

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-260006	1	6

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 17BP.I.R.69 (SF-260006) F.A. PROJ. NA
COUNTY CURRITUCK
PROJECT DESCRIPTION BRIDGE NO. 6 ON SR 1228 OVER MOYOCK
RUN AT -L- STATION 13+90.7

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
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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 RELEASED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-4800. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

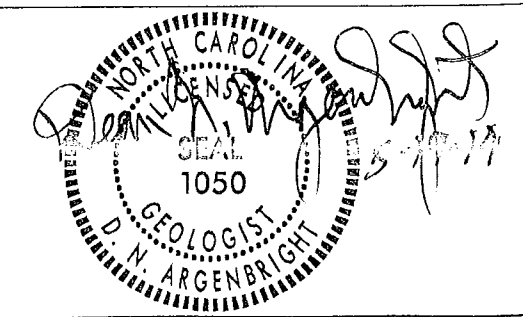
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN-SITU MEASUREMENT 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 SOIL 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: 17BP.I.R.69 ID: SF-260006

PERSONNEL
F&R PERSONNEL

INVESTIGATED BY D.N. ARGENBRIGHT
CHECKED BY D.N. ARGENBRIGHT
SUBMITTED BY D.N. ARGENBRIGHT
DATE MAY 2014



DRAWN BY: T.T. WALKER

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.

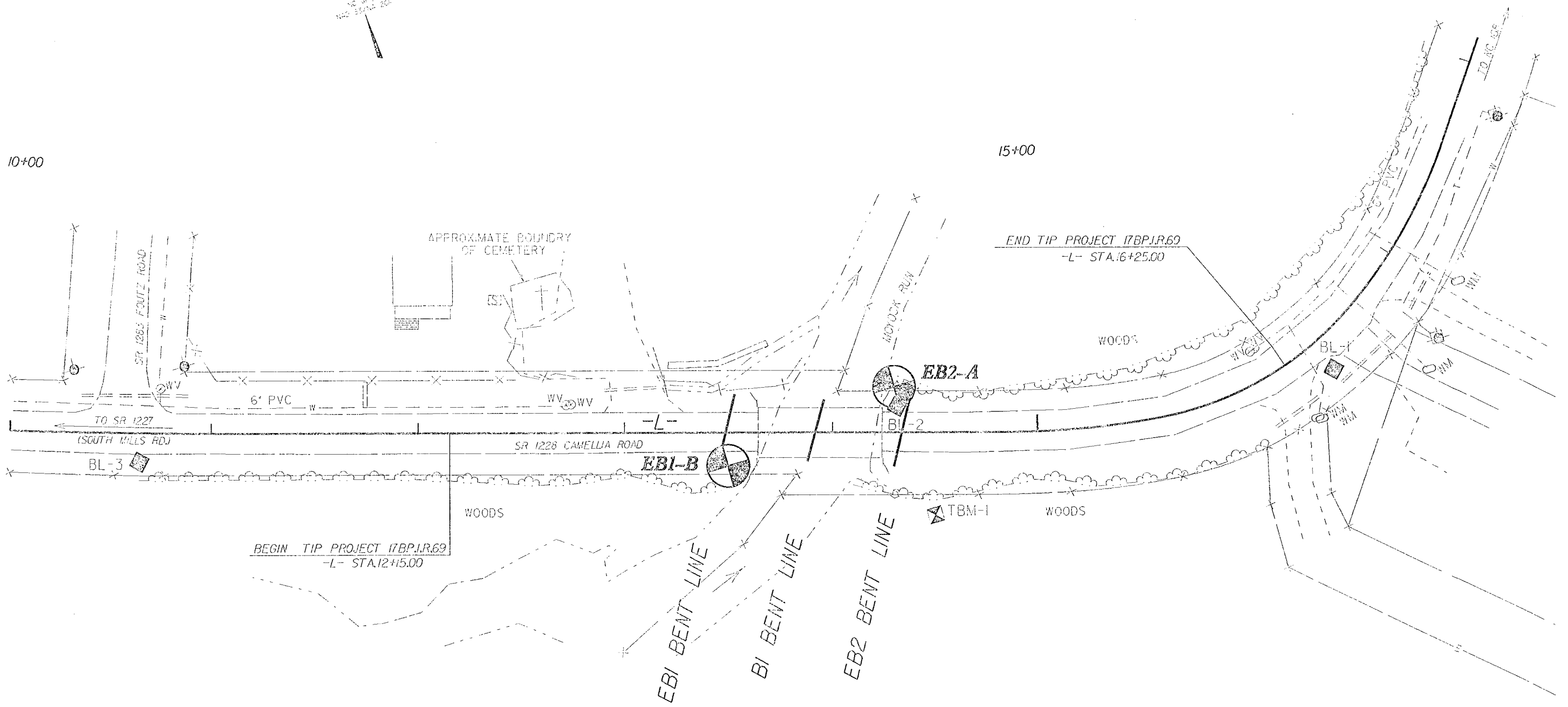
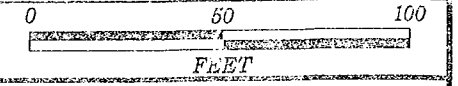
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

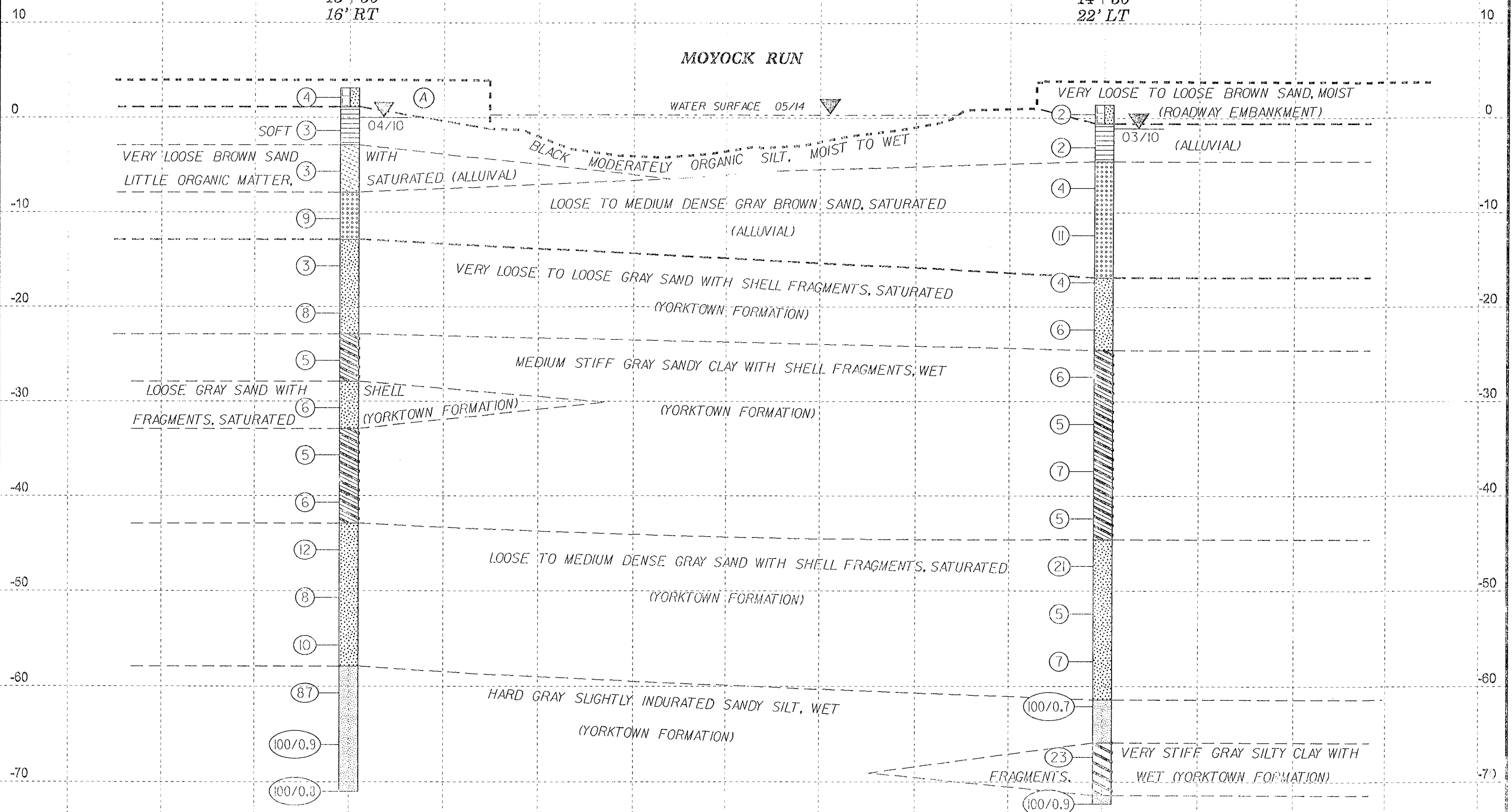
SOIL DESCRIPTION				GRADATION				ROCK DESCRIPTION				TERMS AND DEFINITIONS																																																																																																																																					
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 120 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM 1225, 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>VERY STIFF, GRAU-SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HARD PLASTIC, A-7-5</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) DIP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</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. COLLUVIAL - 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. FESSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOOD - 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 INTRODED ROCKS. SLIP PLANE - 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 (SREC.) - 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>																																																																																																																																					
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ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p>				<p>COMPRESSIBILITY</p> <table border="1"><thead><tr><th></th><th>SLIGHTLY COMPRESSIBLE</th><th>MODERATELY COMPRESSIBLE</th><th>HIGHLY COMPRESSIBLE</th></tr></thead><tbody><tr><td>LIQUID LIMIT LESS THAN 31</td><td></td><td></td><td></td></tr><tr><td>LIQUID LIMIT EQUAL TO 31-50</td><td></td><td></td><td></td></tr><tr><td>LIQUID LIMIT GREATER THAN 50</td><td></td><td></td><td></td></tr></tbody></table>					SLIGHTLY COMPRESSIBLE	MODERATELY COMPRESSIBLE	HIGHLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31				LIQUID LIMIT EQUAL TO 31-50				LIQUID LIMIT GREATER THAN 50				<p>WEATHERING</p> <table border="1"><thead><tr><th></th><th>FRESH</th><th>VERY SLIGHT (V SL)</th><th>SLIGHT (SL)</th><th>MODERATE (MOD)</th><th>MODERATELY SEVERE (MOD. 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SITE PLAN



EB1-B
13+50
16' RT

EB2-A
14+30
22' LT



(A) VERY LOOSE TO LOOSE BROWN SAND, MOIST (ROADWAY EMBANKMENT)

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

NOTE: GROUNDLINE PROFILE TAKEN FROM HYDRAULIC REPORT DATED 04/26/2014

13+50

14+00

14+50

WBS 17BP.1.R.69	TIP SF-260006	COUNTY CURRITUCK	GEOLOGIST Contract Geologist	
SITE DESCRIPTION BRIDGE NO 6 ON -L- (SR 1228) OVER MOYOCK RUN				GROUND WTR (ft)
BORING NO. EB1-B	STATION 13+50	OFFSET 16 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 3.1 ft	TOTAL DEPTH 74.1 ft	NORTHING 1,021,037	EASTING 2,828,370	24 HR. 3.1
DRILL RIG/HAMMER EFF./DATE CME-550		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	

DRILLER Contract Driller	START DATE 04/01/10	COMP. DATE 04/01/10	SURFACE WATER DEPTH N/A
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ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
5															
	3.1	0.0	1	2	2	0.4								GROUND SURFACE	0.0
														ROADWAY EMBANKMENT	
														BROWN SAND, MOIST	2.0
0	-0.4	3.5	2	1	2	0.3								ALLUVIAL	
														BLACK MODERATELY ORGANIC SILT,	
														MOIST TO WET	8.0
-5	-4.7	7.8	1	1	2	0.3								ALLUVIAL	
														BROWN SAND WITH LITTLE ORGANIC	
														MATTER, SAT.	11.0
-10	-9.7	12.8	6	5	4	0.9								ALLUVIAL	
														GRAY BROWN SAND, SAT.	15.0
-15	-14.7	17.8	2	2	1	0.3								COASTAL PLAIN	
														GRAY SAND WITH SHELL FRAGMENTS,	
														SAT.	26.0
														(YORKTOWN FORMATION)	
-20	-19.7	22.8	3	5	3	0.9								COASTAL PLAIN	
														GRAY SANDY CLAY WITH SHELL	
														FRAGMENTS, WET	31.0
														(YORKTOWN FORMATION)	
-25	-24.7	27.8	2	2	3	0.5								COASTAL PLAIN	
														GRAY SAND WITH SHELL FRAGMENTS,	
														SAT.	36.0
														(YORKTOWN FORMATION)	
-30	-29.7	32.8	3	3	3	0.6								COASTAL PLAIN	
														GRAY SANDY CLAY WITH SHELL	
														FRAGMENTS, WET	45.0
														(YORKTOWN FORMATION)	
-35	-34.7	37.8	2	2	3	0.5								COASTAL PLAIN	
														GRAY SANDY CLAY WITH SHELL	
														FRAGMENTS, WET	61.0
														(YORKTOWN FORMATION)	
-40	-39.7	42.8	2	3	3	0.5								COASTAL PLAIN	
														GRAY SAND WITH SHELL FRAGMENTS,	
														SAT.	61.0
														(YORKTOWN FORMATION)	
-45	-44.7	47.8	3	4	3	0.12								COASTAL PLAIN	
														GRAY SAND WITH SHELL FRAGMENTS,	
														SAT.	61.0
														(YORKTOWN FORMATION)	
-50	-49.7	52.8	4	3	5	0.8								COASTAL PLAIN	
														GRAY SLIGHTLY INDURATED SANDY	
														SILT, WET	74.1
														(YORKTOWN FORMATION)	
-55	-54.7	57.8	5	5	5	0.10								COASTAL PLAIN	
														GRAY SLIGHTLY INDURATED SANDY	
														SILT, WET	74.1
														(YORKTOWN FORMATION)	
-60	-59.7	62.8	24	39	48	0.37								COASTAL PLAIN	
														GRAY SLIGHTLY INDURATED SANDY	
														SILT, WET	74.1
														(YORKTOWN FORMATION)	
-65	-64.7	67.8	40	50	50/0.4	0.00/0.9								COASTAL PLAIN	
														GRAY SLIGHTLY INDURATED SANDY	
														SILT, WET	74.1
														(YORKTOWN FORMATION)	
-70	-69.7	72.8	35	60	40/0.3	0.00/0.8								COASTAL PLAIN	
														GRAY SLIGHTLY INDURATED SANDY	
														SILT, WET	74.1
														(YORKTOWN FORMATION)	
														Boring Terminated at Elevation -71.0 ft in	
														Hard Silt	

:DOT BORE DOUBLE SF-260006 GPJ NC_DOT_GDT_5/19/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 17BP.LR.69	TIP SF-200006	COUNTY CURRITUCK	GEOLOGIST Contract Geologist	
SITE DESCRIPTION BRIDGE NO 6 ON -L- (SR 1228) OVER MOYOCK RUN				GROUND WTR (ft)
BORING NO. EB2-A	STATION 14+30	OFFSET 22 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 1.4 ft	TOTAL DEPTH 73.7 ft	NORTHING 1,021,023	EASTING 2,828,282	24 HR. 2.5
DRILL RIG/HAMMER EFF./DATE CME-550		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 03/31/10	COMP. DATE 03/31/10	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
5															
0	1.4	0.0	1	1	1									ROADWAY EMBANKMENT BROWN SAND, MOIST	0.0
-5	-2.1	3.5	1	1	1									ALLUVIAL BLACK MODERATELY ORGANIC SILT, MOIST TO WET	2.0
-10	-6.4	7.8	3	1	3									ALLUVIAL GRAY BROWN SAND, SAT.	6.0
-15	-11.4	12.8	5	6	5										
-20	-16.4	17.8	2	2	2									COASTAL PLAIN GRAY SAND WITH SHELL FRAGMENTS, SAT. (YORKTOWN FORMATION)	18.3
-25	-21.4	22.8	5	3	3									COASTAL PLAIN GRAY SANDY CLAY WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)	26.0
-30	-26.4	27.8	2	3	3										
-35	-31.4	32.8	4	3	2										
-40	-36.4	37.8	3	3	4										
-45	-41.4	42.8	2	2	3									COASTAL PLAIN GRAY SAND WITH SHELL FRAGMENTS, SAT. (YORKTOWN FORMATION)	46.0
-50	-46.4	47.8	5	7	14										
-55	-51.4	52.8	2	2	3										
-60	-56.4	57.8	5	3	4										
-65	-61.4	62.8	60	40/0.2										COASTAL PLAIN GRAY SLIGHTLY INDURATED SANDY SILT, WET (YORKTOWN FORMATION)	62.8
-70	-66.4	67.8	18	12	11									COASTAL PLAIN GRAY SILTY CLAY WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)	67.3
	-71.4	72.8	34	66/0.4										COASTAL PLAIN GRAY SLIGHTLY INDURATED SANDY SILT, WET	72.8
															73.7

WBS 17BP.LR.69	TIP SF-200006	COUNTY CURRITUCK	GEOLOGIST Contract Geologist	
SITE DESCRIPTION BRIDGE NO 6 ON -L- (SR 1228) OVER MOYOCK RUN				GROUND WTR (ft)
BORING NO. EB2-A	STATION 14+30	OFFSET 22 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 1.4 ft	TOTAL DEPTH 73.7 ft	NORTHING 1,021,023	EASTING 2,828,282	24 HR. 2.5
DRILL RIG/HAMMER EFF./DATE CME-550		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 03/31/10	COMP. DATE 03/31/10	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-75															
															(YORKTOWN FORMATION) Boring Terminated at Elevation -72.3 ft in Hard Silt

NCDOT BORE LOG FILE: SF-250006.GPJ NC_DOT_GDT_5/19/14