



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554A	1	10

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 34461.1.3 (R-2554A) F.A. PROJ. NHF-70(30)

COUNTY WAYNE

PROJECT DESCRIPTION US 70 GOLDSBORO BYPASS FROM WEST  
OF NC 581 TO SR 1300

SITE DESCRIPTION RETAINING WALL 2 AT END BENT 2 AT  
-L2RPB- STA. 6+40.0

**REVISED**

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2	LEGEND
3	SITE PLAN
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10	SOIL TEST RESULTS

ATTACHMENT

CPT LOGS

SHEET

I-2

**CAUTION NOTICE**

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GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

J.R. SWARTLEY

J.P. DELOATCH

R.E. SMITH

J.M. EDMONDSON

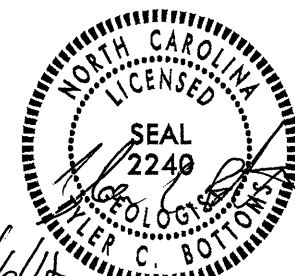
C.M. WRIKE

INVESTIGATED BY T.C. BOTTOMS

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE JUNE 2012



**PROJECT: 34461.1.3 ID: R-2554A**

DRAWN BY: C.P. TURNER

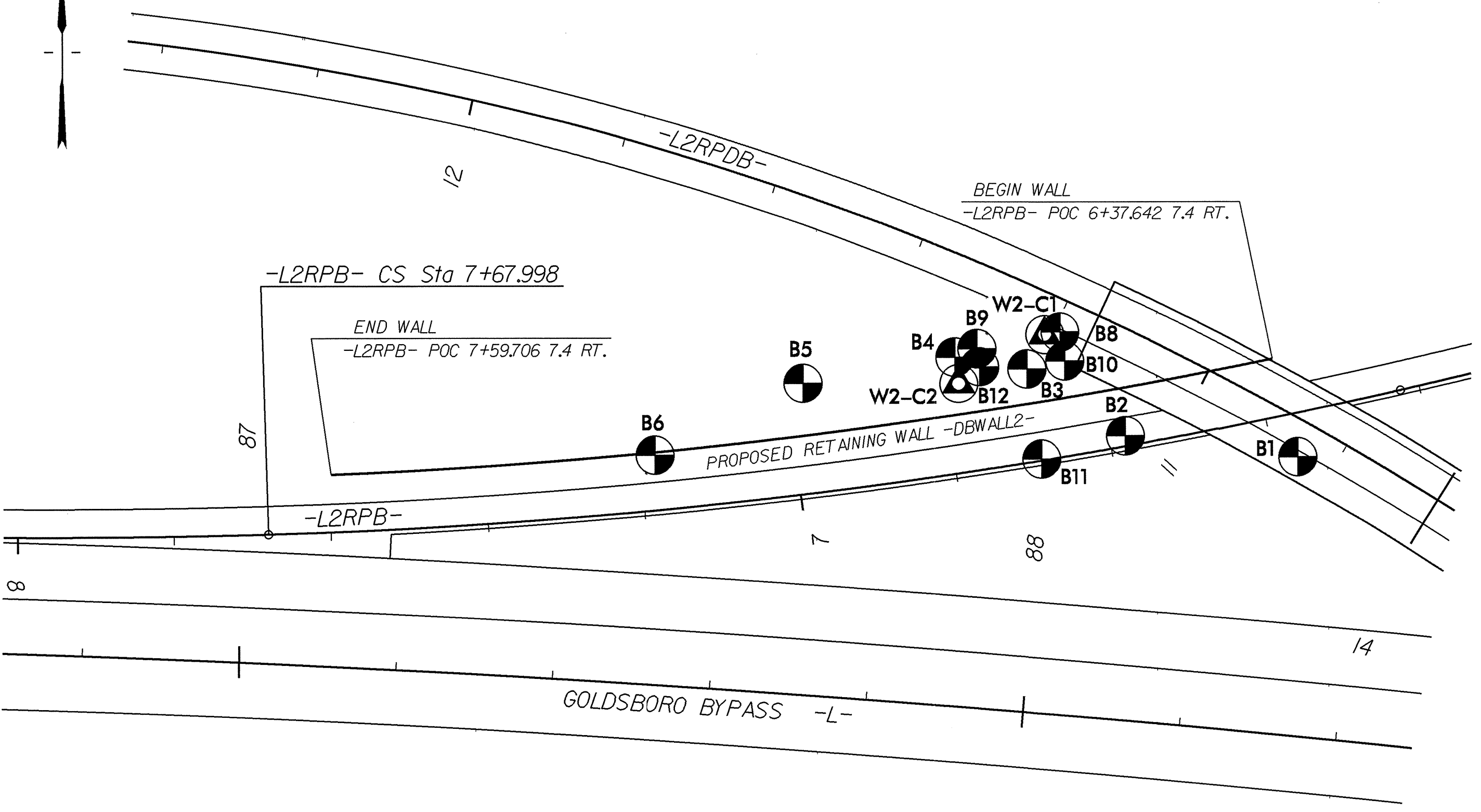
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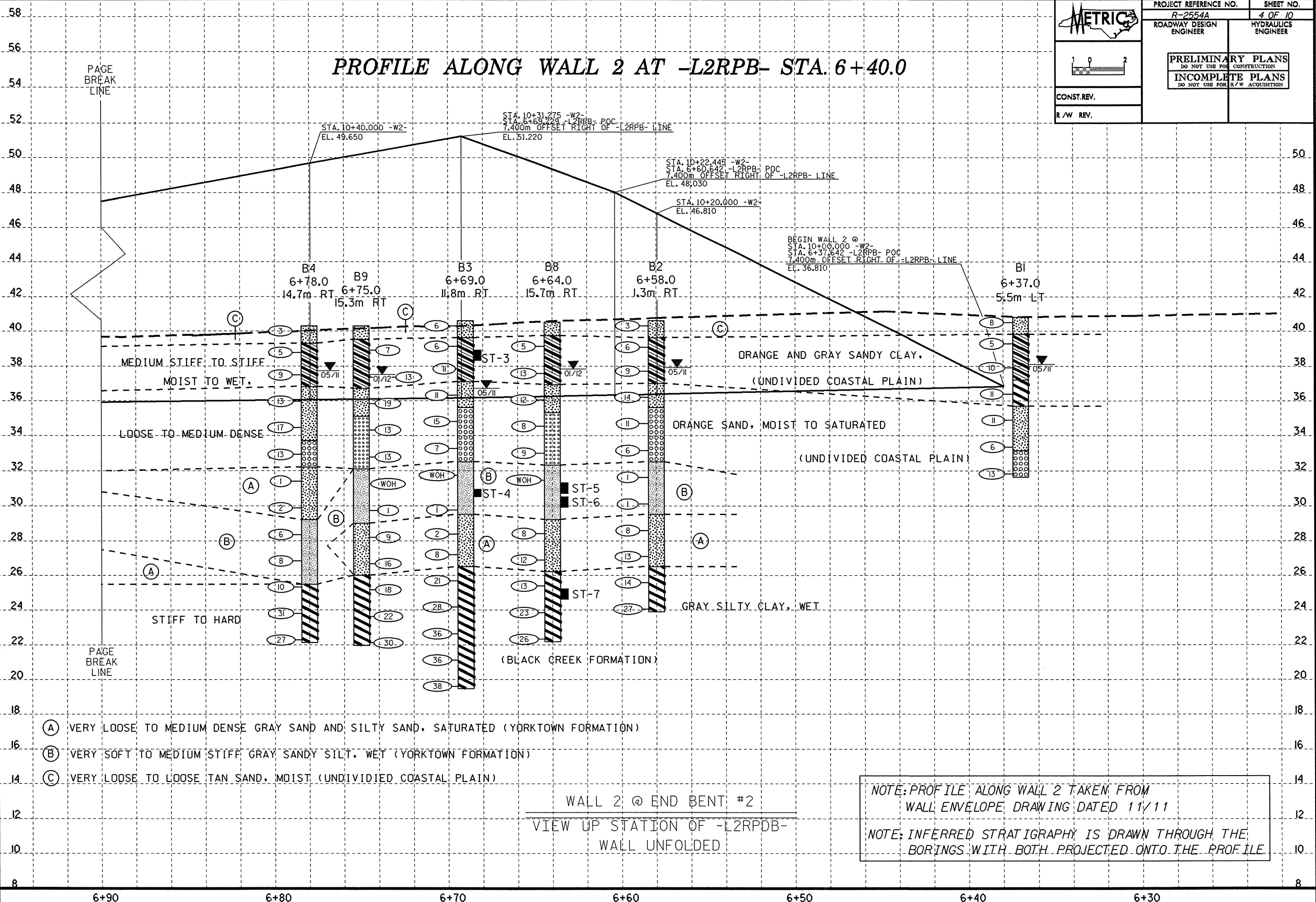
PROJECT REFERENCE NO.	SHEET
R-2554A	3 OF 10
<b>SITE PLAN</b>	
 METERS	





PROJECT REFERENCE NO. R-2554A ROADWAY DESIGN ENGINEER	SHEET NO. 4 OF 10 HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
CONST. REV.	
R/W REV.	

## PROFILE ALONG WALL 2 AT -L2RPB- STA. 6+40.0

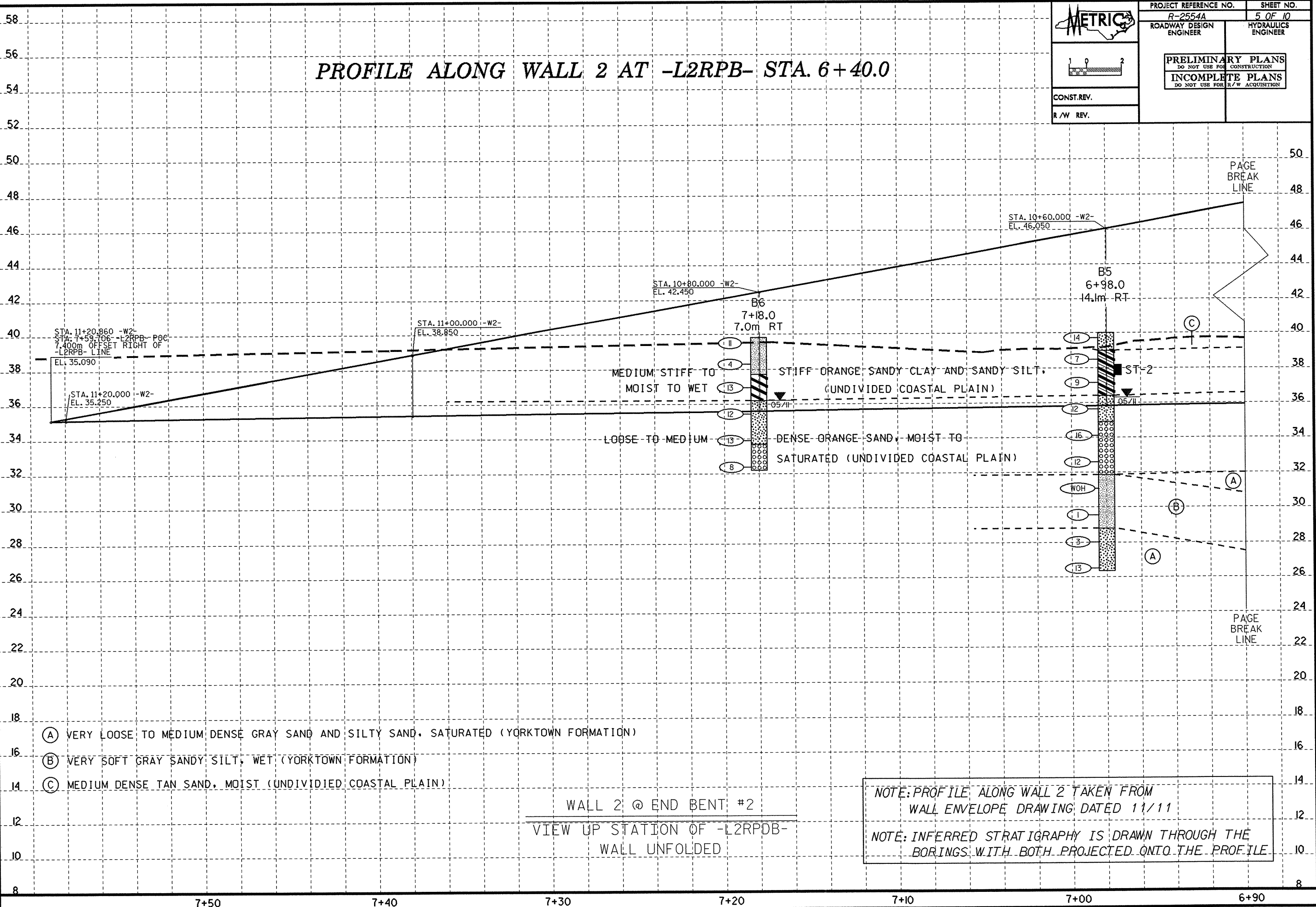


WALL 2 @ END BENT #2  
VIEW UP STATION OF -L2RPB-  
WALL UNFOLDED

NOTE: PROFILE ALONG WALL 2 TAKEN FROM WALL ENVELOPE DRAWING DATED 11/11  
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE

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# PROFILE ALONG WALL 2 AT -L2RPB- STA. 6+40.0



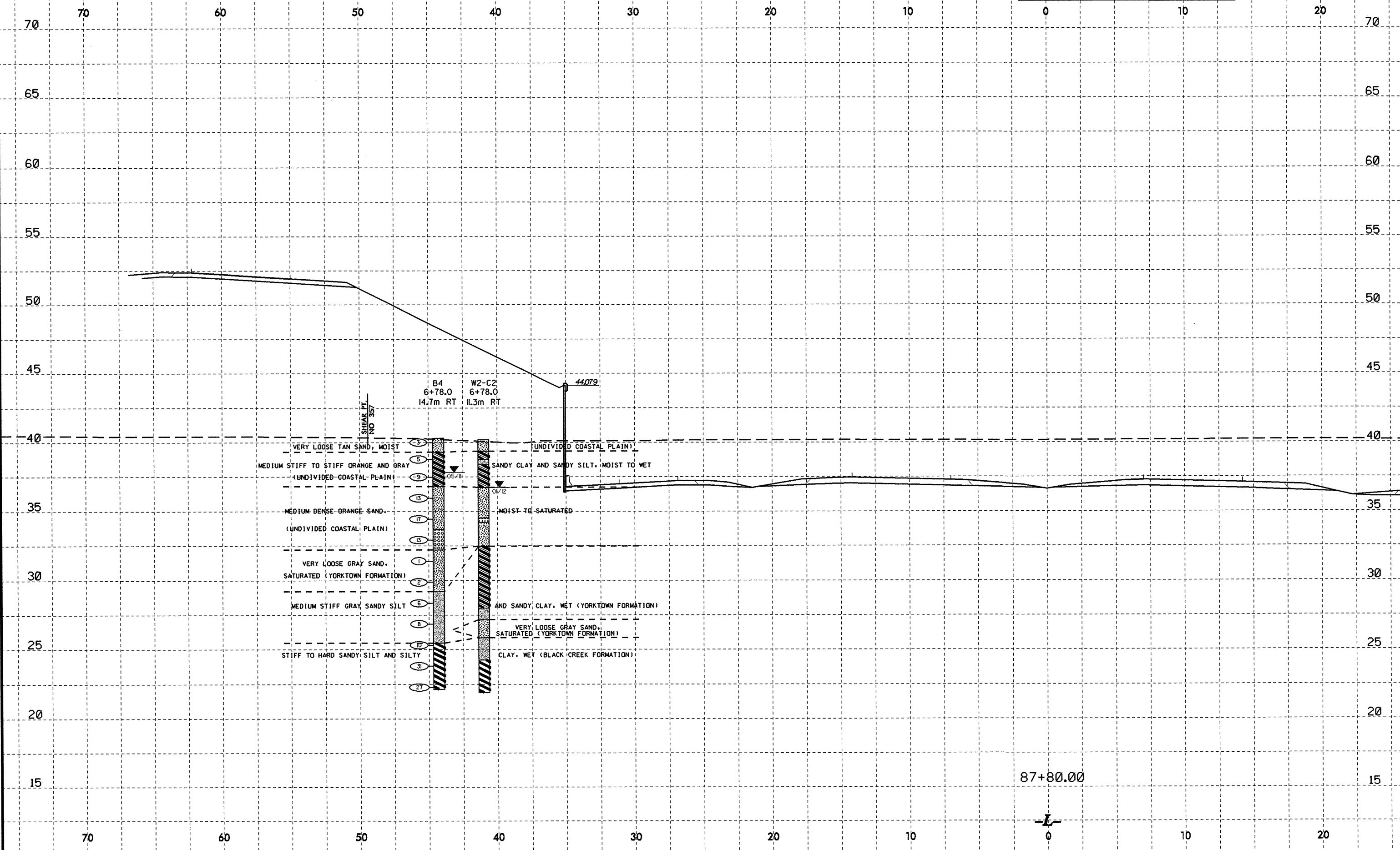
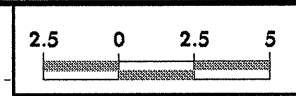
- (A) VERY LOOSE TO MEDIUM DENSE GRAY SAND AND SILTY SAND, SATURATED (YORKTOWN FORMATION)
- (B) VERY SOFT GRAY SANDY SILT, WET (YORKTOWN FORMATION)
- (C) MEDIUM DENSE TAN SAND, MOIST (UNDIVIDED COASTAL PLAIN)

WALL 2 @ END BENT #2  
 VIEW UP STATION OF -L2RPB-  
 WALL UNFOLDED

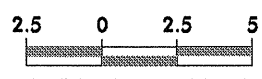
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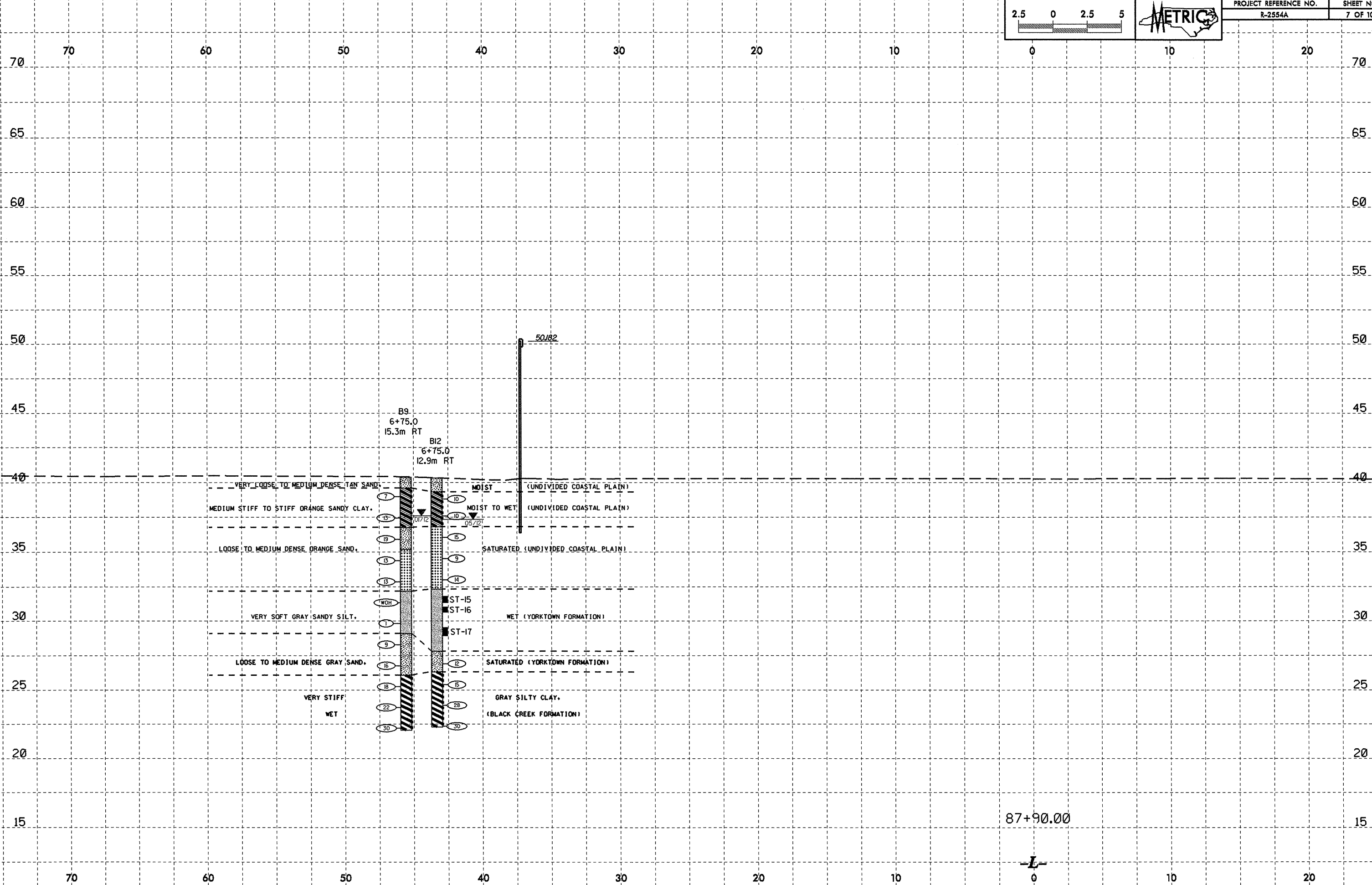
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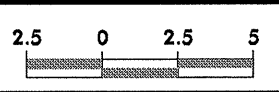
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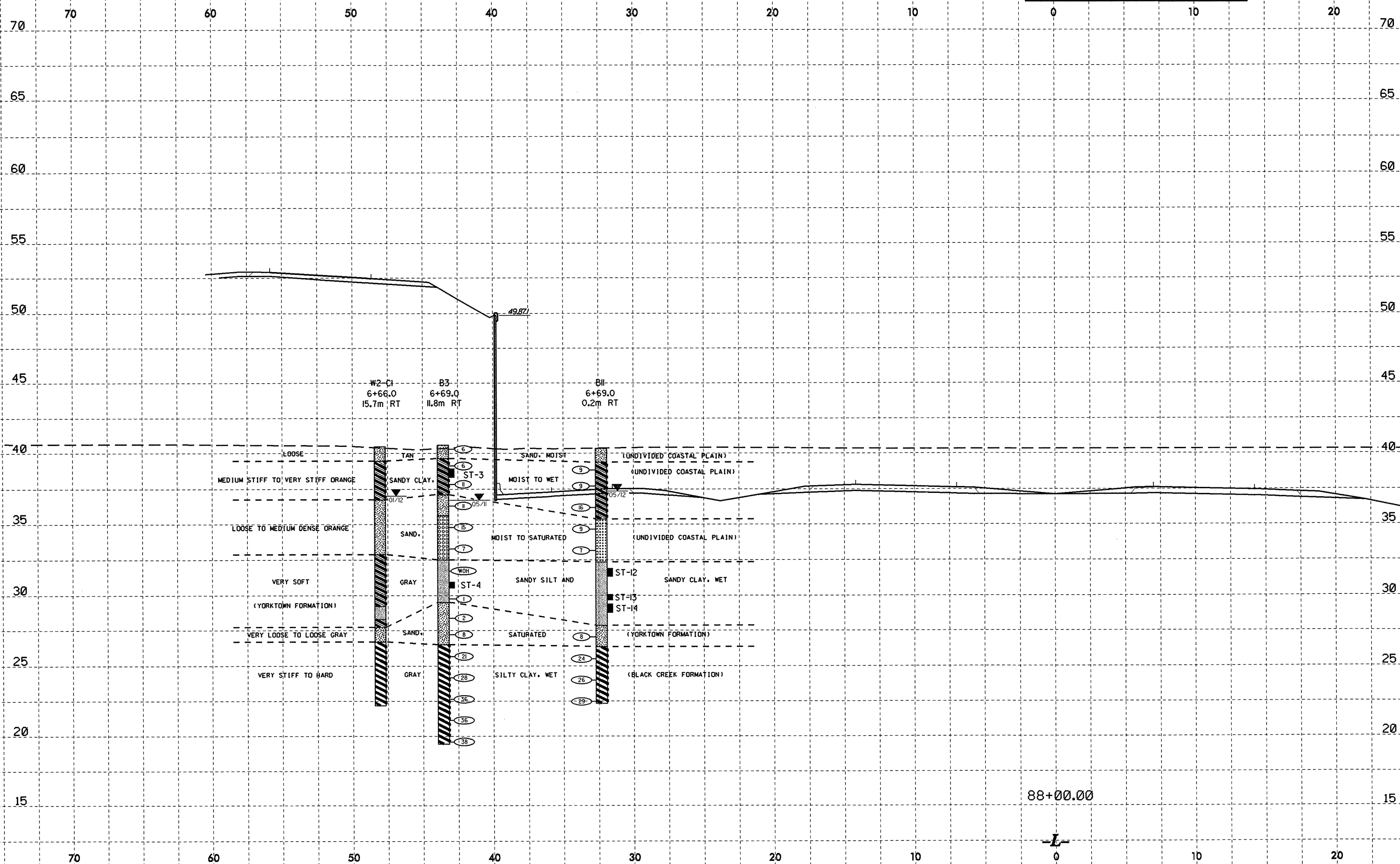
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Author: JAC  
Date: 02/25/06



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PROJECT REFERENCE NO. R-2554A	SHEET NO. 8 OF 10
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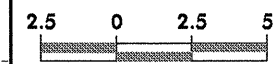


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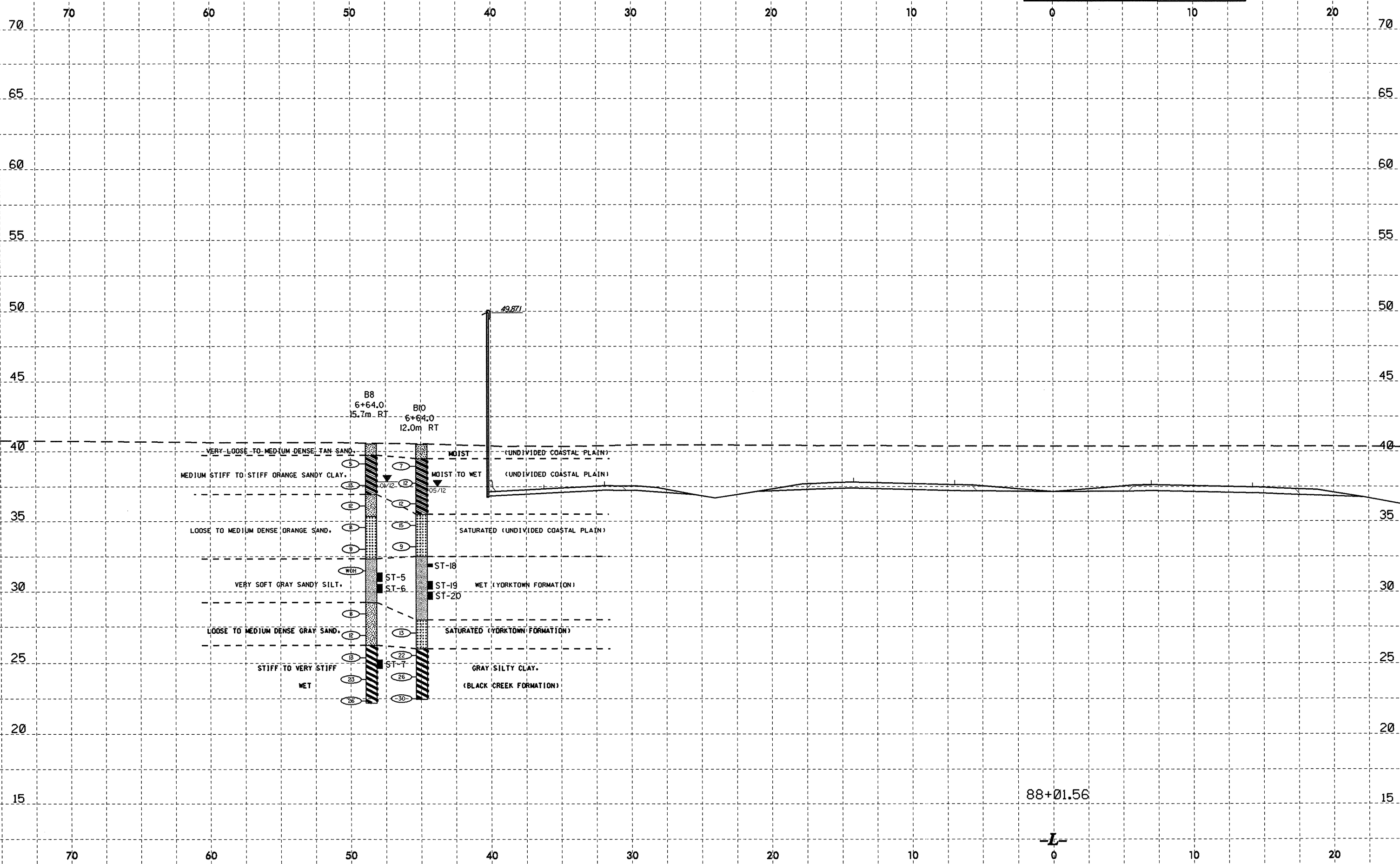




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PROJECT REFERENCE NO. R-2554A	SHEET NO. 9 OF 10
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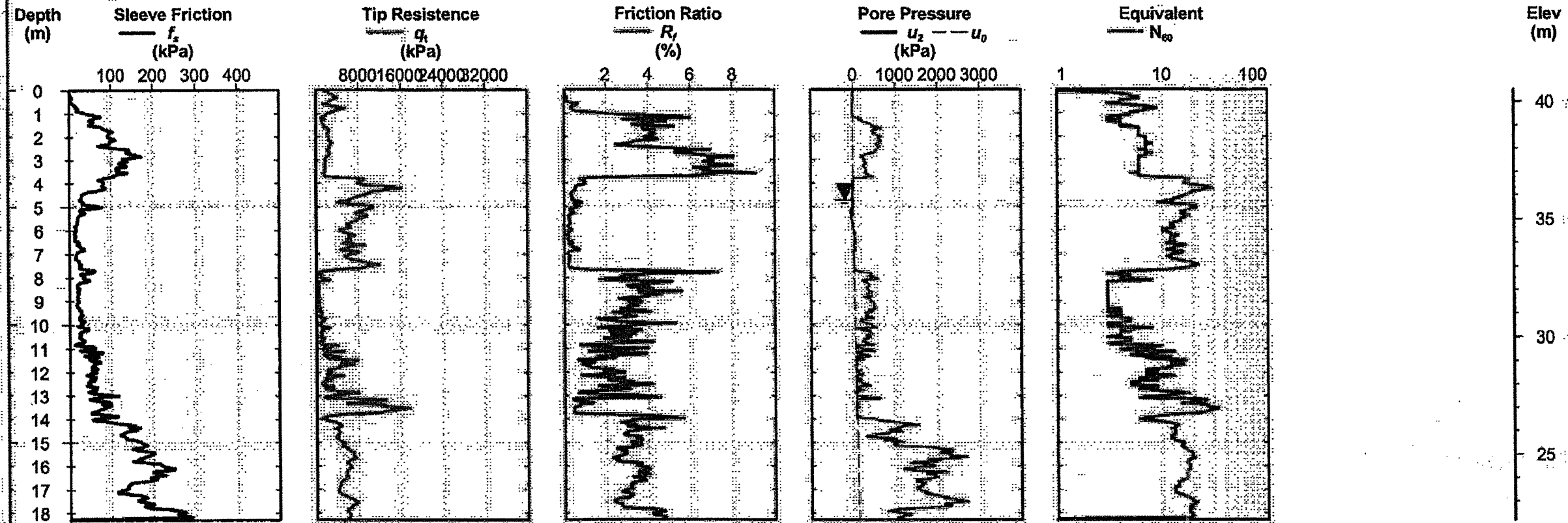
US-70 (Goldsboro Bypass) West of NC 581 to SR 1300  
 Wayne County (Goldsboro, N.C.)  
 S&ME Project No: 1051-12-011

# Cone Penetration Test

## W2-C1

Date: Jan. 10, 2012  
 Estimated Water Depth: 4.72 m  
 Rig/Operator: ATV/A. F. Riggs

Total Depth: 18.3 m  
 Termination Criteria: Target Depth  
 Cone Size: 1.44



CPT REPORT - DYNAMIC - 1051-12-011.GPJ S&ME 2008.06.24.GDT 1/27/12

## W2-C1



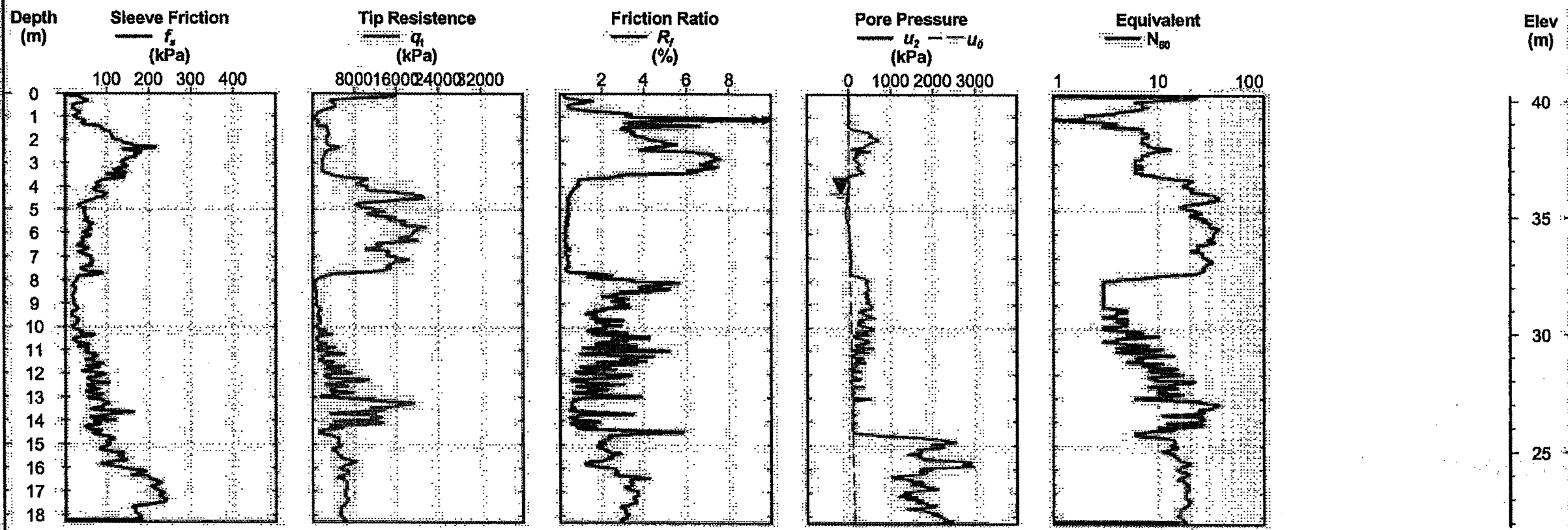
S 70 (Goldsboro Bypass) West of NC 581 to SR 1300  
Wayne County (Goldsboro, N.C.)  
S&ME Project No: 1051-12-011

# Cone Penetration Test

## W2-C2

Date: Jan. 10, 2012  
Estimated Water Depth: 4.27 m  
Rig/Operator: ATV/A. F. Riggs

Total Depth: 18.3 m  
Termination Criteria: Target Depth  
Cone Size: 1.44



CPT REPORT - DYNAMIC\_1051-12-011.GPJ S&ME 2008\_06\_24.GDT 1/27/12

## W2-C2

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 34461.1.3 (R-2554A) F.A. PROJ. NHF-70(30)  
 COUNTY WAYNE  
 PROJECT DESCRIPTION US 70 GOLDSBORO BYPASS FROM WEST  
OF NC 581 TO SR 1300  
 SITE DESCRIPTION RETAINING WALL 1 AT END BENT 1 AT -L-  
STA. 89+20

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	PROFILES
6-7	CROSS SECTIONS
8	SOIL TEST RESULTS

<u>ATTACHMENT</u>	<u>SHEET</u>
CPT LOGS	I-2

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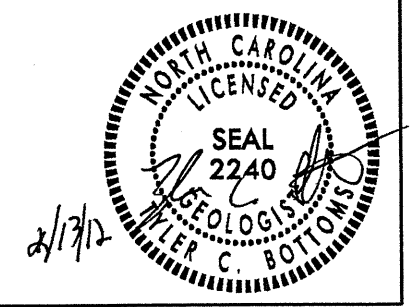
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**PROJECT: 34461.1.3 ID: R-2554A**

PERSONNEL  
J.R. SWARTLEY  
R.E. SMITH  
J.M. EDMONDSON

INVESTIGATED BY T.C. BOTTOMS  
 CHECKED BY D.N. ARGENBRIGHT  
 SUBMITTED BY D.N. ARGENBRIGHT  
 DATE FEBRUARY 2012



DRAWN BY: C.P. TURNER

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT



PROJECT REFERENCE NO. R-2554A  
SHEET NO. 2 OF 8

## SUBSURFACE INVESTIGATION

### SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

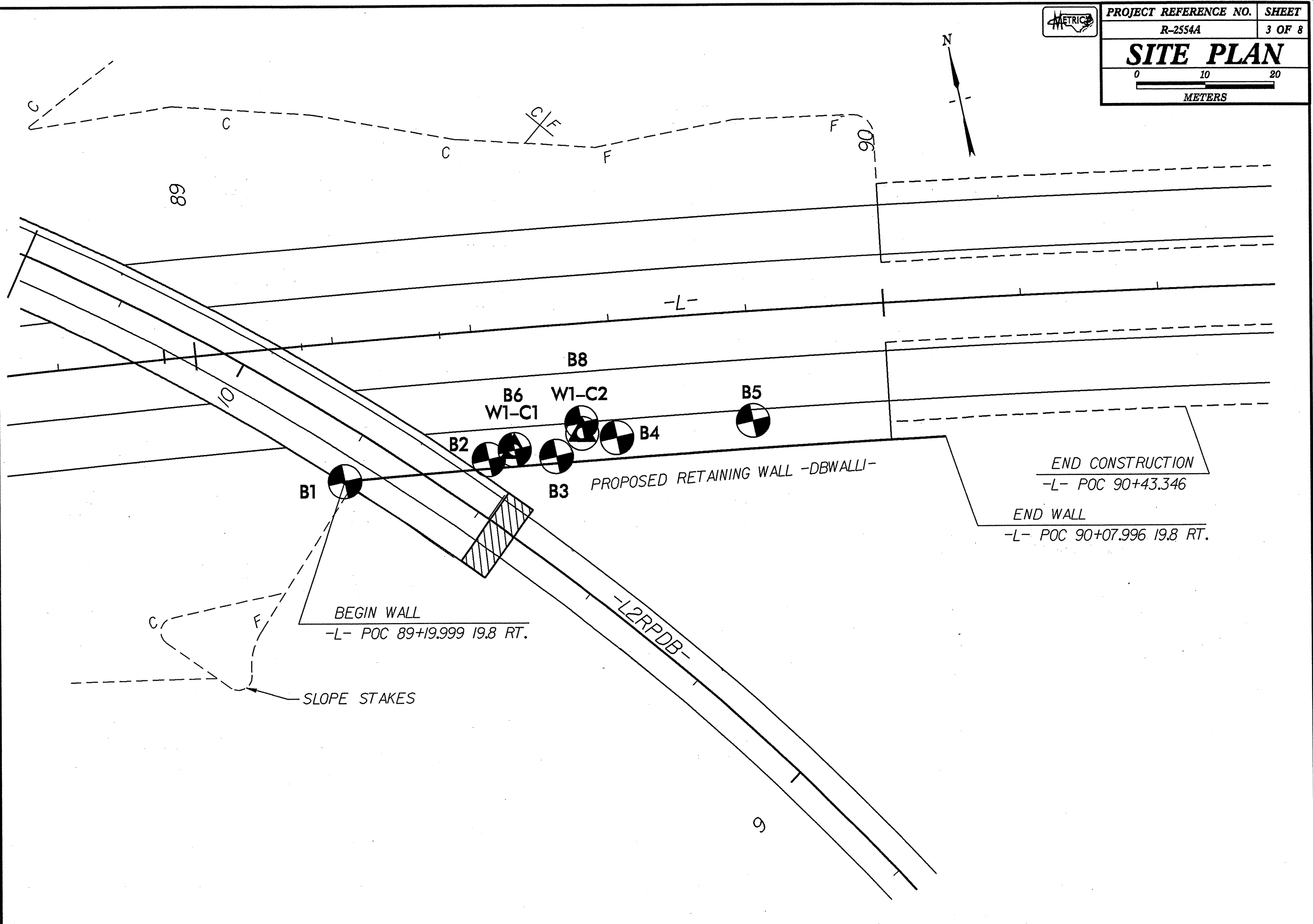
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																													
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 30 CM ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, 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, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) POORLY GRADED GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 3 CM 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: <b>WEATHERED ROCK (WR)</b> - NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER 30 CM IF TESTED. <b>CRYSTALLINE ROCK (CR)</b> - FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. <b>NON-CRYSTALLINE ROCK (NCR)</b> - FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. <b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b> - COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N) OF A 63.5 KG HAMMER FALLING 0.76 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM 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 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																													
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>										<b>MINERALOGICAL COMPOSITION</b>										<b>WEATHERING</b>										<b>GROUND WATER</b>																													
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.										FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SLI.) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SLI.) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BLOWS PER 30 CM. VERY SEVERE (V SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BLOWS PER 30 CM. COMPLETE - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.										SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50										ROCK HARDNESS VERY HARD - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD - CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 6 MM DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD - CAN BE GROOVED OR GOUGED 13 MM DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 25 MM MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT - CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT - CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 25 MM OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP									
<b>PERCENTAGE OF MATERIAL</b>										<b>MISCELLANEOUS SYMBOLS</b>										<b>ABBREVIATIONS</b>										<b>EQUIPMENT USED ON SUBJECT PROJECT</b>																													
ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD										SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL MOISTURE CONTENT V - VERY VSL - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT W <sub>c</sub> - DRY UNIT WEIGHT										DRILL UNITS: MOBILE B- BK-51 CME-45B CME-550 PORTABLE HOIST																													
<b>TEXTURE OR GRAIN SIZE</b>										<b>SOIL MOISTURE - CORRELATION OF TERMS</b>										<b>FRACTURE SPACING</b>										<b>BEDDING</b>																													
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053										SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE										TERM SPACING VERY WIDE MORE THAN 3 M WIDE 3 TO 10 M MODERATELY CLOSE 30 TO 100 CM CLOSE 5 TO 30 CM VERY CLOSE LESS THAN 5 CM										TERM THICKNESS VERY THICKLY BEDDED > 1 M THICKLY BEDDED 0.5 - 1 M THINLY BEDDED 0.05 - 0.5 M VERY THINLY BEDDED 10 - 50 MM THICKLY LAMINATED 2.5 - 10 MM THINLY LAMINATED < 2.5 MM																													
<b>PLASTICITY</b>										<b>INTEGRATION</b>										<b>NOTES:</b>										<b>CONCRETE TEST (CPT)</b>																													
NONPLASTIC 0-5 VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH										FOR SEDIMENTARY ROCKS, INTEGRATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INTEGRATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INTEGRATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INTEGRATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.										BENCH MARK: TBM: B-5 ELEVATION: 39.97 M										CONE PENETRATION TEST (CPT)																													
<b>COLOR</b>										<b>DESCRIPTIONS</b>										<b>DESCRIPTIONS</b>										<b>DESCRIPTIONS</b>																													
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																													



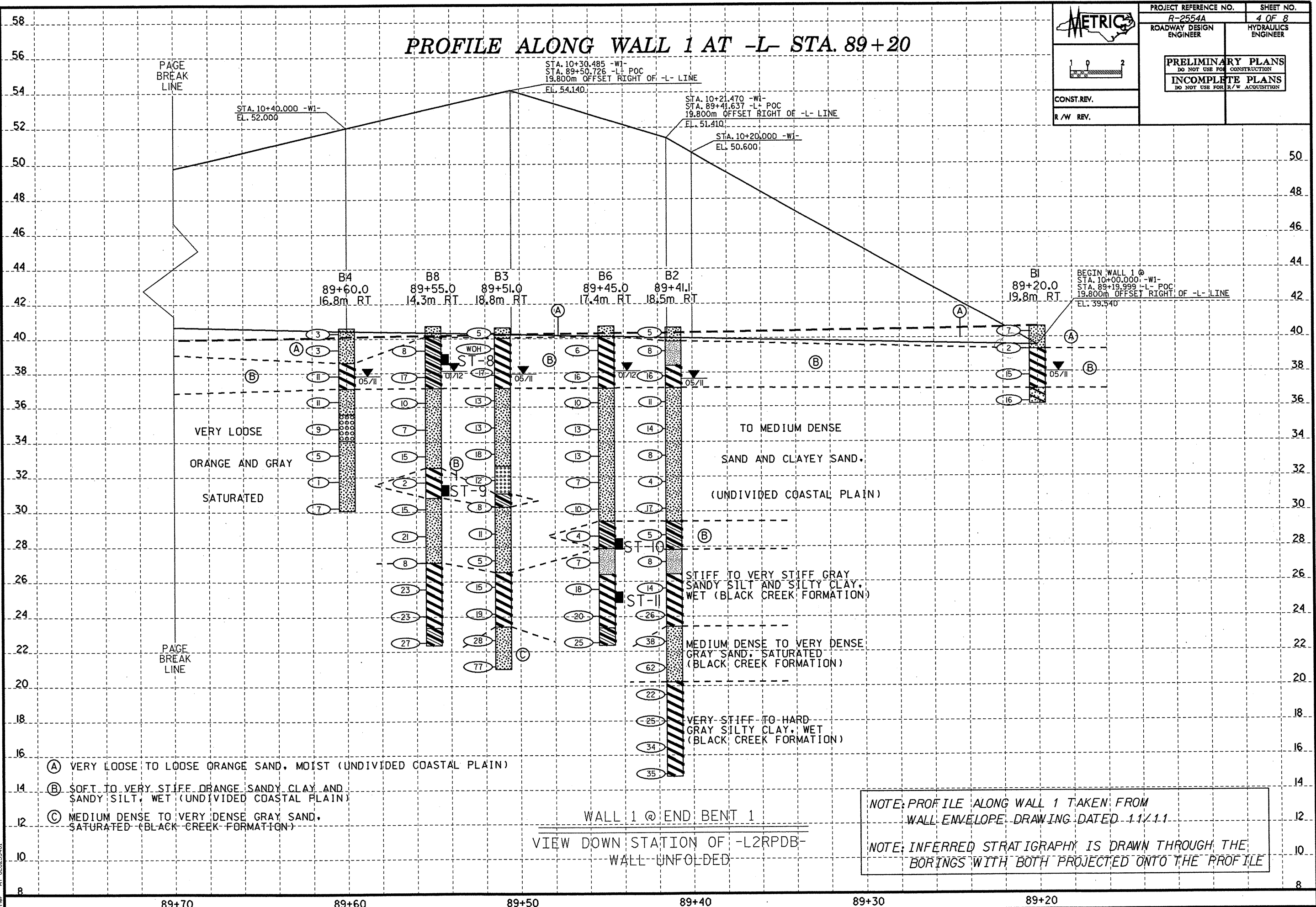
# SITE PLAN

0 10 20

METERS



# PROFILE ALONG WALL 1 AT -L- STA. 89+20



- (A) VERY LOOSE TO LOOSE ORANGE SAND, MOIST (UNDIVIDED COASTAL PLAIN)
- (B) SOFT TO VERY STIFF ORANGE SANDY CLAY AND SANDY SILT, WET (UNDIVIDED COASTAL PLAIN)
- (C) MEDIUM DENSE TO VERY DENSE GRAY SAND, SATURATED (BLACK CREEK FORMATION)

WALL 1 @ END BENT 1  
 VIEW DOWN STATION OF -L2RPDB-  
 WALL UNFOLDED

NOTE: PROFILE ALONG WALL 1 TAKEN FROM WALL ENVELOPE DRAWING DATED 11/11  
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE

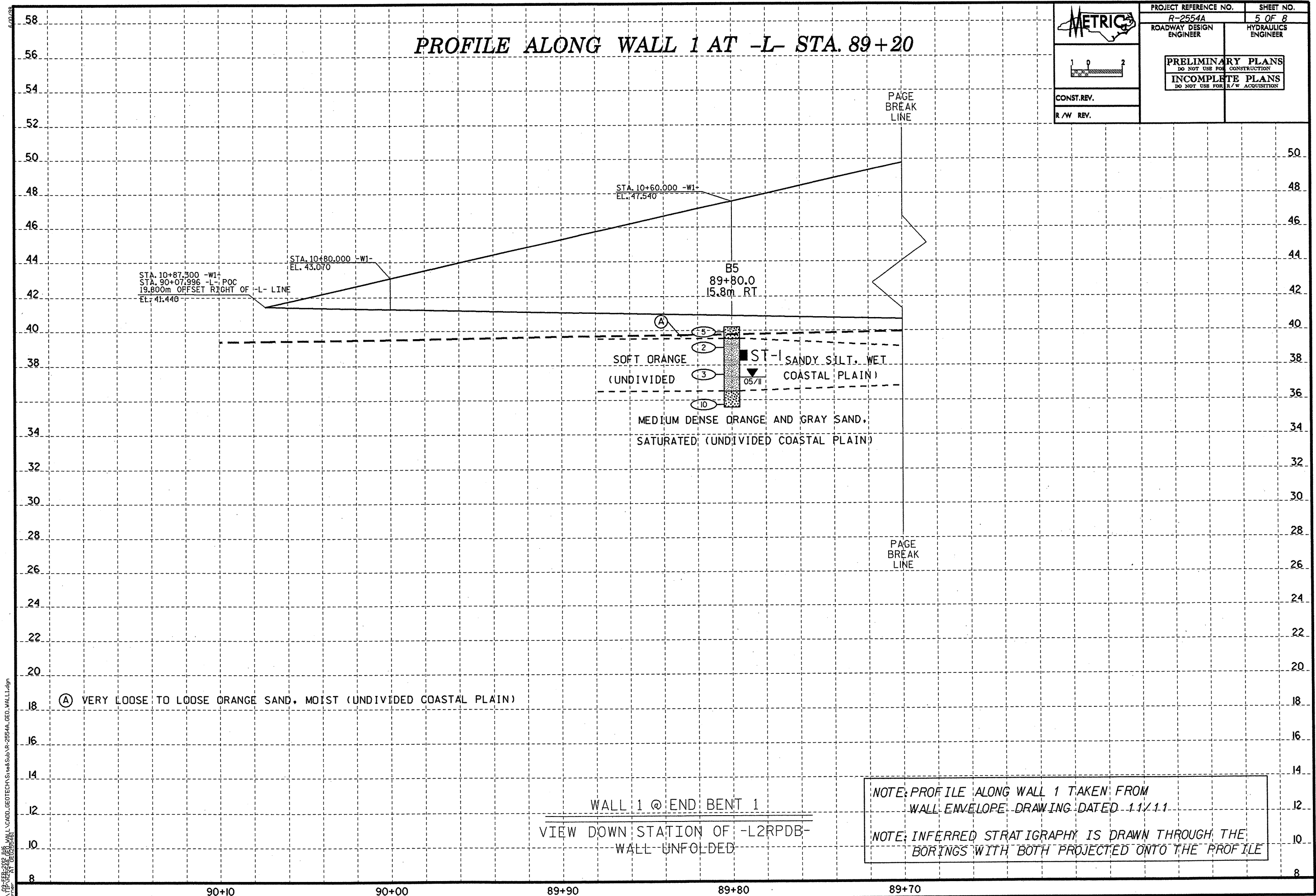
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PROJECT REFERENCE NO. R-2554A	SHEET NO. 5 OF 8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION <b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
CONST. REV.	
R/W REV.	

# PROFILE ALONG WALL 1 AT -L- STA. 89+20



STA. 10+87.500 -W1+  
 STA. 90+07.996 -L- POC  
 19.800m OFFSET RIGHT OF -L- LINE  
 EL: 41.440

STA. 10+80.000 -W1-  
 EL. 43.070

STA. 10+60.000 -W1+  
 EL. 47.540

B5  
 89+80.0  
 15.8m RT

SOFT ORANGE  
 (UNDIVIDED)

MEDIUM DENSE ORANGE AND GRAY SAND,  
 SATURATED (UNDIVIDED COASTAL PLAIN)

SANDY SILT, WET  
 COASTAL PLAIN

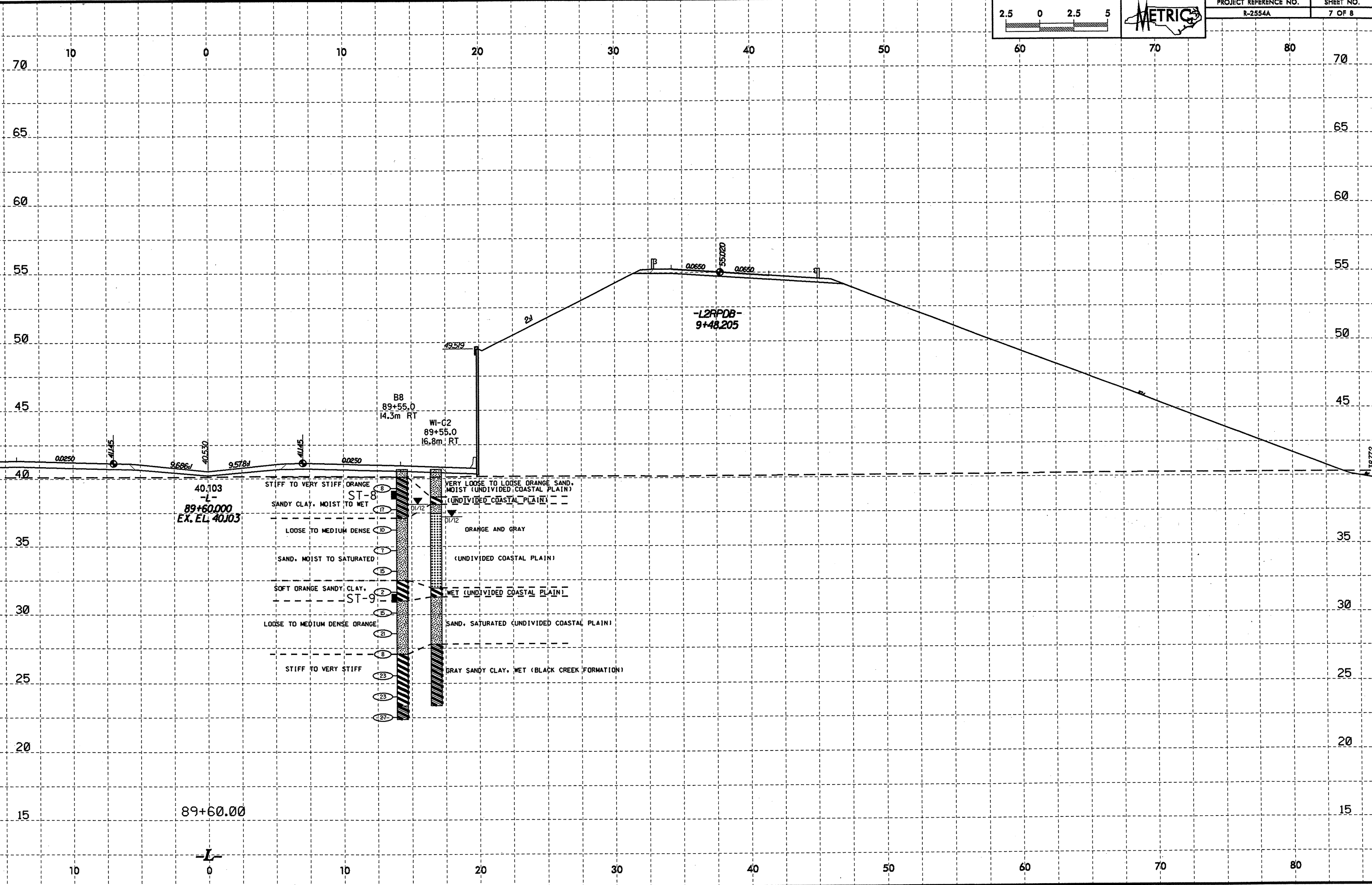
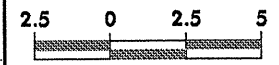
(A) VERY LOOSE TO LOOSE ORANGE SAND, MOIST (UNDIVIDED COASTAL PLAIN)

WALL 1 @ END BENT 1  
 VIEW DOWN STATION OF -L2RPDB-  
 WALL UNFOLDED

NOTE: PROFILE ALONG WALL 1 TAKEN FROM  
 WALL ENVELOPE DRAWING DATED 11/11  
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE  
 BORINGS WITH BOTH PROJECTED ONTO THE PROFILE

08-FEB-2002 JUS  
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34461.1.3

R-2554A

WALL 1 AT END BENT 1 AT -L- STA. 89+20

**B1 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	19.8 RT	89+20.0	2.53-2.98	A-7-6(38)	75	50	15.2	14.0	12.1	58.8	100	88	74	-	-
SS-2	19.8 RT	89+20.0	4.05-4.50	A-2-7(2)	53	29	70.0	7.1	1.6	21.3	96	40	23	-	-

**B2 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-35	18.5 RT	89+41.1	0.00-0.45	A-2-4(0)	17	NP	45.2	35.9	6.7	12.2	98	74	22	-	-
SS-36	18.5 RT	89+41.1	1.06-1.51	A-4(0)	23	8	33.3	31.2	17.2	18.3	100	81	41	-	-
SS-37	18.5 RT	89+41.1	2.53-2.98	A-7-6(30)	61	41	9.5	23.9	21.9	44.6	100	94	73	-	-
SS-38	18.5 RT	89+41.1	4.05-4.50	A-2-4(0)	23	NP	68.7	18.0	1.2	12.2	100	59	14	-	-
SS-39	18.5 RT	89+41.1	7.10-7.55	A-2-4(0)	21	NP	32.5	53.9	4.6	9.1	100	86	17	-	-
SS-40	18.5 RT	89+41.1	11.67-12.12	A-6(6)	30	12	2.0	40.4	33.3	24.3	100	99	65	-	-
SS-41	18.5 RT	89+41.1	13.19-13.64	A-4(0)	24	8	34.3	29.0	20.5	16.2	100	92	41	-	-
SS-42	18.5 RT	89+41.1	14.72-15.17	A-7-6(25)	48	28	6.9	9.1	53.5	30.4	97	92	85	-	-
SS-43	18.5 RT	89+41.1	17.77-18.22	A-2-4(0)	25	8	33.9	42.0	7.9	16.2	100	86	26	-	-
SS-44	18.5 RT	89+41.1	23.86-24.31	A-7-6(26)	44	27	0.4	9.9	36.9	52.7	100	100	94	-	-

**B6 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-46	17.4 RT	89+45.0	11.80-12.25	A-6(7)	33	15	2.2	37.3	28.3	32.1	100	99	61	-	-

**B3 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-3	18.8 RT	89+51.0	0.00-0.45	A-2-4(0)	17	NP	49.9	33.3	3.5	13.2	94	67	18	-	-
SS-4	18.8 RT	89+51.0	2.44-2.89	A-7-6(37)	74	51	9.7	22.3	15.3	52.7	100	94	72	-	-
SS-5	18.8 RT	89+51.0	3.96-4.41	A-2-4(0)	27	8	59.3	22.6	2.9	15.2	100	70	20	-	-
SS-6	18.8 RT	89+51.0	8.53-8.98	A-3(0)	18	NP	81.7	13.7	0.6	4.1	100	53	6	-	-
SS-7	18.8 RT	89+51.0	13.11-13.56	A-2-4(0)	20	NP	55.2	26.2	7.4	11.1	100	86	21	-	-
SS-8	18.8 RT	89+51.0	14.63-15.08	A-7-6(31)	55	32	7.1	6.1	26.0	60.8	100	95	89	-	-
SS-9	18.8 RT	89+51.0	17.68-18.13	A-2-4(0)	27	8	20.9	52.1	10.8	16.2	97	89	28	-	-

**B8 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-45	14.3 RT	89+55.0	8.75-9.20	A-7-6(8)	41	25	29.3	21.1	15.5	34.1	99	78	49	-	-

**B4 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-10	16.8 RT	89+60.0	0.00-0.45	A-2-4(0)	16	NP	51.7	34.3	6.9	7.1	98	69	17	-	-
SS-11	16.8 RT	89+60.0	2.47-2.92	A-7-6(17)	49	29	17.4	23.1	21.0	38.5	100	89	66	-	-
SS-12	16.8 RT	89+60.0	3.99-4.44	A-2-4(0)	22	3	68.7	17.7	1.4	12.2	98	54	15	-	-
SS-13	16.8 RT	89+60.0	5.52-5.97	A-1-b(0)	24	NP	81.7	8.7	2.5	7.1	77	24	8	-	-

**B5 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-14	15.8 RT	89+80.0	0.91-1.36	A-4(0)	20	4	19.9	31.0	26.8	22.3	100	90	57	-	-



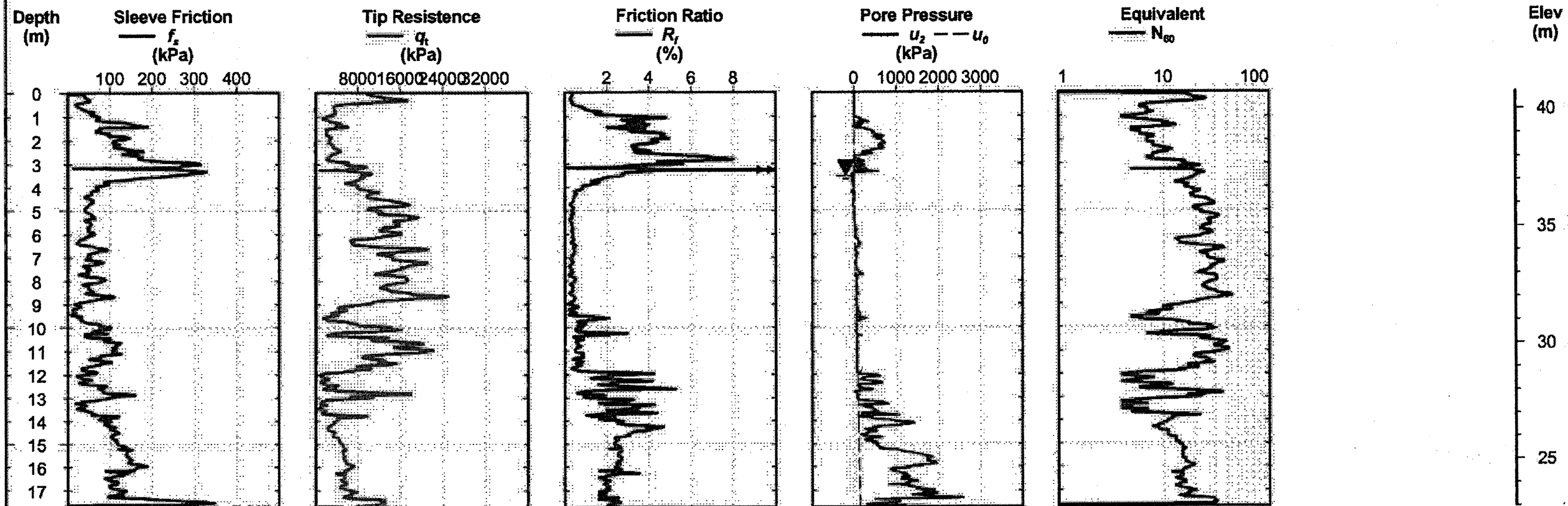
70 (Goldsboro Bypass) West of NC 581 to SR 1300  
Wayne County (Goldsboro, N.C.)  
S&ME Project No: 1051-12-011

# Cone Penetration Test

**W1-C1**

Date: Jan. 10, 2012  
Estimated Water Depth: 3.51 m  
Rig/Operator: ATV/A. F. Riggs

Total Depth: 17.7 m  
Termination Criteria: Target Depth  
Cone Size: 1.44



**W1-C1**



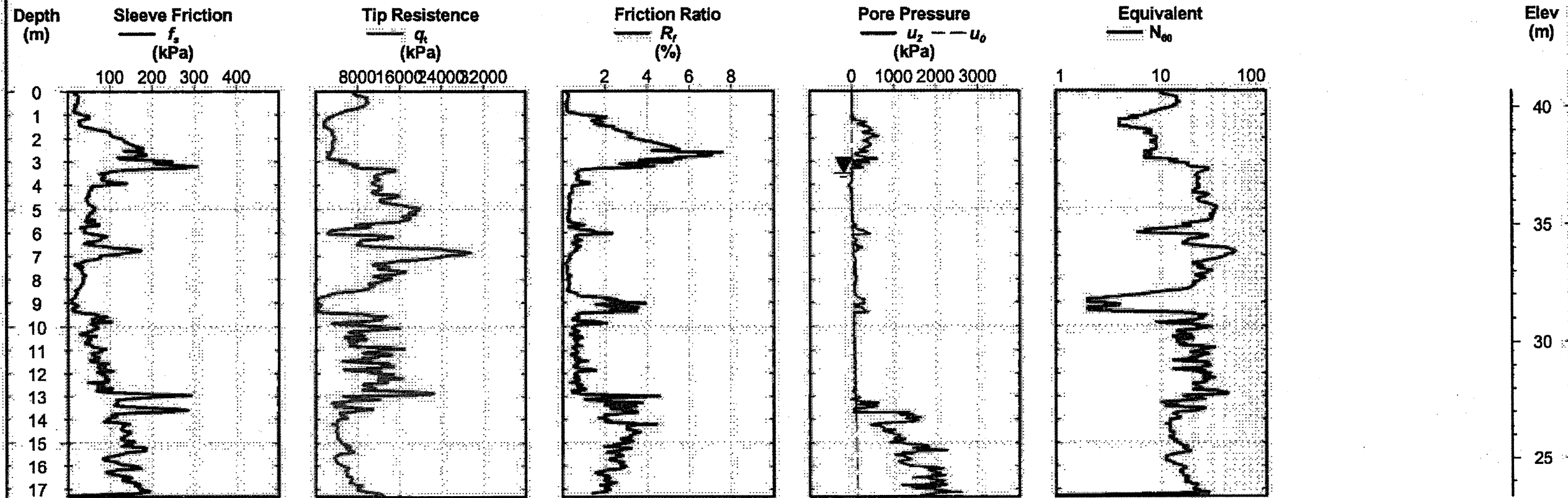
Station 70 (Goldsboro Bypass) West of NC 581 to SR 1300  
 Wayne County (Goldsboro, N.C.)  
 S&ME Project No: 1051-12-011

# Cone Penetration Test

## W1-C2

Date: Jan. 10, 2012  
 Estimated Water Depth: 3.51 m  
 Rig/Operator: ATV/A. F. Riggs

Total Depth: 17.3 m  
 Termination Criteria: Target Depth  
 Cone Size: 1.44



## W1-C2



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554A	1	9

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 34461.1.3 (R-2554A) F.A. PROJ. NHF-70 (30)

COUNTY WAYNE

PROJECT DESCRIPTION US 70 (GOLDSBORO BYPASS) FROM WEST  
OF NC 581 TO SR 1300 (SALEM CHUCH ROAD)

SITE DESCRIPTION BRIDGE ON -Y- (SALEM CHURCH RD.) OVER  
-L- (US 70 BYPASS) AT -Y- STA. 13+87.934

**CONTENTS**

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-8	BORE LOGS
9	SOIL TEST RESULTS

**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.

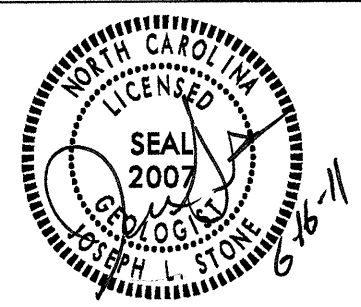
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

- RES
- JME
- HRC
- JRM
- JRS
- JPD

INVESTIGATED BY J.L. STONE  
 CHECKED BY D.N. ARGENBRIGHT  
 SUBMITTED BY D.N. ARGENBRIGHT  
 DATE JUNE 2011



**PROJECT: 34461.1.3 ID: R-2554A**

DRAWN BY: C.R. SUMNER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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



PROJECT REFERENCE NO.  
R-2554A

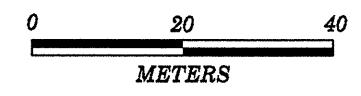
SHEET NO.  
2 OF 9

**SUBSURFACE INVESTIGATION**

**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

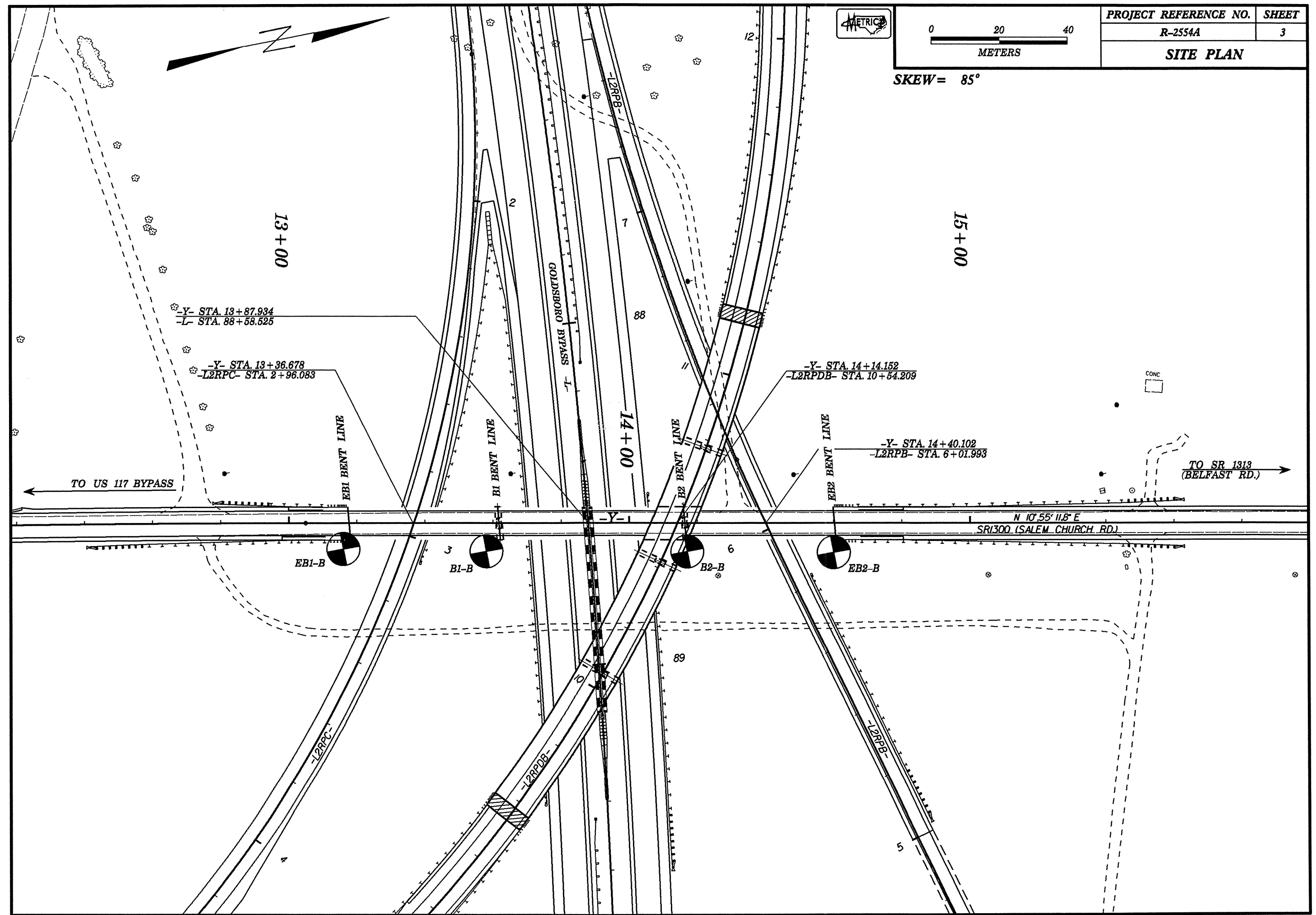
SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 30 CM ACCORDING TO STANDARD PENETRATION 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:</p> <p align="center"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i></p>		<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)</p> <p>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 3 CM 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.</p> <p>ADUIFIER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>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.</p> <p>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.</p> <p>CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHALE-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOTJ) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p>SAPROLITE (SAP) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OF A 63.5 KG HAMMER FALLING 0.76 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>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 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p>TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING			
<p>GENERAL CLASS. GRANULAR MATERIALS (&lt;= 35% PASSING #200) SILT-CLAY MATERIALS (&gt; 35% PASSING #200) ORGANIC MATERIALS</p> <p>GROUP CLASS. A-1, A-1-b, A-3, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-8, 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: STONE FRAGS., GRAVEL, SAND, FINE SAND, SILTY OR CLAYEY GRAVEL AND SAND, SILTY SOILS, CLAYEY SOILS</p> <p>GEN. RATING AS A SUBGRADE: EXCELLENT TO GOOD, FAIR TO POOR, FAIR TO POOR, POOR, UNSUITABLE</p> <p>PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS &gt; LL - 30</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: SLIGHTLY COMPRESSIBLE, MODERATELY COMPRESSIBLE, HIGHLY COMPRESSIBLE</p> <p>PERCENTAGE OF MATERIAL: ORGANIC MATERIAL, GRANULAR SOILS, SILT-CLAY SOILS, OTHER MATERIAL</p> <p>GROUND WATER: WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING, STATIC WATER LEVEL AFTER 24 HOURS, PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA, SPRING OR SEEP</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, VERY SLIGHT (V SL.), SLIGHT (SL.), MODERATE (MOD.), MODERATELY SEVERE (MOD. SEV.), SEVERE (SEV.), VERY SEVERE (V SEV.), COMPLETE</p>			
CONSISTENCY OR DENSENESS		MISCELLANEOUS SYMBOLS		ROCK WEATHERNESS			
<p>PRIMARY SOIL TYPE, COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE), RANGE OF UNCONFINED COMPRESSIVE STRENGTH (KN/M<sup>2</sup>)</p>		<p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION, SOIL SYMBOL, ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT, INFERRED SOIL BOUNDARY, INFERRED ROCK LINE, ALLUVIAL SOIL BOUNDARY, DIP &amp; DIP DIRECTION OF ROCK STRUCTURES, SOUNDING ROD</p> <p>SPT CPT, DMT, VST, TEST BORING, AUGER BORING, CORE BORING, MONITORING WELL, PIEZOMETER INSTALLATION, SLOPE INDICATOR INSTALLATION, SPT N-VALUE, SPT REFUSAL</p>		<p>VERY HARD, HARD, MODERATELY HARD, MEDIUM HARD, SOFT, VERY SOFT</p>			
TEXTURE OR GRAIN SIZE		ABBREVIATIONS		EQUIPMENT USED ON SUBJECT PROJECT			
<p>U.S. STD. SIEVE SIZE OPENING (MM), BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE, SD.), FINE SAND (F SD.), SILT (SL.), CLAY (CL.)</p>		<p>AR - AUGER REFUSAL, BT - BORING TERMINATED, CL - CLAY, CPT - CONE PENETRATION TEST, CSE - COARSE, DMT - DILATOMETER TEST, DPT - DYNAMIC PENETRATION TEST, F - FINE, FOSS. - FOSSILIFEROUS, FRAC. - FRACTURED, FRACTURES, FRAGS. - FRAGMENTS, HI - HIGHLY, MED. - MEDIUM, MICA - MICACEOUS, MOD. - MODERATELY, NP - NON PLASTIC, ORG. - ORGANIC, PMT - PRESSUREMETER TEST, SAP. - SAPROLITIC, SD. - SAND, SANDY, SL. - SILT, SILTY, SLI. - SLIGHTLY, TCR - TRICONE REFUSAL</p>		<p>DRILL UNITS: MOBILE B-, BK-51, CME-55, CME-550X, PORTABLE HOIST, CME-45B</p> <p>ADVANCING TOOLS: CLAY BITS, 152mm CONTINUOUS FLIGHT AUGER, 203mm HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING, TRICONE 75mm STEEL TEETH, TRICONE, CORE BIT</p> <p>HAMMER TYPE: AUTOMATIC, MANUAL</p> <p>CORE SIZE: B, N, H</p> <p>HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST</p>			
SOIL MOISTURE - CORRELATION OF TERMS		EQUIPMENT USED ON SUBJECT PROJECT		FRACTURE SPACING		BEDDING	
<p>SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION</p> <p>LL - LIQUID LIMIT, PL - PLASTIC LIMIT, OM - OPTIMUM MOISTURE, SL - SHRINKAGE LIMIT</p> <p>- SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</p> <p>- WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</p> <p>- MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE</p> <p>- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</p>				<p>TERM, SPACING: VERY WIDE, WIDE, MODERATELY CLOSE, CLOSE, VERY CLOSE</p>		<p>TERM, THICKNESS: VERY THICKLY BEDDED, THICKLY BEDDED, THINLY BEDDED, VERY THINLY BEDDED, THICKLY LAMINATED, THINLY LAMINATED</p>	
PLASTICITY		EQUIPMENT USED ON SUBJECT PROJECT		INDURATION			
<p>NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY</p> <p>PLASTICITY INDEX (PI), DRY STRENGTH, VERY LOW, SLIGHT, MEDIUM, HIGH</p>				<p>FRIABLE, MODERATELY INDURATED, INDURATED, EXTREMELY INDURATED</p> <p>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>			
COLOR		EQUIPMENT USED ON SUBJECT PROJECT		INDURATION		BENCH MARK	
<p>DESCRIPTIONS 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>RIO30A-6 ELEVATION: 40,904 M</p>	
						NOTES:	





PROJECT REFERENCE NO.	SHEET
R-2554A	3
<b>SITE PLAN</b>	

SKEW = 85°



TO US 117 BYPASS

TO SR 1313 (BELFAST RD.)

N 10° 55' 11.8" E  
SR1300 (SALEM CHURCH RD.)

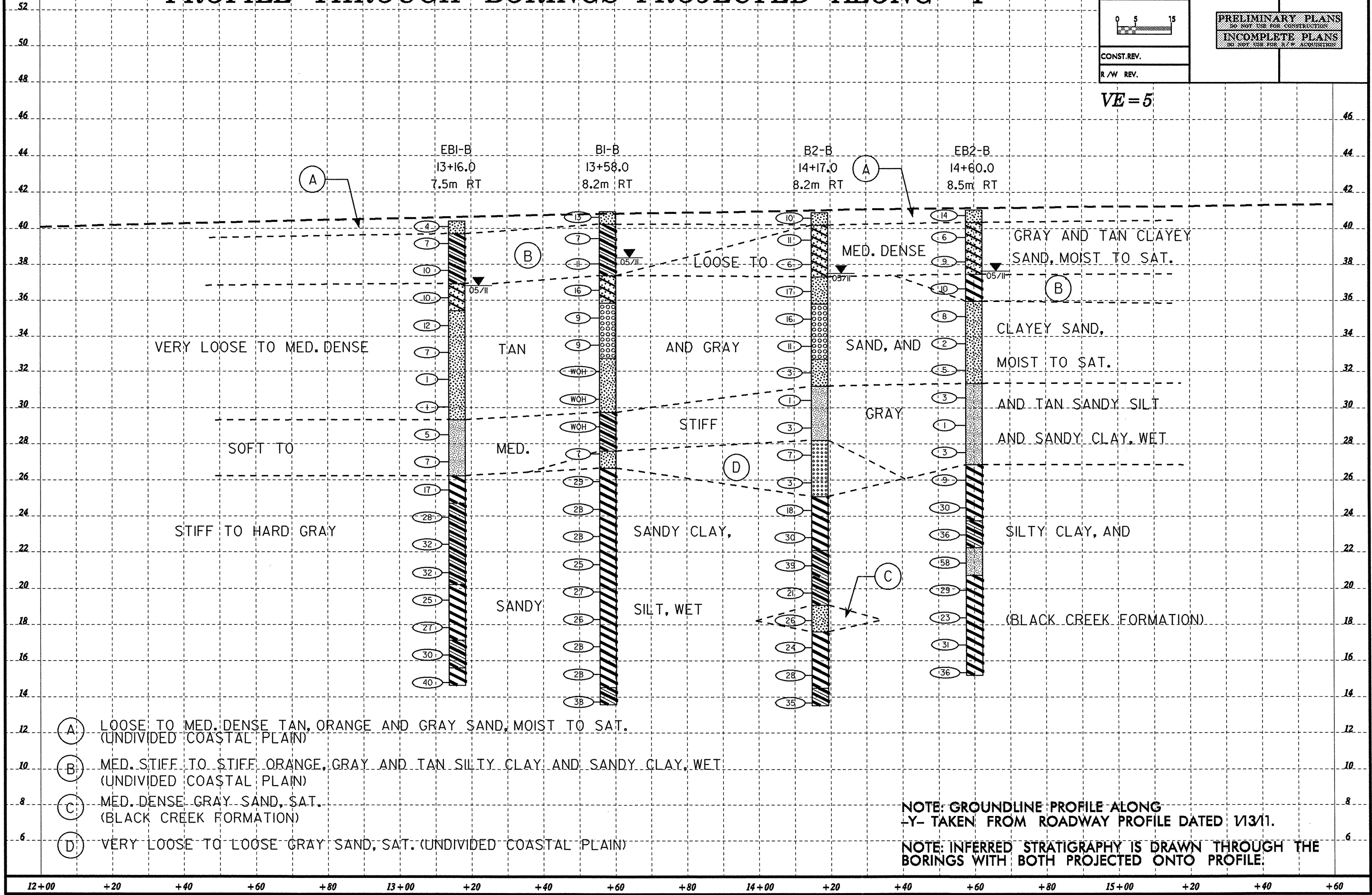
CONC

# PROFILE THROUGH BORINGS PROJECTED ALONG -Y-



PROJECT REFERENCE NO. R-2554A	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
CONST. REV.	
R/W REV.	

VE = 5



- (A) LOOSE TO MED. DENSE TAN, ORANGE AND GRAY SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)
- (B) MED. STIFF TO STIFF ORANGE, GRAY AND TAN SILTY CLAY AND SANDY CLAY, WET (UNDIVIDED COASTAL PLAIN)
- (C) MED. DENSE GRAY SAND, SAT. (BLACK CREEK FORMATION)
- (D) VERY LOOSE TO LOOSE GRAY SAND, SAT. (UNDIVIDED COASTAL PLAIN)

NOTE: GROUNDLINE PROFILE ALONG -Y- TAKEN FROM ROADWAY PROFILE DATED 1/13/11.  
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.										
SITE DESCRIPTION BRIDGE ON -Y- (SALEM CHURCH RD.) OVER -L- (US 70 BYPASS)							GROUND WTR (m)									
BORING NO. EB1-B		STATION 13+16.0		OFFSET 7.5 m RT		ALIGNMENT -Y-										
COLLAR ELEV. 40.41 m		TOTAL DEPTH 25.77 m		NORTHING 186,648.8		EASTING 700,712.7										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Conley, H. R.		START DATE 05/18/11		COMP. DATE 05/19/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100						
41																
40	40.41	0.00	1	2	2									40.41	GROUND SURFACE	0.00
39	39.46	0.95	1	3	4									39.71	UNDIVIDED COASTAL PLAIN ORANGE SAND, MOIST	0.70
38	37.94	2.47	3	4	6										UNDIVIDED COASTAL PLAIN ORANGE AND GRAY SANDY CLAY, MOIST TO WET	
37	36.42	3.99	4	5	5									36.91	UNDIVIDED COASTAL PLAIN GRAY SAND, SAT.	3.50
36	34.89	5.52	2	6	6									35.41	UNDIVIDED COASTAL PLAIN GRAY SAND, SAT.	5.00
35	33.37	7.04	4	5	2											
34	31.84	8.57	1	0	1											
33	30.32	10.09	WOH	WOH	1											
32	28.79	11.62	WOH	3	2									29.31	UNDIVIDED COASTAL PLAIN GRAY SANDY SILT, WET	11.10
31	27.27	13.14	1	2	5											
30	25.74	14.67	5	9	8									26.21	COASTAL PLAIN GRAY SILTY CLAY AND SANDY CLAY, WET (BLACK CREEK FORMATION)	14.20
29	24.22	16.19	7	11	17									24.71		15.70
28	22.70	17.71	7	12	20											
27	21.17	19.24	13	14	18											
26														20.66		19.75

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.										
SITE DESCRIPTION BRIDGE ON -Y- (SALEM CHURCH RD.) OVER -L- (US 70 BYPASS)							GROUND WTR (m)									
BORING NO. EB1-B		STATION 13+16.0		OFFSET 7.5 m RT		ALIGNMENT -Y-										
COLLAR ELEV. 40.41 m		TOTAL DEPTH 25.77 m		NORTHING 186,648.8		EASTING 700,712.7										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Conley, H. R.		START DATE 05/18/11		COMP. DATE 05/19/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100						
21																
20	19.65	20.76	7	11	14									20.21	COASTAL PLAIN GRAY SILTY CLAY AND SANDY CLAY, WET (BLACK CREEK FORMATION) <i>(continued)</i>	20.20
19																
18	18.13	22.28	8	12	15											
17	16.61	23.80	8	13	17									17.11		23.30
16	15.09	25.32	9	9	31									15.61		24.80
15														14.64	Boring Terminated at Elevation 14.64 m IN HARD SILTY CLAY	25.77

NCDOT BORE DOUBLE R2554A\_GEO\_BRDG\_Y\_OVER\_L\_SPT\_BORINGS.GPJ NC\_DOT\_GDT\_01/14/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.	
SITE DESCRIPTION BRIDGE ON -Y- (SALEM CHURCH RD.) OVER -L- (US 70 BYPASS)				GROUND WTR (m)
BORING NO. B1-B	STATION 13+58.0	OFFSET 8.2 m RT	ALIGNMENT -Y-	0 HR. N/A
COLLAR ELEV. 40.93 m	TOTAL DEPTH 27.35 m	NORTHING 186,549.8	EASTING 700,692.9	24 HR. 2.29

DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 83% 12/12/2005	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 05/23/11	COMP. DATE 05/24/11
SURFACE WATER DEPTH N/A		

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
41	40.93	0.00												GROUND SURFACE	0.00
40	39.73	1.20	1	4	9	13								UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	0.70
39	38.31	2.62	2	3	4	7								UNDIVIDED COASTAL PLAIN TAN SANDY CLAY, MOIST TO WET	
38	36.83	4.10	2	5	6	11									
37	35.31	5.62	5	8	8	16								UNDIVIDED COASTAL PLAIN TAN CLAYEY SAND, SAT.	3.60
36	33.79	7.14	4	4	5	9								UNDIVIDED COASTAL PLAIN TAN AND GRAY SAND AND SILTY SAND, SAT.	5.10
35	32.27	8.66	7	4	5	9									
34	30.75	10.18	WOH	WOH	WOH	0									
33	29.23	11.70	WOH	WOH	WOH	0									
32	27.71	13.22	WOH	4	3	7									
31	26.19	14.74	7	11	18	29									
30	24.67	16.26	10	15	13	28									
29	23.15	17.78	9	11	17	28									
28	21.63	19.30	9	9	16	25									

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.	
SITE DESCRIPTION BRIDGE ON -Y- (SALEM CHURCH RD.) OVER -L- (US 70 BYPASS)				GROUND WTR (m)
BORING NO. B1-B	STATION 13+58.0	OFFSET 8.2 m RT	ALIGNMENT -Y-	0 HR. N/A
COLLAR ELEV. 40.93 m	TOTAL DEPTH 27.35 m	NORTHING 186,549.8	EASTING 700,692.9	24 HR. 2.29

DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 83% 12/12/2005	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 05/23/11	COMP. DATE 05/24/11
SURFACE WATER DEPTH N/A		

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
21														Match Line	
20	20.11	20.82	7	11	16	27								COASTAL PLAIN GRAY SILTY CLAY AND SANDY CLAY, WET (BLACK CREEK FORMATION) (continued)	
19	18.59	22.34	7	11	15	26									
18	17.07	23.86	8	13	15	28									
17	15.55	25.38	7	12	16	28									
16	14.03	26.90	11	16	22	38									
15															
14															
														Boring Terminated at Elevation 13.58 m IN HARD SILTY CLAY	27.35

NCDOT BORE DOUBLE R2554A GEO\_BRDG\_Y\_OVER\_L\_SPT\_BORINGS.GPJ NC\_DOT\_GDT 6/14/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST DeLoatch, J. P.											
SITE DESCRIPTION BRIDGE ON -Y- (SALEM CHURCH RD.) OVER -L- (US 70 BYPASS)							GROUND WTR (m)										
BORING NO. B2-B		STATION 14+17.0		OFFSET 8.2 m RT		ALIGNMENT -Y-											
COLLAR ELEV. 40.89 m		TOTAL DEPTH 27.36 m		NORTHING 186,590.9		EASTING 700,701.5											
DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 83% 12/12/2005		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic													
DRILLER Smith, R. E.		START DATE 05/24/11		COMP. DATE 05/24/11		SURFACE WATER DEPTH N/A											
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100							
41	40.89	0.00	1	2	8										40.89	GROUND SURFACE	0.00
40	39.67	1.22	2	6	5										40.19	UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	0.70
39	38.30	2.59	1	2	4											UNDIVIDED COASTAL PLAIN GRAY CLAYEY SAND, MOIST TO SAT.	
38	36.78	4.11	5	7	10										37.29	UNDIVIDED COASTAL PLAIN TAN SAND, SAT.	3.60
37	35.26	5.63	7	8	8										35.79		5.10
36	33.74	7.15	6	6	5										32.69		8.20
35	32.22	8.67	1	3	0										31.19	UNDIVIDED COASTAL PLAIN GRAY SANDY SILT, WET	9.70
34	30.70	10.19	1	0	1										28.19	UNDIVIDED COASTAL PLAIN GRAY SAND, SAT.	12.70
33	29.18	11.71	WOH	WOH	3										25.09	COASTAL PLAIN GRAY SILTY CLAY, WET (BLACK CREEK FORMATION)	15.80
32	27.66	13.23	6	2	5										22.09		18.80
31	26.14	14.75	3	2	1										20.67		20.22
30	24.62	16.27	8	8	10												
29	23.10	17.79	10	12	18												
28	21.58	19.31	11	18	21												
27																	
26																	
25																	
24																	
23																	
22																	
21																	

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST DeLoatch, J. P.											
SITE DESCRIPTION BRIDGE ON -Y- (SALEM CHURCH RD.) OVER -L- (US 70 BYPASS)							GROUND WTR (m)										
BORING NO. B2-B		STATION 14+17.0		OFFSET 8.2 m RT		ALIGNMENT -Y-											
COLLAR ELEV. 40.89 m		TOTAL DEPTH 27.36 m		NORTHING 186,590.9		EASTING 700,701.5											
DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 83% 12/12/2005		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic													
DRILLER Smith, R. E.		START DATE 05/24/11		COMP. DATE 05/24/11		SURFACE WATER DEPTH N/A											
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100							
21																	
20	20.06	20.83	7	9	12										19.09	COASTAL PLAIN GRAY SILTY CLAY, WET (BLACK CREEK FORMATION) (continued)	21.80
19	18.54	22.35	7	13	13										17.59	COASTAL PLAIN GRAY SAND, SAT.	23.30
18	17.02	23.87	7	10	14										14.49	COASTAL PLAIN GRAY CLAY AND SILTY CLAY, WET	26.40
17	15.50	25.39	9	12	16										13.53	Boring Terminated at Elevation 13.53 m IN HARD SILTY CLAY	27.36
16	13.98	26.91	8	15	20												
15																	
14																	

NCDOT BORE DOUBLE R2554A GEO\_BRDG\_Y\_OVER\_L\_SPT\_BORINGS.GPJ NC\_DOT\_GDT 6/14/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST DeLoatch, J. P.										
SITE DESCRIPTION BRIDGE ON -Y- (SALEM CHURCH RD.) OVER -L- (US 70 BYPASS)							GROUND WTR (m)									
BORING NO. EB2-B		STATION 14+60.0		OFFSET 8.5 m RT		ALIGNMENT -Y-										
COLLAR ELEV. 41.04 m		TOTAL DEPTH 25.84 m		NORTHING 186,691.0		EASTING 700,721.1										
DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 83% 12/12/2005		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Smith, R. E.		START DATE 05/24/11		COMP. DATE 05/25/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100						
42																
41	41.04	0.00												41.04	GROUND SURFACE	0.00
40	39.82	1.22	2	8	6									40.34	UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	0.70
39	38.45	2.59	2	3	3										UNDIVIDED COASTAL PLAIN TAN CLAYEY SAND, MOIST TO SAT.	
38	38.45	2.59	2	3	6											
37	36.93	4.11	2	4	6									37.44	UNDIVIDED COASTAL PLAIN TAN SILTY CLAY, WET	3.60
36	35.41	5.63	5	5	3									35.94	UNDIVIDED COASTAL PLAIN TAN AND GRAY SAND, SAT.	5.10
35	33.89	7.15	WOH	1	1											
34	32.37	8.67	3	2	3											
33	30.85	10.19	WOH	1	2											
32	29.33	11.71	1	0	1											
31	27.81	13.23	1	1	2											
30	26.29	14.75	3	4	5											
29	24.77	16.27	8	14	16											
28	23.25	17.79	7	12	24											
27	21.73	19.31														

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST DeLoatch, J. P.									
SITE DESCRIPTION BRIDGE ON -Y- (SALEM CHURCH RD.) OVER -L- (US 70 BYPASS)							GROUND WTR (m)								
BORING NO. EB2-B		STATION 14+60.0		OFFSET 8.5 m RT		ALIGNMENT -Y-									
COLLAR ELEV. 41.04 m		TOTAL DEPTH 25.84 m		NORTHING 186,691.0		EASTING 700,721.1									
DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 83% 12/12/2005		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Smith, R. E.		START DATE 05/24/11		COMP. DATE 05/25/11		SURFACE WATER DEPTH N/A									
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
22															
21			15	30	28										
20	20.21	20.83	10	13	16										
19	18.69	22.35	8	9	14										
18	17.17	23.87	8	13	18										
17	15.65	25.39	10	16	20										
16															

NCDOT BORE DOUBLE R2554A\_GEO\_BRDG\_Y\_OVER\_L\_SPT\_BORINGS.GPJ NC\_DOT.GDT 6/14/11

R-2554A

34461.1.3

BRIDGE ON -Y- OVER -L- (US 70 BYPASS)

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	2.00mm	425µm	75µm		
SS-1	7.5m RT	13+16.0	0.0-0.45	A-2-4(0)	17	NP	51.2	28.2	6.5	14.2	100	69	23	-	-
SS-2	7.5m RT	13+16.0	0.95-1.40	A-6(7)	35	17	26.1	24.3	23.2	26.3	100	85	56	-	-
SS-3	7.5m RT	13+16.0	3.99-4.44	A-2-6(0)	33	11	66.4	17.3	2.1	14.2	100	58	18	-	-
SS-4	7.5m RT	13+16.0	8.57-9.02	A-2-4(0)	24	3	12.6	57.3	13.9	16.2	99	94	34	-	-
SS-5	7.5m RT	13+16.0	11.62-12.07	A-4(0)	21	NP	5.5	50.9	31.5	12.2	100	98	53	-	-
SS-6	7.5m RT	13+16.0	16.19-16.64	A-6(10)	31	17	6.1	30.0	33.5	30.4	98	94	74	-	-
SS-7	7.5m RT	13+16.0	20.76-21.21	A-7-6(36)	60	35	3.6	8.7	43.1	44.6	100	97	91	-	-

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	2.00mm	425µm	75µm		
SS-20	8.2m RT	14+17.0	0.0-0.45	A-2-4(0)	14	NP	54.9	32.0	5.0	8.1	100	70	16	-	-
SS-21	8.2m RT	14+17.0	1.22-1.67	A-2-6(1)	38	20	52.9	22.9	1.9	22.3	100	65	27	-	-
SS-22	8.2m RT	14+17.0	4.11-4.56	A-2-4(0)	26	7	50.7	28.8	4.4	16.2	98	64	22	-	-
SS-23	8.2m RT	14+17.0	5.63-6.08	A-1-b(0)	22	NP	77.4	15.4	3.2	4.0	90	40	7	-	-
SS-24	8.2m RT	14+17.0	8.67-9.12	A-2-4(0)	22	3	62.0	19.5	5.4	13.0	97	66	20	-	-
SS-25	8.2m RT	14+17.0	10.19-10.64	A-4(0)	24	4	3.0	54.9	30.1	12.0	96	95	48	-	-
SS-26	8.2m RT	14+17.0	13.23-13.68	A-3(0)	20	NP	68.8	21.4	2.7	7.0	100	77	10	-	-
SS-27	8.2m RT	14+17.0	16.27-16.72	A-7-6(27)	48	30	3.2	15.4	49.3	32.1	100	99	87	-	-
SS-28	8.2m RT	14+17.0	19.31-19.76	A-6(12)	33	19	9.0	15.8	53.1	22.0	98	93	74	-	-
SS-29	8.2m RT	14+17.0	22.35-22.80	A-2-4(0)	26	4	3.1	72.3	9.5	15.0	100	99	27	-	-
SS-30	8.2m RT	14+17.0	23.87-24.32	A-7-6(47)	66	44	2.2	5.4	16.2	76.2	100	99	95	-	-
SS-31	8.2m RT	14+17.0	26.91-27.36	A-6(21)	39	24	2.0	15.6	32.3	50.1	100	99	88	-	-

B1-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	2.00mm	425µm	75µm		
SS-8	8.2m RT	13+58.0	0.0-0.45	A-2-4(0)	16	NP	45.4	32.6	11.9	10.1	100	75	26	-	-
SS-9	8.2m RT	13+58.0	1.20-1.65	A-6(3)	31	15	37.5	23.7	14.5	24.3	100	76	44	-	-
SS-10	8.2m RT	13+58.0	4.10-4.55	A-2-6(1)	35	18	66.4	10.7	1.6	21.3	96	50	23	-	-
SS-11	8.2m RT	13+58.0	5.62-6.07	A-1-b(0)	23	NP	78.6	14.6	0.7	6.1	90	34	6	-	-
SS-12	8.2m RT	13+58.0	8.66-9.11	A-2-4(0)	21	1	11.8	60.4	19.8	8.1	100	95	33	-	-
SS-13	8.2m RT	13+58.0	11.70-12.15	A-6(4)	32	11	9.7	42.8	33.3	14.2	100	95	55	-	-
SS-14	8.2m RT	13+58.0	13.37-13.82	A-2-4(0)	22	5	56.7	21.9	8.2	13.2	100	74	23	-	-
SS-15	8.2m RT	13+58.0	14.74-15.19	A-7-6(31)	52	33	2.2	16.4	26.6	54.7	100	98	89	-	-
SS-16	8.2m RT	13+58.0	17.78-18.23	A-7-6(26)	48	26	3.9	9.9	45.7	40.5	100	97	91	-	-
SS-17	8.2m RT	13+58.0	20.82-21.27	A-7-6(28)	52	31	5.3	14.0	26.0	54.7	100	97	85	-	-
SS-18	8.2m RT	13+58.0	23.86-24.31	A-7-6(40)	57	38	0.8	7.7	22.6	68.9	100	100	95	-	-
SS-19	8.2m RT	13+58.0	26.90-27.35	A-6(18)	38	25	4.3	21.3	23.8	50.7	98	96	78	-	-

EB2-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	2.00mm	425µm	75µm		
SS-32	8.5m RT	14+60.0	0.0-0.45	A-2-4(0)	14	NP	48.0	35.1	9.9	7.0	100	73	21	-	-
SS-33	8.5m RT	14+60.0	1.22-1.67	A-2-6(1)	32	15	47.0	28.6	4.4	20.0	100	74	27	-	-
SS-34	8.5m RT	14+60.0	4.11-4.56	A-7-6(23)	47	29	3.8	23.6	28.5	44.1	100	98	79	-	-
SS-35	8.5m RT	14+60.0	5.63-6.08	A-2-4(0)	23	NP	66.8	19.9	5.2	8.0	91	51	14	-	-
SS-36	8.5m RT	14+60.0	8.67-9.12	A-2-4(0)	31	7	83.9	7.9	2.2	6.0	88	19	8	-	-
SS-37	8.5m RT	14+60.0	11.71-12.16	A-4(1)	27	6	5.0	52.7	22.2	20.0	99	97	49	-	-
SS-38	8.5m RT	14+60.0	14.75-15.20	A-7-6(19)	41	26	5.8	22.4	33.7	38.1	100	97	79	-	-
SS-39	8.5m RT	14+60.0	17.79-18.24	A-6(13)	35	21	9.4	26.7	35.9	28.1	100	95	73	-	-
SS-40	8.5m RT	14+60.0	19.31-19.76	A-4(0)	21	2	7.0	46.7	28.3	18.0	100	97	66	-	-
SS-41	8.5m RT	14+60.0	20.83-21.28	A-7-6(20)	46	30	14.8	18.8	38.3	28.1	100	90	72	-	-
SS-42	8.5m RT	14+60.0	23.87-24.32	A-7-6(39)	58	39	2.2	8.6	25.1	64.1	100	98	93	-	-

PROJECT: 344561.1.3 ID: R-2554A

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



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554A	1	10

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-9	BORE LOGS
10	SOIL TEST RESULTS

STRUCTURE  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34461.1.3 (R-2554A) F.A. PROJ. NHF-70 (30)  
 COUNTY WAYNE  
 PROJECT DESCRIPTION US 70 (GOLDSBORO BYPASS) FROM WEST OF NC 581 TO SR 1300 (SALEM CHUCH ROAD)  
 SITE DESCRIPTION BRIDGE ON -L2RPDB- OVER -L- (US 70 BYPASS) AT -L2RPDB- STA. 10 + 03.224

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

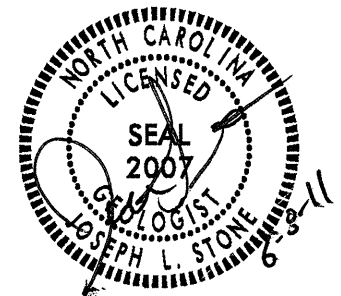
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE, THE LABORATORY SAMPLE DATA AND THE IN SITU (ON-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

CMW  
JRS  
HRC  
JRM

INVESTIGATED BY J.L. STONE  
 CHECKED BY D.N. ARGENBRIGHT  
 SUBMITTED BY D.N. ARGENBRIGHT  
 DATE JUNE 2011



DRAWN BY: C.R. SUMNER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.



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



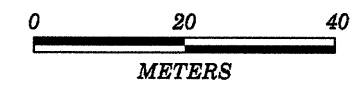
PROJECT REFERENCE NO.  
R-2554A

SHEET NO.  
2 OF 10

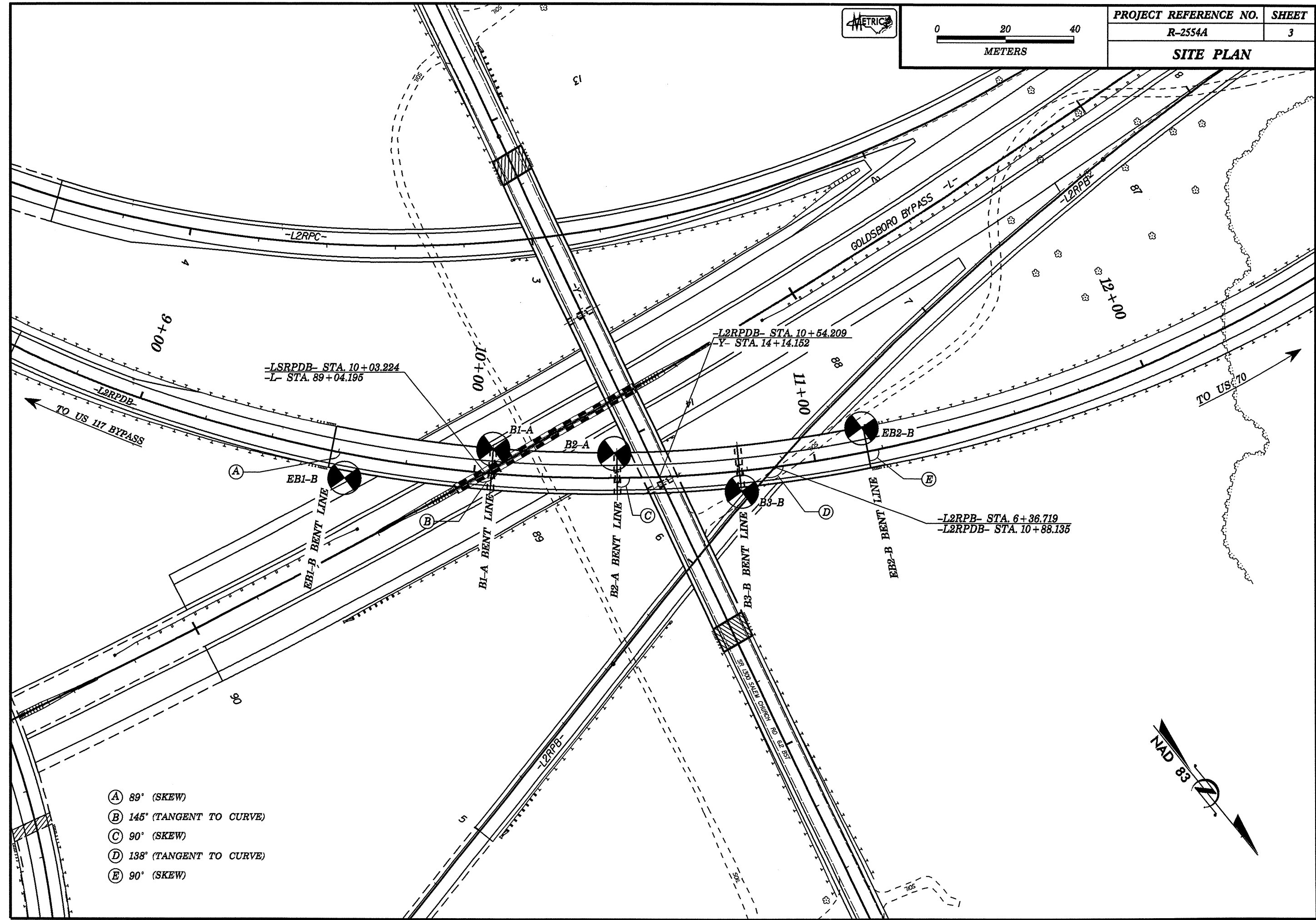
**SUBSURFACE INVESTIGATION**

**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

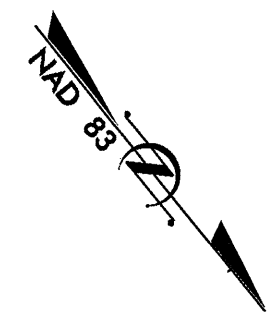
SOIL DESCRIPTION				GRADATION				ROCK DESCRIPTION				TERMS AND DEFINITIONS											
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 30 CM ACCORDING TO STANDARD PENETRATION TEST (AASHTO T200, 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, HIGHLY PLASTIC, A-7-6</i>				WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.				HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 3 CM 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: NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER 30 CM IF TESTED. FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.				ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUIFIER - 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 (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CM 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 INTRODUCED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N) OF A 63.5 KG HAMMER FALLING 0.76 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS. STRATA CORE RECOVERY (SPEC.) - 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 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.											
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>				<b>MINERALOGICAL COMPOSITION</b>				<b>WEATHERING</b>															
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS				MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.				FRESH: ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.): ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.): ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.): SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.): ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV.): ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BLOWS PER 30 CM. VERY SEVERE (V SEV.): ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BLOWS PER 30 CM. COMPLETE: ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.				SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE				LIQUID LIMIT LESS THAN 31 LIQUID LIMIT EQUAL TO 31-50 LIQUID LIMIT GREATER THAN 50							
<b>COMPRESSIBILITY</b>				<b>PERCENTAGE OF MATERIAL</b>				<b>GROUND WATER</b>															
GROUP CLASS. A-1, A-1-b, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-3, A-1, A-2, A-4, A-5, A-6, A-7				ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL				WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP															
SYMBOL				TRACE OF ORGANIC MATTER 2-3% LITTLE ORGANIC MATTER 3-5% MODERATELY ORGANIC 5-10% HIGHLY ORGANIC >10%				TRACE 1-10% LITTLE 10-20% SOME 20-35% HIGHLY 35% AND ABOVE															
SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				HIGHLY ORGANIC SOILS																			
<b>MISCELLANEOUS SYMBOLS</b>				<b>ABBREVIATIONS</b>				<b>EQUIPMENT USED ON SUBJECT PROJECT</b>															
ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD				SPT CPT DMT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL				AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST F - VOID RATIO FOSS - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL W - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED WU - UNIT WEIGHT WU - DRY UNIT WEIGHT				MOBILE B- BK-51 CME-55 CME-550X PORTABLE HOIST				CLAY BITS 152mm CONTINUOUS FLIGHT AUGER 203mm HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING W/ ADVANCER TRICONE 75 mm STEEL TEETH TRICONE mm TUNG-CARB. CORE BIT				AUTOMATIC MANUAL CORE SIZE: B- N- H- HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST			
<b>TEXTURE OR GRAIN SIZE</b>				<b>SOIL MOISTURE - CORRELATION OF TERMS</b>				<b>FRACATURE SPACING</b>				<b>BEDDING</b>											
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053				SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION SATURATED (SAT) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE WET (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE MOIST (M) SOLID; AT OR NEAR OPTIMUM MOISTURE DRY (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE				VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 6 MM DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD CAN BE GROOVED OR GOUGED 13 MM DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 25 MM MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 25 MM OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.				TERM SPACING VERY WIDE MORE THAN 3 M WIDE 3 TO 10 M MODERATELY CLOSE 30 TO 100 CM CLOSE 5 TO 30 CM VERY CLOSE LESS THAN 5 CM				TERM THICKNESS VERY THICKLY BEDDED > 1 M THICKLY BEDDED 0.5 - 1 M THINLY BEDDED 0.05 - 0.5 M VERY THINLY BEDDED 10 - 50 MM THICKLY LAMINATED 2.5 - 10 MM THINLY LAMINATED < 2.5 MM							
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE, SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)				GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005 IN 12 3				INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.				BENCH MARK: -BL- BM. #18 98.0M RT STA. 76+49.50 ELEVATION: 40.801 M NOTES:											
<b>PLASTICITY</b>				<b>COLOR</b>																			
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY				PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH				DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.															



PROJECT REFERENCE NO.	SHEET
R-2554A	3
<b>SITE PLAN</b>	



- (A) 89° (SKEW)
- (B) 145° (TANGENT TO CURVE)
- (C) 90° (SKEW)
- (D) 138° (TANGENT TO CURVE)
- (E) 90° (SKEW)







WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L2PRDB- OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. B1-A	STATION 10+05.0	OFFSET 7.0 m LT	ALIGNMENT -L2RPDB-
COLLAR ELEV. 40.80 m	TOTAL DEPTH 25.95 m	NORTHING 186,612.4	EASTING 700,738.6
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 05/12/11	COMP. DATE 05/12/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)			
			15cm	15cm	15cm	0	25	50	75	100							
41	40.80	0.00												40.80	GROUND SURFACE	0.00	
40	39.79	1.01	1	3	5									39.00	UNDIVIDED COASTAL PLAIN TAN AND ORANGE SAND, MOIST		
39	38.27	2.53	2	3	3									36.00	UNDIVIDED COASTAL PLAIN ORANGE AND GRAY SANDY CLAY, MOIST TO WET	1.80	
38	36.75	4.05	2	5	7									36.00	UNDIVIDED COASTAL PLAIN GRAY AND ORANGE SAND, SAT.	4.80	
37	35.22	5.58	4	8	8									33.00		7.80	
36	33.70	7.10	5	7	6									31.00	COASTAL PLAIN DARK GRAY SAND, SAT. (BLACK CREEK FORMATION)	9.80	
35	32.17	8.63	4	4	5									29.60	COASTAL PLAIN DARK GRAY SANDY SILT, WET (BLACK CREEK FORATION)	11.20	
34	30.65	10.15	2	1	1									26.60	COASTAL PLAIN LIGHT GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	14.20	
33	29.12	11.68	1	0	1									22.00	COASTAL PLAIN GRAY SANDY SILT, WET (CAPE FEAR FORMATION)	18.80	
32	27.60	13.20	1	1	1												
31	26.08	14.72	2	2	4												
30	24.55	16.25	8	10	12												
29	23.03	17.77	1	0	1												
28	21.50	19.30	2	2	4												
27			6	8	13												
26			10	13	15												
25			16	27	22												
24																	
23																	
22																	
21																	

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L2PRDB- OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. B1-A	STATION 10+05.0	OFFSET 7.0 m LT	ALIGNMENT -L2RPDB-
COLLAR ELEV. 40.80 m	TOTAL DEPTH 25.95 m	NORTHING 186,612.4	EASTING 700,738.6
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 05/12/11	COMP. DATE 05/12/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)			
			15cm	15cm	15cm	0	25	50	75	100							
21																	
20	19.98	20.82	6	8	11									20.40	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	20.40	
19	18.45	22.35	8	10	14									14.85	Boring Terminated at Elevation 14.85 m IN HARD SILTY CLAY	25.95	
18	16.93	23.87	9	14	15												
17	15.40	25.40	12	16	24												
16																	
15																	

NCDOT BORE DOUBLE BORINGS.GPJ NC DOT.GDT 6/6/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L2PRDB- OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. B2-A	STATION 10+41.0	OFFSET 7.0 m LT	ALIGNMENT -L2RPDB-
COLLAR ELEV. 40.82 m	TOTAL DEPTH 25.80 m	NORTHING 186,634.4	EASTING 700,710.8
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 05/11/11	COMP. DATE 05/11/11	SURFACE WATER DEPTH N/A

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L2PRDB- OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. B2-A	STATION 10+41.0	OFFSET 7.0 m LT	ALIGNMENT -L2RPDB-
COLLAR ELEV. 40.82 m	TOTAL DEPTH 25.80 m	NORTHING 186,634.4	EASTING 700,710.8
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 05/11/11	COMP. DATE 05/11/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100				
41	40.82	0.00											GROUND SURFACE	0.00
40	39.84	0.98	2	7	5						SS-17		UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	
39	38.32	2.50	2	4	5						SS-18		UNDIVIDED COASTAL PLAIN RED AND GRAY SILTY AND SANDY CLAY, MOIST TO WET	1.80
38	36.80	4.02	2	2	4						SS-19			3.40
37	35.27	5.55	7	8	7						SS-20		UNDIVIDED COASTAL PLAIN LIGHT GRAY AND ORANGE SAND, SAT.	4.80
36	33.75	7.07	4	4	4									
35	32.22	8.60	1	0	1						SS-21			7.80
34	30.70	10.12	1	1	1						SS-22		COASTAL PLAIN DARK GRAY SANDY SILT, WET (BLACK CREEK FORMATION)	9.80
33	29.18	11.64	WOH	1	1									
32	27.65	13.17	2	4	3								COASTAL PLAIN DARK GRAY SAND, SAT. (BLACK CREEK FORMATION)	12.80
31	26.13	14.69	3	3	8									15.07
30	24.60	16.22	5	8	10						SS-23		COASTAL PLAIN LIGHT GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	18.80
29	23.08	17.74	8	13	16									
28	21.56	19.26	10	30	60						SS-24		COASTAL PLAIN GRAY SILT, WET (CAPE FEAR FORMATION)	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100				
21	20.04	20.78	7	9	13									20.40
20	18.51	22.31	6	9	13								COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	20.42
19	16.99	23.83	9	13	17									
18	15.47	25.35	10	13	18						SS-25			15.02
17														
16														
Boring Terminated at Elevation 15.02 m IN HARD SILTY CLAY														

NCDOT BORE DOUBLE BORINGS: GPJ NC\_DOT\_GDT\_6/6/11

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Wrike, C. M.											
SITE DESCRIPTION BRIDGE ON -L2PRDB- OVER -L- (US 70 BYPASS)							GROUND WTR (m)										
BORING NO. B3-B		STATION 10+77.7		OFFSET 6.0 m RT		ALIGNMENT -L2RPDB-											
COLLAR ELEV. 40.94 m		TOTAL DEPTH 25.88 m		NORTHING 186,665.3		EASTING 700,687.3											
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Conley, H. R.		START DATE 05/06/11		COMP. DATE 05/09/11		SURFACE WATER DEPTH N/A											
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	ELEV. (m)	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100							
41	40.94	0.00	1	1	2									40.94	0.00	GROUND SURFACE	
40	39.96	0.98	4	4	3									39.14	1.80	UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	
39																	
38	38.44	2.50	3	4	5									36.14	4.80	UNDIVIDED COASTAL PLAIN TAN AND GRAY SILTY CLAY, MOIST TO WET	
37	36.92	4.02															
36																	
35	35.39	5.55	3	6	7									33.14	7.80	UNDIVIDED COASTAL PLAIN TAN SAND AND GRAVEL, SAT.	
34																	
33	33.87	7.07	3	5	6									31.14	9.80	UNDIVIDED COASTAL PLAIN TAN SANDY SILT, WET	
32	32.34	8.60	WOH	WOH	WOH									28.14	12.80	COASTAL PLAIN DARK GRAY SANDY SILT, WET (BLACK CREEK FORMATION)	
31	30.82	10.12	1	1	2									26.74	14.20	COASTAL PLAIN DARK GRAY SAND, SAT. (BLACK CREEK FORMATION)	
30																	
29	29.30	11.64	1	1	2												
28	27.77	13.17	3	4	5												
27	26.25	14.69	4	9	11												
26	24.72	16.22	5	10	14												
25																	
24	23.20	17.74	5	8	10												
23																	
22	21.68	19.26	9	12	15												
21																	

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Wrike, C. M.											
SITE DESCRIPTION BRIDGE ON -L2PRDB- OVER -L- (US 70 BYPASS)							GROUND WTR (m)										
BORING NO. B3-B		STATION 10+77.7		OFFSET 6.0 m RT		ALIGNMENT -L2RPDB-											
COLLAR ELEV. 40.94 m		TOTAL DEPTH 25.88 m		NORTHING 186,665.3		EASTING 700,687.3											
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Conley, H. R.		START DATE 05/06/11		COMP. DATE 05/09/11		SURFACE WATER DEPTH N/A											
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	ELEV. (m)	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100							
21																	
20	20.16	20.78	8	10	16									19.14	21.80	COASTAL PLAIN LIGHT GRAY SILTY AND SANDY CLAY, WET (CAPE FEAR FORMATION) (continued)	
19																	
18	18.63	22.31	6	10	19									15.06	25.88	Boring Terminated at Elevation 15.06 m IN HARD SANDY CLAY	
17	17.11	23.83	8	13	15												
16	15.58	25.36	11	15	24												

NCDOT BORE DOUBLE BORINGS.GPJ NC DOT.GDT 6/6/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L2PRDB- OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. EB2-A	STATION 11+15.0	OFFSET 7.0 m LT	ALIGNMENT -L2RPDB-
COLLAR ELEV. 40.50 m	TOTAL DEPTH 25.84 m	NORTHING 186,671.2	EASTING 700,648.3
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 05/10/11	COMP. DATE 05/10/11	SURFACE WATER DEPTH N/A

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L2PRDB- OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. EB2-A	STATION 11+15.0	OFFSET 7.0 m LT	ALIGNMENT -L2RPDB-
COLLAR ELEV. 40.50 m	TOTAL DEPTH 25.84 m	NORTHING 186,671.2	EASTING 700,648.3
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 05/10/11	COMP. DATE 05/10/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
41																
40	40.50	0.00	WOH	1	1										40.50	GROUND SURFACE
39	39.49	1.01		1	1										38.70	UNDIVIDED COASTAL PLAIN TAN SAND, MOIST TO SAT.
38	37.97	2.53		2	4	6									35.70	UNDIVIDED COASTAL PLAIN GRAY AND ORANGE SANDY CLAY, WET
37	36.45	4.05		2	4	4									32.70	UNDIVIDED COASTAL PLAIN GRAY SANDY SILT, WET
36	34.92	5.58		6	6	4									30.70	COASTAL PLAIN DARK GRAY SANDY SILT, WET (BLACK CREEK FORMATION)
35	33.40	7.10		2	5	5									27.70	COASTAL PLAIN LIGHT GRAY SILTY AND SANDY CLAY, WET (CAPE FEAR FORMATION)
34	31.87	8.63	WOH	WOH	WOH										25.84	Boring Terminated at Elevation 14.66 m IN VERY STIFF SANDY CLAY
33	30.35	10.15		2	2	3										
32	28.83	11.67		2	4	6										
31	27.30	13.20		5	6	10										
30	25.78	14.72		7	11	14										
29	24.25	16.25		8	9	10										
28	22.73	17.77		7	11	14										
27	21.21	19.29		6	11	14										

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
21																
20	19.68	20.82		5	11	14									18.70	COASTAL PLAIN LIGHT GRAY SILTY AND SANDY CLAY, WET (CAPE FEAR FORMATION) (continued)
19															21.80	
18	18.16	22.34		8	15	23										
17	16.63	23.87		8	15	21										
16	15.11	25.39		8	13	17										
15																

NCDOT BORE DOUBLE BORINGS.GPJ NC\_DOT.GDT 6/6/11



R-2554A

34461.1.3

BRIDGE ON -L2RPDB- OVER -L- (US 70 BYPASS)  
AT -L2RPDB- STA. 10+03.224

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-35	7.0M RT	9+63.0	0.00-0.45	A-2-4(0)	17	NP	45.2	35.9	6.7	12.2	98	74	22	-	-
SS-36	7.0M RT	9+63.0	1.06-1.51	A-4(0)	23	8	33.3	31.2	17.2	18.3	100	81	41	-	-
SS-37	7.0M RT	9+63.0	2.53-2.98	A-7-6(30)	61	41	9.5	23.9	21.9	44.6	100	94	73	26.2	-
SS-38	7.0M RT	9+63.0	4.05-4.50	A-2-4(0)	23	NP	68.7	18.0	1.2	12.2	100	59	14	-	-
SS-39	7.0M RT	9+63.0	7.10-7.55	A-2-4(0)	21	NP	32.5	53.9	4.6	9.1	100	86	17	-	-
SS-40	7.0M RT	9+63.0	11.67-12.12	A-6(6)	30	12	2.0	40.4	33.3	24.3	100	99	65	-	-
SS-41	7.0M RT	9+63.0	13.19-13.64	A-4(0)	24	8	34.3	29.0	20.5	16.2	100	92	41	-	-
SS-42	7.0M RT	9+63.0	14.72-15.17	A-7-6(25)	48	28	6.9	9.1	53.5	30.4	97	92	85	-	-
SS-43	7.0M RT	9+63.0	17.77-18.22	A-2-4(0)	25	8	33.9	42.0	7.9	16.2	100	86	26	-	-
SS-44	7.0M RT	9+63.0	23.86-24.31	A-7-6(26)	44	27	0.4	9.9	36.9	52.7	100	100	94	-	-

B1-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-26	7.0M LT	10+05.0	0.00-0.45	A-2-4(0)	13	NP	50.5	31.2	12.2	6.1	100	73	22	-	-
SS-27	7.0M LT	10+05.0	1.01-1.46	A-2-4(0)	24	8	51.1	25.2	9.5	14.2	100	68	27	-	-
SS-28	7.0M LT	10+05.0	2.53-2.98	A-7-6(26)	64	41	21.1	16.2	20.1	42.6	100	83	67	-	-
SS-29	7.0M LT	10+05.0	5.58-6.03	A-1-b(0)	24	NP	87.2	6.4	2.3	4.1	86	24	6	-	-
SS-30	7.0M LT	10+05.0	8.63-9.08	A-2-4(0)	25	4	23.3	48.1	10.3	18.3	95	80	31	-	-
SS-31	7.0M LT	10+05.0	11.68-12.13	A-4(2)	28	9	4.9	49.7	35.3	10.1	100	98	53	-	-
SS-32	7.0M LT	10+05.0	14.72-15.17	A-7-6(35)	59	31	1.4	5.5	56.6	36.5	100	99	96	-	-
SS-33	7.0M LT	10+05.0	19.30-19.75	A-4(2)	23	5	2.4	33.7	49.7	14.2	98	97	76	-	-
SS-34	7.0M LT	10+05.0	22.35-22.80	A-7-6(32)	56	34	6.7	6.1	22.3	64.9	100	99	88	-	-

B2-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-17	7.0M LT	10+41.0	0.00-0.45	A-2-4(0)	16	NP	53.7	34.2	6.0	6.1	100	70	16	-	-
SS-18	7.0M LT	10+41.0	2.50-2.95	A-7-6(25)	49	31	3.9	23.6	29.8	42.7	100	98	81	-	-
SS-19	7.0M LT	10+41.0	4.02-4.47	A-6(11)	35	20	9.2	33.2	25.1	32.6	100	95	66	-	-
SS-20	7.0M LT	10+41.0	5.55-6.00	A-1-b(0)	24	NP	76.8	16.5	0.6	6.1	89	44	7	-	-
SS-21	7.0M LT	10+41.0	8.60-9.05	A-2-6(1)	31	15	45.2	28.7	7.8	18.3	97	69	29	-	-
SS-22	7.0M LT	10+41.0	10.12-10.57	A-4(1)	28	8	9.2	47.4	29.2	14.2	99	93	50	-	-
SS-23	7.0M LT	10+41.0	16.22-16.67	A-7-6(36)	59	37	3.1	13.0	33.1	50.9	100	98	89	-	-
SS-24	7.0M LT	10+41.0	19.26-19.71	A-4(5)	27	7	1.0	12.6	68.1	18.3	100	99	93	-	-
SS-25	7.0M LT	10+41.0	25.35-25.80	A-7-6(29)	46	31	0.4	18.3	34.5	46.8	100	100	92	-	-

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-1	6.0M RT	10+77.7	0.00-0.45	A-2-4(0)	14	NP	48.0	40.4	5.5	6.1	100	77	15	-	-
SS-2	6.0M RT	10+77.7	2.50-2.95	A-6(17)	39	21	3.3	22.4	35.7	38.7	100	98	83	-	-
SS-3	6.0M RT	10+77.7	5.55-6.00	A-1-b(0)	24	NP	74.4	15.9	3.7	6.1	75	31	9	-	-
SS-4	6.0M RT	10+77.7	8.60-9.05	A-4(2)	30	10	5.9	55.1	16.6	22.4	100	97	45	-	-
SS-5	6.0M RT	10+77.7	10.12-10.57	A-4(0)	25	5	5.5	56.6	29.8	8.1	100	98	46	-	-
SS-6	6.0M RT	10+77.7	13.17-13.62	A-2-4(0)	19	NP	64.8	25.3	2.7	7.1	100	79	11	-	-
SS-7	6.0M RT	10+77.7	14.69-15.14	A-7-6(31)	58	32	6.1	8.3	38.8	46.8	99	95	88	-	-
SS-8	6.0M RT	10+77.7	19.26-19.71	A-7-6(21)	45	25	4.3	19.5	47.7	28.5	99	97	84	-	-
SS-9	6.0M RT	10+77.7	22.30-22.76	A-6(4)	34	17	0.6	59.2	15.8	24.4	100	100	47	-	-

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-10	7.0M LT	11+15.0	0.00-0.45	A-2-4(0)	19	NP	48.6	39.0	8.3	4.1	100	74	17	-	-
SS-11	7.0M LT	11+15.0	2.53-2.98	A-7-6(17)	44	28	5.9	31.3	22.1	40.7	100	98	69	-	-
SS-12	7.0M LT	11+15.0	5.58-6.03	A-1-b(0)	24	NP	83.4	9.3	0.2	7.1	94	37	8	-	-
SS-13	7.0M LT	11+15.0	8.63-9.08	A-4(0)	27	7	11.2	54.1	24.5	10.2	99	93	43	-	-
SS-14	7.0M LT	11+15.0	10.15-10.60	A-4(0)	26	7	5.1	58.4	22.3	14.2	100	99	42	-	-
SS-15	7.0M LT	11+15.0	13.20-13.65	A-7-6(37)	62	36	3.3	7.9	35.9	52.9	99	97	91	-	-
SS-16	7.0M LT	11+15.0	19.29-19.74	A-7-6(30)	51	34	1.2	24.8	25.1	48.8	100	99	86	-	-



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34461.1.3 (R-2554A)	1	79

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 34461.1.3 (R-2554A) F.A. PROJ. \_\_\_\_\_  
COUNTY WAYNE  
PROJECT DESCRIPTION BRIDGE ON US 70 BYPASS OVER  
LITTLE RIVER AT -L- STA. 70+24.00

**CONTENTS**

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
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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.

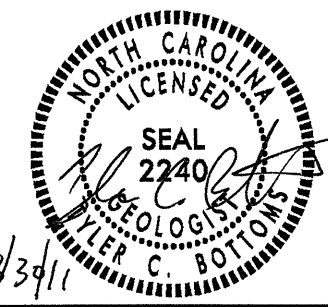
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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: 34461.1.3 ID: R-2554A**

PERSONNEL

- J.R. SWARTLEY
- J.P. DELOATCH
- R.E. SMITH
- J.M. EDMONDSON
- S&ME INC.

INVESTIGATED BY T.C. BOTTOMS  
CHECKED BY D.N. ARGENBRIGHT  
SUBMITTED BY D.N. ARGENBRIGHT  
DATE SEPTEMBER 2011



DRAWN BY: C.P. TURNER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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



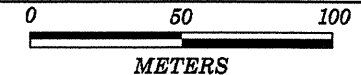
## SUBSURFACE INVESTIGATION

### SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

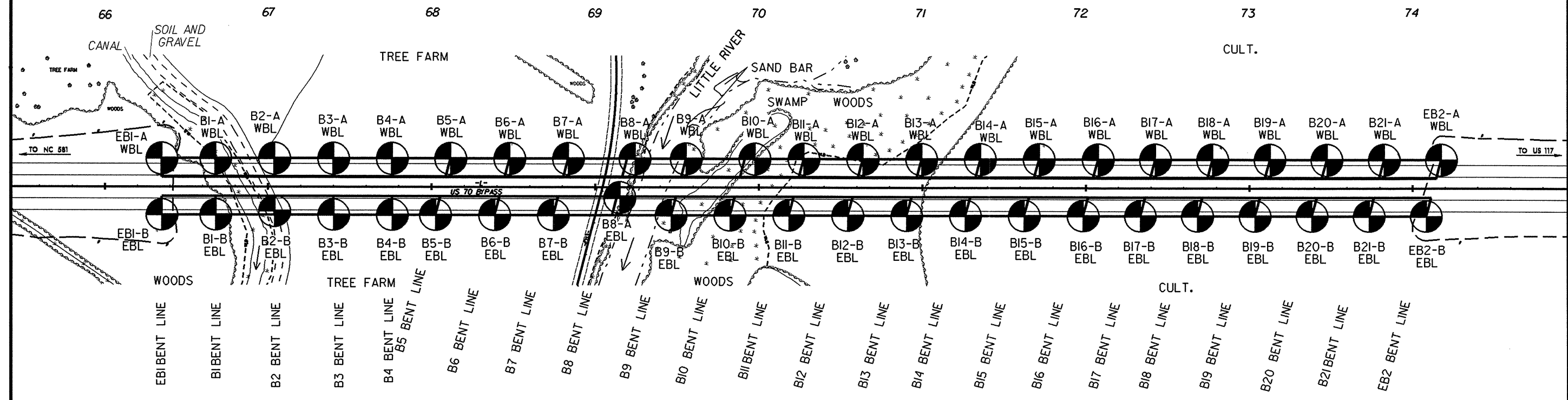
SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																																																																																																					
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 30 CM ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY-SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, MEDIUM 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)</p> <p>GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;"><b>ANGULARITY OF GRAINS</b></p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>		<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 3 CM 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><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.</p> <p><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p><b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.</p> <p><b>ARTESIAN</b> - 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.</p> <p><b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p><b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p><b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p><b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p><b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p><b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p><b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p><b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p><b>ROCK QUALITY DESIGNATION (RQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p><b>SILL</b> - 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.</p> <p><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p><b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (N) OF A 63.5 KG HAMMER FALLING 0.76 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS.</p> <p><b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p><b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p><b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																					
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<p style="text-align: center;"><b>BENCH MARK: BL-523A: N 186,349.8721, E 698,771.3764</b></p> <p style="text-align: right;"><b>ELEVATION: 25.357 M</b></p>		<p>NOTES:</p>																																																																																																																																																																									



# SITE PLAN



SKEW = 90° ON EBI & BI - B4  
SKEW = 105° ON B5 - B21 & EB2





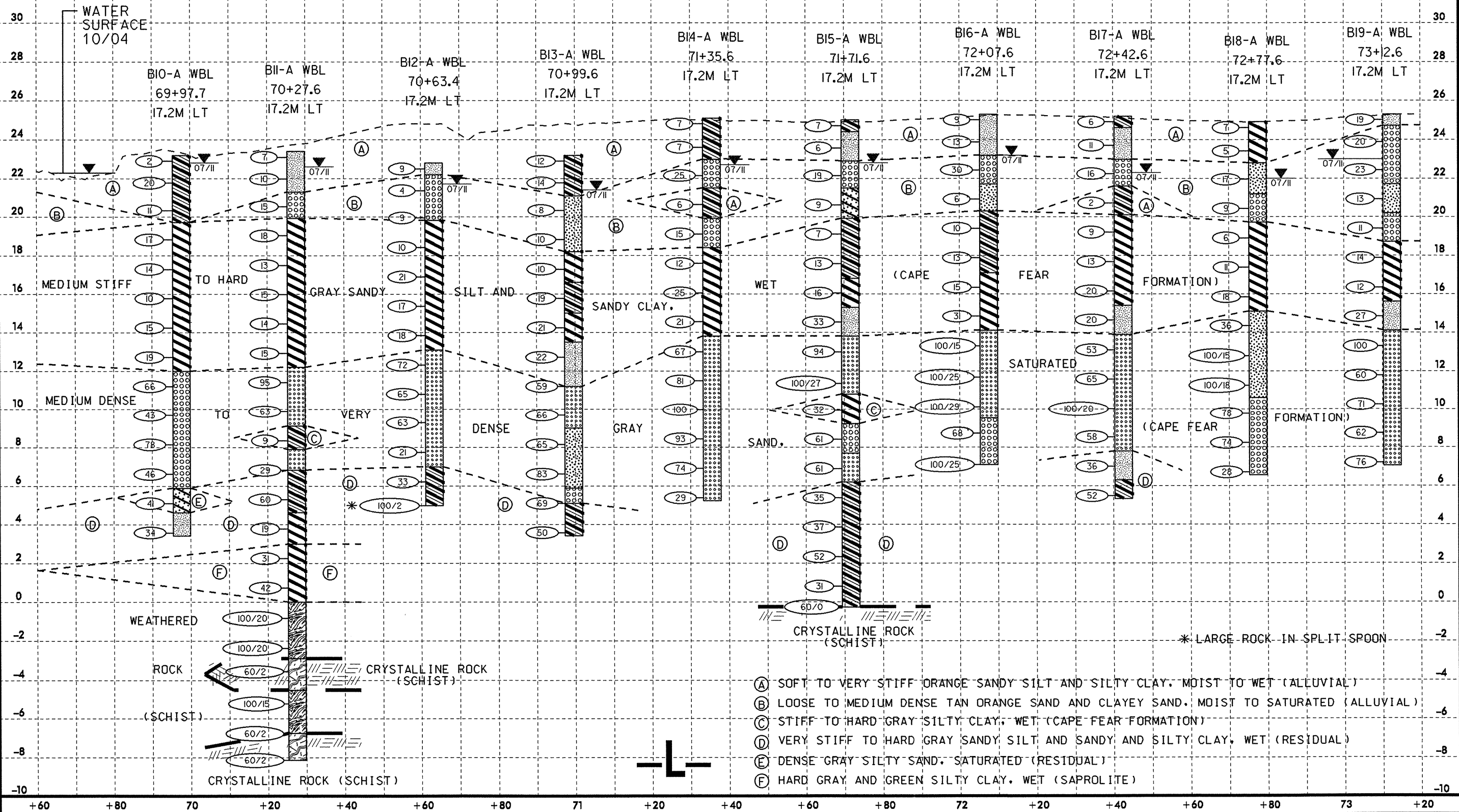
# PROFILE THROUGH WBL BORINGS PROJECTED ALONG CENTER LINE -L-

	PROJECT REFERENCE NO.	SHEET NO.
	R-2554A	5 OF 79
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
<p><b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION</p> <p><b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION</p>		
CONST. REV.		
R/W REV.		

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

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

VE=5

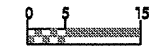


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 4: A:\SEC\BUDGET\10\13\04\River\CADD\GEO\TECH\Struc&Sub\10-2554A\_GEO\_BROG\_LR\_WBL\_PFB.dgn

# PROFILE THROUGH WBL BORINGS PROJECTED ALONG CENTER LINE -L-



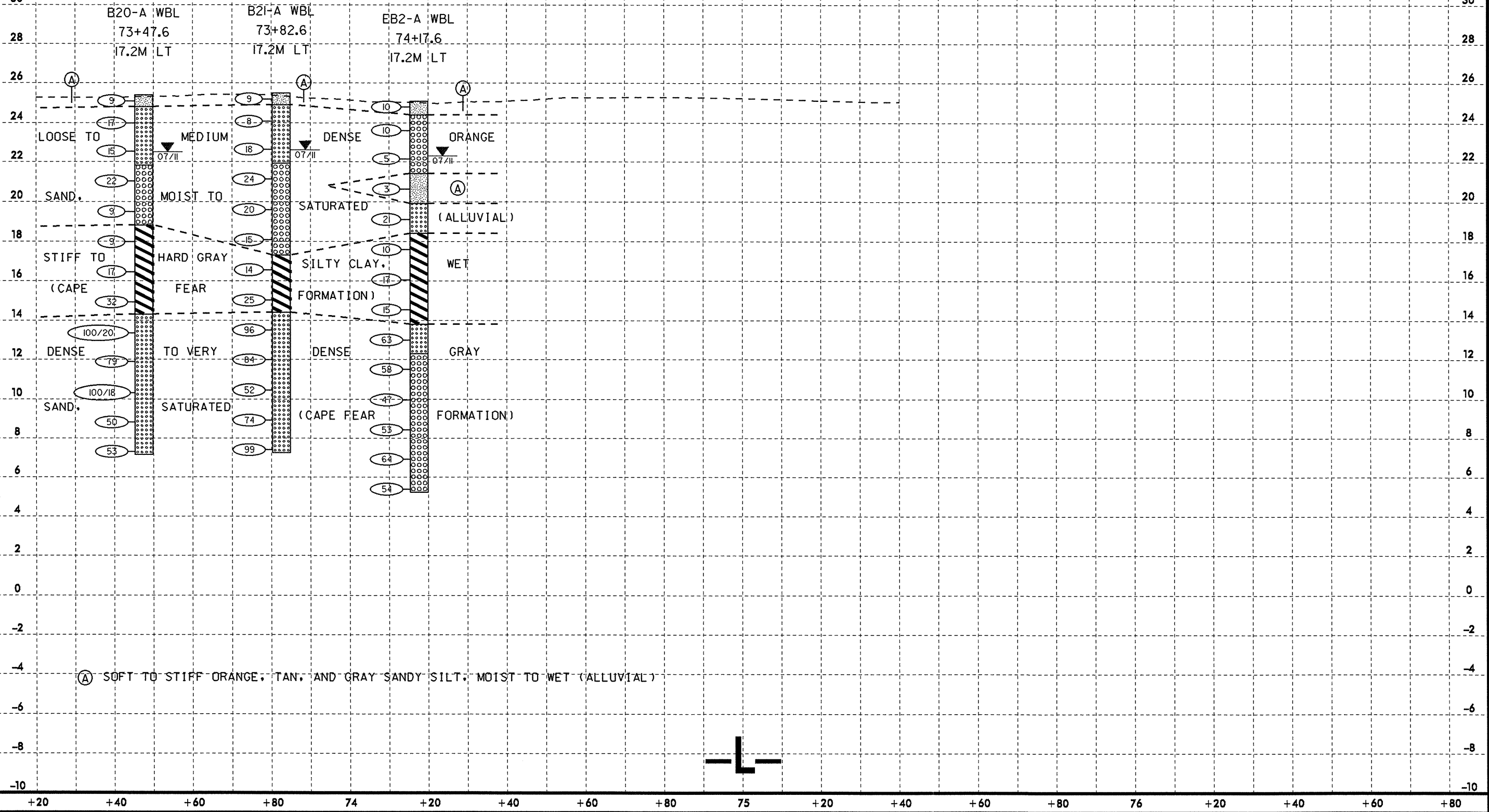
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VE=5



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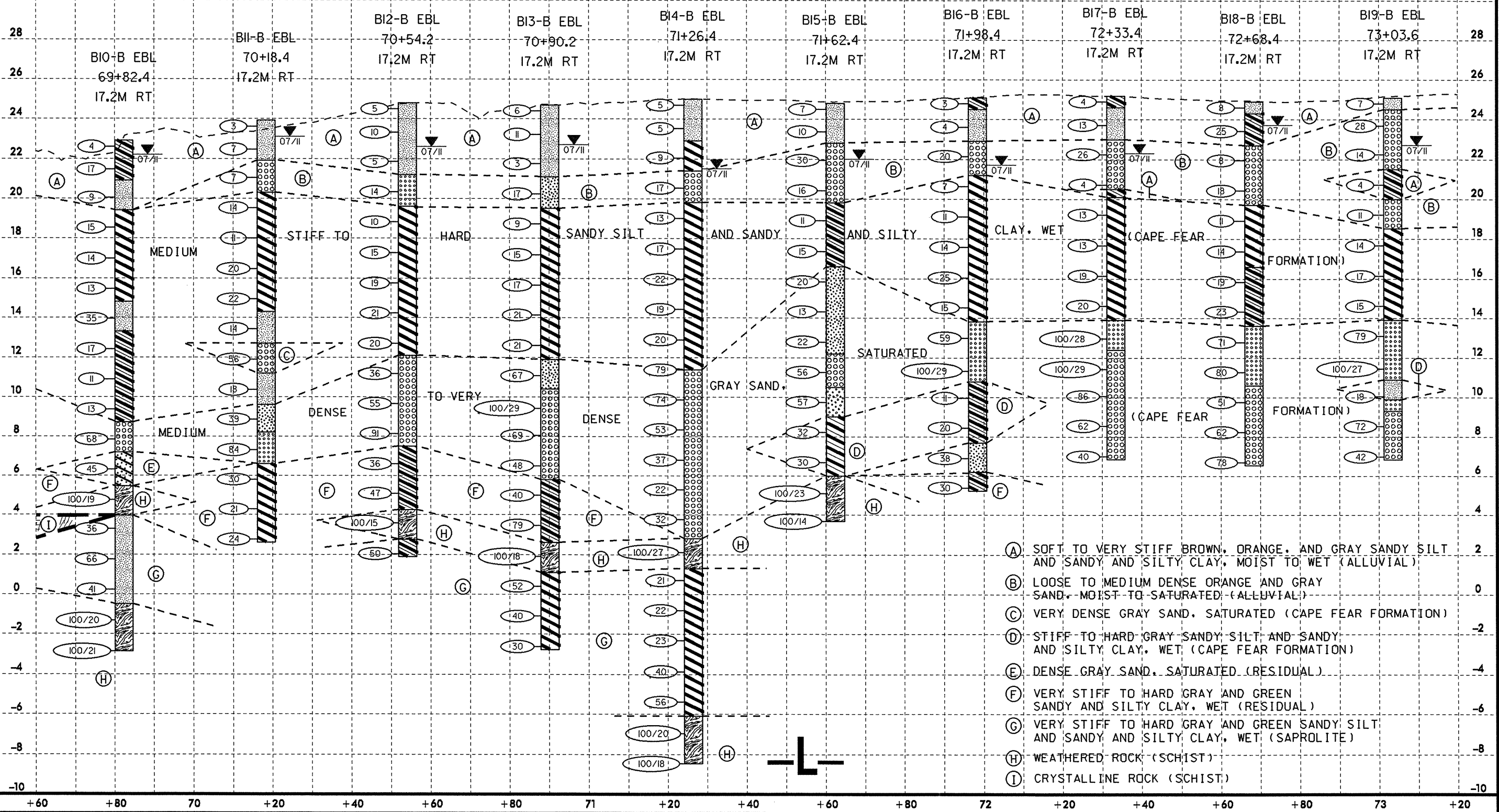
# PROFILE THROUGH EBL BORINGS PROJECTED ALONG CENTER LINE -L-

PROJECT REFERENCE NO. R-2554A		SHEET NO. 8 OF 79	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION <b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION			
CONST. REV.		R/W REV.	

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

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

VE = 5



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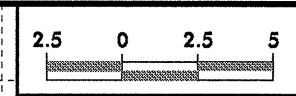








10/26/08



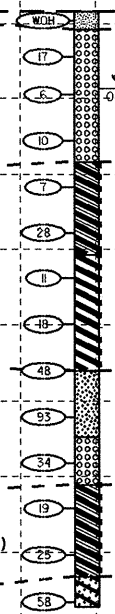
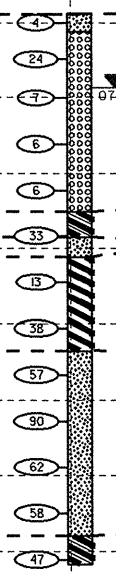
50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50

# CROSS SECTION THROUGH BENT 3

- (A) VERY SOFT BROWN SANDY SILT, MOIST (ALLUVIAL)
- (B) DENSE GRAY SAND, SATURATED (CAPE FEAR FORMATION)

B3-A WBL  
67+40.0  
17.2M LT

B3-B EBL  
67+40.0  
17.2M RT



LOOSE TO MEDIUM DENSE ORANGE, GRAY AND TAN SAND,  
MOIST TO SATURATED (ALLUVIAL)

MEDIUM STIFF TO HARD GRAY SANDY AND  
SILTY CLAY, WET (CAPE FEAR FORMATION)

DENSE TO VERY DENSE GRAY SAND, SATURATED (CAPE FEAR FORMATION)

VERY STIFF TO HARD GRAY SANDY AND SILTY CLAY, WET (RESIDUAL)

VERY DENSE GRAY SAND,  
SATURATED (RESIDUAL)

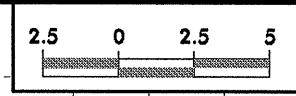
67+40.00

-L-

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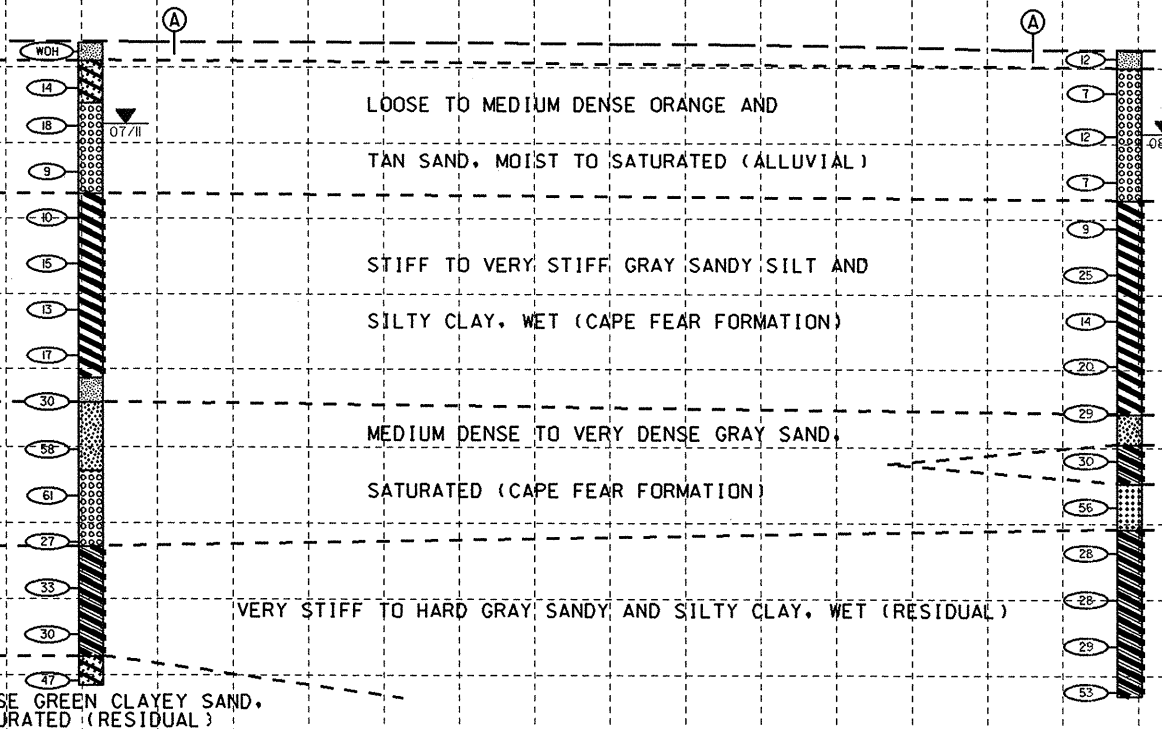


# CROSS SECTION THROUGH BENT 4

- (A) VERY SOFT TO STIFF ORANGE AND BROWN SANDY SILT, MOIST (ALLUVIAL)
- (B) VERY STIFF GRAY SANDY CLAY, WET (CAPE FEAR FORMATION)

B4-A WBL  
67+76.0  
17.2M LT

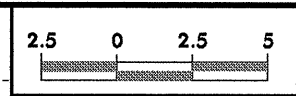
B4-B EBL  
67+76.0  
17.2M RT



67+76.00

-L-  
0

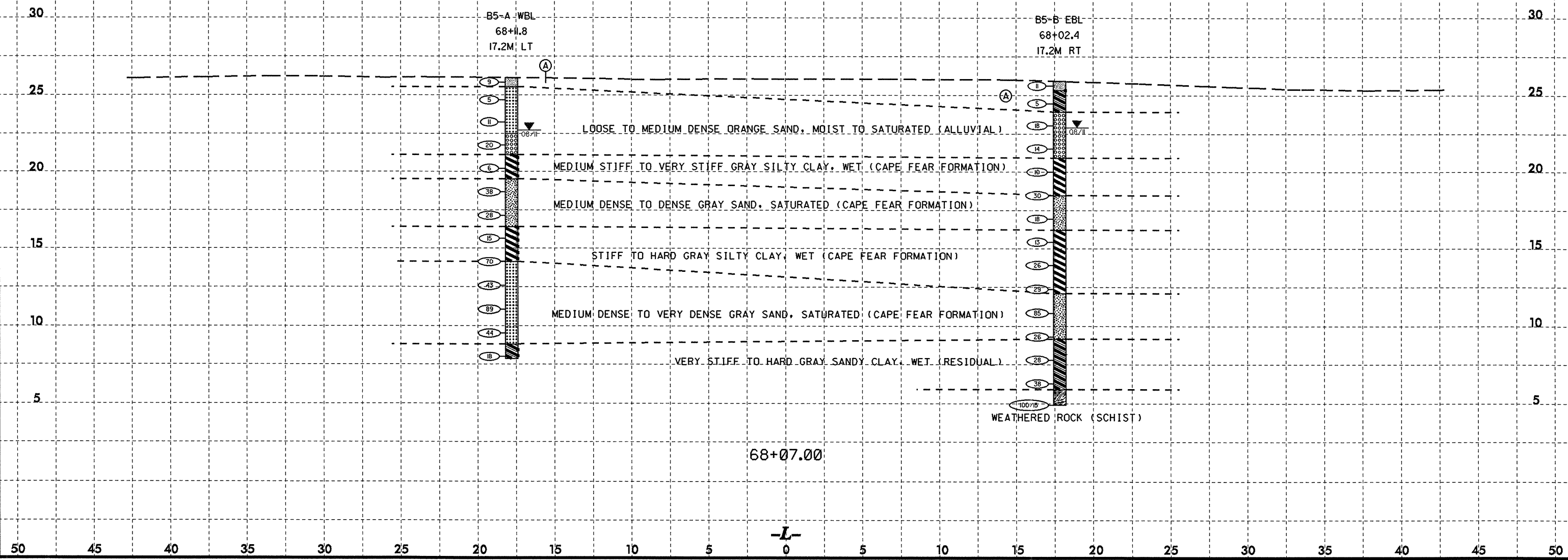
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PROJECT REFERENCE NO. R-2554A	SHEET NO. 15 OF 79
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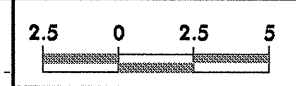
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# CROSS SECTION THROUGH BENT 5



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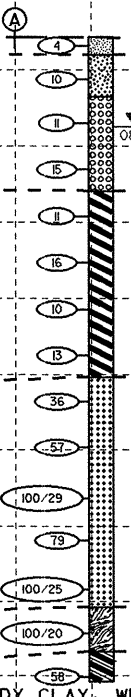
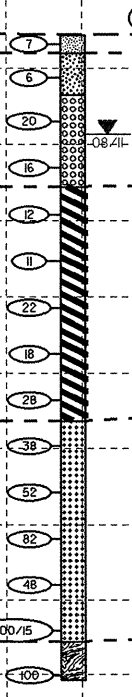
PROJECT REFERENCE NO. R-2554A	SHEET NO. 16 OF 79
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# CROSS SECTION THROUGH BENT 6

(A) MEDIUM STIFF BROWN SANDY SILT, MOIST (ALLUVIAL)

B6-A WBL  
68+47.6  
17.2M LT

B6-B EBL  
68+38.4  
17.2M RT



LOOSE TO MEDIUM DENSE ORANGE SAND, MOIST TO SATURATED (ALLUVIAL)

STIFF TO VERY STIFF GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)

DENSE TO VERY DENSE GRAY SAND, SATURATED (CAPE FEAR FORMATION)

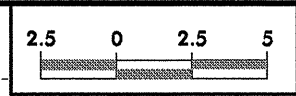
WEATHERED ROCK (SCHIST)

HARD GRAY SANDY CLAY, WET (SAPROLITE)

68+43.00  
-L-

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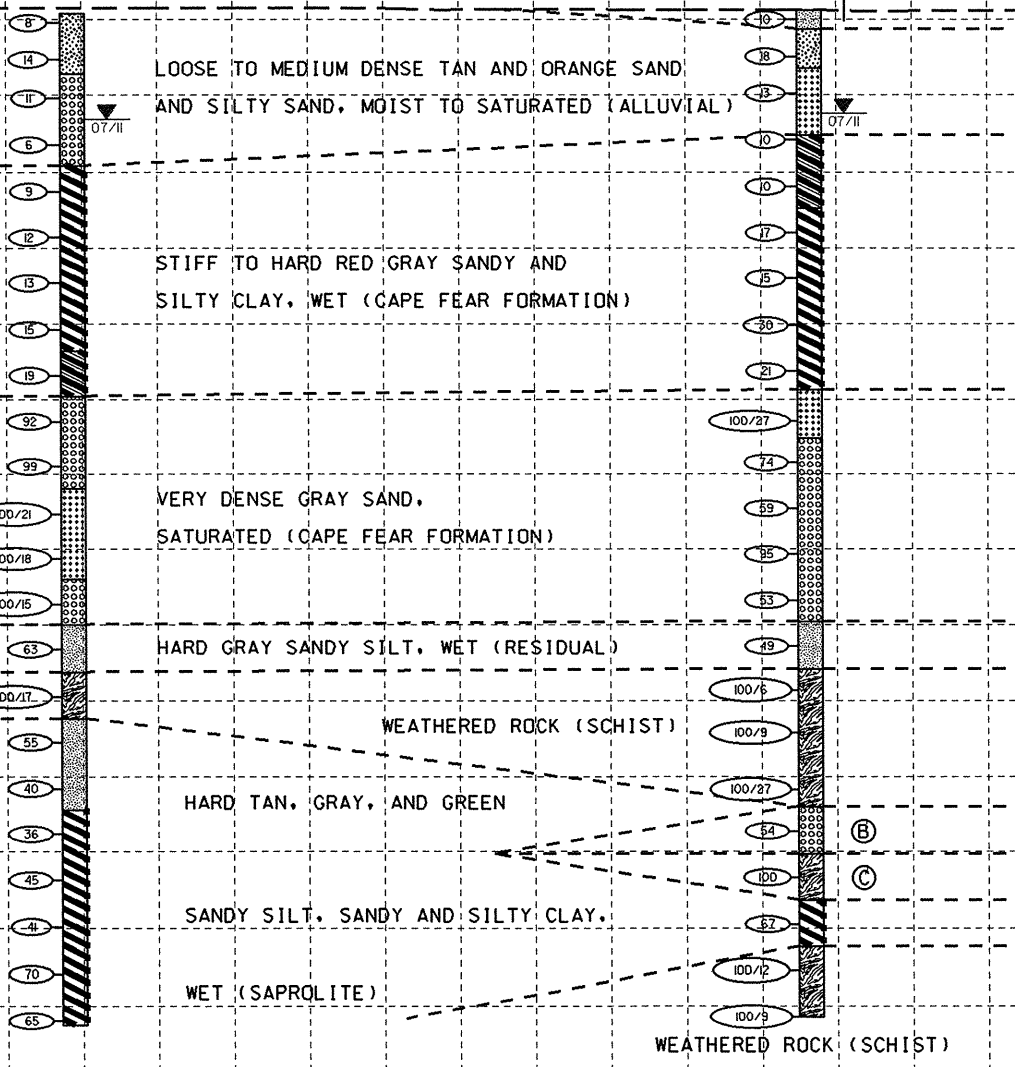


# CROSS SECTION THROUGH BENT 8

- (A) STIFF TAN SANDY SILT, MOIST (ALLUVIAL)
- (B) VERY DENSE GRAY SAND, SATURATED (SAPROLITE)
- (C) WEATHERED ROCK (SCHIST)

B8-A WBL  
69+24.4  
17.2M LT

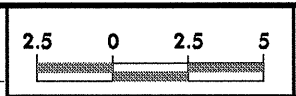
B8-A EBL  
69+15.0  
6.4M RT



69+15.00

-L-

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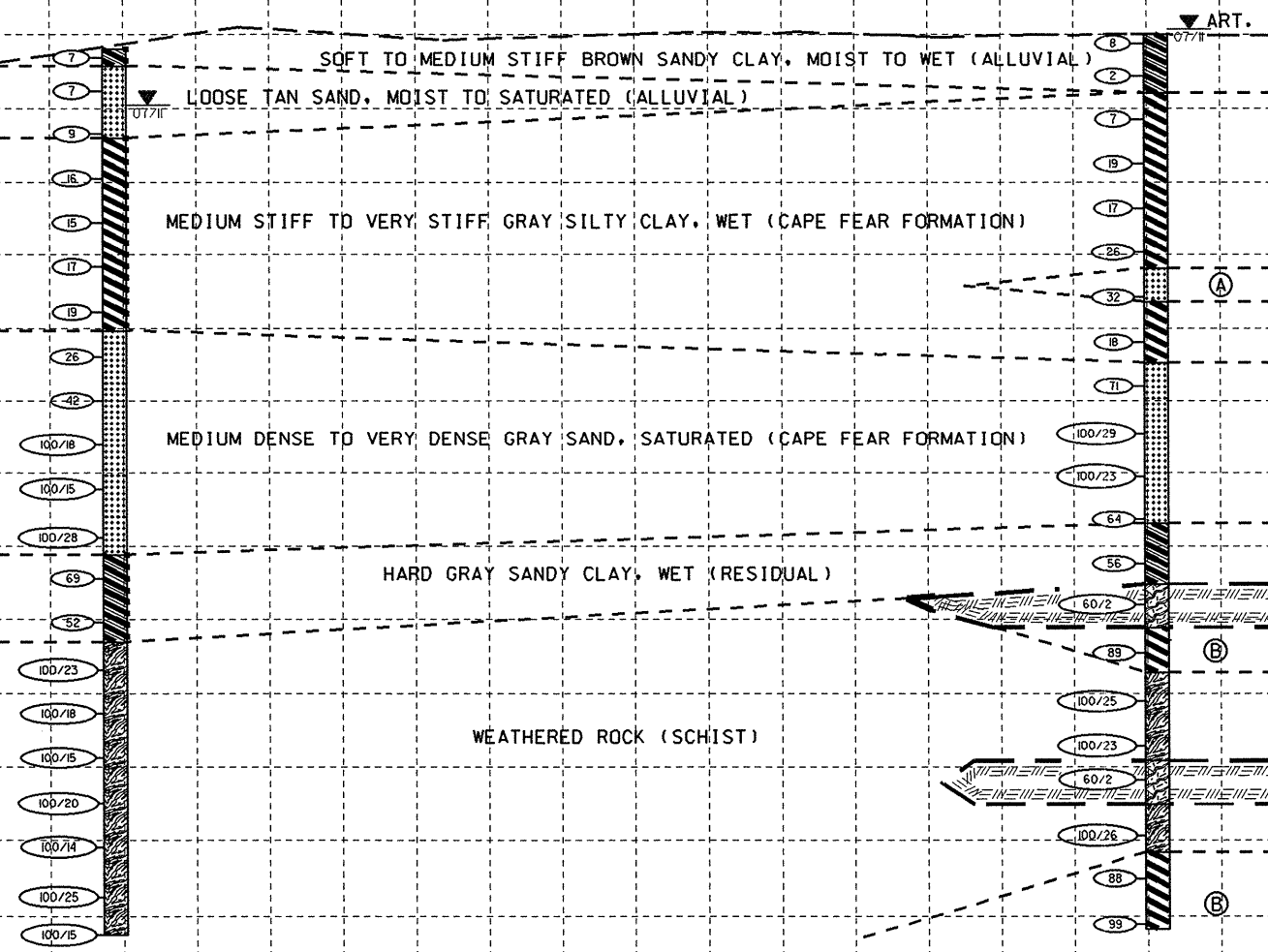


# CROSS SECTION THROUGH BENT 9

- (A) DENSE GRAY SAND, SATURATED (CAPE FEAR FORMATION)
- (B) HARD GRAY SILTY CLAY, WET (SAPROLITE)
- (C) CRYSTALLINE ROCK (SCHIST)

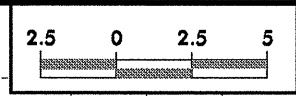
B9-A WBL  
69+55.4  
17.2M LT

B9-B EBL  
69+46.4  
17.2M RT



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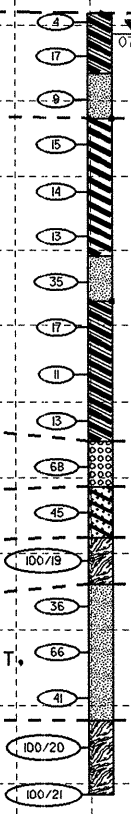
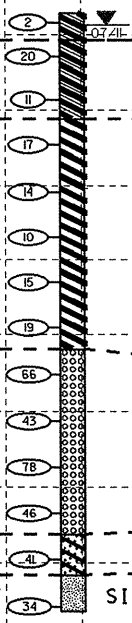


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# CROSS SECTION THROUGH BENT 10

BIO-A WBL  
69+97.7  
17.2M LT

BIO-B EBL  
69+82.4  
17.2M RT



SOFT TO VERY STIFF BROWN AND TAN SANDY SILT AND SILTY CLAY, MOIST TO WET (ALLUVIAL)

STIFF TO HARD GRAY SANDY SILT AND SILTY CLAY, WET (CAPE FEAR FORMATION)

DENSE TO VERY DENSE GRAY SAND, SATURATED (CAPE FEAR FORMATION)

DENSE GRAY SILTY SAND, SATURATED (RESIDUAL)

HARD GRAY SANDY

SILT, WET (RESIDUAL)

WEATHERED ROCK (SCHIST)

HARD GRAY SANDY SILT, WET (SAPROLITE)

WEATHERED ROCK (SCHIST)

69+87.00

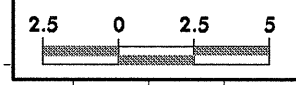
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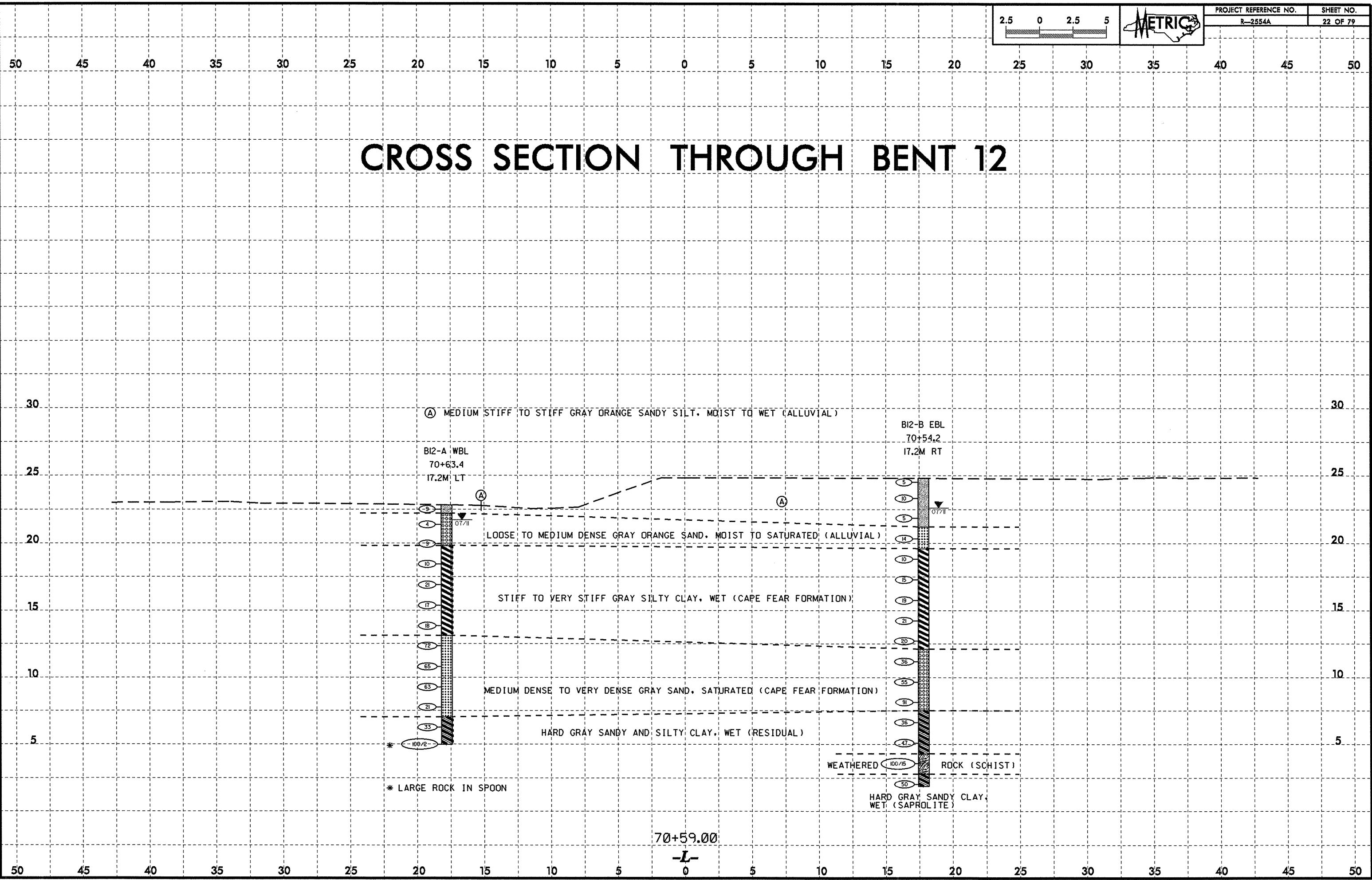


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PROJECT REFERENCE NO. R-2554A	SHEET NO. 22 OF 79
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# CROSS SECTION THROUGH BENT 12



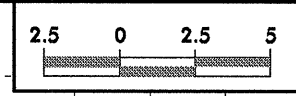
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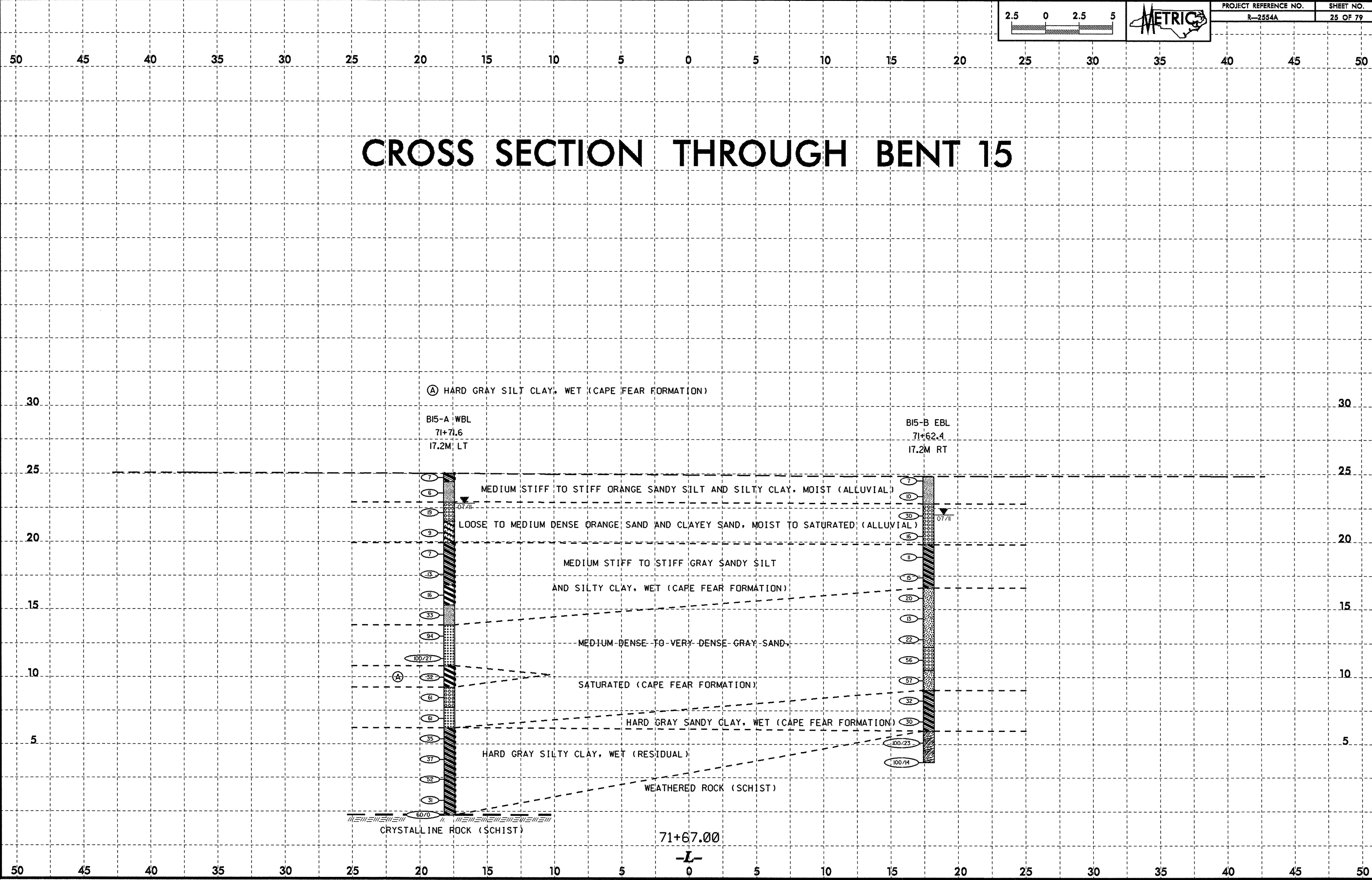




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# CROSS SECTION THROUGH BENT 15



Ⓐ HARD GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)

BI5-A WBL  
71+71.6  
17.2M LT

BI5-B EBL  
71+62.4  
17.2M RT

MEDIUM STIFF TO STIFF ORANGE SANDY SILT AND SILTY CLAY, MOIST (ALLUVIAL)

LOOSE TO MEDIUM DENSE ORANGE SAND AND CLAYEY SAND, MOIST TO SATURATED (ALLUVIAL)

MEDIUM STIFF TO STIFF GRAY SANDY SILT AND SILTY CLAY, WET (CAPE FEAR FORMATION)

MEDIUM-DENSE TO VERY-DENSE GRAY SAND, SATURATED (CAPE FEAR FORMATION)

HARD GRAY SANDY CLAY, WET (CAPE FEAR FORMATION)

HARD GRAY SILTY CLAY, WET (RESIDUAL)

WEATHERED ROCK (SCHIST)

CRYSTALLINE ROCK (SCHIST)

71+67.00

-L-

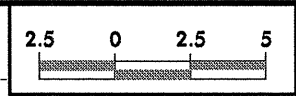








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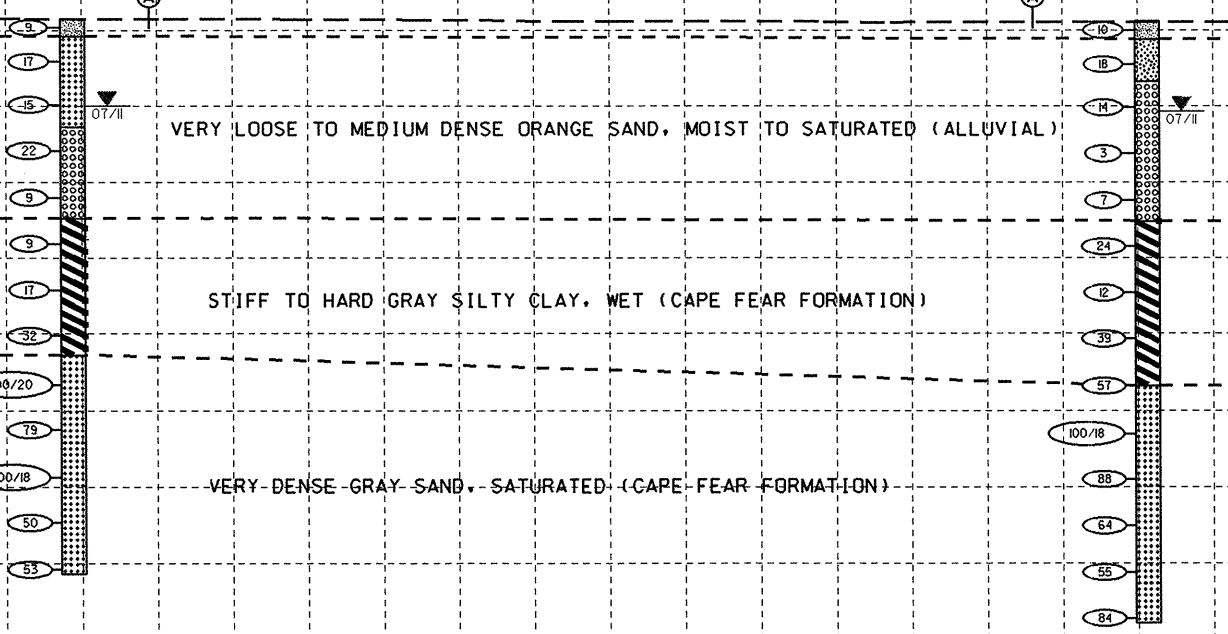


# CROSS SECTION THROUGH BENT 20

Ⓐ STIFF BROWN AND ORANGE SANDY SILT, MOIST (ALLUVIAL)

B20-A; WBL  
73+47.6  
17.2M LT

B20-B EBL  
73+38.4  
17.2M RT

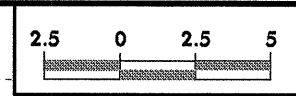


73+43.00

-L-

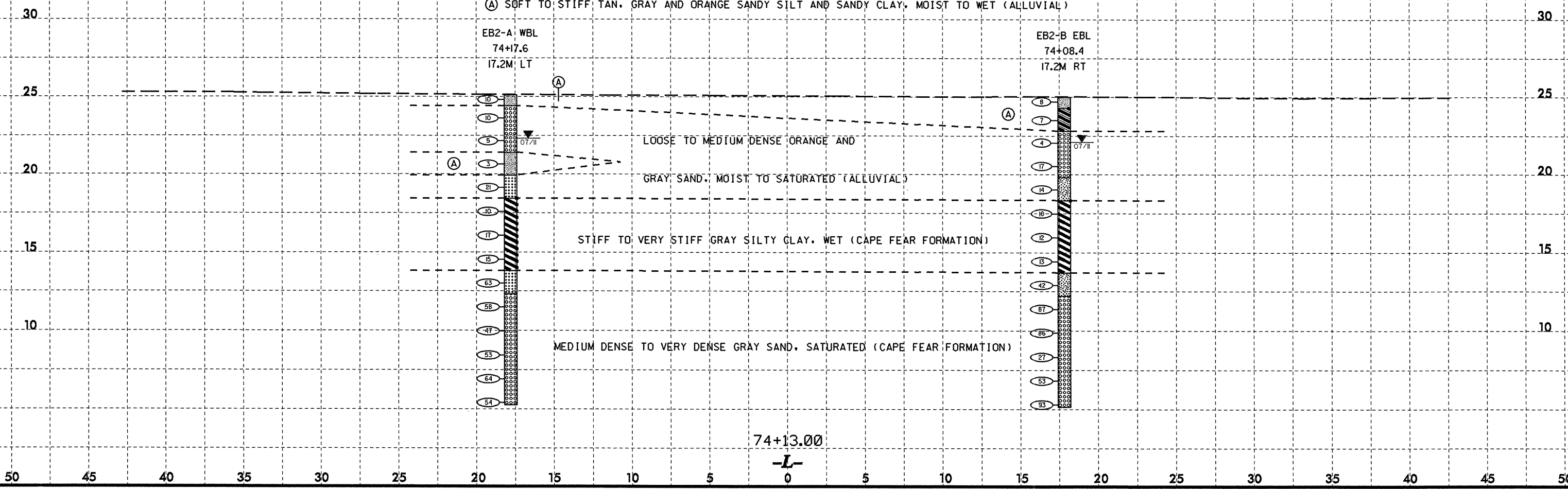






# CROSS SECTION THROUGH END BENT 2

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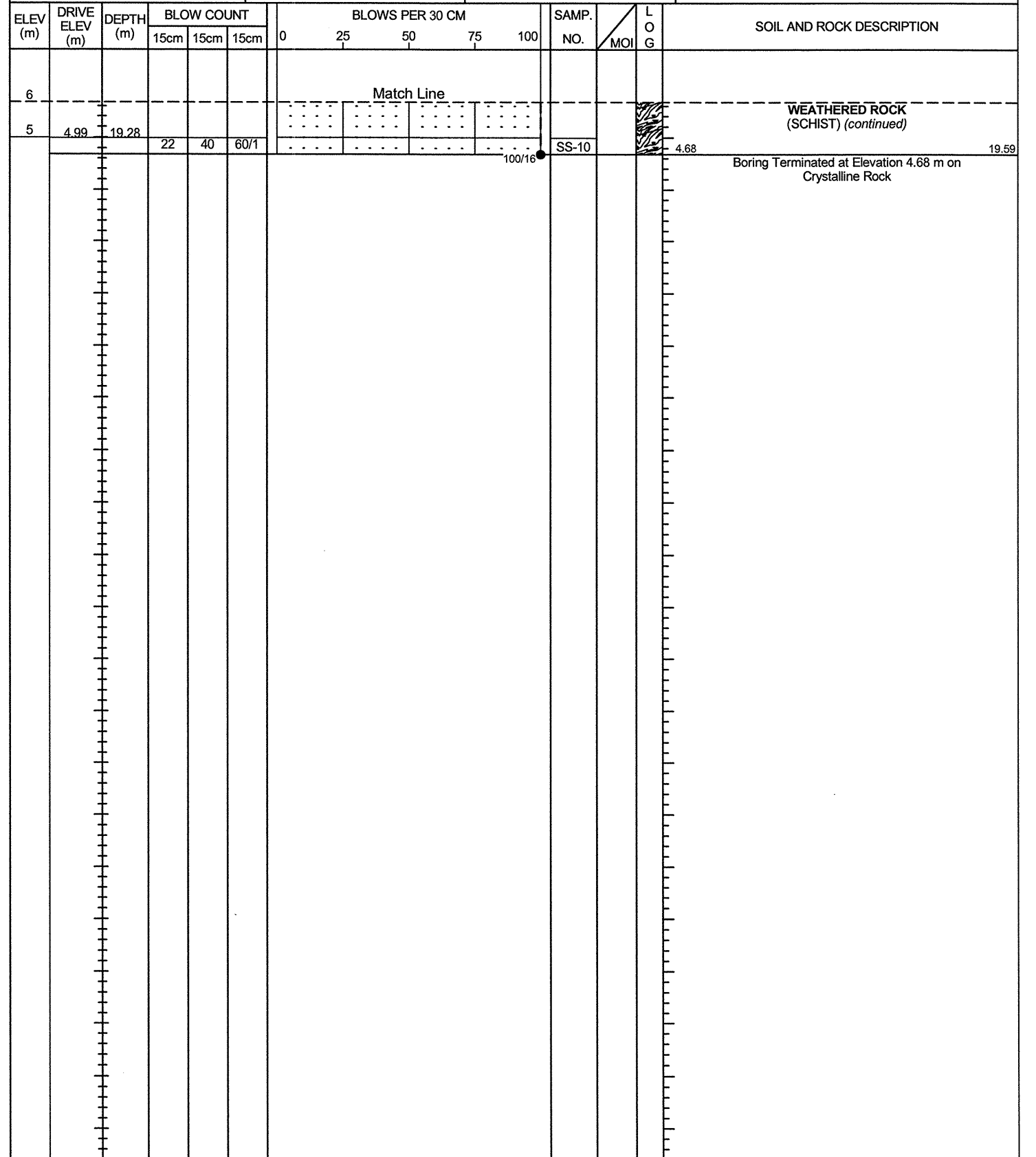
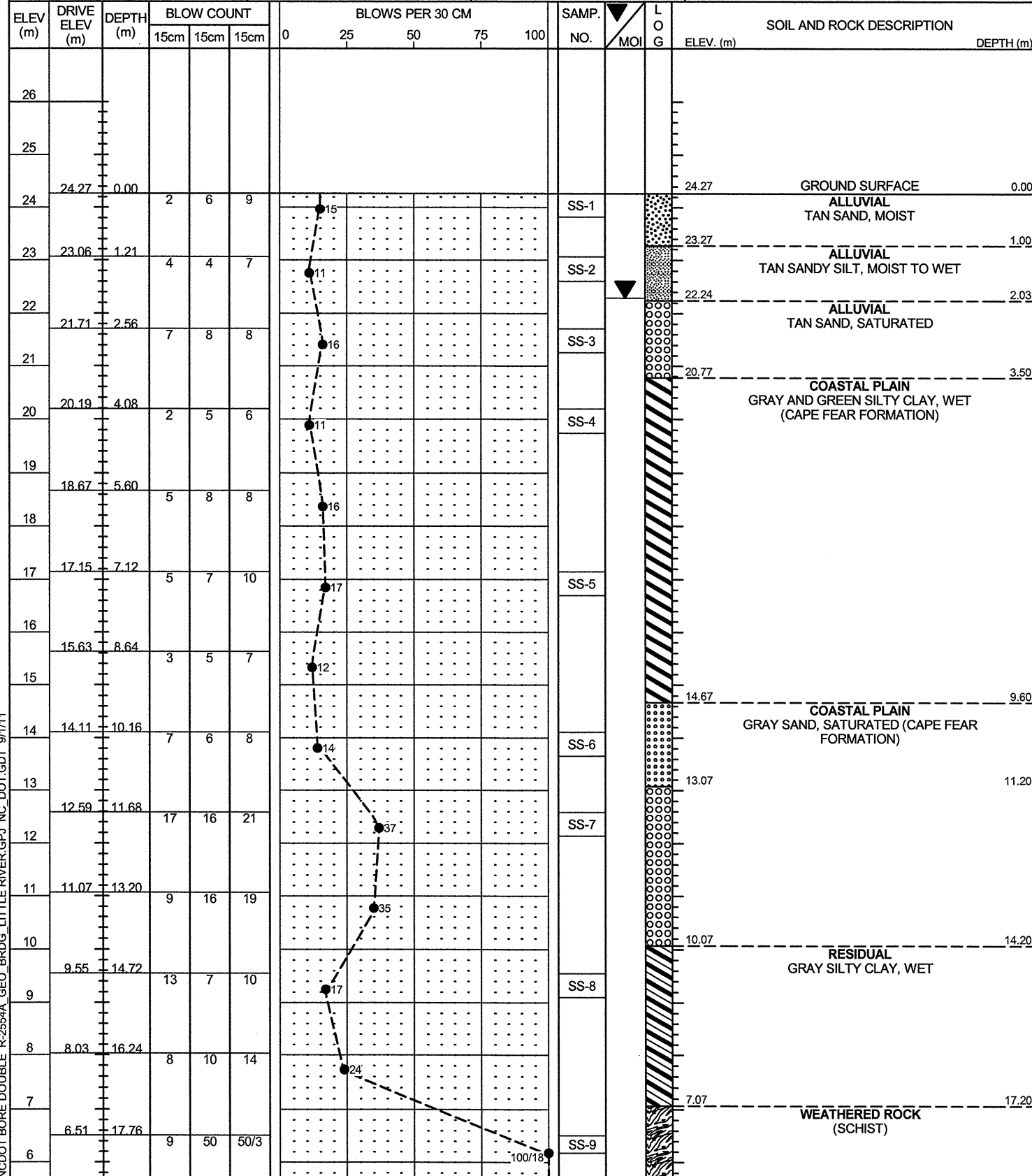


# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. EB1-A WBL	STATION 66+35.0	OFFSET 17.2 m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 24.27 m	TOTAL DEPTH 19.59 m	NORTHING 186,362.7	EASTING 698,511.0	24 HR. 1.98
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Smith, R. E.	START DATE 06/21/11	COMP. DATE 06/21/11	SURFACE WATER DEPTH N/A	

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. EB1-A WBL	STATION 66+35.0	OFFSET 17.2 m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 24.27 m	TOTAL DEPTH 19.59 m	NORTHING 186,362.7	EASTING 698,511.0	24 HR. 1.98
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Smith, R. E.	START DATE 06/21/11	COMP. DATE 06/21/11	SURFACE WATER DEPTH N/A	



NCDOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11







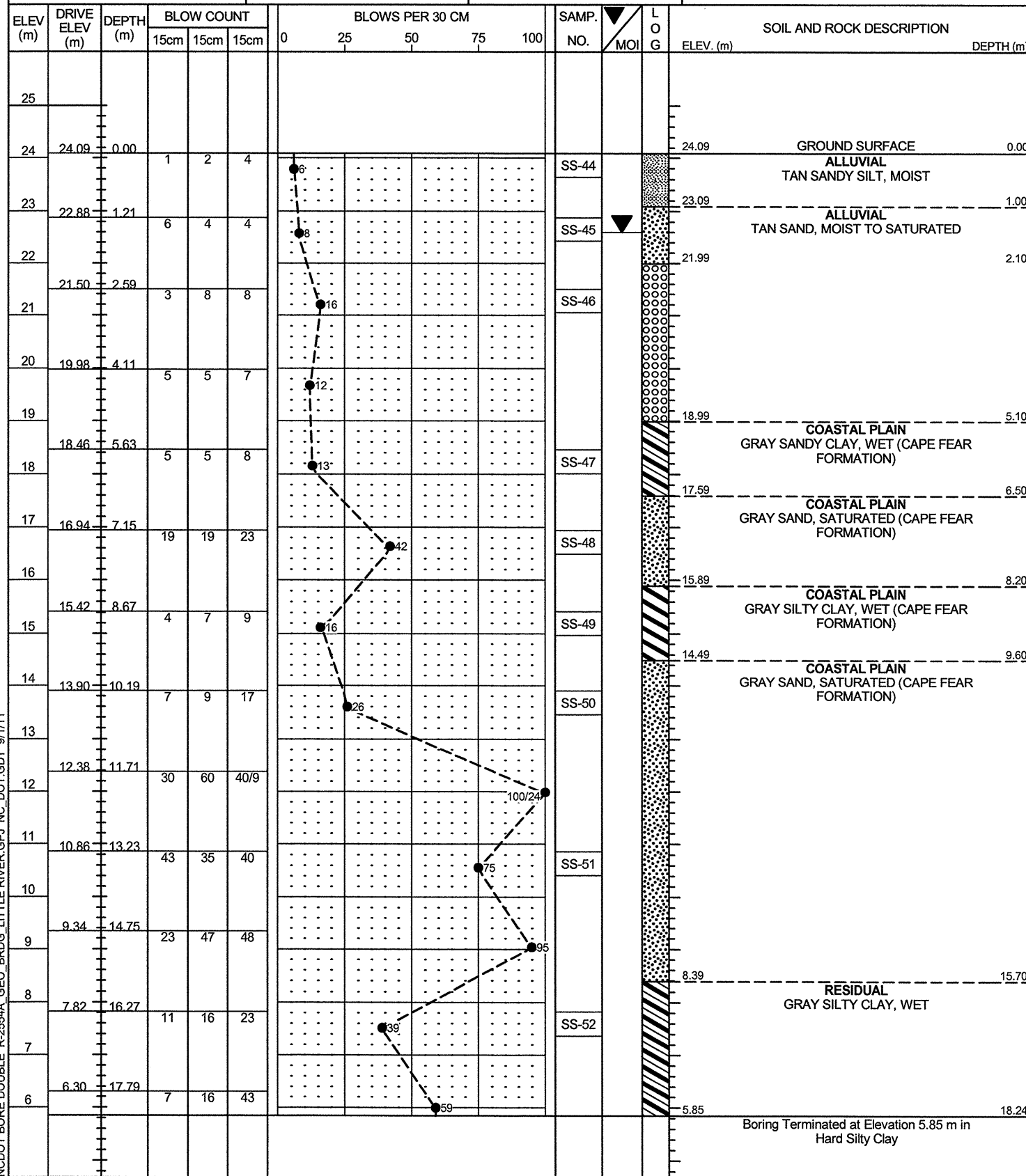
**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B1-B EBL	STATION 66+68.0	OFFSET 17.2 m RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 23.95 m	TOTAL DEPTH 18.18 m	NORTHING 186,334.3	EASTING 698,549.3	24 HR. 2.10
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Smith, R. E.	START DATE 06/22/11	COMP. DATE 06/22/11	SURFACE WATER DEPTH N/A	

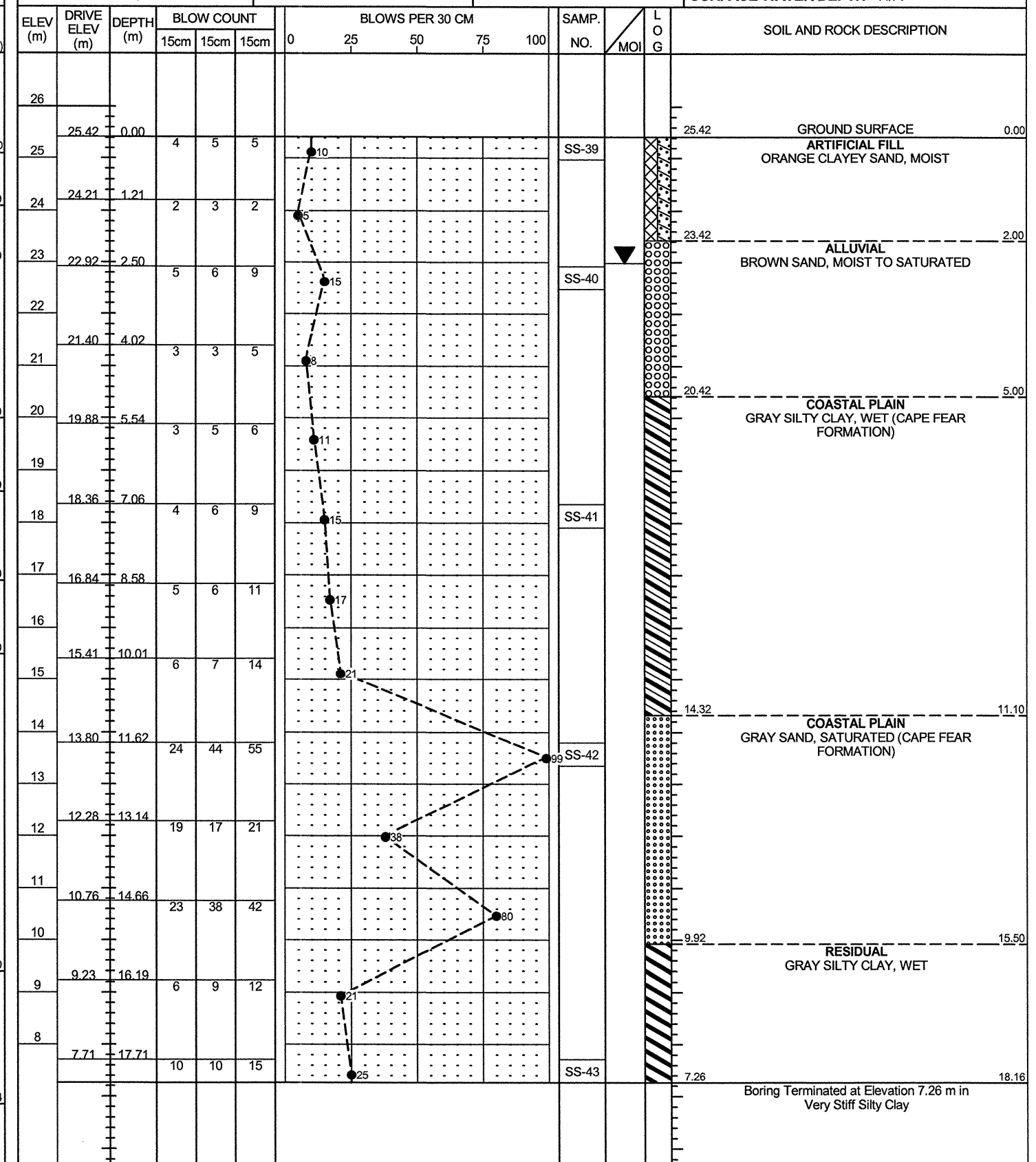
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			15cm	15cm	15cm	0	25	50	75	100			ELEV. (m)	DEPTH (m)	
24	23.95	0.00	1	5	6						SS-19		23.95	0.00	GROUND SURFACE
23	22.74	1.21	6	5	7						SS-20		22.95	1.00	ALLUVIAL BROWN SANDY CLAY, MOIST
22	21.42	2.53	5	7	5						SS-21		21.95	2.00	ALLUVIAL TAN SANDY SILT, MOIST
21	19.90	4.05	6	5	10						SS-22		20.45	3.50	ALLUVIAL TAN SAND, MOIST TO SATURATED
19	18.38	5.57	5	9	12										COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)
18	16.86	7.09	5	8	10						SS-23				
16	15.34	8.61	7	11	11										COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)
15	13.82	10.13	33	57	43/9						SS-24		14.45	9.50	
13	12.30	11.65	28	65	35/6										RESIDUAL GRAY SILTY CLAY, WET
12	10.78	13.17	21	49	45						SS-25		8.35	15.80	
11	9.26	14.69	17	33	30										Boring Terminated at Elevation 5.77 m in Hard Silty Clay
10	7.74	16.21	12	12	14						SS-26		5.77	18.18	
9	6.22	17.73	11	16	18										

NCDOT BORE DOUBLE R-2554A\_GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT\_GDT 9/1/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B2-A WBL	STATION 67+04.0	OFFSET 17.2 m LT	ALIGNMENT -L-
COLLAR ELEV. 24.09 m	TOTAL DEPTH 18.24 m	NORTHING 186,374.3	EASTING 698,579.1
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 06/29/11	COMP. DATE 06/29/11	SURFACE WATER DEPTH N/A



WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B2-B EBL	STATION 67+04.0	OFFSET 15.0 m RT	ALIGNMENT -L-
COLLAR ELEV. 25.42 m	TOTAL DEPTH 18.16 m	NORTHING 186,342.5	EASTING 698,584.5
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 06/23/11	COMP. DATE 06/24/11	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE R-2554A GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11





# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B3-B EBL	STATION 67+40.0	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 25.38 m	TOTAL DEPTH 19.66 m	NORTHING 186,346.4	EASTING 698,620.3
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 07/21/11	COMP. DATE 07/21/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100					
27															
26															
25	25.38	0.00	WOH	WOH	WOH									GROUND SURFACE	0.00
24	24.17	1.21												ALLUVIAL BROWN SANDY SILT, MOIST	0.60
23	22.89	2.49												ALLUVIAL ORANGE AND TAN SAND, MOIST TO SATURATED	
22															
21	21.37	4.01													
20	19.85	5.53												COASTAL PLAIN GRAY SANDY AND SILTY CLAY, WET (CAPE FEAR FORMATION)	5.00
19															
18	18.31	7.07													
17	16.81	8.57													
16															
15	15.29	10.09													
14	13.77	11.61													
13															
12	12.25	13.13													
11	10.73	14.65													
10															
9	9.21	16.17													
8	7.69	17.69													
7															

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B3-B EBL	STATION 67+40.0	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 25.38 m	TOTAL DEPTH 19.66 m	NORTHING 186,346.4	EASTING 698,620.3
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 07/21/11	COMP. DATE 07/21/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100					
7															
6	6.17	19.21												RESIDUAL GRAY SAND, SATURATED	19.66
														Boring Terminated at Elevation 5.72 m in Very Dense Sand	

NCDOT BORE DOUBLE R-2554A GEO BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11





# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B4-A WBL	STATION 67+76.0	OFFSET 17.2 m LT	ALIGNMENT -L-
COLLAR ELEV. 25.82 m	TOTAL DEPTH 21.15 m	NORTHING 186,386.4	EASTING 698,650.0
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 07/21/11	COMP. DATE 07/22/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
27															
26	25.82	0.00												25.82	GROUND SURFACE
25			WOH	WOH	WOH									25.22	ALLUVIAL BROWN SANDY SILT, MOIST
24	24.61	1.21	3	6	8									23.82	ALLUVIAL ORANGE AND TAN SAND, MOIST TO SATURATED
23	23.36	2.46	8	11	7									20.82	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)
22	21.84	3.98	3	5	4									14.72	COASTAL PLAIN GRAY SANDY SILT, WET (CAPE FEAR FORMATION)
21	20.32	5.50	2	4	6									13.94	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)
20	18.80	7.02	4	6	9									11.72	RESIDUAL GRAY SILTY CLAY, WET
19	17.28	8.54	4	6	7									9.22	
18	15.76	10.06	5	7	10										
17	14.24	11.58	10	10	20										
16	12.72	13.10	6	18	40										
15	11.20	14.62	19	31	30										
14	9.68	16.14	12	15	12										
13	8.16	17.66	10	15	18										
12															
11															
10															
9															
8															
7															

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B4-A WBL	STATION 67+76.0	OFFSET 17.2 m LT	ALIGNMENT -L-
COLLAR ELEV. 25.82 m	TOTAL DEPTH 21.15 m	NORTHING 186,386.4	EASTING 698,650.0
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 07/21/11	COMP. DATE 07/22/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
7	6.64	19.18	10	13	17										
6														5.62	RESIDUAL GRAY SILTY CLAY, WET (continued)
5	5.12	20.70	15	23	24									4.67	RESIDUAL GREEN CLAYEY SAND, SATURATED
															Boring Terminated at Elevation 4.67 m in Dense Clayey Sand

NCDOT BORE DOUBLE R-2554A\_GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT\_GDT 9/1/11

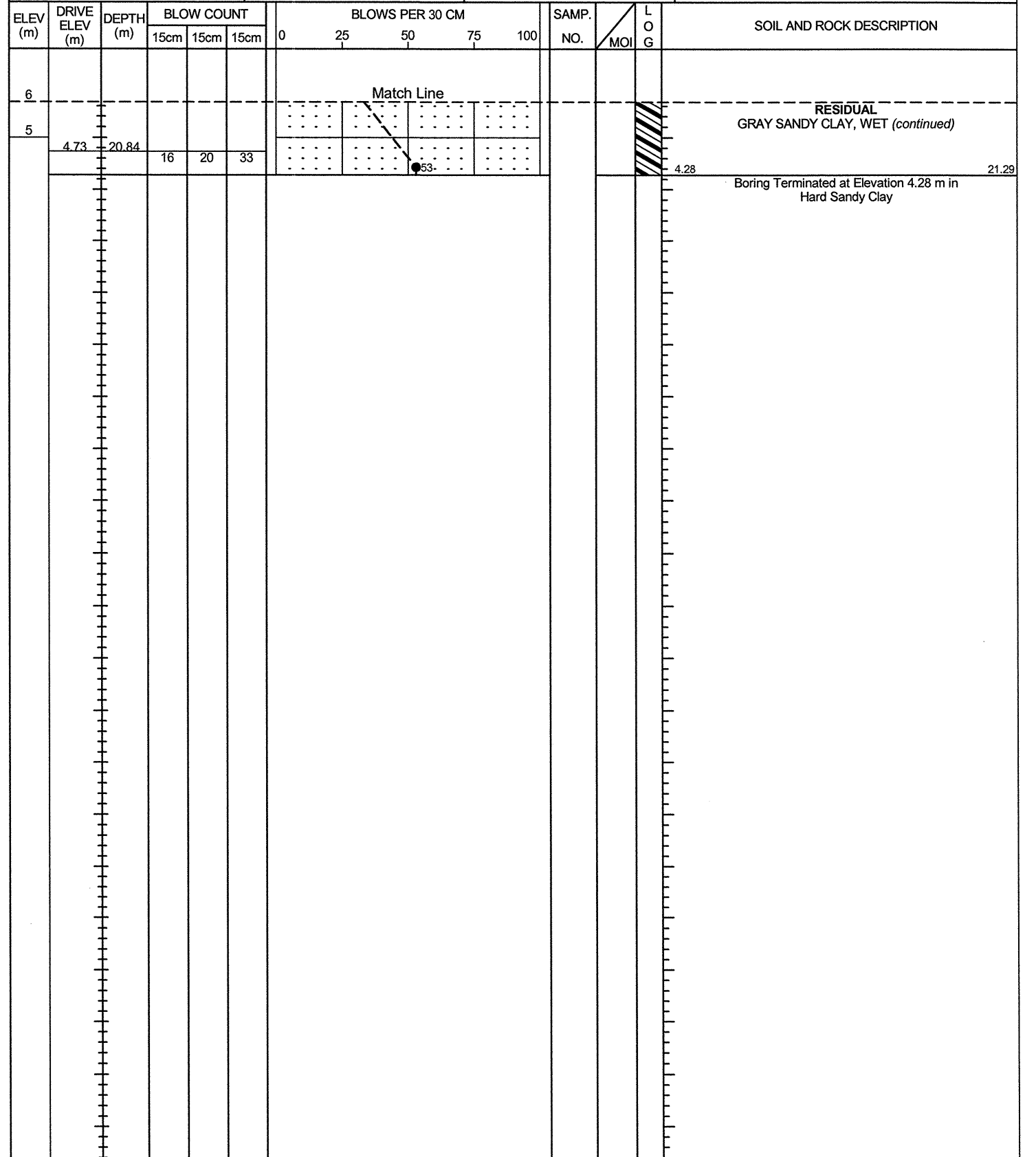
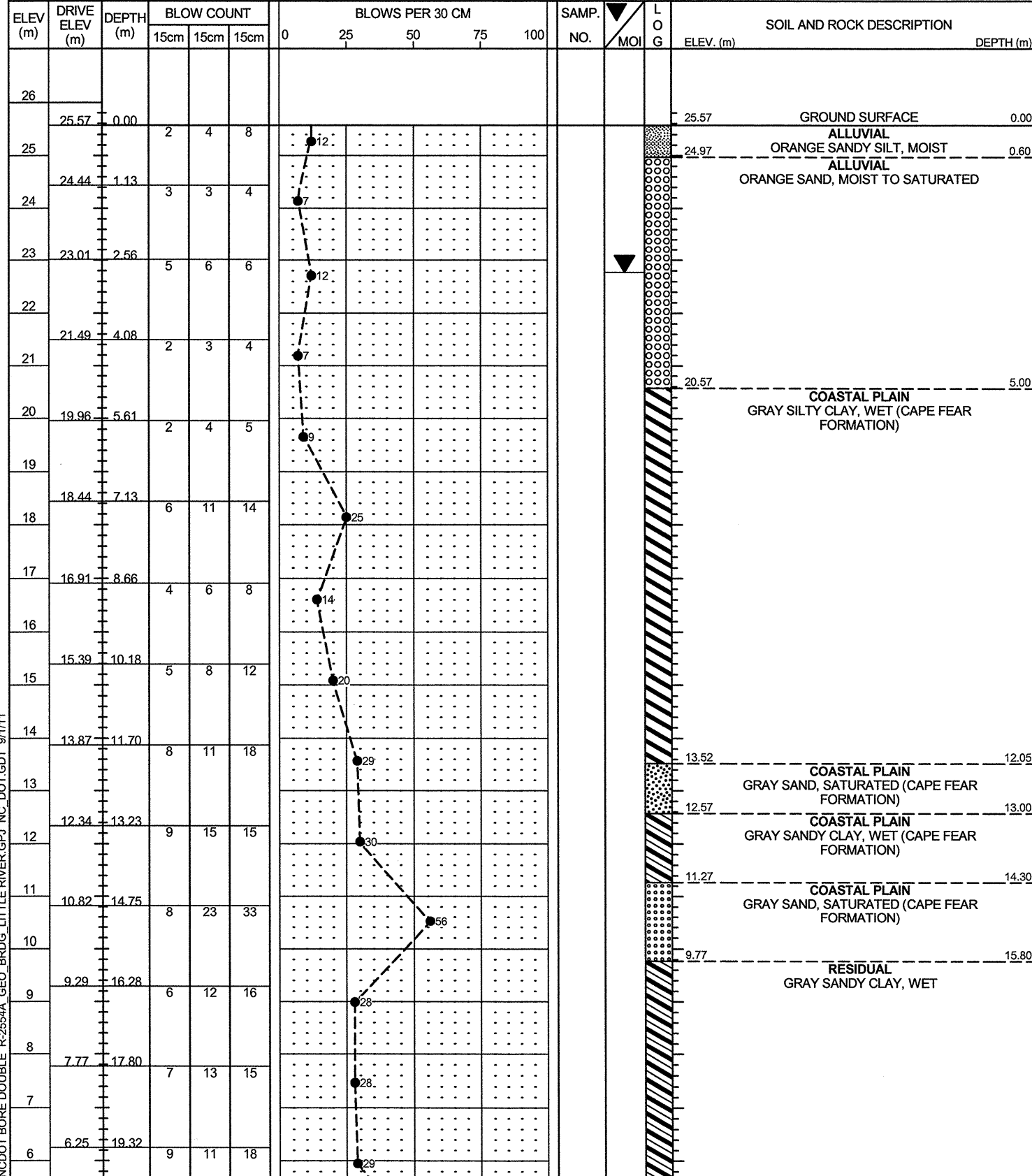


# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B4-B EBL	STATION 67+76.0	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 25.57 m	TOTAL DEPTH 21.29 m	NORTHING 186,352.4	EASTING 698,655.8
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 08/02/11	COMP. DATE 08/02/11	SURFACE WATER DEPTH N/A

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B4-B EBL	STATION 67+76.0	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 25.57 m	TOTAL DEPTH 21.29 m	NORTHING 186,352.4	EASTING 698,655.8
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 08/02/11	COMP. DATE 08/02/11	SURFACE WATER DEPTH N/A



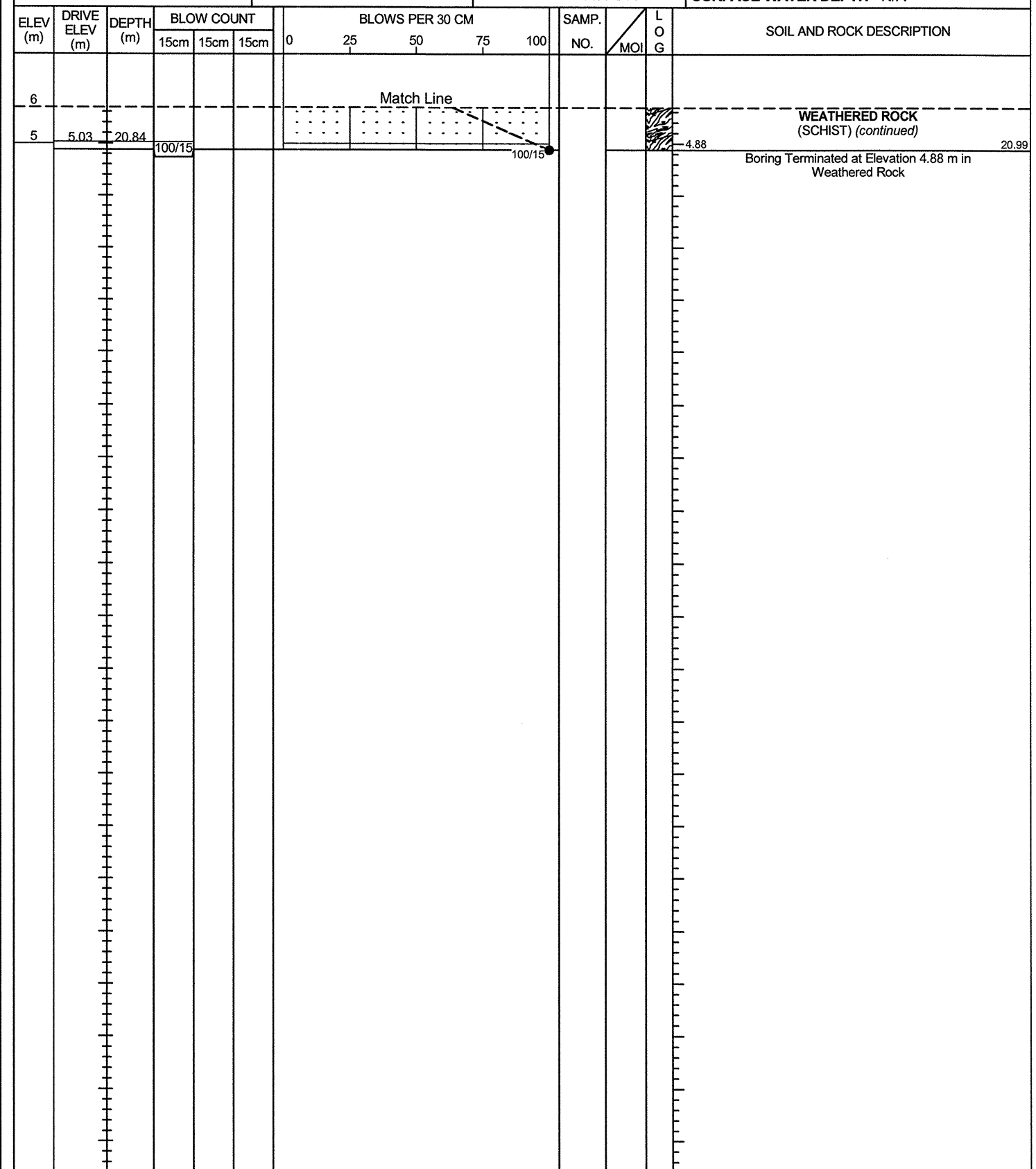
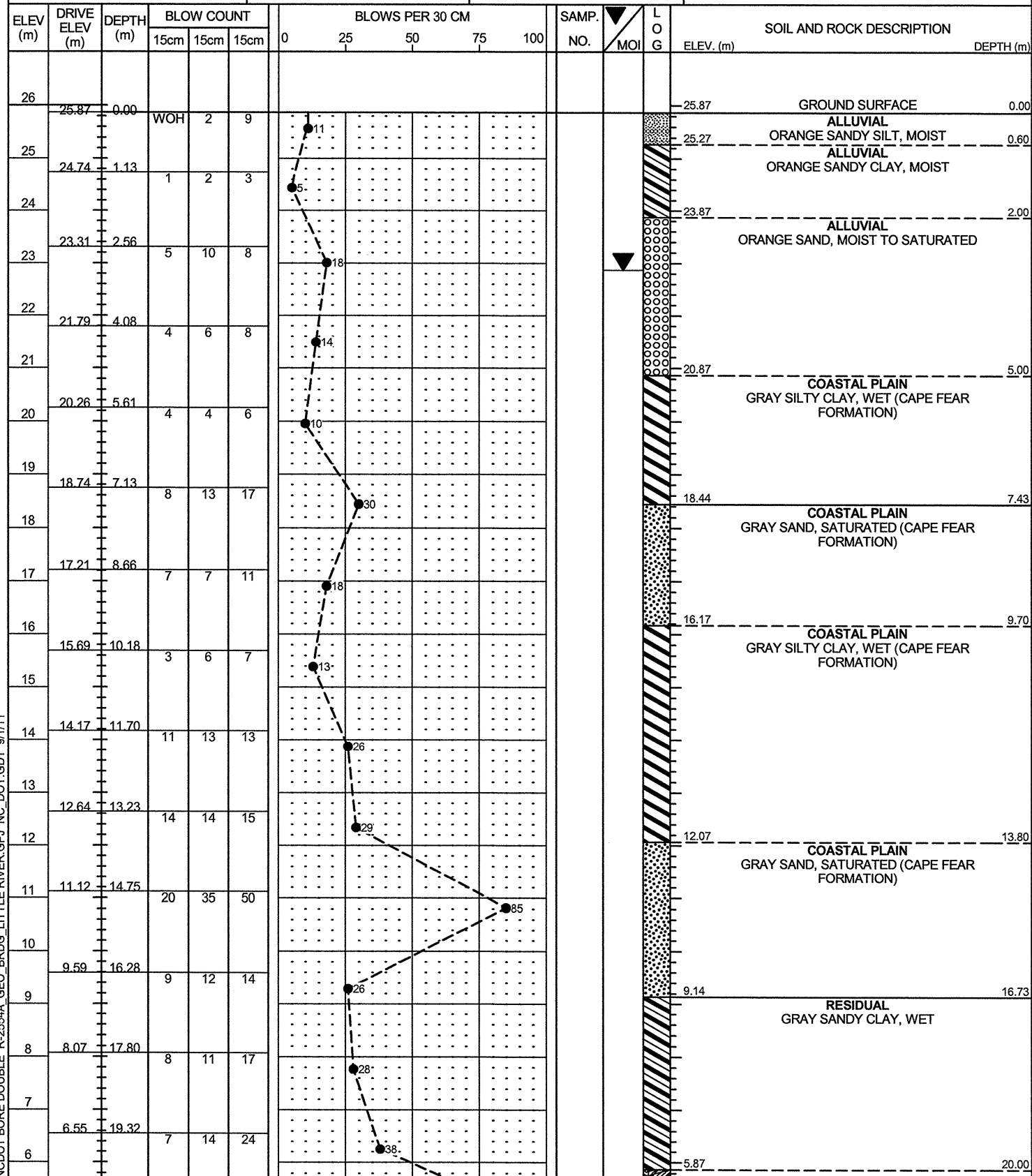
NCDOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.										
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)									
BORING NO. B5-A WBL		STATION 68+11.8		OFFSET 17.2 m LT		ALIGNMENT -L-										
COLLAR ELEV. 26.07 m		TOTAL DEPTH 18.25 m		NORTHING 186,392.4		EASTING 698,685.3										
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 08/03/11		COMP. DATE 08/03/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION			
			15cm	15cm	15cm	0	25	50	75	100			ELEV. (m)	DEPTH (m)		
27																
26	26.07	0.00												26.07	GROUND SURFACE	0.00
			WOH	2	7									25.47	ALLUVIAL ORANGE SANDY SILT, MOIST	0.60
25	24.94	1.13		3	2	3									ALLUVIAL ORANGE SAND, MOIST TO SATURATED	
24																
23	23.51	2.56		4	5	6										
22	21.99	4.08		5	10	10								22.47		3.60
21														21.07	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	5.00
20	20.46	5.61		3	2	4										
19	18.94	7.13		12	18	20								19.47	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	6.60
18																
17	17.41	8.66		11	14	14										
16	15.89	10.18		3	6	9								16.37	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	9.70
15																
14	14.37	11.70		7	39	31								14.07	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	12.00
13	12.84	13.23		24	19	24										
12																
11	11.32	14.75		9	33	56										
10	9.79	16.28		17	21	23										
9																
8	8.27	17.80		3	7	11								8.77	RESIDUAL GRAY SANDY CLAY, WET	17.30
														7.82		18.25
Boring Terminated at Elevation 7.82 m in Very Stiff Sandy Clay																

NCDOT BORE DOUBLE R-2554A\_GEO\_BRDG\_LITTLE RIVER.GPJ\_NC\_DOT.GDT 9/1/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B5-B EBL	STATION 68+02.4	OFFSET 17.2 m RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 25.87 m	TOTAL DEPTH 20.99 m	NORTHING 186,356.9	EASTING 698,681.8	24 HR. 3.00
DRILL RIG/HAMMER EFF/DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 08/02/11	COMP. DATE 08/02/11	SURFACE WATER DEPTH N/A	

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B5-B EBL	STATION 68+02.4	OFFSET 17.2 m RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 25.87 m	TOTAL DEPTH 20.99 m	NORTHING 186,356.9	EASTING 698,681.8	24 HR. 3.00
DRILL RIG/HAMMER EFF/DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 08/02/11	COMP. DATE 08/02/11	SURFACE WATER DEPTH N/A	



NCDOT BORE DOUBLE R-2554A GEO BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

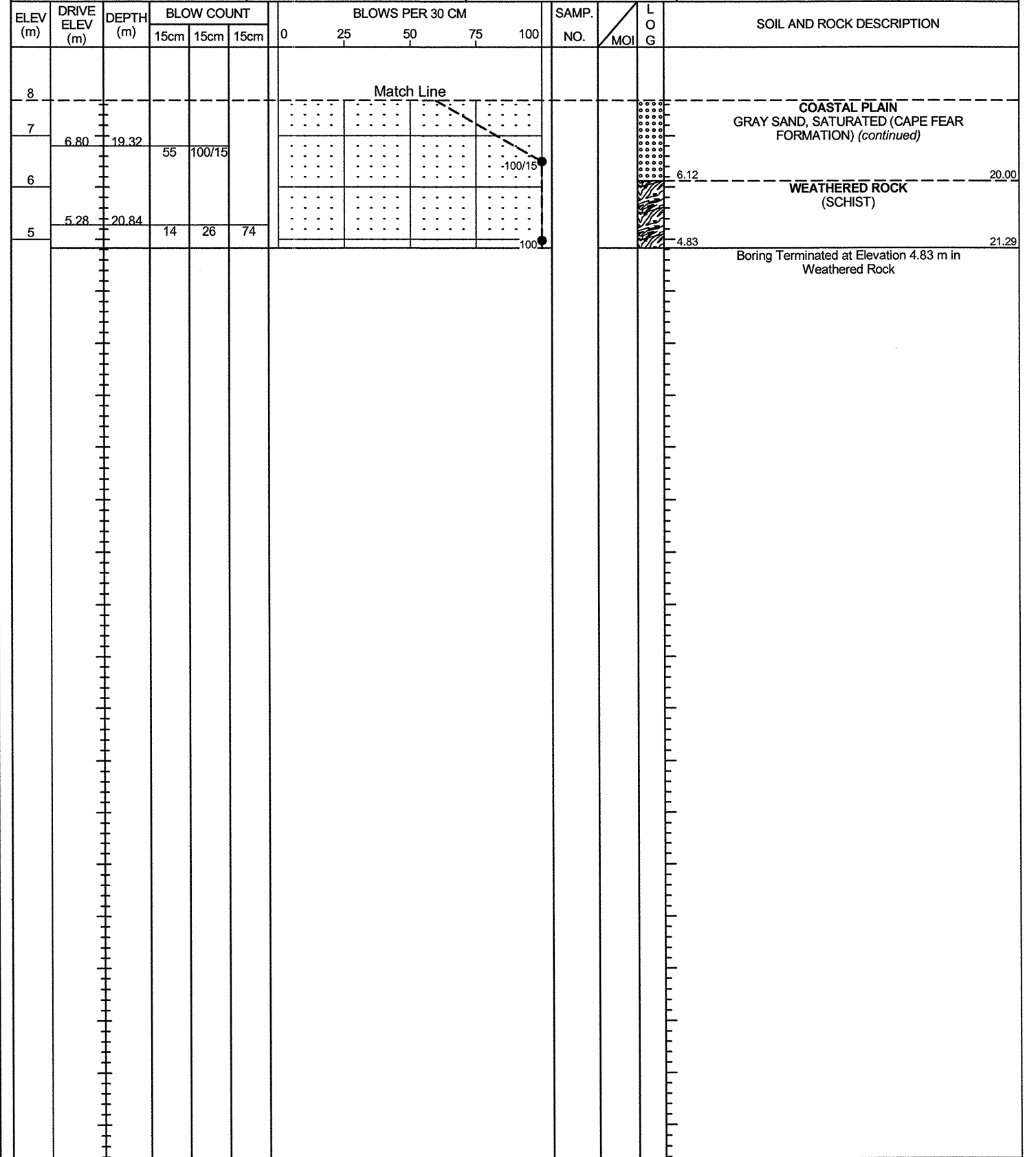
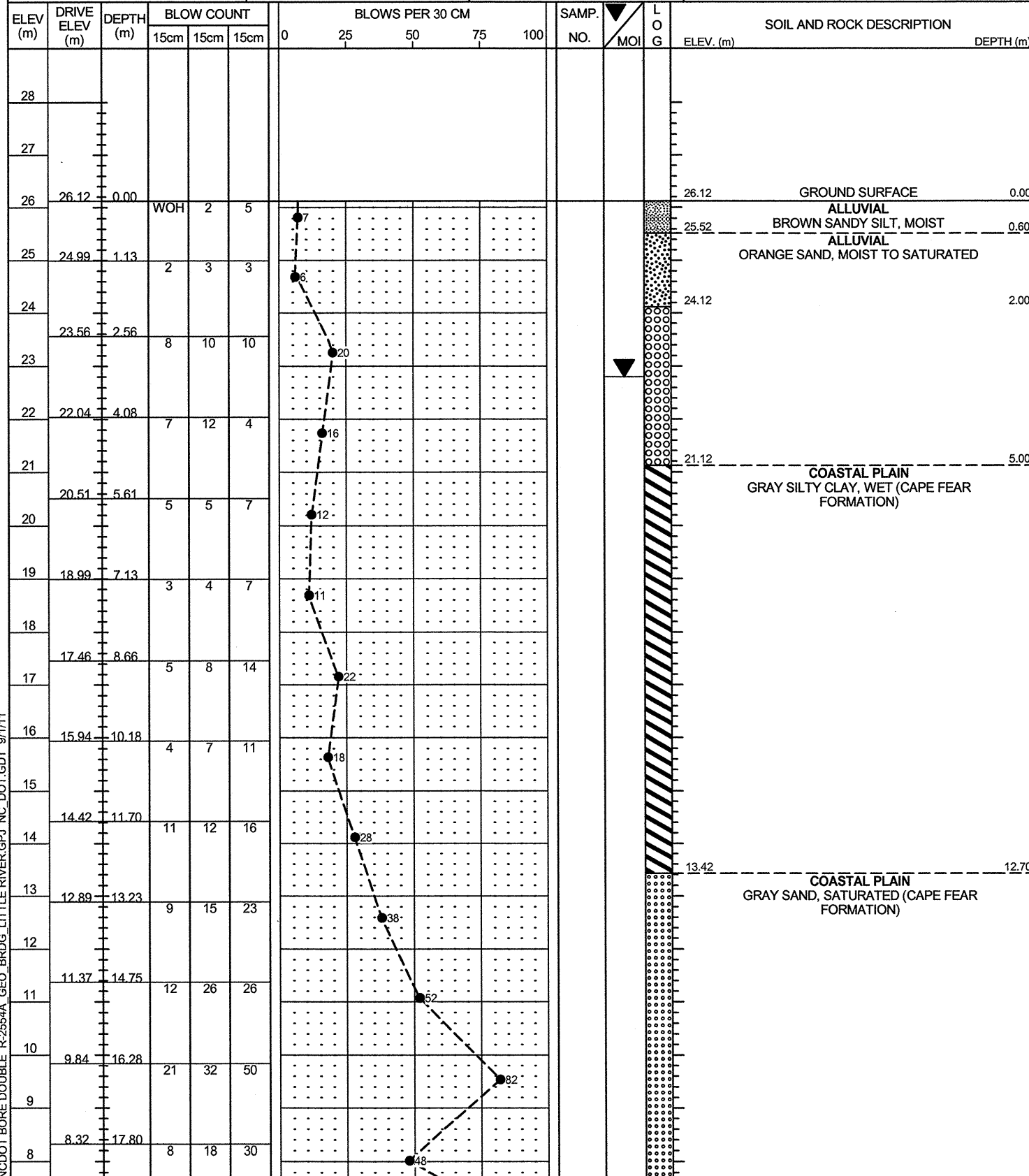


# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B6-A WBL	STATION 68+47.6	OFFSET 17.2 m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 26.12 m	TOTAL DEPTH 21.29 m	NORTHING 186,398.4	EASTING 698,720.6	24 HR. 3.32
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 08/03/11	COMP. DATE 08/03/11	SURFACE WATER DEPTH N/A	

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B6-A WBL	STATION 68+47.6	OFFSET 17.2 m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 26.12 m	TOTAL DEPTH 21.29 m	NORTHING 186,398.4	EASTING 698,720.6	24 HR. 3.32
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 08/03/11	COMP. DATE 08/03/11	SURFACE WATER DEPTH N/A	



NCDOT BORE DOUBLE R-2554A GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11



WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B7-A WBL	STATION 68+83.6	OFFSET 17.2 m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 25.35 m	TOTAL DEPTH 27.39 m	NORTHING 186,404.4	EASTING 698,756.1	24 HR. 2.20
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 08/01/11	COMP. DATE 08/01/11	SURFACE WATER DEPTH N/A	

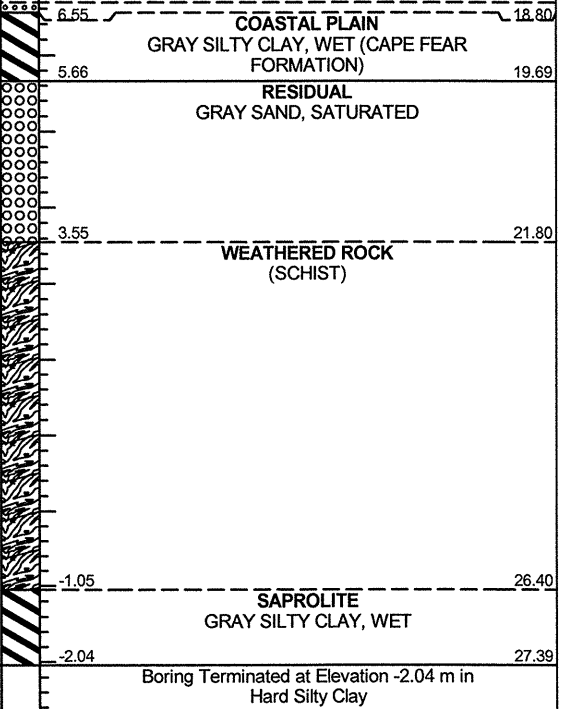
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
27															
26															
25	25.35	0.00	1	5	5									25.35	GROUND SURFACE
24	24.22	1.13	2	3	3									24.75	ALLUVIAL ORANGE SANDY SILT, MOIST ALLUVIAL ORANGE SAND, MOIST TO SATURATED
23	22.79	2.56	2	3	6										
22														21.75	
21	21.27	4.08	2	5	4										
20	19.74	5.61	5	5	8									20.35	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)
19															
18	18.22	7.13	4	6	10										
17	16.69	8.66	6	9	11										
16															
15	15.17	10.18	4	7	11										
14	13.65	11.70	10	26	44									14.15	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)
13															
12	12.12	13.23	9	16	30										
11	10.60	14.75	22	65	35/5										
10	9.07	16.28	28	46	54/12										
9															
8	7.55	17.80	17	23	42										
7															

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B7-A WBL	STATION 68+83.6	OFFSET 17.2 m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 25.35 m	TOTAL DEPTH 27.39 m	NORTHING 186,404.4	EASTING 698,756.1	24 HR. 2.20
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 08/01/11	COMP. DATE 08/01/11	SURFACE WATER DEPTH N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
7															
6	6.03	19.32	4	13	57										
5															
4	4.51	20.84	22	29	35										
3	2.99	22.36			100/15										
2															
1	1.46	23.89	28	70	30/5										
0	-0.06	25.41	24	70	30/6										
-1	-1.59	26.94	23	24	47										
-2															

NCDOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

Match Line









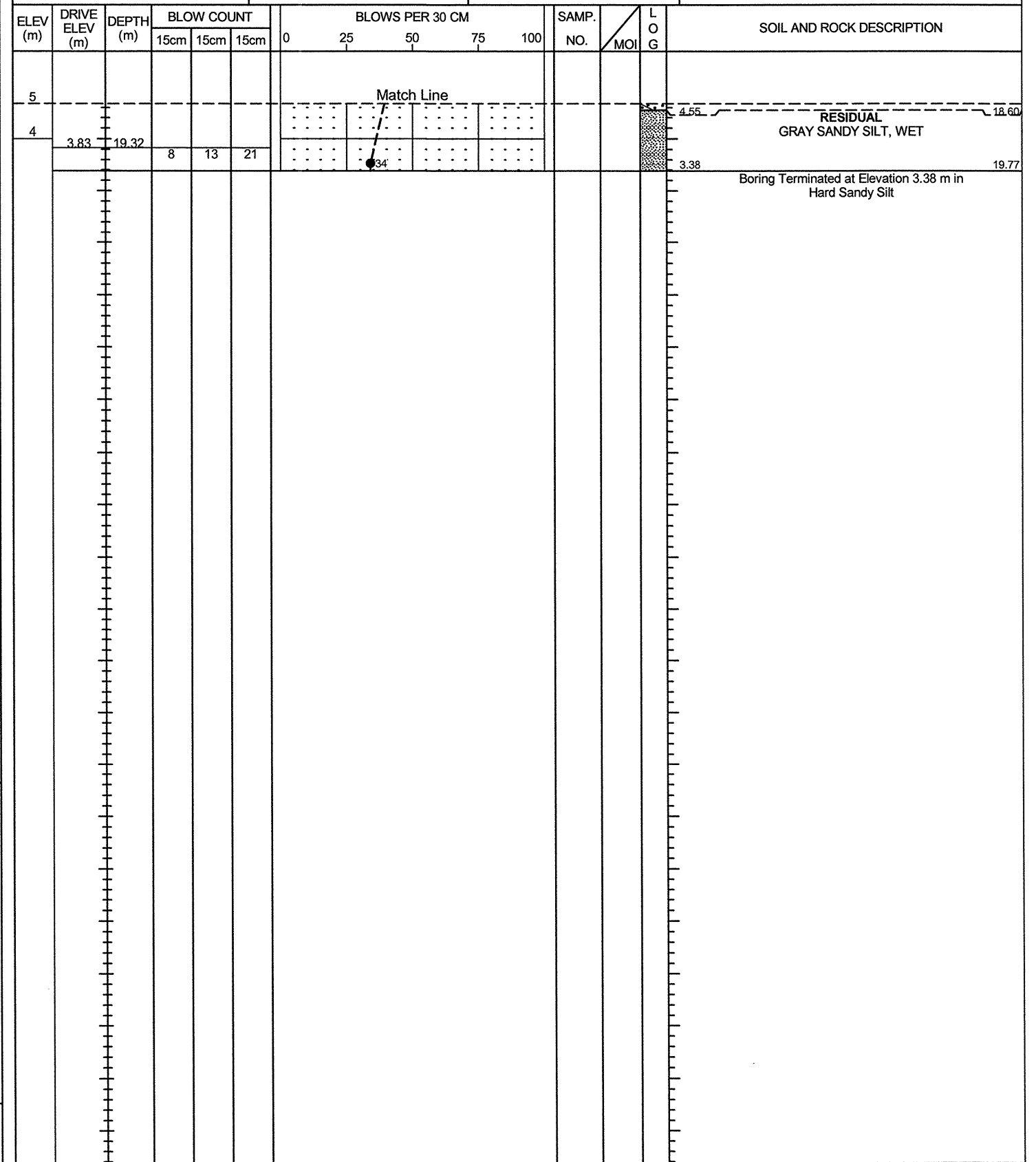
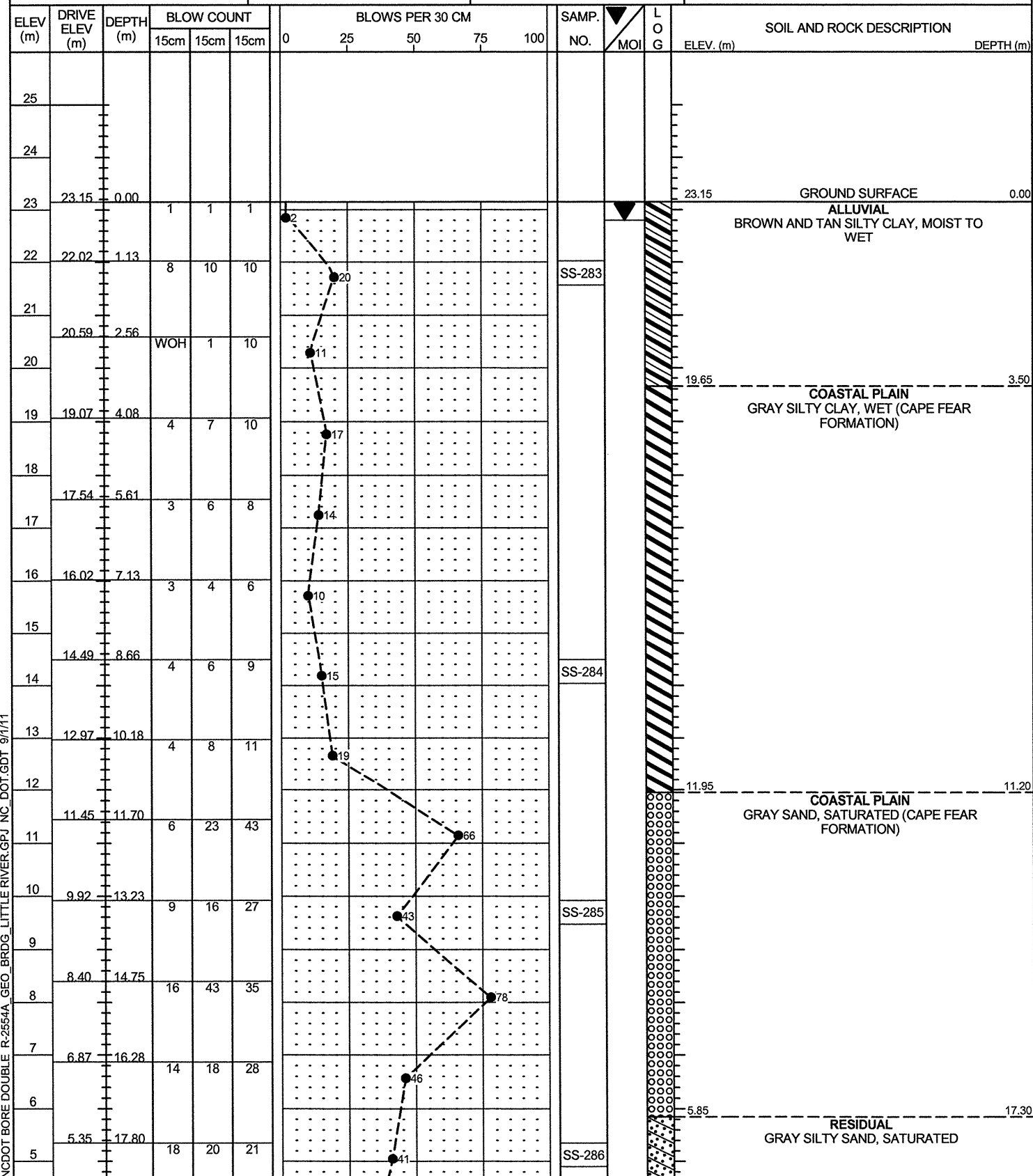






WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B10-A WBL	STATION 69+97.7	OFFSET 17.2 m LT	ALIGNMENT -L-
COLLAR ELEV. 23.15 m	TOTAL DEPTH 19.77 m	NORTHING 186,423.6	EASTING 698,868.6
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/14/11	COMP. DATE 07/14/11	SURFACE WATER DEPTH N/A

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B10-A WBL	STATION 69+97.7	OFFSET 17.2 m LT	ALIGNMENT -L-
COLLAR ELEV. 23.15 m	TOTAL DEPTH 19.77 m	NORTHING 186,423.6	EASTING 698,868.6
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/14/11	COMP. DATE 07/14/11	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE R-2554A\_GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B10-B EBL	STATION 69+82.4	OFFSET 17.2 m RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 22.88 m	TOTAL DEPTH 25.77 m	NORTHING 186,387.1	EASTING 698,859.3	24 HR. 0.71
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 07/14/11	COMP. DATE 07/14/11	SURFACE WATER DEPTH N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100				
23	22.88	0.00	1	1	3								GROUND SURFACE	0.00
22	21.75	1.13	4	7	10								ALLUVIAL TAN SILTY CLAY, MOIST TO WET	
21	20.32	2.56	WOH	WOH	9								ALLUVIAL BROWN SANDY SILT, WET	2.00
20	18.80	4.08	3	7	8								COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	3.50
19	17.27	5.61	4	6	8								COASTAL PLAIN GRAY SANDY SILT, WET (CAPE FEAR FORMATION)	8.10
18	15.75	7.13	5	5	8								COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	9.60
17	14.22	8.66	4	7	10								RESIDUAL GRAY SILTY SAND, SATURATED	15.70
16	12.70	10.18	5	4	7								WEATHERED ROCK (SCHIST)	17.40
15	11.18	11.70	4	5	8								SAPROLITE GRAY SANDY SILT, WET	18.90
14	9.65	13.23	20	28	40									
13	8.13	14.75	15	20	25									
12	6.60	16.28	34	80	20/4									
11	5.08	17.80	8	13	23									
10	3.56	19.32												

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B10-B EBL	STATION 69+82.4	OFFSET 17.2 m RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 22.88 m	TOTAL DEPTH 25.77 m	NORTHING 186,387.1	EASTING 698,859.3	24 HR. 0.71
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 07/14/11	COMP. DATE 07/14/11	SURFACE WATER DEPTH N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100				
3														
2	2.04	20.84	9	20	46								SAPROLITE GRAY SANDY SILT, WET (continued)	
1	0.52	22.36	9	14	27									
0	-1.01	23.89	53	82	18/5								WEATHERED ROCK (SCHIST)	23.40
-1	-2.53	25.41	41	81	19/6									
-2														

NC DOT BORE DOUBLE R-2554A\_GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.										
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)									
BORING NO. B11-A WBL		STATION 70+27.6		OFFSET 17.2 m LT		ALIGNMENT -L-										
COLLAR ELEV. 23.38 m		TOTAL DEPTH 31.54 m		NORTHING 186,428.6		EASTING 698,898.1										
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 07/20/11		COMP. DATE 07/21/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
24																
	23.38	0.00													23.38	GROUND SURFACE
23			3	4	3											ALLUVIAL ORANGE SANDY SILT, MOIST TO WET
	22.25	1.13														
22			4	4	6											
	20.82	2.56														
21			5	7	8											ALLUVIAL ORANGE SAND, SATURATED
	19.30	4.08														
20			5	8	10											
	17.77	5.61														
19			3	5	8											
	16.25	7.13														
18			8	7	8											
	14.72	8.66														
17			4	6	8											
	13.20	10.18														
16			3	6	9											
	11.68	11.70														
15			15	43	52											
	10.15	13.23														
14			20	30	33											
	8.63	14.75														
13			8	4	5											
	7.10	16.28														
12			10	13	16											
	5.58	17.80														
11			9	23	37											
	4.06	19.32														
10			4	8	11											
9																
8																
7																
6																
5																
4																

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.										
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)									
BORING NO. B11-A WBL		STATION 70+27.6		OFFSET 17.2 m LT		ALIGNMENT -L-										
COLLAR ELEV. 23.38 m		TOTAL DEPTH 31.54 m		NORTHING 186,428.6		EASTING 698,898.1										
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 07/20/11		COMP. DATE 07/21/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
4																
	2.53	20.85														
3			6	11	20											
	1.01	22.37														
2			8	18	24											
	-0.52	23.90														
1			17	41	59/5											
	-2.04	25.42														
0			18	40	60/5											
	-3.56	26.94														
-1			60/2													
	-5.09	28.47														
-2			100/15													
	-6.61	29.99														
-3			40	60/2												
	-8.14	31.52														
-4			60/2													
-5																
-6																
-7																
-8																

NCDOT BORE DOUBLE R-2554A GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.									
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)								
BORING NO. B11-B EBL		STATION 70+18.4		OFFSET 17.2 m RT		ALIGNMENT -L-									
COLLAR ELEV. 23.89 m		TOTAL DEPTH 21.29 m		NORTHING 186,393.2		EASTING 698,894.8									
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Contract Driller		START DATE 07/13/11		COMP. DATE 07/13/11		SURFACE WATER DEPTH N/A									
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
24	23.89	0.00	1	2	1									GROUND SURFACE	0.00
23	22.76	1.13	3	4	3									ALLUVIAL ORANGE SANDY SILT, MOIST TO WET	
22	21.33	2.56	3	4	3									ALLUVIAL ORANGE SAND, SATURATED	2.00
21	19.81	4.08	4	7	7									COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	3.60
19	18.28	5.61	3	5	6									COASTAL PLAIN GRAY SANDY SILT, WET (CAPE FEAR FORMATION)	9.60
17	16.76	7.13	4	8	12									COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	11.20
15	15.23	8.66	5	10	12									COASTAL PLAIN GRAY SANDY SILT, WET (CAPE FEAR FORMATION)	12.70
14	13.71	10.18	3	6	8									COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	14.30
13	12.19	11.70	7	30	26									RESIDUAL GRAY SILTY CLAY, WET	17.30
11	10.66	13.23	9	9	9										
10	9.14	14.75	12	23	16										
9	7.61	16.28	9	27	57										
7	6.09	17.80	13	20	10										
6	4.57	19.32	6	10	11										

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.									
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)								
BORING NO. B11-B EBL		STATION 70+18.4		OFFSET 17.2 m RT		ALIGNMENT -L-									
COLLAR ELEV. 23.89 m		TOTAL DEPTH 21.29 m		NORTHING 186,393.2		EASTING 698,894.8									
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Contract Driller		START DATE 07/13/11		COMP. DATE 07/13/11		SURFACE WATER DEPTH N/A									
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
4	3.05	20.84	7	9	15									RESIDUAL GRAY SILTY CLAY, WET (continued)	21.29
														Boring Terminated at Elevation 2.60 m in Very Stiff Silty Clay	

NC DOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC DOT.GDT 9/1/11





WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.											
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)										
BORING NO. B12-B EBL		STATION 70+54.2		OFFSET 17.2 m RT		ALIGNMENT -L-											
COLLAR ELEV. 24.78 m		TOTAL DEPTH 22.91 m		NORTHING 186,399.2		EASTING 698,930.1											
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic													
DRILLER Contract Driller		START DATE 07/12/11		COMP. DATE 07/13/11		SURFACE WATER DEPTH N/A											
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100							
25	24.78	0.00													24.78	GROUND SURFACE	0.00
24	23.59	1.19	2	2	3											ALLUVIAL ORANGE SANDY SILT, MOIST TO WET	
23			5	5	5												
22	22.13	2.65	2	2	3												
21	20.61	4.17													21.18	ALLUVIAL ORANGE SAND, SATURATED	3.60
20			5	6	8										19.58	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	5.20
19	19.08	5.70	3	4	6												
18	17.56	7.22	5	6	9												
17	16.03	8.75	5	8	11												
16	14.51	10.27	6	8	13												
15	12.98	11.80	6	8	12												
14	11.46	13.32	9	17	19												
13	9.94	14.84	12	23	32												
12	8.42	16.36	25	45	46												
11	6.89	17.89	8	14	22												
10	5.37	19.41	11	18	29												
9																	
8																	
7																	
6																	
5																	

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.											
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)										
BORING NO. B12-B EBL		STATION 70+54.2		OFFSET 17.2 m RT		ALIGNMENT -L-											
COLLAR ELEV. 24.78 m		TOTAL DEPTH 22.91 m		NORTHING 186,399.2		EASTING 698,930.1											
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic													
DRILLER Contract Driller		START DATE 07/12/11		COMP. DATE 07/13/11		SURFACE WATER DEPTH N/A											
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100							
5																	
4	3.85	20.93	52	100/15											4.28	WEATHERED ROCK (SCHIST)	20.50
3															2.78	SAPROLITE GRAY SANDY CLAY, WET	22.00
2	2.32	22.46	12	21	29										1.87	Boring Terminated at Elevation 1.87 m in Hard Sandy Clay	22.91

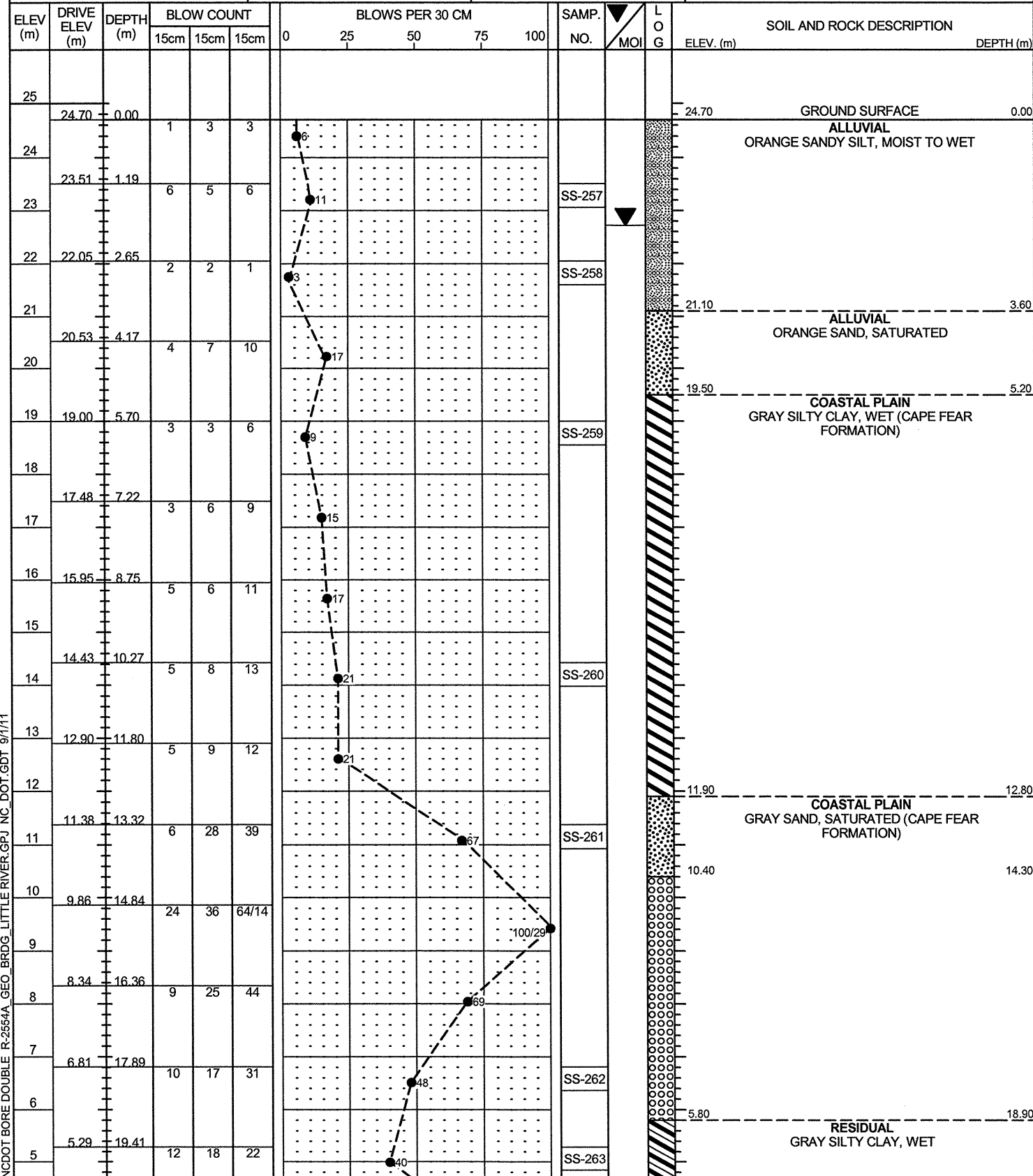
NC DOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC DOT.GDT 9/1/11

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.						
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)					
BORING NO.	STATION	OFFSET	ALIGNMENT			0 HR.	N/A					
B13-A WBL	70+99.6	17.2 m LT	-L-									
COLLAR ELEV.	TOTAL DEPTH	NORTHING	EASTING			24 HR.	1.82					
23.19 m	19.77 m	186,440.7	698,969.0									
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic						
DRILLER Contract Driller		START DATE 07/19/11	COMP. DATE 07/20/11	SURFACE WATER DEPTH N/A								
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM			SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100		
25												
24												
23	23.19	0.00	3	6	6							23.19 GROUND SURFACE 0.00
22	22.06	1.13	5	6	8							
21												21.09 ALLUVIAL ORANGE SAND, SATURATED 2.10
20	20.63	2.56	2	3	5							
19	19.11	4.08	4	6	4							
18												18.19 COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION) 5.00
17	17.58	5.61	3	4	6							
16	16.06	7.13	6	7	12							16.59 6.60
15												14.99 8.20
14	14.53	8.66	5	9	12							
13	13.01	10.18	11	12	10							13.49 COASTAL PLAIN GRAY SANDY SILT, WET (CAPE FEAR FORMATION) 9.70
12												
11	11.49	11.70	11	26	33							11.19 COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION) 12.00
10	9.96	13.23	16	27	39							
9												
8	8.44	14.75	15	26	39							8.99 14.20
7	6.91	16.28	17	33	50							
6												5.89 17.30
5	5.39	17.80	26	38	31							5.09 18.10

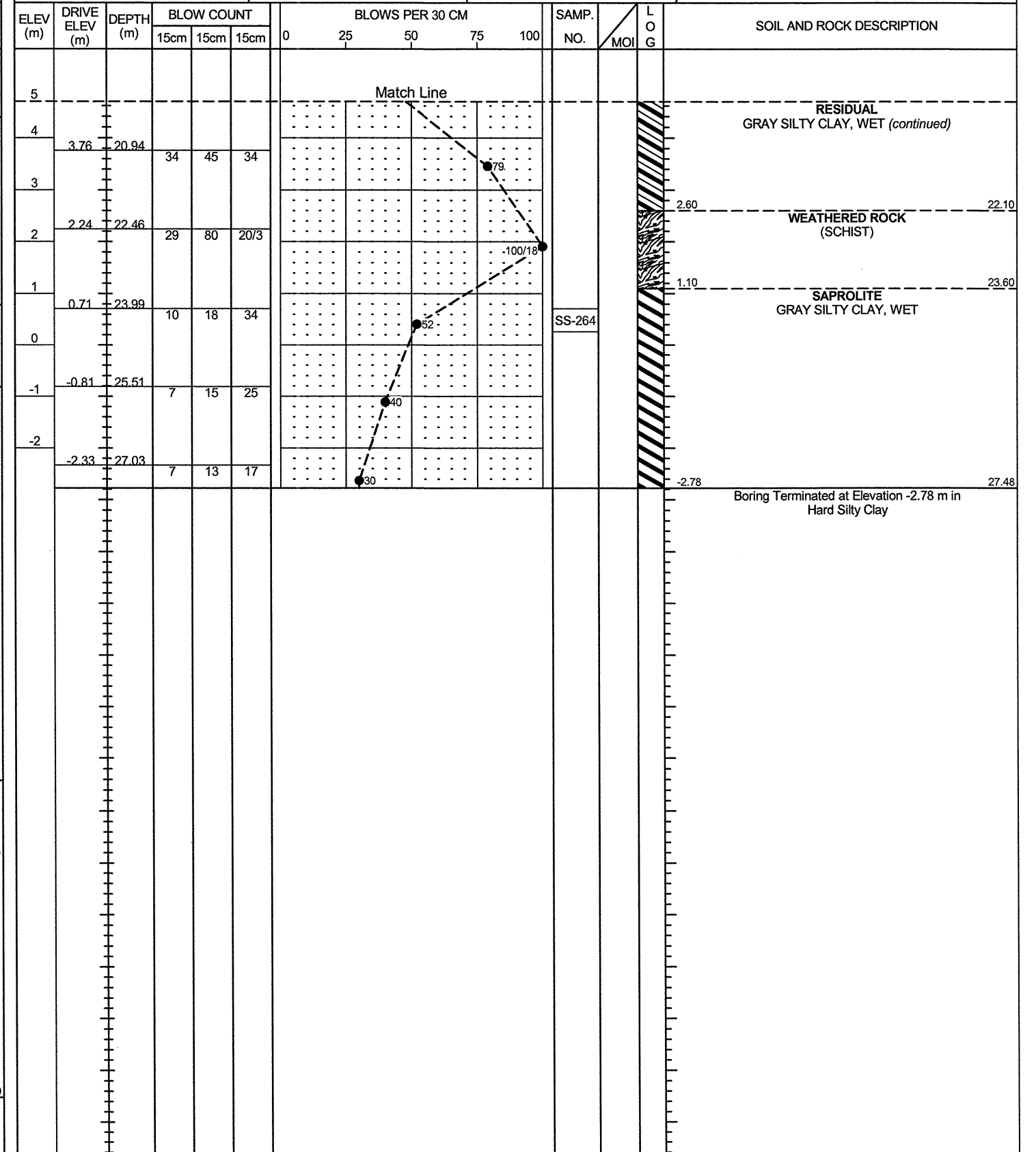
WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.						
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)					
BORING NO.	STATION	OFFSET	ALIGNMENT			0 HR.	N/A					
B13-A WBL	70+99.6	17.2 m LT	-L-									
COLLAR ELEV.	TOTAL DEPTH	NORTHING	EASTING			24 HR.	1.82					
23.19 m	19.77 m	186,440.7	698,969.0									
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic						
DRILLER Contract Driller		START DATE 07/19/11	COMP. DATE 07/20/11	SURFACE WATER DEPTH N/A								
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM			SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100		
5												
4	3.87	19.32	9	18	32							4.00
												3.42

NCDOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B13-B EBL	STATION 70+90.2	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 24.70 m	TOTAL DEPTH 27.48 m	NORTHING 186,405.2	EASTING 698,965.5
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/12/11	COMP. DATE 07/12/11	SURFACE WATER DEPTH N/A



WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B13-B EBL	STATION 70+90.2	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 24.70 m	TOTAL DEPTH 27.48 m	NORTHING 186,405.2	EASTING 698,965.5
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/12/11	COMP. DATE 07/12/11	SURFACE WATER DEPTH N/A



NC DOT BORE DOUBLE R-2554A GEO BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11



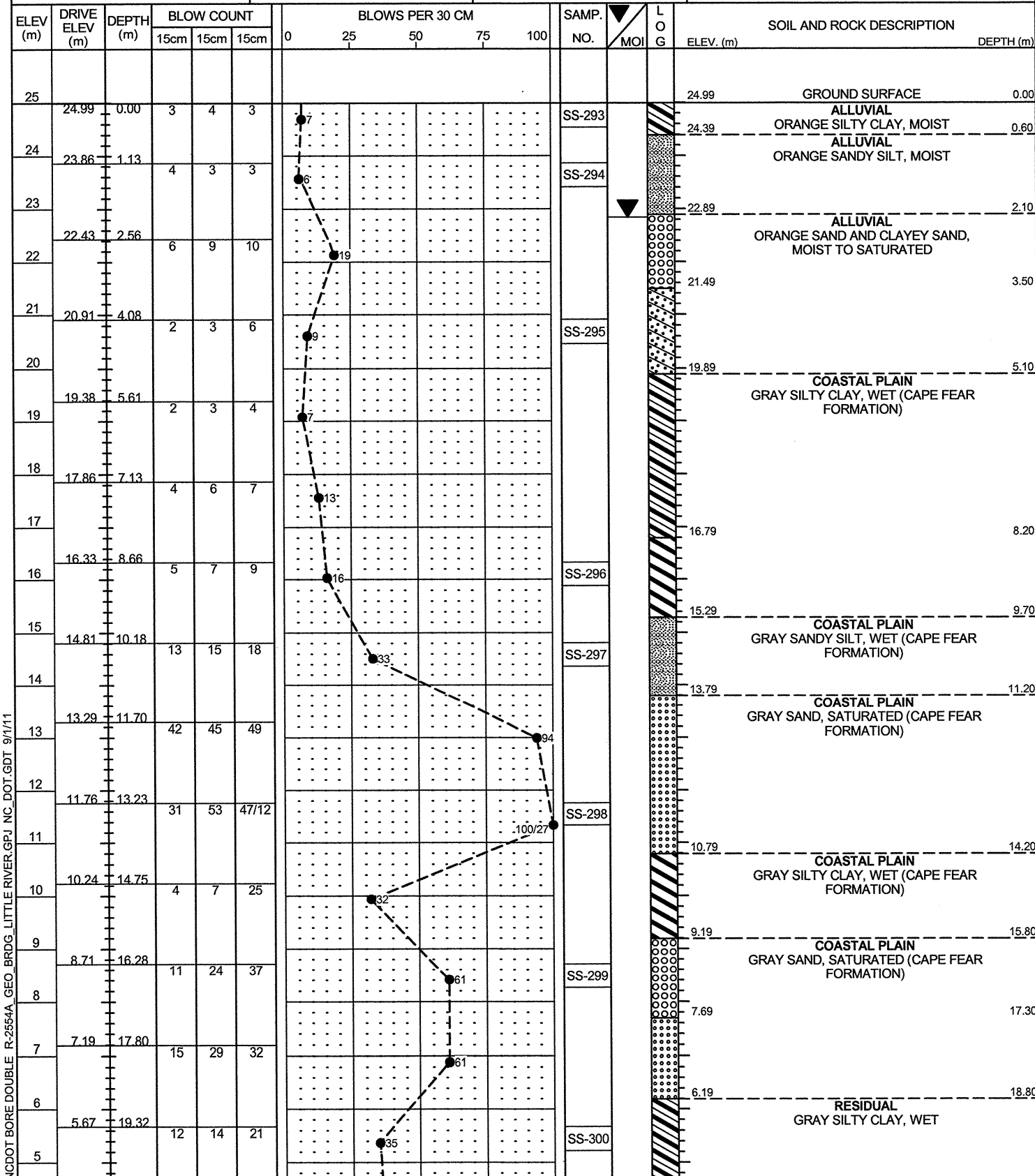


WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.									
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)								
BORING NO.	STATION	OFFSET	ALIGNMENT			0 HR.	N/A								
B14-B EBL	71+26.4	17.2 m RT	-L-												
COLLAR ELEV.	TOTAL DEPTH	NORTHING	EASTING			24 HR.	3.50								
24.99 m	33.46 m	186,411.3	699,001.2												
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 07/08/11	COMP. DATE 07/08/11	SURFACE WATER DEPTH N/A											
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT					BLOWS PER 30 CM		SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100					
25	24.99	0.00	WOH	2	3								24.99	GROUND SURFACE	0.00
24	23.80	1.19		2	3									ALLUVIAL ORANGE SANDY SILT, MOIST	
23	22.34	2.65		1	7								22.89	ALLUVIAL ORANGE SILTY CLAY, MOIST	2.10
22	20.82	4.17		8	7								21.39	ALLUVIAL ORANGE SAND, MOIST TO SATURATED	3.60
21	19.29	5.70		5	8								19.79	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	5.20
20	17.77	7.22		5	9										
19	16.24	8.75		6	14										
18	14.72	10.27		7	11										
17	13.19	11.80		5	12										
16	11.67	13.32		6	45										
15	10.15	14.84		15	36										
14	8.63	16.36		16	25										
13	7.10	17.89		9	20										
12	5.58	19.41		6	13										
11															
10															
9															
8															
7															
6															
5															

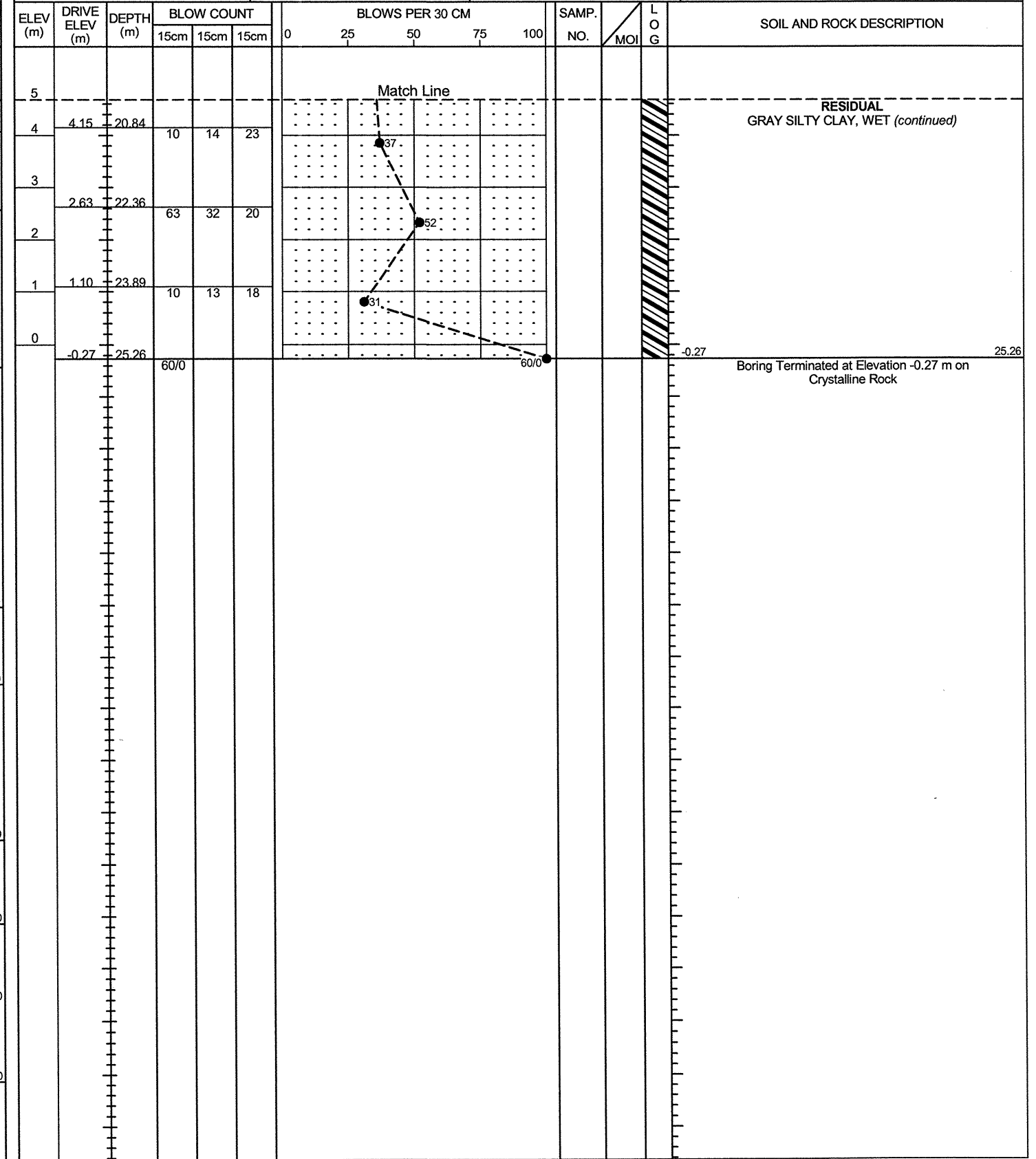
WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.									
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)								
BORING NO.	STATION	OFFSET	ALIGNMENT			0 HR.	N/A								
B14-B EBL	71+26.4	17.2 m RT	-L-												
COLLAR ELEV.	TOTAL DEPTH	NORTHING	EASTING			24 HR.	3.50								
24.99 m	33.46 m	186,411.3	699,001.2												
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 07/08/11	COMP. DATE 07/08/11	SURFACE WATER DEPTH N/A											
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT					BLOWS PER 30 CM		SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100					
5	4.05	20.94		9	21										
4	2.53	22.46		12	56/12										
3	1.00	23.99		5	13										
2	-0.52	25.51		5	13										
1	-2.04	27.03		6	14										
0	-3.57	28.56		8	23										
-1	-5.09	30.08		18	33										
-2	-6.62	31.61		39	61/5										
-3	-8.14	33.13		82	20/3										
-4															
-5															
-6															
-7															
-8															

NCDOT BORE DOUBLE R-2554A GEO BRDG\_LITTLE RIVER.GPJ NC\_DOT\_GDT 9/1/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B15-A WBL	STATION 71+71.6	OFFSET 17.2 m LT	ALIGNMENT -L-
COLLAR ELEV. 24.99 m	TOTAL DEPTH 25.26 m	NORTHING 186,452.8	EASTING 699,040.0
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/18/11	COMP. DATE 07/18/11	SURFACE WATER DEPTH N/A



WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B15-A WBL	STATION 71+71.6	OFFSET 17.2 m LT	ALIGNMENT -L-
COLLAR ELEV. 24.99 m	TOTAL DEPTH 25.26 m	NORTHING 186,452.8	EASTING 699,040.0
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/18/11	COMP. DATE 07/18/11	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE R-2554A GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT\_GDT 9/1/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B15-B EBL	STATION 71+62.4	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 24.82 m	TOTAL DEPTH 21.13 m	NORTHING 186,417.3	EASTING 699,036.7
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/15/11	COMP. DATE 07/15/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100					
25	24.82	0.00												GROUND SURFACE	0.00
24	23.69	1.13	1	2	5									ALLUVIAL ORANGE SANDY SILT, MOIST	
23	22.26	2.56	4	4	6									ALLUVIAL ORANGE SAND, MOIST TO SATURATED	2.00
22	20.74	4.08	10	14	16									COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	5.00
21	19.21	5.61	5	8	8									COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	8.20
20	17.69	7.13	4	5	10									WEATHERED ROCK (SCHIST)	18.80
19	16.16	8.66	4	5	10										
18	14.64	10.18	5	9	11										
17	13.12	11.70	3	5	8										
16	11.59	13.23	6	8	14										
15	10.07	14.75	16	24	32										
14	8.54	16.28	25	28	29										
13	7.02	17.80	12	11	21										
12	5.50	19.32	15	11	19										
11			18	60	40/8										
10															
9															
8															
7															
6															
5															

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B15-B EBL	STATION 71+62.4	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 24.82 m	TOTAL DEPTH 21.13 m	NORTHING 186,417.3	EASTING 699,036.7
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/15/11	COMP. DATE 07/15/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100					
5														Match Line	
4	3.98	20.84	80	100/14										WEATHERED ROCK (SCHIST) (continued)	21.13
														Boring Terminated at Elevation 3.69 m in Weathered Rock	

NCDOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11



WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.											
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)										
BORING NO. B16-A WBL		STATION 72+07.6		OFFSET 17.2 m LT		ALIGNMENT -L-	0 HR. N/A										
COLLAR ELEV. 25.26 m		TOTAL DEPTH 18.20 m		NORTHING 186,458.8		EASTING 699,075.5	24 HR. 2.12										
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Contract Driller		START DATE 07/19/11		COMP. DATE 07/19/11		SURFACE WATER DEPTH N/A											
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			15cm	15cm	15cm	0	25	50	75	100				ELEV. (m)	DEPTH (m)		
26																	
25	25.26	0.00	3	4	5										25.26	0.00	GROUND SURFACE
24	24.13	1.13	6	6	7												ALLUVIAL ORANGE SANDY SILT, MOIST
23	22.70	2.56	12	15	15										23.16	2.10	ALLUVIAL ORANGE AND GRAY SAND, MOIST TO SATURATED
22	21.18	4.08	1	3	3										21.66	3.60	
21	19.65	5.61	3	4	6										20.26	5.00	COASTAL PLAIN GRAY SANDY AND SILTY CLAY, WET (CAPE FEAR FORMATION)
20	18.13	7.13	4	6	7												
19	16.60	8.66	4	6	9										17.06	8.20	
18	15.08	10.18	7	14	17												
17	13.56	11.70	50	100/15											14.06	11.20	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)
16	12.03	13.23	41	65	35/10												
15	10.51	14.75	23	55	45/14												
14	8.98	16.28	20	30	38										9.46	15.80	
13	7.46	17.80	44	75	25/10										7.06	18.20	Boring Terminated at Elevation 7.06 m in Very Dense Sand

NCDOT BORE DOUBLE R-2554A\_GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B16-B EBL	STATION 71+98.4	OFFSET 17.2 m RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 25.13 m	TOTAL DEPTH 19.86 m	NORTHING 186,423.4	EASTING 699,072.2	24 HR. 3.35
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 07/07/11	COMP. DATE 07/07/11	SURFACE WATER DEPTH N/A	

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B16-B EBL	STATION 71+98.4	OFFSET 17.2 m RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 25.13 m	TOTAL DEPTH 19.86 m	NORTHING 186,423.4	EASTING 699,072.2	24 HR. 3.35
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 07/07/11	COMP. DATE 07/07/11	SURFACE WATER DEPTH N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
27																
26																
25	25.13	0.00													25.13	GROUND SURFACE
24	23.94	1.19	1	1	2										24.53	ALLUVIAL ORANGE SILTY CLAY, MOIST ALLUVIAL ORANGE SANDY SILT, MOIST
23	22.48	2.65	2	2	2										22.93	ALLUVIAL ORANGE SAND, MOIST TO SATURATED
22	20.96	4.17	6	10	10										21.23	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)
21	19.43	5.70	2	3	4											
20	17.91	7.22	3	5	6											
19	16.38	8.75	4	6	8											
18	14.86	10.27	7	10	15											
17	13.33	11.80	20	27	32											
16	11.81	13.32	30	54	46/14											
15	10.29	14.84	3	4	7											
14	8.77	16.36	10	11	9											
13	7.24	17.89	14	20	18											

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
7																
6	5.72	19.41	9	15	15										6.23	RESIDUAL GREEN SANDY CLAY, WET
															5.27	Boring Terminated at Elevation 5.27 m in Hard Sandy Clay

NCDOT BORE DOUBLE R-2554A GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B17-A WBL	STATION 72+42.6	OFFSET 17.2 m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 25.18 m	TOTAL DEPTH 19.86 m	NORTHING 186,464.7	EASTING 699,110.0	24 HR. 2.90
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 07/07/11	COMP. DATE 07/07/11	SURFACE WATER DEPTH N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (m)	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
27																
26																
25	25.18	0.00												25.18	0.00	GROUND SURFACE
24	23.99	1.19												24.58	0.60	ALLUVIAL ORANGE SILTY CLAY, MOIST
23														22.98	2.20	ALLUVIAL ORANGE SANDY SILT, MOIST
22	22.53	2.65												21.58	3.60	ALLUVIAL ORANGE SAND, MOIST TO SATURATED
21	21.01	4.17												20.08	5.10	ALLUVIAL GRAY SANDY CLAY, WET
20														15.38	9.80	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)
19	19.48	5.70												13.88	11.30	COASTAL PLAIN GRAY SANDY SILT, WET (CAPE FEAR FORMATION)
18	17.96	7.22												13.88	11.30	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)
17																
16	16.43	8.75														
15	14.91	10.27														
14	13.38	11.80														
13	11.86	13.32														
12	10.34	14.84														
11	8.82	16.36														
10	7.29	17.89														
9																
8																
7																

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				GROUND WTR (m)
BORING NO. B17-A WBL	STATION 72+42.6	OFFSET 17.2 m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 25.18 m	TOTAL DEPTH 19.86 m	NORTHING 186,464.7	EASTING 699,110.0	24 HR. 2.90
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 07/07/11	COMP. DATE 07/07/11	SURFACE WATER DEPTH N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (m)	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
7																
6	5.77	19.41												6.28	18.90	RESIDUAL GREEN SANDY CLAY, WET
														5.32	19.86	Boring Terminated at Elevation 5.32 m in Hard Sandy Clay

NC DOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B17-B EBL	STATION 72+33.4	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 25.16 m	TOTAL DEPTH 18.34 m	NORTHING 186,429.3	EASTING 699,106.7
DRILL RIG/HAMMER EFF/DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/07/11	COMP. DATE 07/07/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
26															
25	25.16	0.00	1	2	2								25.16	GROUND SURFACE	0.00
24	23.97	1.19	4	4	9								24.56	ALLUVIAL ORANGE SILTY CLAY, MOIST	0.60
23														ALLUVIAL ORANGE SANDY SILT, MOIST	
22	22.51	2.65	8	12	14								22.96	ALLUVIAL ORANGE SAND, MOIST TO SATURATED	2.20
21	20.99	4.17	1	2	2										
20	19.46	5.70	3	5	8								20.46	ALLUVIAL GRAY SILTY CLAY, WET	4.70
19													20.06	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	5.10
18	17.94	7.22	5	5	8										
17	16.41	8.75	5	8	11										
16	14.89	10.27	4	8	12										
15	13.36	11.80	26	52	48/13								13.86	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	11.30
14	11.84	13.32	22	42	58/14								12.36		12.80
13	10.32	14.84	18	33	53										
12	8.80	16.36	17	29	33										
11	7.27	17.89	20	18	22										
10															
9															
8															
7													6.82	Boring Terminated at Elevation 6.82 m in Dense Sand	18.34

NCDOT BORE DOUBLE R-2554A\_GEO\_BRDG\_LITTLE RIVER.GPJ\_NC\_DOT\_GDT\_9/1/11

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.										
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)									
BORING NO. B18-A WBL		STATION 72+77.6		OFFSET 17.2 m LT		ALIGNMENT -L-										
COLLAR ELEV. 24.93 m		TOTAL DEPTH 18.34 m		NORTHING 186,470.6		EASTING 699,144.5										
DRILL RIG/HAMMER EFF/DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 07/06/11		COMP. DATE 07/06/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100						
25	24.93	0.00	1	3	4								SS-219	24.93	GROUND SURFACE	0.00
24	23.74	1.19	3	2	3										ALLUVIAL ORANGE SILTY CLAY, MOIST	
23	22.28	2.65	6	8	9									22.83	ALLUVIAL TAN SAND, MOIST TO SATURATED	2.10
22	20.76	4.17	3	5	4									21.23		3.70
21	19.23	5.70	6	2	4									19.73	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	5.20
20	17.71	7.22	3	4	7								SS-221			
19	16.18	8.75	4	7	11											
18	14.66	10.27	15	17	19									15.13	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	9.80
17	13.13	11.80	42	100/15									SS-222			
16	11.61	13.32	39	68	32/3											
15	10.09	14.84	30	37	41									10.63		14.30
14	8.56	16.37	21	40	34											
13	7.04	17.89	13	16	12								SS-223			
12																
11																
10																
9																
8																
7																
														6.59		18.34
Boring Terminated at Elevation 6.59 m in Medium Dense Sand																

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.										
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)									
BORING NO. B18-B EBL		STATION 72+68.4		OFFSET 17.2 m RT		ALIGNMENT -L-										
COLLAR ELEV. 24.91 m		TOTAL DEPTH 18.34 m		NORTHING 186,435.1		EASTING 699,141.2										
DRILL RIG/HAMMER EFF/DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 07/06/11		COMP. DATE 07/06/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100						
25	24.91	0.00	1	3	5									24.91	GROUND SURFACE	0.00
24	23.72	1.19	5	10	15									24.31	ALLUVIAL ORANGE SANDY SILT, MOIST	0.60
23	22.26	2.65	5	4	4									22.71	ALLUVIAL ORANGE SANDY CLAY, MOIST TO WET	2.20
22	20.74	4.17	5	6	12									21.23	ALLUVIAL GRAY SAND, SATURATED	3.70
21	19.21	5.70	5	6	5									19.71	COASTAL PLAIN GRAY SANDY AND SILTY CLAY, WET (CAPE FEAR FORMATION)	5.20
20	17.69	7.22	4	6	8											
19	16.16	8.75	4	7	12									16.61		8.30
18	14.64	10.27	5	8	15											
17	13.11	11.80	33	28	43									13.61	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	11.30
16	11.59	13.32	28	38	42											
15	10.07	14.84	15	19	32									10.61		14.30
14	8.54	16.37	30	30	32											
13	7.02	17.89	15	46	32											
12																
11																
10																
9																
8																
7																
														6.57		18.34
Boring Terminated at Elevation 6.57 m in Very Dense Sand																

NCDOT BORE DOUBLE R-2554A GEO\_BRDGLITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11



WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.										
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)									
BORING NO. B19-A WBL		STATION 73+12.6		OFFSET 17.2 m LT		ALIGNMENT -L-										
COLLAR ELEV. 25.30 m		TOTAL DEPTH 18.25 m		NORTHING 186,476.5		EASTING 699,179.0										
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 07/20/11		COMP. DATE 07/20/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100						
26																
25	25.30	0.00	2	9	10									25.30	GROUND SURFACE	0.00
24	24.17	1.13	6	9	11									24.70	ALLUVIAL ORANGE SANDY SILT, MOIST	0.60
23	22.74	2.56	6	13	10										ALLUVIAL ORANGE AND GRAY SAND, MOIST TO SATURATED	
22	21.22	4.08	1	3	10									21.70		3.60
21	19.69	5.61	1	6	5									20.20		5.10
20	18.17	7.13	4	5	9									18.70	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	6.60
19	16.64	8.66	4	4	8									15.60	COASTAL PLAIN GRAY SANDY SILT, WET (CAPE FEAR FORMATION)	9.70
18	15.12	10.18	5	10	17									14.10	COASTAL PLAIN RED AND GRAY SAND, SATURATED (CAPE FEAR FORMATION)	11.20
17	13.60	11.70	27	41	59											
16	12.07	13.23	20	30	30											
15	10.55	14.75	17	30	41											
14	9.02	16.28	14	31	31											
13	7.50	17.80	15	42	34											
12																
11																
10																
9																
8																
7														7.05	Boring Terminated at Elevation 7.05 m in Very Dense Sand	18.25

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.										
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)									
BORING NO. B19-B EBL		STATION 73+03.6		OFFSET 17.2 m RT		ALIGNMENT -L-										
COLLAR ELEV. 25.11 m		TOTAL DEPTH 18.25 m		NORTHING 186,441.1		EASTING 699,175.9										
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 07/19/11		COMP. DATE 07/19/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)		
			15cm	15cm	15cm	0	25	50	75	100						
26																
25	25.11	0.00	3	3	4									25.11	GROUND SURFACE	0.00
24	23.98	1.13	10	14	14									24.51	ALLUVIAL ORANGE SANDY SILT, MOIST	0.60
23	22.55	2.56	5	9	5										ALLUVIAL ORANGE SAND, MOIST TO SATURATED	
22	21.03	4.08	2	1	3									21.51	ALLUVIAL GRAY SANDY CLAY, WET	3.60
21	19.50	5.61	7	7	4									20.01	ALLUVIAL GRAY SAND, SATURATED	5.10
20	17.98	7.13	4	6	8									18.51	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	6.60
19	16.45	8.66	3	6	11											
18	14.93	10.18	4	6	9											
17	13.41	11.70	26	35	44									13.91	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	11.20
16	11.88	13.23	25	50	50/12											
15	10.36	14.75	4	8	11									10.91	COASTAL PLAIN GRAY SANDY SILT, WET (CAPE FEAR FORMATION)	14.20
14	8.83	16.28	21	35	37									9.91	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	15.20
13	7.31	17.80	14	20	22									9.31	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	15.80
12																
11																
10																
9																
8																
7														6.86	Boring Terminated at Elevation 6.86 m in Dense Sand	18.25

NCDOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC\_DOT\_GDT 9/1/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

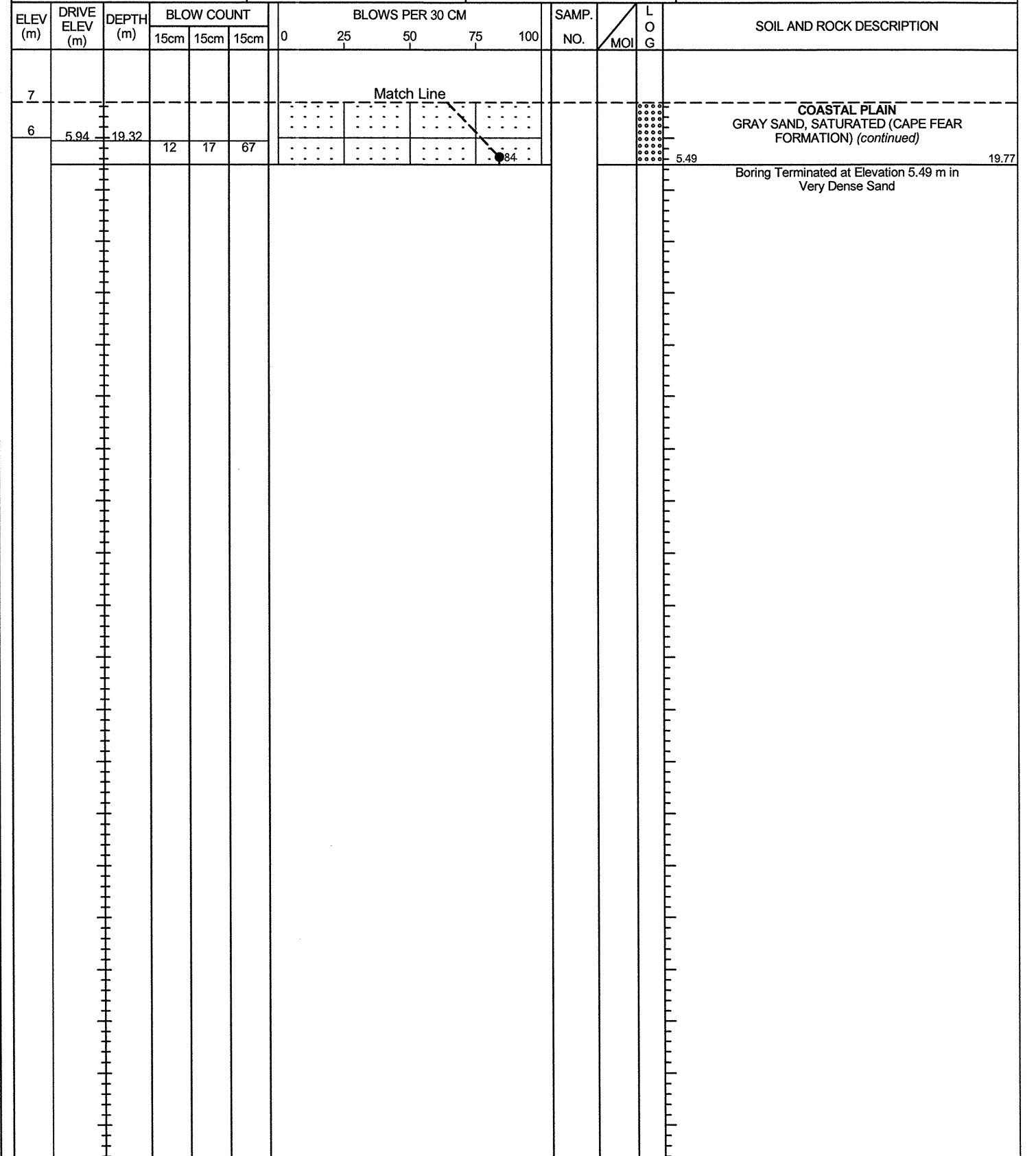
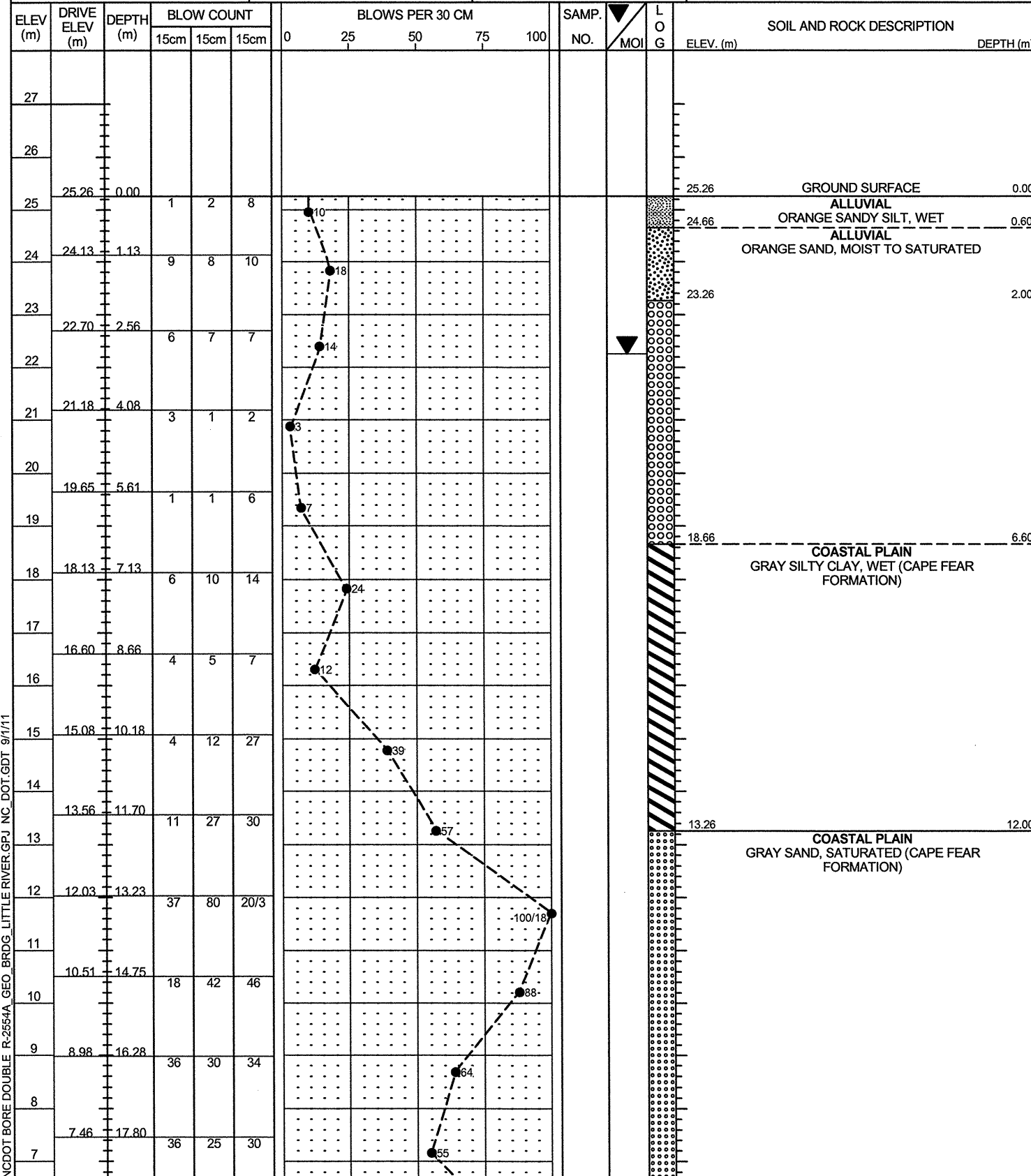
<b>WBS</b> 34461.1.3	<b>TIP</b> R-2554A	<b>COUNTY</b> WAYNE	<b>GEOLOGIST</b> Swartley, J. R.	
<b>SITE DESCRIPTION</b> BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER				<b>GROUND WTR (m)</b>
<b>BORING NO.</b> B20-A WBL	<b>STATION</b> 73+47.6	<b>OFFSET</b> 17.2 m LT	<b>ALIGNMENT</b> -L-	<b>0 HR.</b> N/A
<b>COLLAR ELEV.</b> 25.38 m	<b>TOTAL DEPTH</b> 18.25 m	<b>NORTHING</b> 186,482.4	<b>EASTING</b> 699,213.5	<b>24 HR.</b> 2.90
<b>DRILL RIG/HAMMER EFF./DATE</b> SME R-6 CME-550X 78% 01/27/2011		<b>DRILL METHOD</b> Mud Rotary	<b>HAMMER TYPE</b> Automatic	
<b>DRILLER</b> Contract Driller	<b>START DATE</b> 07/26/11	<b>COMP. DATE</b> 07/26/11	<b>SURFACE WATER DEPTH</b> N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION		
			15cm	15cm	15cm	0	25	50	75	100				ELEV. (m)	DEPTH (m)	
26														25.38	0.00	GROUND SURFACE
25	25.38	0.00	3	5	4									24.78	0.60	ALLUVIAL BROWN SANDY SILT, MOIST ALLUVIAL ORANGE SAND, MOIST TO SATURATED
24	24.25	1.13	7	8	9											
23	22.82	2.56	4	8	7											
22														21.78	3.60	
21	21.30	4.08	4	9	13											
20	19.77	5.61	6	4	5											
19														18.78	6.60	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)
18	18.25	7.13	6	4	5											
17	16.72	8.66	5	7	10											
16																
15	15.20	10.18	6	10	22											
14	13.68	11.70	18	70	30/5									14.28	11.10	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)
13																
12	12.15	13.23	32	37	42											
11	10.63	14.75	28	78	22/3											
10	9.10	16.28	30	20	30											
9																
8	7.58	17.80	14	23	30											
														7.13	18.25	Boring Terminated at Elevation 7.13 m in Very Dense Sand

NCDOT BORE DOUBLE R-2554A\_GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B20-B EBL	STATION 73+38.4	OFFSET 17.2 m RT	ALIGNMENT -L- 0 HR. N/A
COLLAR ELEV. 25.26 m	TOTAL DEPTH 19.77 m	NORTHING 186,446.9	EASTING 699,210.2 24 HR. 3.00
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/25/11	COMP. DATE 07/25/11	SURFACE WATER DEPTH N/A

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B20-B EBL	STATION 73+38.4	OFFSET 17.2 m RT	ALIGNMENT -L- 0 HR. N/A
COLLAR ELEV. 25.26 m	TOTAL DEPTH 19.77 m	NORTHING 186,446.9	EASTING 699,210.2 24 HR. 3.00
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 07/25/11	COMP. DATE 07/25/11	SURFACE WATER DEPTH N/A



NC DOT BORE DOUBLE R-2554A GEO BRDG LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11





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

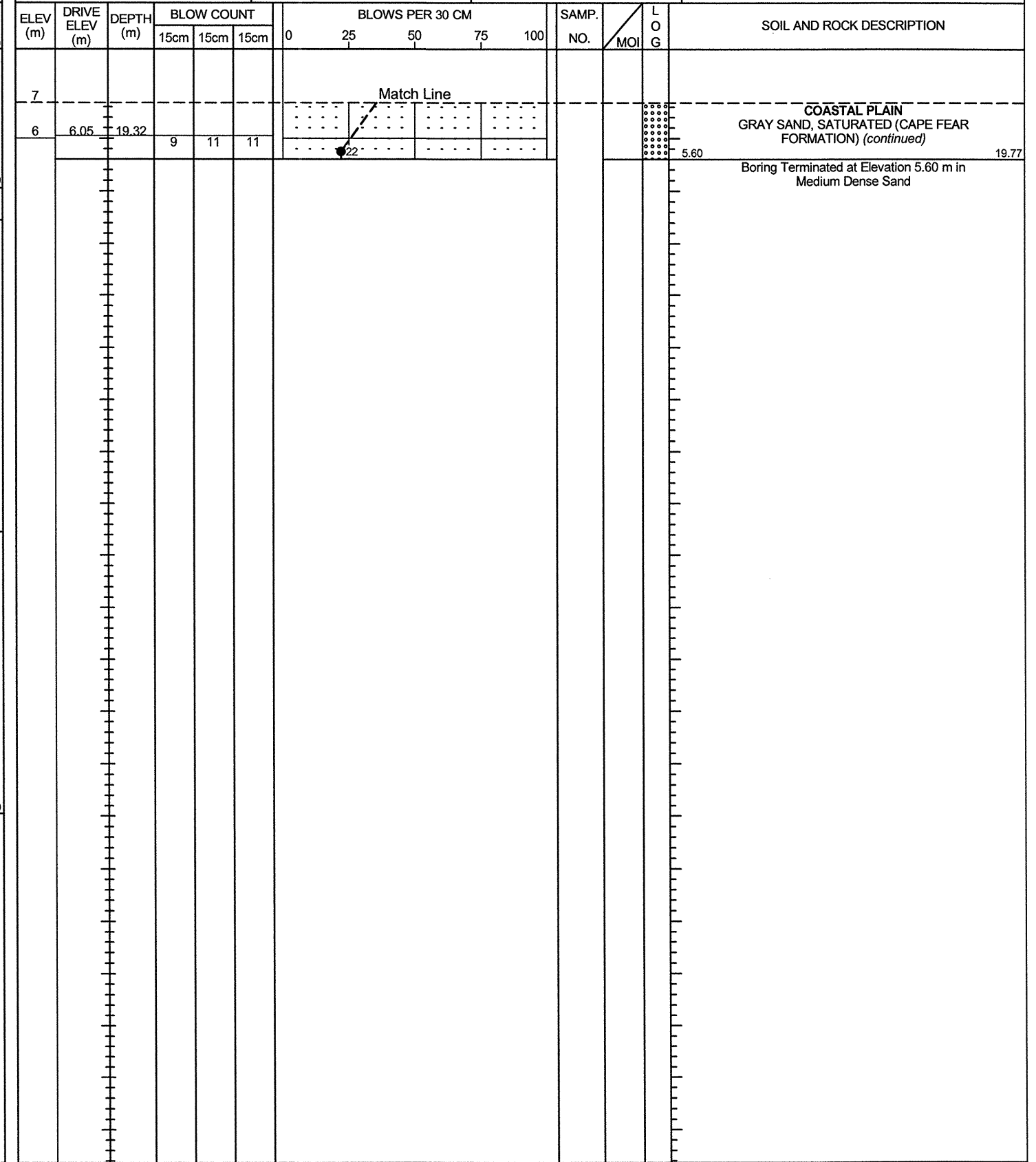
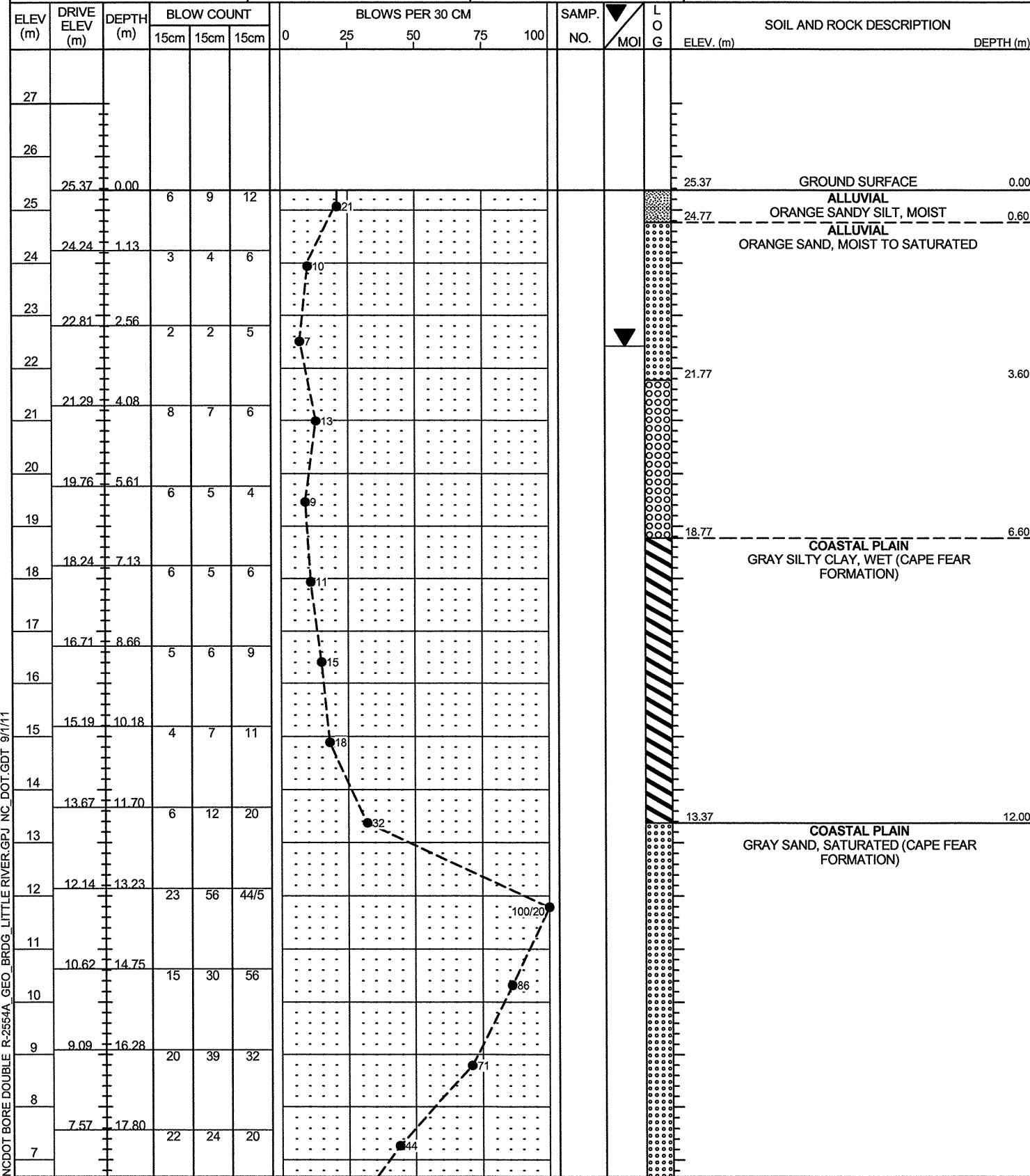
WBS 34461.1.3			TIP R-2554A			COUNTY WAYNE			GEOLOGIST Swartley, J. R.								
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER								GROUND WTR (m)									
BORING NO. B21-A WBL		STATION 73+82.6		OFFSET 17.2 m LT		ALIGNMENT -L-		0 HR.		N/A							
COLLAR ELEV. 25.45 m		TOTAL DEPTH 18.25 m		NORTHING 186,488.2		EASTING 699,248.0		24 HR.		2.90							
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011						DRILL METHOD Mud Rotary			HAMMER TYPE Automatic								
DRILLER Contract Driller			START DATE 07/27/11		COMP. DATE 07/27/11		SURFACE WATER DEPTH N/A										
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION				
			15cm	15cm	15cm	0	25	50	75	100			ELEV. (m)	DEPTH (m)			
26																	
	25.45	0.00												25.45		GROUND SURFACE	0.00
25			3	5	4									24.85	0.60	ALLUVIAL ORANGE SANDY SILT, MOIST	
24	24.32	1.13	3	3	5											ALLUVIAL ORANGE SAND, MOIST TO SATURATED	
23																	
22	22.89	2.56	8	8	10												
21	21.37	4.08	10	10	14									21.85	3.60		
20	19.84	5.61	11	10	10												
19	18.32	7.13	10	8	7												
18																	
17	16.79	8.66	4	6	8									17.25	8.20	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)	
16																	
15	15.27	10.18	5	9	16												
14	13.75	11.70	20	36	60									14.35	11.10	COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION)	
13																	
12	12.22	13.23	27	43	41												
11	10.70	14.75	13	22	30												
10	9.17	16.28	16	30	44												
9																	
8	7.65	17.80	55	53	46									7.20	18.25		
																Boring Terminated at Elevation 7.20 m in Very Dense Sand	

NCDOT BORE DOUBLE R-2554A GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11



WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B21-B EBL	STATION 73+73.4	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 25.37 m	TOTAL DEPTH 19.77 m	NORTHING 186,452.8	EASTING 699,244.7
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011			DRILL METHOD Mud Rotary
DRILLER Contract Driller			HAMMER TYPE Automatic
START DATE 07/26/11	COMP. DATE 07/26/11	SURFACE WATER DEPTH N/A	

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER			GROUND WTR (m)
BORING NO. B21-B EBL	STATION 73+73.4	OFFSET 17.2 m RT	ALIGNMENT -L-
COLLAR ELEV. 25.37 m	TOTAL DEPTH 19.77 m	NORTHING 186,452.8	EASTING 699,244.7
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011			DRILL METHOD Mud Rotary
DRILLER Contract Driller			HAMMER TYPE Automatic
START DATE 07/26/11	COMP. DATE 07/26/11	SURFACE WATER DEPTH N/A	



NCDOT BORE DOUBLE R-2554A GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11



WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.							
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)						
BORING NO.	STATION	OFFSET	ALIGNMENT -L-		0 HR.		N/A						
EB2-A WBL	74+17.6	17.2 m LT											
COLLAR ELEV.	TOTAL DEPTH	NORTHING	EASTING		24 HR.		2.80						
25.12 m	19.86 m	186,494.1	699,282.5										
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011				DRILL METHOD	HAMMER TYPE								
				Mud Rotary	Automatic								
DRILLER		START DATE	COMP. DATE	SURFACE WATER DEPTH									
Contract Driller		07/05/11	07/06/11	N/A									
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100	MOI		
27													
26													
25	25.12	0.00	2	4	6								25.12 GROUND SURFACE 0.00
24	23.93	1.19	3	5	5								24.42 ALLUVIAL TAN SANDY SILT, MOIST 0.70
23													21.42 ALLUVIAL ORANGE SAND, MOIST TO SATURATED 3.70
22	22.47	2.65	1	2	3								19.92 ALLUVIAL GRAY SANDY SILT, WET 5.20
21	20.95	4.17	1	2	1								18.42 ALLUVIAL GRAY SAND, SATURATED 6.70
20	19.42	5.70	8	10	11								13.82 COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION) 11.30
19	17.90	7.22	2	4	6								12.32 COASTAL PLAIN GRAY SAND, SATURATED (CAPE FEAR FORMATION) 12.80
18	16.37	8.75	4	6	11								
17	14.85	10.27	4	4	11								
16	13.32	11.80	27	27	36								
15	11.80	13.32	13	25	33								
14	10.28	14.84	16	20	27								
13	8.75	16.37	13	20	33								
12	7.23	17.89	16	28	36								

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.							
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)						
BORING NO.	STATION	OFFSET	ALIGNMENT -L-		0 HR.		N/A						
EB2-A WBL	74+17.6	17.2 m LT											
COLLAR ELEV.	TOTAL DEPTH	NORTHING	EASTING		24 HR.		2.80						
25.12 m	19.86 m	186,494.1	699,282.5										
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 78% 01/27/2011				DRILL METHOD	HAMMER TYPE								
				Mud Rotary	Automatic								
DRILLER		START DATE	COMP. DATE	SURFACE WATER DEPTH									
Contract Driller		07/05/11	07/06/11	N/A									
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100	MOI		
7													
6	5.71	19.41	17	29	25								5.26 Boring Terminated at Elevation 5.26 m in Very Dense Sand

NCDOT BORE DOUBLE R-2554A GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.						
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)					
BORING NO.	STATION	OFFSET	ALIGNMENT		0 HR.	N/A						
EB2-B EBL	74+08.4	17.2 m RT	-L-		24 HR.	2.90						
COLLAR ELEV.	TOTAL DEPTH	NORTHING	EASTING		24 HR.	2.90						
25.00 m	19.86 m	186,458.7	699,279.2		24 HR.	2.90						
DRILL RIG/HAMMER EFF./DATE			DRILL METHOD		HAMMER TYPE							
SME R-6 CME-550X 78% 01/27/2011			Mud Rotary		Automatic							
DRILLER		START DATE	COMP. DATE	SURFACE WATER DEPTH								
Contract Driller		07/05/11	07/05/11	N/A								
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM			SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100		
27												
26												
25	25.00	0.00										25.00
												0.00
												0.00
24	23.81	1.19	3	3	4							0.70
												0.70
23												
22	22.35	2.65	2	2	2							2.20
												2.20
21	20.83	4.17	7	7	10							
20												
19	19.30	5.70	17	11	3							5.20
												5.20
18	17.78	7.22	3	4	6							6.70
												6.70
17												
16	16.25	8.75	4	5	7							
15												
14	14.73	10.27	3	6	7							
13	13.20	11.80	6	12	30							11.30
												11.30
12	11.68	13.32	22	40	47							12.80
												12.80
11	10.16	14.84	17	29	57							
10												
9	8.63	16.37	9	11	16							
8												
7	7.11	17.89	33	29	24							

WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.						
SITE DESCRIPTION BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER							GROUND WTR (m)					
BORING NO.	STATION	OFFSET	ALIGNMENT		0 HR.	N/A						
EB2-B EBL	74+08.4	17.2 m RT	-L-		24 HR.	2.90						
COLLAR ELEV.	TOTAL DEPTH	NORTHING	EASTING		24 HR.	2.90						
25.00 m	19.86 m	186,458.7	699,279.2		24 HR.	2.90						
DRILL RIG/HAMMER EFF./DATE			DRILL METHOD		HAMMER TYPE							
SME R-6 CME-550X 78% 01/27/2011			Mud Rotary		Automatic							
DRILLER		START DATE	COMP. DATE	SURFACE WATER DEPTH								
Contract Driller		07/05/11	07/05/11	N/A								
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM			SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100		
7												
6	5.59	19.41	26	35	58							19.86
												19.86
												5.14
												5.14

NCDOT BORE DOUBLE R-2554A GEO\_BRDG\_LITTLE RIVER.GPJ NC\_DOT.GDT 9/1/11

34461.1.3  
R-2554A

BRIDGE ON US 70 BYPASS OVER LITTLE RIVER AT -L- STA. 70+24.00



**EB1-A WBL 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	2.00mm	425µm	75µm		
SS-1	17.2 LT	66+35.0	0.00-0.45	A-2-4(0)	26	4	39.7	25.3	20.8	14.2	81	57	32	-	-
SS-2	17.2 LT	66+35.0	1.21-1.66	A-4(1)	25	5	28.8	16.4	36.6	18.2	94	76	58	-	-
SS-3	17.2 LT	66+35.0	2.56-3.01	A-1-b(0)	18	NP	83.5	10.1	4.4	2.0	52	14	4	-	-
SS-4	17.2 LT	66+35.0	4.08-4.53	A-7-6(23)	50	31	6.1	16.8	28.5	48.6	91	87	76	-	-
SS-5	17.2 LT	66+35.0	8.64-9.09	A-7-6(42)	60	38	0.2	7.1	42.0	50.7	100	100	97	-	-
SS-6	17.2 LT	66+35.0	10.16-10.61	A-3(0)	21	NP	50.6	45.1	2.3	2.0	98	78	5	-	-
SS-7	17.2 LT	66+35.0	11.68-12.13	A-1-b(0)	19	NP	83.4	13.0	2.6	1.0	93	33	4	-	-
SS-8	17.2 LT	66+35.0	14.72-15.17	A-6(9)	25	13	4.5	11.6	51.6	32.4	99	96	88	-	-
SS-9	17.2 LT	66+35.0	17.76-18.09	A-6(12)	31	16	6.3	13.2	52.2	28.4	97	93	83	-	-
SS-10	17.2 LT	66+35.0	19.28-19.59	A-6(2)	24	11	27.4	24.7	29.7	18.2	89	72	49	-	-

**B2-B EBL 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	2.00mm	425µm	75µm		
SS-39	15.0M RT	67+04.0	0.00-0.45	A-2-6(2)	39	21	44.2	24.1	7.3	24.3	88	68	29	-	-
SS-40	15.0M RT	67+04.0	2.50-2.95	A-1-b(0)	21	NP	61.1	26.6	8.3	4.1	82	48	11	-	-
SS-41	15.0M RT	67+04.0	7.06-7.51	A-6(16)	38	22	1.2	29.8	36.5	32.5	100	99	80	-	-
SS-42	15.0M RT	67+04.0	11.62-12.07	A-3(0)	15	NP	63.0	31.2	3.8	2.0	100	77	8	-	-
SS-43	15.0M RT	67+04.0	17.71-18.16	A-7-6(20)	41	22	5.5	7.1	40.8	46.7	99	95	89	-	-

**EB1-B EBL 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	2.00mm	425µm	75µm		
SS-11	17.2 RT	66+35.0	0.00-0.45	A-2-4(0)	23	3	41.3	25.7	20.8	12.2	91	67	34	-	-
SS-12	17.2 RT	66+35.0	2.56-3.01	A-1-b(0)	20	3	78.6	12.0	7.4	2.0	56	18	6	-	-
SS-13	17.2 RT	66+35.0	4.08-4.53	A-7-6(29)	54	31	2.8	9.5	47.1	40.5	94	92	86	27.8	-
SS-14	17.2 RT	66+35.0	7.12-7.57	A-6(4)	25	14	9.1	47.6	25.0	18.2	100	95	53	-	-
SS-15	17.2 RT	66+35.0	10.16-10.61	A-6(11)	30	18	3.0	28.0	34.5	34.4	97	95	74	-	-
SS-16	17.2 RT	66+35.0	11.68-12.13	A-3(0)	17	NP	65.0	25.3	7.6	2.0	87	51	10	-	-
SS-17	17.2 RT	66+35.0	14.72-15.17	A-6(17)	32	20	3.4	8.5	49.5	38.5	100	98	91	-	-
SS-18	17.2 RT	66+35.0	17.76-18.21	A-6(8)	34	21	21.7	25.5	30.5	22.3	96	84	56	-	-

**B3-A WBL 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	2.00mm	425µm	75µm		
SS-53	17.2M LT	67+40.0	1.22-1.67	A-1-b(0)	20	5	63.9	16.4	7.6	12.1	66	35	14	-	-
SS-54	17.2M LT	67+40.0	4.05-4.50	A-1-b(0)	18	NP	68.2	19.9	5.9	6.1	89	41	13	-	-
SS-81	17.2M LT	67+40.0	8.63-9.08	A-7-6(46)	64	40	0.2	2.4	35.1	62.3	100	100	99	-	-
SS-82	17.2M LT	67+40.0	14.72-15.17	A-2-4(0)	18	NP	72.1	17.6	6.3	4.0	97	64	11	-	-
SS-83	17.2M LT	67+40.0	17.77-18.22	A-6(16)	33	18	1.8	7.0	57.0	34.2	100	99	95	-	-

**B3-B EBL 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	2.00mm	425µm	75µm		
SS-84	17.2M RT	67+40.0	1.21-1.66	A-1-b(0)	21	NP	73.2	15.1	7.7	4.0	77	36	10	-	-
SS-85	17.2M RT	67+40.0	4.01-4.46	A-1-b(0)	22	NP	78.2	16.3	5.5	0.0	90	41	6	-	-
SS-86	17.2M RT	67+40.0	5.53-5.98	A-6(7)	29	17	4.4	42.6	22.8	30.2	93	91	60	-	-
SS-87	17.2M RT	67+40.0	8.57-9.02	A-7-6(28)	54	32	1.6	22.1	36.1	40.2	100	99	83	-	-
SS-88	17.2M RT	67+40.0	11.91-12.06	A-2-4(0)	15	NP	50.5	38.3	7.2	4.0	97	69	13	-	-
SS-89	17.2M RT	67+40.0	14.65-15.10	A-1-b(0)	17	NP	79.1	14.4	4.5	2.0	89	32	7	-	-
SS-90	17.2M RT	67+40.0	16.17-16.62	A-6(8)	28	17	10.9	30.4	22.6	36.2	100	97	65	-	-
SS-91	17.2M RT	67+40.0	19.21-19.66	A-2-6(0)	25	11	43.6	22.8	17.5	16.1	91	71	33	-	-

**B1-A WBL 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	2.00mm	425µm	75µm		
SS-27	17.2M LT	66+68.0	0.00-0.45	A-2-6(0)	30	11	51.3	19.3	15.3	14.2	83	54	26	-	-
SS-28	17.2M LT	66+68.0	1.21-1.66	A-1-b(0)	20	NP	75.0	14.2	6.8	4.1	68	27	9	-	-
SS-29	17.2M LT	66+68.0	2.50-2.95	A-1-b(0)	21	NP	83.1	12.8	2.1	2.0	55	20	3	-	-
SS-30	17.2M LT	66+68.0	4.02-4.47	A-7-6(41)	67	39	1.4	4.9	28.9	64.8	95	94	91	-	-
SS-31	17.2M LT	66+68.0	7.06-7.51	A-7-6(55)	74	48	0.8	1.8	30.4	66.9	100	100	98	-	-
SS-32	17.2M LT	66+68.0	8.58-10.10	A-4(1)	21	6	2.2	48.9	26.6	22.3	99	98	63	-	-
SS-33	17.2M LT	66+68.0	10.01-10.46	A-3(0)	15	NP	55.6	40.5	2.9	1.0	100	83	5	-	-
SS-34	17.2M LT	66+68.0	13.14-13.59	A-6(6)	26	11	1.0	29.8	40.8	28.4	100	100	77	-	-
SS-35	17.2M LT	66+68.0	16.18-16.63	A-6(8)	27	13	7.3	16.6	49.7	26.4	98	93	81	-	-
SS-36	17.2M LT	66+68.0	17.70-18.15	A-2-7(8)	72	51	37.3	13.0	7.1	42.6	65	44	34	-	-
SS-37	17.2M LT	66+68.0	19.22-19.67	A-7-5(37)	65	32	2.0	5.5	47.9	44.6	100	99	95	-	-
SS-38	17.2M LT	66+68.0	22.26-22.68	A-7-6(30)	57	31	6.1	9.7	57.8	26.4	100	96	87	-	-

**B4-A WBL 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	2.00mm	425µm	75µm		
SS-92	17.2M LT	67+76.0	1.21-1.66	A-2-6(0)	29	12	60.1	14.7	13.2	12.1	65	37	18	-	-
SS-93	17.2M LT	67+76.0	2.46-2.91	A-1-b(0)	20	NP	78.2	14.5	5.3	2.0	77	28	7	-	-
SS-94	17.2M LT	67+76.0	5.50-5.95	A-7-6(33)	57	32	3.4	8.5	33.3	54.8	100	97	92	-	-
SS-95	17.2M LT	67+76.0	8.54-8.99	A-7-6(16)	45	27	2.2	41.2	20.1	36.5	100	98	66	-	-
SS-96	17.2M LT	67+76.0	11.58-11.88	A-4(0)	20	NP	2.8	69.0	18.1	10.1	100	99	39	-	-
SS-97	17.2M LT	67+76.0	14.62-15.07	A-1-b(0)	18	NP	78.3	17.0	2.6	2.0	99	47	6	-	-
SS-98	17.2M LT	67+76.0	17.66-18.11	A-6(12)	30	16	5.5	8.9	53.1	32.5	98	94	88	-	-
SS-99	17.2M LT	67+76.0	20.70-21.15	A-2-7(3)	47	31	42.2	18.9	12.6	26.4	64	44	27	-	-

**B1-B EBL 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	2.00mm	425µm	75µm		
SS-19	17.2M RT	66+68.0	0.00-0.45	A-7-6(3)	41	13	36.5	19.5	25.8	18.2	96	73	45	-	-
SS-20	17.2M RT	66+68.0	1.21-1.66	A-4(0)	25	9	41.1	22.1	20.6	16.2	94	71	39	-	-
SS-21	17.2M RT	66+68.0	2.53-2.98	-	-	-	83.3	11.8	2.9	2.0	34	10	2	-	-
SS-22	17.2M RT	66+68.0	4.05-4.50	A-7-6(25)	52	29	5.7	8.7	47.1	38.5	90	86	81	-	-
SS-23	17.2M RT	66+68.0	7.09-7.54	A-7-6(30)	49	28	0.8	5.7	48.9	44.6	100	100	97	-	-
SS-24	17.2M RT	66+68.0	10.13-10.52	A-3(0)	24	NP	25.1	69.5	5.4	0.0	100	95	8	-	-
SS-25	17.2M RT	66+68.0	13.17-13.62	A-3(0)	20	NP	70.5	23.9	3.5	2.0	96	58	7	-	-
SS-26	17.2M RT	66+68.0	16.21-16.66	A-6(18)	35	22	5.5	9.5	46.5	38.5	99	96	88	-	-

**B8-A EBL 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	2.00mm	425µm	75µm		
SS-55	6.4M RT	69+15.1	0.00-0.45	A-4(0)	19	3	30.3	29.7	23.9	16.1	99	82	45	-	-
SS-56	6.4M RT	69+15.1	1.21-1.66	A-2-4(0)	23	2	49.2	26.6	12.0	12.1	100	67	28	-	-
SS-57	6.4M RT	69+15.1	4.11-4.41	A-6(17)	37										



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BRIDGE ON US 70 BYPASS OVER LITTLE RIVER AT -L- STA. 70+24.00

B8-A WBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B12-A WBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B10-A WBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B12-B EBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B10-B EBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B13-A WBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B11-A WBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B13-B EBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B11-B EBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B14-A WBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

B14-B EBL SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (2.00mm, 425µm, 75µm), % MOISTURE, % ORGANIC.

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R-2554A

BRIDGE ON US 70 BYPASS OVER LITTLE RIVER AT -L- STA. 70+24.00

**B15-A WBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-293	17.2M LT	71+7.1.6	0.00-0.45	A-6(14)	39	16	3.2	17.2	43.0	36.5	100	98	87	-	-
SS-294	17.2M LT	71+7.1.6	1.13-1.58	A-4(2)	28	8	12.4	41.8	27.6	18.3	100	96	55	-	-
SS-295	17.2M LT	71+7.1.6	4.08-4.53	A-2-6(1)	28	13	36.9	29.4	13.4	20.3	89	70	35	-	-
SS-296	17.2M LT	71+7.1.6	8.66-9.11	A-7-6(42)	61	39	0.4	9.3	25.4	64.9	100	100	95	-	-
SS-297	17.2M LT	71+7.1.6	10.18-10.63	A-4(0)	20	3	0.8	55.8	23.1	20.3	97	97	54	-	-
SS-298	17.2M LT	71+7.1.6	13.23-13.65	A-3(0)	16	NP	68.5	24.3	5.2	2.0	99	65	9	-	-
SS-299	17.2M LT	71+7.1.6	16.28-16.73	A-1-b(0)	18	NP	80.9	12.5	3.5	3.0	98	28	8	-	-
SS-300	17.2M LT	71+7.1.6	19.32-19.77	A-6(8)	28	14	10.3	16.0	41.2	32.5	95	90	73	-	-

**B15-B EBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-287	17.2M RT	71+62.4	1.13-1.58	A-4(3)	28	7	8.3	36.5	35.1	20.2	100	97	65	-	-
SS-288	17.2M RT	71+62.4	2.56-3.01	A-1-b(0)	23	NP	71.8	16.9	9.3	2.0	68	31	9	-	-
SS-289	17.2M RT	71+62.4	7.13-7.58	A-6(15)	37	21	1.4	30.2	42.1	26.2	100	99	79	-	-
SS-290	17.2M RT	71+62.4	8.66-9.11	A-2-4(0)	21	NP	58.0	32.0	5.0	5.0	94	76	11	-	-
SS-291	17.2M RT	71+62.4	13.23-13.67	A-1-b(0)	18	NP	83.3	10.3	4.4	2.0	100	31	8	-	-
SS-292	17.2M RT	71+62.4	17.80-18.25	A-6(11)	34	20	0.6	40.7	28.4	30.2	100	100	70	-	-

**B16-A WBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-301	17.2M LT	72+07.6	1.13-1.58	A-4(2)	28	8	13.8	41.6	24.3	20.3	100	97	53	-	-
SS-302	17.2M LT	72+07.6	5.61-6.06	A-6(7)	34	14	2.6	47.9	31.2	18.3	100	99	65	-	-
SS-303	17.2M LT	72+07.6	8.66-9.11	A-7-6(38)	59	36	0.6	9.9	22.5	66.9	100	100	94	-	-
SS-304	17.2M LT	72+07.6	13.23-13.63	A-3(0)	21	NP	41.5	50.8	4.7	3.0	100	99	10	-	-

**B16-B EBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-236	17.2M RT	71+98.4	1.19-1.64	A-4(0)	24	5	11.0	44.1	24.6	20.3	100	99	52	-	-
SS-237	17.2M RT	71+98.4	2.65-3.10	A-1-b(0)	20	NP	79.3	13.6	3.0	4.1	66	25	6	-	-
SS-238	17.2M RT	71+98.4	5.70-6.15	A-7-6(20)	48	26	4.3	31.1	44.3	20.3	100	99	76	-	-
SS-239	17.2M RT	71+98.4	10.27-10.72	A-7-6(34)	53	31	0.4	3.7	24.8	71.1	100	100	98	-	-
SS-240	17.2M RT	71+98.4	14.84-15.29	A-6(16)	33	17	0.8	9.6	42.9	46.7	100	99	95	-	-
SS-241	17.2M RT	71+98.4	17.89-18.34	A-2-4(0)	17	2	44.3	27.4	10.0	18.3	98	88	29	-	-

**B17-A WBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-230	17.2M LT	72+42.6	1.19-1.64	A-4(0)	24	3	12.4	49.0	22.4	16.3	100	98	47	-	-
SS-231	17.2M LT	72+42.6	4.17-4.62	A-6(8)	30	15	5.7	32.5	33.3	28.5	96	92	69	-	-
SS-232	17.2M LT	72+42.6	7.22-7.67	A-7-6(35)	57	33	1.0	8.5	41.7	48.8	100	99	94	-	-
SS-233	17.2M LT	72+42.6	10.27-10.72	A-4(0)	20	6	1.0	64.4	10.2	24.4	100	99	41	-	-
SS-234	17.2M LT	72+42.6	14.84-15.19	A-3(0)	14	NP	69.2	25.5	2.2	3.0	97	53	7	-	-
SS-235	17.2M LT	72+42.6	17.89-18.34	A-4(0)	24	10	21.5	44.7	17.5	16.3	99	92	37	-	-

**B17-B EBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-224	17.2M RT	72+33.4	0.00-0.45	A-6(9)	33	11	3.5	21.5	36.4	38.6	100	99	83	-	-
SS-225	17.2M RT	72+33.4	1.19-1.64	A-4(4)	31	10	7.1	39.3	31.2	22.4	100	98	63	-	-
SS-226	17.2M RT	72+33.4	4.17-4.62	A-6(14)	39	21	8.7	20.3	30.3	40.7	96	90	73	-	-
SS-227	17.2M RT	72+33.4	7.22-7.67	A-7-6(32)	55	30	1.2	7.9	50.2	40.7	100	99	94	-	-
SS-228	17.2M RT	72+33.4	11.80-12.25	A-3(0)	17	NP	13.0	80.1	3.9	3.0	100	99	9	-	-
SS-229	17.2M RT	72+33.4	14.84-15.29	A-1-b(0)	16	NP	83.5	12.3	1.1	3.0	98	29	5	-	-

**B18-A WBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-219	17.2M LT	72+77.6	0.00-0.45	A-7-6(16)	41	18	4.3	11.7	41.3	42.7	98	95	87	-	-
SS-220	17.2M LT	72+77.6	2.65-3.10	A-2-4(0)	20	NP	49.1	38.5	6.3	6.1	71	53	11	-	-
SS-221	17.2M LT	72+77.6	7.22-7.67	A-7-6(30)	50	32	1.8	13.8	29.5	54.9	100	99	89	-	-
SS-222	17.2M LT	72+77.6	10.27-10.72	A-2-4(0)	18	NP	0.8	73.4	7.5	18.3	99	98	32	-	-
SS-223	17.2M LT	72+77.6	16.37-16.82	A-1-b(0)	18	NP	79.1	16.4	1.5	3.0	96	34	6	-	-

**B18-B EBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-214	17.2M RT	72+68.4	1.19-1.64	A-6(2)	37	14	35.2	20.1	24.3	20.3	79	56	39	-	-
SS-215	17.2M RT	72+68.4	5.70-6.15	A-7-6(15)	41	23	6.3	24.8	42.4	26.4	92	88	72	-	-
SS-216	17.2M RT	72+68.4	8.75-9.20	A-6(21)	38	22	0.2	16.9	38.1	44.8	100	100	94	-	-
SS-217	17.2M RT	72+68.4	11.80-12.25	A-3(0)	17	NP	19.9	73.8	4.3	2.0	100	99	8	-	-
SS-218	17.2M RT	72+68.4	14.84-15.29	A-1-b(0)	19	1	74.6	14.9	5.5	5.1	87	29	11	-	-

**B19-A WBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-317	17.2M LT	73+12.6	0.00-0.45	A-4(0)	22	3	40.8	22.1	24.9	12.2	87	59	38	-	-
SS-318	17.2M LT	73+12.6	1.13-1.58	A-1-b(0)	22	NP	80.1	12.4	4.5	3.0	73	22	7	-	-
SS-319	17.2M LT	73+12.6	4.08-4.53	A-2-4(0)	19	NP	51.5	33.3	7.2	8.1	95	72	18	-	-
SS-320	17.2M LT	73+12.6	7.13-7.58	A-7-6(32)	55	31	1.6	6.7	31.2	60.5	100	99	93	-	-
SS-321	17.2M LT	73+12.6	10.18-10.63	A-4(2)	22	8	0.8	48.2	26.7	24.2	99	98	65	-	-
SS-322	17.2M LT	73+12.6	14.75-15.20	A-3(0)	15	NP	71.8	22.5	2.6	3.0	98	57	8	-	-

**B19-B EBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-305	17.2M RT	73+03.6	4.08-4.53	A-6(3)	30	15	20.5	33.7	17.4	28.4	88	75	46	-	-
SS-306	17.2M RT	73+03.6	7.13-7.58	A-7-6(20)	54	22	3.9	23.7	40.0	32.5	100	99	80	-	-
SS-307	17.2M RT	73+03.6	11.70-12.15	A-3(0)	24	NP	5.2	87.9	4.9	2.0	100	100	9	-	-
SS-308	17.2M RT	73+03.6	14.75-15.20	A-4(1)	22	8	13.6	40.6	21.5	24.3	97	91	52	-	-
SS-309	17.2M RT	73+03.6	16.28-16.73	A-1-b(0)	20	NP	78.5	12.8	7.7	1.0	98	32	10	-	-

**EB2-A WBL SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	2.00mm	425µm	75µm		
SS-207	17.2M LT	74+17.6	1.19-1.64	A-1-b(0)	21	NP	81.6	11.5	2.8	4.1	80	27	6	-	-
SS-208	17.2M LT	74+17.6	4.17-4.62	A-4(2)	22	10	7.5	41.7	26.3	24.4	84	80	51	-	-
SS-209	17.2M LT	74+17.6	5.70-6.15	A-3(0)	14	NP	73.3	21.3	4.4	1.0	100	66	7	-	-
SS-210	17.2M LT	74+17.6	7.22-7.67	A-7-6											



## FIELD SCOUR REPORT

WBS: 34461.1.3 TIP: R-2554A COUNTY: WAYNE

DESCRIPTION(1): BRIDGE ON -L- (US 70 BYPASS) OVER LITTLE RIVER

### EXISTING BRIDGE

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

Bridge No.: N/A Length: \_\_\_\_\_ Total Bents: \_\_\_\_\_ Bents in Channel: \_\_\_\_\_ Bents in Floodplain: \_\_\_\_\_  
 Foundation Type: \_\_\_\_\_

#### EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: N/A

Interior Bents: N/A

Channel Bed: N/A

Channel Bank: N/A

#### EXISTING SCOUR PROTECTION

Type(3): N/A

Extent(4): N/A

Effectiveness(5): N/A

Obstructions(6): N/A

#### 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 AND CLAY

Channel Bank Material(8): SAND AND CLAY

Channel Bank Cover(9): TREES, GRASS

Floodplain Width(10): 1000' (±)

Floodplain Cover(11): TREES, GRASS

Stream is(12): Aggrading  Degrading  Static

Channel Migration Tendency(13): WEST TOWARD BENT 8

Observations and Other Comments: \_\_\_\_\_

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK Feet \_\_\_\_\_ Meters

See Sheets 76 and 77 "Soil Test Results", for samples: (Channel Bed) SS-57, SS-68 (Channel Bank) SS-68, SS-283	
--	--

Comparison of DSE to Hydraulics Unit theoretical scour:  
 Geotechnical analysis of the DSE agrees with the Hydraulic Unit's theoretical scour elevations from Bents 1-6 and Bents 16-21. The DSE from Bents 7-15 should be raised 2.0 to 4.0 meters from the 100yr. theoretical scour.

#### DESIGN SCOUR ELEVATIONS (14)

<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B4</b>	<b>B5</b>	<b>B6</b>	<b>B7</b>
20.0	20.0	22.5	22.5	22.5	22.5	20.3
<b>B8</b>	<b>B9</b>	<b>B10</b>	<b>B11</b>	<b>B12</b>	<b>B13</b>	<b>B14</b>
20.2	19.0	19.4	19.9	19.7	18.2	18.4
<b>B15</b>	<b>B16</b>	<b>B17</b>	<b>B18</b>	<b>B19</b>	<b>B20</b>	<b>B21</b>
19.8	21.2	21.2	23.7	23.7	23.7	23.7

Reported by: Tyler C. Bottoms Date: 8/30/2011





STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554A	1	8

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 34461.1.3 (R-2554A) F.A. PROJ. NHF-70 (30)  
 COUNTY WAYNE

PROJECT DESCRIPTION US 70 (GOLDSBORO BYPASS) FROM WEST  
OF NC 581 TO SR 1300 (SALEM CHURCH ROAD)

SITE DESCRIPTION BRIDGE ON -Y10- (NC 581) OVER -L- (US 70  
BYPASS) AT -Y10- STA. 16+08.093

**CONTENTS**

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-7	BORE LOGS
8	SOIL TEST RESULTS

**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: 34461.1.3** **ID: R-2554A**

**PERSONNEL**

JPD  
CRS  
JME

INVESTIGATED BY J.L. STONE

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE AUGUST 2011



DRAWN BY: C.R. SUMNER

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.

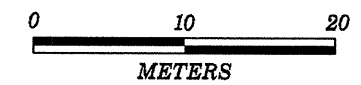
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 GEOTECHNICAL ENGINEERING UNIT



SUBSURFACE INVESTIGATION

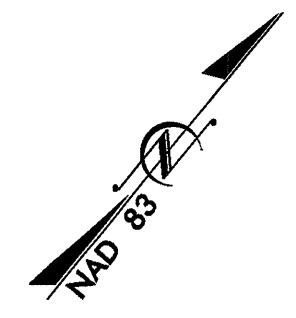
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS	
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 30 CM ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY-SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>		WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.		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 3 CM 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:		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. FESSILE - 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 10 CM DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OF A 63.5 KG HAMMER FALLING 0.76 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS. STRATA CORE RECOVERY (SCREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.	
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING			
GENERAL CLASS. GRANULAR MATERIALS (< 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS		MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		WEATHERED ROCK (WR)			
GROUP CLASS. A-1, A-2, A-3, A-4, A-5, A-6, A-7, A-7.5, A-8		SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50		CRYSTALLINE ROCK (CR)			
SYMBOL		PERCENTAGE OF MATERIAL		NON-CRYSTALLINE ROCK (NCR)			
% PASSING		ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL		COASTAL PLAIN SEDIMENTARY ROCK (CP)			
LIQUID LIMIT PLASTIC INDEX		TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE					
GROUP INDEX		GROUND WATER					
USUAL TYPES OF MAJOR MATERIALS		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD		WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP			
GENERATING AS A SUBGRADE		MISCELLANEOUS SYMBOLS		SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE			
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD		S - BULK SAMPLE SS - SPLIT SPOON SAMPLE ST - SHELBY TUBE SAMPLE RS - ROCK SAMPLE RT - RECOMPACTED TRIAXIAL SAMPLE CBR - CALIFORNIA BEARING RATIO SAMPLE SPT N-VALUE SPT REFUSAL			
CONSISTENCY OR DENSENESS		ABBREVIATIONS		ROCK HARDNESS			
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (kN/m <sup>2</sup> )		AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS		VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT			
TEXTURE OR GRAIN SIZE		HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL		CAN BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 6 MM DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. CAN BE GROOVED OR GOUGED 13 MM DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 25 MM MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 25 MM OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.			
SOIL MOISTURE - CORRELATION OF TERMS		EQUIPMENT USED ON SUBJECT PROJECT		FRACTURE SPACING		BEDDING	
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION		DRILL UNITS: MOBILE B-51, BK-51, CME-45B, CME-550X, PORTABLE HOIST		TERM SPACING		TERM THICKNESS	
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT		ADVANCING TOOLS: CLAY BITS, 152mm CONTINUOUS FLIGHT AUGER, 203mm HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE 75mm STEEL TEETH, TRICONE mm TUNG-CARB. CORE BIT		VERY WIDE MORE THAN 3 M WIDE 3 TO 10 M MODERATELY CLOSE 30 TO 100 CM CLOSE 5 TO 30 CM VERY CLOSE LESS THAN 5 CM		VERY THICKLY BEDDED > 1 M THICKLY BEDDED 0.5 - 1 M THINLY BEDDED 0.05 - 0.5 M VERY THINLY BEDDED 10 - 50 MM THICKLY LAMINATED 2.5 - 10 MM THINLY LAMINATED < 2.5 MM	
PLASTICITY		HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, N, H HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST		INDURATION		INDURATION	
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY		INDURATION		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.		FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	
COLOR		ELEVATION: 43.48 M					
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		NOTES:					



PROJECT REFERENCE NO.	SHEET
R-2554A	3
SITE PLAN	

**SKEW = 63° 40' 50"**



+20

+80

← TO US 70 BUS.

TO SR 1329 →

-Y10-

31+00

16+00

-L- POC STA. 31+55.609  
-Y10- POT STA. 16+08.093

EB1-B

EB1 BENT LINE

B1-B

B1 BENT LINE

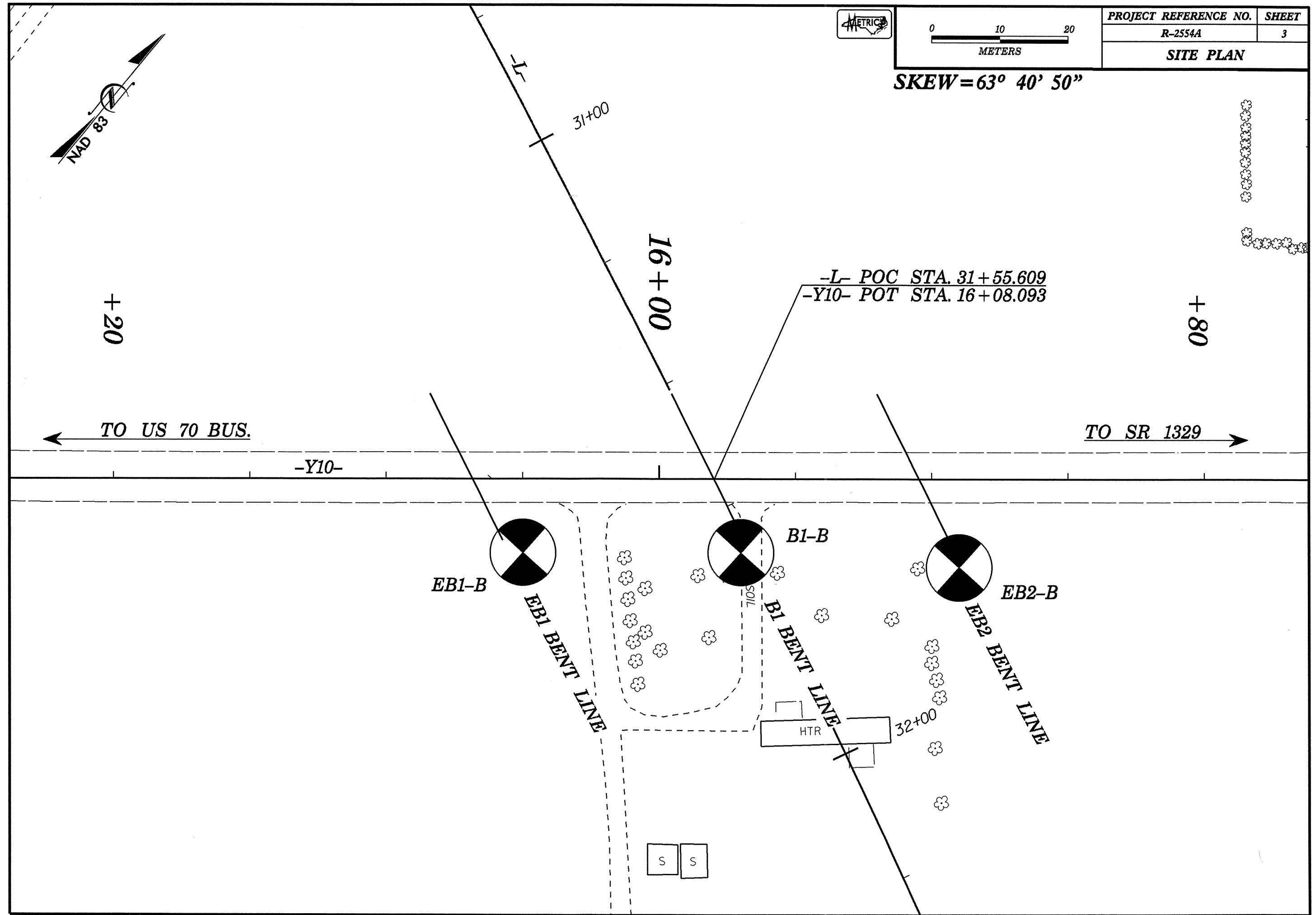
EB2-B

EB2 BENT LINE

HTR

32+00

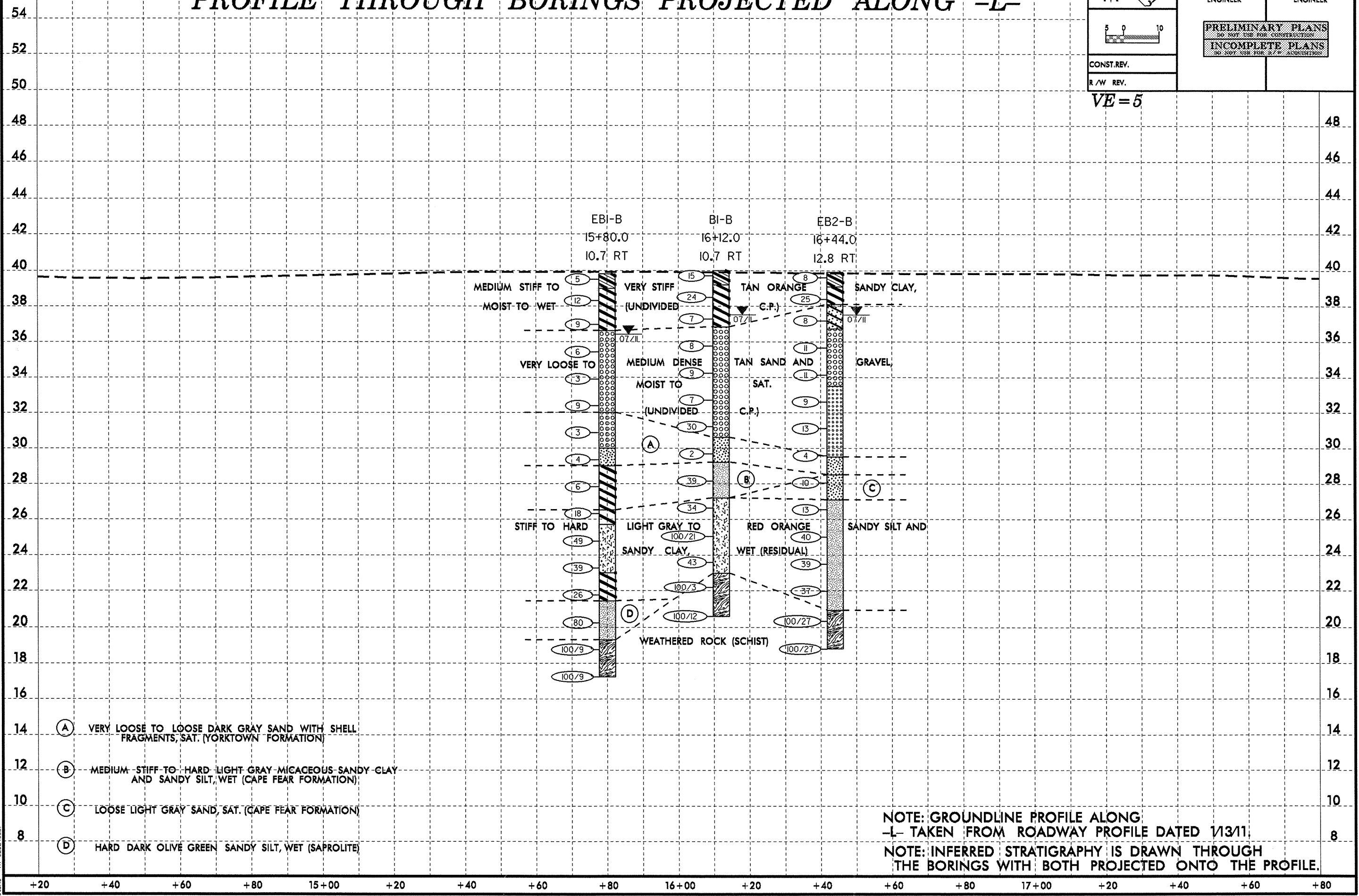
S S



# PROFILE THROUGH BORINGS PROJECTED ALONG -L-

 5 0 10	PROJECT REFERENCE NO.	SHEET NO.
	R-2554A	4
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> <small>DO NOT USE FOR CONSTRUCTION</small>		
<b>INCOMPLETE PLANS</b> <small>DO NOT USE FOR ACCREDITED</small>		
CONST. REV.		
R/W REV.		

VE = 5



- (A) VERY LOOSE TO LOOSE DARK GRAY SAND WITH SHELL FRAGMENTS, SAT. (YORKTOWN FORMATION)
- (B) MEDIUM-STIFF TO HARD LIGHT GRAY MICACEOUS SANDY CLAY AND SANDY SILT, WET (CAPE FEAR FORMATION)
- (C) LOOSE LIGHT GRAY SAND, SAT. (CAPE FEAR FORMATION)
- (D) HARD DARK OLIVE GREEN SANDY SILT, WET (SAPROLITE)

NOTE: GROUNDLINE PROFILE ALONG -L- TAKEN FROM ROADWAY PROFILE DATED 1/31/11  
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

JTP:AR056-AUG2010 08:54 OVER L:\CADDD\GEO\TECH\PI\ar056\AR2554A.RDY\_PFL\_Y18.DGN  
 J:\stone AT 08:52:48:37

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.	
SITE DESCRIPTION BRIDGE ON -Y10- (NC 581) OVER -L- (US 70 BYPASS)				GROUND WTR (m)
BORING NO. EB1-B	STATION 15+80.0	OFFSET 10.7 m RT	ALIGNMENT -Y10-	0 HR. N/A
COLLAR ELEV. 39.83 m	TOTAL DEPTH 22.56 m	NORTHING 187,100.0	EASTING 695,249.0	24 HR. 3.44
DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 96% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Smith, R. E.	START DATE 07/11/11	COMP. DATE 07/12/11	SURFACE WATER DEPTH N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100				
40	39.83	0.00											GROUND SURFACE	0.00
39			2	3	2						SS-1		UNDIVIDED COASTAL PLAIN TAN ORANGE SANDY CLAY, MOIST	0.80
38	38.62	1.21	7	4	8						SS-2			
37	37.27	2.56	4	4	5									
36	35.75	4.08	5	3	3						SS-3		UNDIVIDED COASTAL PLAIN TAN SAND AND GRAVEL, MOIST TO SAT.	3.20
35														
34	34.23	5.60	1	2	1									
33											SS-4			
32	32.71	7.12	3	3	6								COASTAL PLAIN DARK GRAY SAND WITH SHELL FRAGMENTS, SAT. (YORKTOWN FORMATION)	7.80
31	31.19	8.64	1	1	2						SS-5			
30														
29	29.67	10.16	1	1	3						SS-6		UNDIVIDED COASTAL PLAIN LIGHT GRAY MICACEOUS SANDY CLAY, WET (CAPE FEAR FORMATION)	10.80
28	28.15	11.68	2	3	3						SS-7			
27														
26	26.63	13.20	6	7	11						SS-8		RESIDUAL LIGHT GRAY TO RED SILTY CLAY, WET	13.30
25	25.11	14.72	9	19	30						SS-9		RESIDUAL LIGHT GRAY TO RED SANDY SILT, WET	14.10
24														
23	23.59	16.24	8	14	25									
22	22.07	17.76	7	10	16						SS-10		RESIDUAL GRAY TO RED SANDY CLAY, WET	16.80
21														
20	20.57	19.26	22	30	50						SS-11		SAPROLITE DARK OLIVE GREEN SANDY SILT, WET	18.40

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.	
SITE DESCRIPTION BRIDGE ON -Y10- (NC 581) OVER -L- (US 70 BYPASS)				GROUND WTR (m)
BORING NO. EB1-B	STATION 15+80.0	OFFSET 10.7 m RT	ALIGNMENT -Y10-	0 HR. N/A
COLLAR ELEV. 39.83 m	TOTAL DEPTH 22.56 m	NORTHING 187,100.0	EASTING 695,249.0	24 HR. 3.44
DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 96% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Smith, R. E.	START DATE 07/11/11	COMP. DATE 07/12/11	SURFACE WATER DEPTH N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100				
20													Match Line	
19	19.03	20.80	32	100/9									WEATHERED ROCK (SCHIST)	20.50
18														
	17.51	22.32	28	100/9							SS-12		Boring Terminated at Elevation 17.27 m IN WEATHERED ROCK	22.56

NCDOT BORE DOUBLE BORINGS.GPJ NC\_DOT.GDT 8/5/11





# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.
SITE DESCRIPTION BRIDGE ON -Y10- (NC 581) OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. EB2-B	STATION 16+44.0	OFFSET 12.8 m RT	ALIGNMENT -Y10-
COLLAR ELEV. 39.94 m	TOTAL DEPTH 21.09 m	NORTHING 187,141.0	EASTING 695,298.0
DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 96% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 07/12/11	COMP. DATE 07/13/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)				
			15cm	15cm	15cm	0	25	50	75	100								
40	39.94	0.00	2	4	4									39.94	GROUND SURFACE	0.00		
39	38.73	1.21	4	11	14									39.14	UNDIVIDED COASTAL PLAIN TAN ORANGE SANDY CLAY, MOIST	0.80		
38	37.51	2.43	5	4	4									38.14	UNDIVIDED COASTAL PLAIN TAN SAND, MOIST TO SAT.	1.80		
37	35.99	3.95	6	5	6									36.74		3.20		
36	34.47	5.47	4	5	6									33.54		6.40		
35	32.95	6.99	3	4	5									29.55	COASTAL PLAIN DARK GRAY SAND, SAT. (YORKTOWN FORMATION)	10.39		
34	31.43	8.51	6	6	7									28.54	COASTAL PLAIN LIGHT GRAY SAND, SAT. (CAPE FEAR FORMATION)	11.40		
33	29.91	10.03	2	2	2									27.14	RESIDUAL RED ORANGE SANDY SILT, WET	12.80		
32	28.39	11.55	5	6	4									20.94	WEATHERED ROCK (SCHIST)	19.00		
31	26.87	13.07	4	6	7													
30	25.35	14.59	7	15	25													
29	23.83	16.11	8	14	25													
28	22.31	17.63	8	13	24													
27	20.79	19.15	15	27	73/12													
26																		
25																		
24																		
23																		
22																		
21																		
20																		

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST DeLoatch, J. P.
SITE DESCRIPTION BRIDGE ON -Y10- (NC 581) OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. EB2-B	STATION 16+44.0	OFFSET 12.8 m RT	ALIGNMENT -Y10-
COLLAR ELEV. 39.94 m	TOTAL DEPTH 21.09 m	NORTHING 187,141.0	EASTING 695,298.0
DRILL RIG/HAMMER EFF./DATE GFO0062 CME-45B 96% 6/27/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 07/12/11	COMP. DATE 07/13/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (m)					
			15cm	15cm	15cm	0	25	50	75	100									
20																			
19	19.27	20.67	15	32	68/12									18.85	WEATHERED ROCK (SCHIST) (continued)	21.09			

NCDOT BORE DOUBLE BORINGS.GPJ NC DOT.GDT 8/5/11

R-2554A

34461.1.3

## BRIDGE ON -Y10- OVER -L- (US 70 BYPASS)

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	2.00mm	425µm	75µm		
SS-1	10.6 RT	15+80.0	0.00-0.45	A-6(1)	25	13	44.7	18.0	13.0	24.3	100	73	39	-	-
SS-2	10.6 RT	15+80.0	1.21-1.66	A-7-6(4)	49	29	50.8	14.1	6.8	28.3	99	66	36	-	-
SS-3	10.6 RT	15+80.0	4.08-4.53	A-1-b(0)	24	NP	84.6	8.3	1.0	6.1	88	31	7	-	-
SS-4	10.6 RT	15+80.0	7.12-7.57	A-1-b(0)	22	NP	80.3	14.0	0.7	5.1	98	43	6	-	-
SS-5	10.6 RT	15+80.0	8.64-9.09	A-1-b(0)	25	NP	88.7	6.5	1.8	3.0	100	43	5	-	-
SS-6	10.6 RT	15+80.0	10.16-10.61	A-2-4(0)	29	NP	34.5	48.2	8.2	9.1	95	81	18	-	-
SS-7	10.6 RT	15+80.0	11.68-12.13	A-7-6(31)	65	37	18.4	4.9	18.0	58.7	100	85	78	-	-
SS-8	10.6 RT	15+80.0	13.20-13.65	A-7-6(20)	51	25	14.8	7.5	41.3	36.4	92	80	76	-	-
SS-9	10.6 RT	15+80.0	14.72-15.17	A-5(6)	41	8	10.1	32.2	39.5	18.2	100	93	69	-	-
SS-10	10.6 RT	15+80.0	17.76-18.21	A-7-5(17)	52	21	11.3	15.6	24.5	48.6	99	92	76	-	-
SS-11	10.6 RT	15+80.0	19.26-19.71	A-4(2)	36	8	26.7	32.8	26.3	14.2	100	85	47	-	-
SS-12	10.6 RT	15+80.0	22.32-22.56	A-4(1)	37	9	31.0	29.8	25.1	14.2	95	76	44	-	-

B1-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					
SS-13	10.6 RT	16+12.0	0.00-0.45	A-6(2)	28	14	45.3	17.2	15.2	22.3	98	69	39	-	-
SS-14	10.6 RT	16+12.0	1.21-1.66	A-7-6(5)	55	30	52.0	10.2	6.4	31.4	98	63	38	-	-
SS-15	10.6 RT	16+12.0	3.95-4.40	A-1-b(0)	20	NP	74.0	18.5	0.4	7.1	90	43	7	-	-
SS-16	10.6 RT	16+12.0	6.99-7.44	A-1-b(0)	22	NP	73.3	18.0	1.6	7.1	89	49	9	-	-
SS-17	10.6 RT	16+12.0	10.03-10.48	A-2-4(0)	27	NP	33.6	50.5	9.8	6.1	98	80	17	-	-
SS-18	10.6 RT	16+12.0	11.55-12.00	A-4(3)	36	9	24.5	24.5	38.9	12.1	94	75	56	-	-
SS-19	10.6 RT	16+12.0	13.07-13.52	A-5(1)	41	8	29.6	22.1	32.2	16.2	80	62	43	-	-
SS-20	10.6 RT	16+12.0	16.11-16.56	A-5(3)	41	9	23.7	25.3	32.8	18.2	91	76	52	-	-
SS-21	10.6 RT	16+12.0	19.15-19.42	A-4(0)	39	8	37.7	22.7	25.5	14.2	84	60	37	-	-

EB2-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	41		
SS-22	12.8 RT	16+44.0	0.00-0.45	A-6(4)	36	20	46.1	14.7	10.9	28.3	100	71	41	-	-
SS-23	12.8 RT	16+44.0	1.21-1.66	A-7-6(1)	43	14	56.0	6.8	5.9	31.4	95	53	36	-	-
SS-24	12.8 RT	16+44.0	2.43-2.88	A-2-6(0)	39	14	72.6	9.1	2.1	16.2	87	37	17	-	-
SS-25	12.8 RT	16+44.0	3.95-4.40	A-1-b(0)	22	NP	84.2	9.0	1.7	5.1	97	39	7	-	-
SS-26	12.8 RT	16+44.0	6.99-7.44	A-3(0)	23	NP	33.6	59.4	1.9	5.1	100	93	8	-	-
SS-27	12.8 RT	16+44.0	11.55-12.00	A-2-4(0)	35	10	28.1	18.6	33.0	20.2	59	46	35	-	-
SS-28	12.8 RT	16+44.0	13.07-13.52	A-4(5)	34	9	14.4	29.1	38.3	18.2	100	95	65	-	-
SS-29	12.8 RT	16+44.0	16.11-16.56	A-4(2)	35	4	18.8	27.9	37.0	16.2	100	92	60	-	-
SS-30	12.8 RT	16+44.0	19.15-19.57	A-4(3)	38	7	20.4	26.7	34.6	18.2	95	83	58	-	-



PROJECT: 344561.1.3 ID: R-2554A

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



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554A	1	8

**CONTENTS**

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-7	BORE LOGS
8	SOIL TEST RESULTS

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 34461.1.3 (R-2554A) F.A. PROJ. NHF-70 (30)

COUNTY WAYNE

PROJECT DESCRIPTION US 70 (GOLDSBORO BYPASS) FROM WEST OF NC 581 TO SR 1300 (SALEM CHUCH ROAD)

SITE DESCRIPTION BRIDGE ON -FLY- OVER -L- (US 70 BYPASS) AT -FLY- STA. 17+20.212

**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 (ON-PLACED) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

CMW  
JRS  
HRC  
JRM

INVESTIGATED BY J.L. STONE

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE JUNE 2011

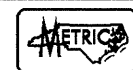


DRAWN BY: C.R. SUMNER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

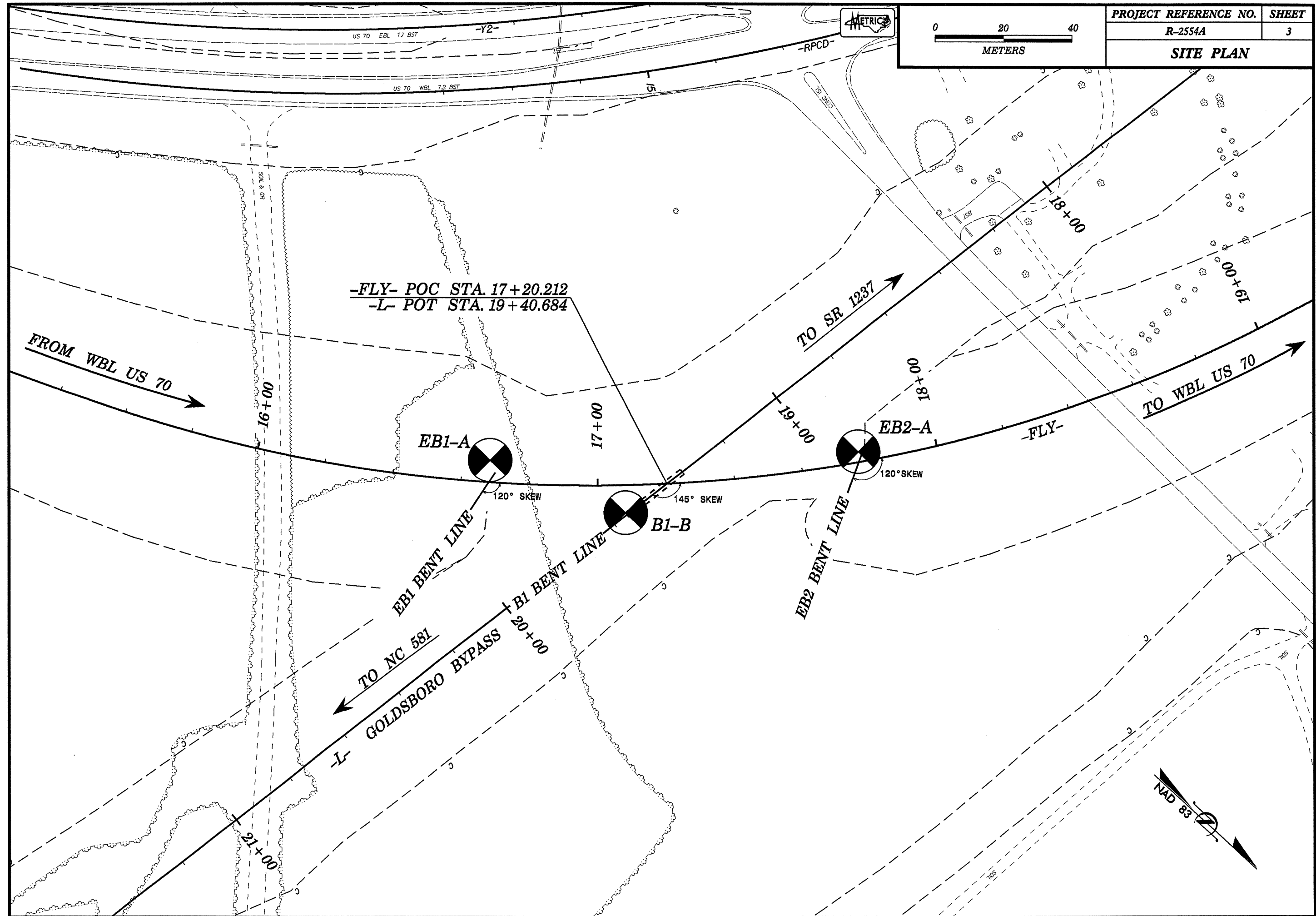
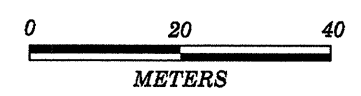
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT**



**SUBSURFACE INVESTIGATION**

**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 30 CM ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY-SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>	<b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORM</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.  <b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <b>ANGULAR</b> , <b>SUBANGULAR</b> , <b>SUBROUNDED</b> , OR <b>ROUNDED</b> .	<b>HARD ROCK</b> 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 3 CM 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:  <b>WEATHERED ROCK (WR)</b> <b>CRYSTALLINE ROCK (CR)</b> <b>NON-CRYSTALLINE ROCK (NCR)</b> <b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b>	<b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. <b>ARTESIAN</b> - 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. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOROUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - 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. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (N) OF A 63.5 KG HAMMER FALLING 0.76 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS. <b>STRATA CORE RECOVERY (SREC)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. <b>TOPSOIL (TS)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>																																			
GENERAL CLASS. GROUP CLASS. SYMBOL % PASSING LIQUID LIMIT PLASTIC INDEX GROUP INDEX USUAL TYPES OF MAJOR MATERIALS GENERAL RATING AS A SUBGRADE		MINERALOGICAL COMPOSITION COMPRESSIBILITY PERCENTAGE OF MATERIAL GROUND WATER MISCELLANEOUS SYMBOLS																																	
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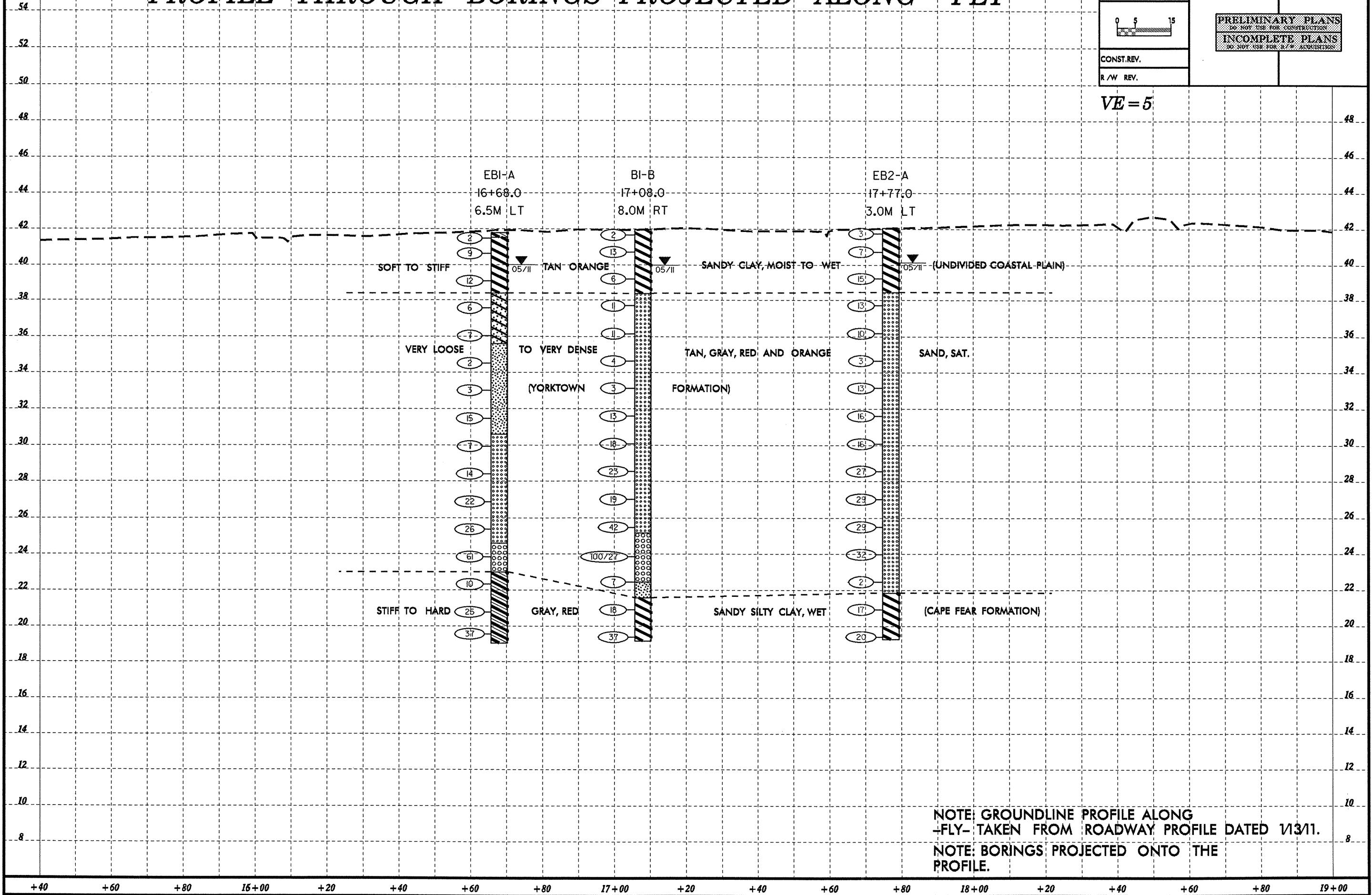


# PROFILE THROUGH BORINGS PROJECTED ALONG -FLY-



PROJECT REFERENCE NO. R-2554A	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION <b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
CONST. REV.	
R/W REV.	

VE = 5'



NOTE: GROUNDLINE PROFILE ALONG -FLY- TAKEN FROM ROADWAY PROFILE DATED 1/13/11.  
 NOTE: BORINGS PROJECTED ONTO THE PROFILE.

+40 +60 +80 16+00 +20 +40 +60 +80 17+00 +20 +40 +60 +80 18+00 +20 +40 +60 +80 19+00



WBS 34461.1.3		TIP R-2554A		COUNTY WAYNE		GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE ON -FLY- OVER -L- (US 70 BYPASS)							GROUND WTR (m)
BORING NO. B1-B		STATION 17+08.0		OFFSET 8.0 m RT		ALIGNMENT -FLY-	
COLLAR ELEV. 41.89 m		TOTAL DEPTH 22.80 m		NORTHING 187,347.0		EASTING 694,086.0	
						0 HR.	N/A
						24 HR.	2.01
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic	
DRILLER Conley, H. R.		START DATE 05/03/11		COMP. DATE 05/04/11		SURFACE WATER DEPTH N/A	

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DRILLER Conley, H. R.		START DATE 05/03/11		COMP. DATE 05/04/11		SURFACE WATER DEPTH N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	ELEV. (m)	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100						
42	41.89	0.00	1	1	1										41.89	0.00
41	40.94	0.95	2	5	8											
40																
39	39.42	2.47	1	2	4											
38	37.90	3.99	3	4	7										38.29	3.60
37																
36	36.37	5.52	5	6	5											
35	34.85	7.04	4	2	2											
34																
33	33.32	8.57	3	1	2											
32	31.80	10.09	5	6	7											
31																
30	30.28	11.61	5	8	10											
29	28.75	13.14	9	11	12											
28																
27	27.23	14.66	7	9	10											
26																
25	25.70	16.19	8	20	22										25.09	16.80
24	24.18	17.71	15	44	56/12											
23																
22	22.66	19.23	7	3	4										22.36	19.53

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	ELEV. (m)	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100						
22																
21	21.13	20.76	5	7	11										21.49	20.40
20																
	19.61	22.28	11	15	22										19.09	22.80
															Boring Terminated at Elevation 19.09 m IN HARD SILTY CLAY	

NCDOT BORE DOUBLE BORINGS.GPJ NC DOT.GDT 6/2/11

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -FLY- OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. EB2-A	STATION 17+77.0	OFFSET 3.0 m LT	ALIGNMENT -FLY-
COLLAR ELEV. 42.07 m	TOTAL DEPTH 22.79 m	NORTHING 187,383.0	EASTING 694,026.0
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 05/02/11	COMP. DATE 05/03/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
43																
42	42.07	0.00	1	2	1										42.07	GROUND SURFACE
41	41.06	1.01	1	3	4											UNDIVIDED COASTAL PLAIN ORANGE SANDY CLAY, MOIST TO WET
40																
39	39.54	2.53	3	6	9											
38	38.02	4.05	7	6	7										38.47	COASTAL PLAIN GRAY RED TAN SAND, SAT. (YORKTOWN FORMATION)
37																
36	36.49	5.58	3	4	6											
35	34.97	7.10	1	2	1											
34																
33	33.44	8.63	5	5	8											
32	31.92	10.15	5	7	9											
31																
30	30.39	11.68	7	8	8											
29	28.87	13.20	8	12	15											
28																
27	27.34	14.73	9	13	16											
26	25.82	16.25	8	16	13											
25																
24	24.29	17.78	9	12	20											
23	22.77	19.30														

WBS 34461.1.3	TIP R-2554A	COUNTY WAYNE	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE ON -FLY- OVER -L- (US 70 BYPASS)			GROUND WTR (m)
BORING NO. EB2-A	STATION 17+77.0	OFFSET 3.0 m LT	ALIGNMENT -FLY-
COLLAR ELEV. 42.07 m	TOTAL DEPTH 22.79 m	NORTHING 187,383.0	EASTING 694,026.0
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 00% 00/00/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 05/02/11	COMP. DATE 05/03/11	SURFACE WATER DEPTH N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100						
23																
22																
21	21.25	20.82	4	6	11										21.87	COASTAL PLAIN GRAY SILTY CLAY, WET (CAPE FEAR FORMATION)
20	19.73	22.34	5	8	12										19.28	Boring Terminated at Elevation 19.28 m IN VERY STIFF SILTY CLAY

NCDOT BORE DOUBLE BORINGS.GPJ NC DOT.GDT 6/2/11

R-2554A

34461.1.3

**BRIDGE ON -FLY- OVER -L- (US 70 BYPASS)  
AT -FLY- STA. 17+20.212**

<b>EB1-A SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-14	6.5M RT	16+68.0	0.00-0.25	A-6(4)	20	14	15.6	33.5	28.8	22.1	100	93	57	-	-
SS-15	6.5M RT	16+68.0	0.85-1.30	A-7-6(17)	47	28	12.8	25.3	19.8	42.1	100	94	67	-	-
SS-16	6.5M LT	16+68.0	3.93-4.38	A-2-7(0)	42	23	74.2	9.6	2.1	14.0	98	42	16	-	-
SS-17	6.5M LT	16+68.0	6.98-7.43	A-2-4(0)	24	NP	34.9	52.8	2.3	10.0	100	96	14	-	-
SS-18	6.5M LT	16+68.0	11.55-12.00	A-3(0)	23	NP	7.0	84.7	0.3	8.0	100	99	9	-	-
SS-19	6.5M LT	16+68.0	16.12-16.57	A-3(0)	24	NP	8.0	84.9	3.1	4.0	100	98	8	-	-
SS-20	6.5M LT	16+68.0	17.65-18.10	A-1-b(0)	25	NP	78.8	14.6	2.5	4.0	95	29	7	-	-
SS-21	6.5M LT	16+68.0	19.17-19.62	A-6(5)	28	12	18.5	20.9	32.6	28.1	93	80	64	-	-

<b>B1-B SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-7	8.0M RT	17+08.0	0.95-1.40	A-7-6(30)	65	40	7.0	24.6	16.0	52.4	100	96	74	-	-
SS-8	8.0M RT	17+08.0	2.47-2.92	A-7-6(8)	41	25	4.0	53.6	8.2	34.2	100	99	48	-	-
SS-9	8.0M RT	17+08.0	5.52-5.97	A-3(0)	22	NP	65.1	27.7	2.2	5.0	97	57	8	-	-
SS-10	8.0M RT	17+08.0	10.09-10.54	A-3(0)	22	NP	8.2	84.7	3.1	4.0	100	98	8	-	-
SS-11	8.0M RT	17+08.0	14.66-15.11	A-3(0)	20	NP	17.5	76.2	2.3	4.0	100	98	7	-	-
SS-12	8.0M RT	17+08.0	17.71-18.13	A-1-b(0)	18	NP	75.8	18.5	3.7	2.0	100	49	7	-	-
SS-13	8.0M RT	17+08.0	20.76-21.21	A-7-5(16)	50	17	8.8	20.3	48.8	22.1	96	89	80	-	-

<b>EB2-A SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	3.0M LT	17+77.0	0.00-0.45	A-7-6(9)	41	24	29.2	23.4	17.2	30.2	100	82	54	23.4	-
SS-2	3.0M LT	17+77.0	4.05-4.50	A-3(0)	22	NP	68.3	22.3	3.4	6.0	94	55	10	-	-
SS-3	3.0M LT	17+77.0	8.63-9.08	A-3(0)	23	NP	7.0	85.5	1.4	6.0	100	97	9	-	-
SS-4	3.0M LT	17+77.0	13.20-13.65	A-3(0)	22	NP	13.6	79.9	2.5	4.0	100	99	8	-	-
SS-5	3.0M LT	17+77.0	17.78-18.23	A-3(0)	21	NP	37.4	57.1	2.5	3.0	100	95	7	-	-
SS-6	3.0M LT	17+77.0	20.28-20.73	A-7-6(20)	48	20	3.8	19.5	48.4	28.2	100	98	87	-	-