

CONTRACT: 33713.1.2 ID: B-4463

CONTENTS

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

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

BRIDGE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33713.1.2 (B-4463) F.A. PROJ. STP-0032(8)
 COUNTY CHOWAN
 PROJECT DESCRIPTION BRIDGE NO. 12 ON NC 32 OVER QUEEN ANNE CREEK AT -L- STA 21+24

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33713.1.2 (B-4463)	1	10
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33713.1.2	STP-0032(8)	P.E.	
		RW & UTIL.	

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 1919 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

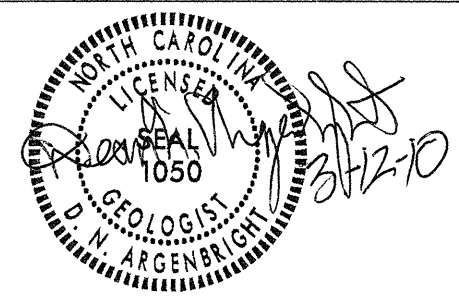
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE, THE LABORATORY SAMPLE DATA AND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

- CMW
- SCD
- JRS
- RES
- JME

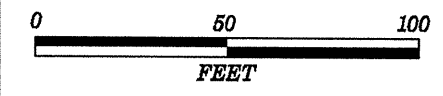
INVESTIGATED BY C.M. WRIKE
 CHECKED BY D.N. ARGENBRIGHT
 SUBMITTED BY D.N. ARGENBRIGHT
 DATE SEPTEMBER 2009



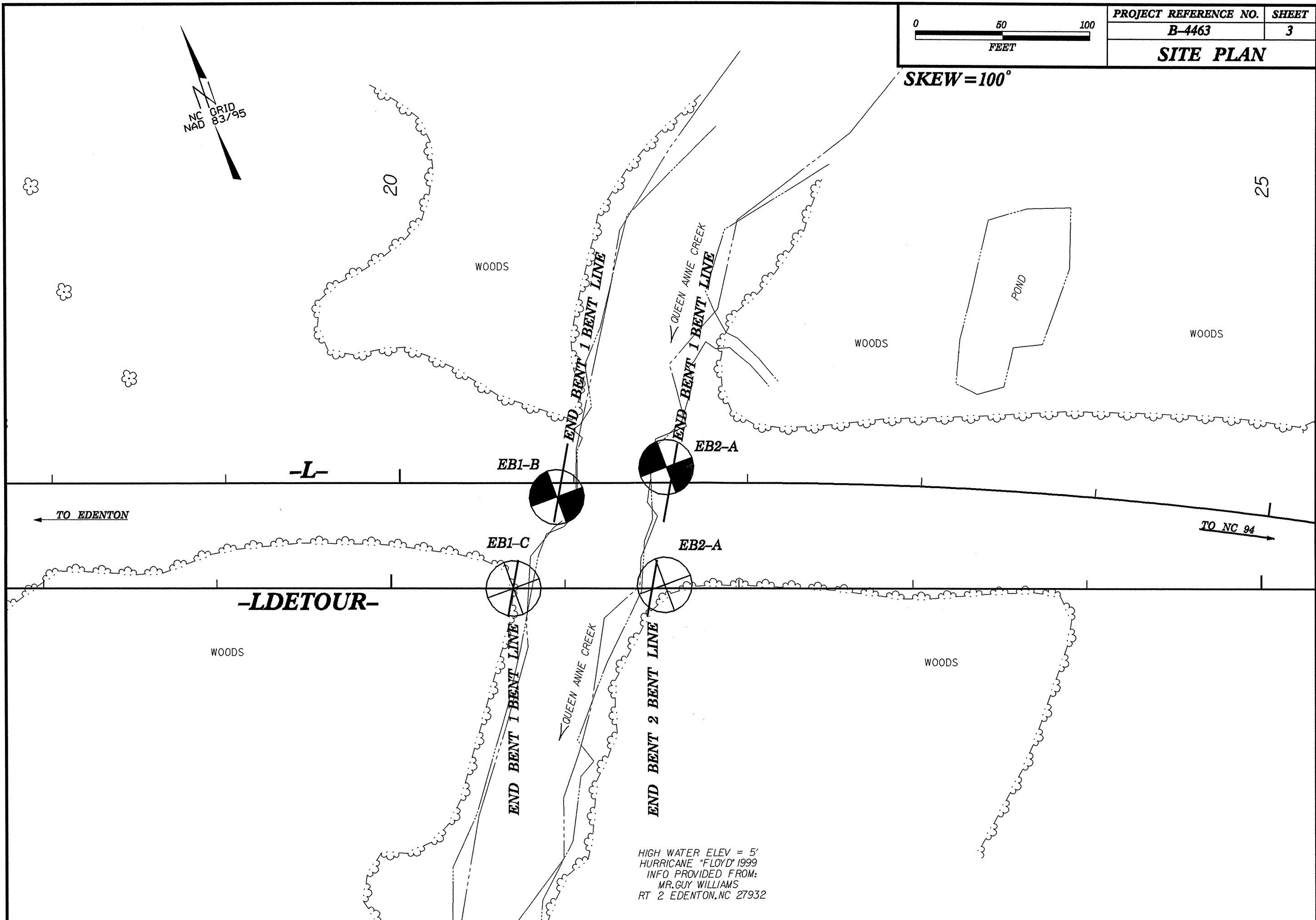
DRAWN BY: C.R. SUMNER, C.M. WRIKE

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.



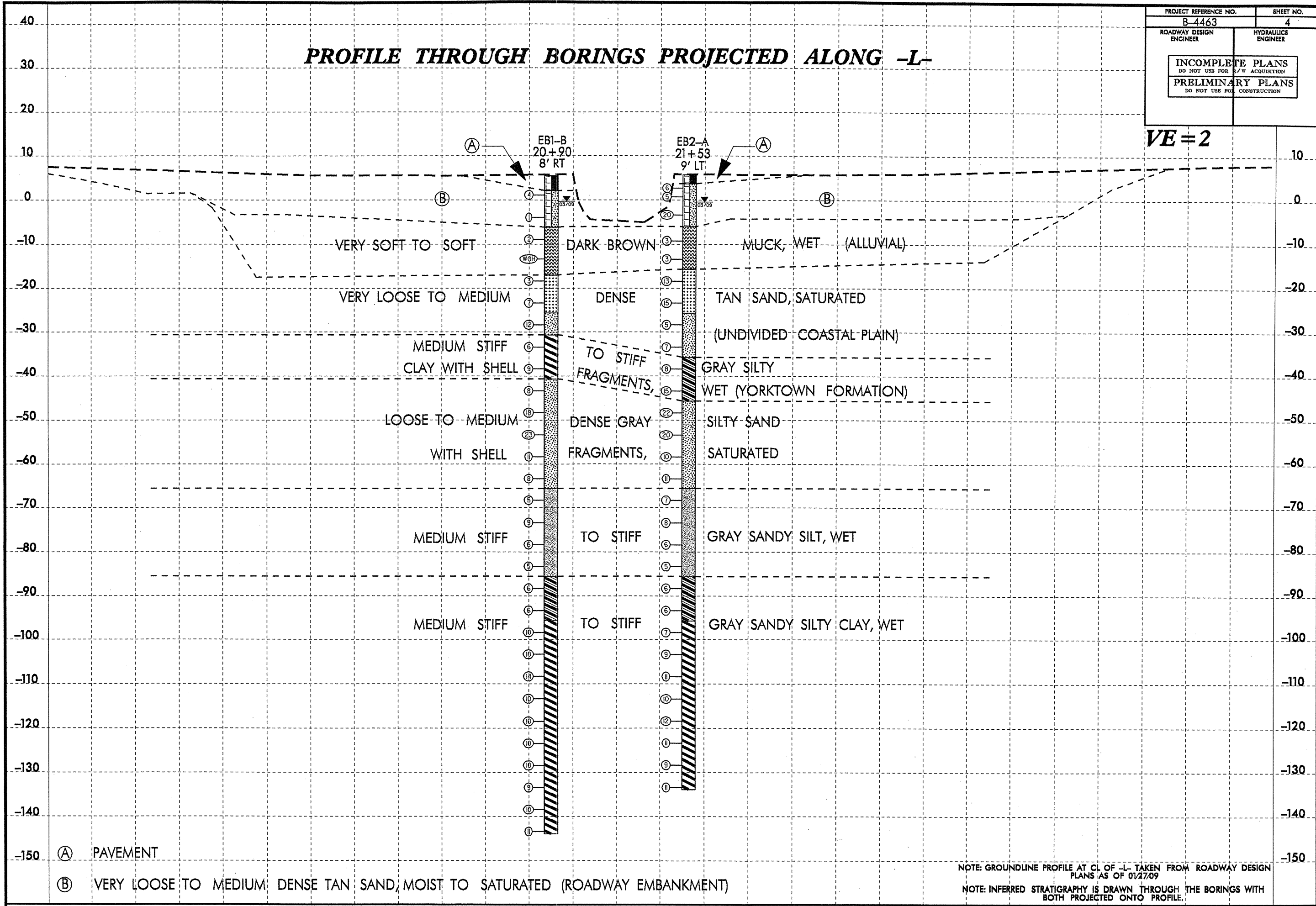
SKEW = 100°



HIGH WATER ELEV = 5'
HURRICANE "FLOYD" 1999
INFO PROVIDED FROM:
MR. GUY WILLIAMS
RT 2 EDENTON, NC 27932

PROFILE THROUGH BORINGS PROJECTED ALONG -L-

VE = 2



- (A) PAVEMENT
- (B) VERY LOOSE TO MEDIUM DENSE TAN SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

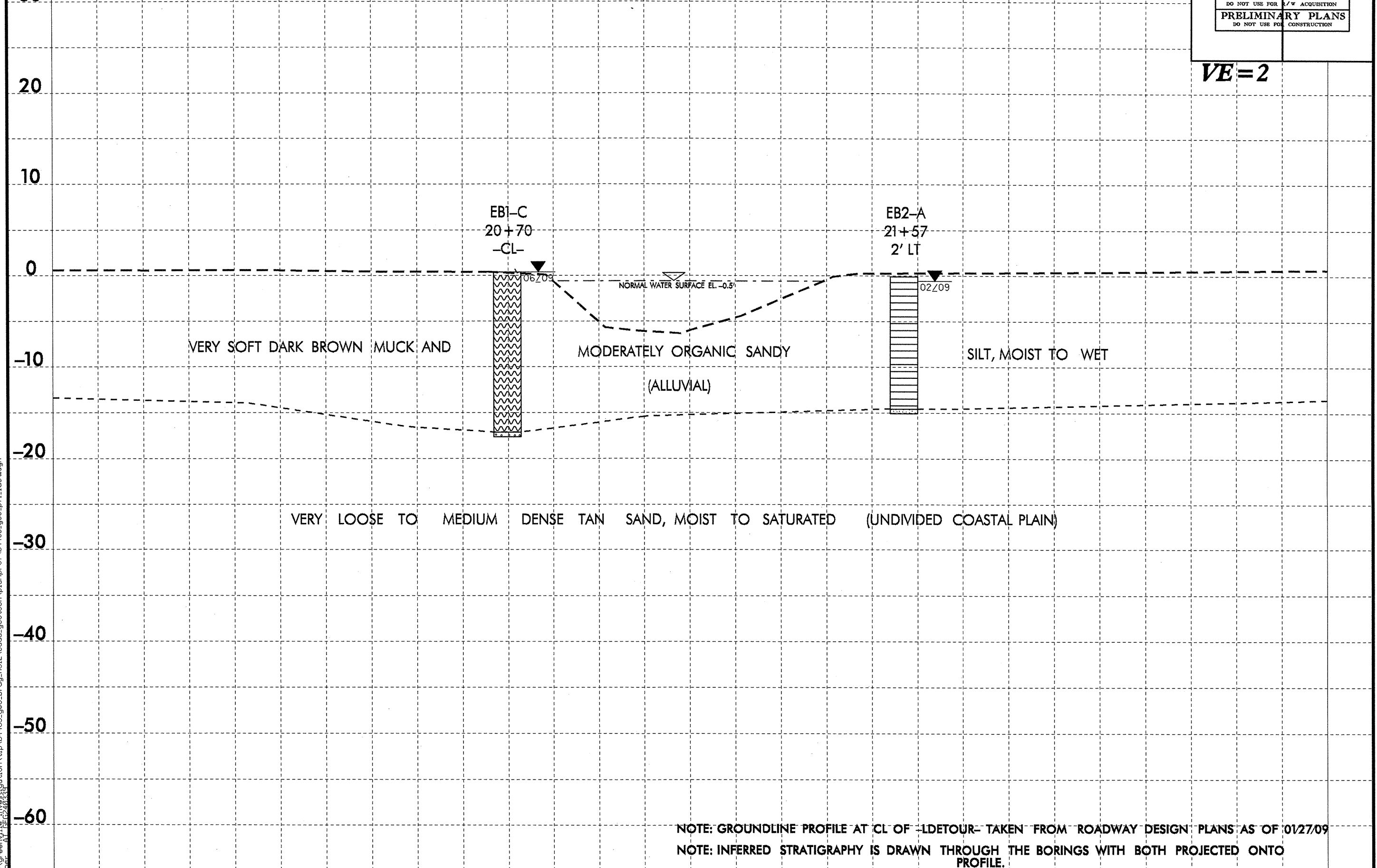
NOTE: GROUNDLINE PROFILE AT CL OF -L- TAKEN FROM ROADWAY DESIGN PLANS AS OF 01/27/09
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

5/14/99
08-SEP-2009 15:00
I:\ero\green\116_investigation\tp\4463\geo_brdg\m012\cecd-geotech\planprof\4463-geo-pf1_1det.dgn
AT 16023433

PROJECT REFERENCE NO. B-4463	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PROFILE THROUGH BORINGS PROJECTED ALONG -LDETOUR-

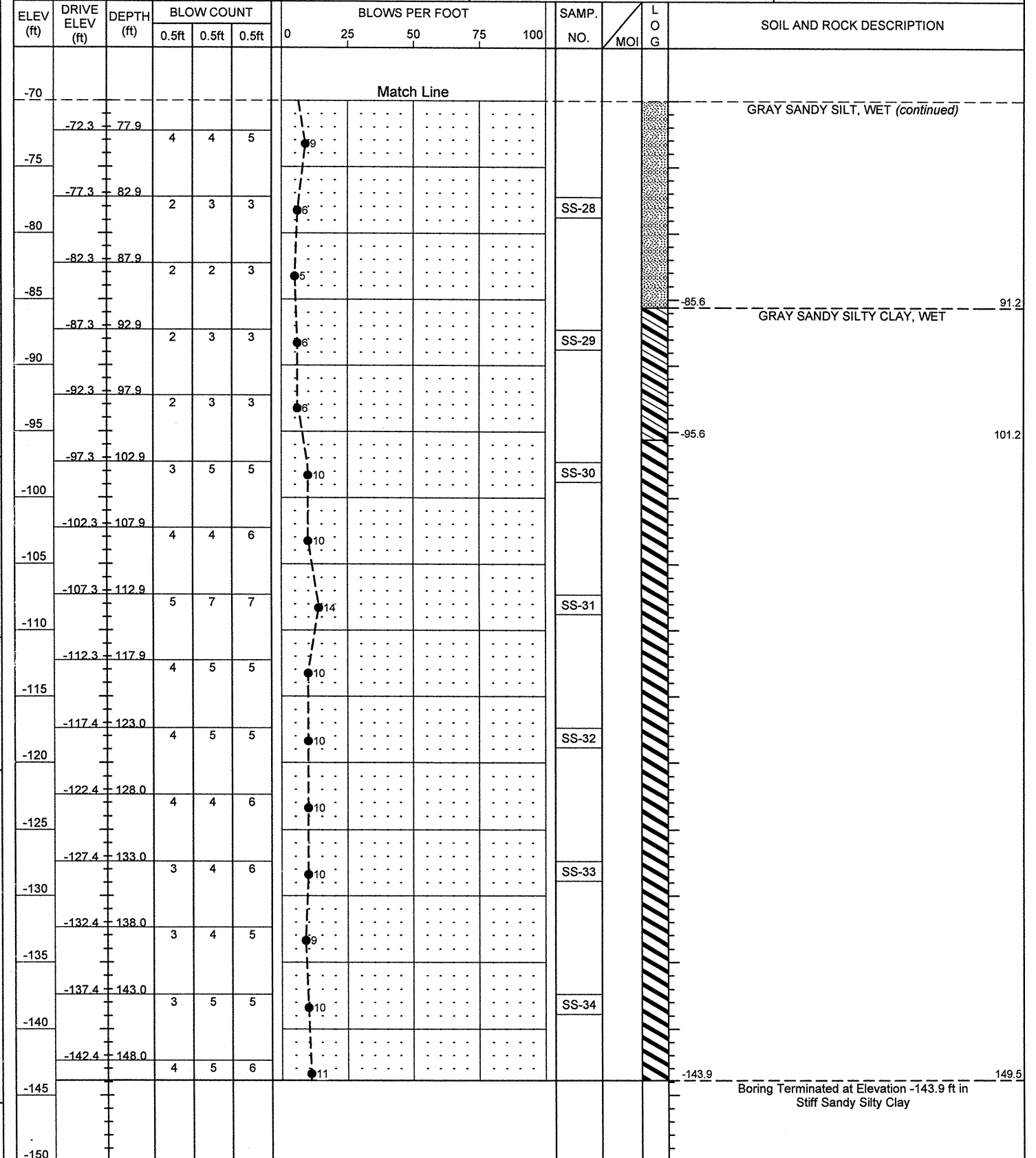
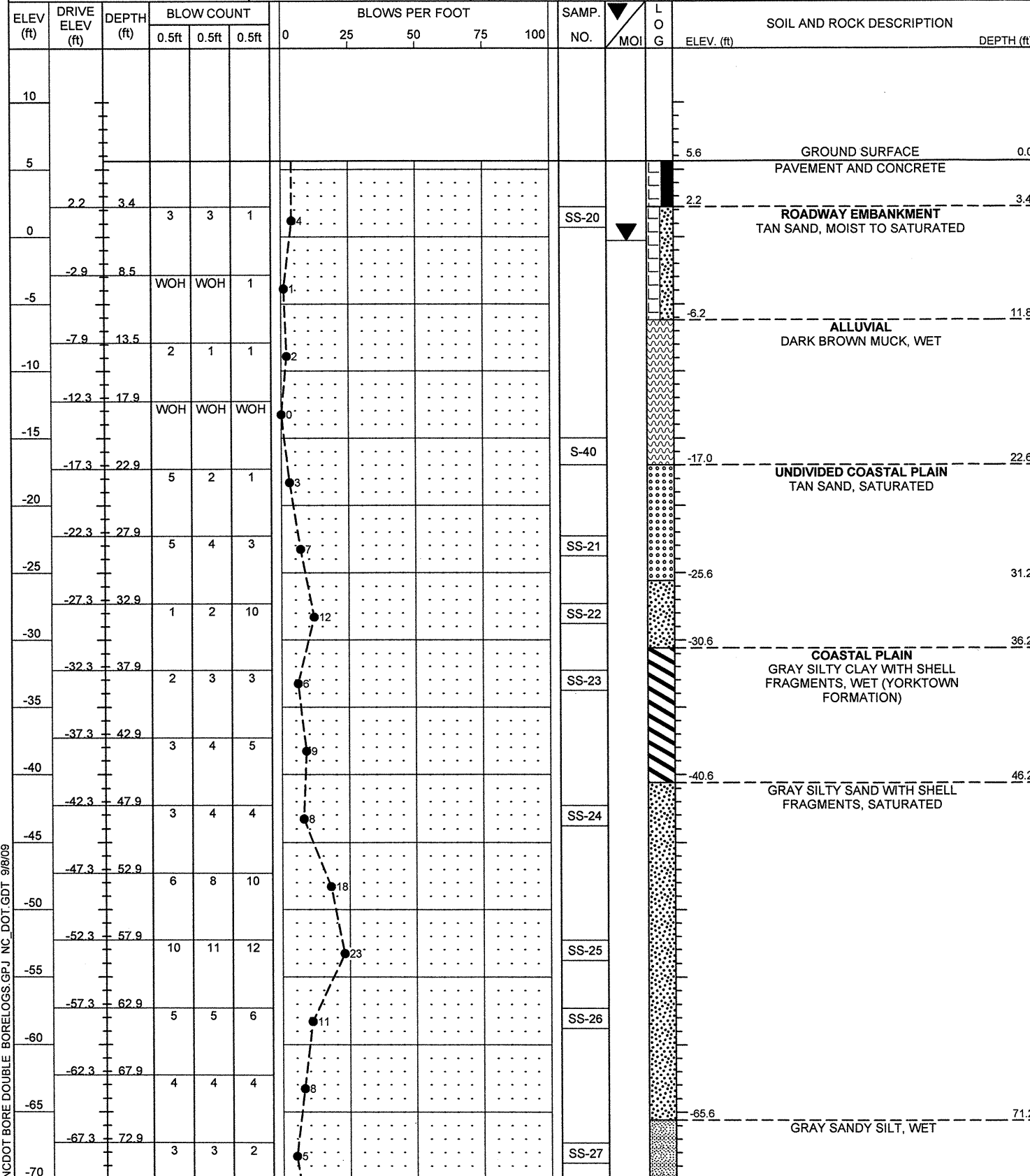
VE=2



NOTE: GROUNDLINE PROFILE AT CL OF -LDETOUR- TAKEN FROM ROADWAY DESIGN PLANS AS OF 01/27/09
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

PROJECT NO. 33713.1.2	ID. B-4463	COUNTY Chowan	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 12 ON -L- (NC 32) OVER QUEEN ANNE CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 20+90	OFFSET 8ft RT	ALIGNMENT -L-
COLLAR ELEV. 5.6 ft	TOTAL DEPTH 149.5 ft	NORTHING 849,207	EASTING 2,713,768
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/10/09	COMP. DATE 03/11/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

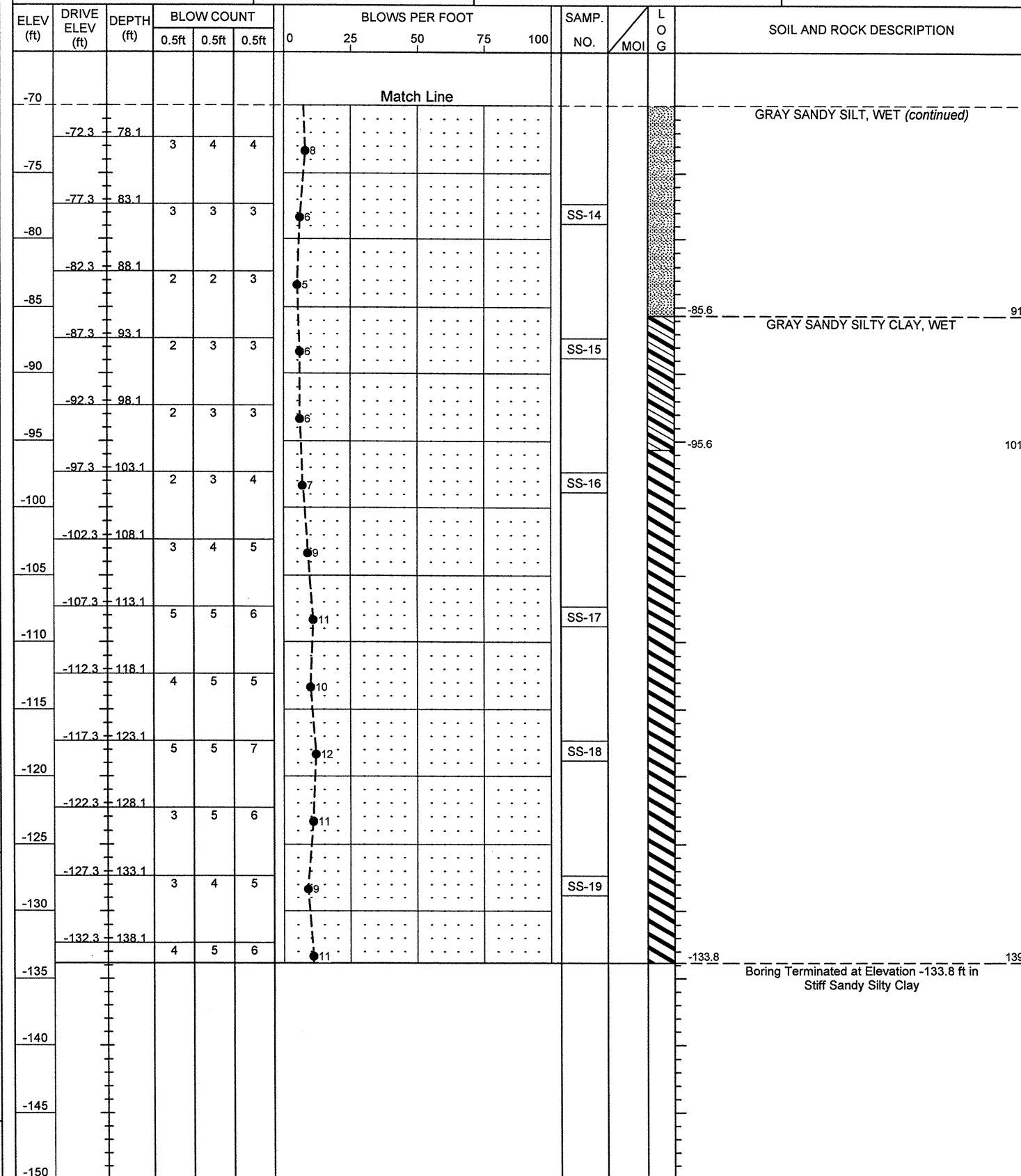
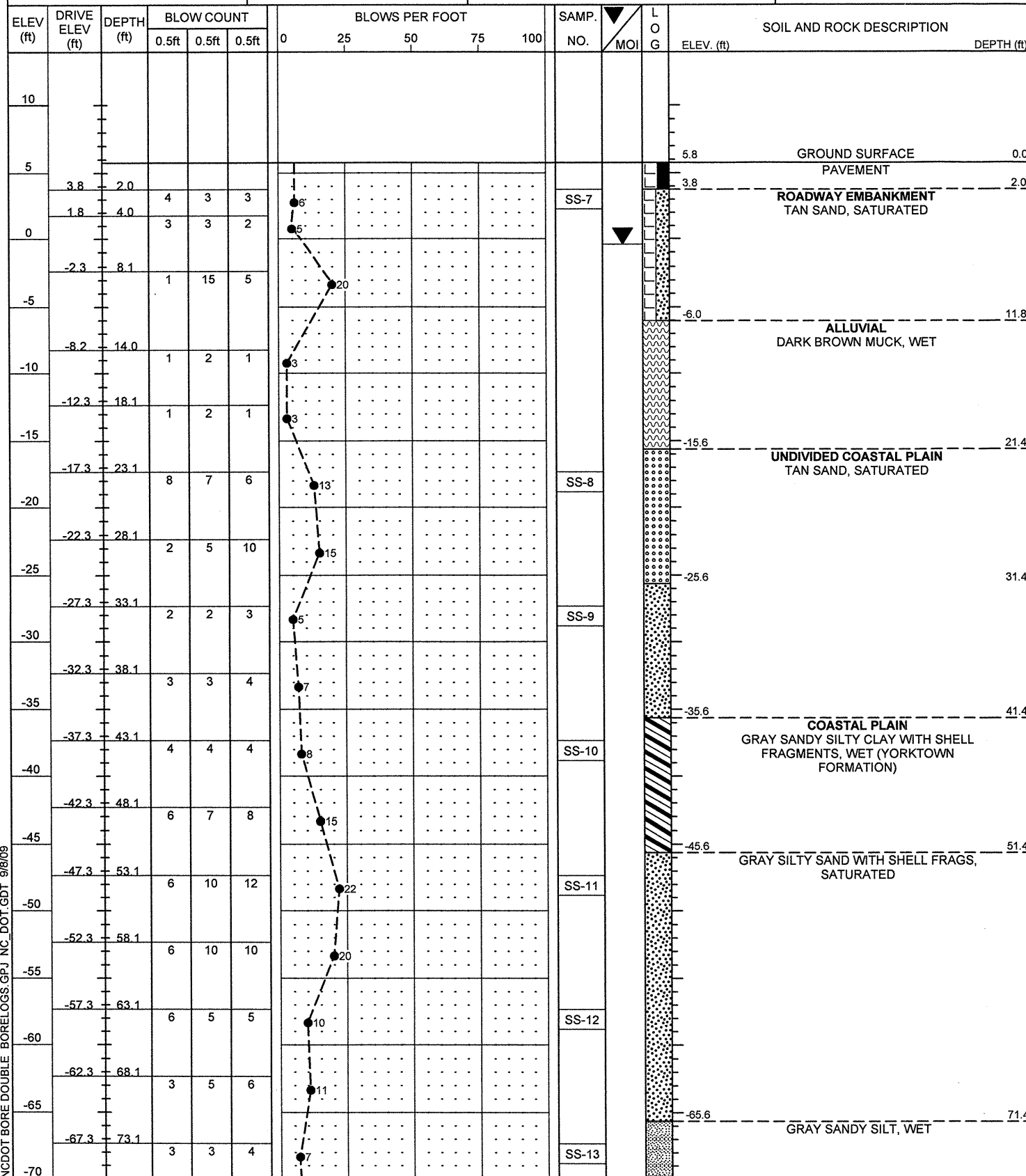
PROJECT NO. 33713.1.2	ID. B-4463	COUNTY Chowan	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 12 ON -L- (NC 32) OVER QUEEN ANNE CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 20+90	OFFSET 8ft RT	ALIGNMENT -L-
COLLAR ELEV. 5.6 ft	TOTAL DEPTH 149.5 ft	NORTHING 849,207	EASTING 2,713,768
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/10/09	COMP. DATE 03/11/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE BORELOGS.GPJ NC_DOT_GDT_9/9/09

PROJECT NO. 33713.1.2	ID. B-4463	COUNTY Chowan	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 12 ON -L- (NC 32) OVER QUEEN ANNE CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 21+53	OFFSET 9ft LT	ALIGNMENT -L-
COLLAR ELEV. 5.8 ft	TOTAL DEPTH 139.6 ft	NORTHING 849,201	EASTING 2,713,833
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/05/09	COMP. DATE 03/06/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

PROJECT NO. 33713.1.2	ID. B-4463	COUNTY Chowan	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 12 ON -L- (NC 32) OVER QUEEN ANNE CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 21+53	OFFSET 9ft LT	ALIGNMENT -L-
COLLAR ELEV. 5.8 ft	TOTAL DEPTH 139.6 ft	NORTHING 849,201	EASTING 2,713,833
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/05/09	COMP. DATE 03/06/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE BORELOGS.GPJ NC_DOT_GDT_98/09

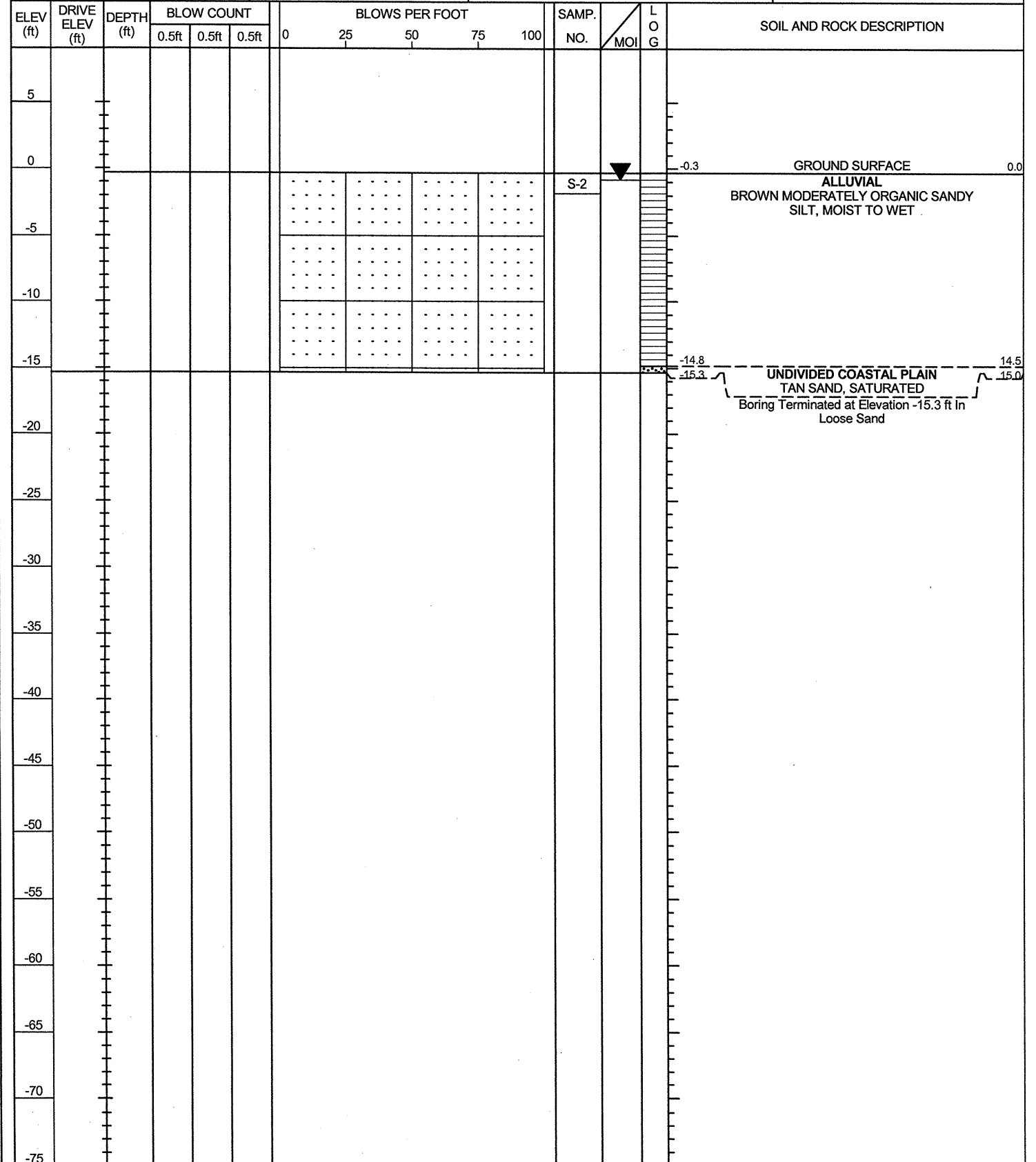
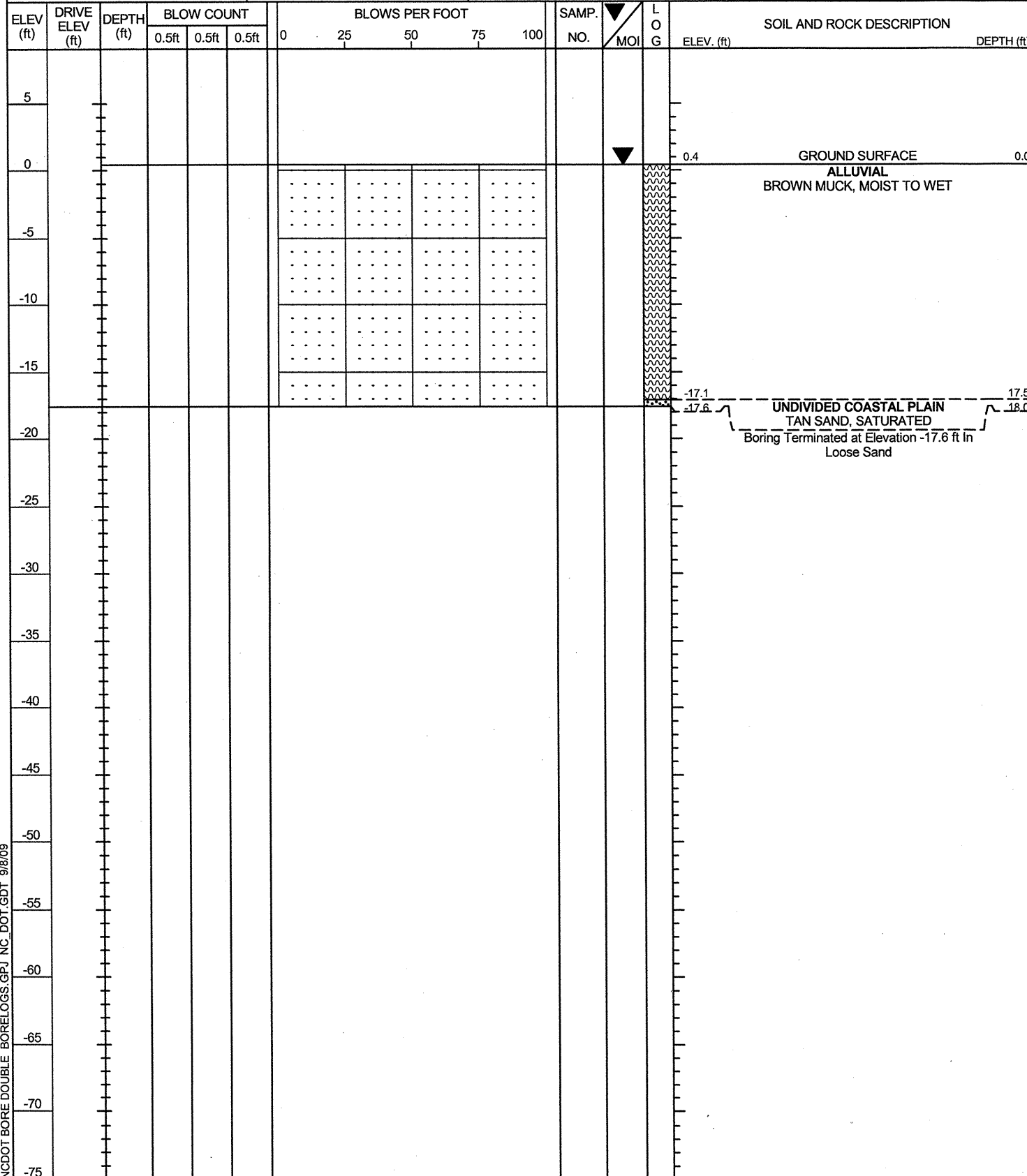


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 33713.1.2	ID. B-4463	COUNTY Chowan	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 12 ON -LDETOUR- (NC 32) OVER QUEEN ANNE CREEK			GROUND WTR (ft)
BORING NO. EB1-C	STATION 20+70	OFFSET CL	ALIGNMENT -LDETOUR-
COLLAR ELEV. 0.4 ft	TOTAL DEPTH 18.0 ft	NORTHING 849,167	EASTING 2,713,727
DRILL MACHINE N/A	DRILL METHOD Hand Auger	HAMMER TYPE N/A	
START DATE 06/25/09	COMP. DATE 06/25/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

PROJECT NO. 33713.1.2	ID. B-4463	COUNTY Chowan	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 12 ON -LDETOUR- (NC 32) OVER QUEEN ANNE CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 21+57	OFFSET 2ft LT	ALIGNMENT -LDETOUR-
COLLAR ELEV. -0.3 ft	TOTAL DEPTH 15.0 ft	NORTHING 849,138	EASTING 2,713,809
DRILL MACHINE N/A	DRILL METHOD Hand Auger	HAMMER TYPE N/A	
START DATE 02/17/09	COMP. DATE 02/17/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE BORELOGS.GPJ NC_DOT_GDT 9/8/09

B-4463

33713.1.2

BRIDGE NO. 12 OVER QUEEN ANNE CREEK AT -L- STA 21+24

SOIL TEST RESULTS EB1-B															
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-20	8' RT	20+90	3.4-4.9	A-2-4(0)	19	1	20.0	54.6	9.3	16.1	100	94	30	-	-
S-40	8' RT	20+90	20.6-22.6	-	-	-	-	-	-	-	-	-	-	-	30.4
SS-21	8' RT	20+90	27.9-29.4	A-3(0)	23	NP	71.9	24.7	1.4	2.0	99	55	4	-	-
SS-22	8' RT	20+90	32.9-34.4	A-2-4(0)	21	2	17.8	55.0	13.0	14.1	98	93	28	-	-
SS-23	8' RT	20+90	37.9-39.4	A-7-6(20)	44	21	3.2	17.7	54.8	24.2	100	99	90	-	-
SS-24	8' RT	20+90	47.9-49.4	A-2-4(0)	26	9	35.3	35.2	13.4	16.1	80	67	25	-	-
SS-25	8' RT	20+90	57.9-59.4	A-2-4(0)	22	NP	13.1	75.4	5.4	6.0	89	86	12	-	-
SS-26	8' RT	20+90	62.9-64.4	A-2-4(0)	23	NP	3.9	74.0	10.0	12.1	100	99	24	-	-
SS-27	8' RT	20+90	72.9-74.4	A-4(0)	27	3	0.4	62.1	19.4	18.1	100	100	54	-	-
SS-28	8' RT	20+90	82.9-84.4	A-4(6)	34	9	0.4	49.0	30.4	20.2	100	100	75	-	-
SS-29	8' RT	20+90	92.9-94.4	A-6(9)	35	12	0.6	44.4	32.9	22.2	100	100	80	-	-
SS-30	8' RT	20+90	102.9-104.4	A-7-6(34)	54	31	0.2	13.5	52.0	34.3	100	100	97	-	-
SS-31	8' RT	20+90	112.9-114.4	A-7-6(27)	48	25	0.4	18.8	46.6	34.3	100	100	96	-	-
SS-32	8' RT	20+90	123.0-124.5	A-7-6(35)	54	32	0.2	11.1	54.4	34.3	100	100	98	-	-
SS-33	8' RT	20+90	133.0-134.5	A-7-6(34)	53	31	0.2	9.9	55.6	34.3	100	100	98	-	-
SS-34	8' RT	20+90	143.0-144.5	A-7-6(21)	41	20	0.4	16.1	55.2	28.2	100	100	97	-	-

SOIL TEST RESULTS EB2-A															
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-7	9' LT	21+53	2.0-3.5	A-2-4(0)	21	3	8.7	61.7	11.3	18.2	100	97	35	-	-
SS-8	9' LT	21+53	23.1-24.6	A-3(0)	25	NP	15.5	81.3	2.2	1.0	100	99	5	-	-
SS-9	9' LT	21+53	33.1-34.6	A-2-4(0)	24	5	20.6	51.4	15.8	12.1	98	89	30	-	-
SS-10	9' LT	21+53	43.1-44.6	A-6(2)	33	17	40.9	20.9	22.1	16.2	91	71	36	-	-
SS-11	9' LT	21+53	53.1-54.6	A-2-4(0)	21	NP	48.6	35.0	8.3	8.1	79	59	14	-	-
SS-12	9' LT	21+53	63.1-64.6	A-2-4(0)	24	NP	5.5	77.3	7.1	10.1	99	97	19	-	-
SS-13	9' LT	21+53	73.1-74.6	A-4(0)	26	2	0.4	64.2	21.3	14.2	100	100	51	-	-
SS-14	9' LT	21+53	83.1-84.6	A-4(6)	32	9	0.2	49.8	31.8	18.2	100	100	77	-	-
SS-15	9' LT	21+53	93.1-94.6	A-6(10)	36	13	0.6	43.7	35.4	20.2	100	100	80	-	-
SS-16	9' LT	21+53	103.1-104.6	A-7-6(29)	52	27	0.4	19.6	47.6	32.4	100	100	94	-	-
SS-17	9' LT	21+53	113.1-114.6	A-7-6(28)	48	26	0.0	19.4	52.2	28.3	100	100	96	-	-
SS-18	9' LT	21+53	123.1-124.6	A-7-6(33)	52	30	0.4	10.7	56.7	32.3	100	100	98	-	-
SS-19	9' LT	21+53	133.1-134.6	A-7-6(36)	55	33	0.6	9.3	55.8	34.3	100	100	98	-	-

SOIL TEST RESULTS -LDETOUR- STA 21+52															
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		
S-2	2' LT	21+52	1.0-14.50	A-4(0)	41	9	22.4	28.8	28.1	20.7	100	86	52	41.5	17.3



FIELD SCOUR REPORT

WBS: 33713.1.2 TIP: B-4463 COUNTY: Chowan

DESCRIPTION(1): Bridge No. 12 on NC 32 over Queen Anne Creek at -L- Sta. 21+24

EXISTING BRIDGE

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

Bridge No.: 12 Length: 47' Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 2
 Foundation Type: Concrete and timber piles

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: Erosion 1-2 feet at EB1 and EB2

Interior Bents: None noted

Channel Bed: None noted

Channel Bank: Erosion 2-3' on southeast bank

EXISTING SCOUR PROTECTION

Type(3): Abutment walls and wing walls

Extent(4): Under bridge and out 2-6 feet from ends of bridge

Effectiveness(5): Effective

Obstructions(6): None noted

INSTRUCTIONS

- Describe the specific site's location, including route number and body of water crossed.
- Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- Note existing scour protection (e.g. rip rap).
- Describe extent of existing scour protection.
- Describe whether or not the scour protection appears to be working.
- Note obstructions such as dams, fallen trees, debris at bents, etc.
- Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- Determine the approximate floodplain width from field observation or a topographic map.
- Describe the material covering the floodplain (e.g. grass, trees, crops).
- Use professional judgement to specify if the stream is degrading, aggrading, or static.
- Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 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): Muck

Channel Bank Material(8): Muck

Channel Bank Cover(9): Grass and shrubs

Floodplain Width(10): 500 feet

Floodplain Cover(11): Grass, shrubs, and trees

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): Slight tendency to migrate south

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

BENTS

EB1	EB2										
-15.4	-15.4										

Comparison of DSE to Hydraulics Unit theoretical scour:
 Geotechnical analysis agrees with Hydraulics Unit theoretical scour elevation.

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:
 Channel Bank: S-2
 S-40

Reported by: Dean Argenbright
 Dean Argenbright

Date: 3/10/2009