

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4438	1	27

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 35742.1.1 (U-4438) F.A. PROJ. STP-0158(31)
COUNTY PASQUOTANK/CAMDEN
PROJECT DESCRIPTION BRIDGE NO. 19 ON US 158/NC 34 OVER THE
PASQUOTANK RIVER AT -LI- STA. 16+31.22

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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.

PROJECT: 35742.1.1 ID: U-4438

PERSONNEL

C.M. WRIKE

J.R. SWARTLEY

S&ME, INC.

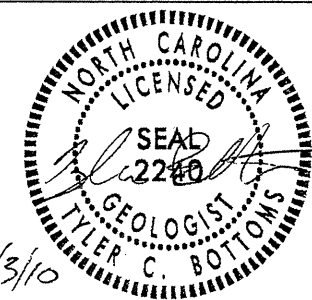
MACTEC, INC.

INVESTIGATED BY T.C. BOTTOMS

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE JUNE 2010



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

PROJECT REFERENCE NO. U-4438
SHEET NO. 2 OF 27

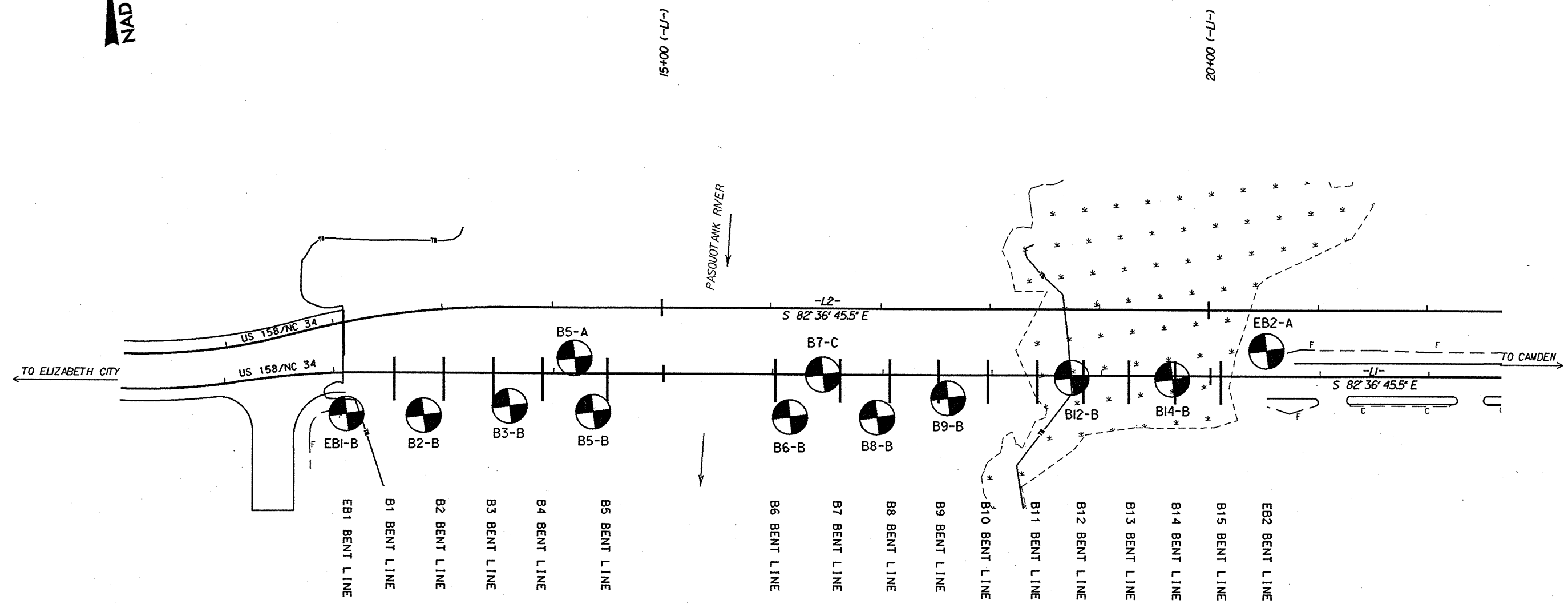
SUBSURFACE INVESTIGATION

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 (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, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HARD 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>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</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>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 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 (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - 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>	
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING		ROCK HARDNESS	
<p>GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS</p> <p>GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7</p> <p>SYMBOL</p> <p>% PASSING #10, #40, #200</p> <p>LIQUID LIMIT, PLASTIC INDEX, GROUP INDEX</p> <p>USUAL TYPES OF MAJOR MATERIALS</p> <p>GEN. RATING AS A SUBGRADE</p>		<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p>COMPRESSIBILITY</p> <p>PERCENTAGE OF MATERIAL</p> <p>GROUND WATER</p> <p>MISCELLANEOUS SYMBOLS</p>		<p>WEATHERED ROCK (WR)</p> <p>CRYSTALLINE ROCK (CR)</p> <p>NON-CRYSTALLINE ROCK (NCR)</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP)</p> <p>FRESH</p> <p>VERY SLIGHT (V SL.)</p> <p>SLIGHT (SL.)</p> <p>MODERATE (MOD.)</p> <p>MODERATELY SEVERE (MOD. SEV.)</p> <p>SEVERE (SEV.)</p> <p>VERY SEVERE (V SEV.)</p> <p>COMPLETE</p>		<p>ARGILLACEOUS</p> <p>ARENACEOUS</p> <p>ARTESIAN</p> <p>CALCAREOUS (CALC.)</p> <p>COLLUVIUM</p> <p>CORE RECOVERY (REC.)</p> <p>DIKE</p> <p>DIP</p> <p>DIP DIRECTION (DIP AZIMUTH)</p> <p>FAULT</p> <p>FISSILE</p> <p>FLOOD PLAIN (FP)</p> <p>FORMATION (FM)</p> <p>JOINT</p> <p>LEDGE</p> <p>LENS</p> <p>MOTTLED (MOT.)</p> <p>PERCHED WATER</p> <p>RESIDUAL (RES.) SOIL</p> <p>ROCK QUALITY DESIGNATION (RQD)</p> <p>SAPROLITE (SAP.)</p> <p>SILL</p> <p>SLICKENSIDE</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</p> <p>STRATA CORE RECOVERY (SREC)</p> <p>STRATA ROCK QUALITY DESIGNATION (SROD)</p> <p>TOPSOIL (TS.)</p>	
CONSISTENCY OR DENSENESS		TEXTURE OR GRAIN SIZE		ABBREVIATIONS		EQUIPMENT USED ON SUBJECT PROJECT	
<p>PRIMARY SOIL TYPE</p> <p>COMPACTNESS OR CONSISTENCY</p> <p>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</p> <p>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</p>		<p>U.S. STD. SIEVE SIZE OPENING (MM)</p> <p>BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE, SD.), FINE SAND (F SD.), SILT (SL.), CLAY (CL.)</p> <p>GRAIN SIZE</p>		<p>AR - AUGER REFUSAL</p> <p>BT - BORING TERMINATED</p> <p>CL - CLAY</p> <p>CPT - CONE PENETRATION TEST</p> <p>CSE - COARSE</p> <p>DMT - DILATOMETER TEST</p> <p>DPT - DYNAMIC PENETRATION TEST</p> <p>F - FINE</p> <p>F - FINE</p> <p>FOSS. - FOSSILIFEROUS</p> <p>FRAC. - FRACTURED, FRACTURES</p> <p>FRAGS. - FRAGMENTS</p> <p>HL - HIGHLY</p>		<p>DRILL UNITS:</p> <p>MOBILE B-51</p> <p>CME-550</p> <p>CME-750</p> <p>PORTABLE HOIST</p>	
SOIL MOISTURE - CORRELATION OF TERMS		PLASTICITY		FRACTURE SPACING		BEDDING	
<p>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</p> <p>FIELD MOISTURE DESCRIPTION</p> <p>GUIDE FOR FIELD MOISTURE DESCRIPTION</p> <p>LL - LIQUID LIMIT</p> <p>PL - PLASTIC LIMIT</p> <p>OM - OPTIMUM MOISTURE</p> <p>SL - SHRINKAGE LIMIT</p>		<p>PLASTICITY INDEX (PI)</p> <p>DRY STRENGTH</p> <p>NONPLASTIC</p> <p>LOW PLASTICITY</p> <p>MED. PLASTICITY</p> <p>HIGH PLASTICITY</p>		<p>TERM</p> <p>VERY WIDE</p> <p>WIDE</p> <p>MODERATELY CLOSE</p> <p>CLOSE</p> <p>VERY CLOSE</p>		<p>TERM</p> <p>VERY THICKLY BEDDED</p> <p>THICKLY BEDDED</p> <p>THINLY BEDDED</p> <p>VERY THINLY BEDDED</p> <p>THICKLY LAMINATED</p> <p>THINLY LAMINATED</p>	
COLOR		INDURATION		BENCH MARK		NOTES	
<p>DESCRIPTORS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>		<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE</p> <p>MODERATELY INDURATED</p> <p>INDURATED</p> <p>EXTREMELY INDURATED</p>		<p>BL #4 -PINC- STA 29+01.83 (MAG NAIL & BRASS WASHER IN SIDEWALK)</p> <p>ELEVATION: 4.61 FT.</p>		<p>NOTES:</p>	

SKEW = 90°

NAD 83/NSRS 2007

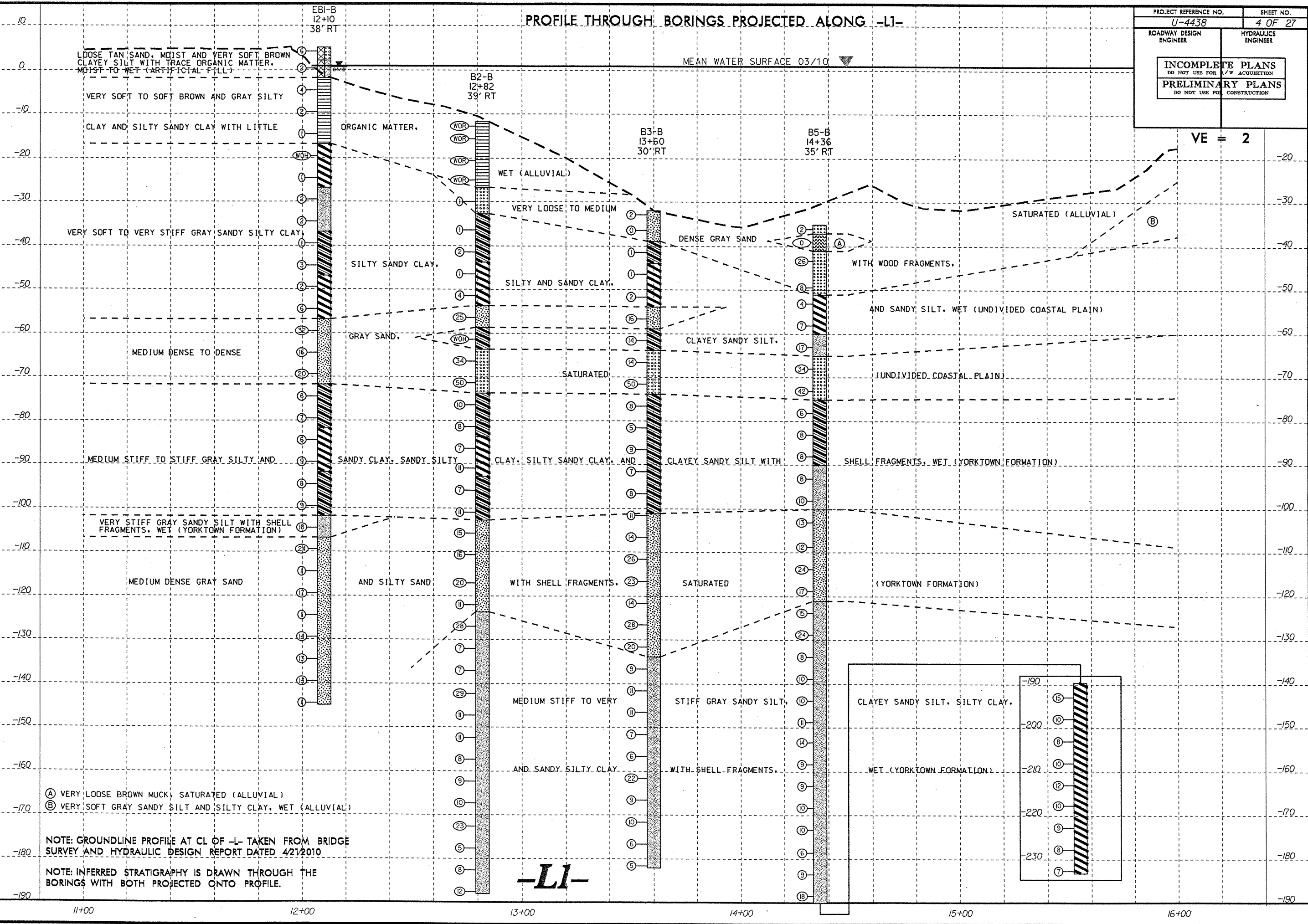


5/14/99

PROFILE THROUGH BORINGS PROJECTED ALONG -L1-

PROJECT REFERENCE NO. U-4438	SHEET NO. 4 OF 27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

VE = 2

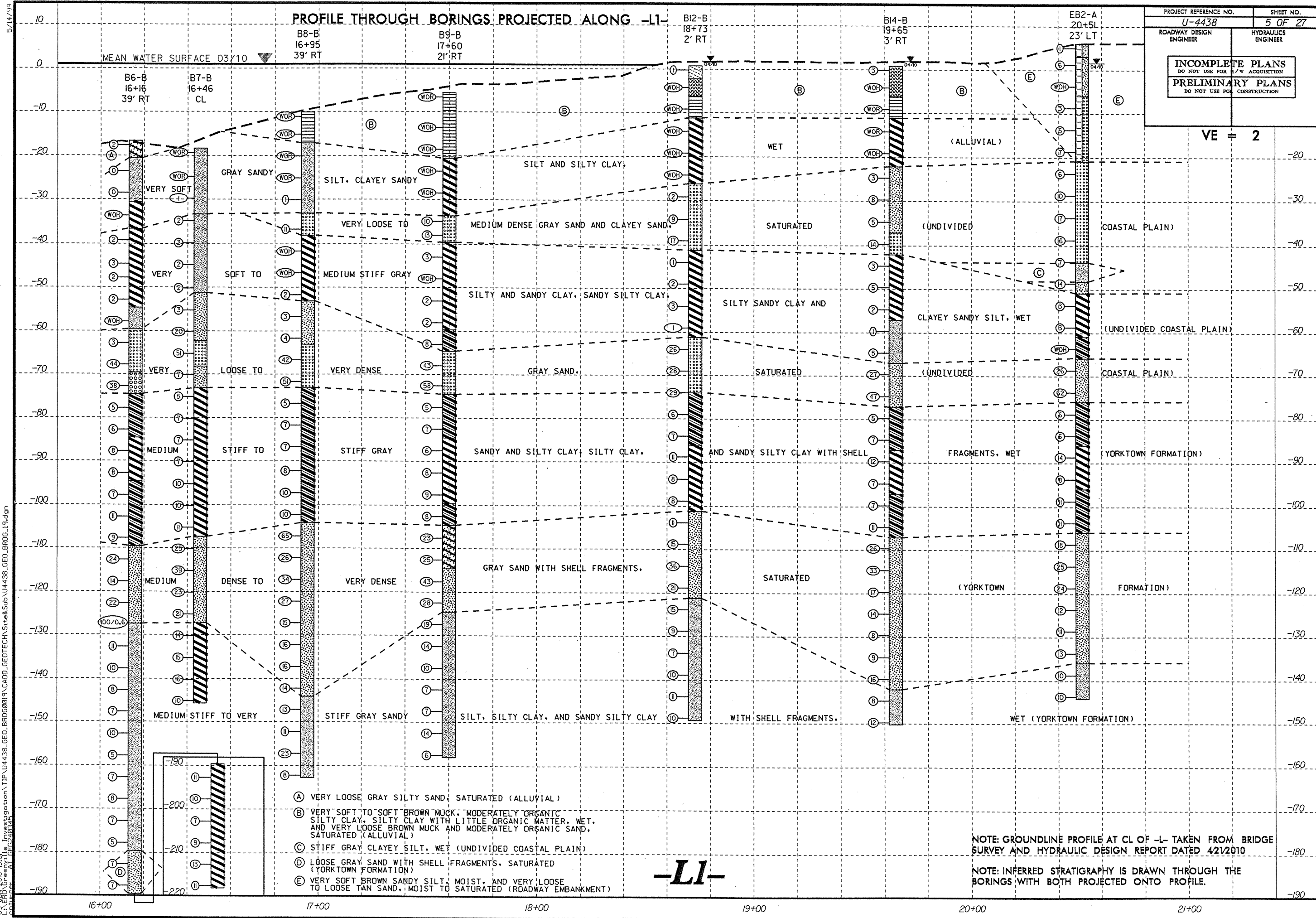


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-L1-

VE = 2

PROFILE THROUGH BORINGS PROJECTED ALONG -L-



- (A) VERY LOOSE GRAY SILTY SAND, SATURATED (ALLUVIAL)
- (B) VERY SOFT TO SOFT BROWN MUCK, MODERATELY ORGANIC SILTY CLAY, SILTY CLAY WITH LITTLE ORGANIC MATTER, WET, AND VERY LOOSE BROWN MUCK AND MODERATELY ORGANIC SAND, SATURATED (ALLUVIAL)
- (C) STIFF GRAY CLAYEY SILT, WET (UNDIVIDED COASTAL PLAIN)
- (D) LOOSE GRAY SAND WITH SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)
- (E) VERY SOFT BROWN SANDY SILT, MOIST, AND VERY LOOSE TO LOOSE TAN SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

NOTE: GROUNDLINE PROFILE AT CL OF -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 4/21/2010

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

-L-

5/14/99
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 16+00 17+00 18+00 19+00 20+00 21+00

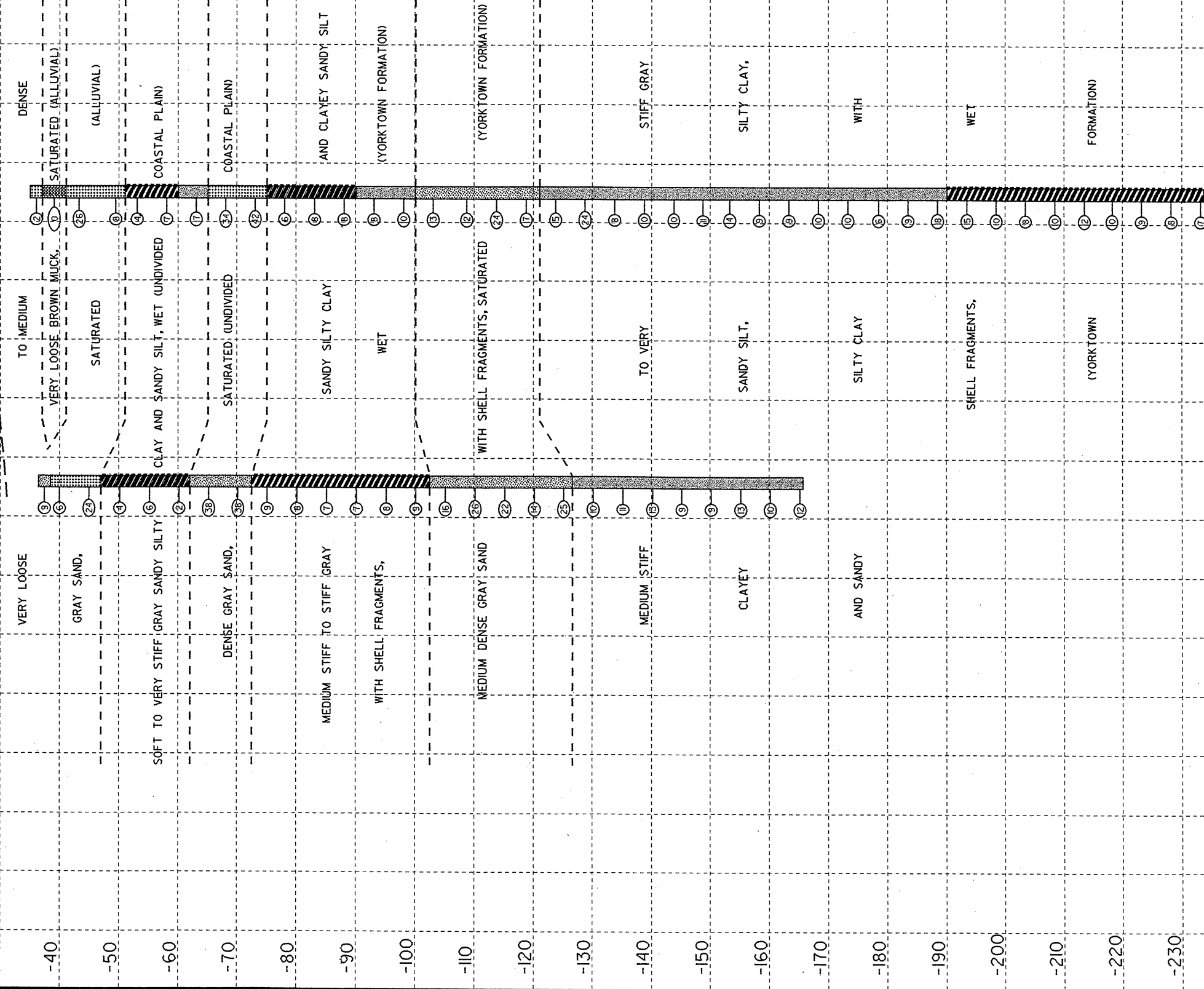
CROSS SECTION THROUGH BENT 5

MEAN WATER SURFACE 03/10



B5-A
14+19

B5-B
14+36



19+49.00

NOTE: EXISTING GROUND LINE DERIVED FROM .TIN FILE DATED 04/10

PROJ. REFERENCE NO. U-4438	SHEET NO. 6 OF 27
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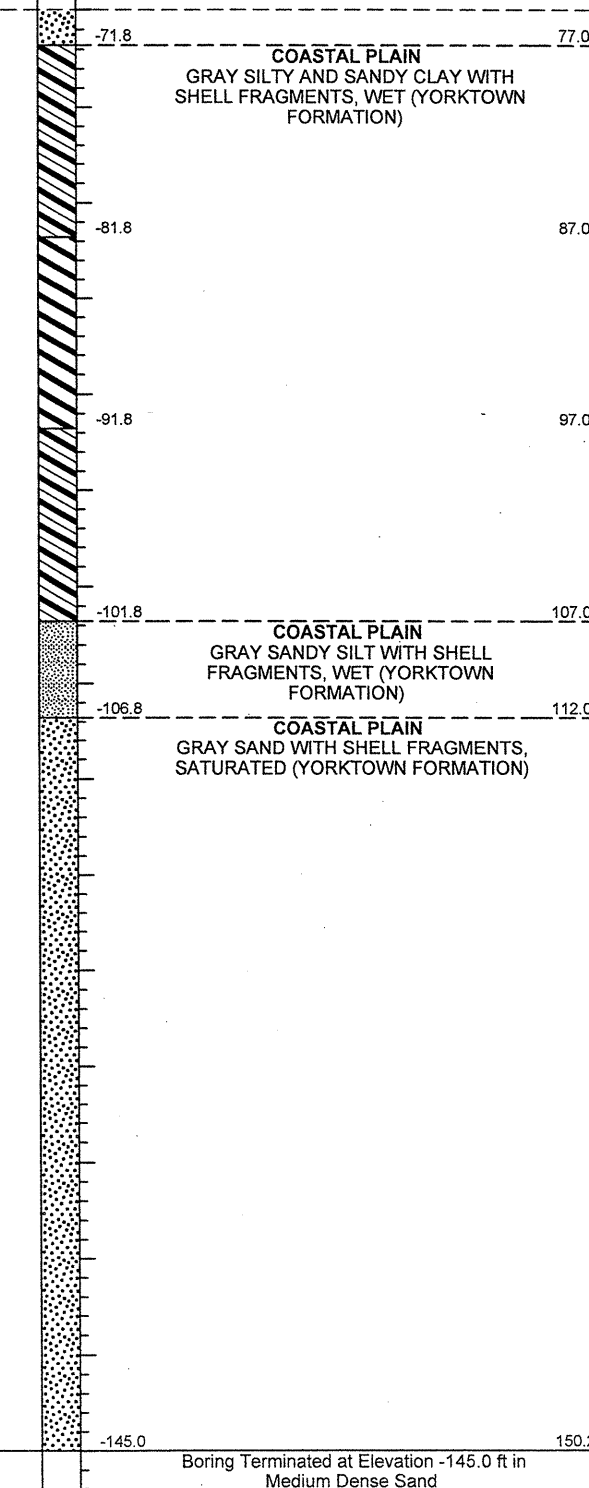
PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. EB1-B	STATION 12+10	OFFSET 38 ft RT	ALIGNMENT -L1-
COLLAR ELEV. 5.2 ft	TOTAL DEPTH 150.2 ft	NORTHING 2,819,665	EASTING 940,029
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 03/30/10	COMP. DATE 03/31/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
10															
5	5.2	0.0	2	3	3									GROUND SURFACE TAN SAND, MOIST	0.0
0	1.4	3.8	2	1	1									BROWN CLAYEY SILT WITH TRACE ORGANIC MATTER (4.5% ORGANIC), MOIST TO WET	3.0
-5	-3.6	8.8	1	2	2									BROWN SILTY SANDY CLAY WITH LITTLE ORGANIC MATTER AND WOOD FRAGMENTS, WET	7.0
-10	-8.6	13.8	2	1	1										
-15	-13.5	18.7	WOH	WOH	1										
-20	-18.5	23.7	WOH	WOH	WOH									UNDIVIDED COASTAL PLAIN GRAY SANDY SILTY CLAY, WET	22.0
-25	-23.5	28.7	WOH	WOH	1										
-30	-28.5	33.7	1	1	1									UNDIVIDED COASTAL PLAIN GRAY CLAYEY SANDY SILT, WET	32.0
-35	-33.5	38.7	1	1	1										
-40	-38.5	43.7	1	0	1									UNDIVIDED COASTAL PLAIN GRAY SILTY SANDY CLAY AND SILTY CLAY WITH SHELL FRAGMENTS, WET	42.0
-45	-43.5	48.7	1	2	1										
-50	-48.5	53.7	1	1	1										
-55	-53.5	58.7	2	3	3										
-60	-58.5	63.7	9	18	14									UNDIVIDED COASTAL PLAIN GRAY SAND, SATURATED	62.0
-65	-63.5	68.7	5	8	8										
-70	-68.5	73.7	8	9	11										

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. EB1-B	STATION 12+10	OFFSET 38 ft RT	ALIGNMENT -L1-
COLLAR ELEV. 5.2 ft	TOTAL DEPTH 150.2 ft	NORTHING 2,819,665	EASTING 940,029
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 03/30/10	COMP. DATE 03/31/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-70															
-75	-73.5	78.7	2	3	3										
-80	-78.5	83.7	3	3	4										
-85	-83.5	88.7	2	3	3										
-90	-88.5	93.7	2	4	5										
-95	-93.5	98.7	3	4	4										
-100	-98.5	103.7	3	4	5										
-105	-103.5	108.7	9	8	10										
-110	-108.5	113.7	3	9	15										
-115	-113.5	118.7	7	4	7										
-120	-118.5	123.7	4	4	13										
-125	-123.5	128.7	4	6	5										
-130	-128.5	133.7	4	5	9										
-135	-133.5	138.7	4	5	8										
-140	-138.5	143.7	4	5	9										
-145	-143.5	148.7	3	5	6										
-150															

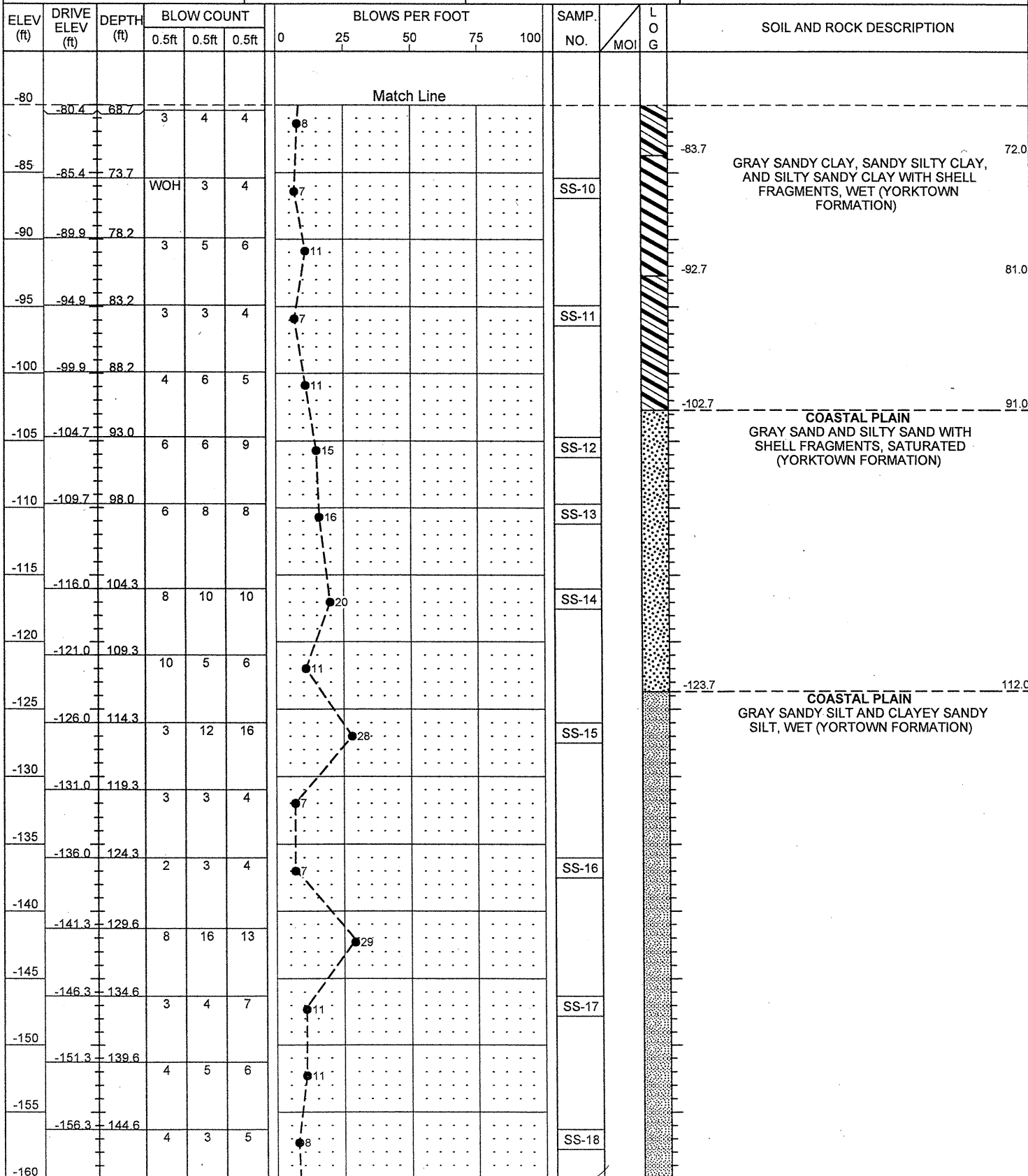
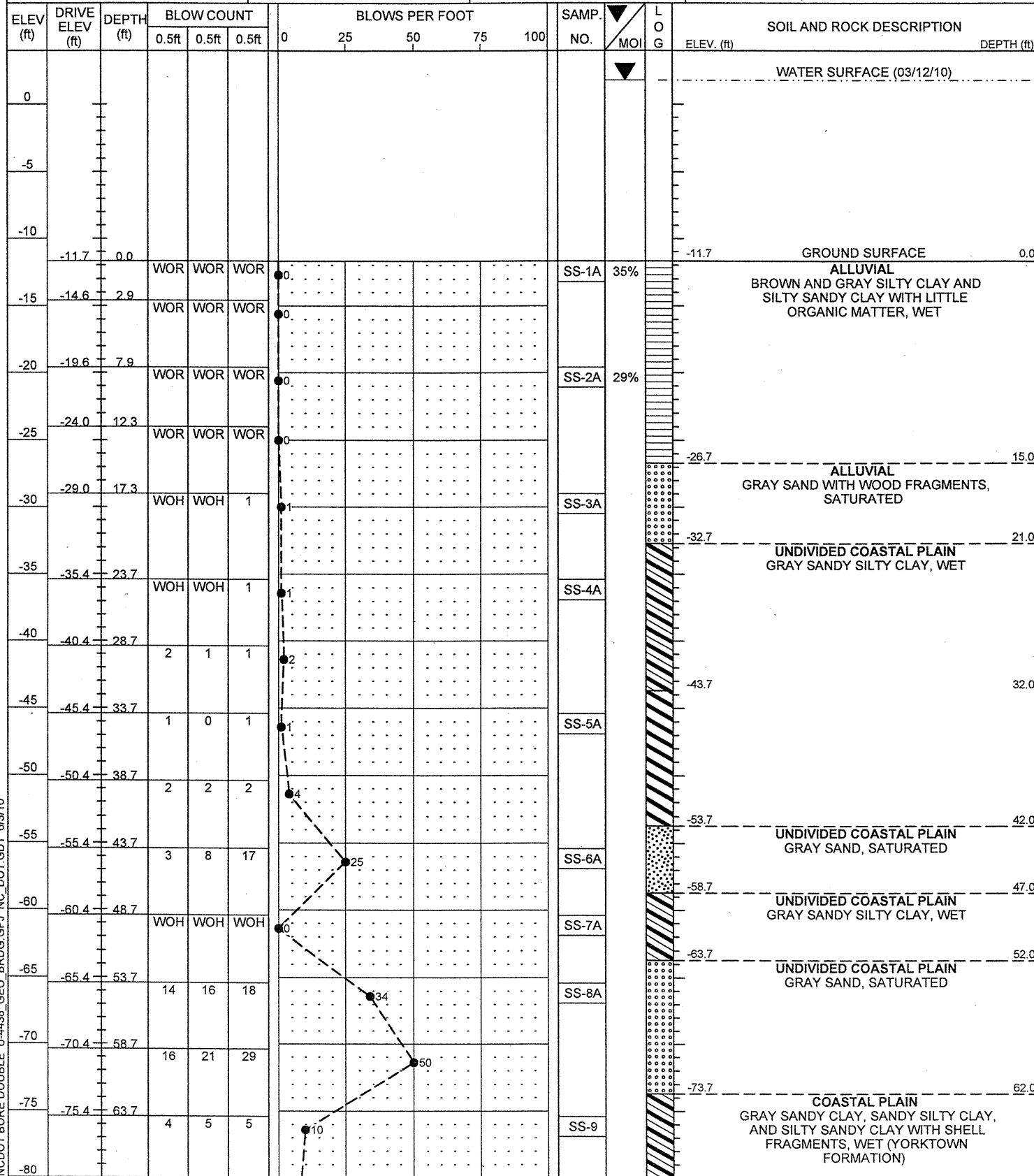
NCDOT BORE DOUBLE U-4438 GEO BRDG.GPJ NC DOT.GDT 6/3/10





PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B2-B	STATION 12+82	OFFSET 39 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -11.7 ft	TOTAL DEPTH 176.4 ft	NORTHING 940,019	EASTING 2,819,735
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 03/12/10	COMP. DATE 03/16/10	SURFACE WATER DEPTH 13.5ft

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B2-B	STATION 12+82	OFFSET 39 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -11.7 ft	TOTAL DEPTH 176.4 ft	NORTHING 940,019	EASTING 2,819,735
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 03/12/10	COMP. DATE 03/16/10	SURFACE WATER DEPTH 13.5ft



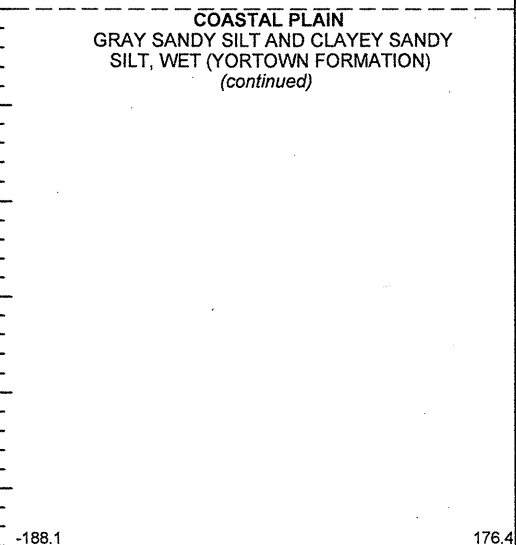
NCDOT BORE DOUBLE U-4438 GEO BRDG.GPJ NC_DOT.GDT 6/23/10



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B2-B	STATION 12+82	OFFSET 39 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -11.7 ft	TOTAL DEPTH 176.4 ft	NORTHING 940,019	EASTING 2,819,735
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 03/12/10	COMP. DATE 03/16/10	SURFACE WATER DEPTH 13.5ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-160	-161.3	149.6	5	4	5	Match Line									
-165	-166.3	154.6	4	4	6						SS-19				
-170	-171.6	159.9	5	6	17										
-175	-176.6	164.9	3	2	3						SS-20				
-180	-181.6	169.9	3	3	5										
-185	-186.6	174.9	3	4	8						SS-21				
-190															
-195															
-200															
-205															
-210															
-215															
-220															
-225															
-230															
-235															
-240															



NCDOT BORE DOUBLE U-4438 GEO_BRDG.GPJ NC_DOT.GDT 6/3/10

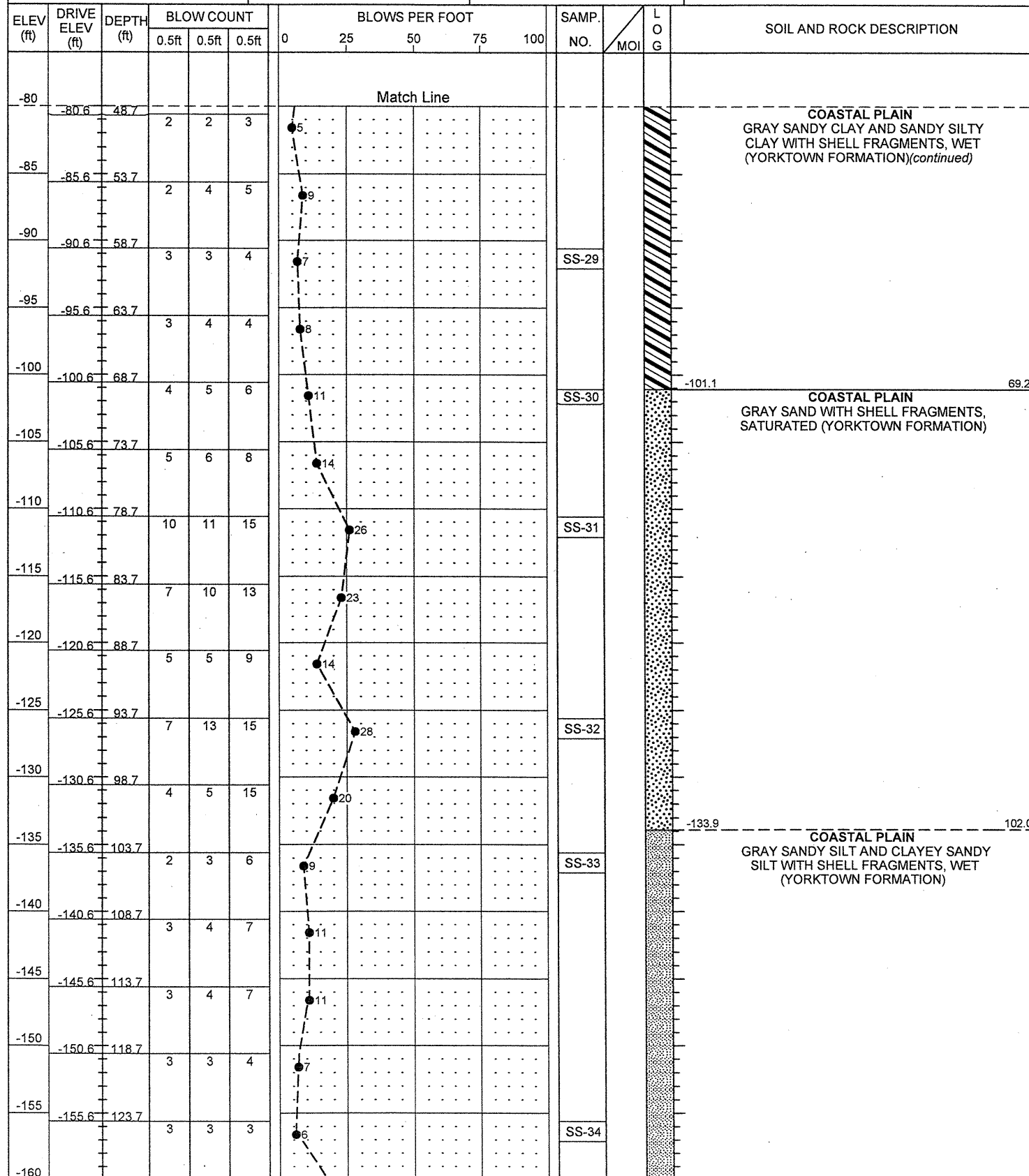
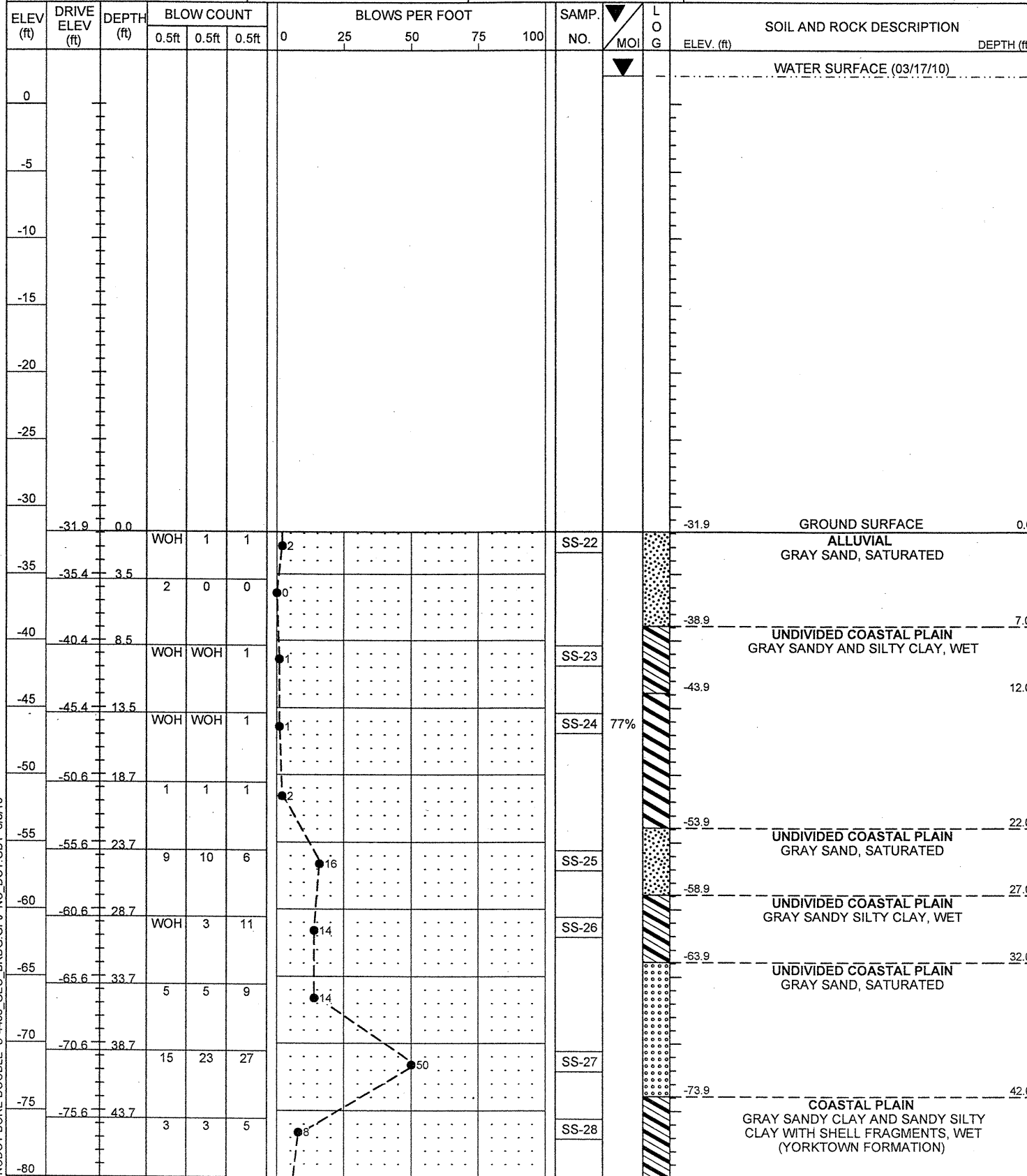


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B3-B	STATION 13+60	OFFSET 30 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -31.9 ft	TOTAL DEPTH 150.2 ft	NORTHING 940,018	EASTING 2,819,813
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 03/17/10	COMP. DATE 03/19/10	SURFACE WATER DEPTH 34.0ft

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B3-B	STATION 13+60	OFFSET 30 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -31.9 ft	TOTAL DEPTH 150.2 ft	NORTHING 940,018	EASTING 2,819,813
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 03/17/10	COMP. DATE 03/19/10	SURFACE WATER DEPTH 34.0ft



NCDOT BORE DOUBLE U-4438_GEO BRDG GPJ NC_DOT_GDT 6/3/10



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 35742.1.1		ID. U-4438		COUNTY Pasquotank		GEOLOGIST Swartley, J. R.											
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER							GROUND WTR (ft)										
BORING NO. B3-B		STATION 13+60		OFFSET 30 ft RT		ALIGNMENT -L1-											
COLLAR ELEV. -31.9 ft		TOTAL DEPTH 150.2 ft		NORTHING 940,018		EASTING 2,819,813											
DRILL MACHINE CME-550		DRILL METHOD Mud Rotary			HAMMER TYPE Automatic												
DRILLER MACTEC		START DATE 03/17/10		COMP. DATE 03/19/10		SURFACE WATER DEPTH 34.0ft											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
-160	-160.6	128.7				Match Line								COASTAL PLAIN GRAY SANDY SILT AND CLAYEY SANDY SILT WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)(continued)			
-165	-165.6	133.7	4	6	16	22											
-170	-170.6	138.7	3	3	6	9											
-175	-175.6	143.7	3	4	6	10											
-180	-180.6	148.7	2	2	4	6											
-180	-180.6	148.7	2	2	3	5											
-182.1																	
Boring Terminated at Elevation -182.1 ft in Medium Stiff Clayey Sandy Silt																	

NCDOT BORE DOUBLE U-4438 GEO BRDG.GPJ NC_DOT.GDT 6/3/10



PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Bradley, N.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B5-A	STATION 14+19	OFFSET 14 ft LT	ALIGNMENT -L1-
COLLAR ELEV. -36.5 ft	TOTAL DEPTH 129.2 ft	NORTHING 940,054	EASTING 2,819,878
DRILL MACHINE CME-750		DRILL METHOD Mud Rotary	
DRILLER S&ME		HAMMER TYPE Automatic	
START DATE 07/07/09		COMP. DATE 07/08/09	
SURFACE WATER DEPTH 38.0ft			

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
0															
-5															
-10															
-15															
-20															
-25															
-30															
-35															
-36.5	0.0														
-39.0	2.5		1	3	6										
-44.0	7.5		3	2	4										
-45			8	12	12						SS-1				
-49.2	12.7		1	2	2										
-54.2	17.7		1	1	5										
-59.2	22.7		2	1	1										
-64.2	27.7		17	17	21						SS-2				
-69.2	32.7		10	15	23										
-74.2	37.7		5	4	5										
-79.2	42.7														

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Bradley, N.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B5-A	STATION 14+19	OFFSET 14 ft LT	ALIGNMENT -L1-
COLLAR ELEV. -36.5 ft	TOTAL DEPTH 129.2 ft	NORTHING 940,054	EASTING 2,819,878
DRILL MACHINE CME-750		DRILL METHOD Mud Rotary	
DRILLER S&ME		HAMMER TYPE Automatic	
START DATE 07/07/09		COMP. DATE 07/08/09	
SURFACE WATER DEPTH 38.0ft			

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-80															
-85	-84.2	47.7	2	3	5										
-90	-89.2	52.7	3	3	4										
-95	-94.2	57.7	2	3	4										
-100	-99.2	62.7	3	4	4										
-105	-104.2	67.7	3	4	5										
-110	-109.2	72.7	5	7	9										
-115	-114.2	77.7	6	12	14										
-120	-119.2	82.7	6	9	13										
-125	-124.2	87.7	7	7	7										
-130	-129.2	92.7	8	14	11						SS-3				
-135	-134.2	97.7	6	4	6										
-140	-139.2	102.7	6	4	6										
-145	-144.2	107.7	3	3	8										
-150	-149.2	112.7	2	4	9										
-155	-154.2	117.7	2	3	6										
-160	-159.2	122.7	2	4	5										

NCDOT BORE DOUBLE U-4438 GEO BRDG.GPJ NC_DOT.GDT 6/3/10



**NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT**

PROJECT NO. 35742.1.1		ID. U-4438		COUNTY Pasquotank		GEOLOGIST Bradley, N.									
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER							GROUND WTR (ft)								
BORING NO. B5-A		STATION 14+19		OFFSET 14 ft LT		ALIGNMENT -L1-									
COLLAR ELEV. -36.5 ft		TOTAL DEPTH 129.2 ft		NORTHING 940,054		EASTING 2,819,878									
DRILL MACHINE CME-750		DRILL METHOD Mud Rotary				HAMMER TYPE Automatic									
DRILLER S&ME		START DATE 07/07/09		COMP. DATE 07/08/09		SURFACE WATER DEPTH 38.0ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-160															
-165	-164.2	127.7	3	4	6	10									
-165			2	5	7	12						SS-4			129.2
-170															
-175															
-180															
-185															
-190															
-195															
-200															
-205															
-210															
-215															
-220															
-225															
-230															
-235															
-240															

Match Line

COASTAL PLAIN
GRAY SANDY SILT WITH SHELL
FRAGMENTS, WET (YORKTOWN
FORMATION) (continued)

Boring Terminated at Elevation -165.7 ft in
Stiff Gray Sandy Silt

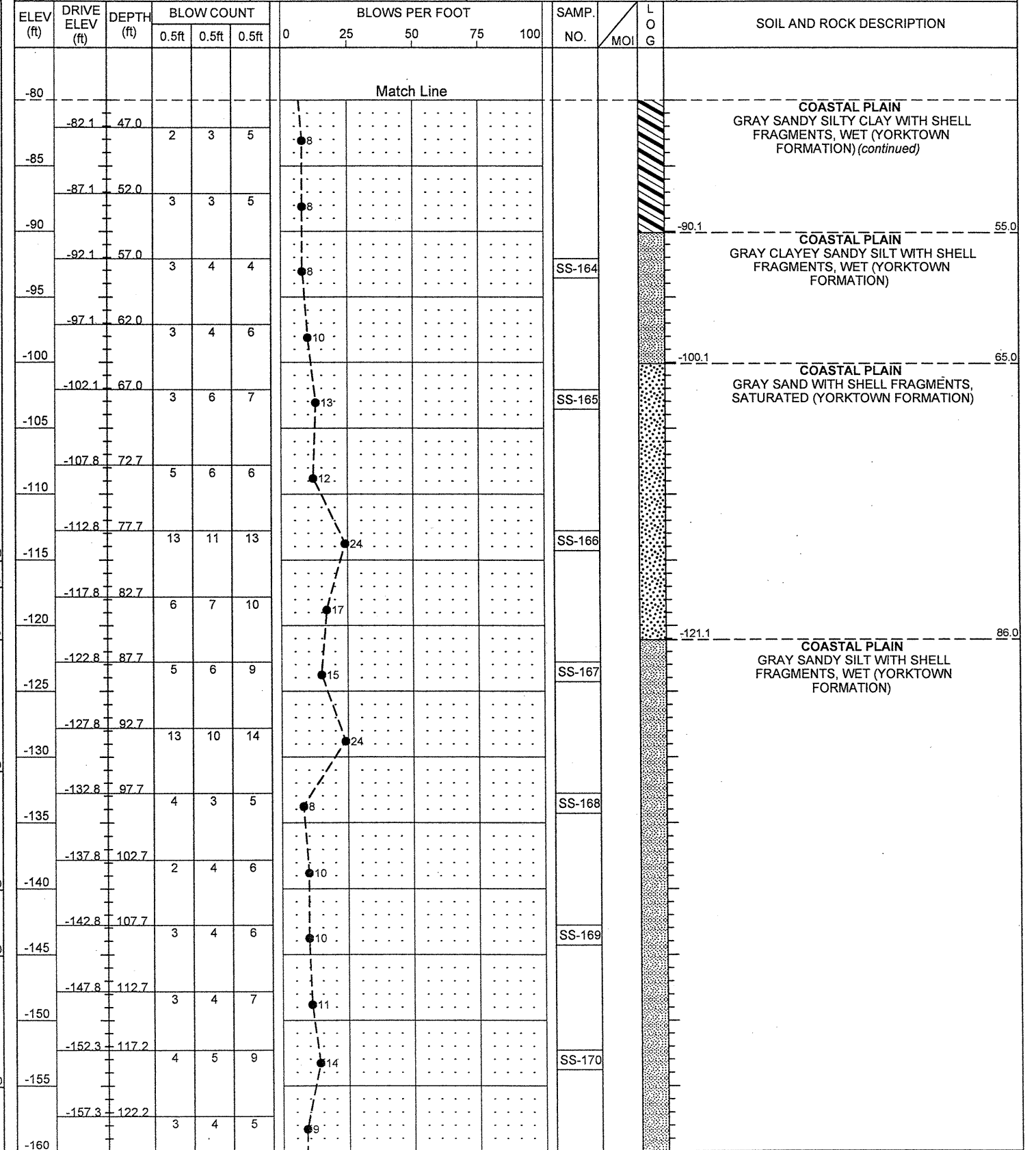
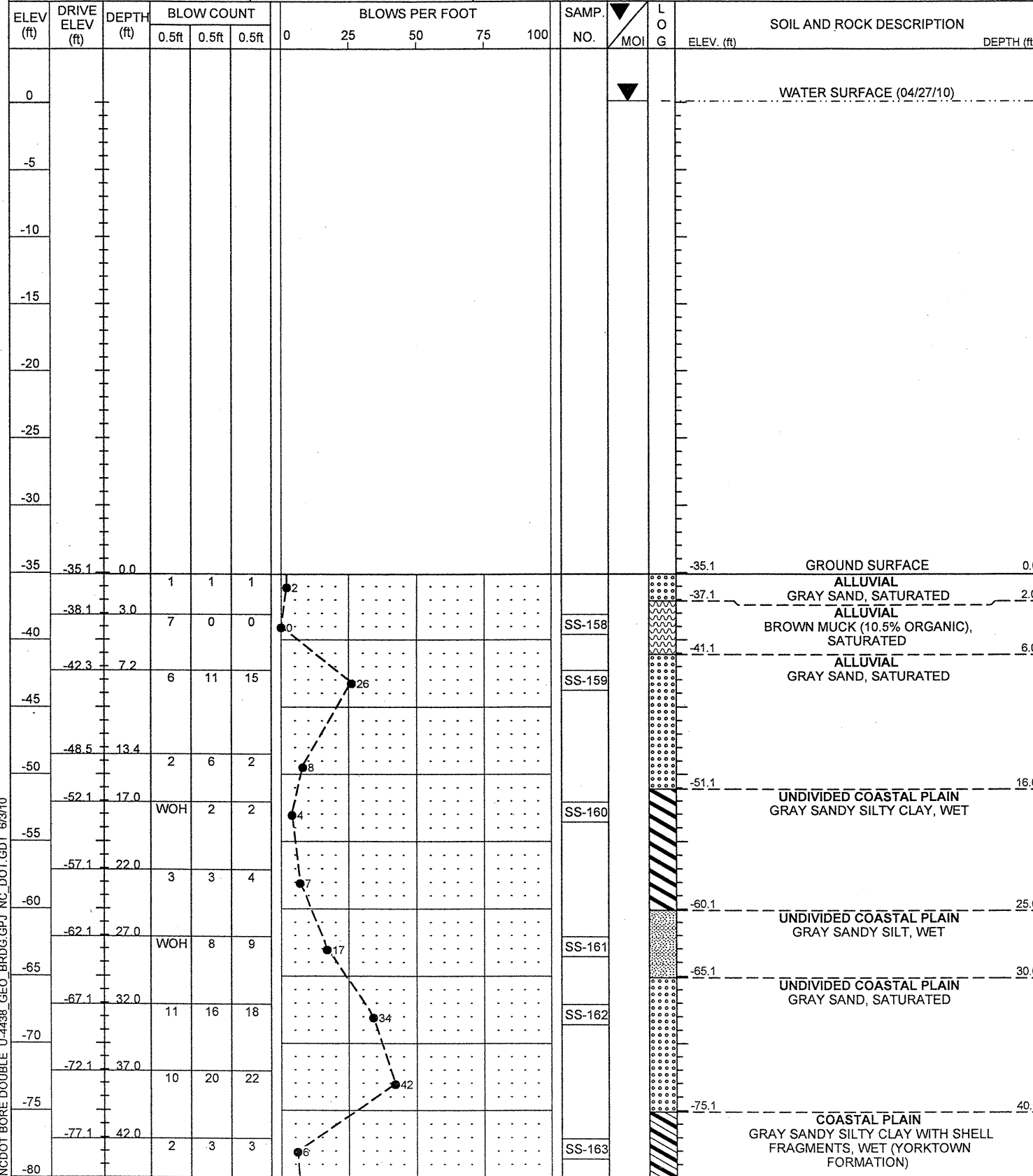
Log Converted from S&ME Project No.
1B.107011 Boring No. B-1

NCDOT BORE DOUBLE U-4438_GEO_BRDG.GPJ NC_DOT.GDT 6/3/10



PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B5-B	STATION 14+36	OFFSET 35 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -35.1 ft	TOTAL DEPTH 198.6 ft	NORTHING 940,003	EASTING 2,819,888
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/27/10	COMP. DATE 04/30/10	SURFACE WATER DEPTH 35.2ft

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B5-B	STATION 14+36	OFFSET 35 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -35.1 ft	TOTAL DEPTH 198.6 ft	NORTHING 940,003	EASTING 2,819,888
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/27/10	COMP. DATE 04/30/10	SURFACE WATER DEPTH 35.2ft



NCDOT BORE DOUBLE U-4438 GEO BRDG GPJ NC DOT GDT 6/3/10



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B5-B	STATION 14+36	OFFSET 35 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -35.1 ft	TOTAL DEPTH 198.6 ft	NORTHING 940,003	EASTING 2,819,888
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/27/10	COMP. DATE 04/30/10	SURFACE WATER DEPTH 35.2ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-160						Match Line									
-162.3	-127.2	127.2	4	4	5	1	1	1	1	1				COASTAL PLAIN GRAY SANDY SILT WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION) (continued)	
-167.3	-132.2	132.2	3	4	6	1	1	1	1	1					
-172.3	-137.2	137.2	3	4	6	1	1	1	1	1					
-177.5	-142.4	142.4	2	2	4	1	1	1	1	1					
-182.5	-147.4	147.4	3	3	6	1	1	1	1	1			SS-171		
-187.5	-152.4	152.4	3	6	12	1	1	1	1	1					
-192.5	-157.4	157.4	1	7	8	1	1	1	1	1			SS-172	COASTAL PLAIN GRAY SILTY CLAY AND SANDY SILTY CLAY WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)	-190.1
-197.5	-162.4	162.4	1	4	6	1	1	1	1	1					
-202.5	-167.4	167.4	2	3	5	1	1	1	1	1					
-207.5	-172.4	172.4	2	4	6	1	1	1	1	1			SS-173		
-212.5	-177.4	177.4	2	5	7	1	1	1	1	1					
-217.2	-182.1	182.1	3	3	7	1	1	1	1	1			SS-174		
-222.2	-187.1	187.1	1	3	6	1	1	1	1	1					
-227.2	-192.1	192.1	2	2	6	1	1	1	1	1			SS-175		
-232.2	-197.1	197.1	3	2	5	1	1	1	1	1					
-233.7														Boring Terminated at Elevation -233.7 ft in Medium Stiff Silty Clay	198.6

NCDOT BORE DOUBLE U-4438 GEO_BRDG.GPJ NC_DOT.GDT 6/3/10



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B6-B	STATION 16+16	OFFSET 39 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -16.6 ft	TOTAL DEPTH 201.6 ft	NORTHING 939,976	EASTING 2,820,066
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/20/10	COMP. DATE 04/22/10	SURFACE WATER DEPTH 16.7ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
0																
-5																
-10																
-15																
-16.6	-16.6	0.0														
-20			3	1	1											
-22.6		6.0														
-25			1	0	0											
-27.5		10.9														
-30			1	0	0											
-32.6		16.0	WOH	WOH	WOH											
-35																
-38.2		21.6	2	1	1											
-40																
-43.6		27.0	1	1	2											
-45																
-46.8		30.2	1	1	1											
-50																
-51.8		35.2	1	1	1											
-55																
-56.8		40.2	WOH	WOH	WOH											
-60																
-61.8		45.2	WOH	1	2											
-65																
-66.8		50.2	15	22	22											
-70																
-71.8		55.2	6	16	22											
-75																
-76.8		60.2	3	2	3											
-80																

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B6-B	STATION 16+16	OFFSET 39 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -16.6 ft	TOTAL DEPTH 201.6 ft	NORTHING 939,976	EASTING 2,820,066
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/20/10	COMP. DATE 04/22/10	SURFACE WATER DEPTH 16.7ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-80																
-81.8		65.2	2	3	3											
-85																
-86.8		70.2	3	3	5											
-90																
-91.7		75.1	3	3	5											
-95																
-96.7		80.1	3	3	4											
-100																
-101.7		85.1	5	4	7											
-105																
-106.7		90.1	5	4	5											
-110																
-111.7		95.1	8	10	14											
-115																
-116.7		100.1	7	6	8											
-120																
-121.7		105.1	10	11	11											
-125																
-126.7		110.1	51	60/0.1	100/0.6											
-130																
-131.7		115.1	4	5	6											
-135																
-136.7		120.1	4	4	6											
-140																
-141.7		125.1	3	3	5											
-145																
-146.7		130.1	2	3	4											
-150																
-151.7		135.1	3	4	6											
-155																
-156.7		140.1	2	2	3											
-160																

NCDOT BORE DOUBLE U-4438_GEO_BRDG.GPJ NC_DOT.GDT 6/3/10

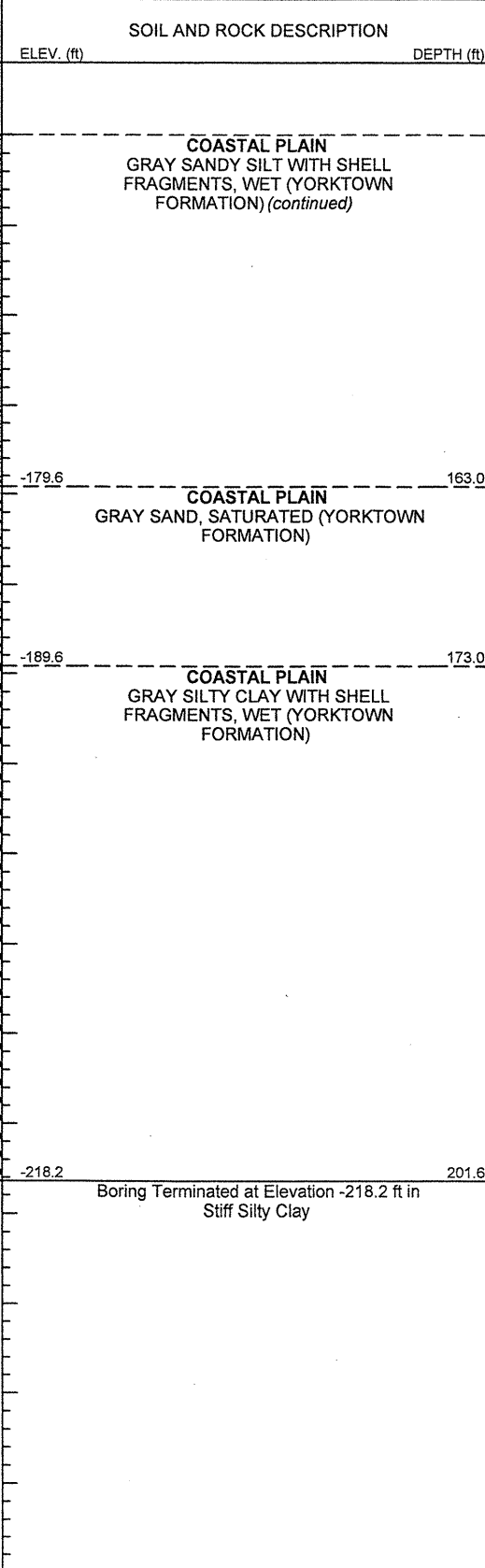


NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B6-B	STATION 16+16	OFFSET 39 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -16.6 ft	TOTAL DEPTH 201.6 ft	NORTHING 939,976	EASTING 2,820,066
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/20/10	COMP. DATE 04/22/10	SURFACE WATER DEPTH 16.7ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
-160	-161.7	145.1											COASTAL PLAIN GRAY SANDY SILT WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION) (continued)	
-165	-166.7	150.1	3	2	5									
-170	-171.7	155.1	3	4	4									
-175	-176.7	160.1	3	3	4									
-180	-176.7	160.1	2	1	4									
-185	-181.7	165.1	4	4	3									
-190	-186.7	170.1	2	2	5									
-195	-191.7	175.1	2	3	8									
-200	-196.7	180.1	2	3	7									
-205	-201.7	185.1	2	2	5									
-210	-206.7	190.1	WOH	3	6									
-215	-211.7	195.1	3	4	9									
-220	-216.7	200.1	3	3	8									
-225														
-230														
-235														
-240														

NCDOT BORE DOUBLE U-4438 GEO. BRDG.GPJ NC_DOT.GDT 6/3/10





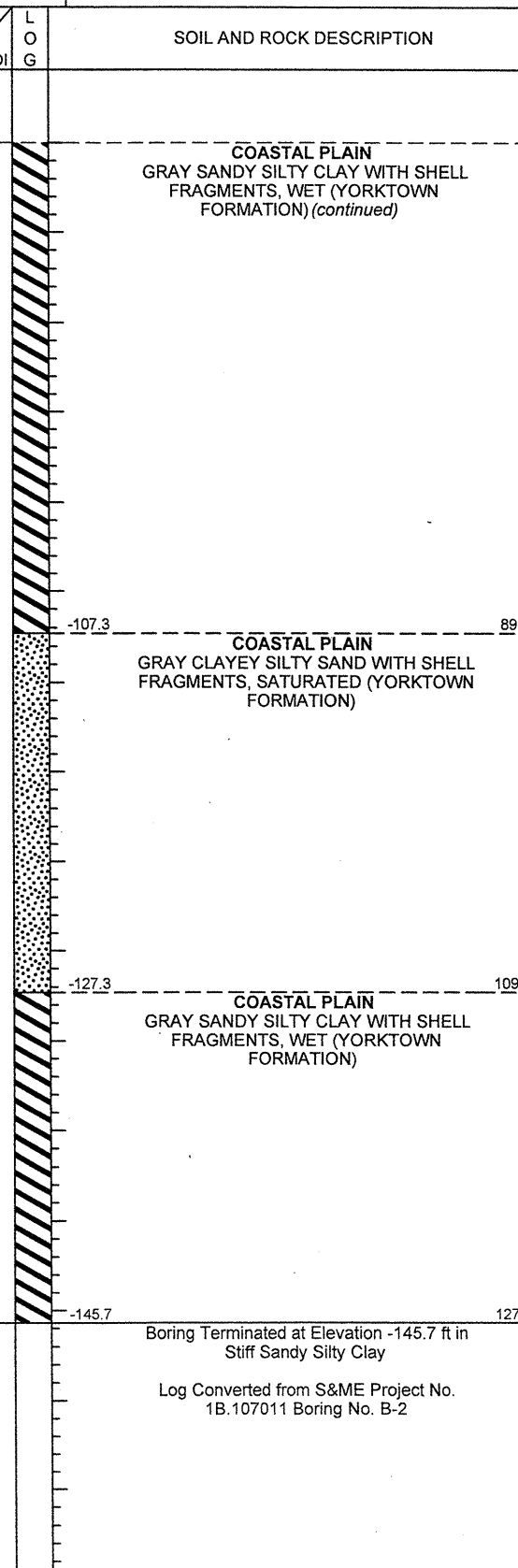
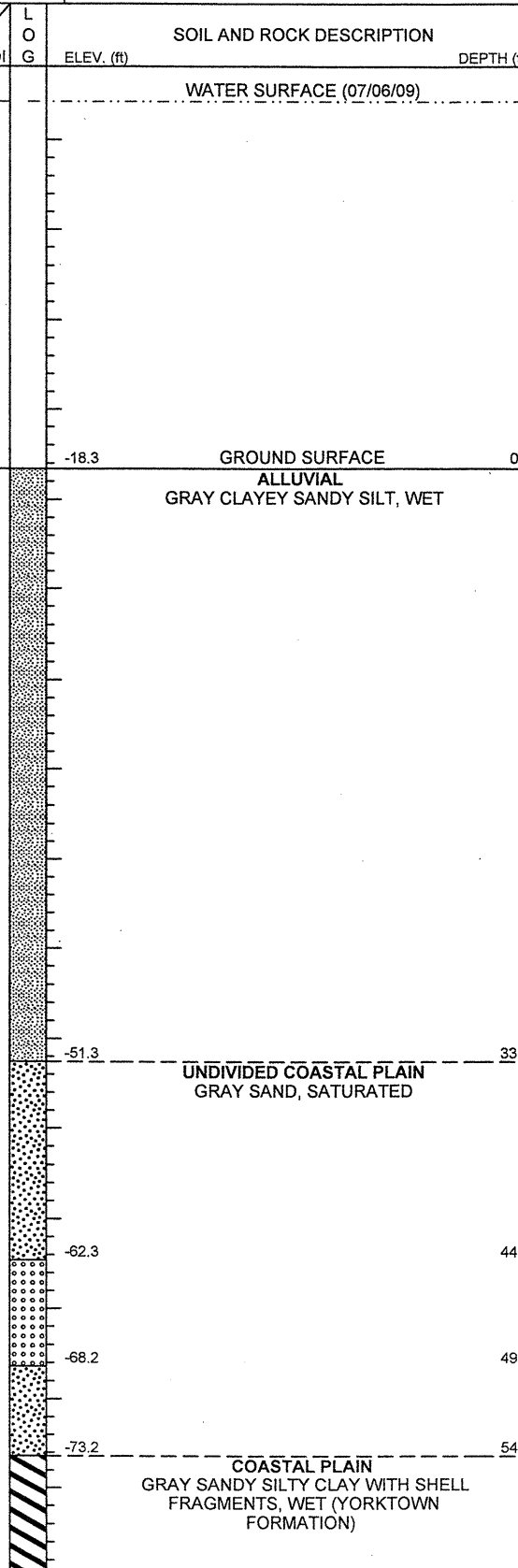
PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Bradley, N.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B7-C	STATION 16+46	OFFSET CL	ALIGNMENT -L1-
COLLAR ELEV. -18.3 ft	TOTAL DEPTH 127.4 ft	NORTHING 940,011	EASTING 2,820,101
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER S&ME	START DATE 07/06/09	COMP. DATE 07/07/09	SURFACE WATER DEPTH 20.4ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
0															
-5															
-10															
-15															
-18.3	0.0														
-20			WOR	WOR	WOR										
-23.8	5.5		WOR	WOR	WOR										
-25															
-28.8	10.5		WOH	1	0										
-30															
-33.8	15.5		WOH	1	1										
-35															
-38.8	20.5		WOH	1	2										
-40															
-43.8	25.5		1	1	1										
-45															
-49.2	30.9		1	1	1										
-50															
-54.2	35.9		2	2	1										
-55															
-59.2	40.9		12	13	7										
-60															
-64.2	45.9		15	25	26										
-65															
-69.2	50.9		1	1	6										
-70															
-74.2	55.9		2	3	2										
-75															
-79.2	60.9														
-80															

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Bradley, N.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B7-C	STATION 16+46	OFFSET CL	ALIGNMENT -L1-
COLLAR ELEV. -18.3 ft	TOTAL DEPTH 127.4 ft	NORTHING 940,011	EASTING 2,820,101
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER S&ME	START DATE 07/06/09	COMP. DATE 07/07/09	SURFACE WATER DEPTH 20.4ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-80			1	3	4										
-85	-84.2	65.9	2	3	4										
-90	-89.2	70.9	3	3	4										
-95	-94.2	75.9	3	4	6										
-100	-99.2	80.9	4	4	6										
-105	-104.2	85.9	6	4	7										
-110	-109.2	90.9	10	9	16										
-115	-114.2	95.9	11	18	21										
-120	-119.2	100.9	15	10	13										
-125	-124.2	105.9	3	8	13										
-130	-129.2	110.9	3	5	9										
-135	-134.2	115.9	4	5	10										
-140	-139.2	120.9	3	4	12										
-145	-144.2	125.9	3	4	6										
-150															
-155															
-160															

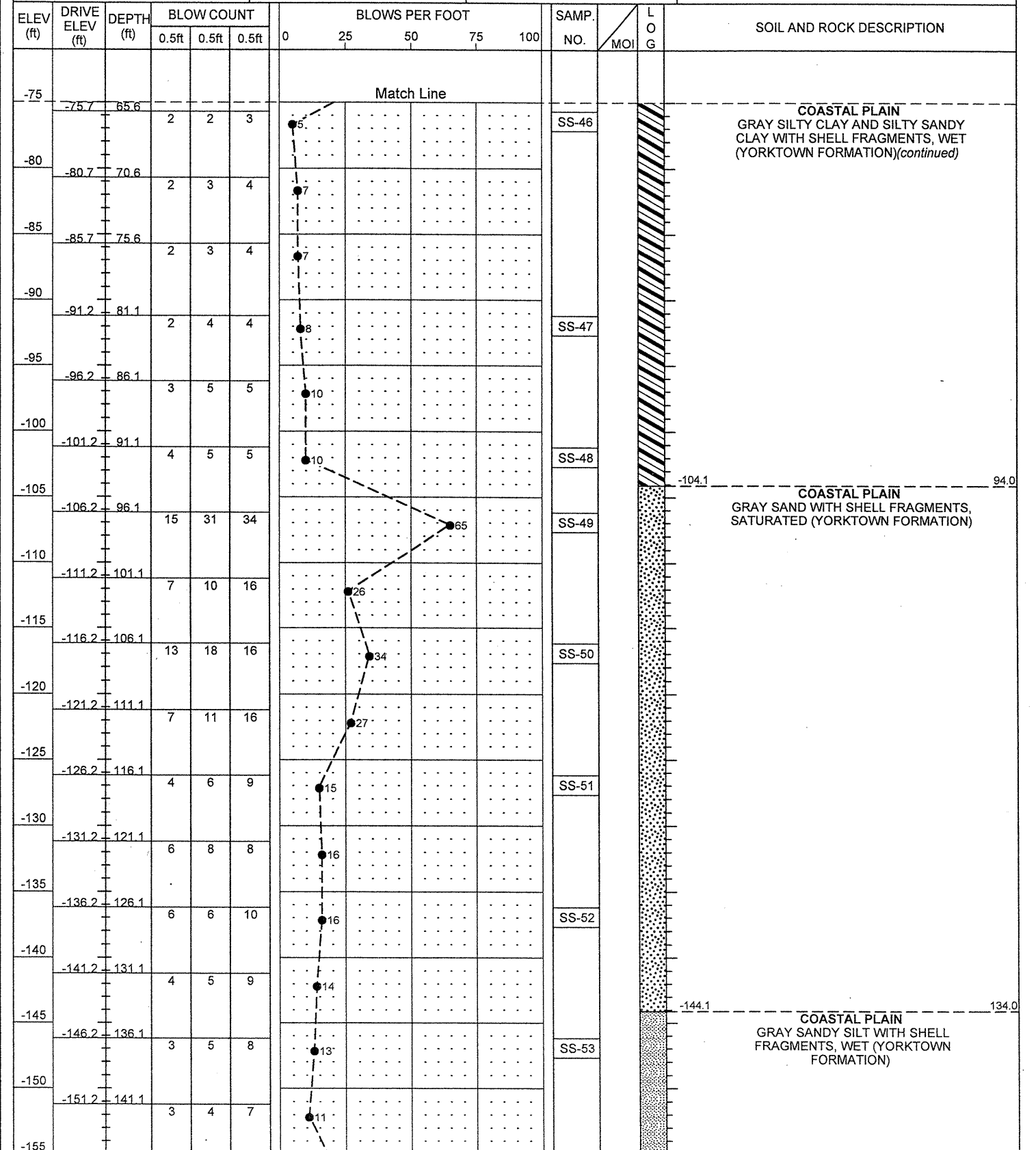
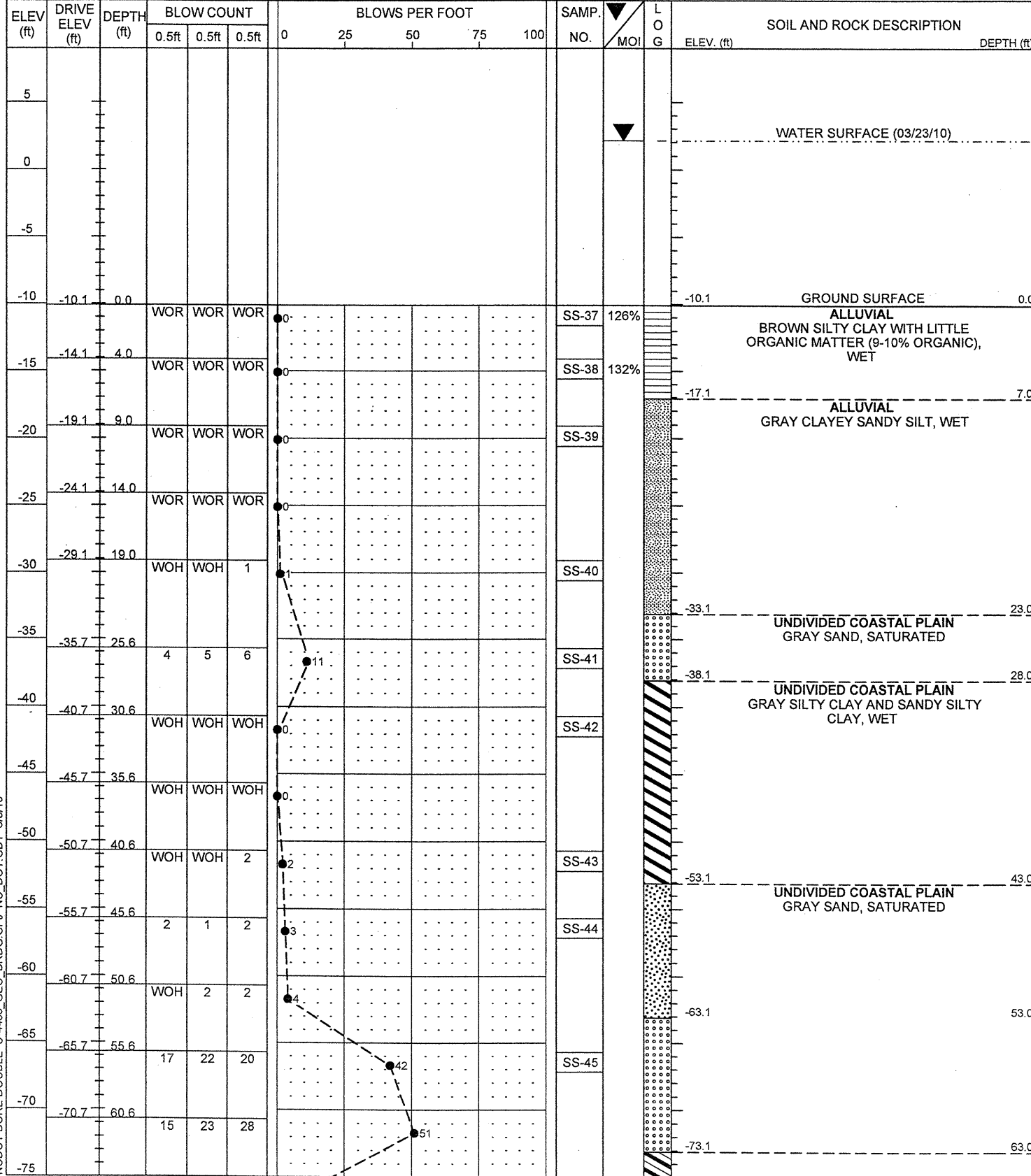
NCDOT BORE DOUBLE U-4438_GEO_BRDG.GPJ NC_DOT.GDT 6/3/10



Log Converted from S&ME Project No. 1B.107011 Boring No. B-2

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B8-B	STATION 16+95	OFFSET 39 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -10.1 ft	TOTAL DEPTH 152.6 ft	NORTHING 939,966	EASTING 2,820,144
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 03/23/10	COMP. DATE 03/24/10	SURFACE WATER DEPTH 12.2ft

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B8-B	STATION 16+95	OFFSET 39 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -10.1 ft	TOTAL DEPTH 152.6 ft	NORTHING 939,966	EASTING 2,820,144
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 03/23/10	COMP. DATE 03/24/10	SURFACE WATER DEPTH 12.2ft



NCDOT BORE DOUBLE U-4438 GEO_BRDG.GPJ NC_DOT.GDT 6/23/10



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 35742.1.1		ID. U-4438		COUNTY Pasquotank		GEOLOGIST Wrike, C. M.								
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER							GROUND WTR (ft)							
BORING NO. B8-B		STATION 16+95		OFFSET 39 ft RT		ALIGNMENT -L1-								
COLLAR ELEV. -10.1 ft		TOTAL DEPTH 152.6 ft		NORTHING 939,966		EASTING 2,820,144								
DRILL MACHINE CME-550		DRILL METHOD Mud Rotary			HAMMER TYPE Automatic									
DRILLER MACTEC		START DATE 03/23/10		COMP. DATE 03/24/10		SURFACE WATER DEPTH 12.2ft								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)
-155														
	-156.2	146.1												
			8	9	14									
-160														
	-161.2	151.1												
			3	4	4									
-165														
-170														
-175														
-180														
-185														
-190														
-195														
-200														
-205														
-210														
-215														
-220														
-225														
-230														
-235														

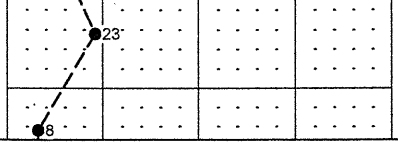
NCDOT BORE DOUBLE U-4438 GEO. BRDG.GPJ NC_DOT.GDT 6/3/10

Match Line

COASTAL PLAIN
 GRAY SANDY SILT WITH SHELL
 FRAGMENTS, WET (YORKTOWN
 FORMATION) (continued)

Boring Terminated at Elevation -162.7 ft in
 Stiff Sandy Silt

SS-54



NC DOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

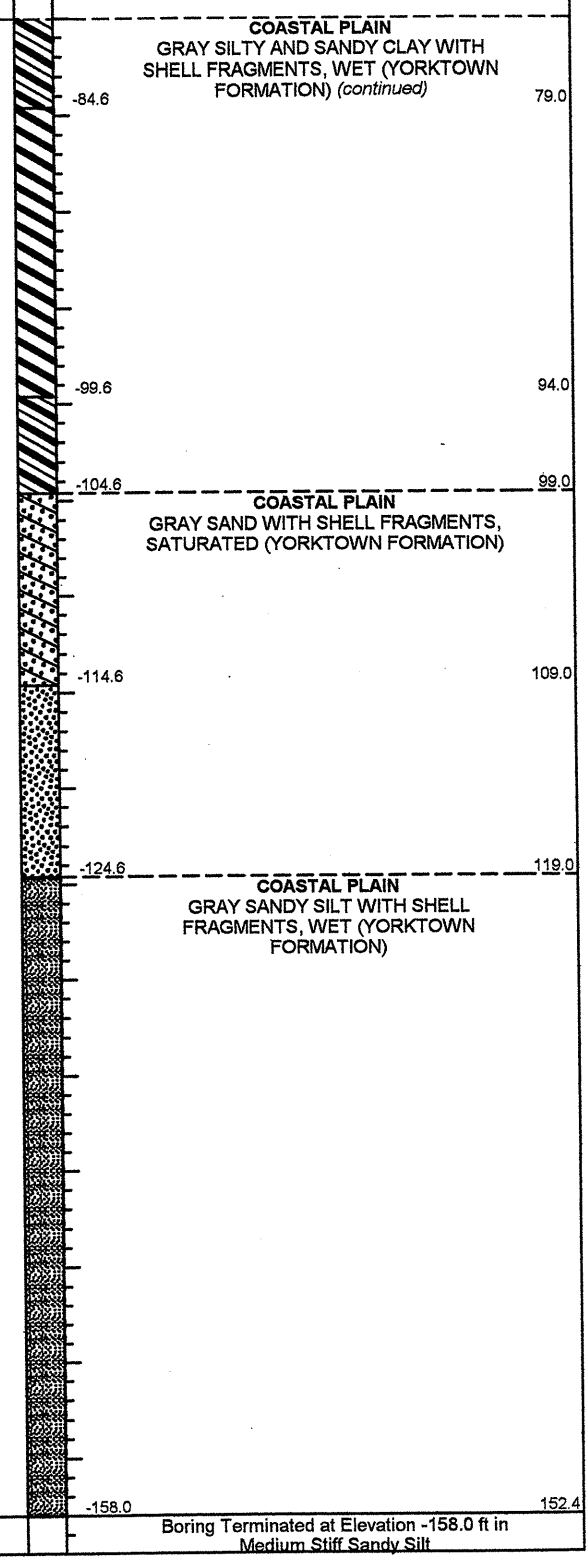
PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B9-B	STATION 17+60	OFFSET 21 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -5.6 ft	TOTAL DEPTH 152.4 ft	NORTHING 939,975	EASTING 2,820,211
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/23/10	COMP. DATE 04/27/10	SURFACE WATER DEPTH 5.8ft

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B9-B	STATION 17+60	OFFSET 21 ft RT	ALIGNMENT -L1-
COLLAR ELEV. -5.6 ft	TOTAL DEPTH 152.4 ft	NORTHING 939,975	EASTING 2,820,211
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/23/10	COMP. DATE 04/27/10	SURFACE WATER DEPTH 5.8ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
0															
-5	-5.6	0.0													
-10	-12.5	6.9	WOR	WOR	WOR										
-15	-17.5	11.9	WOH	WOH	WOH						SS-142	134%			
-20	-22.5	16.9	WOH	WOH	WOH						SS-143				
-25	-27.5	21.9	WOH	WOH	WOH						SS-144				
-30	-33.9	28.3	WOH	3	7						SS-145				
-35	-37.0	31.4		1	5	8									
-40	-42.0	36.4		2	2	1					SS-146				
-45	-47.0	41.4	WOH	WOH	WOH										
-50	-52.0	46.4	WOH	WOH	2						SS-147				
-55	-57.0	51.4		1	1	1									
-60	-62.0	56.4	WOH	2	6						SS-148				
-65	-67.0	61.4		14	20	23					SS-149				
-70	-71.6	66.0		17	28	30									
-75	-76.6	71.0		2	2	3					SS-150				

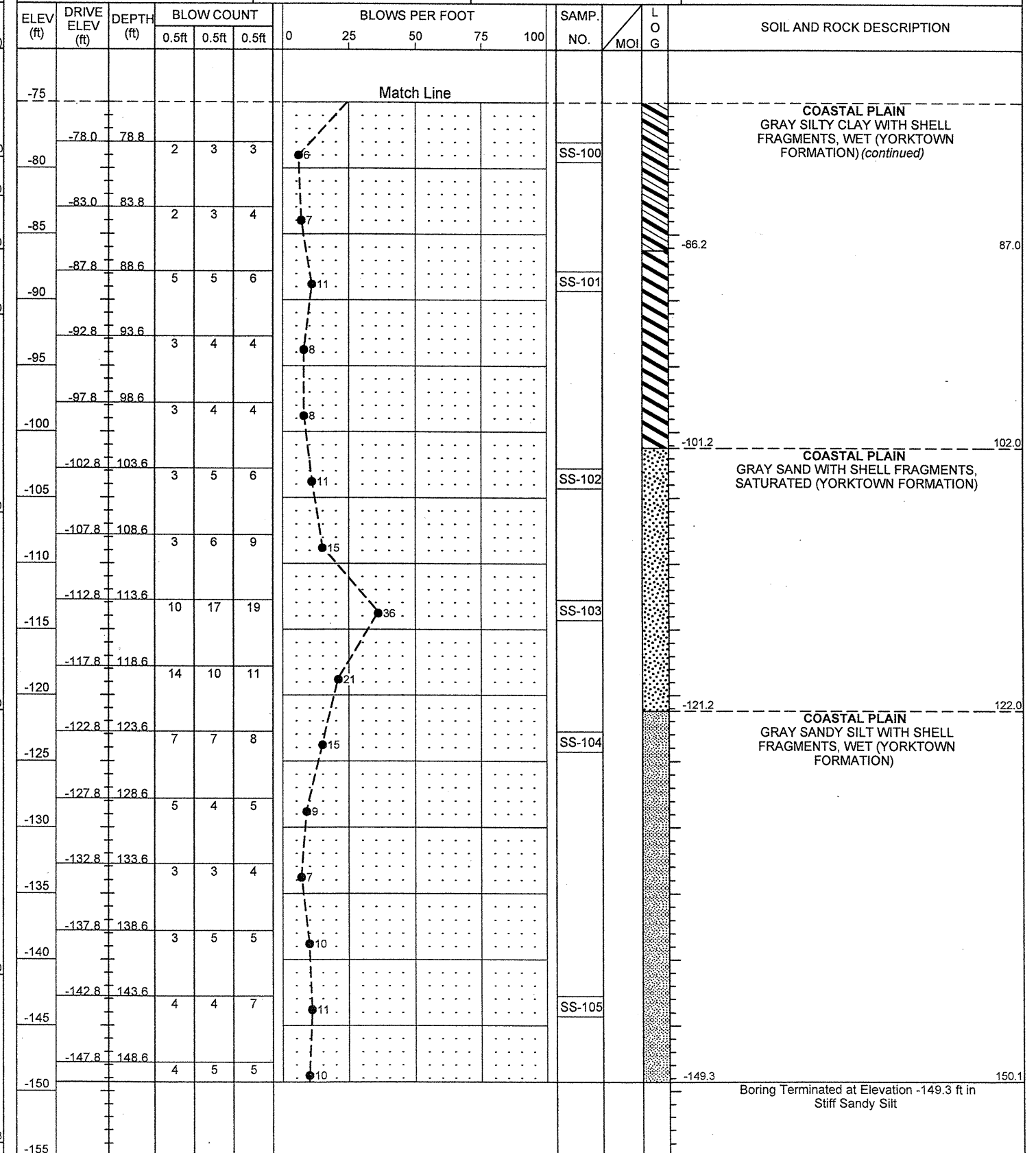
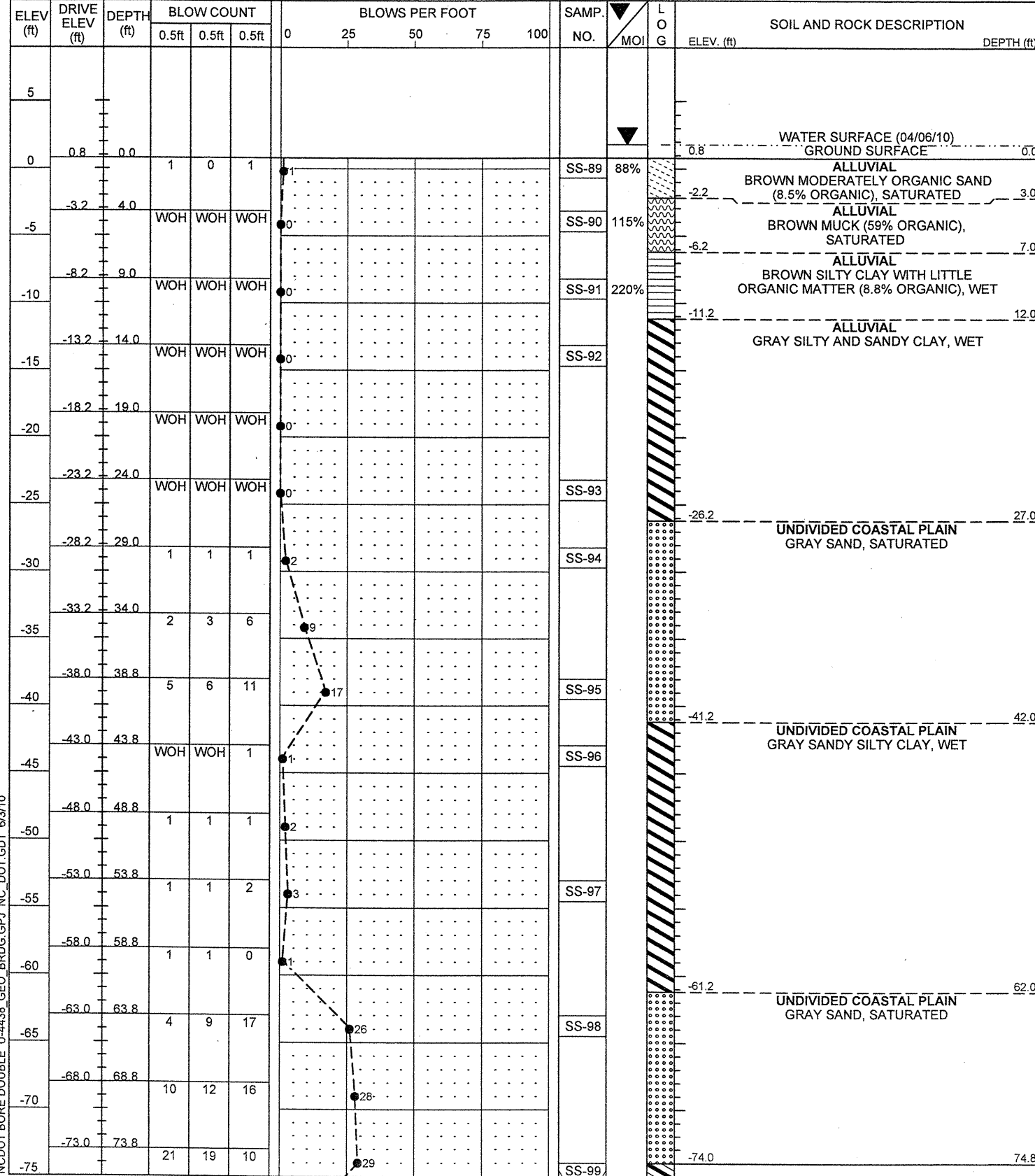
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-80															
-85	-81.6	76.0		2	3	4									
-90	-86.6	81.0		2	3	3					SS-151				
-95	-91.6	86.0		3	3	5									
-100	-96.6	91.0		2	4	5									
-105	-101.6	96.0		2	3	5					SS-152				
-110	-106.6	101.0		5	6	17					SS-153				
-115	-111.6	106.0		17	13	12									
-120	-116.6	111.0		20	21	22					SS-154				
-125	-121.5	115.9		7	13	15									
-130	-126.5	120.9		7	8	11					SS-155				
-135	-131.5	125.9		4	6	8									
-140	-136.5	130.9		4	4	6					SS-156				
-145	-141.5	135.9		3	3	4									
-150	-146.5	140.9		3	3	4					SS-157				
-155	-151.5	145.9		5	7	7									
-160	-156.5	150.9		3	3	3									

NC DOT BORE DOUBLE U-4438_GEO_BRDG.GPJ NC_DOT.GDT 6/3/10



PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B12-B	STATION 18+73	OFFSET 2 ft RT	ALIGNMENT -L1-
COLLAR ELEV. 0.8 ft	TOTAL DEPTH 150.1 ft	NORTHING 939,979	EASTING 2,820,326
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/06/10	COMP. DATE 04/07/10	SURFACE WATER DEPTH 1.0ft

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B12-B	STATION 18+73	OFFSET 2 ft RT	ALIGNMENT -L1-
COLLAR ELEV. 0.8 ft	TOTAL DEPTH 150.1 ft	NORTHING 939,979	EASTING 2,820,326
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/06/10	COMP. DATE 04/07/10	SURFACE WATER DEPTH 1.0ft



NCDOT BORE DOUBLE U-4438 GEO_BRDG.GPJ NC_DOT.GDT 6/3/10

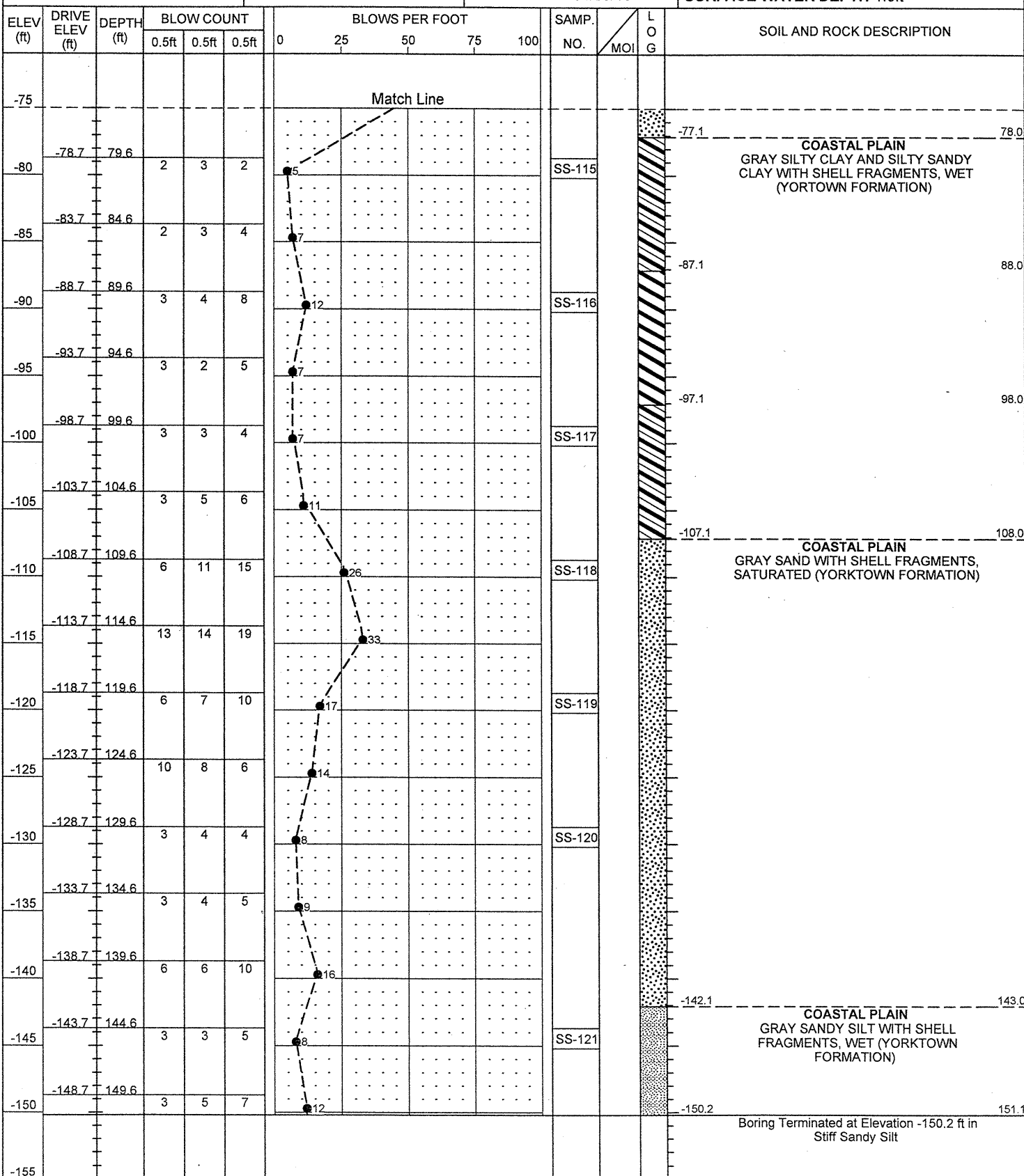
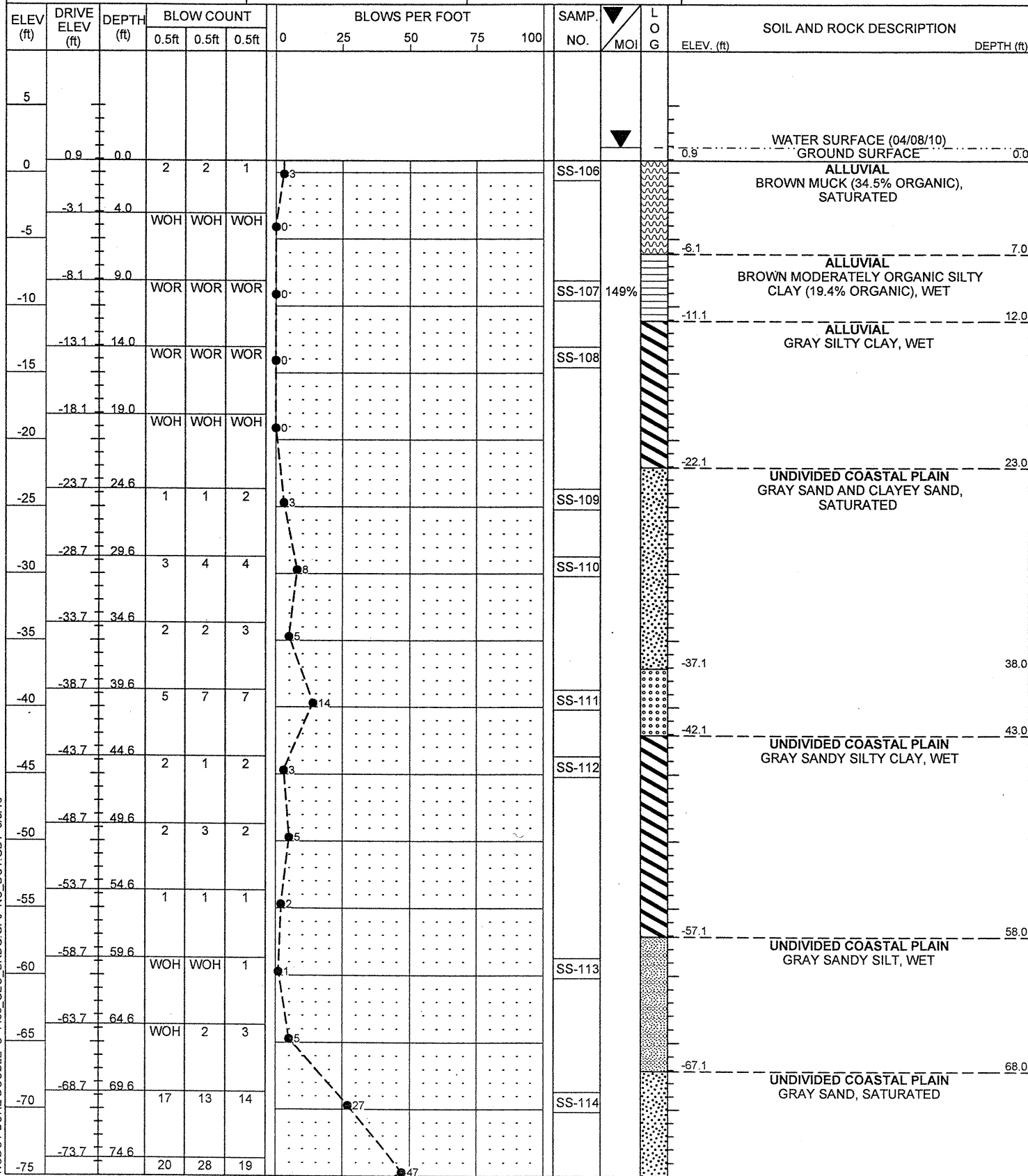


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B14-B	STATION 19+65	OFFSET 3 ft RT	ALIGNMENT -L1-
COLLAR ELEV. 0.9 ft	TOTAL DEPTH 151.1 ft	NORTHING 939,967	EASTING 2,820,417
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/08/10	COMP. DATE 04/08/10	SURFACE WATER DEPTH 1.0ft

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. B14-B	STATION 19+65	OFFSET 3 ft RT	ALIGNMENT -L1-
COLLAR ELEV. 0.9 ft	TOTAL DEPTH 151.1 ft	NORTHING 939,967	EASTING 2,820,417
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/08/10	COMP. DATE 04/08/10	SURFACE WATER DEPTH 1.0ft



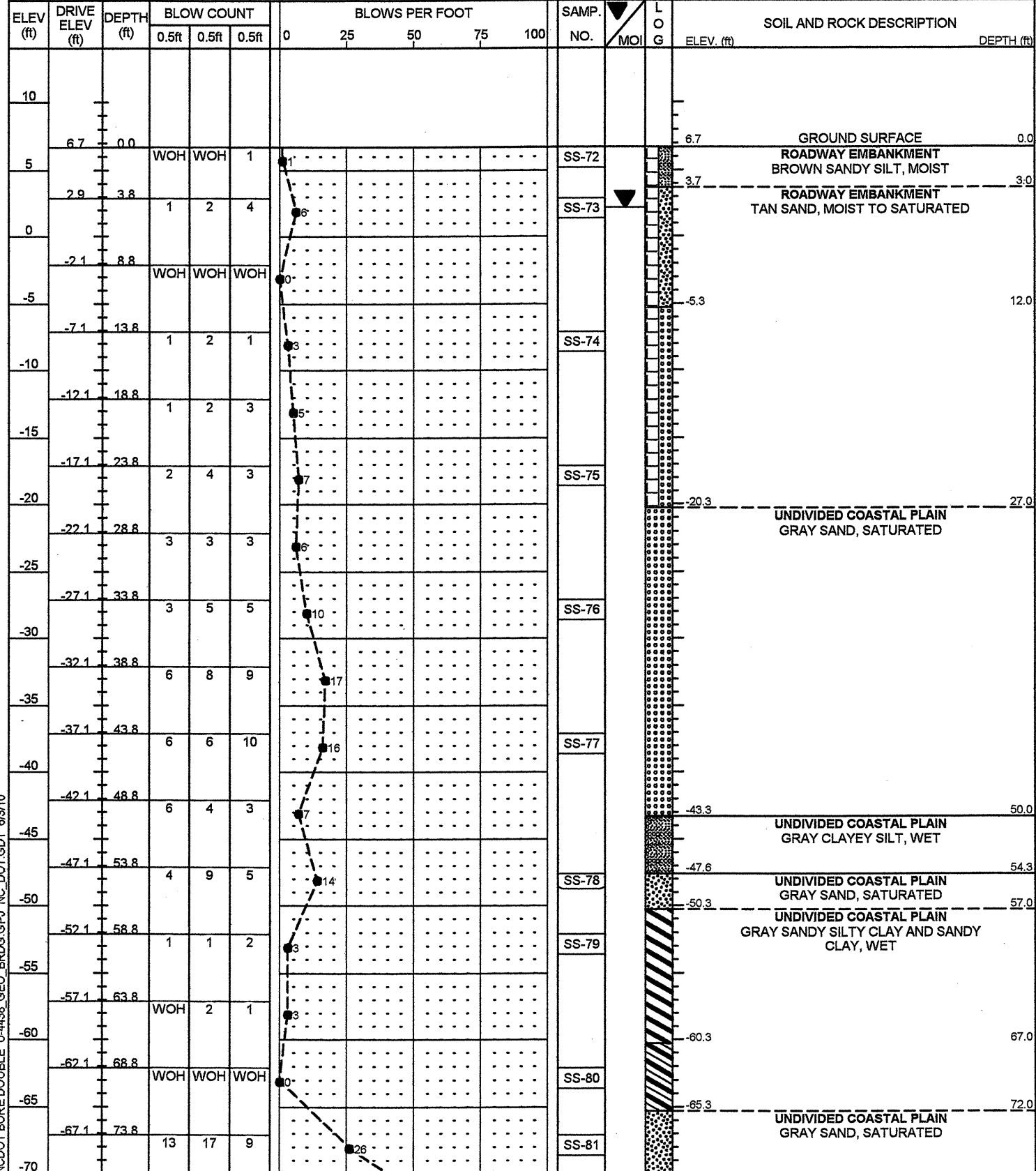
NCDOT BORE DOUBLE U-4438 GEO BRDG G.P.I. NC_DOT_GDT 6/3/10



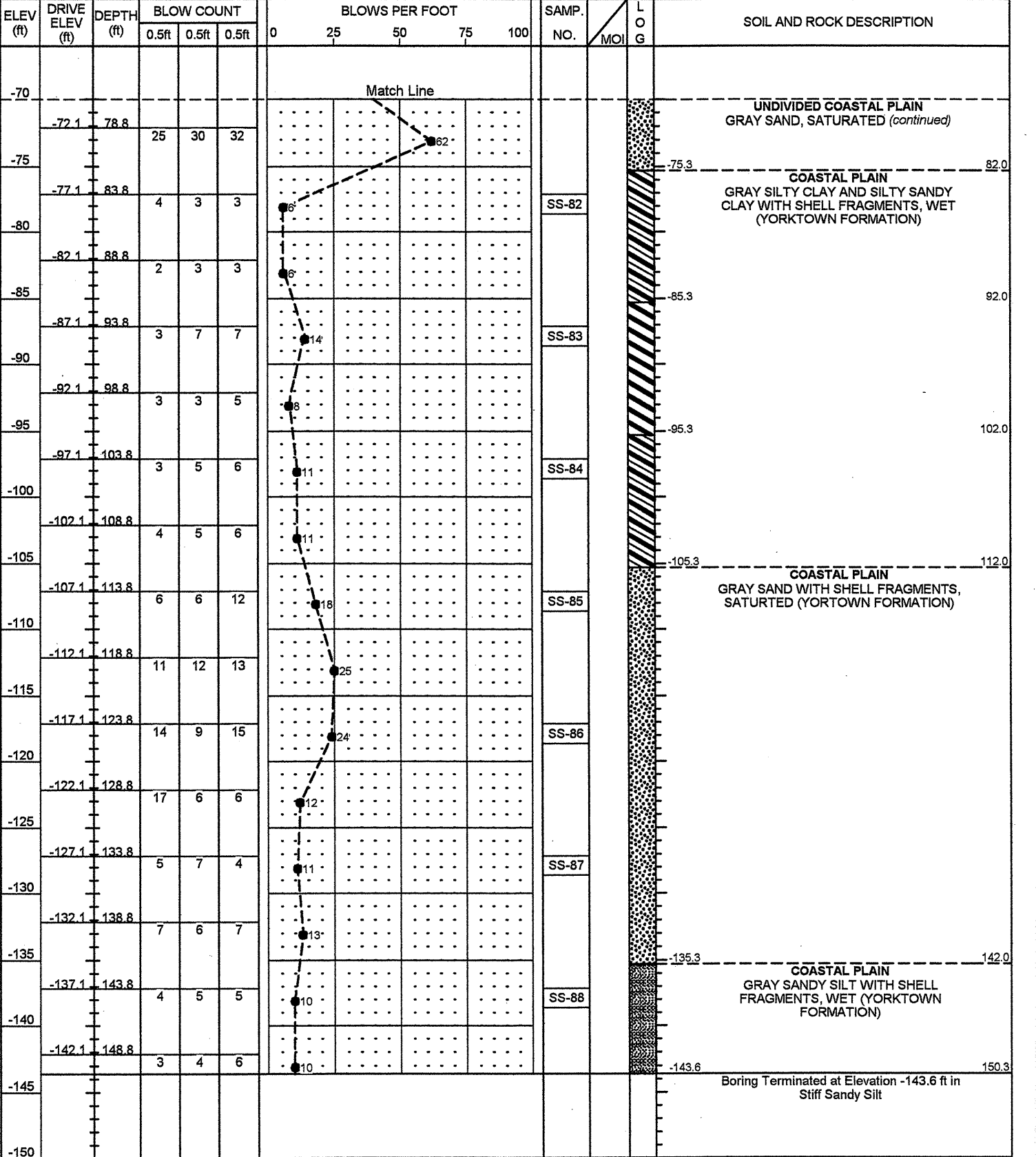
NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. EB2-A	STATION 20+51	OFFSET 23 ft LT	ALIGNMENT -L1-
COLLAR ELEV. 6.7 ft	TOTAL DEPTH 150.3 ft	NORTHING 939,981	EASTING 2,820,505
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/01/10	COMP. DATE 04/05/10	SURFACE WATER DEPTH N/A



PROJECT NO. 35742.1.1	ID. U-4438	COUNTY Pasquotank	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 19 ON -L1- (US 158/ NC34) OVER PASQUOTANK RIVER			GROUND WTR (ft)
BORING NO. EB2-A	STATION 20+51	OFFSET 23 ft LT	ALIGNMENT -L1-
COLLAR ELEV. 6.7 ft	TOTAL DEPTH 150.3 ft	NORTHING 939,981	EASTING 2,820,505
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER MACTEC	START DATE 04/01/10	COMP. DATE 04/05/10	SURFACE WATER DEPTH N/A



NCDOT BOREDOUBLE U-4438 GEO_BROD.GPJ NC DOT GDT 6/3/10

EB1-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-55	38 RT	12+10	1.0-1.5	A-3(0)	17	NP	44.2	48.7	3.1	4.1	100	86	10	-	-
SS-56	38 RT	12+10	3.8-5.3	A-4(7)	28	10	5.3	17.3	44.9	32.6	100	98	87	-	4.5
SS-57	38 RT	12+10	18.7-20.2	A-7-5(17)	65	26	13.0	25.2	23.1	38.7	100	96	64	-	-
SS-58	38 RT	12+10	23.7-25.2	A-7-6(23)	45	25	0.4	21.6	29.2	48.8	100	100	87	-	-
SS-59	38 RT	12+10	33.7-35.2	A-4(7)	32	8	0.2	36.0	35.3	28.5	100	100	86	-	-
SS-60	38 RT	12+10	43.7-45.2	A-6(11)	37	21	8.7	31.3	25.3	34.6	98	94	64	-	-
SS-61	38 RT	12+10	53.7-55.2	A-7-6(26)	46	25	0.2	15.5	39.6	44.8	100	100	95	-	-
SS-62	38 RT	12+10	63.7-65.2	A-2-4(0)	18	NP	29.4	61.3	5.2	4.1	100	98	13	-	-
SS-63	38 RT	12+10	73.7-75.2	A-2-4(0)	21	NP	12.8	70.2	7.8	9.2	100	96	23	-	-
SS-64	38 RT	12+10	78.7-80.2	A-6(21)	40	22	0.2	18.5	40.6	40.7	100	100	92	-	-
SS-65	38 RT	12+10	88.7-90.2	A-7-6(28)	48	26	0.8	5.5	51.0	42.7	100	99	97	-	-
SS-66	38 RT	12+10	98.7-100.2	A-6(4)	30	15	7.7	48.2	15.6	28.5	93	88	50	-	-
SS-67	38 RT	12+10	108.7-110.2	A-4(1)	29	10	20.1	44.2	17.4	18.3	97	87	40	-	-
SS-68	38 RT	12+10	113.7-115.2	A-2-4(0)	25	2	24.8	49.7	11.2	14.2	96	89	27	-	-
SS-69	38 RT	12+10	123.7-125.2	A-2-4(0)	26	4	18.1	47.4	18.2	16.3	90	80	35	-	-
SS-70	38 RT	12+10	133.7-135.2	A-2-4(0)	22	NP	18.7	51.5	14.5	15.3	95	86	31	-	-
SS-71	38 RT	12+10	143.7-145.2	A-2-4(0)	26	1	10.0	60.3	14.4	15.3	98	96	34	-	-

B2-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-1A	39 RT	12+82	1.0-1.5	A-7-5(35)	65	32	6.0	2.8	41.7	49.4	100	95	92	35.4	-
SS-2A	39 RT	12+82	7.9-9.4	A-7-6(16)	53	31	17.9	15.9	28.8	37.4	88	81	59	28.6	-
SS-3A	39 RT	12+82	17.3-18.8	A-3(0)	21	NP	34.4	62.9	2.7	0.0	100	89	4	-	-
SS-4A	39 RT	12+82	23.7-25.2	A-6(13)	37	16	0.8	32.2	37.7	29.3	100	99	84	-	-
SS-5A	39 RT	12+82	33.7-35.2	A-7-6(25)	45	25	1.6	22.9	44.1	31.4	100	100	93	-	-
SS-6A	39 RT	12+82	43.7-45.2	A-2-4(0)	21	NP	5.6	71.2	14.0	9.2	100	100	34	-	-
SS-7A	39 RT	12+82	48.7-50.2	A-6(12)	34	15	0.6	32.6	45.5	21.3	100	100	83	-	-
SS-8A	39 RT	12+82	53.7-55.2	A-3(0)	17	NP	66.3	25.9	6.5	1.2	98	63	10	-	-
SS-9	39 RT	12+82	63.7-65.2	A-6(14)	35	16	1.2	25.7	43.7	29.3	96	95	88	-	-
SS-10	39 RT	12+82	73.7-75.2	A-7-6(31)	50	31	2.0	9.6	48.9	39.4	100	98	93	-	-
SS-11	39 RT	12+82	83.2-84.7	A-6(11)	38	21	3.4	41.6	23.6	31.4	96	94	65	-	-
SS-12	39 RT	12+82	93.0-94.5	A-2-4(0)	31	8	35.2	46.4	11.2	7.2	90	77	19	-	-
SS-13	39 RT	12+82	98.0-99.5	A-2-4(0)	23	NP	27.1	40.6	13.0	19.3	90	79	33	-	-
SS-14	39 RT	12+82	104.3-105.8	A-2-4(0)	24	4	22.5	43.9	21.5	12.1	91	80	34	-	-
SS-15	39 RT	12+82	114.3-115.8	A-4(0)	23	3	11.1	54.7	18.1	16.1	97	92	38	-	-
SS-16	39 RT	12+82	124.3-125.8	A-4(0)	25	2	9.9	55.1	16.9	18.1	94	90	38	-	-
SS-17	39 RT	12+82	134.6-136.1	A-4(0)	26	2	5.4	65.0	13.5	16.1	99	98	39	-	-
SS-18	39 RT	12+82	144.6-146.1	A-4(0)	26	2	2.6	63.8	15.5	18.1	100	100	47	-	-
SS-19	39 RT	12+82	154.6-156.1	A-4(0)	26	3	4.8	59.6	17.5	18.1	99	97	47	-	-
SS-20	39 RT	12+82	164.9-166.4	A-4(1)	28	5	3.8	52.7	21.3	22.1	100	99	59	-	-
SS-21	39 RT	12+82	174.9-176.4	A-4(0)	25	4	10.9	50.3	18.7	20.1	97	91	50	-	-

B3-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-22	30 RT	13+60	1.0-1.5	A-2-4(0)	21	NP	30.4	61.0	2.6	6.0	100	91	13	-	-
SS-23	30 RT	13+60	8.5-10.0	A-6(10)	38	22	15.9	32.8	17.1	34.2	100	94	58	-	-
SS-24	30 RT	13+60	13.5-15.0	A-7-6(29)	49	27	0.8	13.5	37.4	48.3	100	100	96	76.7	-
SS-25	30 RT	13+60	23.7-25.2	A-2-4(0)	23	NP	9.1	79.3	5.6	6.0	100	100	19	-	-
SS-26	30 RT	13+60	28.7-30.2	A-6(11)	34	15	1.2	30.0	40.6	28.2	100	100	81	-	-
SS-27	30 RT	13+60	38.7-40.2	A-3(0)	19	NP	68.2	27.8	2.0	2.0	94	60	5	-	-
SS-28	30 RT	13+60	43.7-45.2	A-6(15)	36	18	1.2	25.6	39.0	34.2	99	98	86	-	-
SS-29	30 RT	13+60	58.7-60.2	A-6(6)	29	11	5.2	41.2	7.2	46.3	99	96	70	-	-
SS-30	30 RT	13+60	69.2-70.2	A-2-4(0)	24	NP	26.2	54.7	5.0	14.1	95	76	22	-	-
SS-31	30 RT	13+60	78.7-80.2	A-2-4(0)	25	NP	41.6	41.4	6.8	10.1	88	67	17	-	-
SS-32	30 RT	13+60	93.7-95.2	A-2-4(0)	21	1	33.4	35.4	15.1	16.1	91	72	31	-	-
SS-33	30 RT	13+60	103.7-105.2	A-4(0)	24	5	11.3	50.9	21.7	16.1	93	89	40	-	-
SS-34	30 RT	13+60	123.7-125.2	A-4(0)	26	3	3.6	62.8	15.5	18.1	99	98	44	-	-
SS-35	30 RT	13+60	133.7-135.2	A-4(0)	26	3	4.4	57.9	19.5	18.1	99	98	49	-	-
SS-36	30 RT	13+60	148.7-150.2	A-4(0)	25	1	7.6	56.5	15.7	20.1	98	94	47	-	-

B5-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-1	14 LT	14+19	7.5-9.0	A-3(0)	21	NP	23.0	73.0	3.0	1.0	100	96	6.1	-	-
SS-2	14 LT	14+19	27.7-29.2	A-2-4(0)	20	NP	44.0	47.0	5.0	4.0	97	73	12.7	-	-
SS-3	14 LT	14+19	87.7-89.2	A-2-4(0)	28	4	13.0	55.0	17.0	15.0	88	81	35.1	-	-
SS-4	14 LT	14+19	127.7-129.2	A-4(1)	30	6	4.0	61.0	20.0	15.0	99	98	49.4	-	-

B5-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-158	35 RT	14+36	3.0-4.5	A-2-4(0)	39	NP	33.2	39.3	17.4	10.1	98	82	29	-	10.5
SS-159	35 RT	14+36	7.2-8.7	A-3(0)	21	NP	58.1	39.7	1.2	1.0	100	81	3	-	-
SS-160	35 RT	14+36	17.0-18.5	A-7-6(21)	44	27	3.0	26.5	30.0	40.5	100	99	81	-	-
SS-161	35 RT	14+36	27.0-28.5	A-4(0)	19	1	10.3	56.1	21.5	12.1	100	99	38	-	-
SS-162	35 RT	14+36	32.0-33.5	A-3(0)	17	NP	77.3	18.6	2.0	2.0	100	52	5	-	-
SS-163	35 RT	14+36	42.0-43.5	A-6(15)	37	19	10.3	11.1	46.2	32.4	98	90	82	-	-
SS-164	35 RT	14+36	57.0-58.5	A-4(2)	25	7	5.1	42.5	30.2	22.3	98	96	66	-	-
SS-165	35 RT	14+36	67.0-68.5	A-2-4(0)	23	3	24.1	53.3	8.4	14.2	94	78	25	-	-
SS-166	35 RT	14+36	77.7-79.2	A-2-4(0)	24	NP	36.9	46.6	7.4	9.1	92	69	18	-	-
SS-167	35 RT	14+36	87.7-89.2	A-4(0)	24	3	25.5	39.7	16.6	18.2	91	78	36	-	-
SS-168	35 RT	14+36	97.7-99.2	A-4(0)	24	3	9.1	52.8	21.9	16.2	97	93	43	-	-
SS-169	35 RT	14+36	107.7-109.2	A-4(0)	26	5	8.3	53.4	22.1	16.2	99	97	45	-	-
SS-170	35 RT	14+36	117.2-118.7	A-4(0)	24	3	5.1	56.1	22.7	16.2	97	96	47	-	-
SS-171	35 RT	14+36	147.4-148.9	A-4(0)	27	3	9.5	45.1	27.1	18.2	97	92	55	-	-
SS-172	35 RT	14+36	157.4-158.9	A-7-6(34)	53	32	0.8	11.9	46.8	40.5	100	100	96	-	-
SS-173	35 RT	14+36	172.4-173.9	A-7-6(21)	43	23	1.2	24.1	36.2	38.5	100	99	89	-	-
SS-174	35 RT	14+36	182.1-183.6	A-7-6(31)	50	30	1.0	12.1	38.3	48.6	100	99	96	-	-
SS-175	35 RT	14+36	192.1-193.6	A-7-6(37)	55	34	0.6	7.1	35.6	56.7	100	100	97	-	-

B6-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-122	39 RT	16+16	1.0-1.5	A-2-7(1)	42	NP	26.4	2							

B8-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-37	39 RT	16+95	1.0-1.5	A-7-5(35)	66	33	2.8	1.2	47.5	48.5	93	91	90	125.6	10.2
SS-38	39 RT	16+95	4.0-5.5	A-7-6(32)	57	28	1.8	3.4	48.3	46.5	99	97	96	132.4	9.3
SS-39	39 RT	16+95	9.0-10.5	A-4(4)	32	6	1.2	40.4	38.2	20.2	100	99	76	-	-
SS-40	39 RT	16+95	19.0-20.5	A-4(3)	33	10	1.8	47.5	28.5	22.2	100	99	56	-	-
SS-41	39 RT	16+95	25.6-27.1	A-3(0)	18	NP	84.8	11.3	3.8	0.0	100	51	5	-	-
SS-42	39 RT	16+95	30.6-32.1	A-7-6(25)	50	27	3.2	14.7	31.5	50.5	100	99	86	-	-
SS-43	39 RT	16+95	40.6-42.1	A-7-6(26)	52	31	2.0	18.6	34.9	44.4	95	94	82	-	-
SS-44	39 RT	16+95	45.6-47.1	A-2-4(0)	26	NP	1.0	77.4	13.5	8.1	100	99	29	-	-
SS-45	39 RT	16+95	55.6-57.1	A-3(0)	20	NP	45.9	46.7	5.5	2.0	99	81	10	-	-
SS-46	39 RT	16+95	65.6-67.1	A-6(15)	36	15	1.0	7.9	60.8	30.3	100	99	98	-	-
SS-47	39 RT	16+95	81.1-82.6	A-6(7)	31	15	5.9	38.6	31.3	24.2	93	90	65	-	-
SS-48	39 RT	16+95	91.1-92.6	A-6(10)	38	22	6.3	40.6	24.8	28.3	97	94	59	-	-
SS-49	39 RT	16+95	96.1-97.6	A-2-4(0)	21	NP	39.4	43.6	8.9	8.1	93	77	19	-	-
SS-50	39 RT	16+95	106.1-107.6	A-2-4(0)	24	NP	48.9	31.7	9.3	10.1	95	69	21	-	-
SS-51	39 RT	16+95	116.1-117.6	A-2-4(0)	27	4	23.0	43.2	17.6	16.2	91	78	35	-	-
SS-52	39 RT	16+95	121.1-127.6	A-2-4(0)	25	5	15.8	53.3	16.8	14.1	97	92	34	-	-
SS-53	39 RT	16+95	136.1-137.6	A-4(0)	27	4	3.4	57.6	24.8	14.1	100	99	48	-	-
SS-54	39 RT	16+95	146.1-147.6	A-4(0)	25	1	1.8	53.1	28.9	16.2	100	99	58	-	-

B14-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-106	3 RT	19+65	1.0-1.5	A-5(8)	111	NP	22.2	10.5	30.8	36.4	82	70	57	-	34.5
SS-107	3 RT	19+65	9.0-10.5	A-7-5(29)	81	31	8.1	3.6	35.7	52.6	84	79	75	149.0	19.4
SS-108	3 RT	19+65	14.0-15.5	A-7-5(41)	76	37	0.6	1.0	35.7	62.7	90	90	89	-	-
SS-109	3 RT	19+65	24.6-26.1	A-2-4(0)	25	7	26.1	44.5	9.2	20.2	96	91	30	-	-
SS-110	3 RT	19+65	29.6-31.1	A-2-4(0)	20	NP	27.0	61.3	3.6	8.1	100	93	13	-	-
SS-111	3 RT	19+65	39.6-41.1	A-3(0)	23	NP	17.0	79.9	2.1	1.0	100	97	4	-	-
SS-112	3 RT	19+65	44.6-46.1	A-7-6(26)	52	32	3.0	19.6	32.9	44.5	96	95	80	-	-
SS-113	3 RT	19+65	59.6-61.1	A-4(0)	28	NP	1.0	64.3	22.5	12.1	100	100	55	-	-
SS-114	3 RT	19+65	69.6-71.1	A-2-4(0)	20	NP	27.4	62.1	6.5	4.0	99	91	13	-	-
SS-115	3 RT	19+65	79.6-81.1	A-6(18)	38	18	2.8	6.3	56.5	34.4	100	98	96	-	-
SS-116	3 RT	19+65	89.6-91.1	A-7-6(21)	42	24	2.4	14.0	45.2	38.4	97	96	87	-	-
SS-117	3 RT	19+65	99.6-101.1	A-6(9)	33	17	2.4	38.2	25.0	34.4	95	94	69	-	-
SS-118	3 RT	19+65	109.6-111.1	A-2-4(0)	24	NP	29.9	47.6	8.3	14.2	95	83	23	-	-
SS-119	3 RT	19+65	119.6-121.1	A-2-4(0)	28	6	30.2	37.6	15.0	17.2	91	76	33	-	-
SS-120	3 RT	19+65	129.6-131.1	A-2-4(0)	24	2	13.4	51.8	18.6	16.2	88	82	34	-	-
SS-121	3 RT	19+65	144.6-146.1	A-4(0)	25	2	7.1	60.3	18.5	14.2	99	98	40	-	-

B9-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-142	21 RT	17+60	6.9-8.4	A-7-5(32)	66	32	4.8	3.2	41.5	50.5	92	89	85	134.0	8.5
SS-143	21 RT	17+60	11.9-13.4	A-7-5(37)	62	30	0.4	1.8	45.3	52.5	100	100	99	-	7.8
SS-144	21 RT	17+60	16.9-18.4	A-7-6(18)	42	18	0.4	19.4	49.9	30.3	100	100	91	-	-
SS-145	21 RT	17+60	28.3-29.8	A-3(0)	20	NP	62.7	29.4	3.9	4.0	98	86	8	-	-
SS-146	21 RT	17+60	36.4-37.9	A-7-6(30)	52	32	1.8	11.1	38.6	48.4	95	95	88	-	-
SS-147	21 RT	17+60	46.4-47.9	A-7-6(21)	47	27	5.7	18.8	33.2	42.4	95	94	78	-	-
SS-148	21 RT	17+60	56.4-57.9	A-6(9)	32	17	0.6	40.8	30.4	28.3	98	98	69	-	-
SS-149	21 RT	17+60	61.4-62.9	A-3(0)	21	NP	60.7	34.9	3.3	1.0	99	80	5	-	-
SS-150	21 RT	17+60	71.0-72.5	A-6(20)	38	19	0.6	5.7	55.3	38.5	100	100	99	-	-
SS-151	21 RT	17+60	81.0-82.5	A-7-6(25)	44	24	0.8	6.1	52.6	40.5	100	100	97	-	-
SS-152	21 RT	17+60	96.0-97.5	A-6(11)	37	20	3.0	47.2	19.4	30.4	100	99	65	-	-
SS-153	21 RT	17+60	101.0-102.5	A-2-6(0)	29	12	33.5	33.6	13.7	19.2	93	77	34	-	-
SS-154	21 RT	17+60	111.0-112.5	A-2-4(0)	21	NP	59.1	23.9	7.9	9.1	95	66	19	-	-
SS-155	21 RT	17+60	120.9-122.4	A-4(0)	29	5	12.1	51.4	18.2	18.2	94	88	40	-	-
SS-156	21 RT	17+60	130.9-132.4	A-4(0)	24	4	16.6	47.0	22.3	14.2	93	87	38	-	-
SS-157	21 RT	17+60	140.9-142.4	A-4(0)	23	2	6.9	52.6	26.3	14.2	99	98	48	-	-

EB2-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-72	23 LT	20+51	1.0-1.5	A-4(0)	20	2	14.4	40.5	30.8	14.2	99	95	53	-	-
SS-73	23 LT	20+51	3.8-5.3	A-2-4(0)	18	NP	13.1	65.6	14.1	7.1	100	96	26	-	-
SS-74	23 LT	20+51	13.8-15.3	A-3(0)	19	NP	5.5	93.2	0.3	1.0	100	100	2	-	-
SS-75	23 LT	20+51	23.8-25.3	A-3(0)	24	NP	7.0	90.8	1.1	1.0	100	100	4	-	-
SS-76	23 LT	20+51	33.8-35.3	A-3(0)	26	NP	53.2	42.7	1.0	3.1	100	83	5	-	-
SS-77	23 LT	20+51	43.8-45.3	A-3(0)	24	NP	16.0	79.7	2.3	2.0	100	99	8	-	-
SS-78	23 LT	20+51	54.3-55.3	A-2-4(0)	18	NP	56.2	23.8	9.9	10.2	99	84	23	-	-
SS-79	23 LT	20+51	58.8-60.3	A-7-6(22)	46	25	3.5	22.6	31.2	42.7	100	99	84	-	-
SS-80	23 LT	20+51	68.8-70.3	A-6(18)	37	21	2.0	16.5	42.8	38.7	100	99	88	-	-
SS-81	23 LT	20+51	73.8-75.3	A-2-4(0)	19	NP	23.9	68.1	4.0	4.1	100	93	11	-	-
SS-82	23 LT	20+51	83.8-85.3	A-6(13)	34	13	0.8	8.3	58.3	32.6	100	99	98	-	-
SS-83	23 LT	20+51	93.8-95.3	A-7-6(25)	45	26	3.1	9.6	44.7	42.7	100	98	91	-	-
SS-84	23 LT	20+51	103.8-105.3	A-6(9)	34	18	5.1	38.2	22.4	34.3	94	91	64	-	-
SS-85	23 LT	20+51	113.8-115.3	A-2-4(0)	26	4	30.1	43.9	8.8	17.2	95	83	27	-	-
SS-86	23 LT	20+51	123.8-125.3	A-2-4(0)	24	NP	38.5	35.5	12.9	13.1	93	74	27	-	-
SS-87	23 LT	20+51	133.8-135.3	A-2-4(0)	23	1	22.8	45.5	15.6	16.2	93	82	33	-	-
SS-88	23 LT	20+51	143.8-145.2	A-4(0)	22	1	12.3	52.7	20.8	14.1	100	97	40	-	-

B12-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-89	2 RT	18+73	1.0-1.5	A-2-5(0)	46	NP	41.4	40.0	10.5	8.1	90	71	19	88.3	8.5
SS-90	2 RT	18+73	4.0-5.5	A-2-5(0)	167	NP	55.4	6.7	21.8	16.2	85	45	33	114.9	59.0
SS-91	2 RT	18+73	9.0-10.5	A-7-6(42)	71	42	10.5	1.2	33.7	54.5	100	90	88	219.7	8.8
SS-92	2 RT	18+73	14.0-15.5	A-7-5(46)	69	38	0.6	0.8	38.0	60.6	100	100	99	-	-
SS-93	2 RT	18+73	24.0-25.5	A-7-6(12)	43	22	0.8	40.0	18.7	40.4	100	100	63	-	-
SS-94	2 RT	18+73	29.0-30.5	A-3(0)	20	NP	34.8	56.9	3.2	5.1	100	92	9	-	-
SS-95	2 RT	18+73	38.8-40.3	A-3(0)	21	NP	35.3	60.8	1.9	2.0	100	90	5	-	-
SS-96	2 RT	18+73	43.8-45.3	A-7-6(27)	53	31	1.4	18.8	29.2	50.6	100	100	84	-	-
SS-97	2 RT	18+73	53.8-55.3	A-7-6(19)	45	25	3.6	25.1	26.8	44.5	100	99	77	-	-
SS-98	2 RT	18+73	63.8-65.3	A-3(0)	22	NP	43.8	48.9	4.2	3.0	100	82	10	-	-
SS-99	2 RT	18+73	74.8-75.3	A-6(18)	37	18	3.4	3.8							



**FIELD
 SCOUR REPORT**

WBS: 35742.1.1 TIP: U-4438 COUNTY: PASQUOTANK/ CAMDEN

DESCRIPTION(1): BRIDGE NO. 19 ON NC 158/ NC34 OVER PASQUOTANK RIVER

EXISTING BRIDGE

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

Bridge No.: 19 Length: 844' Total Bents: 36 Bents in Channel: 16 Bents in Floodplain: 20
 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: NONE NOTED

EXISTING SCOUR PROTECTION

Type(3): CONCRETE AND STEEL WING WALLS

Extent(4): 6-10'+ OUTSIDE EDGE OF 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 (SS-22), ORGANIC SAND AND CLAY (SS-37), AND MUCK (SS-158)

Channel Bank Material(8): ORGANIC SAND AND CLAY (SS-57, SS-89, SS-91) AND MUCK (SS-90)

Channel Bank Cover(9): TREES AND SHRUBS

Floodplain Width(10): APPROX. 2.5 MILES

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

EB1	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
-8.1	-14.2	-22.1	-34.0	-42.0	-51.1	-36.6	-27.0	-15.1	-11.8	-10.0
B11	B12	B13	B14	B15						
-8.0	-3.7	-3.7	-3.5	-2.6						

Comparison of DSE to Hydraulics Unit theoretical scour:

Based on site flooding history, historical scour depth and geologic conditions, DSE should be raised 4.1' and 8.6' at Bent 5 and 6 respectively from the theoretical scour elevation proposed in the Hydraulics report dated 4/2010.

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 25 and 26,
 "Soil Test Results",
 for samples:
 Channel Bed: SS-22, SS-37, SS-158
 Channel Bank: SS-57, SS-89, SS-90, SS-91

Reported by: *[Signature]*
 Tyler Bottoms

Date: 6/3/2010