(0)	24	NP	20.4	66.4	3.1	10.1	100	95	14	-	-
SS- 7	CL	17+00	53.1-54.6	A-3(0)	17	NP	75.9	16.0	2.0	6.1	100	60	9	-	-

EB2-B

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS- 16	6' RT	17+48	1.0-2.5	A-2-4(0)	19	NP	20.2	56.1	7.6	16.1	99	90	28	-	-
SS- 17	6' RT	17+48	8.2-9.7	A-7-6(4)	41	20	19.6	41.0	11.2	28.3	100	93	43	-	-
SS- 18	6' RT	17+48	13.2-14.7	A-6(1)	32	12	22.2	49.6	8.0	20.2	99	88	36	24.0	-
SS- 19	6' RT	17+48	18.2-19.7	A-2-4(0)	22	NP	46.6	41.6	1.7	10.1	100	85	13	-	-
SS- 20	6' RT	17+48	28.2-29.7	A-2-4(0)	26	NP	4.0	76.7	5.1	14.1	100	99	25	-	-
SS- 21	6' RT	17+48	38.2-39.7	A-3(0)	23	NP	21.3	70.3	1.3	7.1	100	97	9	-	-
SS- 22	6' RT	17+48	43.2-44.7	A-3(0)	24	NP	45.7	49.1	1.1	4.0	100	92	6	-	-
SS- 23	6' RT	17+48	53.2-54.7	A-2-4(0)	25	NP	24.2	64.4	3.3	8.1	100	97	13	-	-



**FIELD
 SCOUR REPORT**

WBS: 33752.1.1 TIP: B-4533 COUNTY: GREENE/LENOIR

DESCRIPTION(1): BRIDGE NO. 48 ON SR 1432 OVER WHEAT SWAMP CREEK

EXISTING BRIDGE

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

Bridge No.: 48 Length: 60' Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 2
 Foundation Type: TIMBER PILES

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: NONE NOTED

Interior Bents: NONE NOTED

Channel Bed: NONE NOTED

Channel Bank: NONE NOTED

EXISTING SCOUR PROTECTION

Type(3): WOODEN WING WALLS

Extent(4): 12 FEET OUTSIDE BRIDGE

Effectiveness(5): EFFECTIVE

Obstructions(6): NONE NOTED

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): SAND

Channel Bank Material(8): SANDY CLAY

Channel Bank Cover(9): GRASSES AND SHRUBS

Floodplain Width(10): APPROX. 500'

Floodplain Cover(11): TREES AND SHRUBS

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): SLIGHT TENDENCY TO MIGRATE WEST TOWARD EB1

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

BENTS

B1

18.0																			

Comparison of DSE to Hydraulics Unit theoretical scour:
 Design Scour Elevations agree with the Hydraulic Unit's theoretical 100 year 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 7,
 "Soil Test Results",
 for samples:
 Channel Bed: SS-1
 Channel Bank: SS-9

Reported by: Tyler Bottoms Date: 7/20/2009