

PROJECT: 34440.1.1 ID: R-2510C

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34440.1.1 (R-2510C)	1	18

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	PROFILE(S)
6-8	CROSS SECTION(S)
9-15	BORE LOG(S)
16-17	SOIL TEST RESULTS
18	SCOUR REPORT

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34440.1.1 (R-2510C) F.A. PROJ. MAF-75-3(26)

COUNTY BEAUFORT

PROJECT DESCRIPTION US 17 FROM US 17 SOUTH OF SR 1001
(CHERRY RUN RD.) TO NORTH OF NC 171

SITE DESCRIPTION BRIDGE NO. 50 ON US 17 OVER OLD FORD
SWAMP AT -L- STATION 222+51.5

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

TRIGON PERSONNEL

INVESTIGATED BY F.M. WESCOTT III

CHECKED BY D.N. ARGENBRIGHT

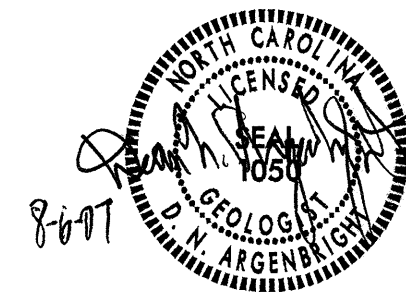
SUBMITTED BY D.N. ARGENBRIGHT

DATE AUGUST, 2007

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 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.



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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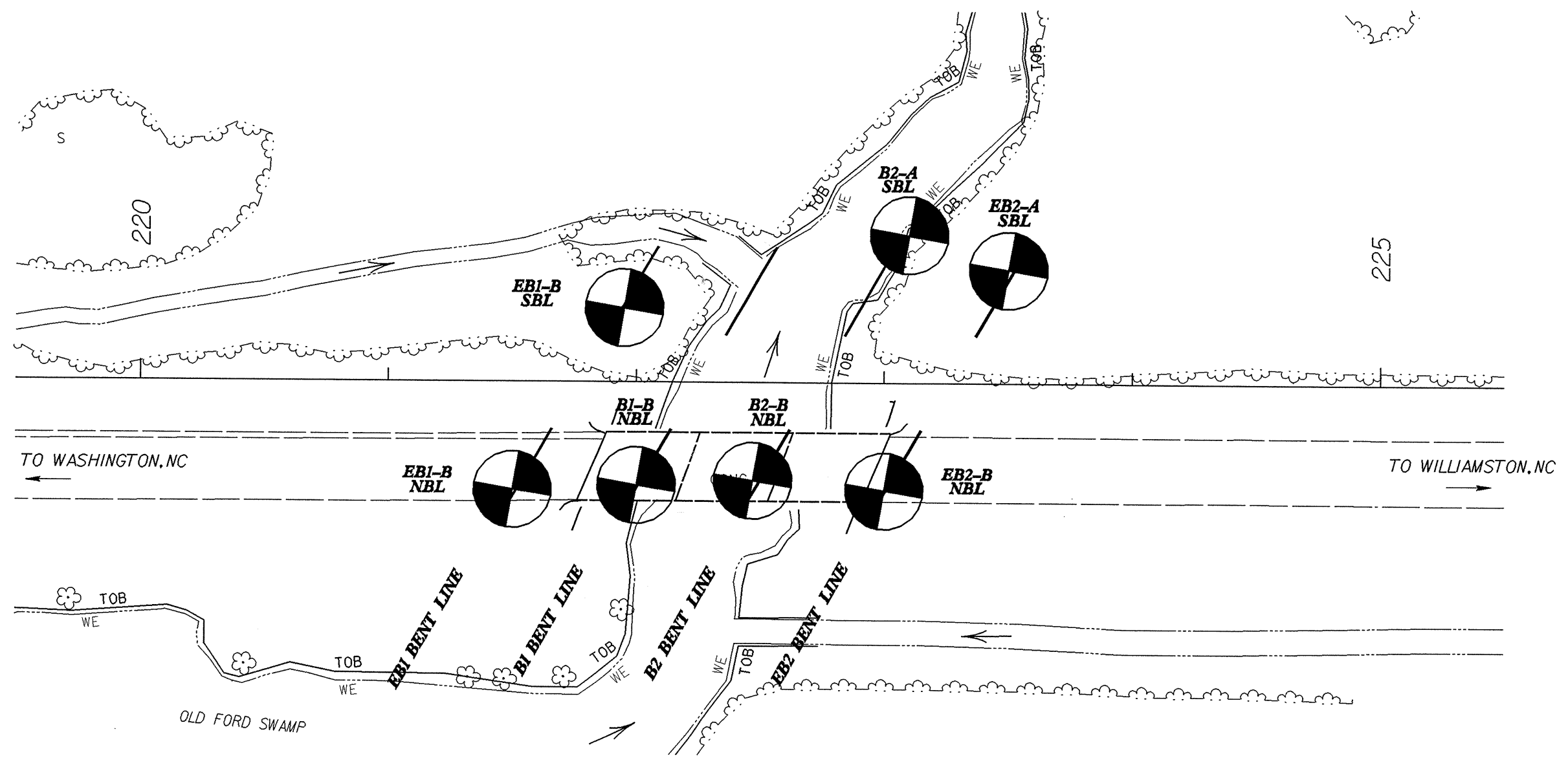
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, DARK CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SCREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	WEATHERING	
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED. SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BPF. VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF. COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	
SOIL LEGEND AND AASHTO CLASSIFICATION	COMPRESSION	GROUND WATER	
GROUP CLASS. A-1, A-1-b, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP	
SOIL LEGEND AND AASHTO CLASSIFICATION	PERCENTAGE OF MATERIAL	MISCELLANEOUS SYMBOLS	
% PASSING: 10, 40, 200 (50, 100, 150, 200, 250, 300, 35, 40, 45, 50, 60, 70, 75, 80, 85, 90, 95, 100)	ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% LITTLE ORGANIC MATTER 3 - 5% MODERATELY ORGANIC 5 - 10% HIGHLY ORGANIC >10%	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD	
SOIL LEGEND AND AASHTO CLASSIFICATION	GROUND WATER	ABBREVIATIONS	
LIQUID LIMIT PLASTIC INDEX GROUP INDEX USUAL TYPES OF MAJOR MATERIALS GEN. RATING AS A SUBGRADE	TRACE OF ORGANIC MATTER 2 - 3% LITTLE ORGANIC MATTER 3 - 5% MODERATELY ORGANIC 5 - 10% HIGHLY ORGANIC >10%	AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS	
SOIL LEGEND AND AASHTO CLASSIFICATION	GROUND WATER	ABBREVIATIONS	
PI OF A-7-5 SUBGROUP IS <= LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP	HL - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL	
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PI OF A-7-5 SUBGROUP IS <= LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP		
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SOIL LEGEND AND AASHTO CLASSIFICATION	GROUND WATER	ABBREVIATIONS	
PI OF A-7-5 SUBGROUP IS <= LL - 30 ; PI OF A-7-6 SUBGROUP IS >			



SKEW = 120°

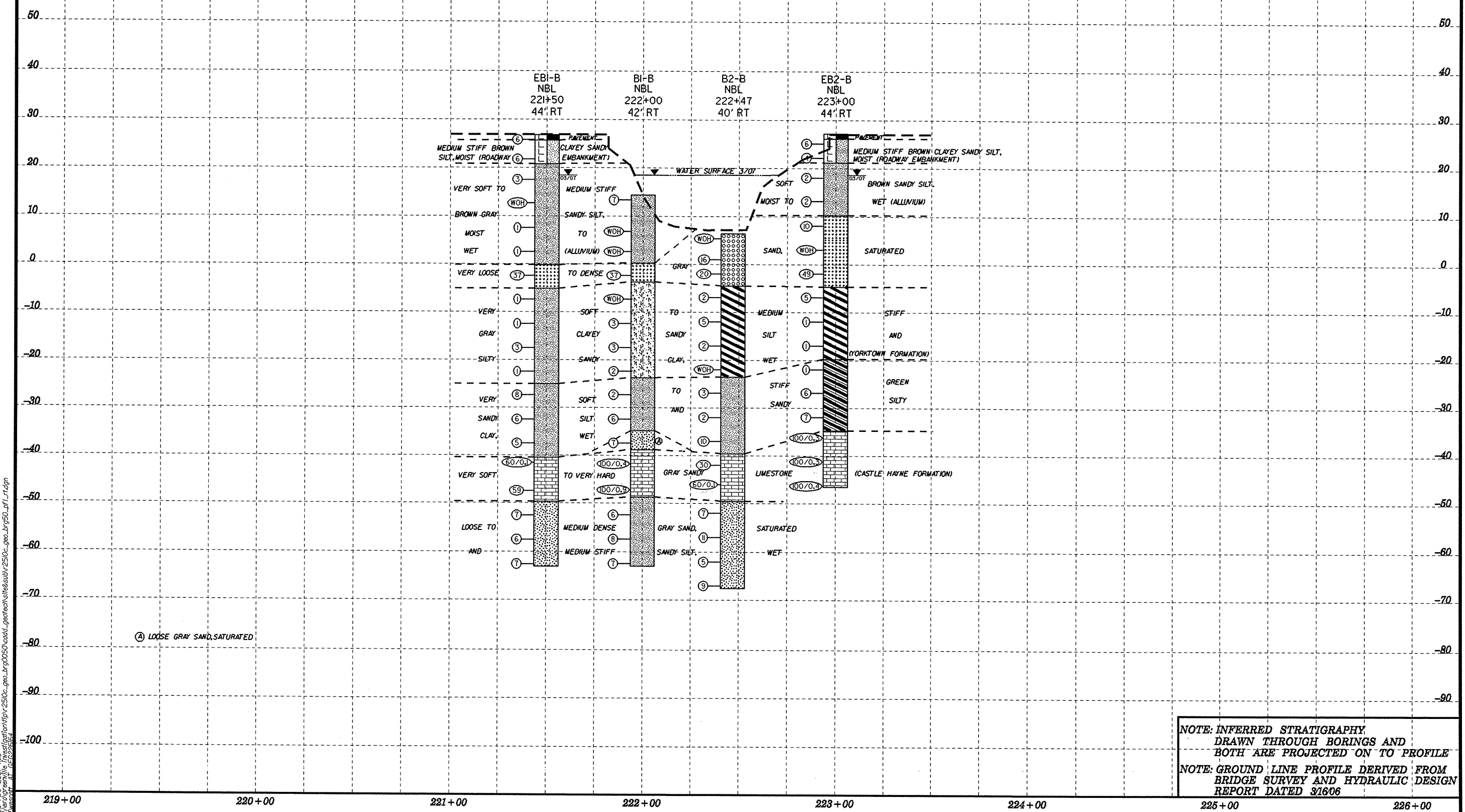


5/14/99

PROJECT REFERENCE NO. 34440JJ(R-250C)	SHEET NO. 4 OF 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
HORIZONTAL SCALE: 1"=50' VERTICAL SCALE: 1"=20' VE=2.5	

BRIDGE 50

PROFILE THROUGH BORING PROJECTED ALONG +L- NORTHBOUND LANE



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 3/16/06

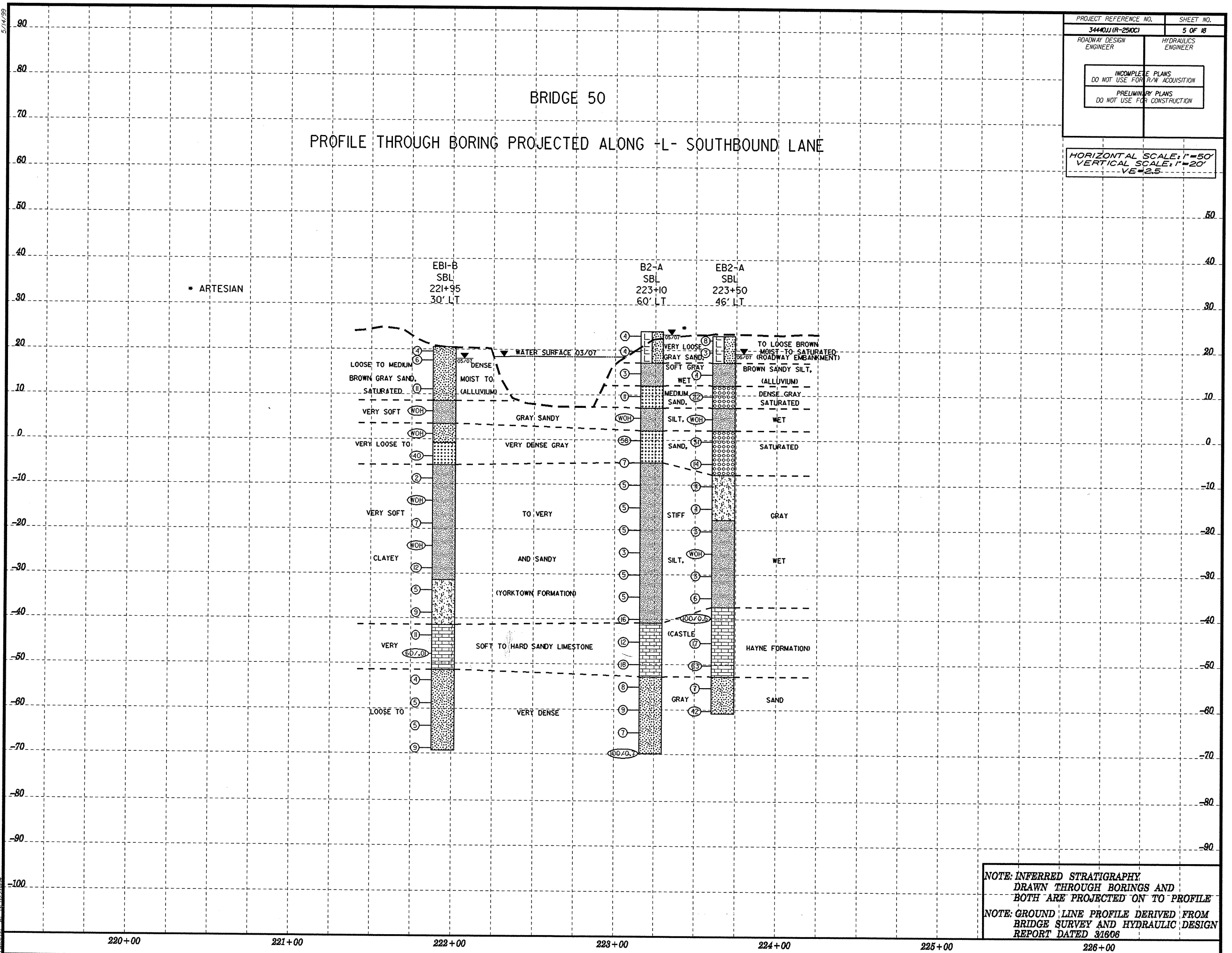
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 118
 3/16/06

5/14/99

PROJECT REFERENCE NO. 344011(R-2500)	SHEET NO. 5 OF 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
HORIZONTAL SCALE: 1"=50' VERTICAL SCALE: 1"=20' VE=2.5	

BRIDGE 50

PROFILE THROUGH BORING PROJECTED ALONG -L- SOUTHBOUND LANE



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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 3/16/06

8/23/99

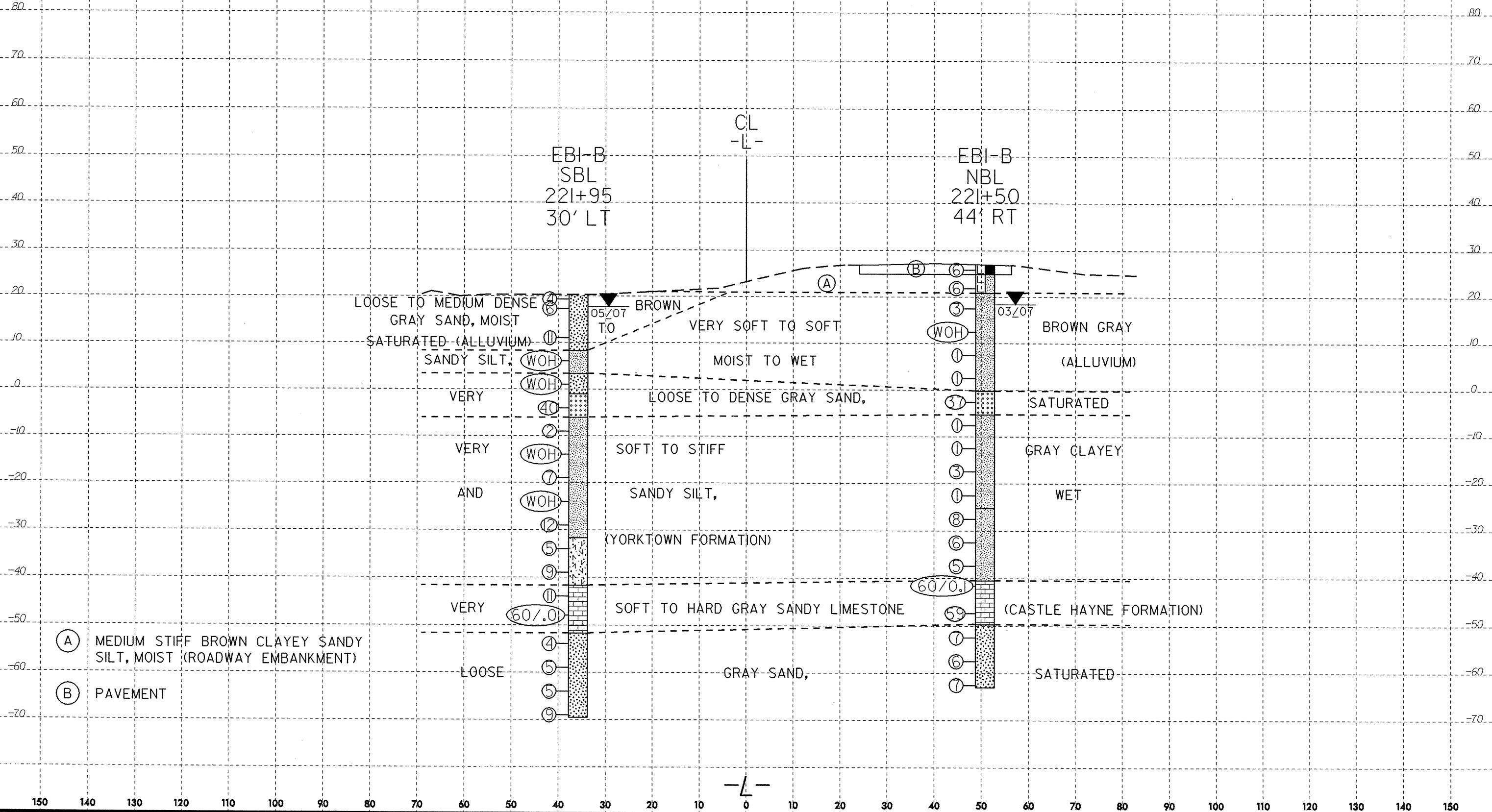


PROJ. REFERENCE NO.	SHEET NO.
R2510c	6 OF 18

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BRIDGE 50

CROSS SECTION THROUGH END BENT 1



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BRIDGE 50

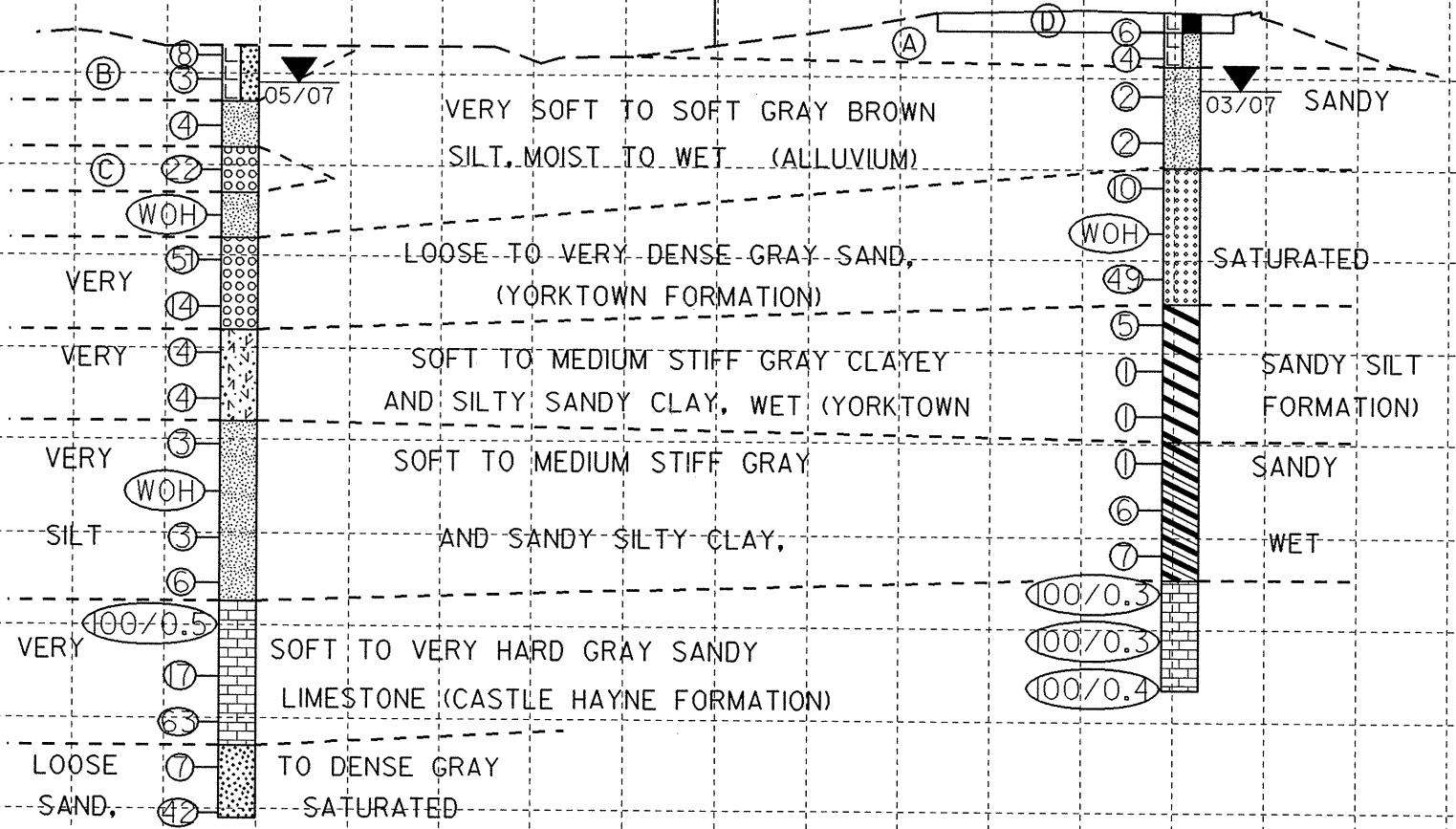
CROSS SECTION THROUGH END BENT 2

- (A) MEDIUM STIFF BROWN CLAYEY SANDY SILT, MOIST (ROADWAY EMBANKMENT)
- (B) VERY LOOSE TO LOOSE BROWN SAND, MOIST (ROADWAY EMBANKMENT)
- (C) MEDIUM DENSE GRAY SAND, SATURATED
- (D) PAVEMENT

EB2-A
SBL
223+50
46' LT

EB2-B
NBL
223+00
44' RT

CL
-L-



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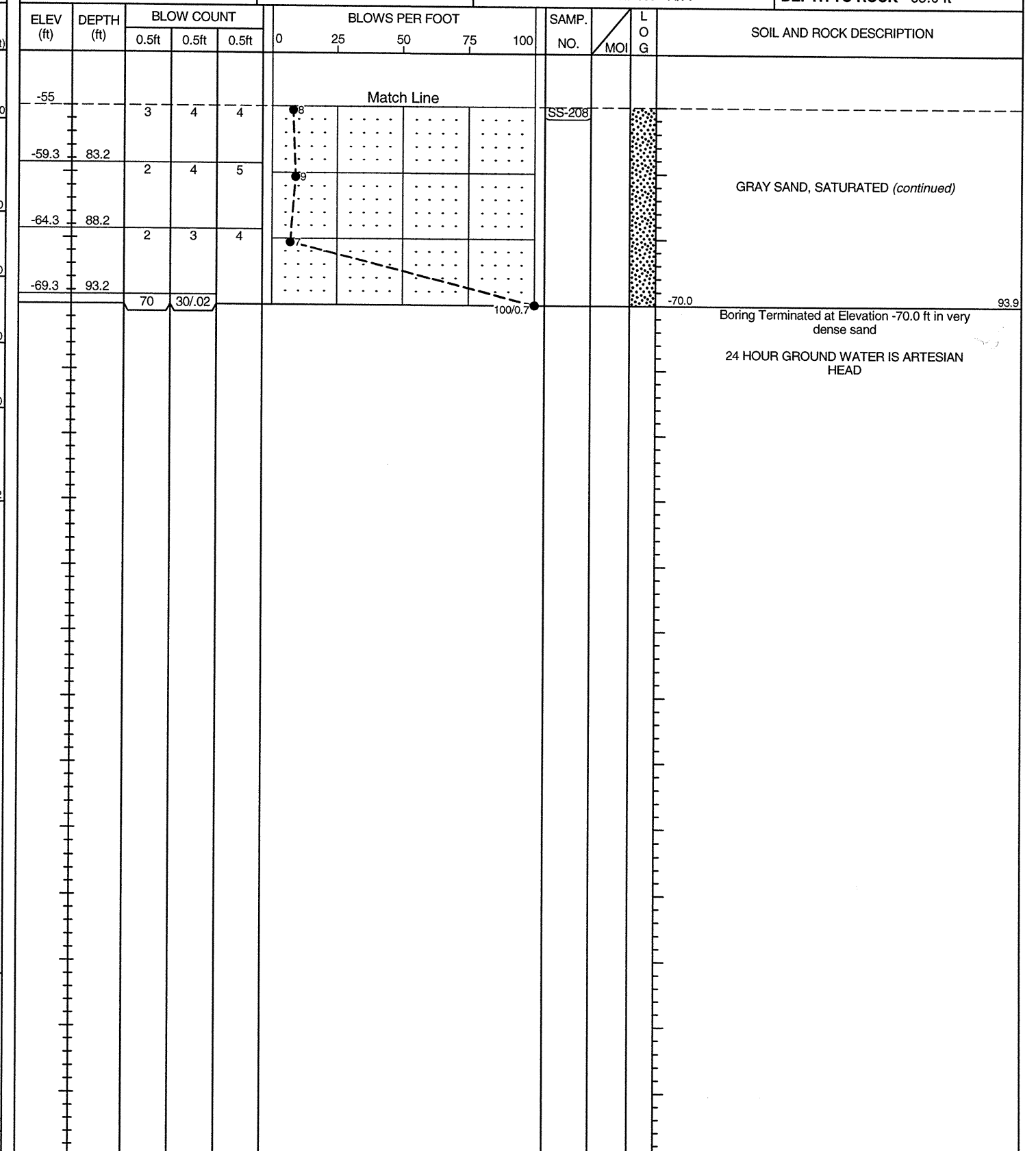
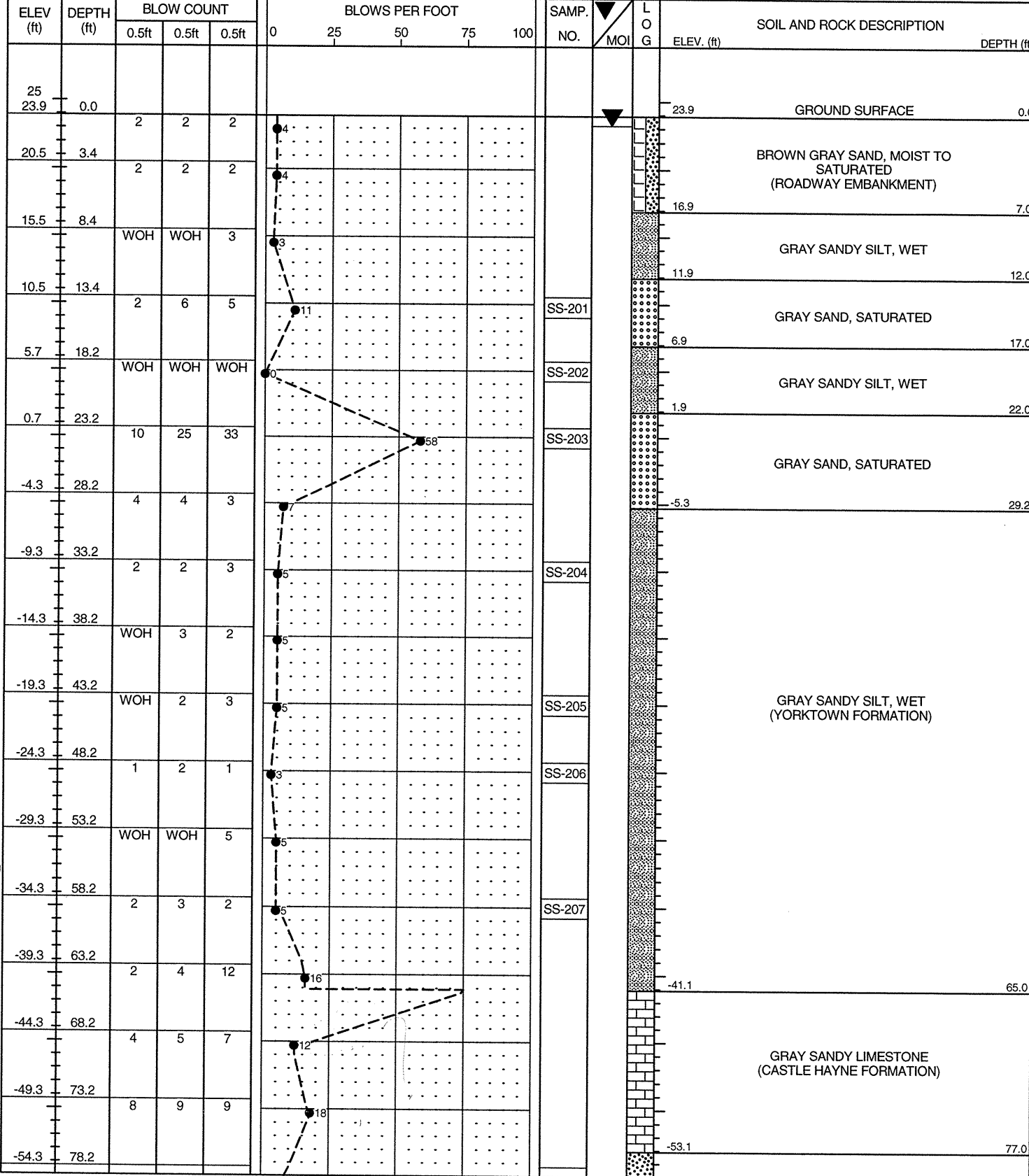


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY Beaufort	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 50 ON US 17 OVER OLD FORD SWAMP			GROUND WTR (ft)
BORING NO. B2-A SBL	STATION 223+10	OFFSET 60ft LT	ALIGNMENT -L-
COLLAR ELEV. 23.9 ft	TOTAL DEPTH 93.9 ft	NORTHING 690,398	EASTING 2,575,413
DRILL MACHINE CME-850	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 05/15/07	COMP. DATE 05/16/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 65.0 ft

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY Beaufort	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 50 ON US 17 OVER OLD FORD SWAMP			GROUND WTR (ft)
BORING NO. B2-A SBL	STATION 223+10	OFFSET 60ft LT	ALIGNMENT -L-
COLLAR ELEV. 23.9 ft	TOTAL DEPTH 93.9 ft	NORTHING 690,398	EASTING 2,575,413
DRILL MACHINE CME-850	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 05/15/07	COMP. DATE 05/16/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 65.0 ft



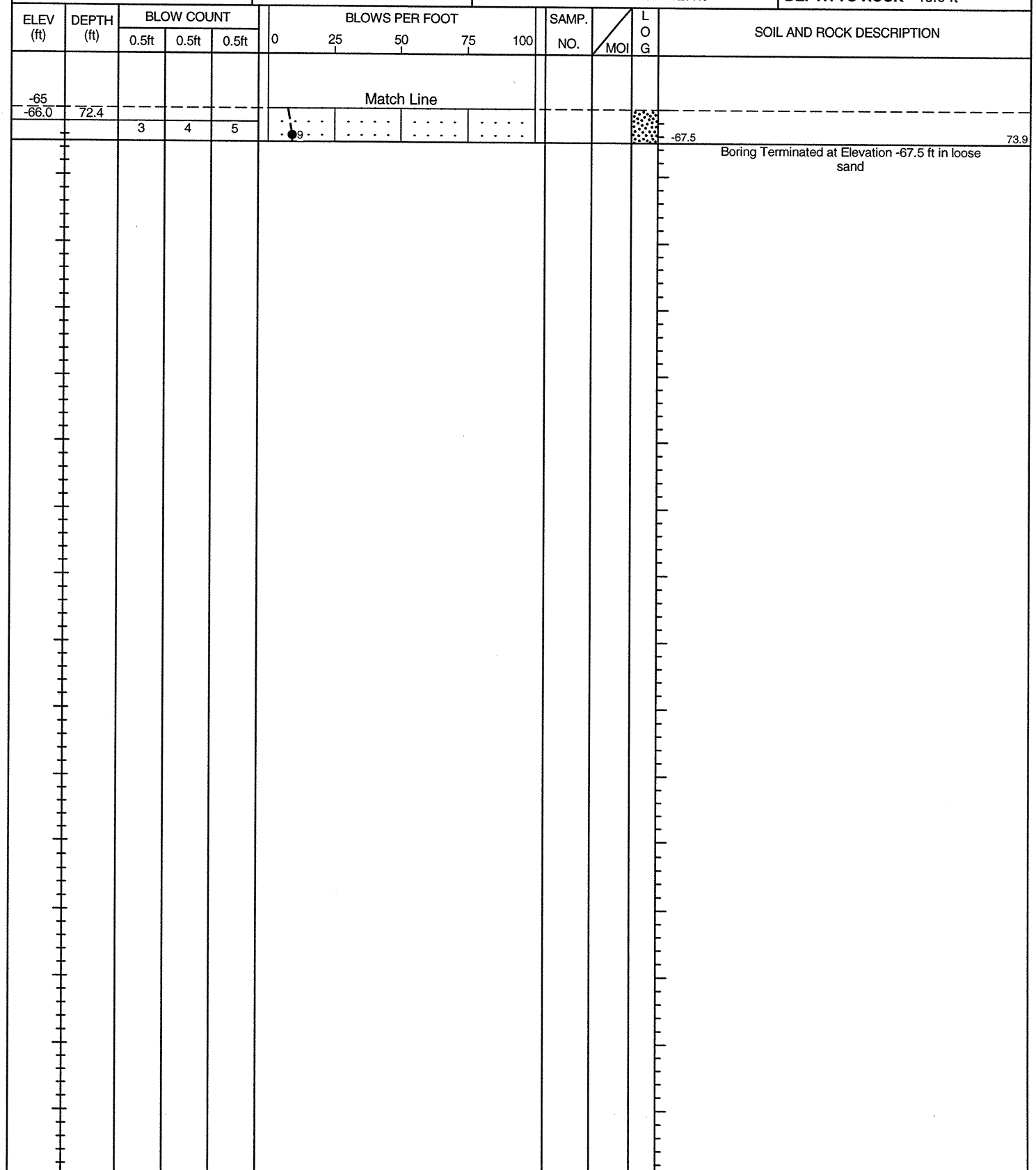
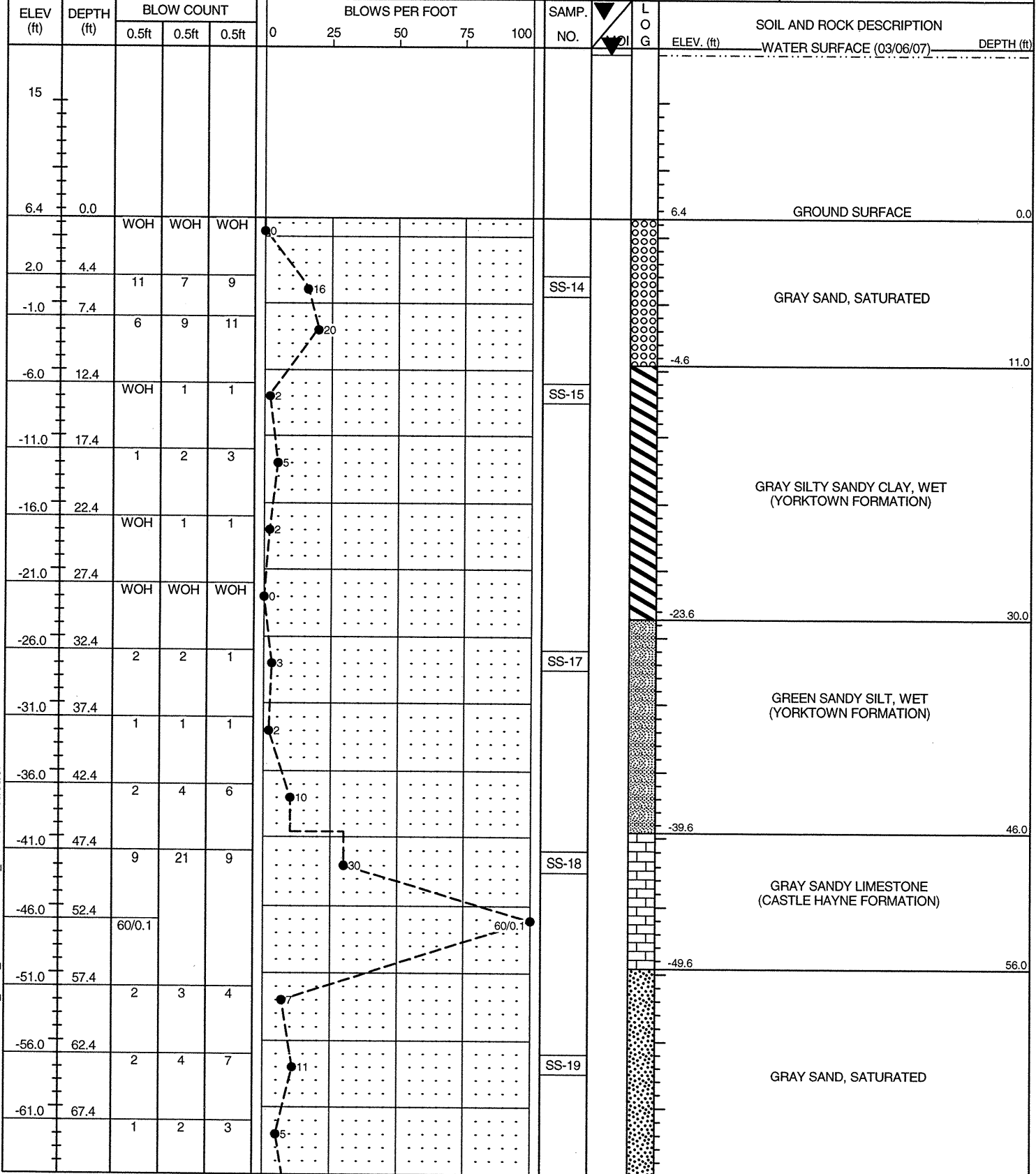
NCDOT BORE DOUBLE R2510C_GEO_BRDGS0.GPJ NC_DOT_GDT_08/06/07



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY Beaufort	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 50 ON US 17 OVER OLD FORD SWAMP			GROUND WTR (ft)
BORING NO. B2-B NBL	STATION 222+47	OFFSET 40ft RT	ALIGNMENT -L-
COLLAR ELEV. 6.4 ft	TOTAL DEPTH 73.9 ft	NORTHING 690,358	EASTING 2,575,516
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/06/07	COMP. DATE 03/07/07	SURFACE WATER DEPTH 12.1ft	DEPTH TO ROCK 46.0 ft

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY Beaufort	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 50 ON US 17 OVER OLD FORD SWAMP			GROUND WTR (ft)
BORING NO. B2-B NBL	STATION 222+47	OFFSET 40ft RT	ALIGNMENT -L-
COLLAR ELEV. 6.4 ft	TOTAL DEPTH 73.9 ft	NORTHING 690,358	EASTING 2,575,516
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/06/07	COMP. DATE 03/07/07	SURFACE WATER DEPTH 12.1ft	DEPTH TO ROCK 46.0 ft



NCDOT BORE DOUBLE R2510C.GEO_BRD350.GPJ NC_DOT.GDT 08/06/07



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 34440.1.1		ID. R-2510C		COUNTY Beaufort		GEOLOGIST Swartley, J. R.								
SITE DESCRIPTION BRIDGE NO. 50 ON US 17 OVER OLD FORD SWAMP							GROUND WTR (ft)							
BORING NO. EB2-A SBL	STATION 223+50	OFFSET 46ft LT	ALIGNMENT -L-					0 HR. N/A						
COLLAR ELEV. 23.0 ft	TOTAL DEPTH 84.0 ft	NORTHING 690,447	EASTING 2,575,412					24 HR. 4.0						
DRILL MACHINE CME-850	DRILL METHOD Mud Rotary				HAMMER TYPE Automatic									
START DATE 05/16/07	COMP. DATE 05/16/07	SURFACE WATER DEPTH N/A		DEPTH TO ROCK 60.5 ft										
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					
25														
23.0	0.0	4	5	3								GROUND SURFACE	0.0	
20.3	2.7	1	1	2						SS-209		BROWN SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)		
15.3	7.7	WOH	2	2						SS-210		BROWN SANDY SILT, WET (ALLUVIUM)		
10.5	12.5	6	10	12						SS-211		GRAY SAND, SATURATED		
5.5	17.5	WOH	WOH	WOH						SS-212		GRAY SANDY SILT, WET		
0.5	22.5	13	21	30								GRAY SAND, SATURATED		
-4.5	27.5	12	9	5						SS-213		GRAY SANDY SILT, WET (YORKTOWN FORMATION)		
-9.5	32.5	WOH	2	2						SS-214				
-14.5	37.5	WOH	2	2										
-19.5	42.5	WOH	2	1						SS-215				
-24.5	47.5	WOH	WOH	WOH										
-29.5	52.5	WOH	WOH	3										
-34.5	57.5	3	2	4										
-39.5	62.5	100/0.5												
-44.5	67.5	7	7	10						SS-216		GRAY SANDY LIMESTONE (CASTLE HAYNE FORMATION)		
-49.5	72.5	13	44	19										
-54.5	77.5													

NCDOT BORE DOUBLE R2510C_GEO_BRDG50.GPJ NC_DOT_GDT 08/06/07

PROJECT NO. 34440.1.1		ID. R-2510C		COUNTY Beaufort		GEOLOGIST Swartley, J. R.								
SITE DESCRIPTION BRIDGE NO. 50 ON US 17 OVER OLD FORD SWAMP							GROUND WTR (ft)							
BORING NO. EB2-A SBL	STATION 223+50	OFFSET 46ft LT	ALIGNMENT -L-					0 HR. N/A						
COLLAR ELEV. 23.0 ft	TOTAL DEPTH 84.0 ft	NORTHING 690,447	EASTING 2,575,412					24 HR. 4.0						
DRILL MACHINE CME-850	DRILL METHOD Mud Rotary				HAMMER TYPE Automatic									
START DATE 05/16/07	COMP. DATE 05/16/07	SURFACE WATER DEPTH N/A		DEPTH TO ROCK 60.5 ft										
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					
-55		2	3	4										
-59.5	82.5	9	23	19						SS-217		GRAY SAND, SATURATED (continued)		
												Boring Terminated at Elevation -61.0 ft in dense sand	84.0	

R-2510C

Bridge No. 50 on US 17 over Old Ford Swamp

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST. ORG.
EB1-B	SS-1	100	99	59	13.4	37.4	26.8	22.4	27	2	A-4(0)	1.0-1.5	
NBL	SS-2	100	99	61	2.2	46.6	32.8	18.4	28	8	A-4(3)	4.0-5.5	
	SS-3	100	100	69	1.0	64.0	22.6	12.4	27	NP	A-4(0)	18.3-19.8	
	SS-4	100	75	7	55.0	39.2	5.8	0.0	25	NP	A-3(0)	28.3-29.8	
	SS-5	100	93	58	12.2	32.0	29.4	26.4	15	NP	A-4(0)	33.3-34.8	
	SS-6	100	99	43	2.2	71.0	18.4	8.4	22	NP	A-4(0)	53.3-54.8	
	SS-7	100	79	25	40.4	38.4	18.8	2.4	22	NP	A-2-4(0)	73.3-74.8	
	SS-8	100	99	18	16.6	68.2	12.8	2.4	21	NP	A-2-4(0)	83.3-84.8	
B1-B	SS-9	100	100	67	0.8	60.0	24.8	14.4	30	3	A-4(1)	6.4-7.9	
NBL	SS-10	100	75	5	58.6	37.4	3.6	0.4	13	NP	A-3(0)	15.6-17.1	
	SS-11	100	98	77	4.4	21.8	37.4	36.4	45	6	A-5(7)	20.6-22.1	
	SS-12	100	100	62	0.8	52.0	32.8	14.4	26	NP	A-4(0)	40.6-42.1	
	SS-12A	100	99	22	19.2	63.2	11.2	6.4	23	NP	A-2-4(0)	50.6-52.1	
	SS-13	100	99	52	2.6	59.0	28	10.4	22	NP	A-4(0)	65.6-67.1	
B2-B	SS-14	100	41	4	82.2	14.6	2.8	0.4	21	NP	A-1-b(0)	4.4-5.9	
NBL	SS-15	100	96	61	8.4	32.8	30.4	28.4	43	11	A-7-5(6)	12.4-13.9	
	SS-17	100	100	44	2.0	65.6	24.0	8.4	20	NP	A-4(0)	32.4-33.9	
	SS-18	100	89	25	23.4	53.4	17.2	6.0	29	NP	A-2-4(0)	47.4-48.9	
	SS-19	100	99	21	10.1	72.2	11.8	6.0	23	NP	A-2-4(0)	62.4-63.9	
EB2-B	SS-20	100	98	74	3.4	37.8	32.7	26.1	26	NP	A-4(0)	1.1-2.6	
NBL	SS-21	100	99	50	2.8	53.1	34.1	10.1	29	NP	A-4(0)	13.2-14.7	
	SS-22	100	74	6	56.3	39.4	4.3	0.0	18	NP	A-3(0)	28.2-29.7	
	SS-23	100	99	68	2.2	37.4	40.3	20.1	33	13	A-6(7)	48.2-49.7	
B2-A	SS-201	100	91	8	26.0	69.4	1.4	3.2	20	NP	A-3(0)	13.4-14.9	
SBL	SS-202	100	92	52	15.3	49.9	21.5	13.3	21	NP	A-4(0)	18.2-19.7	
	SS-203	100	60	6	69.0	26.8	3.0	1.2	18	NP	A-3(0)	23.2-24.7	
	SS-204	NOT	ENOUGH	SAMPLE								33.2-34.7	
	SS-205	100	100	67	1.8	43.1	45.9	9.3	27	4	A-4(1)	43.2-44.7	
	SS-206	100	99	31	5.6	71.0	10.1	13.3	18	NP	A-2-4(0)	48.2-49.7	
	SS-207	100	99	45	7.2	57.5	19.9	15.3	16	NP	A-4(0)	58.2-59.7	
	SS-208	100	99	23	7.8	71.8	9.1	11.3	22	NP	A-2-4(0)	78.2-79.7	
EB2-A	SS-209	100	99	33	2.0	81.8	12.2	4.0	26	NP	A-2-4(0)	2.7-4.2	
SBL	SS-210	100	99	42	3.4	61.4	23.2	12.0	22	NP	A-4(0)	7.7-9.2	
	SS-211	100	50	4	74.2	23.0	0.8	2.0	17	NP	A-1-b(0)	12.5-14.0	
	SS-212	100	93	56	14.6	46.6	24.8	14.0	24	NP	A-4(0)	17.5-19.0	

Bridge No. 50 on US 17 over Old Ford Swamp

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST. ORG.
EB2-A	SS-213	100	46	7	77.4	17.4	3.2	2.0	19	NP	A-1-b(0)	27.5-29.0	
SBL	SS-214	100	82	67	24.4	10.0	29.6	36.0	62	9	A-5(9)	32.5-34.0	
	SS-215	100	98	49	5.0	52.6	28.4	14.0	22	NP	A-4(0)	42.5-44.0	
	SS-216	100	72	20	49.2	33.4	9.4	8.0	24	NP	A-2-4(0)	67.5-69.0	
	SS-217	100	97	23	22.8	58.6	6.6	12.0	22	NP	A-2-4(0)	77.5-79.0	
EB1-B	SS-218	100	92	25	17.8	65.0	9.2	8.0	16	NP	A-2-4(0)	2.0-3.5	
SBL	SS-219	100	99	65	1.2	60.6	26.2	12.0	25	NP	A-4(0)	13.3-14.8	
	SS-220	100	86	26	33.6	44.2	14.2	8.0	20	NP	A-2-4(0)	18.3-19.8	
	SS-221	100	71	6	62.2	33.2	2.6	2.0	18	NP	A-3(0)	23.3-24.8	
	SS-222	100	90	69	14.0	17.6	36.4	32.0	37	3	A-4(3)	28.3-29.8	
	SS-223	100	100	40	2.2	71.4	16.4	10.0	22	NP	A-4(0)	48.3-49.8	
	SS-224	100	87	69	17.6	17.0	25.4	40.0	45	4	A-5(4)	53.3-54.8	
	SS-225	100	99	23	14.0	67.2	6.8	12.0	22	NP	A-2-4(0)	73.3-74.8	



**FIELD
 SCOUR REPORT**

WBS: 34440.1.1 TIP: R-2510C COUNTY: Beaufort

DESCRIPTION(1): Bridge 50 on US 17 over Old Ford Swamp

EXISTING BRIDGE

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

Bridge No.: 50 Length: 114' Total Bents: 4 Bents in Channel: 2 Bents in Floodplain: 2
 Foundation Type: Concrete piles

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None noted

Interior Bents: None noted

Channel Bed: None noted

Channel Bank: 10-15 feet of erosion of bank under bridge at both end bents

EXISTING SCOUR PROTECTION

Type(3): Concrete end slope

Extent(4): 15 feet from outside edge of bridge

Effectiveness(5): Appears Satisfactory

Obstructions(6): Old timbers between End Bent 1 and Bent 1

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): Sandy silt (SS-9)

Channel Bank Material(8): Sandy silt (SS-3) and sand (SS-209)

Channel Bank Cover(9): Woods and brush

Floodplain Width(10): 1350+/- feet

Floodplain Cover(11): Woods and brush

Stream is(12): Aggrading Degrading Static

Channel Migration Tendency(13): Slightly south toward End Bent 1

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14) Feet Meters

BENTS

	B1	B2								
SB Lanes	1	9								
NB Lanes	4	0								

Comparison of DSE to Hydraulics Unit theoretical scour:
 Design Scour Elevation agrees with the Hydraulics Unit's 100 yr. 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 16,
 "Soil Test Results",
 for samples:
 SS-9 Channel Bed
 SS-3, SS-209 Channel Bank

Reported by: Fred M. W... Date: 8/6/07

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34440.1.1 (R-2510C) F.A. PROJ. MAF-75-3(26)
 COUNTY BEAUFORT
 PROJECT DESCRIPTION US 17 FROM US 17 SOUTH OF SR 1001
(CHERRY RUN RD.) TO NORTH OF NC 171

SITE DESCRIPTION BRIDGE 41 ON US 17 OVER CHERRY RUN
AT -L- STATION 54+34

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	PROFILE(S)
6-8	CROSS SECTION(S)
9-15	BORE LOG(S)
16-17	SOIL TEST RESULTS
18	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

W.N. CHERRY

R.E. SMITH

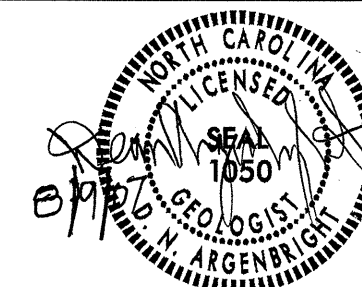
TRIGON PERSONNEL

INVESTIGATED BY F.M. WESCOTT III

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE AUGUST, 2007



PROJECT: 34440.1.1 ID: R-2510C

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 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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

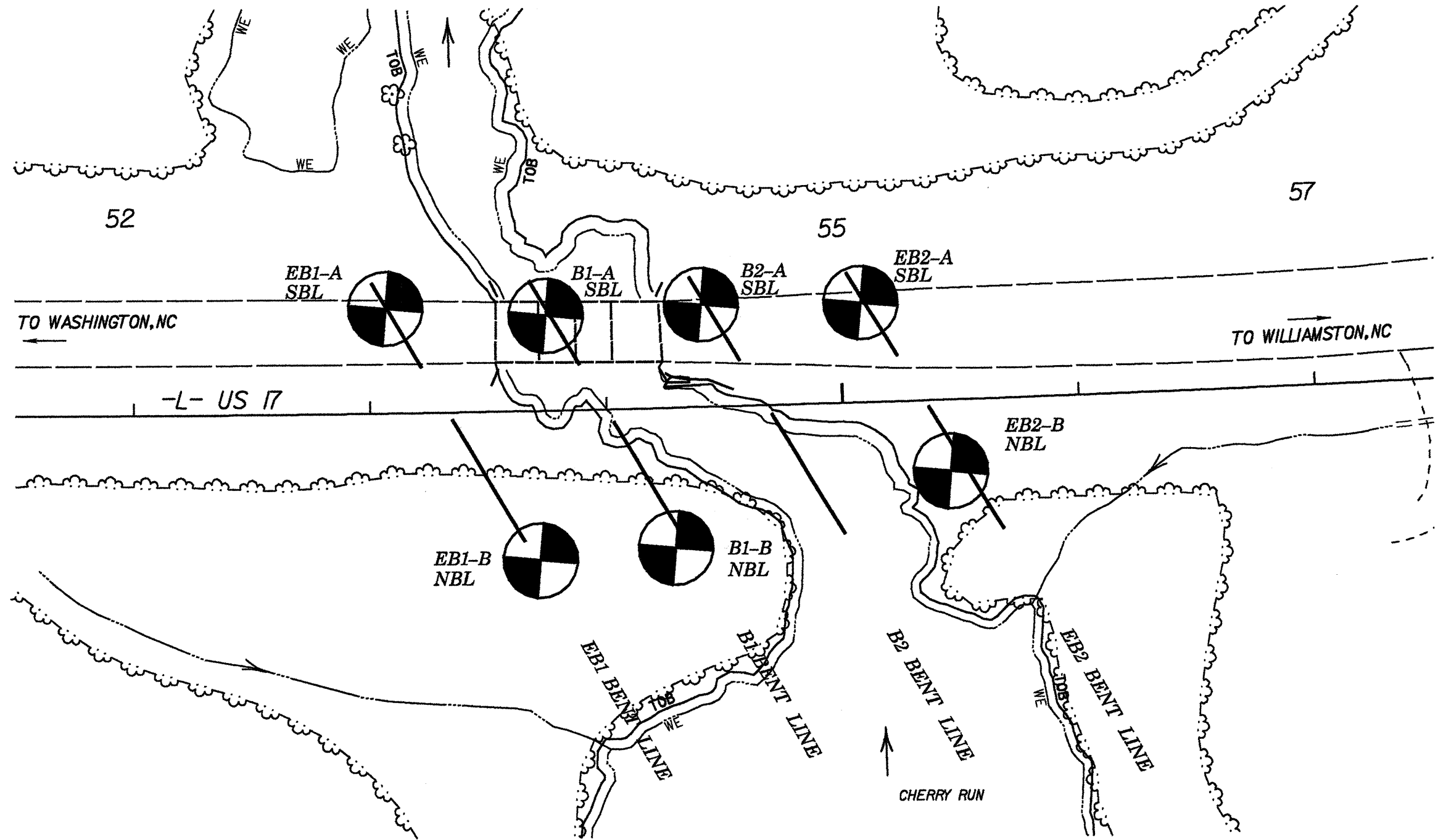
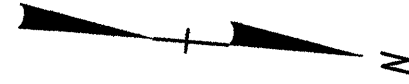
PROJECT REFERENCE NO. 34440.11(R-2510C)	SHEET NO. 2 OF 18
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SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																																																																																																				
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i></p>	<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>	<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p> <p>WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p> <p>CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p> <p>NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>	<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SCREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																				
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (< 35% PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th colspan="2">A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td>A-7-5</td> <td>A-7-6</td> <td>A-7-8</td> <td>A-3</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td></td> <td></td> <td></td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td></td> <td></td> <td></td> </tr> <tr> <td>LIQUID LIMIT PLASTIC INDEX</td> <td>6 MX</td> <td>NP</td> <td>10 MX 10 MN</td> <td>11 MX 11 MN</td> <td>12 MX 12 MN</td> <td>13 MX 13 MN</td> <td>14 MX 14 MN</td> <td>15 MX 15 MN</td> <td>16 MX 16 MN</td> <td>17 MX 17 MN</td> <td>18 MX 18 MN</td> <td>19 MX 19 MN</td> <td></td> <td></td> <td></td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>20 MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS. 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A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-7-5	A-7-6	A-7-8	A-3	A-4, A-5	A-6, A-7				SYMBOL																% PASSING	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200				LIQUID LIMIT PLASTIC INDEX	6 MX	NP	10 MX 10 MN	11 MX 11 MN	12 MX 12 MN	13 MX 13 MN	14 MX 14 MN	15 MX 15 MN	16 MX 16 MN	17 MX 17 MN	18 MX 18 MN	19 MX 19 MN				GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	20 MX								USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS											GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD				FAIR TO POOR				FAIR TO POOR	POOR	UNSATURABLE					<p style="text-align: center;">MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p style="text-align: center;">COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p> <p style="text-align: center;">PERCENTAGE OF MATERIAL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> </thead> <tbody> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> </tbody> </table> <p style="text-align: center;">GROUND WATER</p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p>		GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY	<p style="text-align: center;">WEATHERING</p> <p>FRESH - ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SL.) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</p> <p>SLIGHT (SL.) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.</p> <p>MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.</p> <p>MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i></p> <p>VERY SEVERE (V SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i></p> <p>COMPLETE - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.</p>
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SKEW = 60°

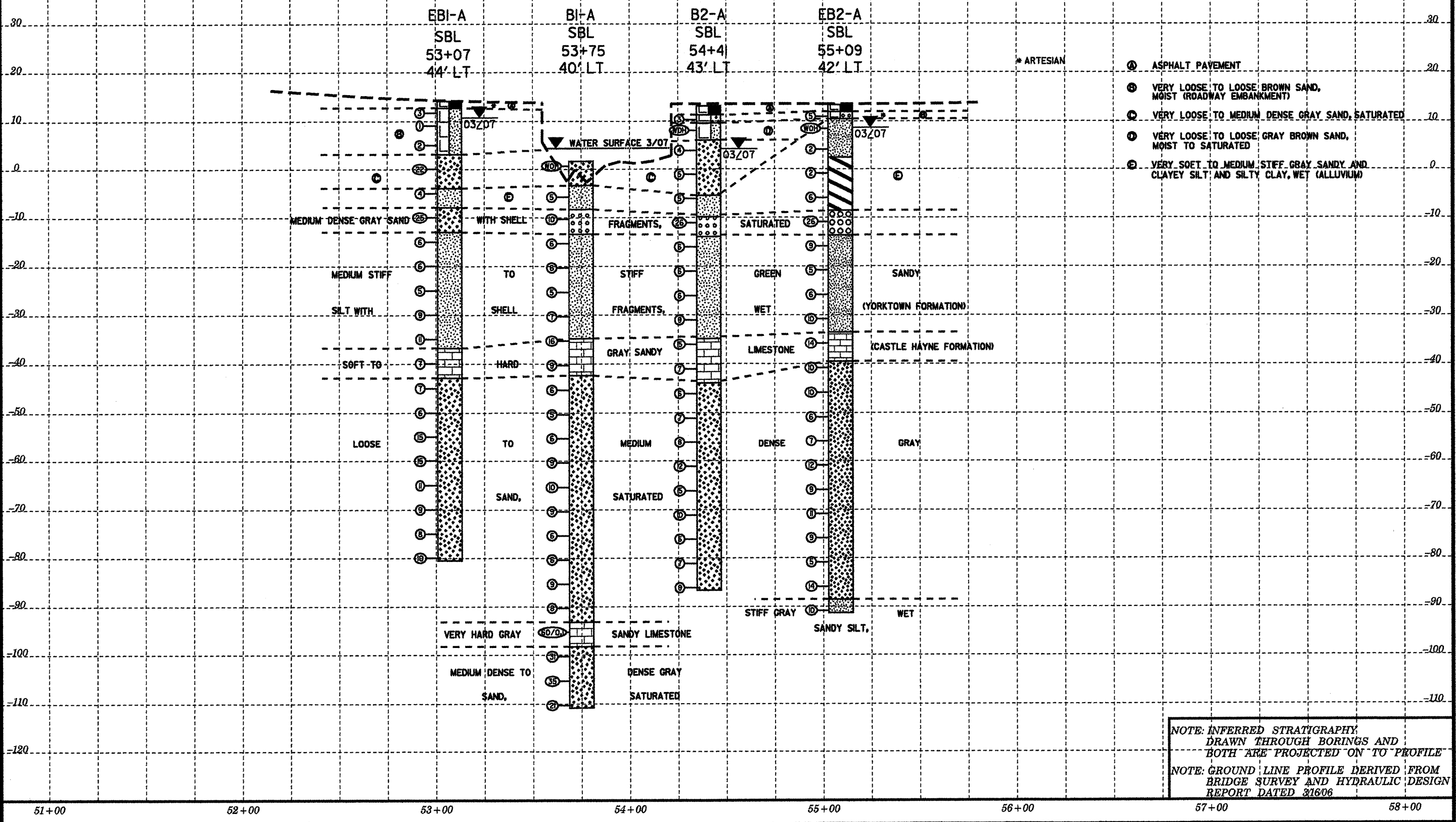


5/14/99

PROJECT REFERENCE NO. 34440JJ(R-25)0C	SHEET NO. 5 OF 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/C ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
HORIZONTAL SCALE: 1"=50' VERTICAL SCALE: 1"=20' VE=2.5	

BRIDGE 41

PROFILE THROUGH BORING PROJECTED ALONG -L- SOUTHBOUND LANE



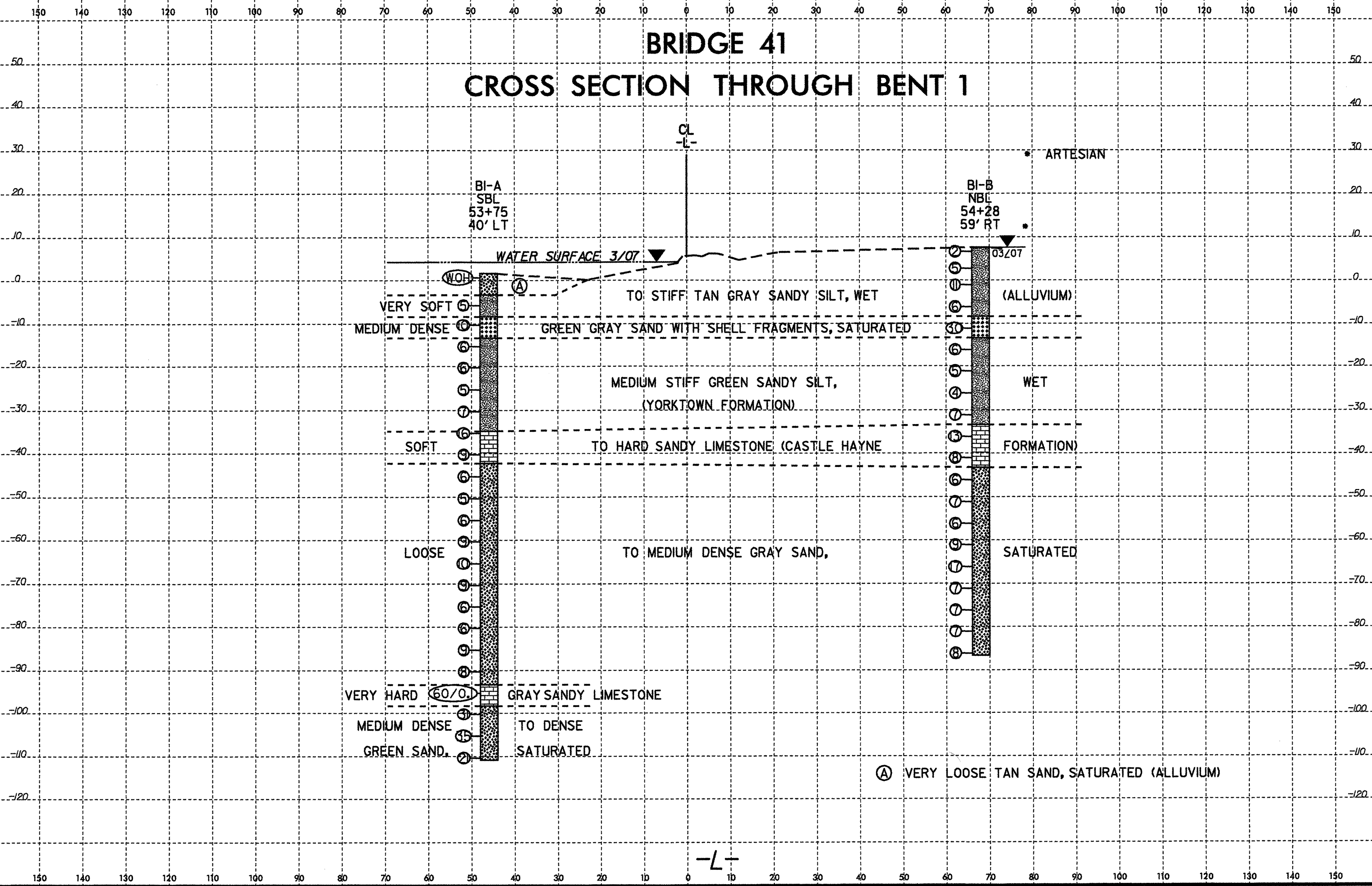
NOTE: INFERRED STRATIGRAPHY
 DRAWN THROUGH BORINGS AND
 BOTH ARE PROJECTED ON TO PROFILE
 NOTE: GROUND LINE PROFILE DERIVED FROM
 BRIDGE SURVEY AND HYDRAULIC DESIGN
 REPORT DATED 3/16/06

09-AUG-2007 14:22
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 AT 116-2510C

8/23/99

BRIDGE 41

CROSS SECTION THROUGH BENT 1

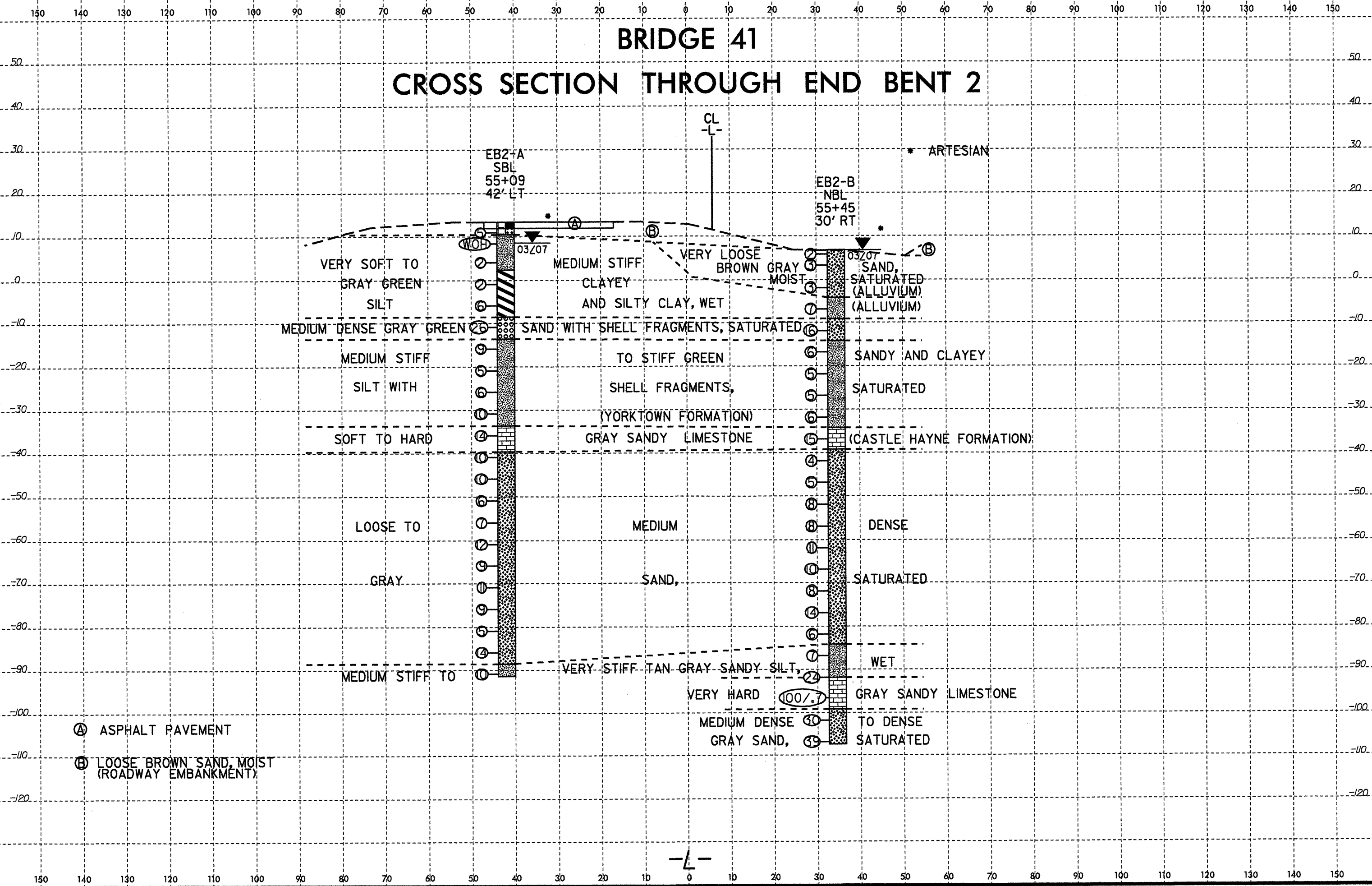


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 DATE: 08/23/99
 BY: [signature]

-L-

BRIDGE 41

CROSS SECTION THROUGH END BENT 2



8/23/99

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NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34440.1.1		ID. R-2510C		COUNTY BEAUFORT		GEOLOGIST Swartley, J. R.								
SITE DESCRIPTION BRIDGE NO. 41 ON US 17 OVER CHERRY RUN							GROUND WTR (ft)							
BORING NO. EB1-A SBL		STATION 53+07		OFFSET 44ft LT		ALIGNMENT -L-								
COLLAR ELEV. 14.2 ft		TOTAL DEPTH 94.6 ft		NORTHING 673,635		EASTING 2,574,589								
DRILL MACHINE CME-45B		DRILL METHOD Mud Rotary			HAMMER TYPE Automatic									
START DATE 03/15/07		COMP. DATE 03/15/07		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 51.0 ft								
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					
15														
12.8	1.4													
10.2	4.0													
6.1	8.1													
1.1	13.1													
-3.9	18.1													
-8.9	23.1													
-13.9	28.1													
-18.9	33.1													
-23.9	38.1													
-28.9	43.1													
-33.9	48.1													
-38.9	53.1													
-43.9	58.1													
-48.9	63.1													
-53.9	68.1													
-58.9	73.1													
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		0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-65														
-68.9	83.1													
-73.9	88.1													
-78.9	93.1													

NCDOT BORE DOUBLE R2510C.GEO.BRDG41.GPJ NC.DOT.GDT 08/08/07

Match Line

GRAY SAND, SATURATED (continued)

Boring Terminated at Elevation -80.4 ft in medium dense sand
24 HOUR GROUND WATER IS ARTESIAN HEAD



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 41 ON US 17 OVER CHERRY RUN			GROUND WTR (ft)
BORING NO. EB1-B NBL	STATION 53+71	OFFSET 63ft RT	ALIGNMENT -L-
COLLAR ELEV. 9.3 ft	TOTAL DEPTH 104.6 ft	NORTHING 673,709	EASTING 2,574,689
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/21/07	COMP. DATE 03/21/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 45.0 ft

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
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BORING NO. EB1-B NBL	STATION 53+71	OFFSET 63ft RT	ALIGNMENT -L-
COLLAR ELEV. 9.3 ft	TOTAL DEPTH 104.6 ft	NORTHING 673,709	EASTING 2,574,689
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/21/07	COMP. DATE 03/21/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 45.0 ft

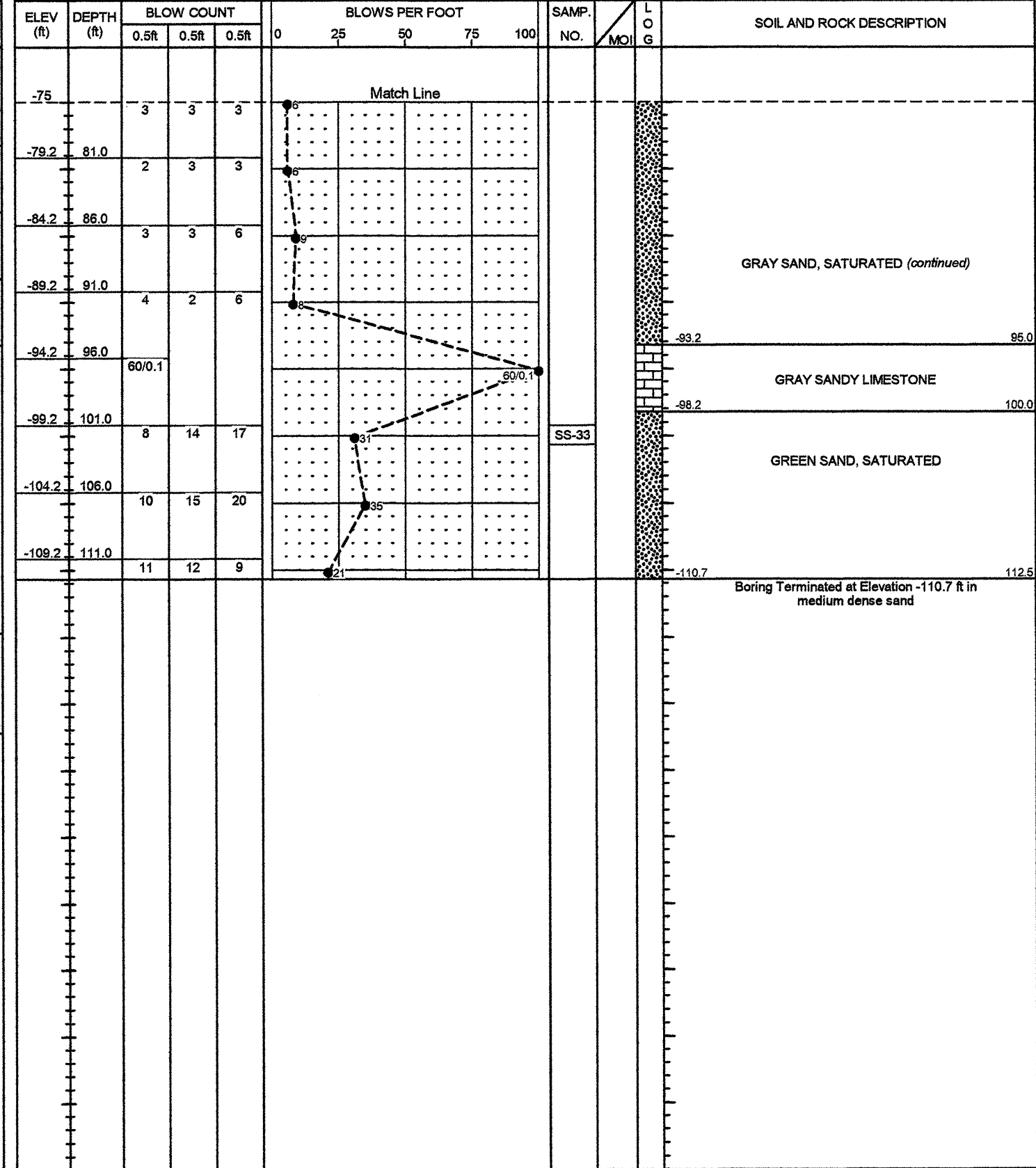
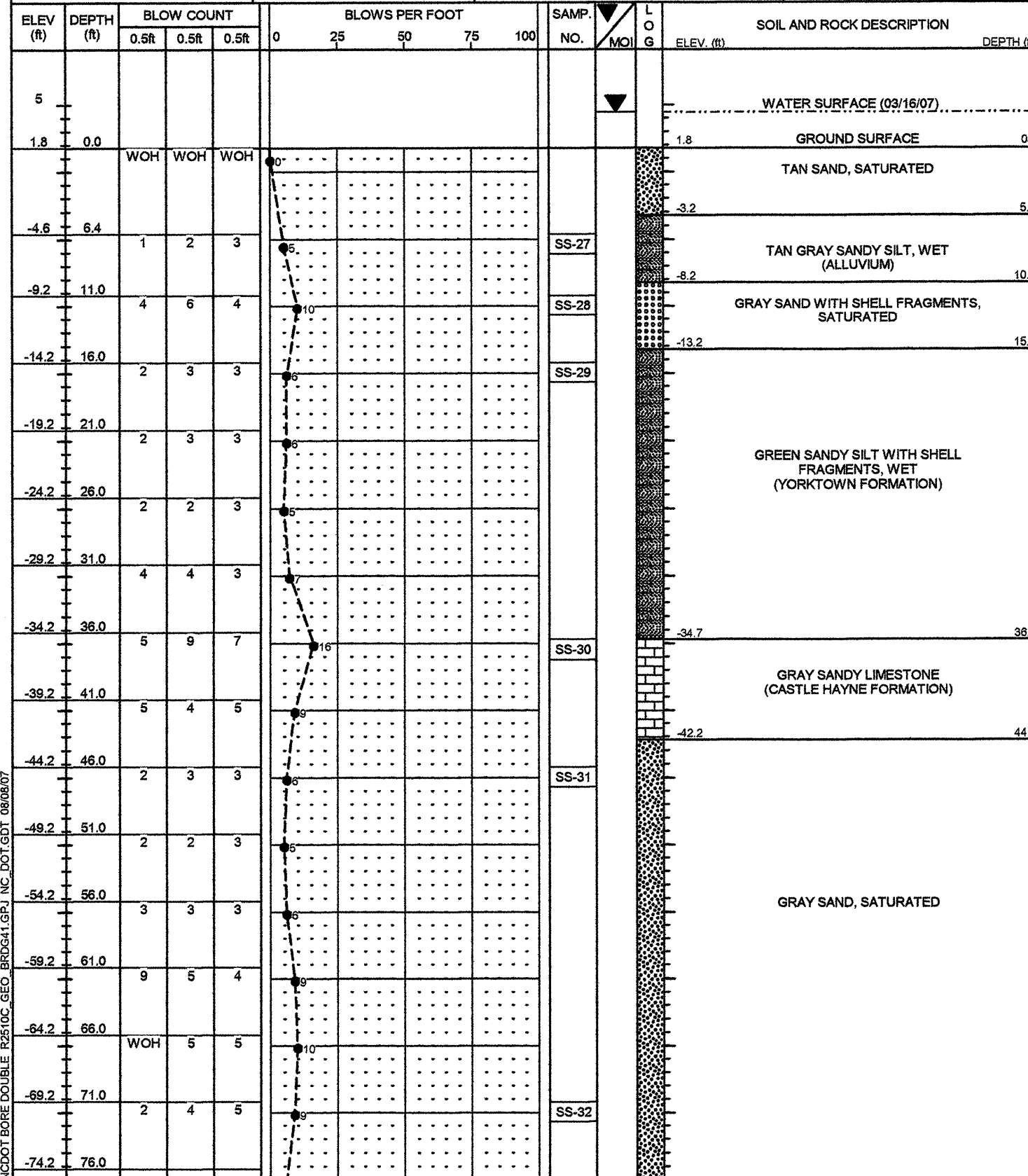
ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
		0.5ft	0.5ft	0.5ft	0	25	50	75	100				
9.3	0.0											GROUND SURFACE	0.0
5.3	4.0	2	5	1								TAN BROWN SAND, MOIST TO SATURATED (ALLUVIUM)	
1.2	8.1	1	4	11									
-3.8	13.1	3	5	5						SS-42			
-8.8	18.1	1	1	2						SS-43		GREEN SANDY SILT, WET	11.5
-13.8	23.1	4	6	7						SS-44			
-18.8	28.1	3	3	3						SS-45		GRAY SAND WITH SHELL FRAGMENTS, SATURATED	22.0
-23.8	33.1	2	2	3									
-28.8	38.1	2	3	3								GREEN SANDY SILT WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)	
-33.8	43.1	3	4	6						SS-46			
-38.8	48.1	3	4	5									
-43.8	53.1	2	3	5						SS-47		GRAY SANDY LIMESTONE (CASTLE HAYNE FORMATION)	45.0
-48.8	58.1	2	2	4						SS-48			
-53.8	63.1	4	3	5									
-58.8	68.1	6	3	4								GRAY SAND, SATURATED	
-63.8	73.1	4	8	5									
-68.8	78.1	3	3	5									
		2	3	4						SS-49			

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				
-70												Match Line	
-73.8	83.1	2	3	4									
-78.8	88.1	11	17	7									
-83.8	93.1	3	3	4								GRAY SAND, SATURATED (continued)	
-88.8	98.1	1	3	3						SS-50			
-93.8	103.1	8	8	11									
												Boring Terminated at Elevation -95.3 ft in medium dense sand	104.6
												24 HOUR GROUND WATER IS ARTESIAN HEAD	

NCDOT BORE DOUBLE R2510C.GEO_BROG41.GPJ NC_DOT_GDT 08/08/07

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 41 ON US 17 OVER CHERRY RUN			GROUND WTR (ft)
BORING NO. B1-A SBL	STATION 53+75	OFFSET 40ft LT	ALIGNMENT -L-
COLLAR ELEV. 1.8 ft	TOTAL DEPTH 112.5 ft	NORTHING 673,702	EASTING 2,574,586
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/16/07	COMP. DATE 03/19/07	SURFACE WATER DEPTH 2.6ft	DEPTH TO ROCK 36.5 ft

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 41 ON US 17 OVER CHERRY RUN			GROUND WTR (ft)
BORING NO. B1-A SBL	STATION 53+75	OFFSET 40ft LT	ALIGNMENT -L-
COLLAR ELEV. 1.8 ft	TOTAL DEPTH 112.5 ft	NORTHING 673,702	EASTING 2,574,586
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/16/07	COMP. DATE 03/19/07	SURFACE WATER DEPTH 2.6ft	DEPTH TO ROCK 36.5 ft

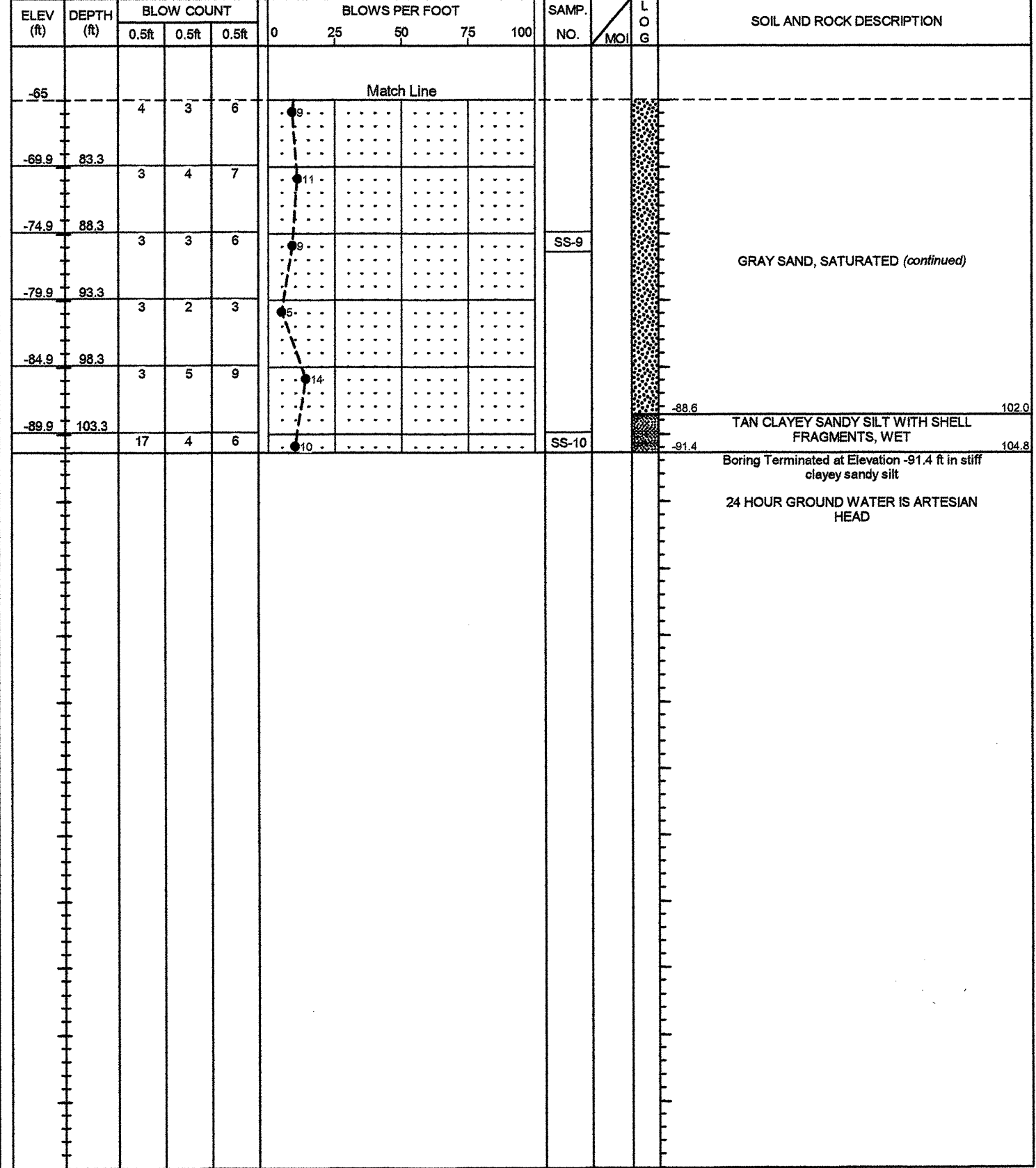
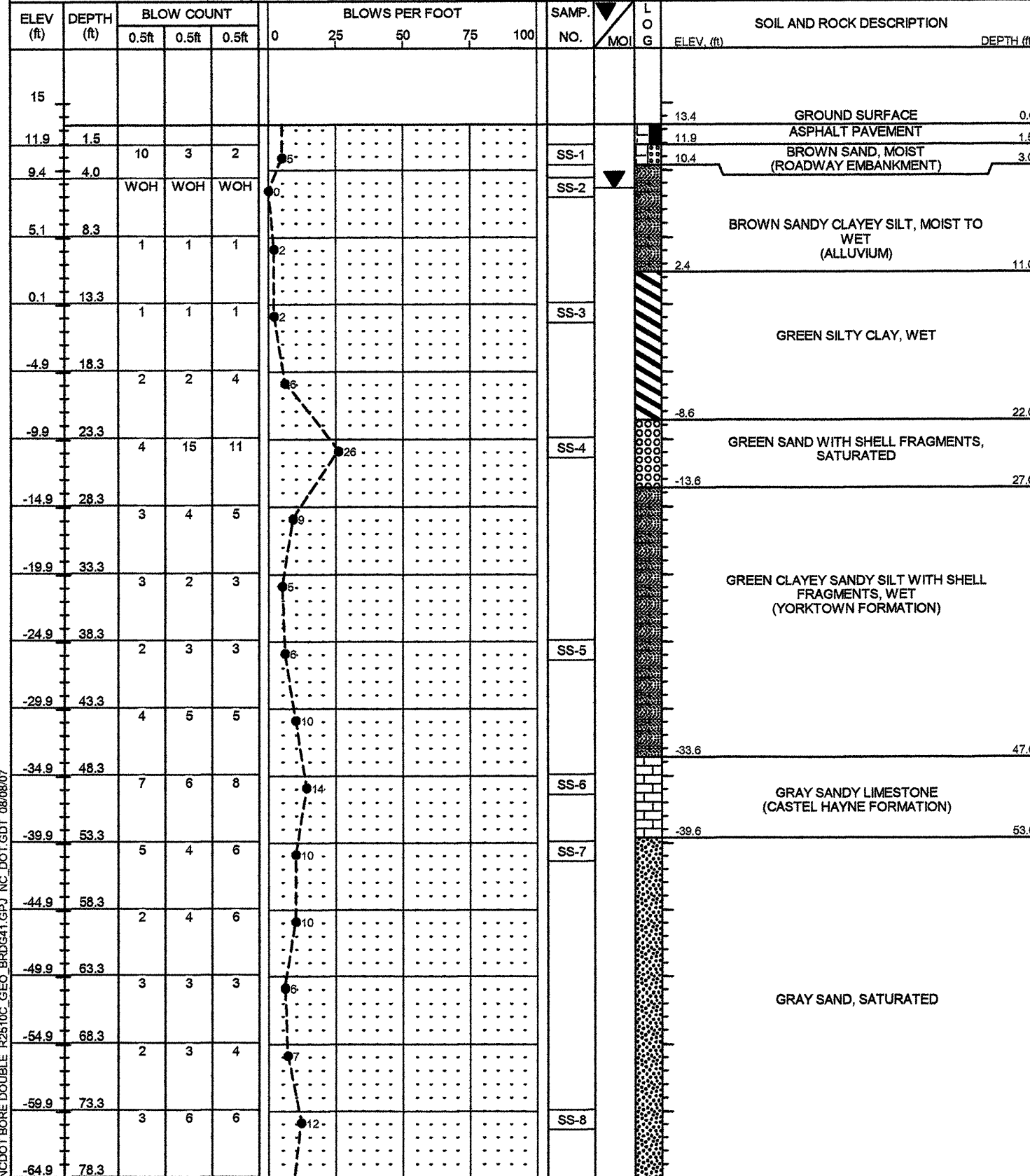


NCDOT BORE DOUBLE R2510C.GEO.BRDG41.GPJ.NC.DOT.GDT.08/08/07

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 41 ON US 17 OVER CHERRY RUN			GROUND WTR (ft)
BORING NO. EB2-A SBL	STATION 55+09	OFFSET 42ft LT	ALIGNMENT -L-
COLLAR ELEV. 13.4 ft	TOTAL DEPTH 104.8 ft	NORTHING 673,835	EASTING 2,574,569
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/09/07	COMP. DATE 03/09/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 47.0 ft

PROJECT NO. 34440.1.1	ID. R-2510C	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 41 ON US 17 OVER CHERRY RUN			GROUND WTR (ft)
BORING NO. EB2-A SBL	STATION 55+09	OFFSET 42ft LT	ALIGNMENT -L-
COLLAR ELEV. 13.4 ft	TOTAL DEPTH 104.8 ft	NORTHING 673,835	EASTING 2,574,569
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/09/07	COMP. DATE 03/09/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 47.0 ft



NCDOT BORE DOUBLE R2510C_GEO_BRDG41.GPJ NC_DOT_GDT 08/08/07

Bridge No. 41 on US 17 over Cherry Run

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST. ORG.
EB2-A	SS-1	100	83	8	54.4	39.2	0.4	6.0	22	NP	A-3(0)	1.5-3.0	
SBL	SS-2	100	99	72	2.2	32.1	7.0	58.6	38	7	A-4(5)	4.0-5.5	
	SS-3	100	99	87	3.0	14.5	31.9	50.6	46	14	A-7-5(15)	13.3-14.8	
	SS-4	54	46	5	41.8	49.2	4.6	4.4	23	NP	A-1-b(0)	23.3-24.8	
	SS-5	71	67	42	9.8	51.4	2.2	36.5	25	NP	A-4(0)	38.3-39.8	
	SS-6	52	38	15	39.6	33.5	6.4	20.5	19	NP	A-1-b(0)	48.3-49.8	
	SS-7	100	96	35	8.6	59.4	1.4	30.5	19	NP	A-2-4(0)	53.3-54.8	
	SS-8	100	99	16	8.0	77.7	3.8	10.4	19	NP	A-2-4(0)	73.3-74.8	
	SS-9	100	98	24	5.8	72.7	3.0	18.5	17	NP	A-2-4(0)	88.3-89.8	
	SS-10	100	91	38	15.1	52.8	11.6	20.5	22	NP	A-4(0)	103.3-104.8	
B2-A	SS-11	100	97	13	20.7	71.9	5.0	2.4	15	NP	A-2-4(0)	8.2-9.7	
SBL	SS-12	100	90	46	16.3	39.8	29.5	14.5	24	NP	A-4(0)	18.5-19.7	
	SS-13	100	95	8	25.1	67.5	5	2.4	15	NP	A-3(0)	23.2-24.7	
	SS-14	100	95	63	7.6	48.6	27.3	16.5	25	5	A-4(1)	28.2-29.7	21.7
	SS-15	100	85	36	31.9	38.6	17.1	12.4	26	NP	A-4(0)	43.2-44.7	
	SS-16	100	78	29	36.1	36.9	16.5	10.4	19	NP	A-2-4(0)	48.2-49.7	
	SS-17	100	93	27	15.5	60.0	14.1	10.4	16	NP	A-2-4(0)	53.2-54.7	
	SS-18	100	99	18	7.0	76.9	5.6	10.4	18	NP	A-2-4(0)	78.2-79.7	
EB1-A	SS-19	100	99	68	3.8	33.5	26.1	36.5	34	10	A-4(6)	4.0-5.5	
SBL	SS-20	100	99	16	10.8	78.1	4.6	6.4	22	NP	A-2-4(0)	13.1-14.6	
	SS-21	100	93	65	12.7	29.5	37.3	20.5	32	NP	A-4(0)	18.1-19.6	
	SS-22	100	85	15	44.2	41.8	7.6	6.4	19	NP	A-2-4(0)	23.1-24.6	
	SS-23	75	71	50	6.2	46.0	29.3	18.5	31	NP	A-4(0)	33.1-34.6	
	SS-24	100	90	31	17.3	53.6	14.7	14.5	16	NP	A-2-4(0)	53.1-54.6	
	SS-25	100	99	24	5.6	72.3	17.7	4.4	18	NP	A-2-4(0)	63.1-64.6	
	SS-26	100	97	31	7.4	64.7	13.5	14.5	18	NP	A-2-4(0)	93.1-94.6	
B1-A	SS-27	100	96	44	7.4	51.8	24.3	16.5	26	NP	A-4(0)	6.4-7.9	
SBL	SS-28	100	94	10	32.1	58.0	7.4	2.4	17	NP	A-3(0)	11.0-12.5	
	SS-29	100	96	68	5.0	47.4	29.1	18.5	32	NP	A-4(0)	16.0-17.5	
	SS-30	100	73	27	41.8	32.9	14.9	10.4	21	NP	A-2-4(0)	36.5-37.5	
	SS-31	100	99	32	3.6	68.3	11.6	16.5	18	NP	A-2-4(0)	46.0-47.5	
	SS-32	100	98	23	7.0	73.1	11.4	8.4	21	NP	A-2-4(0)	71.0-72.5	
	SS-33	100	72	18	61.0	22.7	11.8	4.4	25	NP	A-2-4(0)	101.0-102.5	

R-2510C
Bridge No. 41 on US 17 over Cherry Run

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST. ORG.
B1-B	SS-34	100	97	43	9.4	57.6	18.5	14.5	24	5	A-4(0)	1.0-1.5	
NBL	SS-35	100	100	39	1.0	78.5	12.4	8.0	20	NP	A-4(0)	7.8-9.3	
	SS-36	100	81	7	53.6	40.2	4.2	2.0	15	NP	A-3(0)	17.8-19.3	
	SS-37	100	99	66	6.4	45.0	32.5	16.1	34	10	A-4(5)	22.8-24.3	
	SS-38	100	73	28	40.6	33.3	14.1	12.0	18	NP	A-2-4(0)	42.8-44.3	
	SS-39	100	95	36	11.4	55.6	18.9	14.1	21	NP	A-4(0)	47.8-49.3	
	SS-40	100	98	26	7.4	69.3	11.2	12.0	20	NP	A-2-4(0)	52.8-54.3	
	SS-41	100	99	17	6.8	77.9	7.2	8.0	19	NP	A-2-4(0)	72.8-74.3	
EB1-B	SS-42	100	100	16	5.8	84.7	3.4	6.0	22	NP	A-2-4(0)	8.1-9.6	
NBL	SS-43	100	94	61	14.1	30.7	37.1	18.1	30	NP	A-4(0)	13.1-14.6	
	SS-44	100	83	14	51.8	34.1	6.0	8.0	18	NP	A-2-4(0)	18.6-19.6	
	SS-45	100	96	71	6.0	46.0	29.9	18.1	34	6	A-4(4)	23.1-24.6	
	SS-46	100	84	37	31.3	39.8	14.9	14.1	25	1	A-4(0)	38.1-39.6	
	SS-47	100	90	31	19.5	51.6	14.9	14.1	17	NP	A-2-4(0)	48.1-49.6	
	SS-48	100	99	33	4.4	66.1	13.5	16.1	21	NP	A-2-4(0)	53.1-54.6	
	SS-49	100	98	25	7.6	70.7	9.6	12.0	16	NP	A-2-4(0)	78.1-79.6	
	SS-50	100	91	34	16.3	54.2	13.5	16.1	25	NP	A-2-4(0)	98.1-99.6	
EB2-B	SS-100	100	98	16	14.6	75.7	3.1	6.5	17	NP	A-2-4(0)	2.5-4.0	
NBL	SS-101	100	96	76	9.9	17.5	37.7	34.9	39	8	A-4(7)	12.7-14.2	
	SS-102	100	76	12	52.3	36.4	4.0	7.2	20	NP	A-2-4(0)	17.7-19.2	
	SS-103	100	96	70	4.8	45.1	32.8	17.3	38	9	A-4(6)	22.7-24.2	
	SS-104	100	93	56	14.5	41.0	23.1	21.3	32	4	A-4(1)	37.7-39.2	
	SS-105	100	97	31	7.4	64.2	11.1	17.3	21	NP	A-2-4(0)	47.7-49.2	
	SS-106	100	99	17	6.8	78.1	5.8	9.3	17	NP	A-2-4(0)	67.7-69.2	
	SS-107	100	97	27	6.6	69.0	11.1	13.3	18	NP	A-2-4(0)	82.7-84.2	
	SS-108	100	94	37	12.5	53.5	14.7	19.3	20	NP	A-4(0)	92.7-94.2	
	SS-109	100	85	42	25.2	38.2	23.3	13.3	21	NP	A-4(0)	97.7-98.7	
	SS-110	100	75	22	54.7	25.4	8.7	11.3	22	NP	A-2-4(0)	107.7-109.2	



**FIELD
 SCOUR REPORT**

WBS: 34440.1.1 TIP: R-2510C COUNTY: Beaufort

DESCRIPTION(1): Bridge 41 on US 17 over Cherry Run

EXISTING BRIDGE

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

Bridge No.: 41 Length: 70.5' Total Bents: 5 Bents in Channel: 3 Bents in Floodplain: 2
 Foundation Type: Concrete piles

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: 3-5 foot of scour behind NE wingwall

Interior Bents: None noted

Channel Bed: None noted

Channel Bank: 20+/- feet of bank eroded at EB1 and EB2

EXISTING SCOUR PROTECTION

Type(3): 1) Sheet pile from NE wingwall parallel to US 17 2) Rip-rap NE embank. parallel to US 17
 3) Concrete end walls 4) Rip-rap on both sides of End Bent 1 and 2

Extent(4): 1) 30+/- feet 2) 60+/- feet 3) 10 feet outside edge of bridge 4) 30 feet outside edge of bridge

Effectiveness(5): Somewhat 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): Sandy silt (SS-27) and sand

Channel Bank Material(8): Sandy clayey silt (SS-19) and sand (SS-42)

Channel Bank Cover(9): Woods and shrubs

Floodplain Width(10): 300+/- feet

Floodplain Cover(11): Woods and shrubs

Stream is(12): Aggrading _____ Degrading _____ Static

Channel Migration Tendency(13): Slightly south toward End Bent 1

Observations and Other Comments: The first and third bents are steel pile crutch bents. The second bent is concrete (unknown type)

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

	BENTS									
	B1	B2								
SB Lanes	-10	0								
NB Lanes	-0.5	-3								

Comparison of DSE to Hydraulics Unit theoretical scour:
 Design Scour Elevation agrees with the Hydraulics Unit's 100 yr. 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 Sheets 16 and 17,
 "Soil Test Results",
 for samples:
 SS-27 Channel Bed
 SS-19, SS-42 Channel Bank

7

Reported by: Frank W. [Signature] Date: 8/9/07