

STATE	STATE PROJECT NUMBER	SHEET	TOTAL
N.C.	BD-5102R	1	6

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 45348.I.18 (BD-5102R) F.A. PROJ. BRZ-1324(6)  
COUNTY GREENE  
PROJECT DESCRIPTION BRIDGE NO. 9 ON SR 1324 (TAYLOR ROAD)  
OVER SANDY RUN AT -L- STA. 12+17.50

**CONTENTS**

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**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF SURVEY, PLANNING, AND DESIGN AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE HARBOR, FIELD BORING LOGS, TEST CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN FULL OR BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1001-707-6500. NEITHER THE SUBSURFACE PLANS NOR 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 GEOLOGICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BORING. THE LABORATORY SAMPLE DATA AND THE IN SITU MEASURED TEST DATA CAN BE RELIED ON ONLY TO THE EXTENT OF RELIABILITY INDICATED BY THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS BY SOIL MOISTURE CONTENTS INDICATED IN THE SUBSURFACE INVESTIGATION ARE AS MEASURED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OF SOIL MOISTURE CONTENTS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER HYDROLOGIC FACTORS.

THE BORER 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 BORING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND SPECIFICATIONS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE ACCURACY OR ADEQUACY 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 BORER OR CONTRACTOR IS CAUTIONED TO MAKE SOON RESPONSIBILITY SUBSURFACE INVESTIGATIONS AS BEING NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE HIS OWN FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY DESIGN RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

**PROJECT: 45348.I.18 ID: BD-5102R**

PERSONNEL

C.M. WRIKE

R.E. SMITH

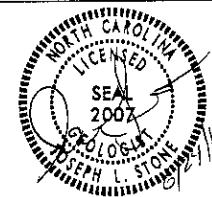
D.G. PINTZ

INVESTIGATED BY J.L. STONE

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE JUNE 2013



DRAWN BY: G.P. TURNER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE FOR 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.

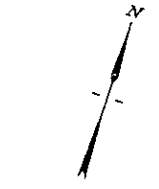
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
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**SUBSURFACE INVESTIGATION**

PROJECT REFERENCE NO. BD-5102R SHEET NO. 2 OF 6

**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 BOURNEMAN FLIGHT PROBE AND YIELD LESS THAN 100 BLUYS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM D 1586) WITH A 60 LB. SOIL CLASSIFICATION IS BASED ON THE HANCOCK SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE CONSISTENCY, COLOR, TEXTURE, MOISTURE, HARDNESS, CLASSIFICATION AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, AGGREGATE, PLASTICITY, ETC. (EXAMPLES: VERY SOFT, MEDIUM STIFF, HARD, VERY HARD, SAND, SILT, CLAY, GRAVEL, SILT-SAND, SILT-CLAY, SAND-SILT, SAND-CLAY, SILT-SAND-SILT, SAND-SILT-CLAY, SAND-SILT-CLAY-GRAVEL, SAND-SILT-CLAY-GRAVEL-GRAPE, SAND-SILT-CLAY-GRAVEL-GRAPE-PEAT, SAND-SILT-CLAY-GRAVEL-GRAPE-PEAT-SHELLS, SAND-SILT-CLAY-GRAVEL-GRAPE-PEAT-SHELLS-SHELLS).</p>		<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNDESIRABLE - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO FINELY GRADED). SILT-SAND - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS THE ANGLARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUND, OR ROUND.</p>		<p>HARD ROCK IS NON-CRYSTALLINE PLAIN MATERIAL THAT IF TESTED WOULD YIELD SPT REFUSAL AN INCREASED PICK LINE INDICATES THE LEVEL AT WHICH NON-CRYSTALLINE PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPINER SAMPLER EQUAL TO OR LESS THAN 10 BLUYS PER FOOT. IN NON-CRYSTALLINE PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS BETTER REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>ALUMINUM (AL<sub>2</sub>O<sub>3</sub>) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. SANDIER - A WATER BEARING FORMATION ON STRATA. ANEMOUS - APPLIED TO ROCKS THAT HAVE BEEN WEATHERED FROM CLAY THAT CONTAIN SAND. ANGLICLACER - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF SAND MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. METEORIC - GRAIN 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. CALICHE (CAL<sub>2</sub>) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. DILUVIAL - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CONE PENETRATION - TOTAL LENGTH OF ALL MATERIALS RECOVERED IN THE CONE BARREL DIVIDED BY TOTAL LENGTH OF BARREL AND EXPRESSED AS A PERCENTAGE. BISE - A TALLER BODY OF JOHNSON ROCK THAT CUTS ACROSS THE STRUCTURE OF ANJACENT ROCKS OR CUTS PASSIVE ROCK. BISE - THE ANGLE AT WHICH A STRATUM OR ANY FLAVOR FEATURE IS INCLINED FROM THE HORIZONTAL. SOIL-BEINGING AND SOIL-BEINGING - THE SECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DISCONTINUITY OR BOUNDARY BETWEEN SOILS. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE STRATA RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLINT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND UNDISCOVERED FROM PARENT MATERIAL. FLOW PLAIN (FP) - LAND FORMING A STREAM BUILT BY SEDIMENTS DEPOSITED BY THE STREAM. FOLDING (FM) - A FOLDABLE GEOLGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. GROUND - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE THICKNESS HAS ACCUMULATED. LENS - A SHELL-LIKE NODULE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LEAK - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. METEORIC (MET) - IRREGULARLY SHAPED WITH SPOTS OF DIFFERENT COLORS, HAVING IN GENERAL, USUALLY INDICATES FROM AERATION AND LACK OF SOIL DRAINAGE. PENECHER WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES) - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY (RQ) - 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. SAMPLING (S) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OF FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF JOHNSON ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN REPLACED PARALLEL TO THE BEARING OR SUSCEPTIBILITY OF THE INTERVED ROCKS. SLOTTING - POLISHED AND STRATED SURFACE THAT RESULTS FROM FRACTURING ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (SPT) - NUMBER OF BLUYS IN AN SPT OF 1 FT. 12 INCHES FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH DIAMETER SPT SPINER SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 10 BLUYS PER FOOT. STRATA (STR) - SOILS - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY (SRQ) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATA EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. SURFACE (S) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																								
<p><b>SOIL LEGEND AND AASHTO CLASSIFICATION</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th>GRAVEL MATERIALS (1.5% PASSING #200)</th> <th>SILT-CLAY MATERIALS (7.5% PASSING #40)</th> <th>ORGANIC MATERIALS</th> </tr> <tr> <td>A-1</td> <td>A-1-1</td> <td>A-1-2</td> <td>A-1-3</td> </tr> <tr> <td>A-2</td> <td>A-2-1</td> <td>A-2-2</td> <td>A-2-3</td> </tr> <tr> <td>A-3</td> <td>A-3-1</td> <td>A-3-2</td> <td>A-3-3</td> </tr> <tr> <td>A-4</td> <td>A-4-1</td> <td>A-4-2</td> <td>A-4-3</td> </tr> <tr> <td>A-5</td> <td>A-5-1</td> <td>A-5-2</td> <td>A-5-3</td> </tr> <tr> <td>A-6</td> <td>A-6-1</td> <td>A-6-2</td> <td>A-6-3</td> </tr> <tr> <td>A-7</td> <td>A-7-1</td> <td>A-7-2</td> <td>A-7-3</td> </tr> </table>		GENERAL CLASS.	GRAVEL MATERIALS (1.5% PASSING #200)	SILT-CLAY MATERIALS (7.5% PASSING #40)	ORGANIC MATERIALS	A-1	A-1-1	A-1-2	A-1-3	A-2	A-2-1	A-2-2	A-2-3	A-3	A-3-1	A-3-2	A-3-3	A-4	A-4-1	A-4-2	A-4-3	A-5	A-5-1	A-5-2	A-5-3	A-6	A-6-1	A-6-2	A-6-3	A-7	A-7-1	A-7-2	A-7-3	<p><b>MINERALOGICAL COMPOSITION</b></p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS UNLESS THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p><b>COMPRESSIBILITY</b></p> <p>SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE</p> <p><b>PERCENTAGE OF MATERIAL</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRAVEL</th> <th>SILT</th> <th>CLAY</th> <th>OVERMATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>0 - 5%</td> <td>0 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 10%</td> <td>5 - 10%</td> <td>5 - 10%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>10 - 20%</td> <td>10 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>10%</td> <td>20%</td> <td>20%</td> <td>HEAVY</td> </tr> </table>		ORGANIC MATERIAL	GRAVEL	SILT	CLAY	OVERMATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	0 - 5%	0 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 10%	5 - 10%	5 - 10%	LITTLE	MODERATELY ORGANIC	5 - 10%	10 - 20%	10 - 20%	SOME	HIGHLY ORGANIC	10%	20%	20%	HEAVY	<p><b>WEATHERING</b></p> <p>FRESH - ROCK FRESH CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK PORES UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY CRUSTINGS IF OPEN TO SOIL. SLIGHT - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY CRUSTINGS IF OPEN TO SOIL. MODERATE - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS, IN GRANITE ROCKS, MOST FELDSPARS ARE BUILT AND DISCOLORING, SOME SANDY CLAY, ROCK HAS SMALL SANDY UNDER HAMMER BLUYS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY - ALL ROCK EXCEPT QUARTZ DISCOLORS ON STRATA, IN GRANITE ROCKS, ALL FELDSPARS ARE BUILT AND DISCOLORING AND A MAJORITY SHOW FINE PARTICULATION, ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLGIST'S PICK, ROCK GIVES 10-20 BLUYS PER FOOT. SEVERE - ALL ROCK EXCEPT QUARTZ DISCOLORS ON STRATA, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL, IN GRANITE ROCKS, ALL FELDSPARS ARE FINE PARTICULATION TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. VERY SEVERE - ALL ROCK EXCEPT QUARTZ DISCOLORS ON STRATA, ROCK FABRIC ELEMENTS ARE DISCOLORABLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING, SAMPLES IS AN EXAMPLE OF ROCK WEATHERING IN A RECORD SUCH THAT ONLY HEAVY WEDGES OF THE ORIGINAL ROCK FABRIC REMAIN. COMPLETE - ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCOLORABLE, DISCOLORABLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AND BUBBLES BY STRONGERS, SAMPLES IS ALSO AN EXAMPLE.</p>	
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<p><b>TEXTURE OR GRAIN SIZE</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. SIEVE SIZE</th> <th>4</th> <th>10</th> <th>40</th> <th>200</th> <th>270</th> </tr> <tr> <th>APPROX. PERCENT</th> <td>4.76</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.60</td> </tr> </table>		U.S. SIEVE SIZE	4	10	40	200	270	APPROX. PERCENT	4.76	2.00	0.42	0.25	0.60	<p><b>ABBREVIATIONS</b></p> <p>AP - ALGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - CHANGE F - FINE FBL - FISSILIFEROUS FRAC - FRACTURES, FRACTURES FRAGS - FRAGMENTS H - HIGHLY</p> <p>HEB - HEAVY HIC - HIGHLY COHESIVE HMB - HIGHLY MODERATELY BOUND HNP - HIGHLY NON-PLASTIC HNL - HIGHLY NON-LIQUID HNT - HIGHLY NON-TENSILE HPT - HIGHLY PENETRATION TEST HSA - HIGHLY SANDY AND SILTY HSL - HIGHLY SILTY HT - HIGHLY TENSILE HUB - HIGHLY UNIFORM BOUND HVB - HIGHLY VERY BOUND HVP - HIGHLY VERY PLASTIC HWR - HIGHLY WATER RESISTANT HWR - HIGHLY WATER RESISTANT</p>		<p><b>ROCK HARDNESS</b></p> <p>CANNOT BE SEPARATED BY KNIFE OR SHARP PICK, BREAKING OF HARD SPECIMENS REQUIRED GENERAL HARD BLUYS OF THE GEOLGIST'S PICK. CAN BE SEPARATED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLUYS REQUIRED TO DETACH HARD SPECIMENS. CAN BE SEPARATED BY KNIFE OR PICK, GRIDES OR GRUBBIES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HAND BLOW BY A GEOLGIST'S PICK, HARD SPECIMENS CAN BE DETACHED BY MODERATE BLOW. CAN BE EXCAVATED OR MOVED 10 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1/2 INCH MAXIMUM SIZE BY HAND BLOW OF THE POINT OF A GEOLGIST'S PICK. CAN BE EXCAVATED OR MOVED 10 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1/2 INCH MAXIMUM SIZE BY HAND BLOW OF THE POINT OF A GEOLGIST'S PICK. CAN BE EXCAVATED OR MOVED 10 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1/2 INCH MAXIMUM SIZE BY HAND BLOW OF THE POINT OF A GEOLGIST'S PICK. CAN BE EXCAVATED OR MOVED 10 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1/2 INCH MAXIMUM SIZE BY HAND BLOW OF THE POINT OF A GEOLGIST'S PICK. CAN BE EXCAVATED OR MOVED 10 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1/2 INCH MAXIMUM SIZE BY HAND BLOW OF THE POINT OF A GEOLGIST'S PICK.</p>																																														
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<p><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SOIL MOISTURE SCALE (WATERBEND LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>DRIVE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>1 - SATURATED (SAT)</td> <td>USUALLY LIQUID, VERY WET, USUALLY FIRM BELOW THE GROUND WATER TABLE</td> <td></td> </tr> <tr> <td>2 - WET (W)</td> <td>SENSOLIN REAKES WETTING TO ATTAIN OPTIMUM MOISTURE</td> <td></td> </tr> <tr> <td>3 - MOIST (M)</td> <td>SLIP-AT OR NEAR OPTIMUM MOISTURE</td> <td></td> </tr> <tr> <td>4 - DRY (D)</td> <td>REMARKS: ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> <td></td> </tr> </table>		SOIL MOISTURE SCALE (WATERBEND LIMITS)	FIELD MOISTURE DESCRIPTION	DRIVE FOR FIELD MOISTURE DESCRIPTION	1 - SATURATED (SAT)	USUALLY LIQUID, VERY WET, USUALLY FIRM BELOW THE GROUND WATER TABLE		2 - WET (W)	SENSOLIN REAKES WETTING TO ATTAIN OPTIMUM MOISTURE		3 - MOIST (M)	SLIP-AT OR NEAR OPTIMUM MOISTURE		4 - DRY (D)	REMARKS: ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		<p><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> <p>DRILL UNITS MORSE B-1 MORSE B-2 MORSE B-3 MORSE B-4 MORSE B-5 MORSE B-6 MORSE B-7 MORSE B-8 MORSE B-9 MORSE B-10 MORSE B-11 MORSE B-12 MORSE B-13 MORSE B-14 MORSE B-15 MORSE B-16 MORSE B-17 MORSE B-18 MORSE B-19 MORSE B-20 MORSE B-21 MORSE B-22 MORSE B-23 MORSE B-24 MORSE B-25 MORSE B-26 MORSE B-27 MORSE B-28 MORSE B-29 MORSE B-30 MORSE B-31 MORSE B-32 MORSE B-33 MORSE B-34 MORSE B-35 MORSE B-36 MORSE B-37 MORSE B-38 MORSE B-39 MORSE B-40 MORSE B-41 MORSE B-42 MORSE B-43 MORSE B-44 MORSE B-45 MORSE B-46 MORSE B-47 MORSE B-48 MORSE B-49 MORSE B-50 MORSE B-51 MORSE B-52 MORSE B-53 MORSE B-54 MORSE B-55 MORSE B-56 MORSE B-57 MORSE B-58 MORSE B-59 MORSE B-60 MORSE B-61 MORSE B-62 MORSE B-63 MORSE B-64 MORSE B-65 MORSE B-66 MORSE B-67 MORSE B-68 MORSE B-69 MORSE B-70 MORSE B-71 MORSE B-72 MORSE B-73 MORSE B-74 MORSE B-75 MORSE B-76 MORSE B-77 MORSE B-78 MORSE B-79 MORSE B-80 MORSE B-81 MORSE B-82 MORSE B-83 MORSE B-84 MORSE B-85 MORSE B-86 MORSE B-87 MORSE B-88 MORSE B-89 MORSE B-90 MORSE B-91 MORSE B-92 MORSE B-93 MORSE B-94 MORSE B-95 MORSE B-96 MORSE B-97 MORSE B-98 MORSE B-99 MORSE B-100</p>		<p><b>FRACTURE SPACING</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ITEM</th> <th>SPACING</th> <th>THICKNESS</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> <td>VERY THINLY BEDDED 3-4 FEET</td> </tr> <tr> <td>WIDE</td> <td>5 TO 10 FEET</td> <td>THINLY BEDDED 1.5-4 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 5 FEET</td> <td>VERY THINLY BEDDED 0.8-1.5 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.5 TO 1 FEET</td> <td>THINLY BEDDED 0.4-0.8 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.5 FEET</td> <td>THINLY BEDDED 0.2-0.4 FEET</td> </tr> </table>		ITEM	SPACING	THICKNESS	VERY WIDE	MORE THAN 10 FEET	VERY THINLY BEDDED 3-4 FEET	WIDE	5 TO 10 FEET	THINLY BEDDED 1.5-4 FEET	MODERATELY CLOSE	1 TO 5 FEET	VERY THINLY BEDDED 0.8-1.5 FEET	CLOSE	0.5 TO 1 FEET	THINLY BEDDED 0.4-0.8 FEET	VERY CLOSE	LESS THAN 0.5 FEET	THINLY BEDDED 0.2-0.4 FEET																								
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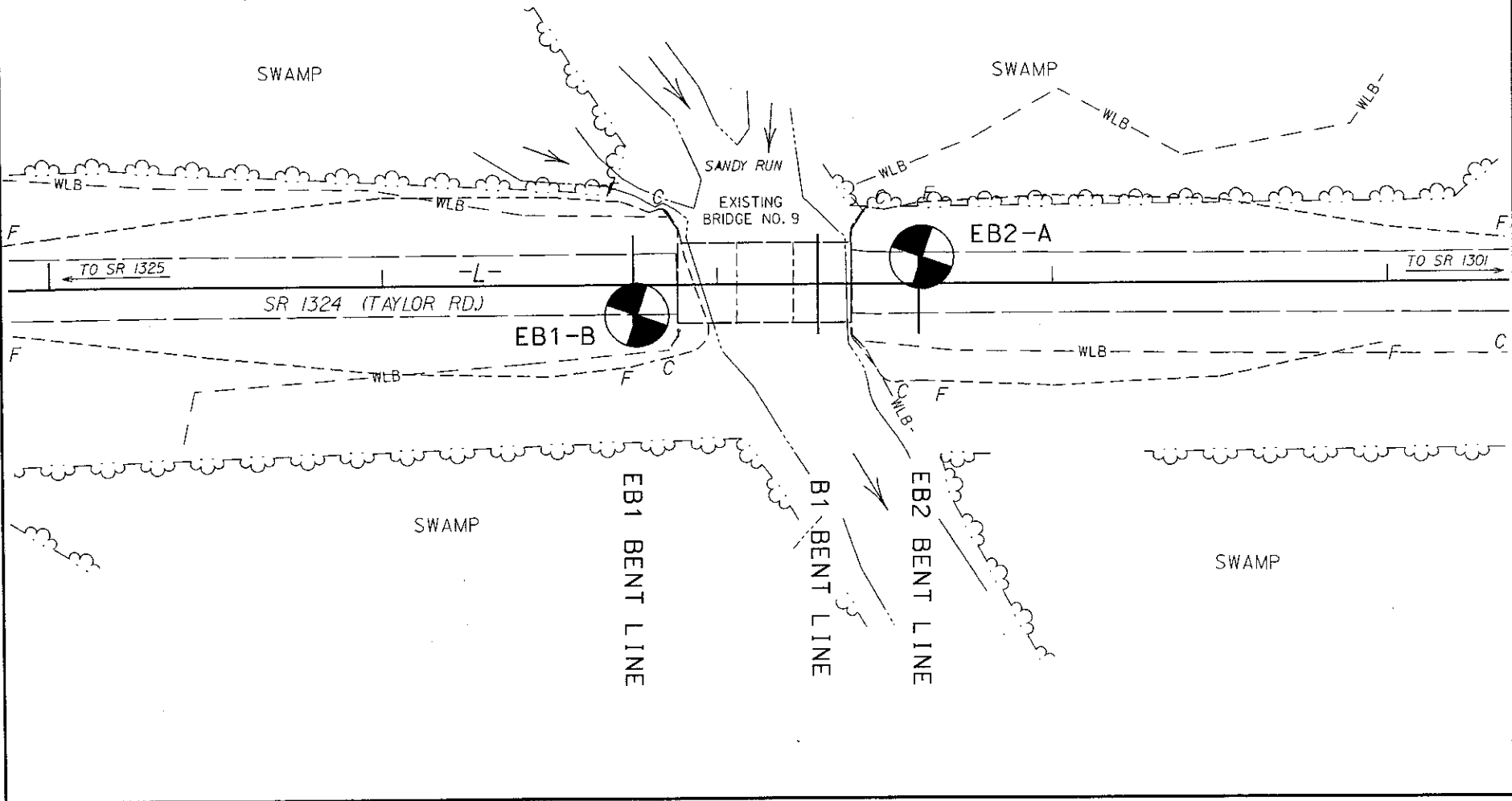
SKREW = 90°



10

12

14



5/12/47

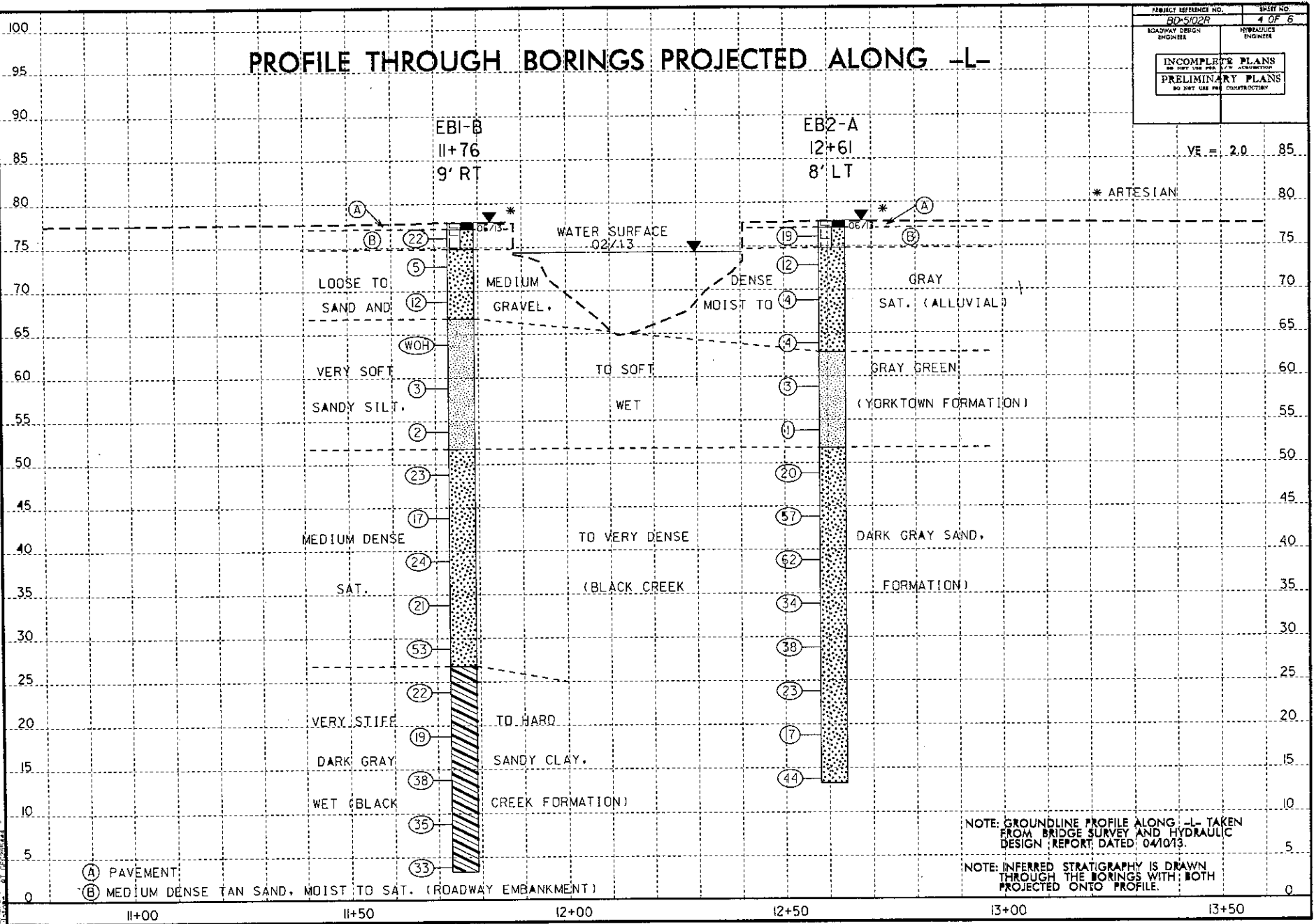
24-100-003 4408  
C. J. F. B. C. P. 11/11/47  
SUPERVISOR, CIVIL ENGINEERING, MASSACHUSETTS DEPARTMENT OF HIGHWAYS

PROJECT REFERENCE NO. BD-502R		SHEET NO. 4 OF 6	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR PRELIMINARY PLANS CONSTRUCTION			

# PROFILE THROUGH BORINGS PROJECTED ALONG -L-

VE = 2.0 85

\* ARTESIAN



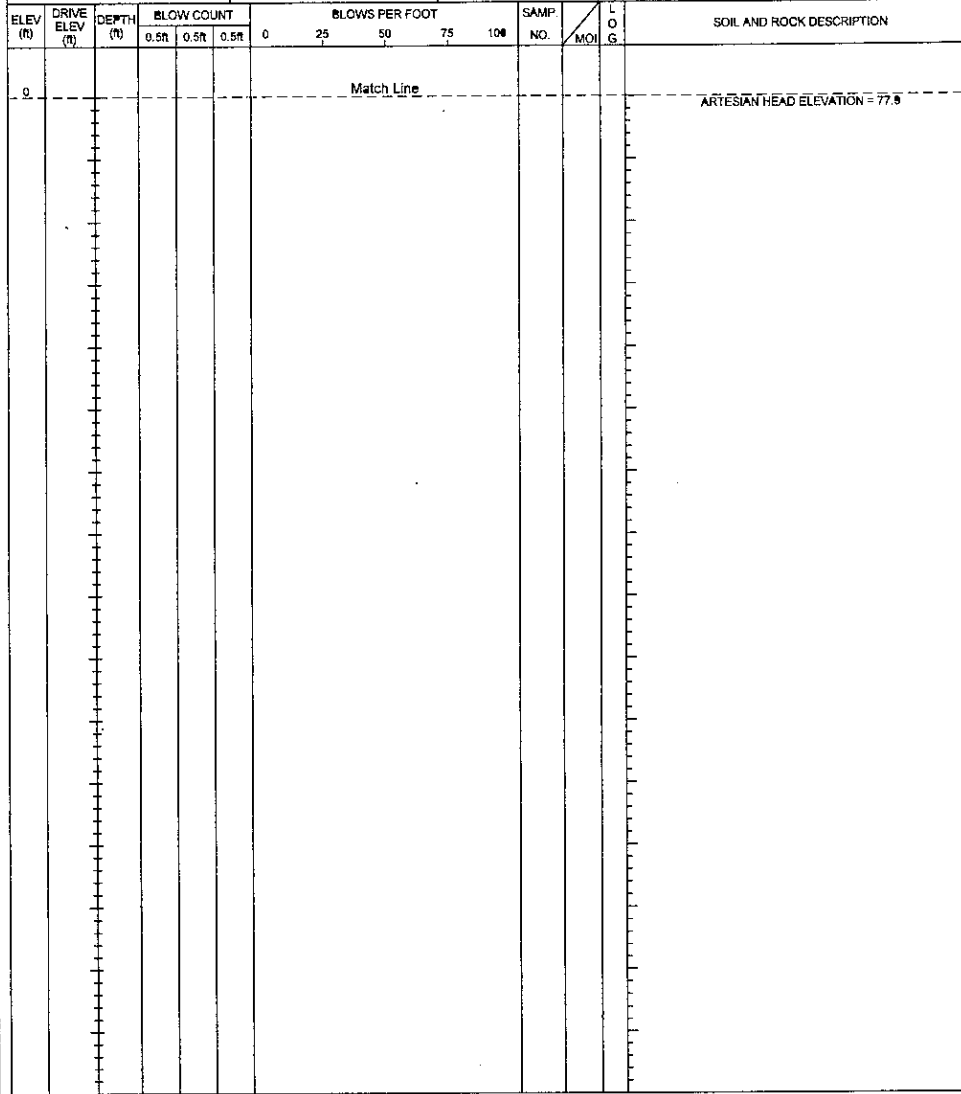
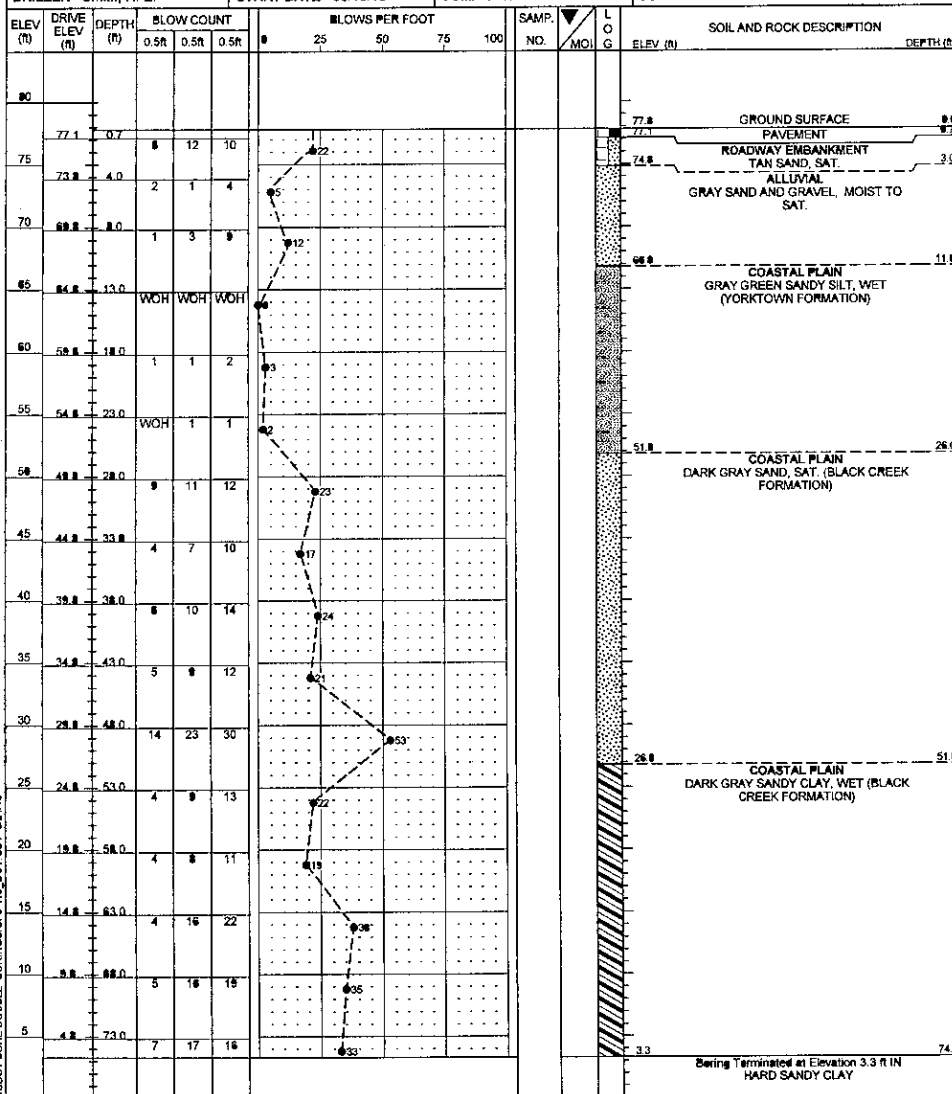
NOTE: GROUNDLINE PROFILE ALONG -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 04/10/13.

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

**NC DOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 45348.1.1B	TIP BD-5102R	COUNTY GREENE	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION BRIDGE NO. 9 ON -L- (SR 1324) OVER SANDY RUN			
BORING NO. EB1-B	STATION 11+76	OFFSET 9 ft RT	ALIGNMENT -L-
COLLAR ELEV. 77.8 ft	TOTAL DEPTH 74.5 ft	NORTHING 654,541	EASTING 2,395,750
DRILL RIGHAMMER EFF./DATE RFO0057 CME-550X 73% 01/22/2013		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 06/19/13	COMP. DATE 06/19/13	SURFACE WATER DEPTH N/A

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DRILLER Smith, R. E.	START DATE 06/19/13	COMP. DATE 06/19/13	SURFACE WATER DEPTH N/A



NC DOT BORE DOUBLE BORINGS GPJ NC DOT GDT 6/24/13

Boring Terminated at Elevation 3.3 ft in HARD SANDY CLAY



**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 45348.1.1B		TIP BD-9102R		COUNTY GREENE		GEOLOGIST Wille, G. M.								
SITE DESCRIPTION BRIDGE NO. 9 ON -L- (SR 1324) OVER SANDY RUN														
BORING NO. EB2-A		STATION 12+61		OFFSET 8 ft LT		ALIGNMENT -L-								
COLLAR ELEV. 77.8 ft		TOTAL DEPTH 64.5 ft		NORTHING 654,585		EASTING 2,385,825								
						GROUND WTR (ft) 0 HR. N/A 24 HR. artesian								
DRILL RIGHAMMER EFF./DATE RFO0057 CME-550X 73% 01/22/2013				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic								
DRILLER Smith, R. E.		START DATE 06/19/13		COMP. DATE 06/20/13		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5R	0.5R	0.5R	0	25	50	75					100
80														
77.1	77.1	0.7	7	7	12								GROUND SURFACE 77.8	
75	73.8	4.0	4	5	7								PAVEMENT 77.1	
70	69.8	8.0	1	2	2								ROADWAY EMBANKMENT TAN SAND, MOIST 74.8	
65	64.8	13.0	5	3	1								ALLUVIAL GRAY SAND, MOIST TO SAT.	
60	59.8	18.0	1	2	1								COASTAL PLAIN GRAY GREEN SANDY SILT, WET (YORKTOWN FORMATION) 62.8	
55	54.8	23.0	WOH	WOH	1									
50	49.8	28.0	2	6	14								COASTAL PLAIN DARK GRAY SAND, SAT. (BLACK CREEK FORMATION) 51.8	
45	44.8	33.0	8	22	35									
40	39.8	38.0	15	28	33									
35	34.8	43.0	7	15	18									
30	29.8	48.0	10	16	22									
25	24.8	53.0	5	10	13									
20	19.8	58.0	5	7	10									
15	14.8	63.0	8	23	21									
														Boring Terminated at Elevation 13.3 ft IN DENSE SAND
														ARTESIAN HEAD ELEVATION = 77.8

NCDOT BORE DOUBLE BORINGS GP-1 INC. DOT. GDT. #2413