



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34414.1.1 (R-2301A)	1	20

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34414.1.1 I.D. NO. R-2301A

COUNTY JONES / CRAVEN

PROJECT DESCRIPTION US 17 (NEW BERN BYPASS) FROM US 17
SOUTH OF NEW BERN TO US 70

SITE DESCRIPTION STRUCTURES 1 AND 2 ON -L- (US 17 BYPASS)
OVER DEEP GULLY AT -L- STATION 18+22.00

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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: 34414.1.1 ID: R-2301A

PERSONNEL
J.R. SWARTLEY

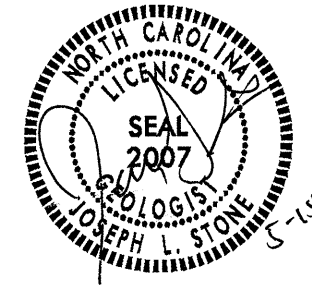
S&ME PERSONNEL

INVESTIGATED BY JL STONE

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE MAY, 2008



DRAWN BY: C.P. TURNER, 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. 34414.11 (R-2301A) SHEET NO. 2 OF 20

SUBSURFACE INVESTIGATION

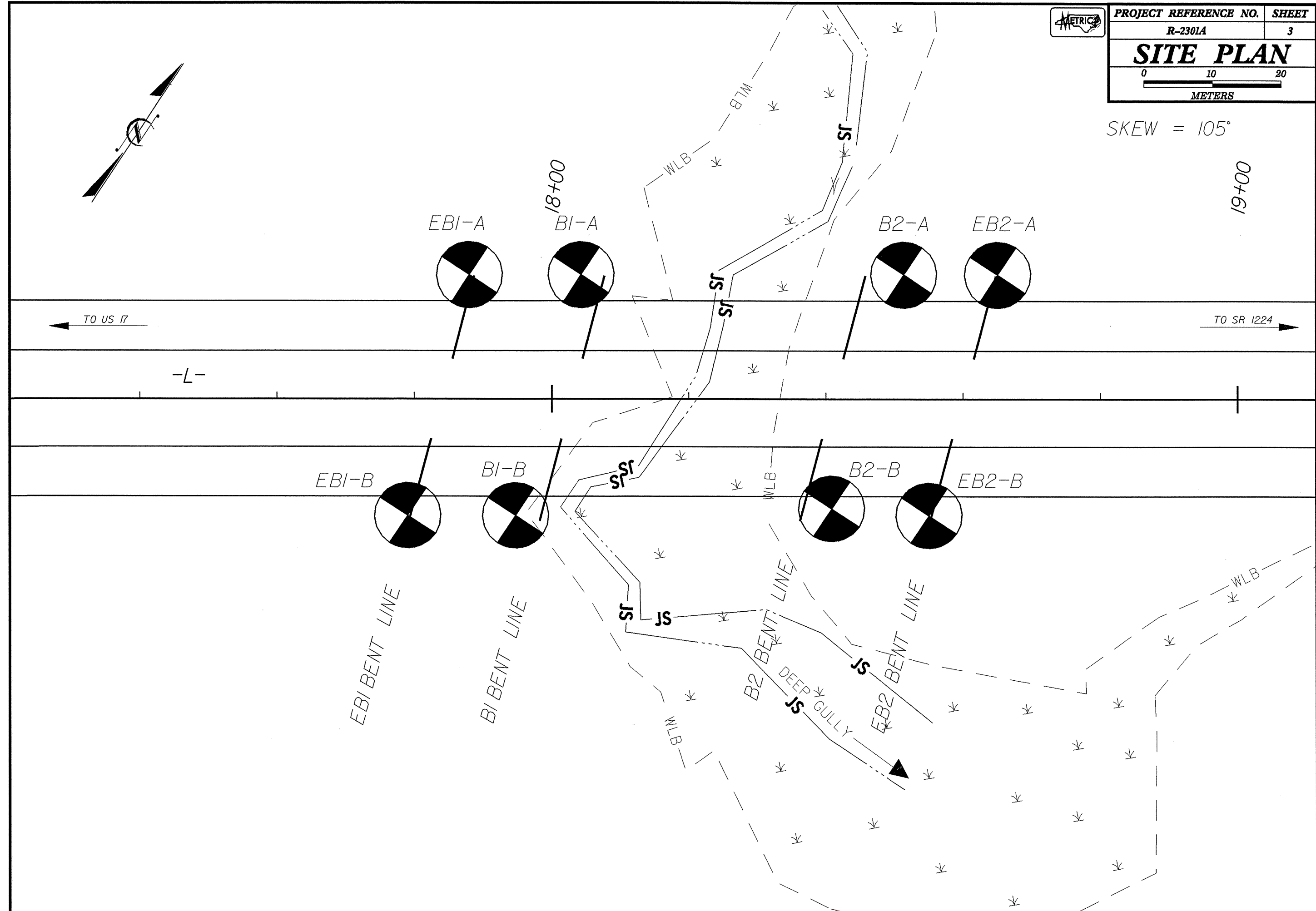
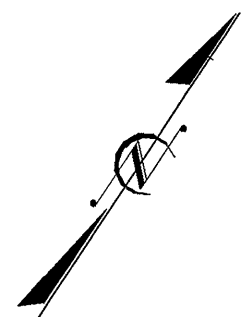
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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 T208, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i></p>		<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) POORLY GRADED GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: 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>WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER 30 CM IF TESTED.</p> <p>CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p> <p>NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>		<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND 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 (ROQ) - 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 (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.</p>																																																																																																																																																																																							
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<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>GENERAL CLASS.</th> <th colspan="2">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="2">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th>ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </thead> <tbody> <tr> <td>% PASSING</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> </tr> <tr> <td>LIQUID LIMIT</td> <td>50</td> <td>50</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> </tr> <tr> <td>PLASTIC INDEX</td> <td>6</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS, GRAVEL, AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILT</td> <td>SILTY SILTS</td> <td>CLAYEY SILTS</td> <td>CLAYEY SOILS</td> <td>SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td>HIGHLY ORGANIC SOILS</td> <td>MUCK, PEAT</td> <td></td> </tr> <tr> <td>GENERAL INDEX AS A SUBGRADE</td> <td colspan="3">EXCELLENT TO GOOD</td> <td colspan="3">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATURABLE</td> <td></td> <td></td> </tr> </tbody> </table>		GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)		SILT-CLAY MATERIALS (> 35% PASSING #200)		ORGANIC MATERIALS	GROUP CLASS.	A-1	A-3	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	SYMBOL												% PASSING	10	10	10	10	10	10	10	10	10	10	10	LIQUID LIMIT	50	50	40	40	40	40	40	40	40	40	40	PLASTIC INDEX	6	6	4	4	4	4	4	4	4	4	4	GROUP INDEX	0	0	0	0	0	0	0	0	0	0	0	USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILT	SILTY SILTS	CLAYEY SILTS	CLAYEY SOILS	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER	HIGHLY ORGANIC SOILS	MUCK, PEAT		GENERAL INDEX AS A SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR			FAIR TO POOR	POOR	UNSATURABLE			<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p style="text-align: center;">COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p> <p style="text-align: center;">PERCENTAGE OF MATERIAL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> </thead> <tbody> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> </tbody> </table>			GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY	<p>FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SL.) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</p> <p>SLIGHT (SL.) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1/2 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.</p> <p>MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.</p> <p>MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BLOWS PER 30 CM</i></p> <p>VERY SEVERE (V SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BLOWS PER 30 CM</i></p> <p>COMPLETE - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.</p>		<p style="text-align: center;">GROUND WATER</p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p> <p style="text-align: center;">MISCELLANEOUS SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td> ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td> SPT TEST BORING</td> <td> SAMPLE DESIGNATIONS</td> </tr> <tr> <td> SOIL SYMBOL</td> <td> AUGER BORING</td> <td>S - BULK SAMPLE</td> </tr> <tr> <td> ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td> CORE BORING</td> <td>SS - SPLIT SPOON SAMPLE</td> </tr> <tr> <td> INFERRERD SOIL BOUNDARY</td> <td> MONITORING WELL</td> <td>ST - SHELBY TUBE SAMPLE</td> </tr> <tr> <td> INFERRERD ROCK LINE</td> <td> PIEZOMETER INSTALLATION</td> <td>RS - ROCK SAMPLE</td> </tr> <tr> <td> ALLUVIAL SOIL BOUNDARY</td> <td> SLOPE INDICATOR INSTALLATION</td> <td>RT - RECOMPACTED TRIAXIAL SAMPLE</td> </tr> <tr> <td> DIP & DIP DIRECTION OF ROCK STRUCTURES</td> <td> SPT N-VALUE</td> <td>CBR - CALIFORNIA BEARING RATIO SAMPLE</td> </tr> <tr> <td> SOUNDING ROD</td> <td> SPT REFUSAL</td> <td></td> </tr> </table> <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>HI - HIGHLY</td> <td>W - MOISTURE CONTENT</td> </tr> <tr> <td>BT - BORING TERMINATED</td> <td>MED. - MEDIUM</td> <td>V - VERY</td> </tr> <tr> <td>CL - CLAY</td> <td>MICA - MICACEOUS</td> <td>VST - VANE SHEAR TEST</td> </tr> <tr> <td>CPT - CONE PENETRATION TEST</td> <td>MOD. - MODERATELY</td> <td>WEA. - WEATHERED</td> </tr> <tr> <td>CSE. - COARSE</td> <td>NP - NON PLASTIC</td> <td>W - UNIT WEIGHT</td> </tr> <tr> <td>DMT - DILATOMETER TEST</td> <td>ORG. - ORGANIC</td> <td>W_d - DRY UNIT WEIGHT</td> </tr> <tr> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>PMT - PRESSUREMETER TEST</td> <td></td> </tr> <tr> <td>F - VOID RATIO</td> <td>SAP. - SAPROLITIC</td> <td></td> </tr> <tr> <td>FOSS. - FOSSILIFEROUS</td> <td>SD. - SAND, SANDY</td> <td></td> </tr> <tr> <td>FRAC. - FRACTURED, FRACTURES</td> <td>SL. - SILT, SILTY</td> <td></td> </tr> <tr> <td>FRAGS. - FRAGMENTS</td> <td>SLI. - SLIGHTLY</td> <td></td> </tr> <tr> <td></td> <td>TCR - TRICONE REFUSAL</td> <td></td> </tr> </table>		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION	SPT TEST BORING	SAMPLE DESIGNATIONS	SOIL SYMBOL	AUGER BORING	S - BULK SAMPLE	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT	CORE BORING	SS - SPLIT SPOON SAMPLE	INFERRERD SOIL BOUNDARY	MONITORING WELL	ST - SHELBY TUBE SAMPLE	INFERRERD ROCK LINE	PIEZOMETER INSTALLATION	RS - ROCK SAMPLE	ALLUVIAL SOIL BOUNDARY	SLOPE INDICATOR INSTALLATION	RT - RECOMPACTED TRIAXIAL SAMPLE	DIP & DIP DIRECTION OF ROCK STRUCTURES	SPT N-VALUE	CBR - CALIFORNIA BEARING RATIO SAMPLE	SOUNDING ROD	SPT REFUSAL		AR - AUGER REFUSAL	HI - HIGHLY	W - MOISTURE CONTENT	BT - BORING TERMINATED	MED. - MEDIUM	V - VERY	CL - CLAY	MICA - MICACEOUS	VST - VANE SHEAR TEST	CPT - CONE PENETRATION TEST	MOD. - MODERATELY	WEA. - WEATHERED	CSE. - COARSE	NP - NON PLASTIC	W - UNIT WEIGHT	DMT - DILATOMETER TEST	ORG. - ORGANIC	W _d - DRY UNIT WEIGHT	DPT - DYNAMIC PENETRATION TEST	PMT - PRESSUREMETER TEST		F - VOID RATIO	SAP. - SAPROLITIC		FOSS. - FOSSILIFEROUS	SD. - SAND, SANDY		FRAC. - FRACTURED, FRACTURES	SL. - SILT, SILTY		FRAGS. - FRAGMENTS	SLI. - SLIGHTLY			TCR - TRICONE REFUSAL	
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	26 OR MORE	HIGH																																																																																																																																																																																											



PROJECT REFERENCE NO.	SHEET
R-2301A	3
SITE PLAN	
 METERS	

SKEW = 105°





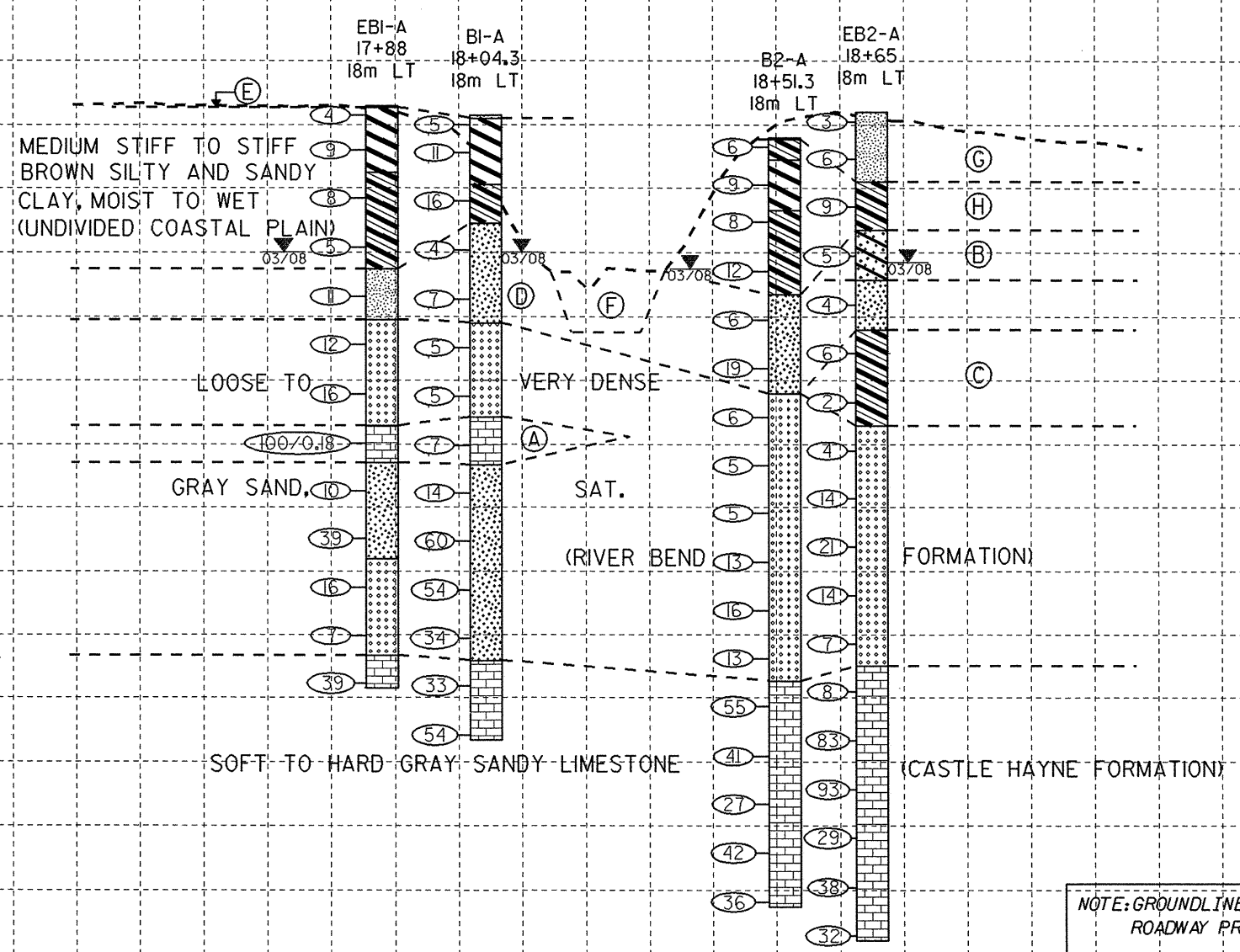
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
CONST. REV.	
R/W REV.	

STRUCTURE 1

PROFILE THROUGH LEFT LANE BORINGS PROJECTED ALONG -L-

VE = 5

- (A) SOFT TO HARD GRAY SANDY LIMESTONE
- (B) LOOSE TAN CLAYEY SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)
- (C) SOFT TO MEDIUM STIFF BROWN SANDY CLAY, WET (UNDIVIDED COASTAL PLAIN)
- (D) STIFF BROWN SANDY SILT, WET AND LOOSE TO MEDIUM DENSE TAN SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)
- (E) SOFT TAN SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)
- (F) VERY SOFT TO VERY STIFF BLACK SILT WITH LITTLE ORGANIC MATTER, MOIST TO WET (ALLUVIAL)
- (G) SOFT TO MEDIUM STIFF TAN SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)
- (H) MEDIUM STIFF TO STIFF TAN SANDY CLAY, MOIST TO WET (UNDIVIDED COASTAL PLAIN)



NOTE: GROUNDLINE PROFILE OF -L- TAKEN FROM ROADWAY PROFILE DRAWING DATED 03/13/07

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

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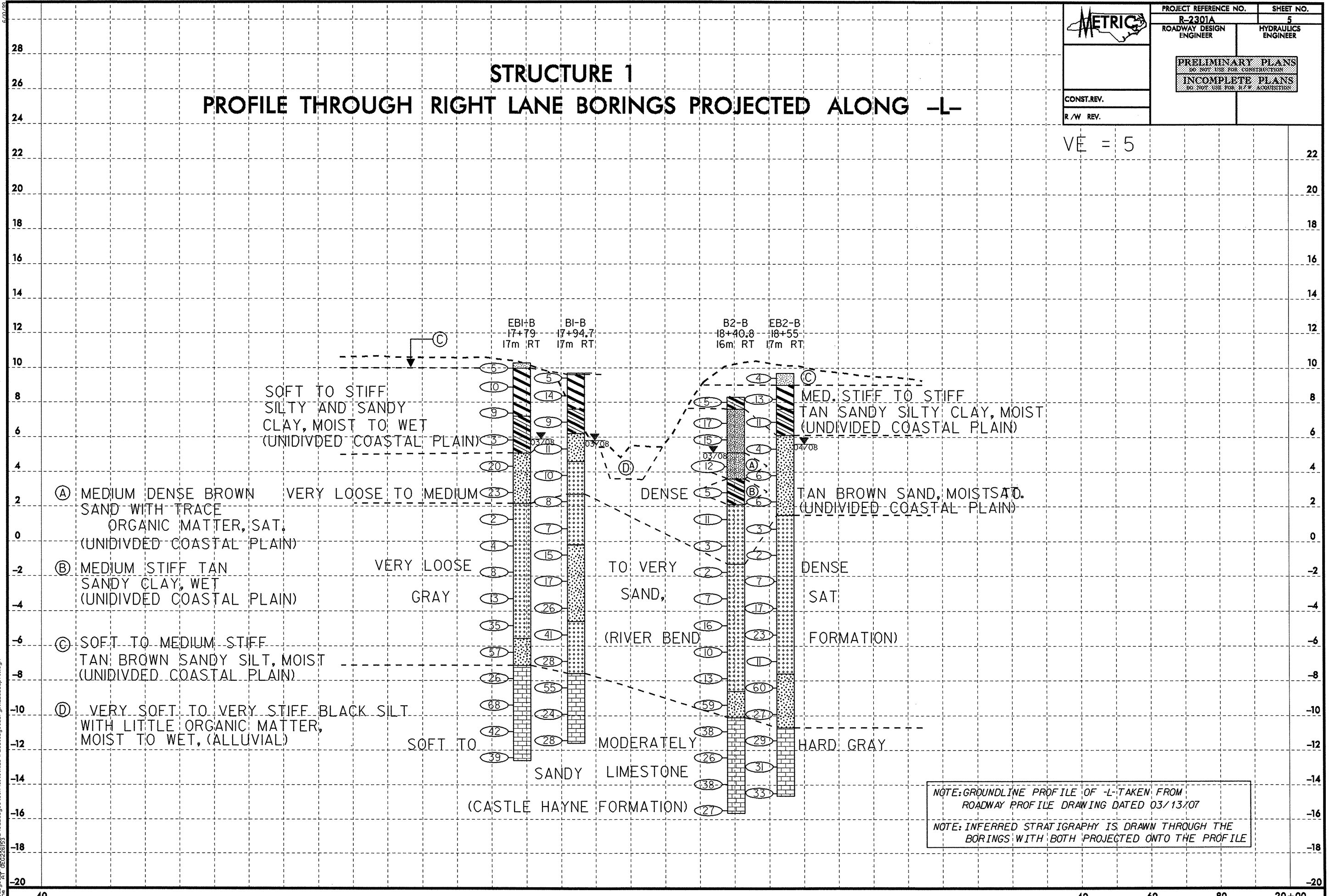


PROJECT REFERENCE NO.	SHEET NO.
R-2301A	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
CONST. REV.	
R/W REV.	

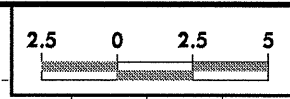
STRUCTURE 1

PROFILE THROUGH RIGHT LANE BORINGS PROJECTED ALONG -L-

VE = 5

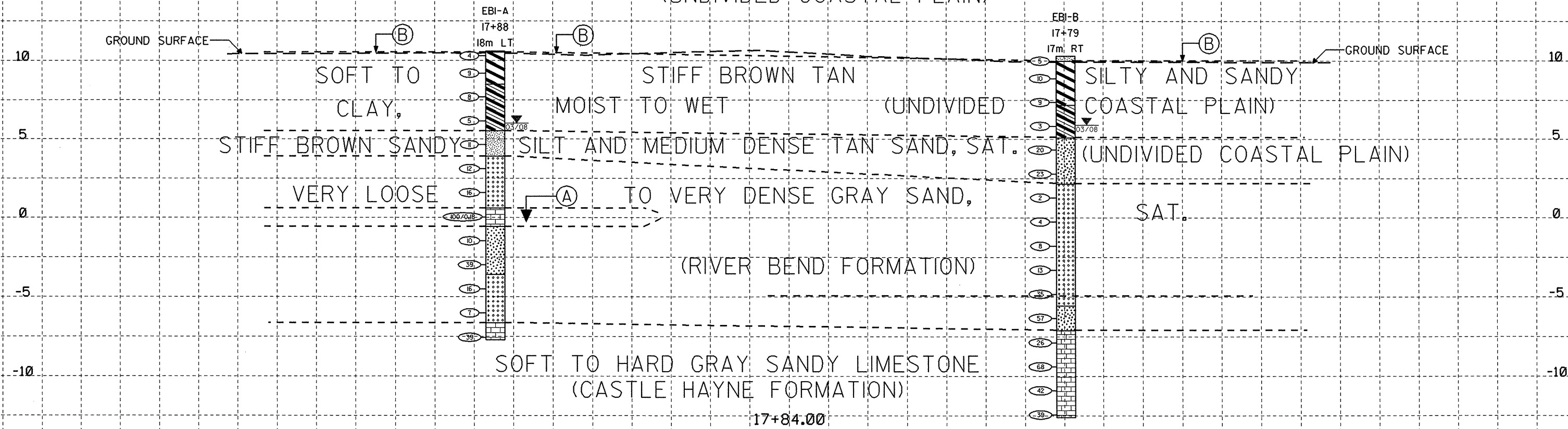


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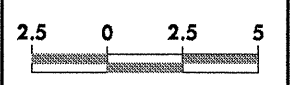
STRUCTURE 1 AND 2 CROSS SECTION THROUGH END BENT 1

- Ⓐ HARD GRAY SANDY LIMESTONE
- Ⓑ SOFT TAN SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)



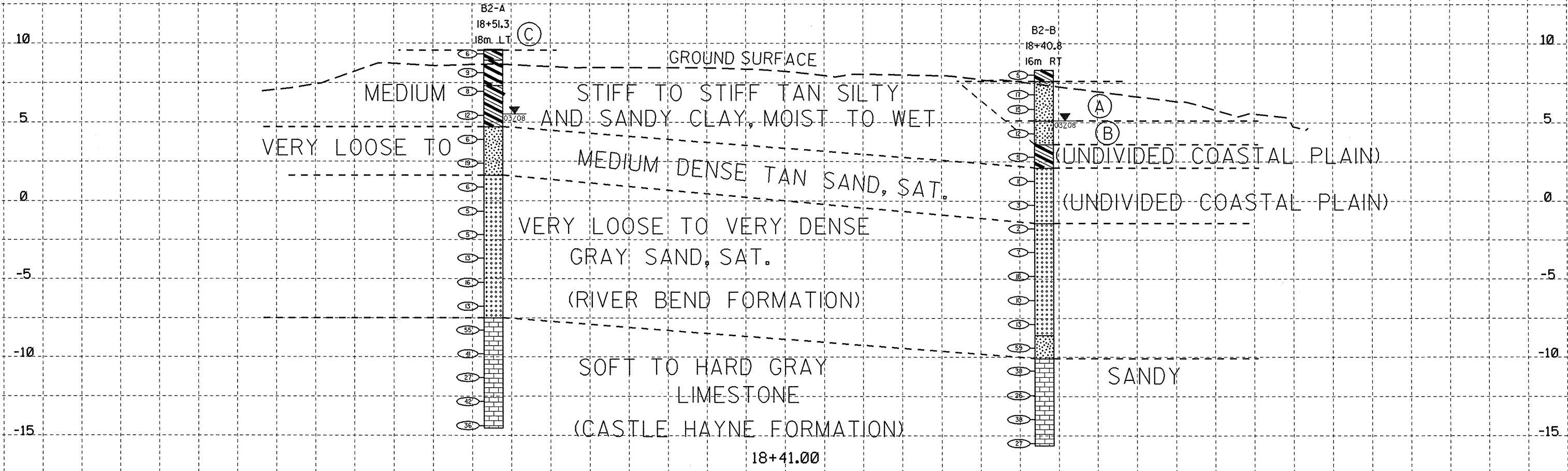
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 j:\stone AT 05/22/08

-L-
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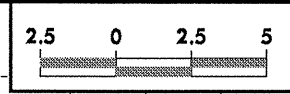


STRUCTURE 1 AND 2 CROSS SECTION THROUGH BENT 2

(A) MEDIUM DENSE TAN SAND, MOIST TO SATURATED (UNDIVIDED COASTAL PLAIN)
 (B) MEDIUM DENSE BROWN SAND WITH TRACE ORGANIC MATTER, SATURATED (UNDIVIDED COASTAL PLAIN)
 (C) SOFT TAN SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)

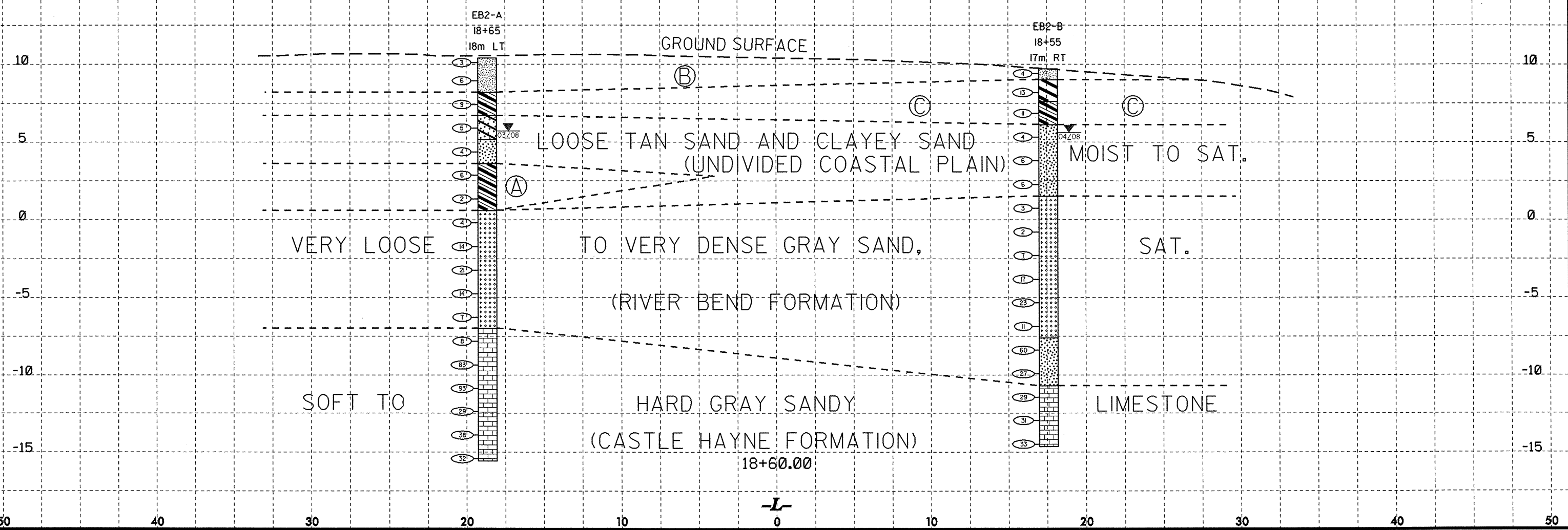


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 11/26/08



STRUCTURE 1 AND 2 CROSS SECTION THROUGH END BENT 2

- Ⓐ SOFT TO MEDIUM STIFF BROWN SANDY CLAY, WET (UNDIVIDED COASTAL PLAIN)
- Ⓑ SOFT TO MEDIUM STIFF TAN SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)
- Ⓒ STIFF TAN SILTY AND SANDY CLAY, MOIST (UNDIVIDED COASTAL PLAIN)



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NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/ CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 1 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. EB1-A	STATION 17+88.0	OFFSET 18.0m LT	ALIGNMENT -L-
COLLAR ELEV. 10.61 m	TOTAL DEPTH 18.31 m	NORTHING 148,109.4	EASTING 774,588.8
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/25/08	COMP. DATE 03/25/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 10.0 m

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				
11	10.61	0.00											GROUND SURFACE	10.61
10	9.51	1.10	1	2	2	4							UNDIVIDED COASTAL PLAIN BROWN SANDY SILT, MOIST	8.68
9	7.99	2.62	3	3	6	9					SS-1	28%	UNDIVIDED COASTAL PLAIN BROWN SILTY AND SANDY CLAY, MOIST TO WET	8.51
8	6.46	4.15	4	3	5	8					SS-2			2.10
7	4.94	5.67	5	3	8	11					SS-3		UNDIVIDED COASTAL PLAIN BROWN SANDY SILT, WET	5.10
6	3.42	7.19	4	6	6	12					SS-4		COASTAL PLAIN GRAY SAND, SAT. (RIVER BEND FORMATION)	6.70
5	1.89	8.72	4	7	9	16								
4	0.37	10.24	54	80	20/0.03	100/0.18					SS-5		COASTAL PLAIN GRAY SANDY LIMESTONE	10.00
3	-1.16	11.77	8	4	6	10					SS-6		COASTAL PLAIN GRAY SAND, SAT.	11.17
2	-2.68	13.29	16	18	21	39								
1	-4.20	14.81	6	9	7	16					SS-7			14.21
0	-5.73	16.34	3	3	4	7								
-1	-7.25	17.86	15	17	22	39					SS-8		COASTAL PLAIN GRAY SANDY LIMESTONE (CASTLE HAYNE FORMATION)	17.26
-2													Boring Terminated at Elevation -7.70 m IN SOFT GRAY SANDY LIMESTONE	18.31

NCDOT BORE DOUBLE R2301A GEO_STRUCTURE1&2.GPJ NC_DOT.GDT 05/14/08

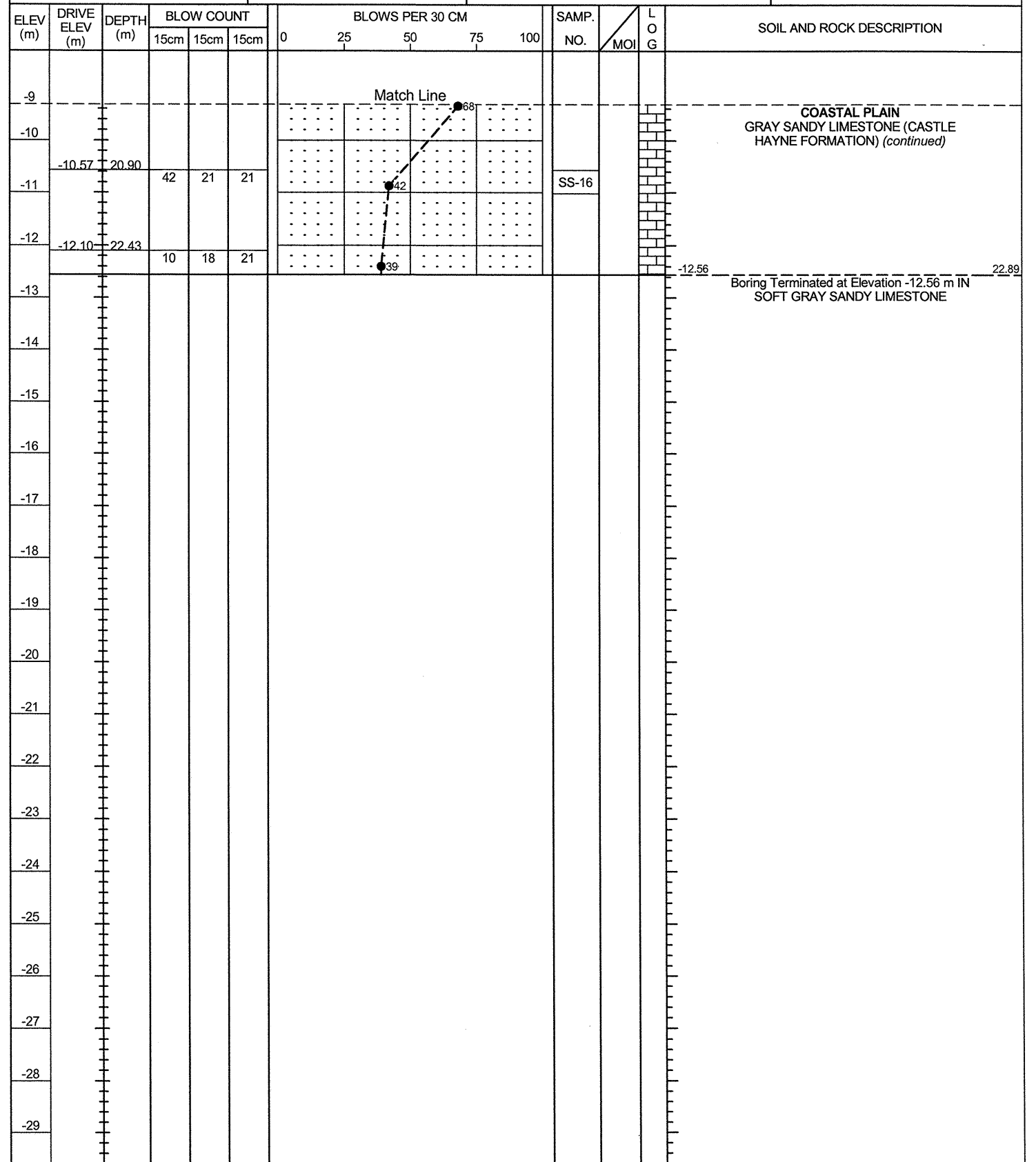
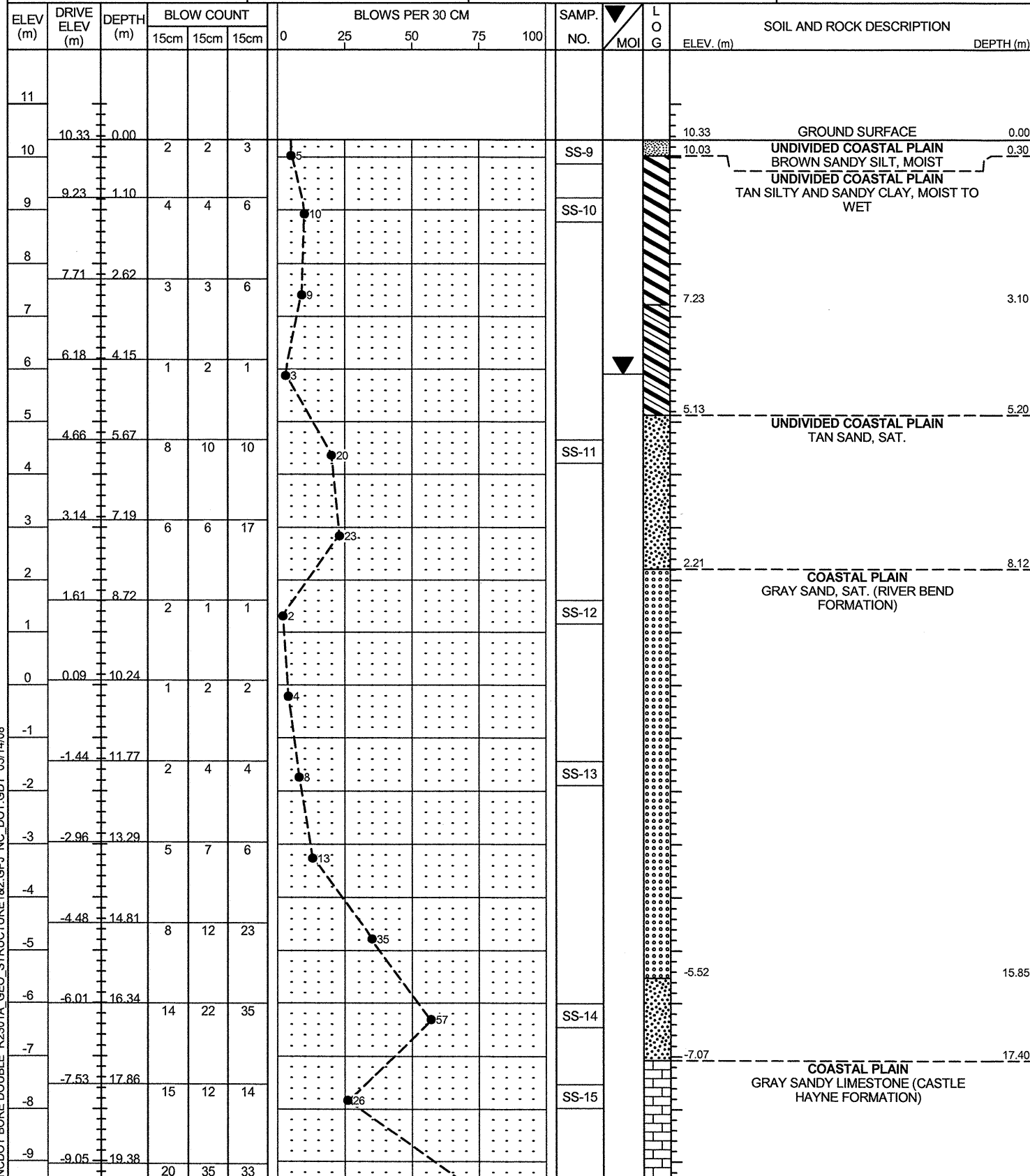


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 2 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BOHRING NO. EB1-B	STATION 17+79.0	OFFSET 17.0m RT	ALIGNMENT -L-
COLLAR ELEV. 10.33 m	TOTAL DEPTH 22.89 m	NORTHING 148,075.2	EASTING 774,600.6
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/25/08	COMP. DATE 03/25/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 17.4 m

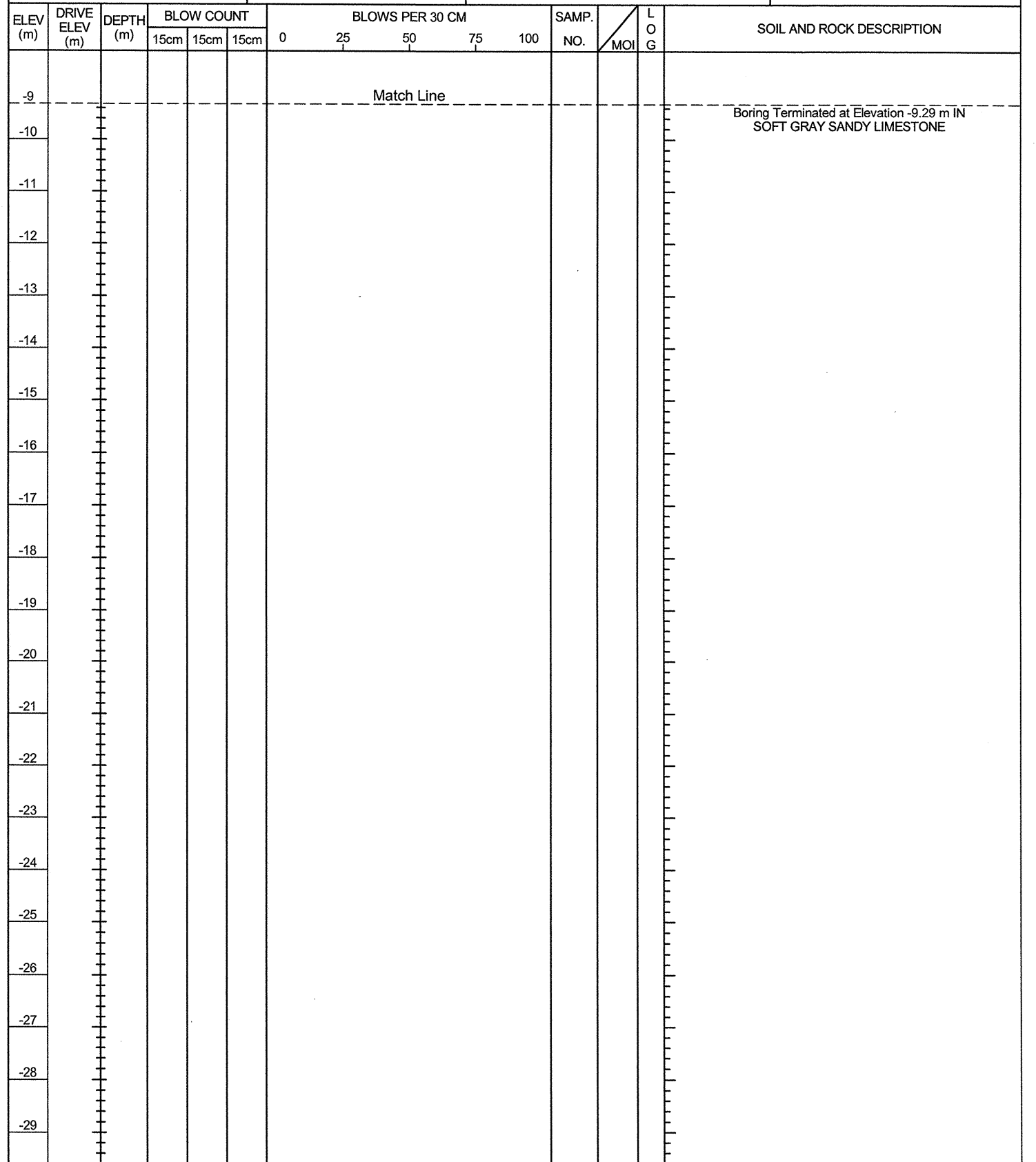
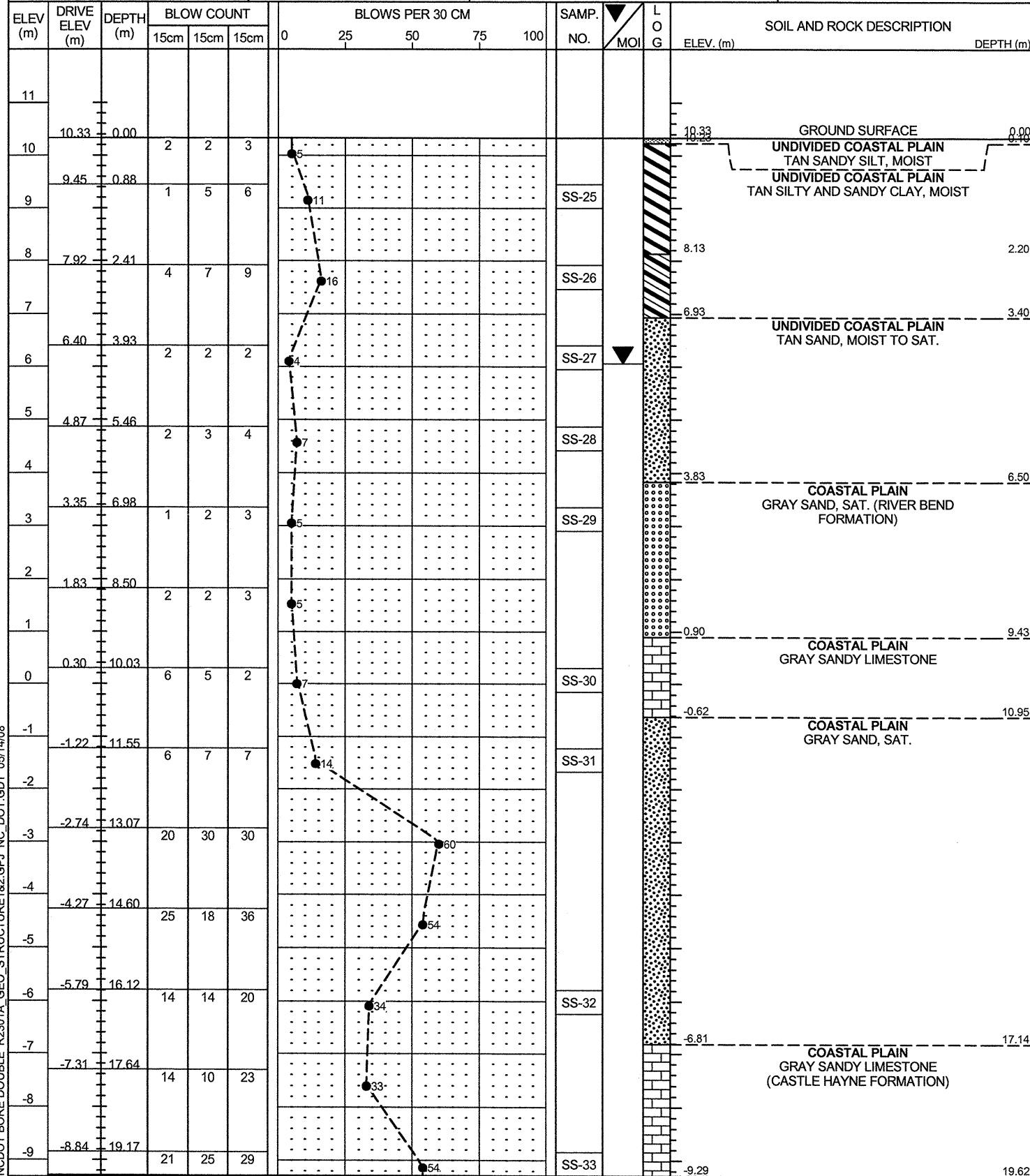
PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 2 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BOHRING NO. EB1-B	STATION 17+79.0	OFFSET 17.0m RT	ALIGNMENT -L-
COLLAR ELEV. 10.33 m	TOTAL DEPTH 22.89 m	NORTHING 148,075.2	EASTING 774,600.6
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/25/08	COMP. DATE 03/25/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 17.4 m



NCDOT BORE DOUBLE R2301A_GEO_STRUCTURE1&2.GPJ NC_DOT_GDT_0514/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 1 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BOHRING NO. B1-A	STATION 18+04.3	OFFSET 18.0m LT	ALIGNMENT -L-
COLLAR ELEV. 10.33 m	TOTAL DEPTH 19.62 m	NORTHING 148,118.4	EASTING 774,602.4
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/26/08	COMP. DATE 03/26/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 9.4 m

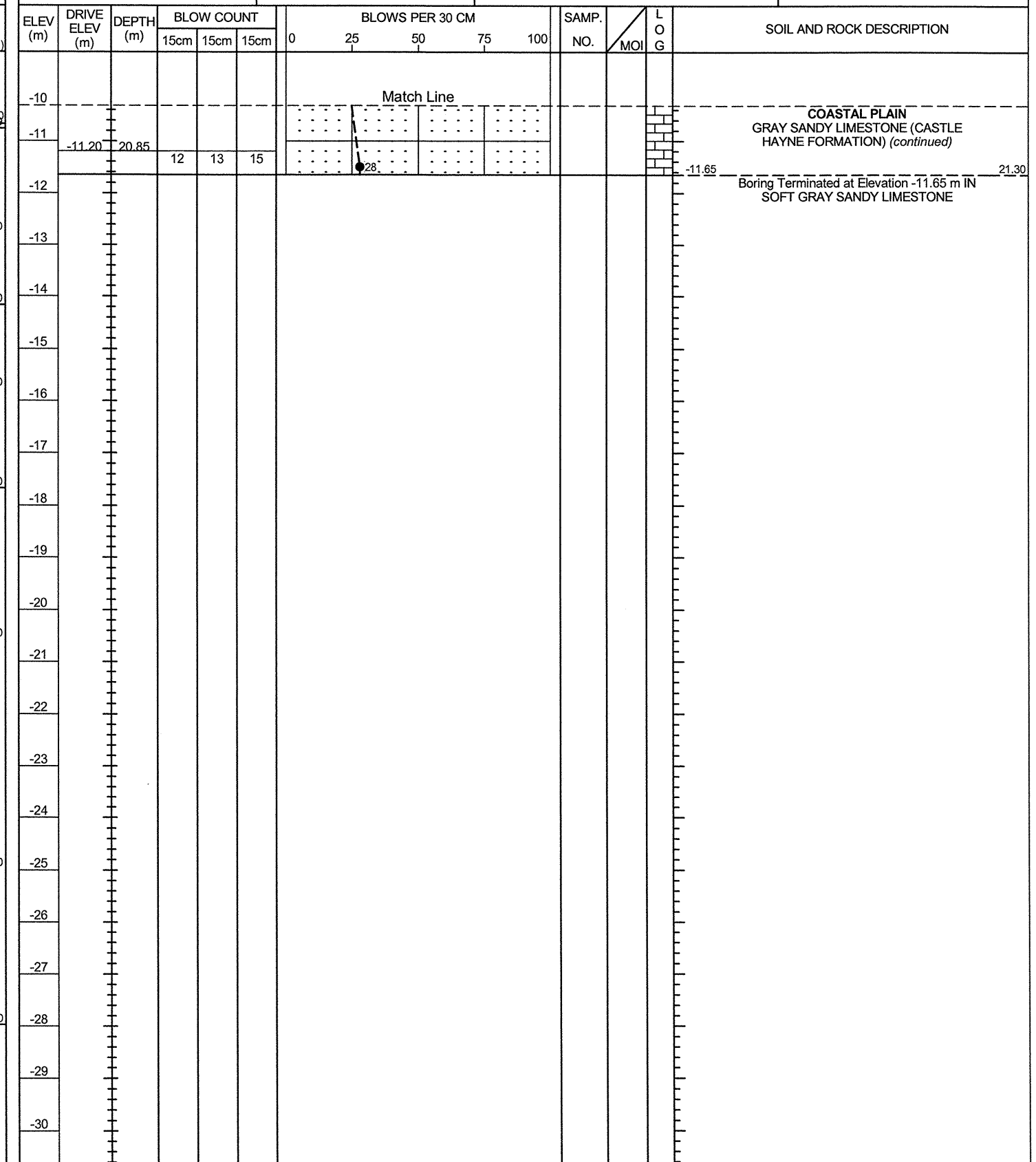
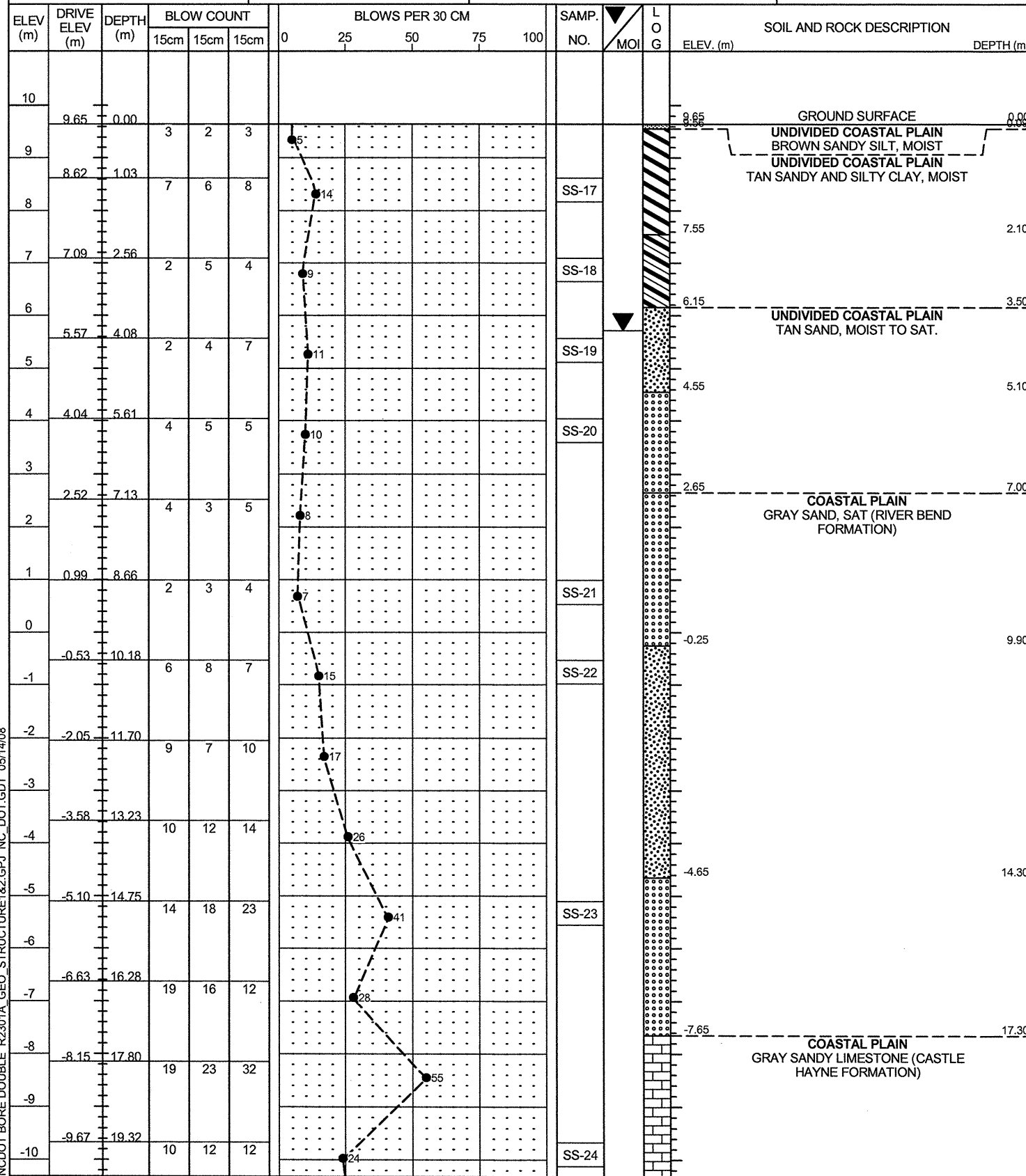
PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 1 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BOHRING NO. B1-A	STATION 18+04.3	OFFSET 18.0m LT	ALIGNMENT -L-
COLLAR ELEV. 10.33 m	TOTAL DEPTH 19.62 m	NORTHING 148,118.4	EASTING 774,602.4
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/26/08	COMP. DATE 03/26/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 9.4 m



NCDOT BORE DOUBLE R2301A_GEO_STRUCTURE1&2.GPJ NC_DOT_GDT_05/14/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 2 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. B1-B	STATION 17+94.7	OFFSET 17.0m RT	ALIGNMENT -L-
COLLAR ELEV. 9.65 m	TOTAL DEPTH 21.30 m	NORTHING 148,083.9	EASTING 774,613.7
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/26/08	COMP. DATE 03/26/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 17.3 m

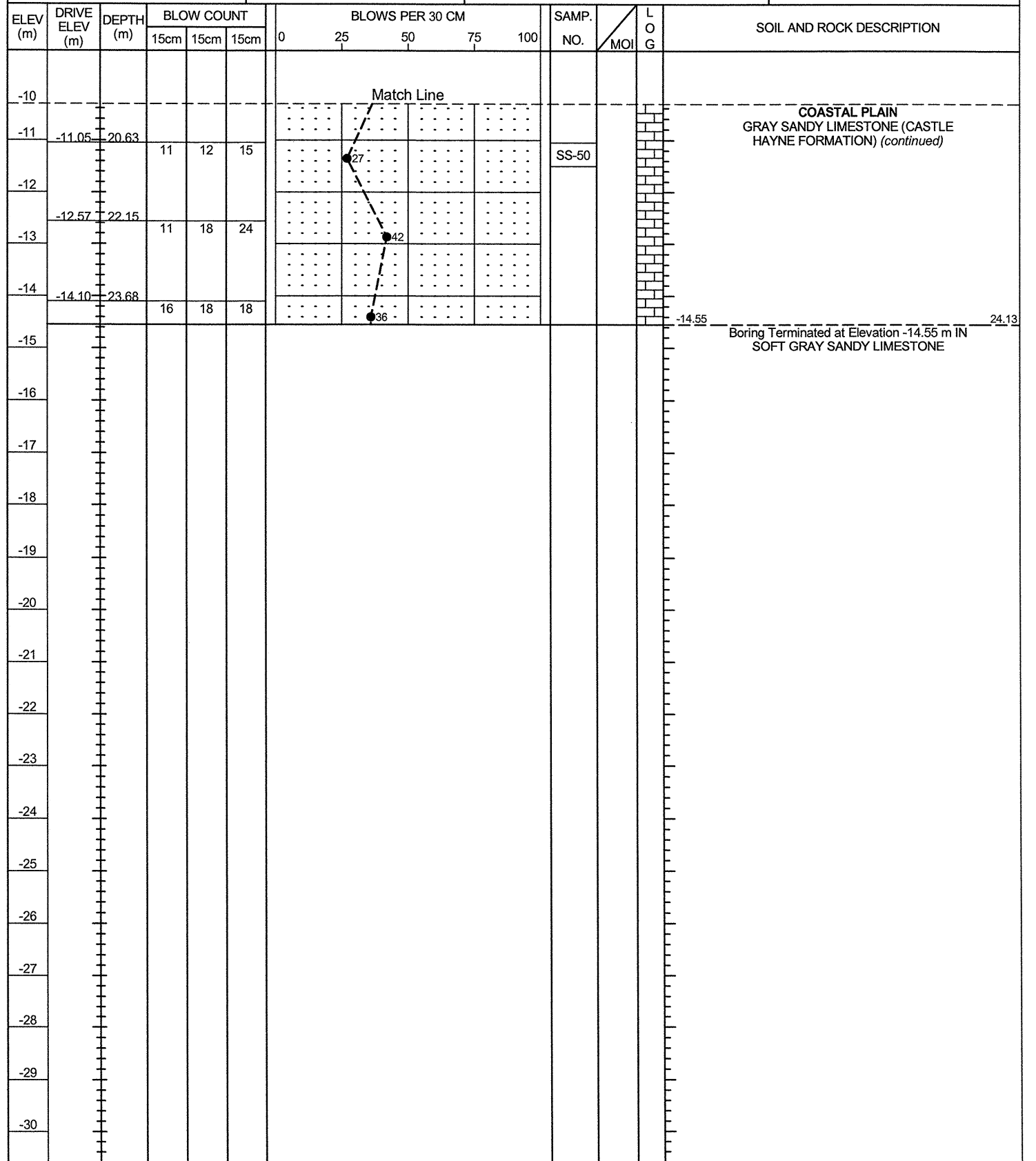
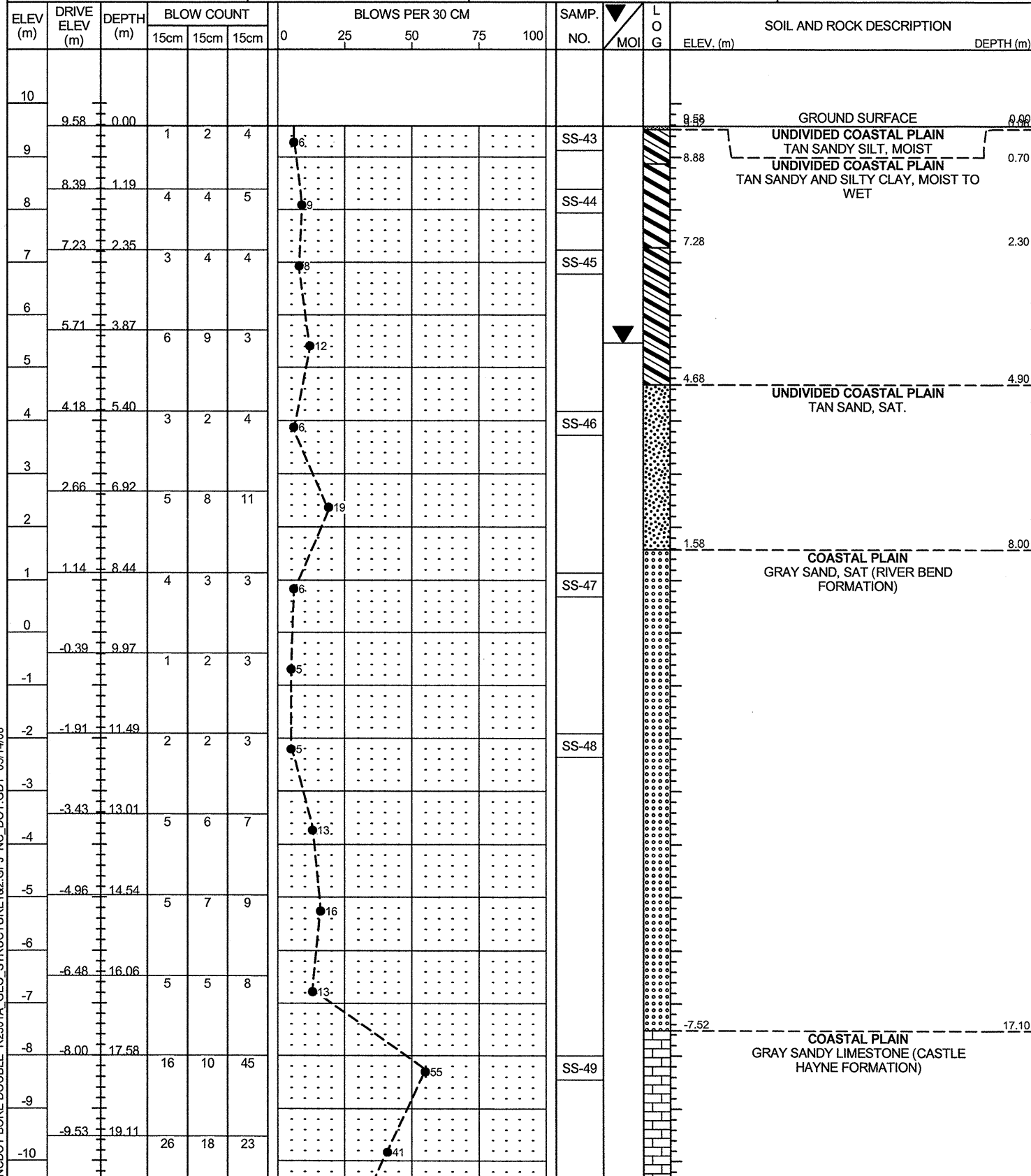
PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 2 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. B1-B	STATION 17+94.7	OFFSET 17.0m RT	ALIGNMENT -L-
COLLAR ELEV. 9.65 m	TOTAL DEPTH 21.30 m	NORTHING 148,083.9	EASTING 774,613.7
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/26/08	COMP. DATE 03/26/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 17.3 m



NCDOT BORE DOUBLE R2301A GEO_STRUCTURE1&2.GPJ NC_DOT.GDT 05/14/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 1 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. B2-A	STATION 18+51.3	OFFSET 18.0m LT	ALIGNMENT -L-
COLLAR ELEV. 9.58 m	TOTAL DEPTH 24.13 m	NORTHING 148,144.3	EASTING 774,641.6
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/27/08	COMP. DATE 03/27/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 17.1 m

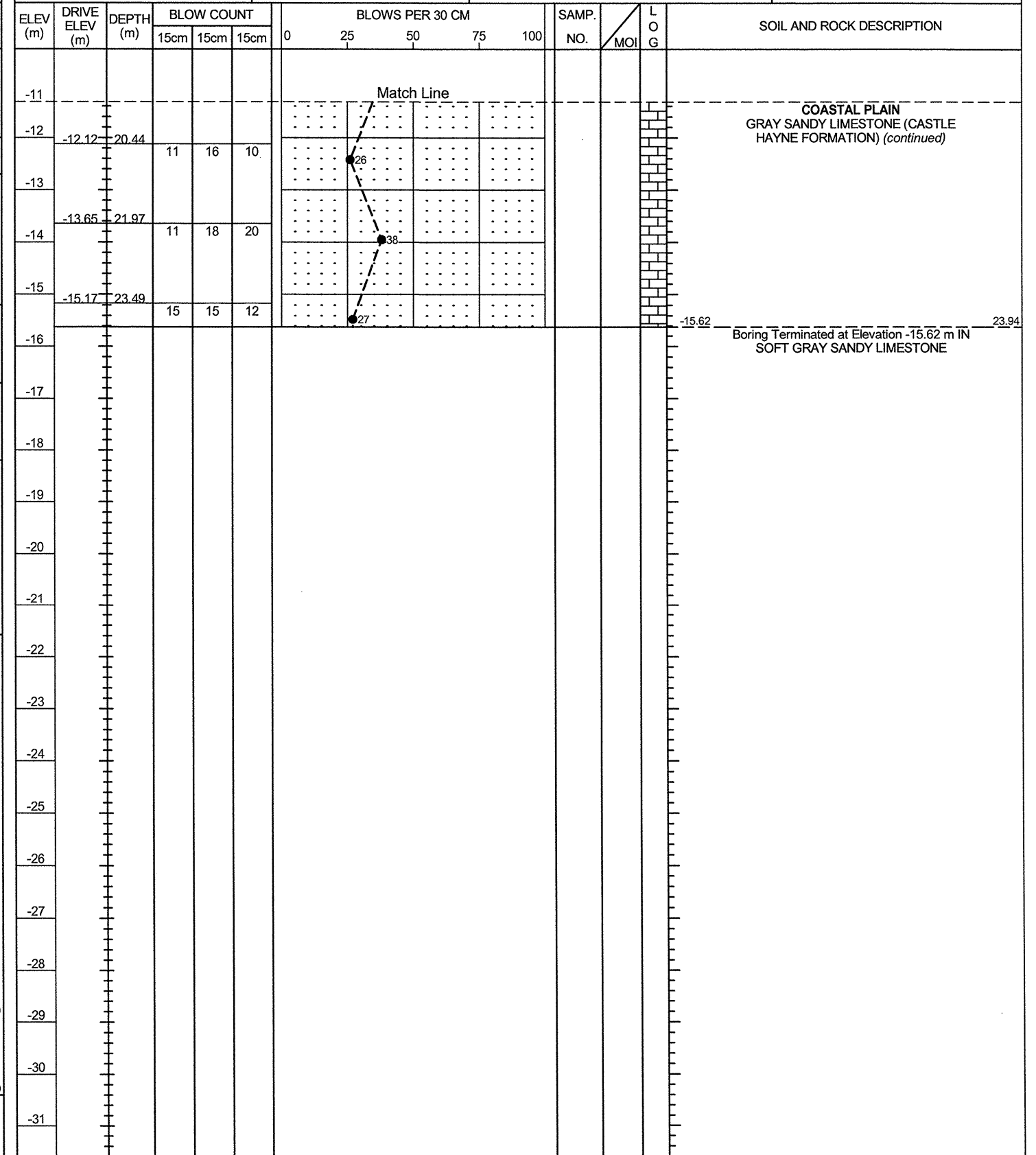
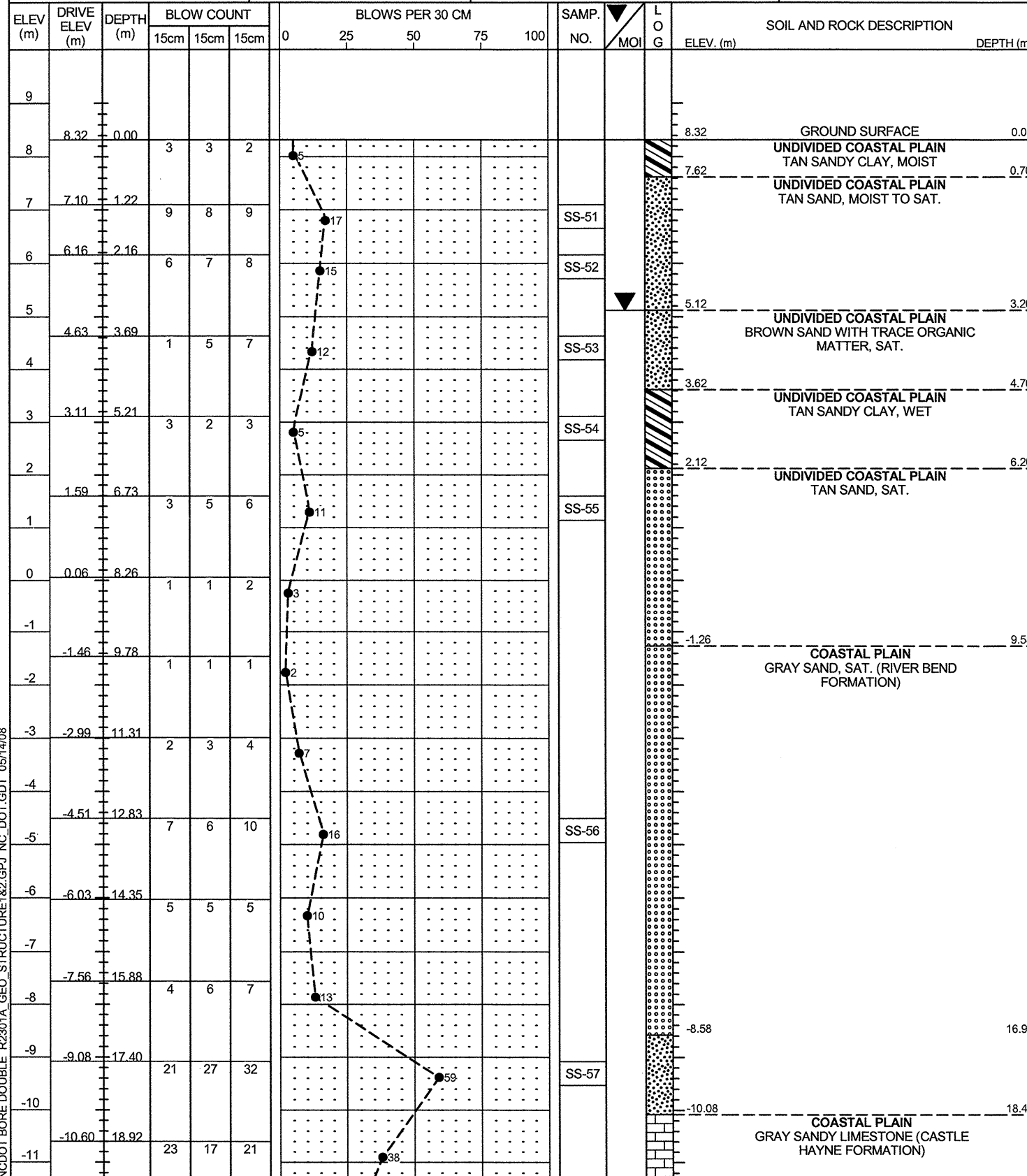
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SITE DESCRIPTION STRUCTURE NO. 1 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. B2-A	STATION 18+51.3	OFFSET 18.0m LT	ALIGNMENT -L-
COLLAR ELEV. 9.58 m	TOTAL DEPTH 24.13 m	NORTHING 148,144.3	EASTING 774,641.6
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/27/08	COMP. DATE 03/27/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 17.1 m



NCDOT BORE DOUBLE R2301A GEO_STRUCTURE1&2.GPJ NC_DOT_GDT 05/14/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/ CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 2 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. B2-B	STATION 18+40.8	OFFSET 16.0m RT	ALIGNMENT -L-
COLLAR ELEV. 8.32 m	TOTAL DEPTH 23.94 m	NORTHING 148,110.1	EASTING 774,651.6
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/27/08	COMP. DATE 03/27/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 18.4 m

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/ CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 2 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. B2-B	STATION 18+40.8	OFFSET 16.0m RT	ALIGNMENT -L-
COLLAR ELEV. 8.32 m	TOTAL DEPTH 23.94 m	NORTHING 148,110.1	EASTING 774,651.6
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/27/08	COMP. DATE 03/27/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 18.4 m



NCDOT BORE DOUBLE R2301A_GEO_STRUCTURE1&2.GPJ NC_DOT_GDT_05/14/08

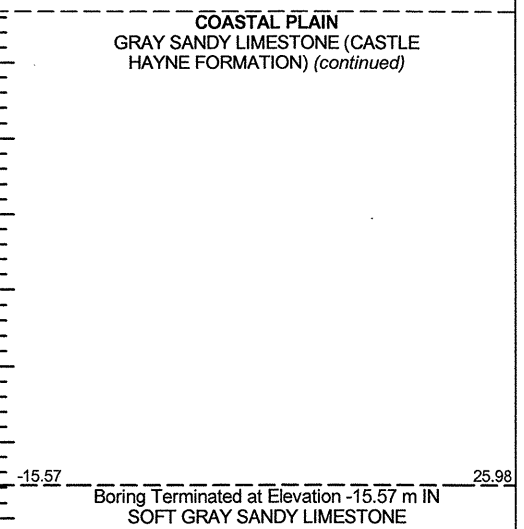
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SITE DESCRIPTION STRUCTURE NO. 1 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. EB2-A	STATION 18+65.0	OFFSET 18.0m LT	ALIGNMENT -L-
COLLAR ELEV. 10.41 m	TOTAL DEPTH 25.98 m	NORTHING 148,151.8	EASTING 774,653.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/26/08	COMP. DATE 03/26/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 17.4 m

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 1 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. EB2-A	STATION 18+65.0	OFFSET 18.0m LT	ALIGNMENT -L-
COLLAR ELEV. 10.41 m	TOTAL DEPTH 25.98 m	NORTHING 148,151.8	EASTING 774,653.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/26/08	COMP. DATE 03/26/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 17.4 m

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						
11																
	10.41	0.00												10.41	GROUND SURFACE	0.00
10			1	1	2										UNDIVIDED COASTAL PLAIN TAN SANDY SILT, MOIST	
9	9.25	1.16	3	2	4											
8	7.73	2.68	4	5	4									8.21	UNDIVIDED COASTAL PLAIN TAN SANDY CLAY, MOIST	2.20
7																
6	6.20	4.21	3	2	3									6.71	UNDIVIDED COASTAL PLAIN TAN CLAYEY SAND, MOIST TO SAT.	3.70
5	4.68	5.73	3	3	1									5.17	UNDIVIDED COASTAL PLAIN TAN SAND, SAT.	5.24
4																
3	3.16	7.25	4	3	3									3.61	UNDIVIDED COASTAL PLAIN BROWN SANDY CLAY, WET	6.80
2	1.64	8.77	1	1	1											
1	0.11	10.30	1	1	3									0.60	COASTAL PLAIN GRAY SAND, SAT. (RIVER BEND FORMATION)	9.81
0																
-1	-1.41	11.82	3	4	10											
-2																
-3	-2.93	13.34	7	10	11											
-4																
-5	-4.45	14.86	5	7	7											
-6	-5.98	16.39	2	3	4											
-7																
-8	-7.51	17.92	4	3	5											
-9	-9.03	19.44	25	43	40											

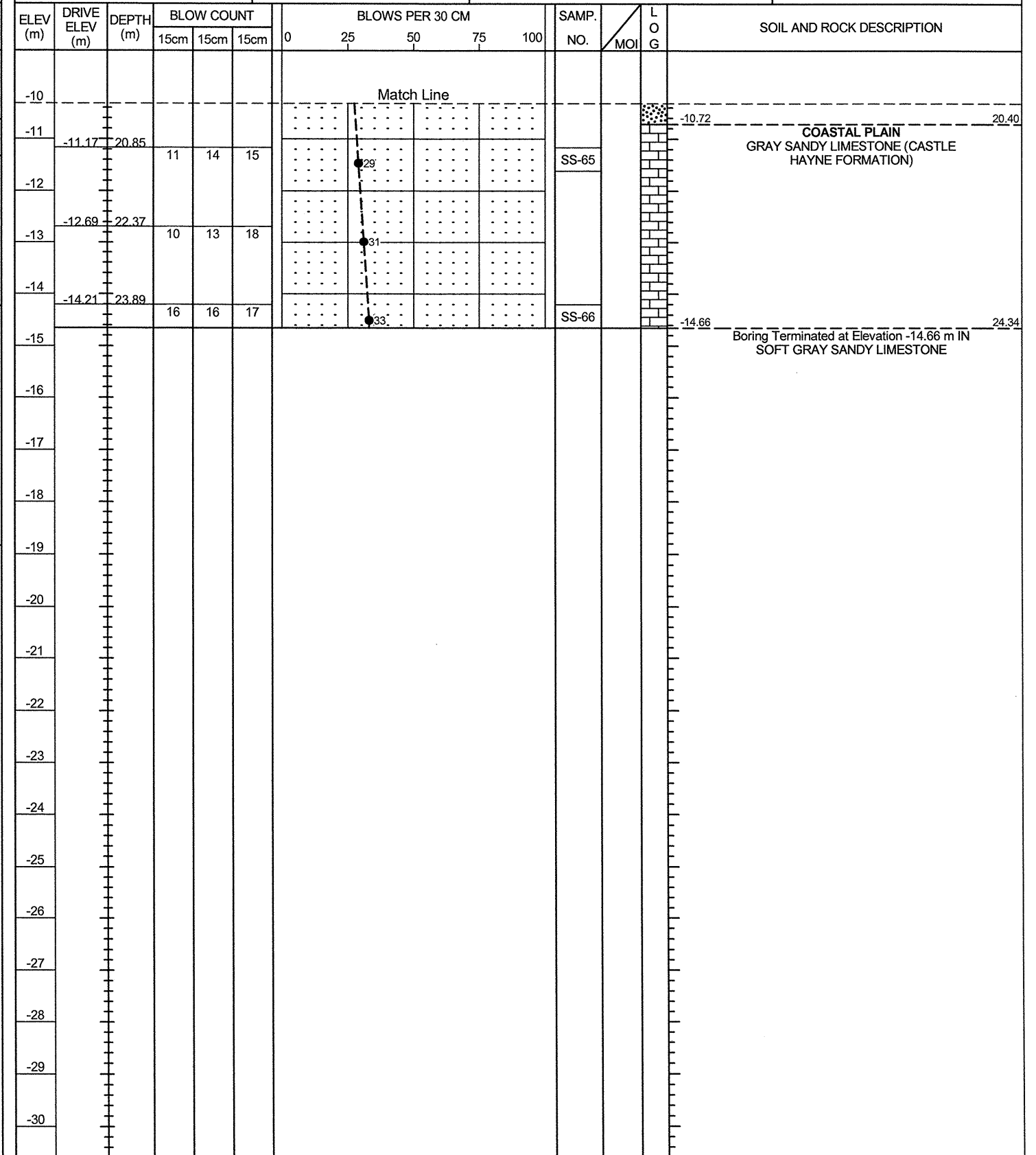
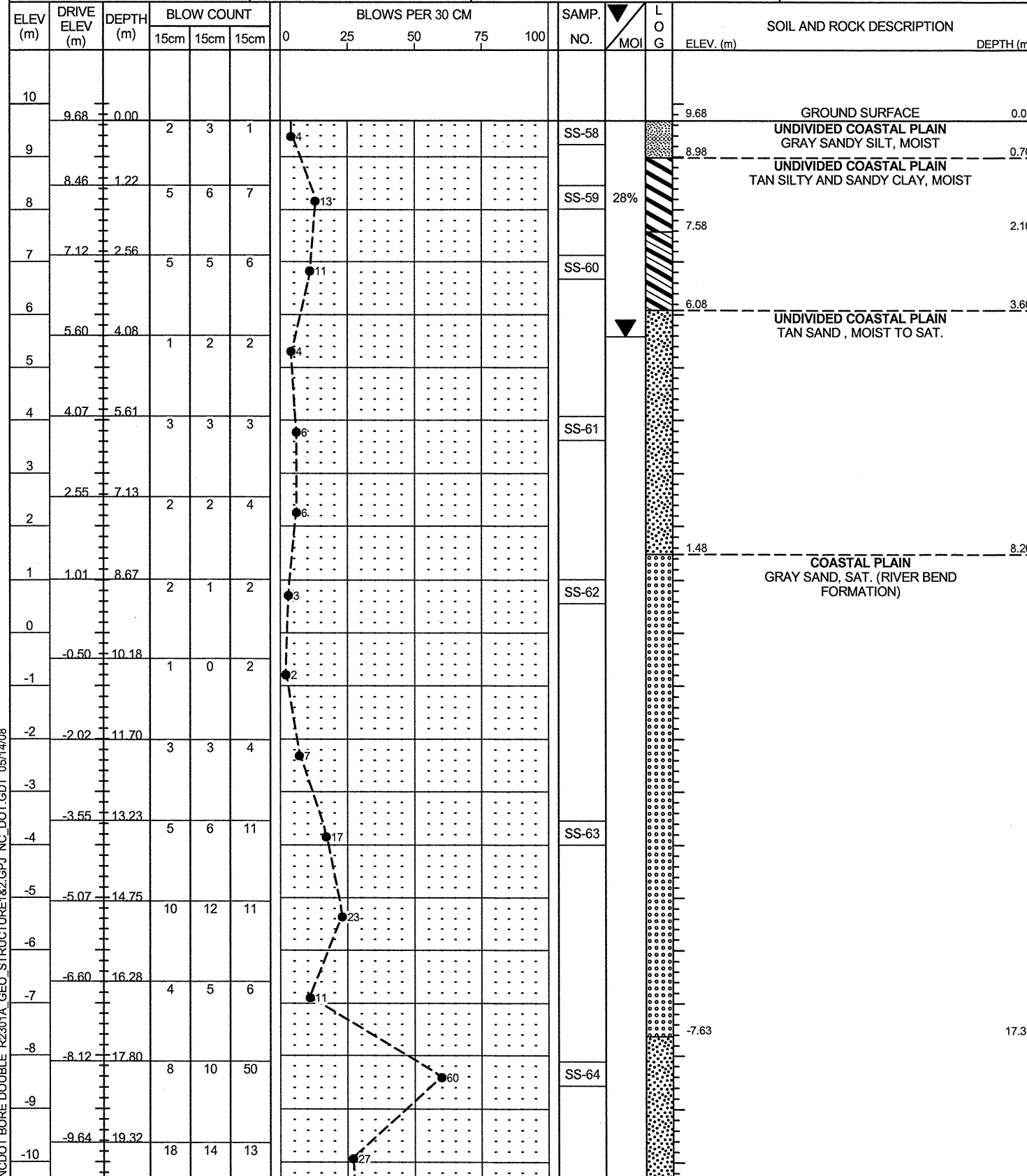
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (m)	
			15cm	15cm	15cm	0	25	50	75	100					
-9															
-10															
	-10.56	20.97	57	13	80										
-11															
-12															
	-12.08	22.49	10	13	16										
-13															
-14															
	-13.60	24.01	27	18	20										
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NCDOT BORE DOUBLE R2301A_GEO_STRUCTURE1&2.GPJ NC_DOT_GDT_0514/08



PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/ CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 2 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. EB2-B	STATION 18+55.0	OFFSET 17.0m RT	ALIGNMENT -L-
COLLAR ELEV. 9.68 m	TOTAL DEPTH 24.34 m	NORTHING 148,117.1	EASTING 774,664.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/31/08	COMP. DATE 03/31/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 20.4 m

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY JONES/ CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 2 ON -L- (US 17 BYPASS) OVER DEEP GULLY			GROUND WTR (m)
BORING NO. EB2-B	STATION 18+55.0	OFFSET 17.0m RT	ALIGNMENT -L-
COLLAR ELEV. 9.68 m	TOTAL DEPTH 24.34 m	NORTHING 148,117.1	EASTING 774,664.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/31/08	COMP. DATE 03/31/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 20.4 m



NCDOT BORE DOUBLE R2301A_GEO_STRUCTURE1&2.GPJ NC_DOT_GDT_05/14/08

Structure No.s 1 and 2 on -L- (US 17 Bypass) over Deep Gulley

HOLE #	SAMPLE #	PASS 2mm	PASS 425µm	PASS 75µm	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST. ORG.
EB1-A	SS-1	100	99	87	2.0	16.3	31.2	50.5	49	30	A-7-6(27)	1.10-1.55	27.5
	SS-2	100	93	46	16.3	41.0	10.4	32.3	31	16	A-6(4)	2.62-3.07	
	SS-3	100	95	39	16.8	48.6	8.4	26.2	24	8	A-4(0)	5.67-6.12	
	SS-4	100	98	6	31.1	63.7	1.2	4.0	19	NP	A-3(0)	7.19-7.64	
	SS-5	40	19	6	63.6	23.4	7.0	6.1	16	NP	A-1-a(0)	10.24-10.57	
	SS-6	100	99	27	2.8	72.3	12.8	12.1	18	NP	A-2-4(0)	11.77-12.22	
	SS-7	100	100	6	1.4	94.3	2.2	2.0	19	NP	A-3(0)	14.81-15.26	
	SS-8	69	39	18	51.5	25.6	10.8	12.1	17	NP	A-1-b(0)	17.86-18.31	
EB1-B	SS-9	100	100	88	1.6	17.2	51.0	30.3	24	5	A-4(3)	0.30-0.45	
	SS-10	97	96	85	2.0	14.9	24.5	58.5	43	20	A-7-6(18)	1.10-1.55	
	SS-11	100	97	16	11.8	74.4	2.7	11.1	17	NP	A-2-4(0)	5.67-6.12	
	SS-12	100	98	5	32.1	63.5	1.4	3.0	14	NP	A-3(0)	8.72-9.17	
	SS-13	100	98	6	5.9	90.2	0.9	3.0	25	NP	A-3(0)	11.77-12.22	
	SS-14	100	98	13	6.5	83.8	4.7	5.0	24	NP	A-2-4(0)	16.34-16.79	
	SS-15	99	89	25	13.9	64.8	11.2	10.1	17	NP	A-2-4(0)	17.86-18.31	
	SS-16	46	26	14	53.9	28.1	10.0	8.1	16	NP	A-1-a(0)	20.90-21.35	
B1-B	SS-17	92	92	78	1.4	19.2	24.9	54.5	49	26	A-7-6(21)	1.03-1.48	
	SS-18	99	97	52	8.1	42.2	11.4	38.3	32	16	A-6(5)	2.56-3.01	
	SS-19	99	86	24	31.1	46.6	4.1	18.2	20	3	A-2-4(0)	4.08-4.53	
	SS-20	99	88	5	51.2	44.7	1.1	3.0	13	NP	A-3(0)	5.61-6.06	
	SS-21	100	88	9	31.0	61.6	3.4	4.0	15	NP	A-3(0)	8.66-9.11	
	SS-22	100	100	21	1.2	80.5	10.2	8.1	20	NP	A-2-4(0)	10.18-10.63	
	SS-23	100	100	10	2.7	89.2	4.0	4.0	21	NP	A-3(0)	14.75-15.20	
	SS-24	93	71	15	30.0	55.4	8.6	6.1	18	NP	A-2-4(0)	19.32-19.77	
B1-A	SS-25	100	98	78	4.4	24.2	24.9	46.4	41	23	A-7-6(17)	0.88-1.33	
	SS-26	100	99	57	4.8	41.8	13.0	40.4	40	23	A-6(10)	2.41-2.86	
	SS-27	100	79	16	48.7	36.3	1.8	13.1	18	NP	A-2-4(0)	3.93-4.38	
	SS-28	96	86	28	19.0	55.7	7.2	18.2	22	3	A-2-4(0)	5.46-5.91	
	SS-29	100	98	5	40.0	54.9	1.1	4.0	17	NP	A-3(0)	6.98-7.43	
	SS-30	94	78	27	24.4	50.5	17.1	8.1	20	NP	A-2-4(0)	10.03-10.48	
	SS-31	100	100	12	3.7	87.0	4.2	5.0	23	NP	A-2-4(0)	11.55-12.00	
	SS-32	100	99	11	6.6	85.6	3.8	4.0	23	NP	A-2-4(0)	16.12-16.57	
	SS-33	100	98	15	4.1	83.9	6.0	6.1	20	NP	A-2-4(0)	19.17-19.62	
EB2-A	SS-34	100	88	37	28.7	36.3	6.8	28.3	27	13	A-6(1)	2.68-3.13	
	SS-35	98	77	30	44.6	26.0	9.2	20.2	28	13	A-2-6(0)	4.21-4.66	
	SS-36	100	81	12	49.4	39.9	1.6	9.1	18	NP	A-2-4(0)	5.73-6.18	
	SS-37	98	94	36	22.6	44.4	8.9	24.2	24	11	A-6(0)	7.25-7.70	

Structure No.s 1 and 2 on -L- (US 17 Bypass) over Deep Gulley

HOLE #	SAMPLE #	PASS 2mm	PASS 425µm	PASS 75µm	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST. ORG.
EB2-A	SS-38	100	78	7	61.5	32.1	1.4	5.0	21	NP	A-3(0)	10.30-10.75	
	SS-39	100	98	6	4.3	91.5	0.1	4.0	24	NP	A-3(0)	13.34-13.79	
	SS-40	75	47	19	45.5	33.1	9.3	12.1	20	NP	A-1-b(0)	17.92-18.37	
	SS-41	100	99	12	1.8	89.4	1.7	7.1	19	NP	A-2-4(0)	19.44-19.89	
	SS-42	82	49	16	50.9	32.5	5.5	11.1	17	NP	A-1-b(0)	24.01-24.46	
B2-A	SS-43	100	99	91	1.6	13.9	29.9	54.5	39	17	A-6(16)	0.30-0.45	
	SS-44	99	98	83	1.8	20.8	16.8	60.6	54	32	A-7-6(28)	1.19-1.64	
	SS-45	100	94	40	26.5	34.1	3.0	36.4	30	13	A-6(2)	2.35-2.80	
	SS-46	100	89	17	24.6	58.6	1.6	15.2	19	NP	A-2-4(0)	5.40-5.85	
	SS-47	100	96	5	45.6	49.8	0.6	4.0	18	NP	A-3(0)	8.44-8.89	
	SS-48	100	99	5	1.6	95.4	1.0	2.0	19	NP	A-3(0)	11.49-11.94	
	SS-49	99	92	22	10.7	70.5	2.6	16.2	18	NP	A-2-4(0)	17.58-18.03	
	SS-50	74	30	11	67.7	19.6	0.6	12.1	20	NP	A-1-b(0)	20.63-21.08	
B2-B	SS-51	100	88	35	30.3	36.6	2.8	30.3	25	10	A-2-4(0)	1.22-1.67	
	SS-52	100	93	31	28.9	41.4	1.4	28.3	21	5	A-2-4(0)	2.16-2.61	
	SS-53	100	85	14	45.1	41.7	2.1	11.1	22	NP	A-2-4(0)	3.69-4.14	3.0
	SS-54	99	91	43	16.6	43.6	5.5	34.3	29	12	A-6(2)	5.21-5.66	
	SS-55	100	97	7	31.8	61.1	3.0	4.0	18	NP	A-3(0)	6.73-7.18	
	SS-56	100	99	4	3.1	93.7	0.1	3.0	21	NP	A-3(0)	12.83-13.28	
	SS-57	100	97	14	6.5	82.0	2.4	9.1	19	NP	A-2-4(0)	17.40-17.85	
EB2-B	SS-58	100	99	86	3.6	15.6	40.4	40.4	25	6	A-4(4)	0.30-0.45	
	SS-59	100	99	83	2.0	18.2	13.1	66.7	62	39	A-7-6(35)	1.22-1.67	28.4
	SS-60	100	95	37	29.9	34.3	3.4	32.3	27	12	A-6(1)	2.56-3.01	
	SS-61	100	78	15	41.6	42.8	1.4	14.1	18	NP	A-2-4(0)	5.61-6.06	
	SS-62	100	96	6	18.7	75.6	2.7	3.0	15	NP	A-3(0)	8.67-9.12	
	SS-63	100	98	5	4.2	92.5	0.2	3.0	23	NP	A-3(0)	13.23-13.68	
	SS-64	98	89	20	13.5	70.1	4.2	12.1	16	NP	A-2-4(0)	17.80-18.25	
	SS-65	85	40	16	62.0	22.2	1.6	14.1	25	NP	A-1-b(0)	20.85-21.30	
	SS-66	84	43	17	57.6	25.1	5.3	12.1	20	NP	A-1-b(0)	23.89-24.34	



**FIELD
 SCOUR REPORT**

WBS: 34414.1.1 TIP: R-2301A COUNTY: JONES

DESCRIPTION(1): BRIDGE ON -L- (US 17 NEW BERN BYPASS) OVER DEEP GULLY

EXISTING BRIDGE

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

Bridge No.: NA Length: NA Total Bents: NA Bents in Channel: NA Bents in Floodplain: NA
 Foundation Type: NA

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: NA

Interior Bents: NA

Channel Bed: NONE NOTED

Channel Bank: UNDERCUTTING OF BANK AT BOTH ENDS OF PROPOSED BRIDGE LOCATION

EXISTING SCOUR PROTECTION

Type(3): NA

Extent(4): NA

Effectiveness(5): NA

Obstructions(6): NUMEROUS LOGS FOUND WITHIN CHANNEL

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): SILT WITH LITTLE ORGANIC MATTER

Channel Bank Material(8): CLAY SS-10, SS-25

Channel Bank Cover(9): TREES AND SHRUBS

Floodplain Width(10): 45m (+/-)

Floodplain Cover(11): CLEAR CUT, TREE STUMPS

Stream is(12): Aggrading Degrading _____ Static _____

Channel Migration Tendency(13): MODERATE TO THE WEST/SOUTHWEST

Observations and Other Comments: NO FLOW AT TIME OF INVESTIGATION, NUMEROUS FALLEN TREES FOUND IN CHANNEL

DESIGN SCOUR ELEVATIONS(14) Feet _____ Meters

	B1	B2											
100yr	5.00	NONE											
500yr	4.65	NONE											

Comparison of DSE to Hydraulics Unit theoretical scour:
 GEOTECHNICAL ANALYSIS AGREES WITH A MAXIMUM THEORETICAL SCOUR ELEVATION OF 5.00 M AS OUTLINED IN THE BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Sample No.													
Retained #4													
Passed #10													
Passed #40													
Passed #200													
Coarse Sand													
Fine Sand													
Silt													
Clay													
LL													
PI													
AASHTO													
Station													
Offset													
Depth													

See Sheet 8
 "Soil Test Results",
 for samples:
 SS-10, SS-25 (CHANNEL BANK)

Reported by: *Jane S.* Date: 5/7/2008



STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL SHEETS
N.C.	34414.1.1 (R-2301A)	1	11

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34414.1.1 I.D. NO. R-2301A

COUNTY CRAVEN

PROJECT DESCRIPTION US 17 (NEW BERN BYPASS) FROM US 17
SOUTH OF NEW BERN TO US 70

SITE DESCRIPTION STRUCTURES 3 AND 4 ON -L- (US 17 BYPASS)
OVER -Y3- (SR 1224) AT -L- STATION 30+04.517

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	PROFILES
6	CROSS SECTIONS
7-10	BORE LOG(S)
11	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 (UN-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

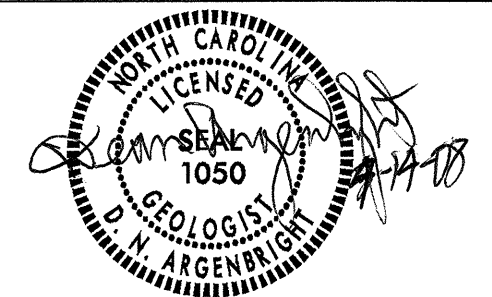
S&ME PERSONNEL

INVESTIGATED BY F.M. WESCOTT III

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE APRIL, 2008



PROJECT: 34414.1.1 ID: R-2301A

DRAWN BY: C.P. TURNER, 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



Main content table with sections: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, EQUIPMENT USED ON SUBJECT PROJECT, ROCK HARDNESS, FRACTURE SPACING, BEDDING, INDURATION.

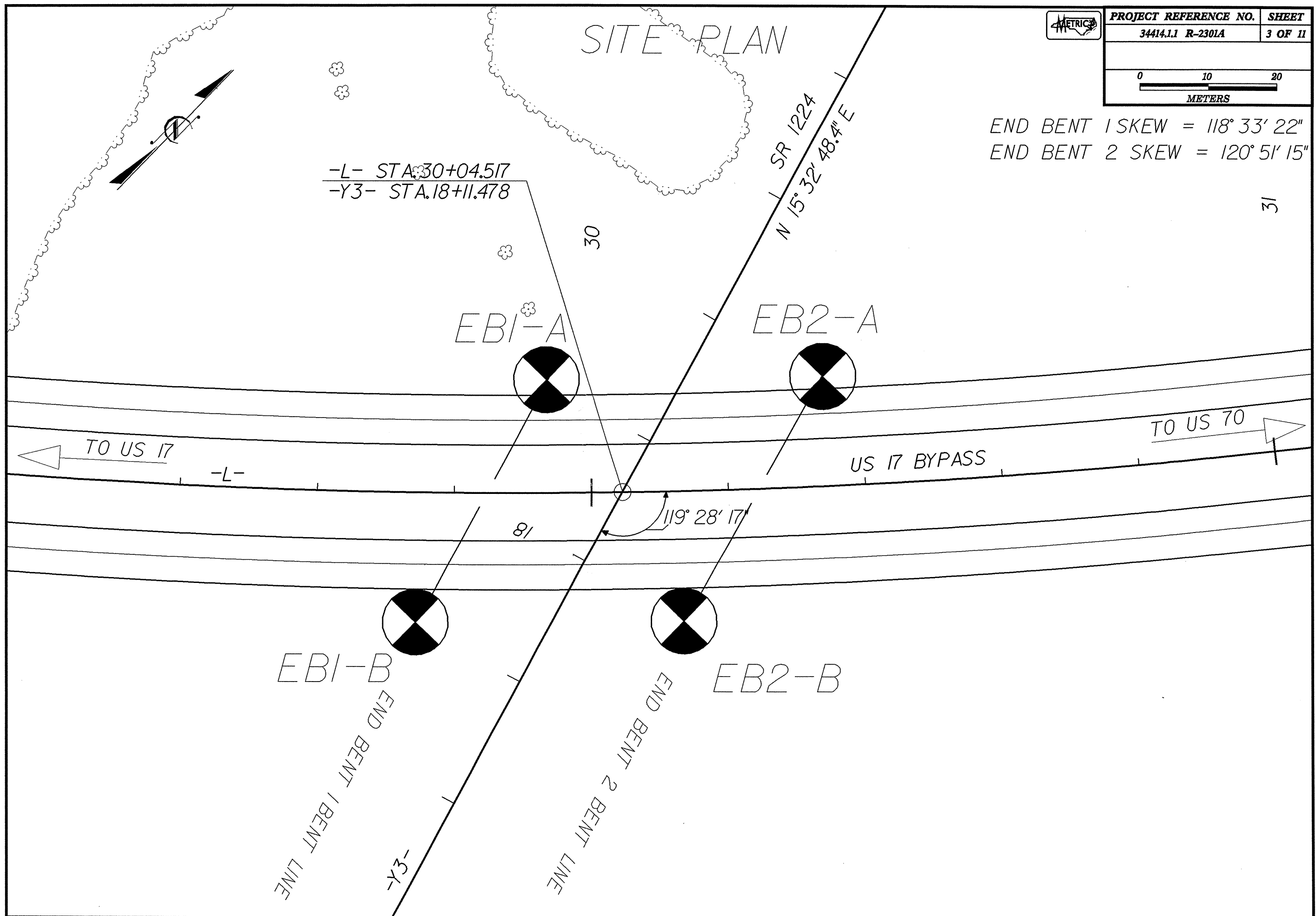
SITE PLAN



PROJECT REFERENCE NO.	SHEET
34414.1.1 R-2301A	3 OF 11
0 10 20 METERS	

END BENT 1 SKEW = 118° 33' 22"
END BENT 2 SKEW = 120° 51' 15"

31



-L- STA 30+04.517
-Y3- STA 18+11.478

EB1-A

EB2-A

TO US 17

TO US 70

US 17 BYPASS

119° 28' 17"

EB1-B

EB2-B

END BENT 1 BENT LINE

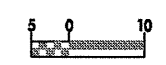
END BENT 2 BENT LINE

-L-

-Y3-



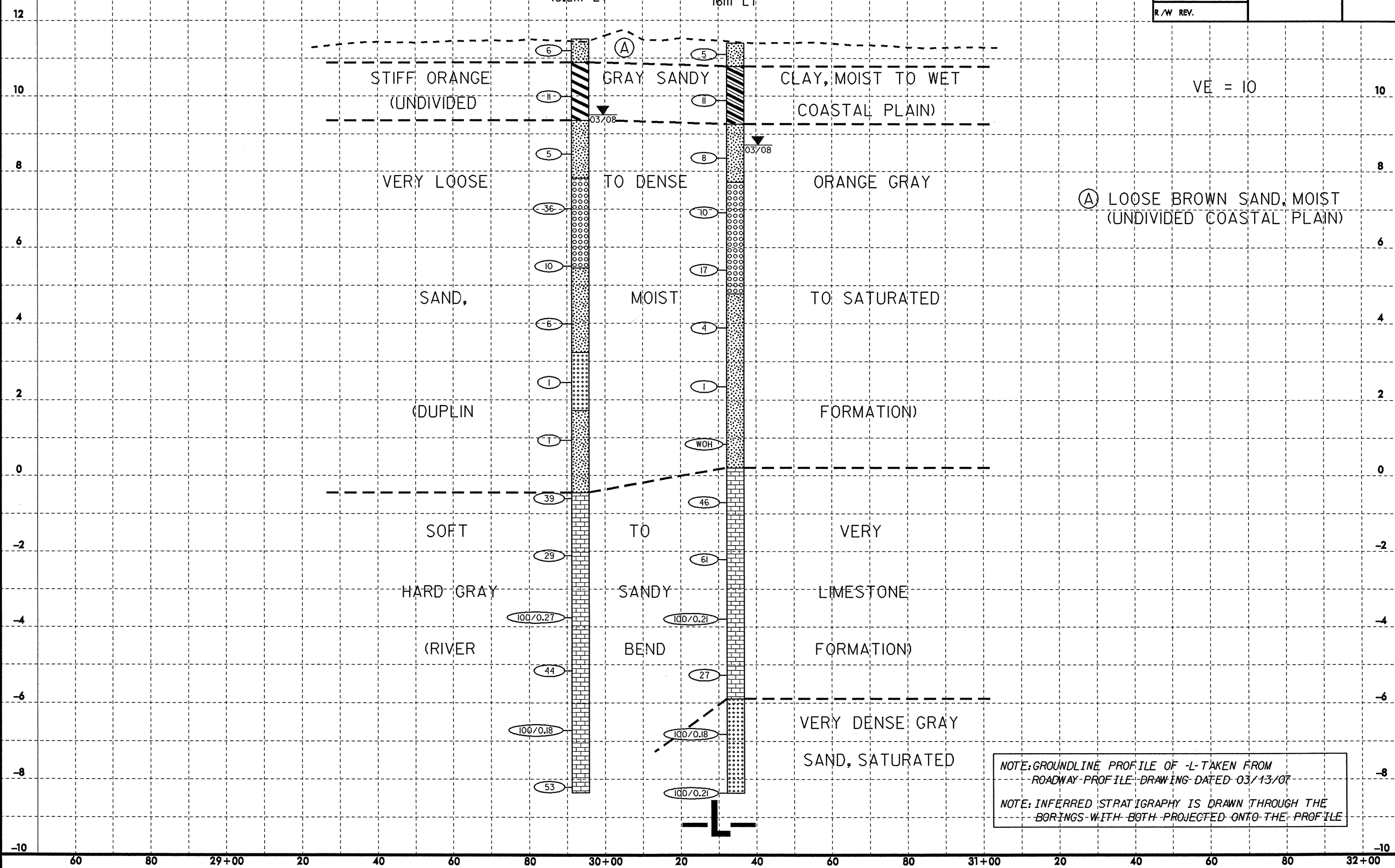
PROJECT REFERENCE NO.	R-2301A	SHEET NO.	4 OF 11
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
CONST. REV.			
R/W REV.			



STRUCTURE 3
PROFILE THROUGH LEFT LANE BORINGS PROJECTED ALONG -L-

EBI-A
29+93.5
16.5m LT

EB2-A
30+34.5
16m LT



VE = 10

(A) LOOSE BROWN SAND, MOIST
(UNDIVIDED COASTAL PLAIN)

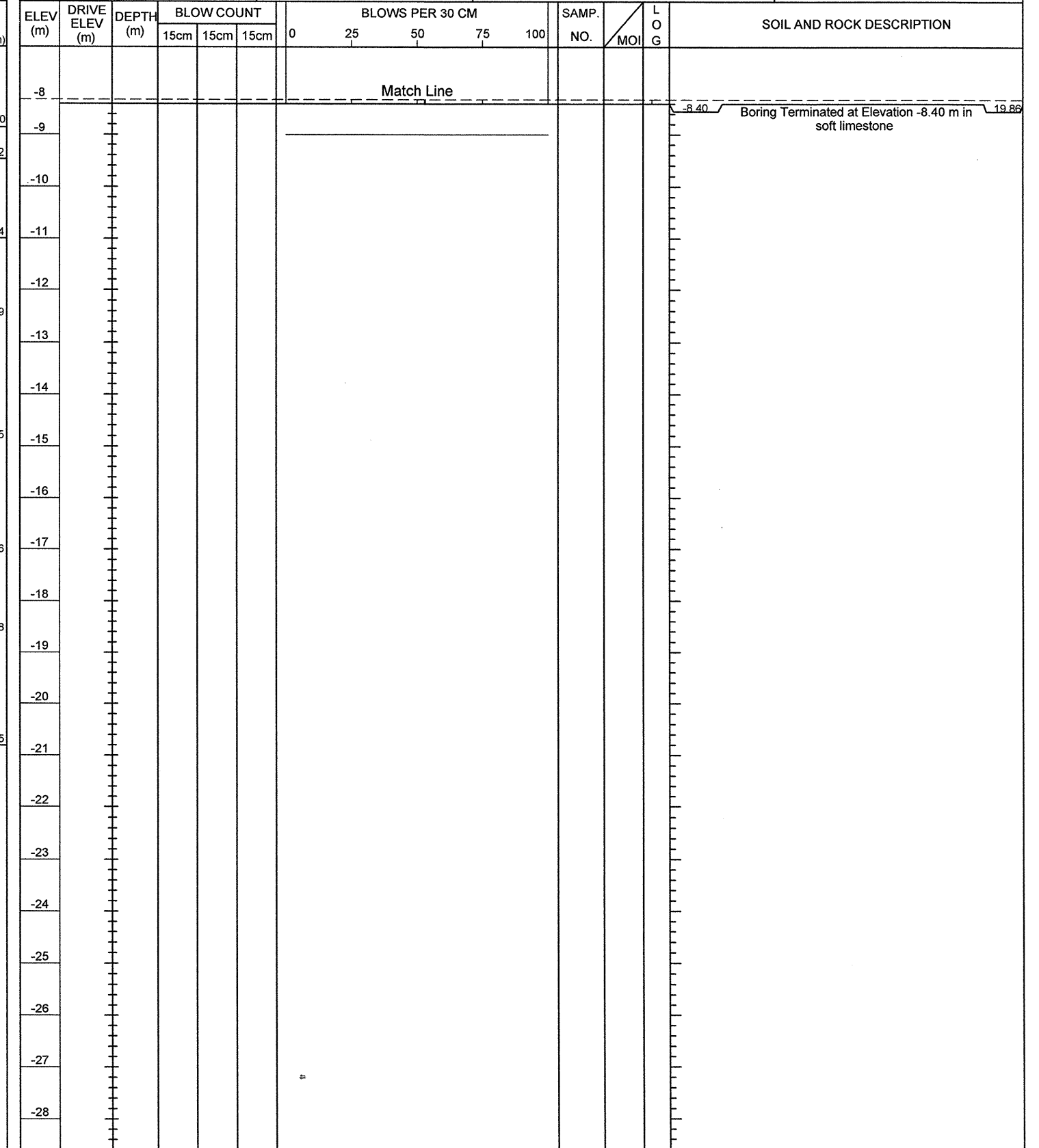
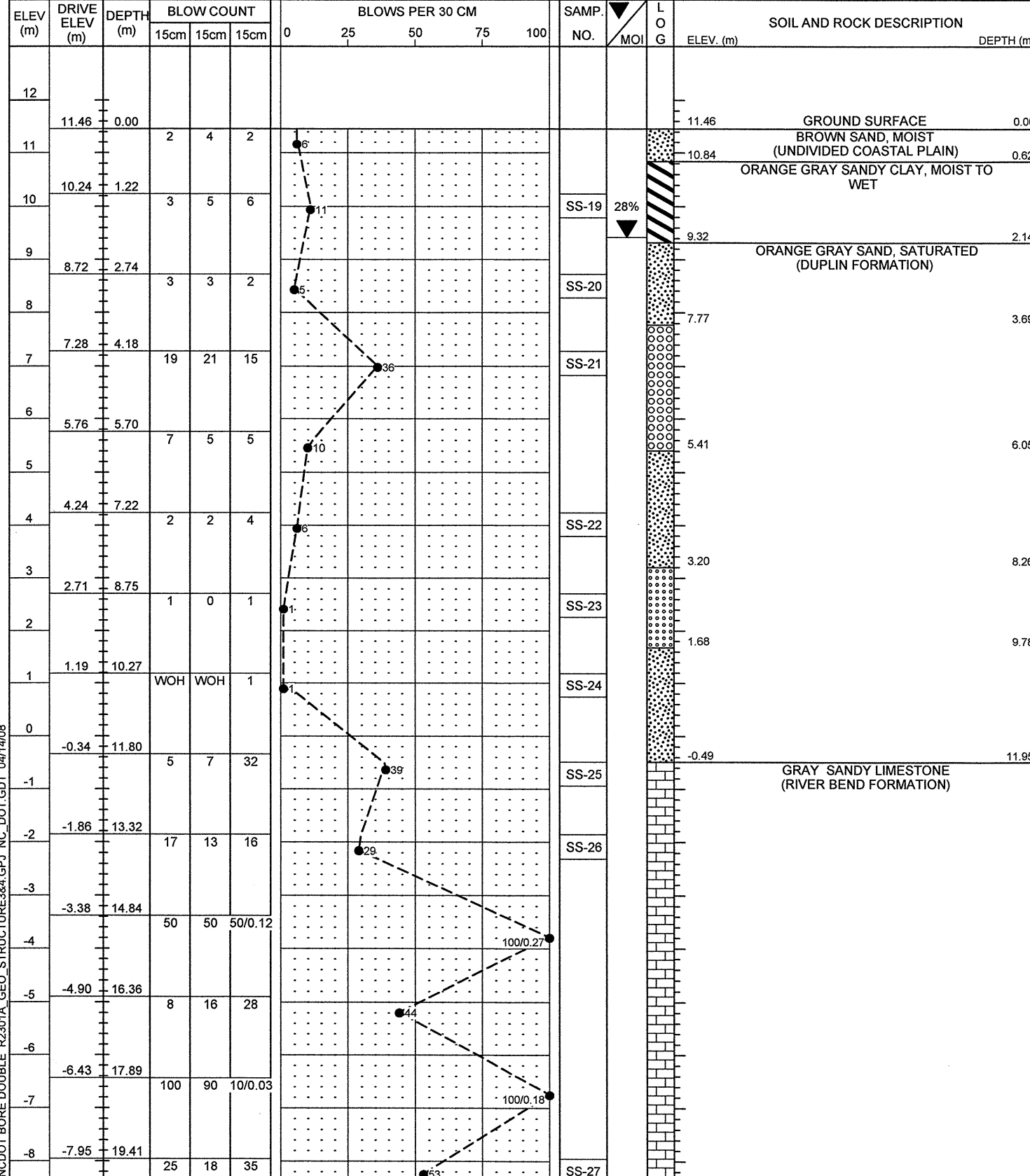
NOTE: GROUNDLINE PROFILE OF -L- TAKEN FROM
ROADWAY PROFILE DRAWING DATED 03/13/07

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

I:\APR-2008_15148
 restructure\city\125019833\br-g0003\0001\cadd\geotech\ar\ar\sub v-2301a-geo-br-g3-a-pf.rdg
 6/10/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE 3 ON -L- (US 17 BYPASS) OVER -Y3- (SR 1224)			GROUND WTR (m)
BORING NO. EB1-A	STATION 29+93.5	OFFSET 16.5m LT	ALIGNMENT -L-
COLLAR ELEV. 11.46 m	TOTAL DEPTH 19.86 m	NORTHING 148,730.0	EASTING 775,614.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/19/08	COMP. DATE 03/19/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 12.0 m

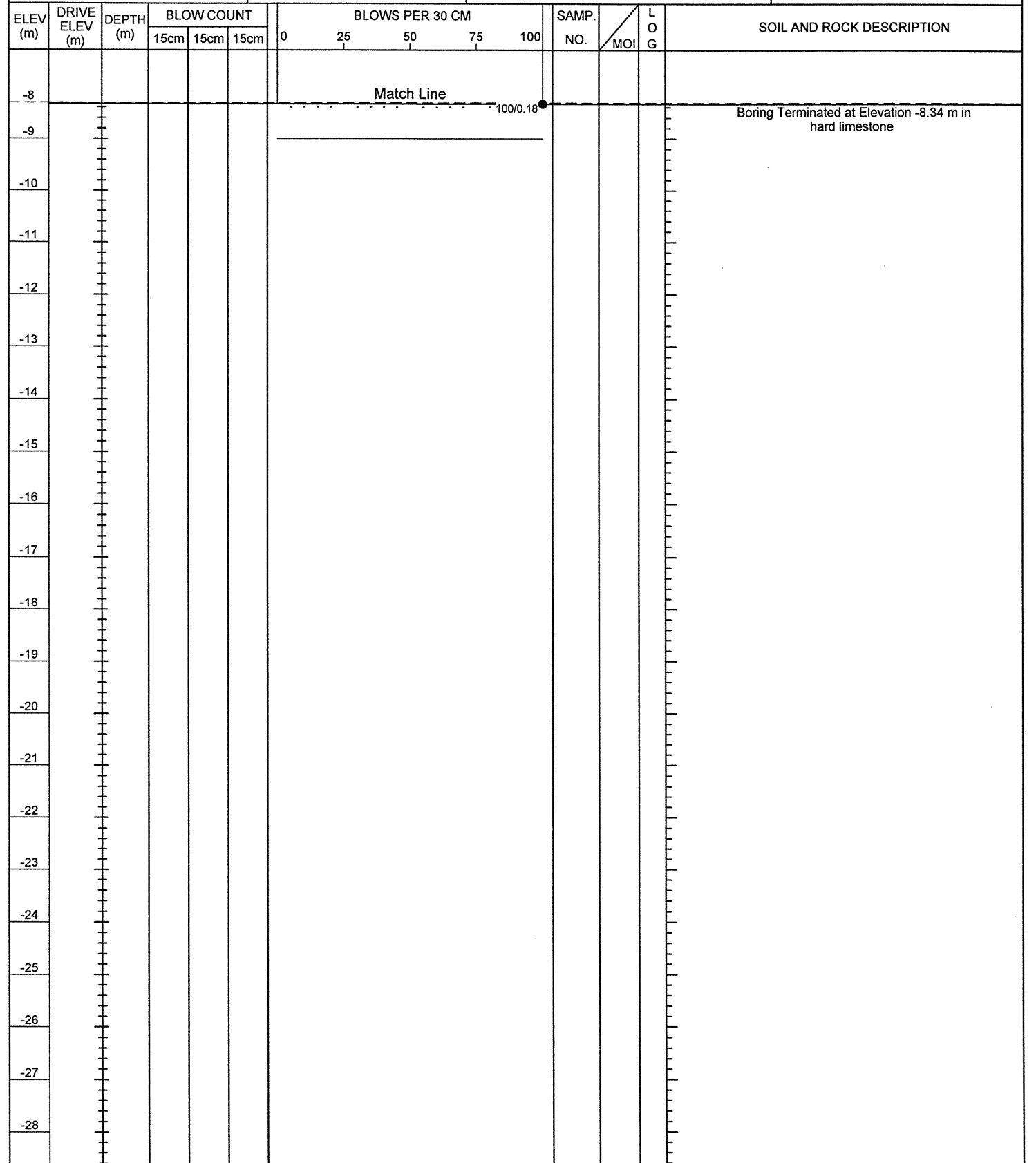
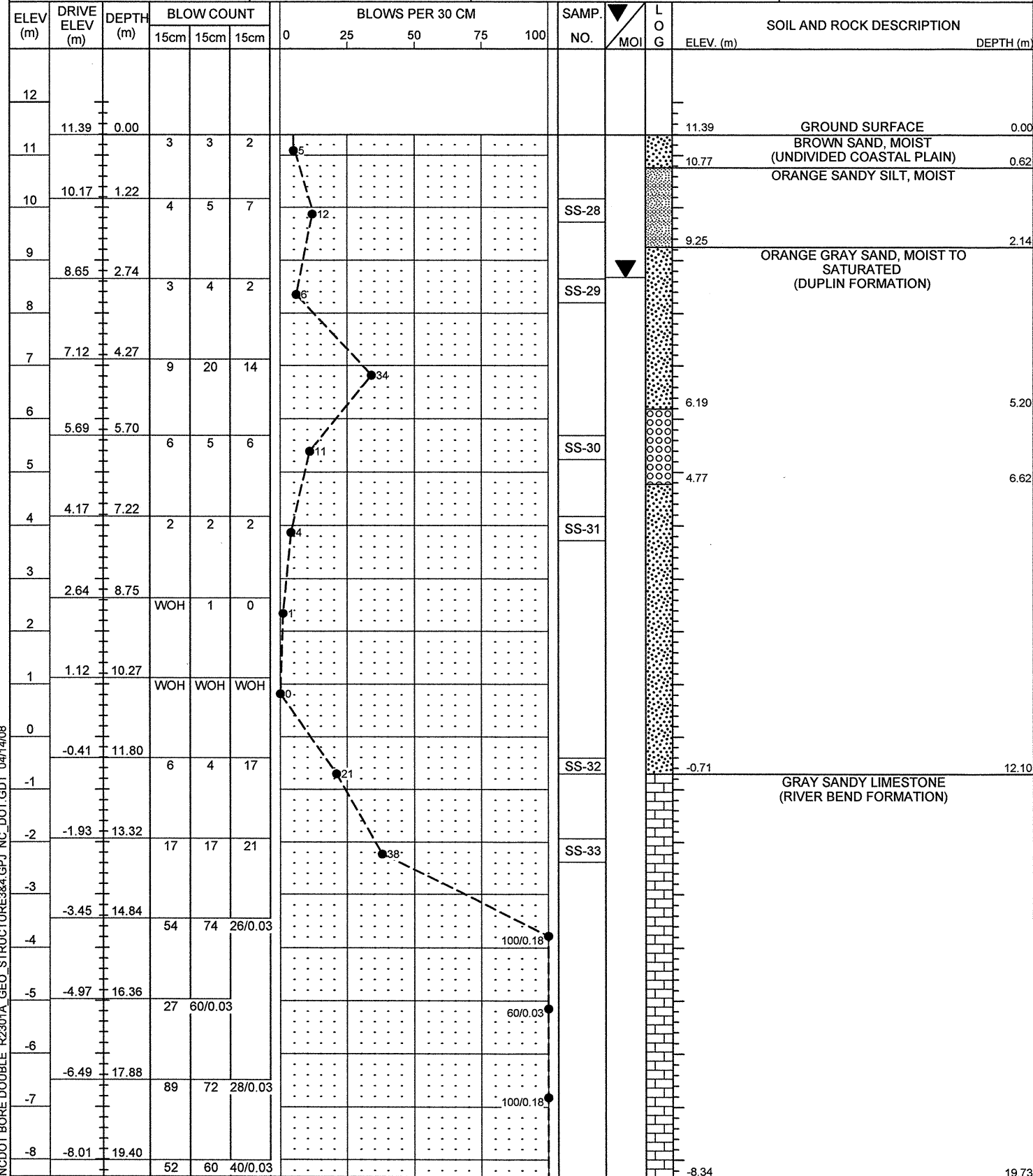
PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE 3 ON -L- (US 17 BYPASS) OVER -Y3- (SR 1224)			GROUND WTR (m)
BORING NO. EB1-A	STATION 29+93.5	OFFSET 16.5m LT	ALIGNMENT -L-
COLLAR ELEV. 11.46 m	TOTAL DEPTH 19.86 m	NORTHING 148,730.0	EASTING 775,614.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/19/08	COMP. DATE 03/19/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 12.0 m



NC DOT BORE DOUBLE R2301A GEO_STRUCTURE3&4.GPJ NC_DOT_GDT_04/14/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE 4 ON -L- (US 17 BYPASS) OVER -Y3- (SR 1224)			GROUND WTR (m)
BORING NO. EB1-B	STATION 29+74.5	OFFSET 19.0m RT	ALIGNMENT -L-
COLLAR ELEV. 11.39 m	TOTAL DEPTH 19.73 m	NORTHING 148,692.0	EASTING 775,625.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/19/08	COMP. DATE 03/19/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 12.1 m

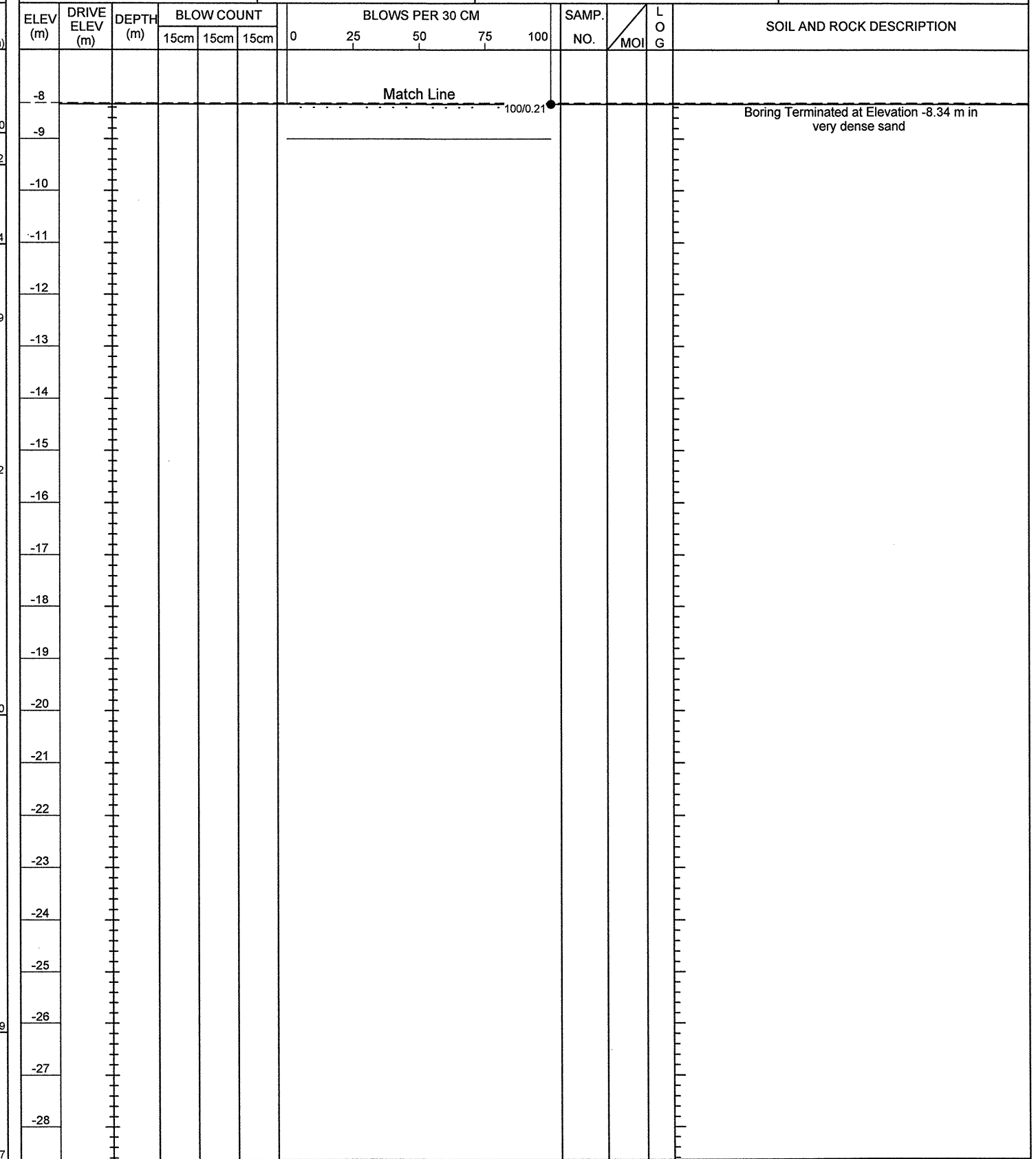
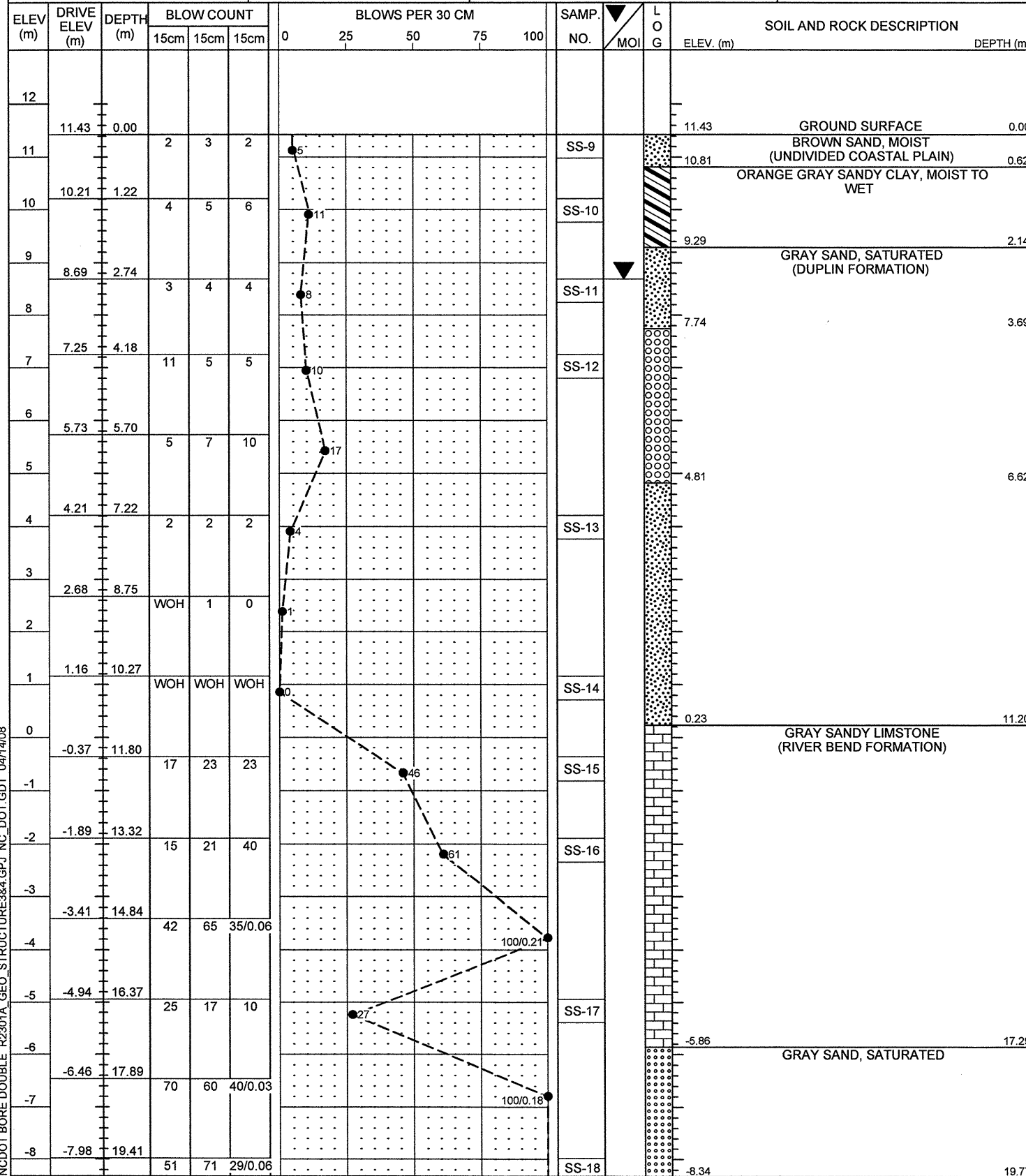
PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE 4 ON -L- (US 17 BYPASS) OVER -Y3- (SR 1224)			GROUND WTR (m)
BORING NO. EB1-B	STATION 29+74.5	OFFSET 19.0m RT	ALIGNMENT -L-
COLLAR ELEV. 11.39 m	TOTAL DEPTH 19.73 m	NORTHING 148,692.0	EASTING 775,625.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/19/08	COMP. DATE 03/19/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 12.1 m



NCDOT BORE DOUBLE R2301A GEO_STRUCTURE3&4.GPJ NC_DOT.GDT 04/14/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION STRUCTURE 3 ON -L- (US 17 BYPASS) OVER -Y3- (SR 1224)				GROUND WTR (m)
BORING NO. EB2-A	STATION 30+34.5	OFFSET 16.0m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 11.43 m	TOTAL DEPTH 19.77 m	NORTHING 148,759.0	EASTING 775,642.0	24 HR. 2.74
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic		
START DATE 03/18/08	COMP. DATE 03/18/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 11.2 m	

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION STRUCTURE 3 ON -L- (US 17 BYPASS) OVER -Y3- (SR 1224)				GROUND WTR (m)
BORING NO. EB2-A	STATION 30+34.5	OFFSET 16.0m LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 11.43 m	TOTAL DEPTH 19.77 m	NORTHING 148,759.0	EASTING 775,642.0	24 HR. 2.74
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic		
START DATE 03/18/08	COMP. DATE 03/18/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 11.2 m	



NCDOT BORE DOUBLE R2301A_GEO_STRUCTURE3&4.GPJ NC_DOT_GDT_04/14/08

Structure No.s 3 and 4 on -L- (US 17 Bypass) over -Y3- (SR 1224)

HOLE #	SAMPLE #	PASS 2	PASS 425	PASS 75	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST. ORG.
EB2-B	SS-1	100	98	51	7.1	45.4	11.3	36.3	40	25	A-6(9)	1.22-1.67	
	SS-2	100	86	18	26.3	57.9	3.7	12.1	21	NP	A-2-4(0)	2.74-3.19	
	SS-3	98	56	7	60.3	33.9	1.8	4.0	21	NP	A-3(0)	5.73-6.18	
	SS-4	92	75	16	26.7	57.8	8.5	7.1	28	NP	A-2-4(0)	7.25-7.70	
	SS-5	100	99	19	3.8	79.2	6.9	10.1	25	NP	A-2-4(0)	10.30-10.75	
	SS-6	42	26	11	50.2	26.8	8.9	14.1	18	NP	A-1-a(0)	11.83-12.28	
	SS-7	100	98	10	5.4	86.5	3.0	5.0	23	NP	A-3(0)	13.35-13.80	
	SS-8	55	44	6	30.5	61.3	4.1	4.0	23	NP	A-1-b(0)	16.39-16.84	
EB2-A	SS-9	100	90	28	31.9	43.5	15.5	9.1	17	NP	A-2-4(0)	0.15-0.45	
	SS-10	100	96	47	16.5	39.3	9.9	34.3	36	21	A-6(6)	1.22-1.67	
	SS-11	100	85	19	28.1	55.6	4.1	12.1	20	NP	A-2-4(0)	2.74-3.19	
	SS-12	94	49	8	69.0	23.5	2.5	5.0	19	NP	A-1-b(0)	4.18-4.63	
	SS-13	96	78	17	26.3	57.8	6.9	9.1	30	NP	A-2-4(0)	7.22-7.67	
	SS-14	100	95	17	9.9	75.0	9.1	6.0	29	NP	A-2-4(0)	10.27-10.72	
	SS-15	37	22	8	52.0	29.2	6.7	12.1	17	NP	A-1-a(0)	11.80-12.25	
	SS-16	100	98	10	5.8	86.5	3.6	4.0	26	NP	A-3(0)	13.32-13.77	
	SS-17	67	60	8	15.3	75.2	5.4	4.0	24	NP	A-3(0)	16.37-16.82	
	SS-18	97	90	10	14.0	78.1	2.8	5.0	25	NP	A-3(0)	19.41-19.77	
EB1-A	SS-19	100	98	58	9.5	35.7	12.5	42.3	41	25	A-7-6(11)	1.22-1.67	27.7
	SS-20	100	86	17	32.2	53.5	3.2	11.1	19	NP	A-2-4(0)	2.74-3.19	
	SS-21	90	28	6	83.2	11.4	1.4	4.0	20	NP	A-1-b(0)	4.18-4.63	
	SS-22	95	70	15	37.5	48.3	4.1	10.1	29	NP	A-2-4(0)	7.22-7.67	
	SS-23	100	98	5	18.1	76.9	0.9	4.0	24	NP	A-3(0)	8.75-9.20	
	SS-24	100	99	18	6.6	76.1	5.2	12.1	29	NP	A-2-4(0)	10.27-10.72	
	SS-25	50	38	20	33.5	29.0	13.3	24.2	26	5	A-1-b(0)	11.80-12.25	
	SS-26	86	79	12	14.1	73.4	4.4	8.1	21	NP	A-2-4(0)	13.32-13.77	
	SS-27	73	60	13	24.2	60.3	7.5	8.1	20	NP	A-2-4(0)	19.41-19.86	
EB1-B	SS-28	100	99	36	4.2	63.7	7.9	24.2	26	6	A-4(0)	1.22-1.67	
	SS-29	100	86	13	31.0	57.6	2.3	9.1	17	NP	A-2-4(0)	2.74-3.19	
	SS-30	90	47	7	67.6	25.6	0.7	6.0	22	NP	A-1-b(0)	5.70-6.15	
	SS-31	93	78	16	24.5	60.0	5.4	10.1	27	NP	A-2-4(0)	7.22-7.67	
	SS-32	73	60	29	23.2	38.5	14.1	24.2	24	5	A-2-4(0)	11.80-12.25	
	SS-33	98	91	16	12.3	73.0	6.7	8.1	23	NP	A-2-4(0)	13.32-13.77	



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34414.1.1 (R-2301A)	1	15

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34414.1.1 I.D. NO. R-2301A

COUNTY CRAVEN

PROJECT DESCRIPTION US 17 (NEW BERN BYPASS) FROM US 17
SOUTH OF NEW BERN TO US 70

SITE DESCRIPTION STRUCTURES 5 AND 6 ON -L- (US 17 BYPASS)
OVER -Y4- (US 70)

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
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4-5	PROFILES
6-7	CROSS SECTIONS
8-13	BORE LOG(S)
14-15	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: 34414.1.1 ID: R-2301A

PERSONNEL

J.R. SWARTLEY

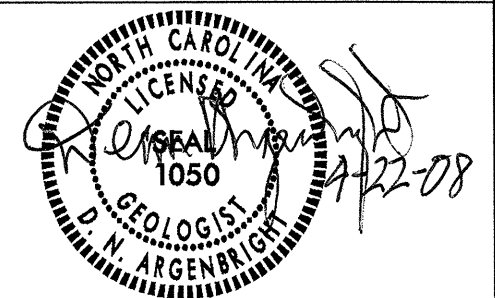
S&ME PERSONNEL

INVESTIGATED BY F.M. WESCOTT III

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE APRIL, 2008

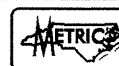


DRAWN BY: C.P. TURNER, C.R. SUMNER

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.
34414.1.I (R2301A)

SHEET NO.
2 OF 15

SUBSURFACE INVESTIGATION

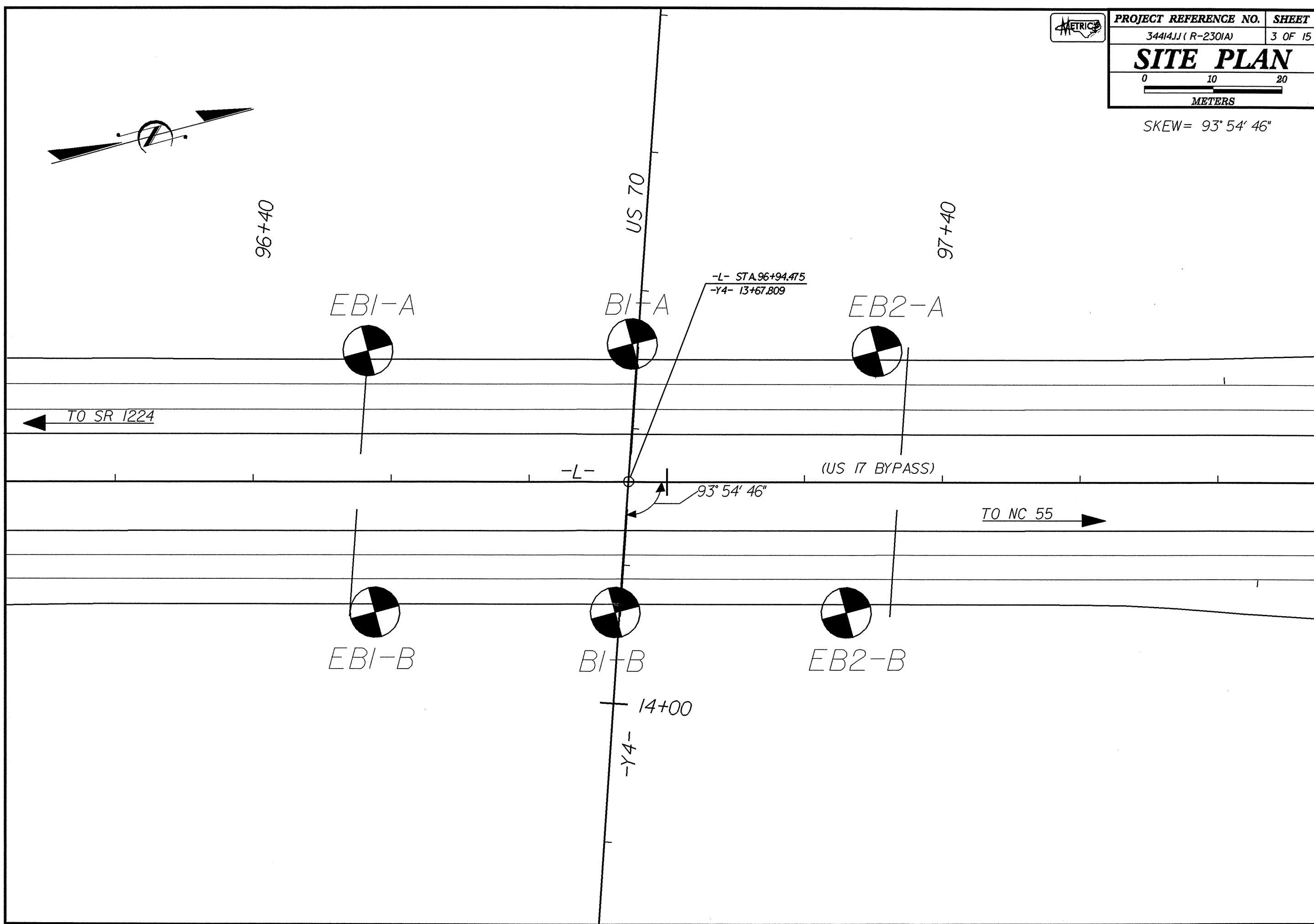
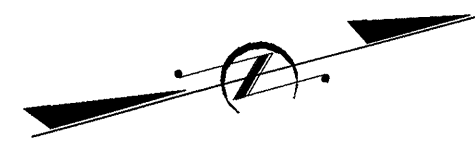
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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. ANGULARITY OF GRAINS 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: WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)		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 DISLOADED 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 (SCRC) - 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		ROCK HARDNESS			
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 VERY SLIGHT (V SLI.) SLIGHT (SLI.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE		VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT			
COMPRESSIONIBILITY		PERCENTAGE OF MATERIAL		GROUND WATER		ROCK HARDNESS			
SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE		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		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		CANNOT 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 GROUDED 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 GROUDED 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.			
TEXTURE OR GRAIN SIZE		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS			
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		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 DPT VST TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL		VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT			
CONSISTENCY OR DENSENESS		ABBREVIATIONS		ROCK HARDNESS		ROCK HARDNESS			
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (KN/M ²)		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 HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT v - VERY VST - VANE SHEAR TEST WEA. - WEATHERED γ - UNIT WEIGHT γ _d - DRY UNIT WEIGHT		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD		VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT		VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
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: ADVANCING TOOLS: HAMMER TYPE: CORE SIZE: HAND TOOLS:		TERM SPACING		TERM THICKNESS			
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT		<input type="checkbox"/> MOBILE B- <input type="checkbox"/> BK-51 <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-550 <input type="checkbox"/> PORTABLE HOIST <input checked="" type="checkbox"/> CME-750		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		INDURATION		FRACTURE SPACING		BEDDING			
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED		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			
COLOR		INDURATION		FRACTURE SPACING		BEDDING			
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.		RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.		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			



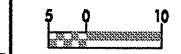
PROJECT REFERENCE NO.	SHEET
34414JJ (R-2301A)	3 OF 15
SITE PLAN	
0 10 20 METERS	

SKEW = 93° 54' 46"

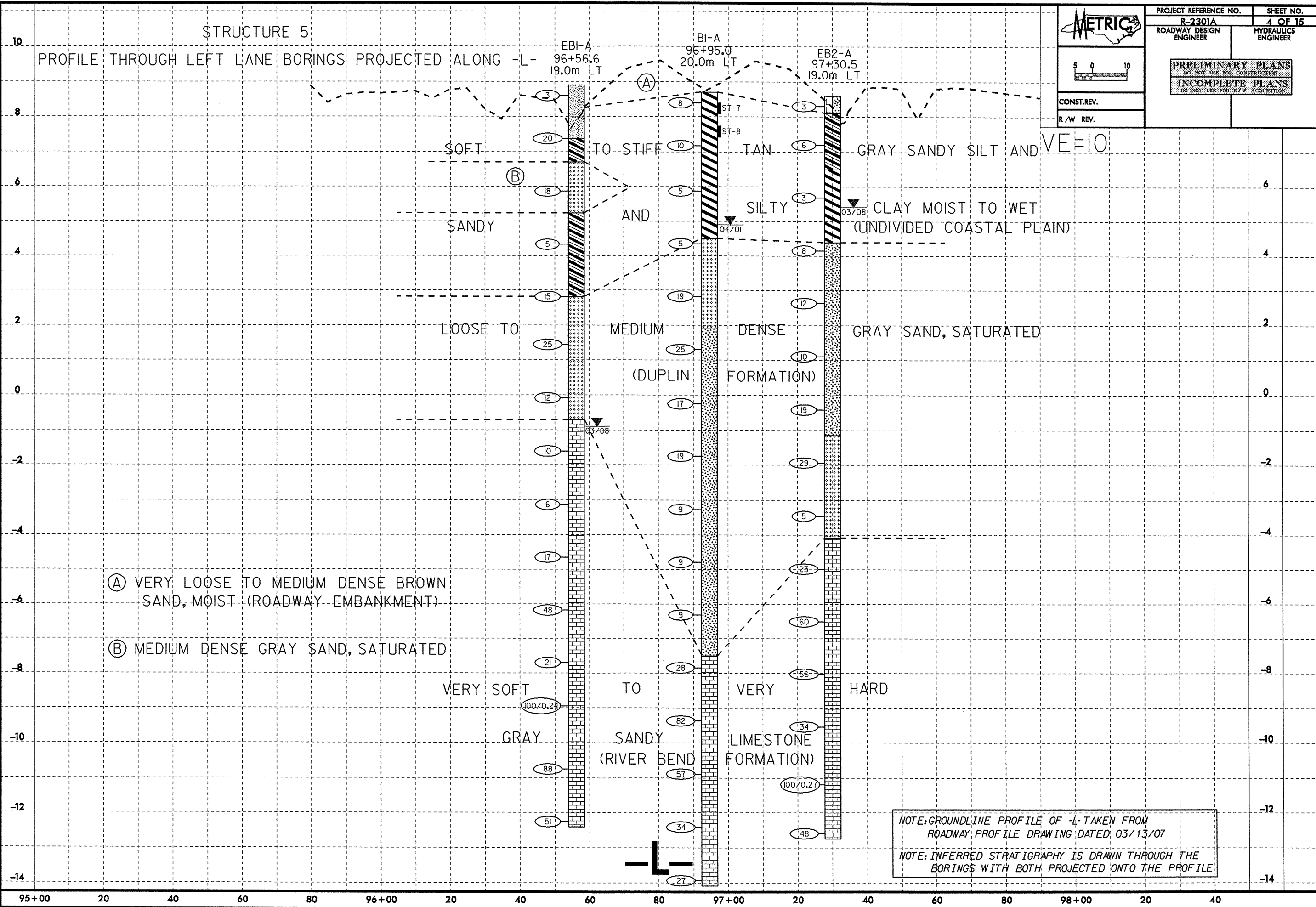




PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



CONST. REV.
R/W REV.



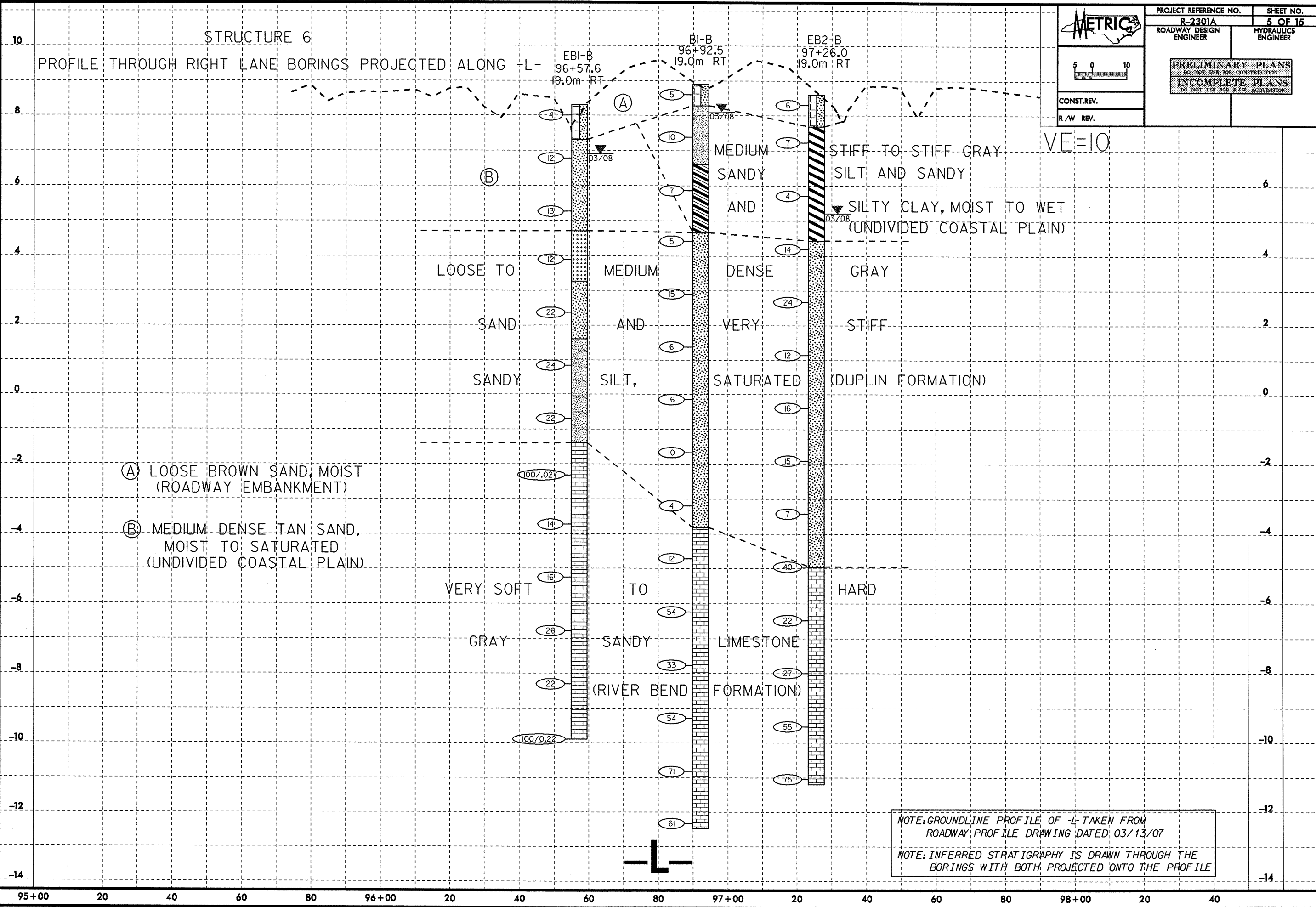
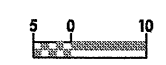
- Ⓐ VERY LOOSE TO MEDIUM DENSE BROWN SAND, MOIST (ROADWAY EMBANKMENT)
- Ⓑ MEDIUM DENSE GRAY SAND, SATURATED

NOTE: GROUNDLINE PROFILE OF -L- TAKEN FROM ROADWAY PROFILE DRAWING DATED 03/13/07
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE

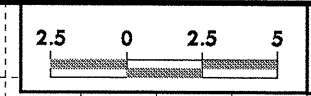
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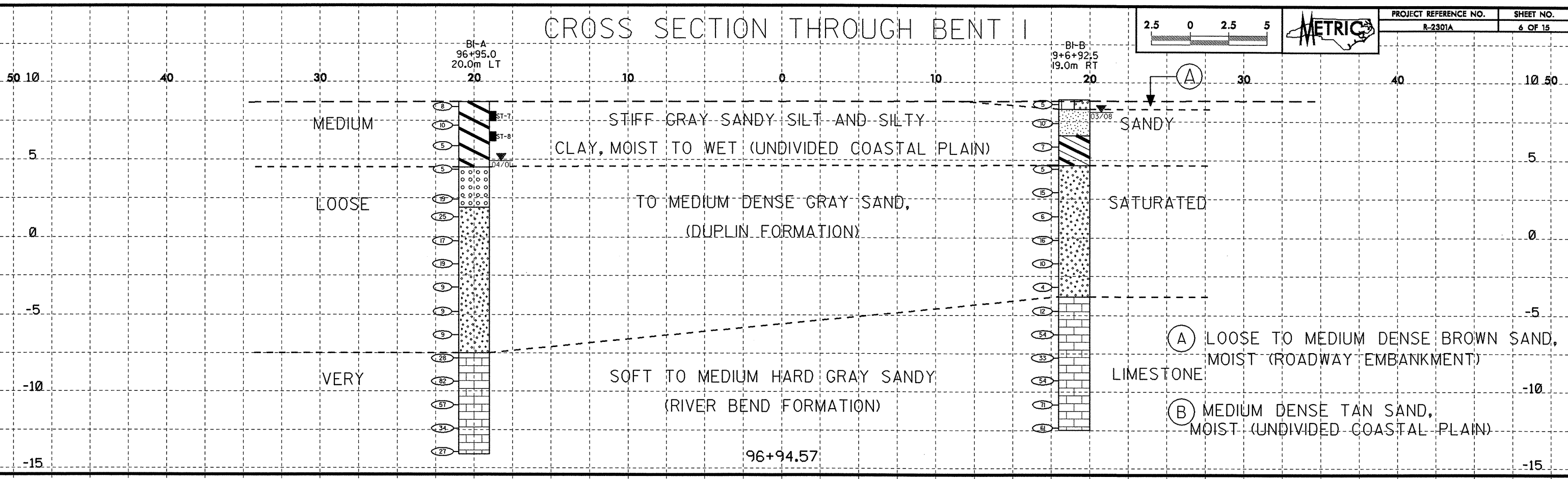
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	5 OF 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R.F.V. ACQUISITION	
CONST.REV.	
R/W REV.	



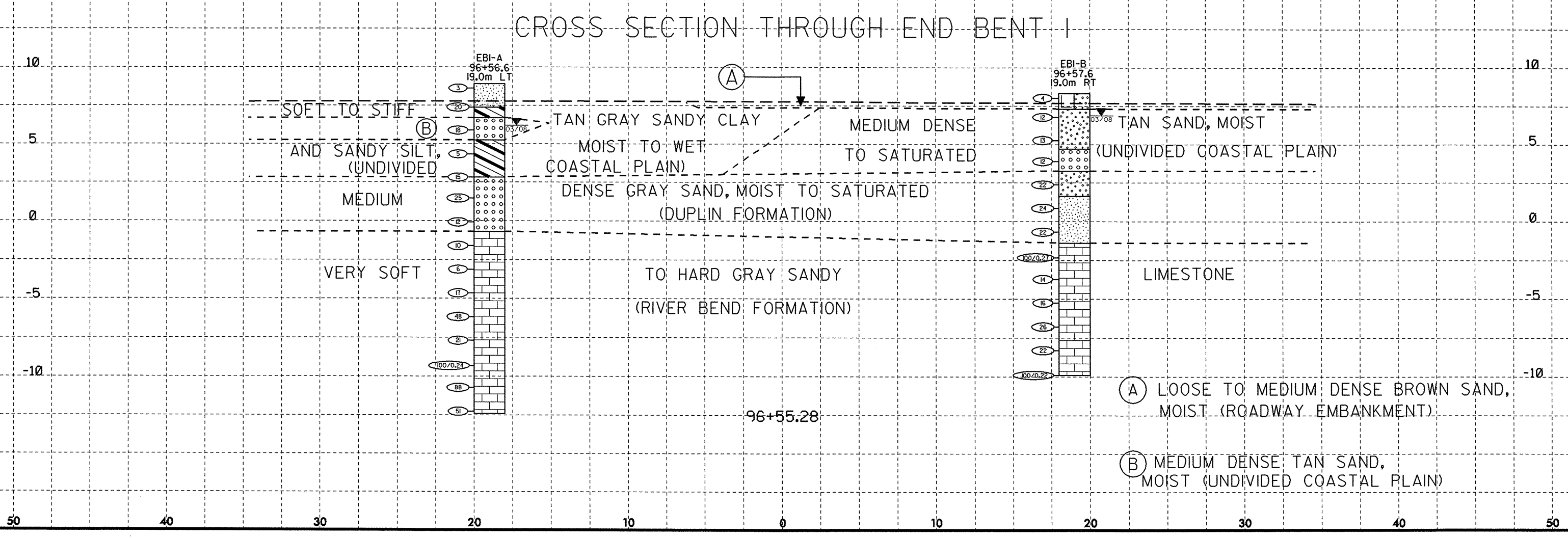
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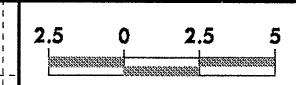
CROSS SECTION THROUGH BENT I



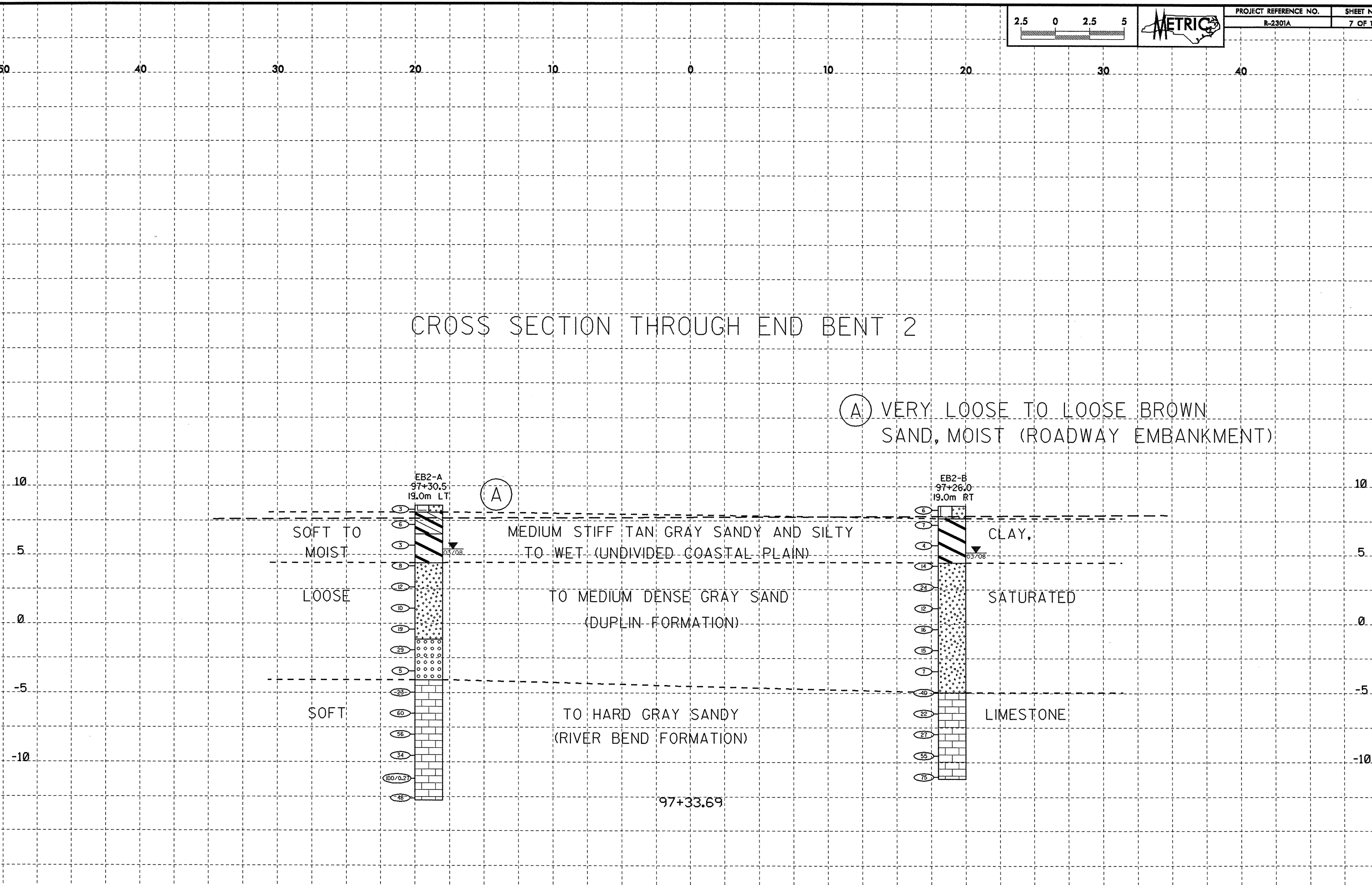
CROSS SECTION THROUGH END BENT I



10/26/08
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 PLOT DATE: 10/26/08
 PLOT TIME: 10:26:08
 PLOT USER: JLE



CROSS SECTION THROUGH END BENT 2

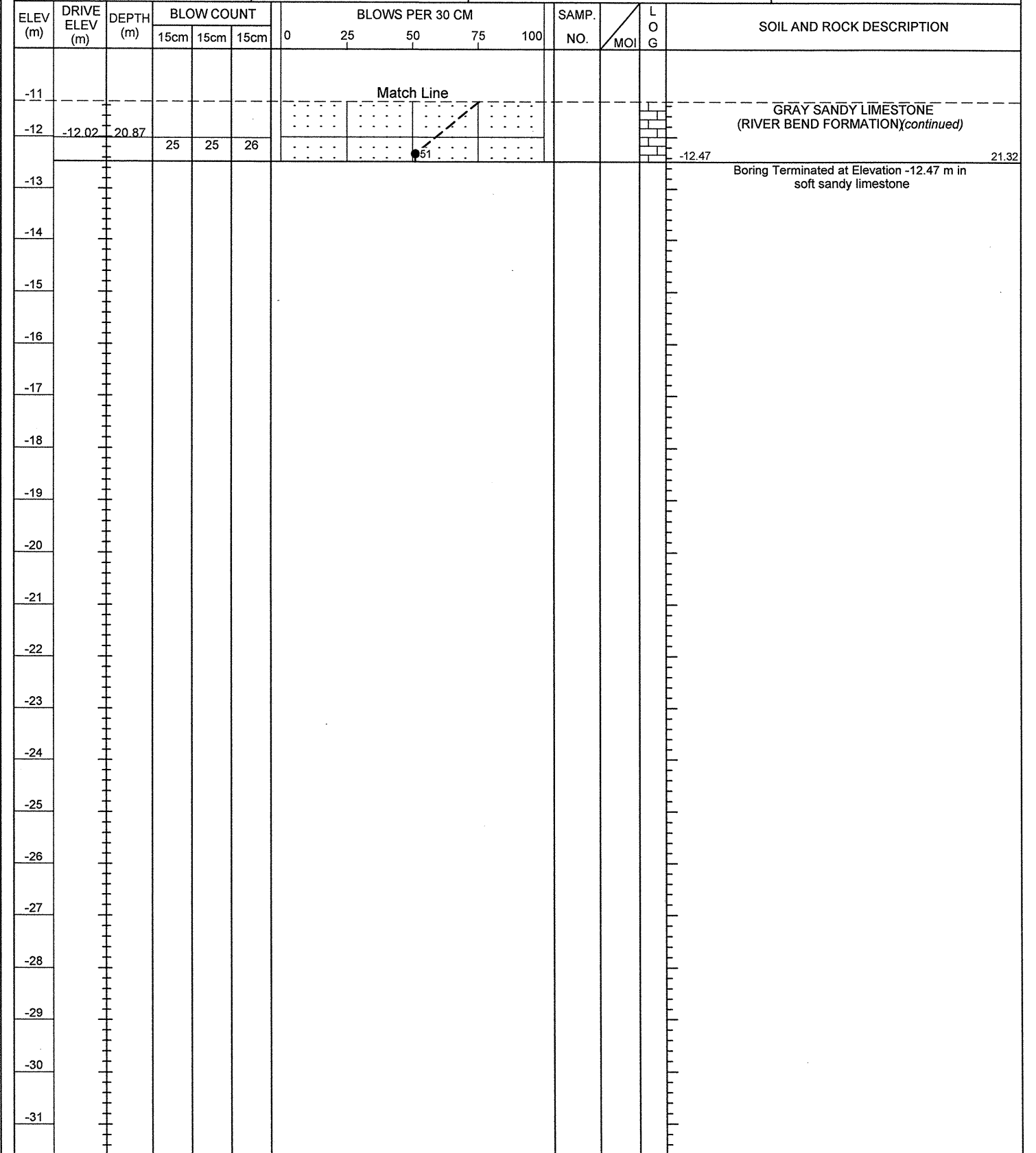
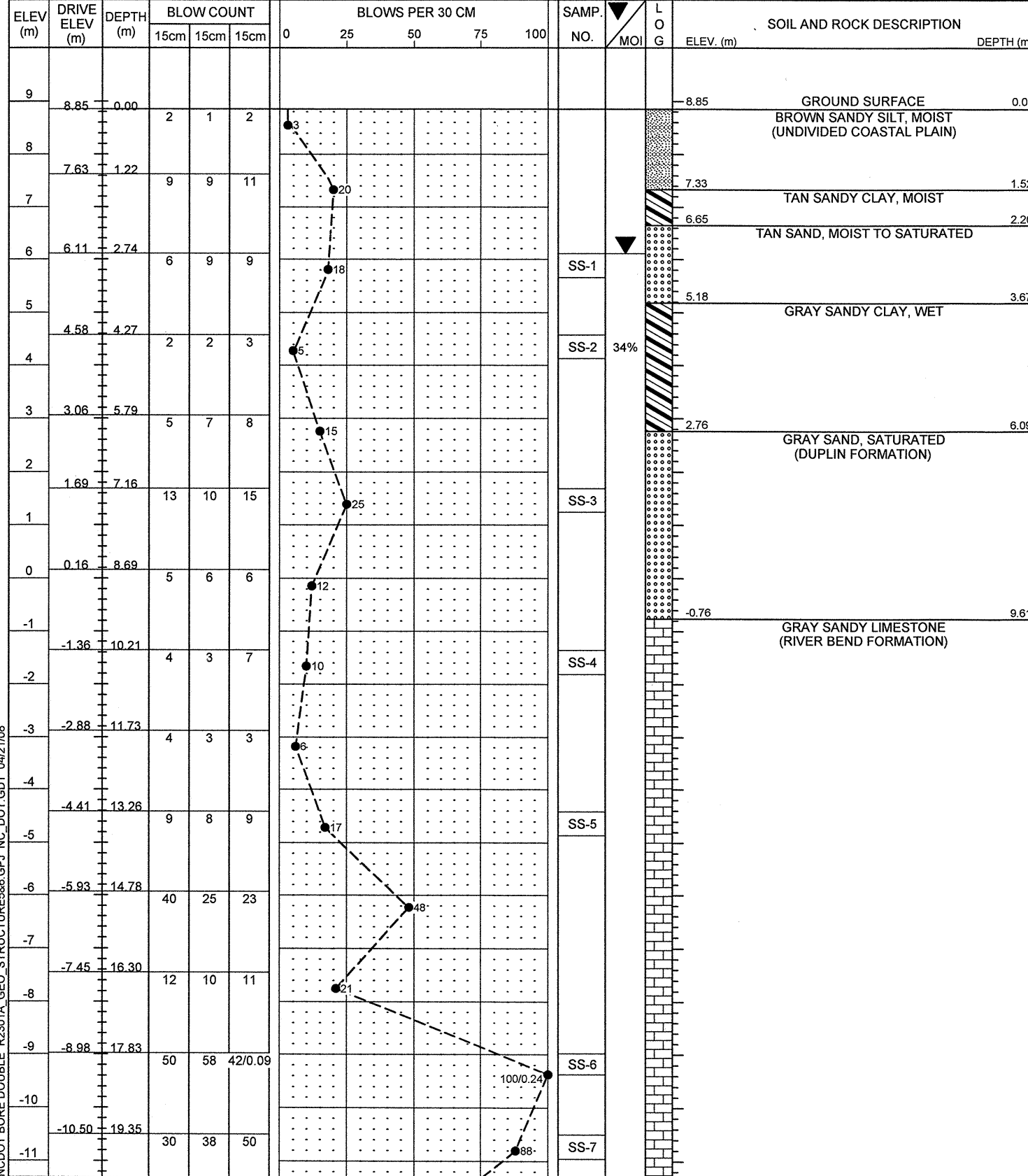


(A) VERY LOOSE TO LOOSE BROWN SAND, MOIST (ROADWAY EMBANKMENT)

o:\aon\230108_0525_0006\0006\cadd\geotech\1\sec\2301a_geo_xpl.dgn
 or number: 176524839

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 5 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. EB1-A	STATION 96+56.6	OFFSET 19.0m LT	ALIGNMENT -L-
COLLAR ELEV. 8.85 m	TOTAL DEPTH 21.32 m	NORTHING 778,006.0	EASTING 154,875.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/20/08	COMP. DATE 03/20/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 9.6 m

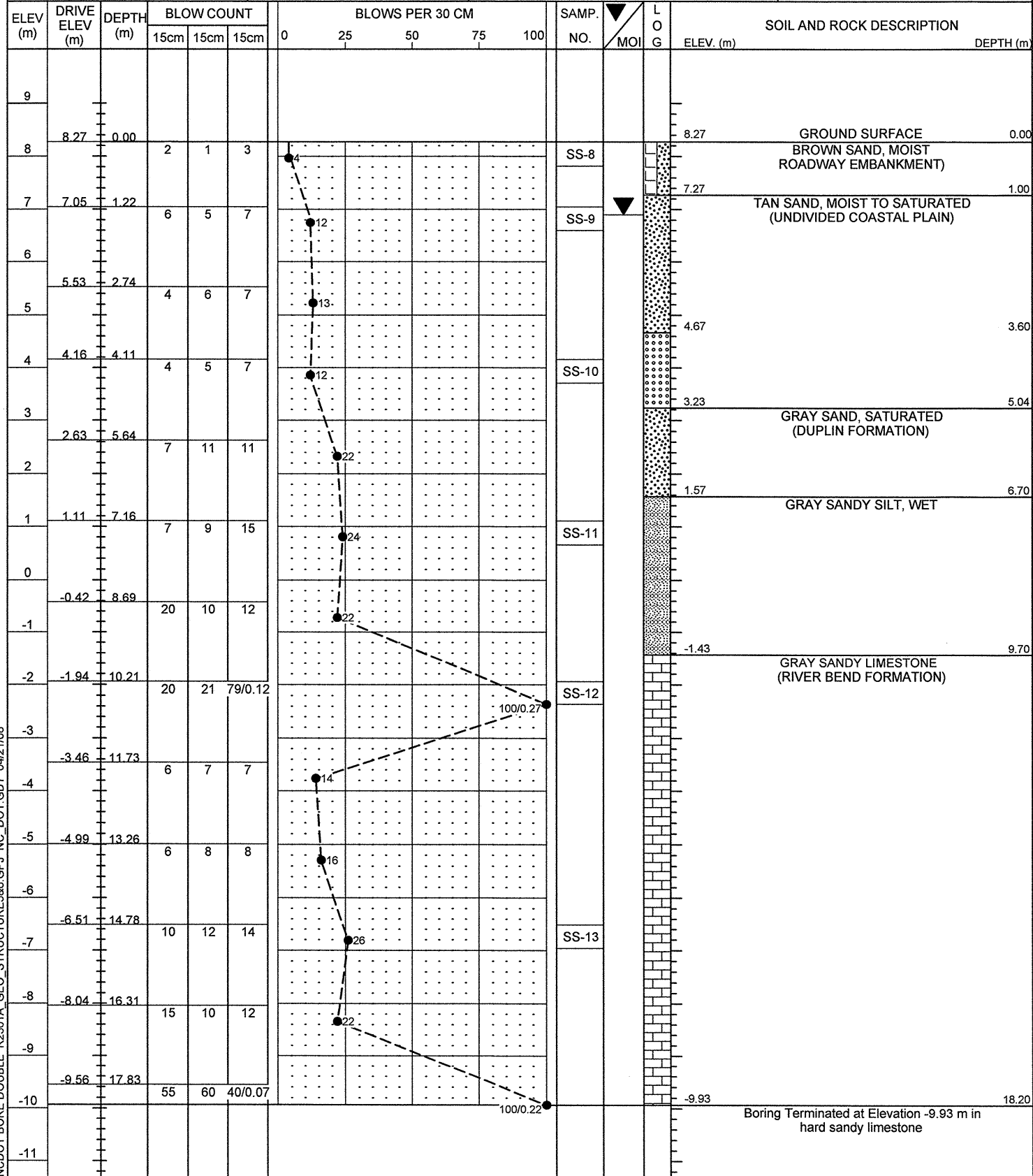
PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 5 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. EB1-A	STATION 96+56.6	OFFSET 19.0m LT	ALIGNMENT -L-
COLLAR ELEV. 8.85 m	TOTAL DEPTH 21.32 m	NORTHING 778,006.0	EASTING 154,875.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/20/08	COMP. DATE 03/20/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 9.6 m



NC DOT BORE DOUBLE R2301A_GEO_STRUCTURES&6.GPJ NC_DOT_GDT_04/21/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 6 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. EB1-B	STATION 96+57.6	OFFSET 19.0m RT	ALIGNMENT -L-
COLLAR ELEV. 8.27 m	TOTAL DEPTH 18.20 m	NORTHING 778,042.0	EASTING 154,866.0
DRILL MACHINE CME-750		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
START DATE 03/20/08	COMP. DATE 03/20/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 9.7 m

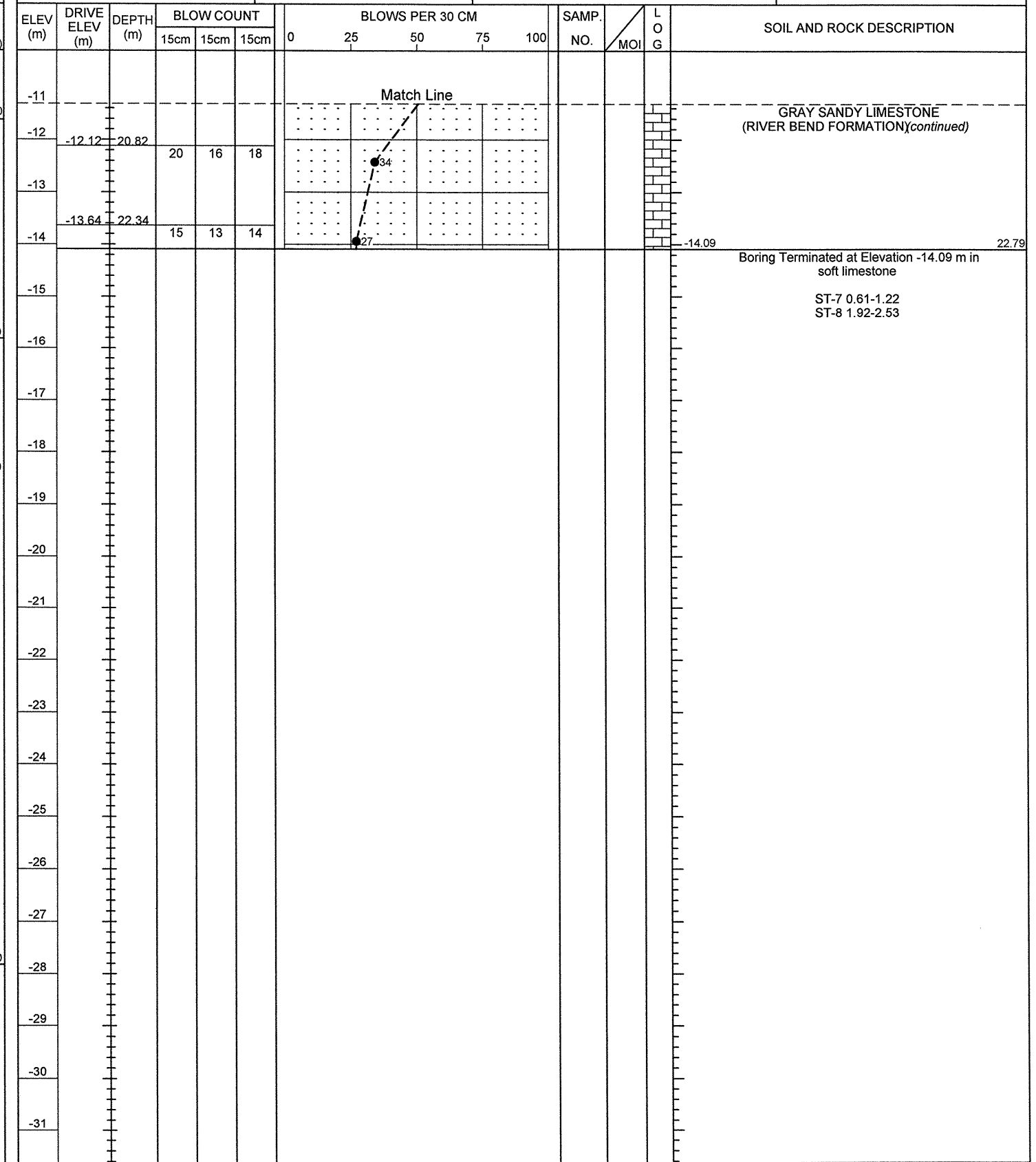
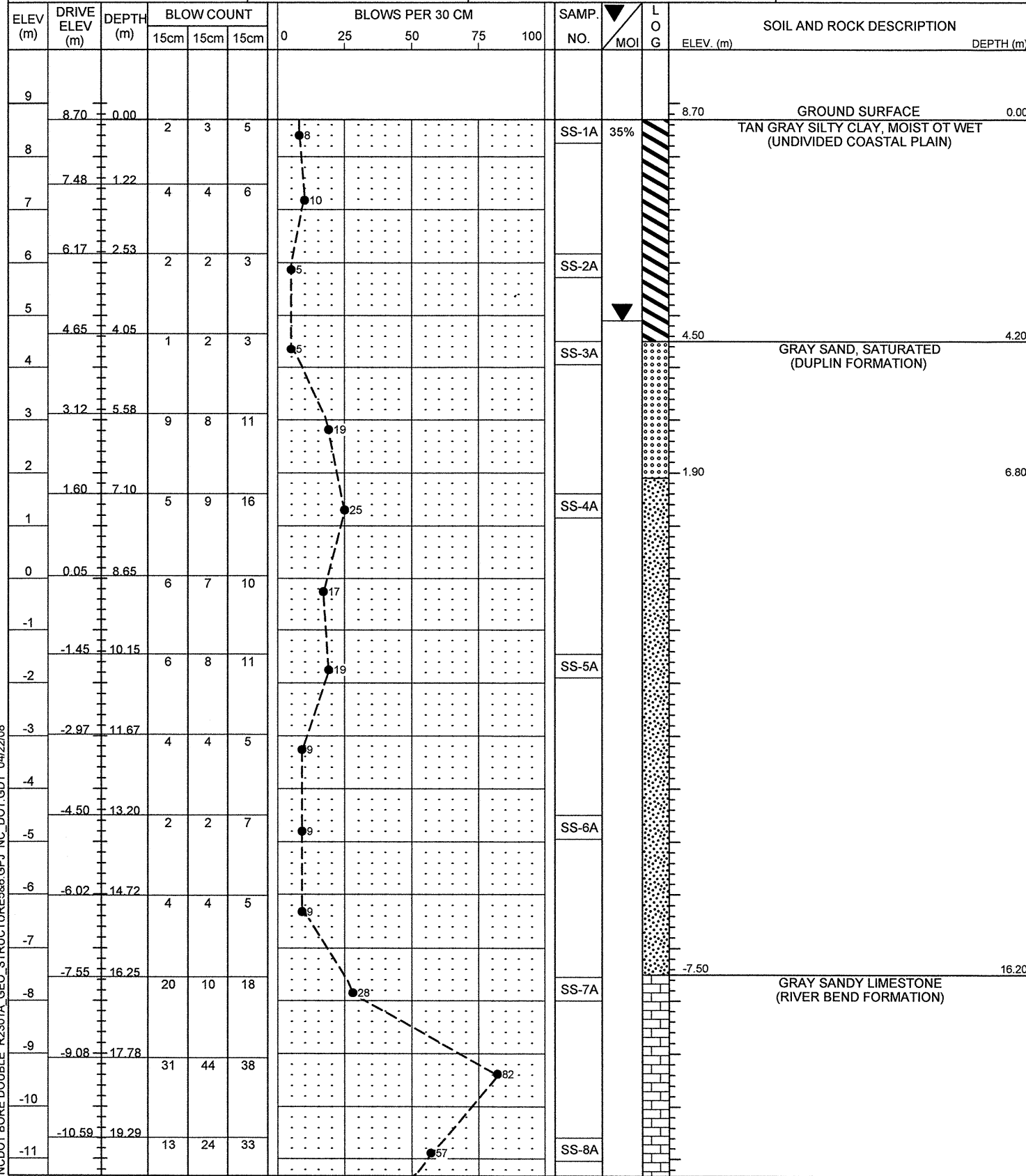


NCDOT BORE DOUBLE R2301A_GEO_STRUCTURES&6.GPJ_NC_DOT.GDT_04/21/08

Boring Terminated at Elevation -9.93 m in hard sandy limestone

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Wescott, F. M.
SITE DESCRIPTION STRUCTURE NO. 5 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. B1-A	STATION 96+95.0	OFFSET 20.0m LT	ALIGNMENT -L-
COLLAR ELEV. 8.70 m	TOTAL DEPTH 22.79 m	NORTHING 778,015.0	EASTING 154,913.0
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 04/16/01	COMP. DATE 04/16/01	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 16.2 m

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Wescott, F. M.
SITE DESCRIPTION STRUCTURE NO. 5 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. B1-A	STATION 96+95.0	OFFSET 20.0m LT	ALIGNMENT -L-
COLLAR ELEV. 8.70 m	TOTAL DEPTH 22.79 m	NORTHING 778,015.0	EASTING 154,913.0
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 04/16/01	COMP. DATE 04/16/01	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 16.2 m



NCDOT BORE DOUBLE R2301A GEO_STRUCTURE5&6.GPJ NC_DOT.GDT 04/22/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 6 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. B1-B	STATION 96+92.5	OFFSET 19.0m RT	ALIGNMENT -L-
COLLAR ELEV. 8.88 m	TOTAL DEPTH 21.39 m	NORTHING 778,052.0	EASTING 154,900.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/24/08	COMP. DATE 03/24/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 12.7 m

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 6 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. B1-B	STATION 96+92.5	OFFSET 19.0m RT	ALIGNMENT -L-
COLLAR ELEV. 8.88 m	TOTAL DEPTH 21.39 m	NORTHING 778,052.0	EASTING 154,900.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/24/08	COMP. DATE 03/24/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 12.7 m

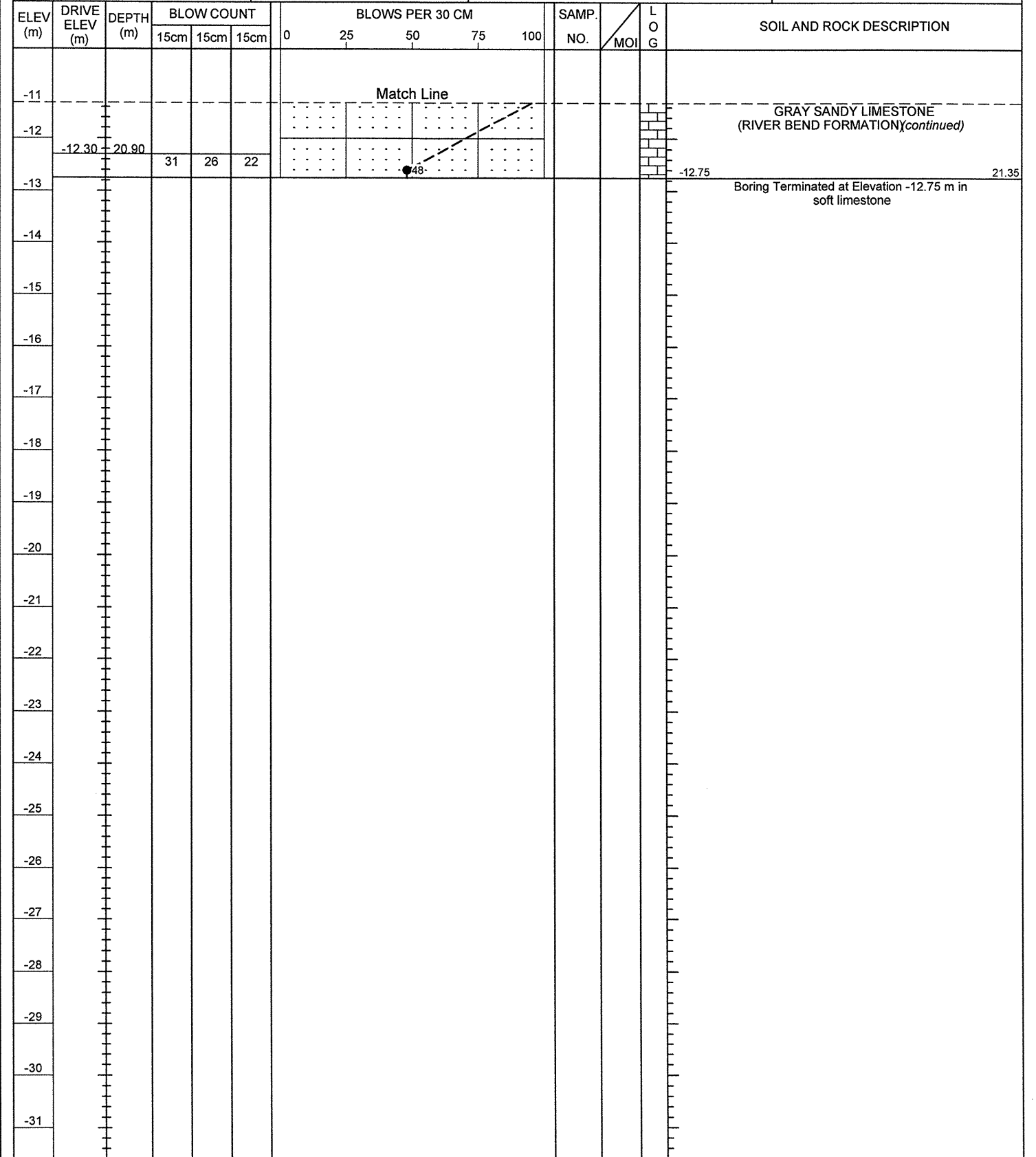
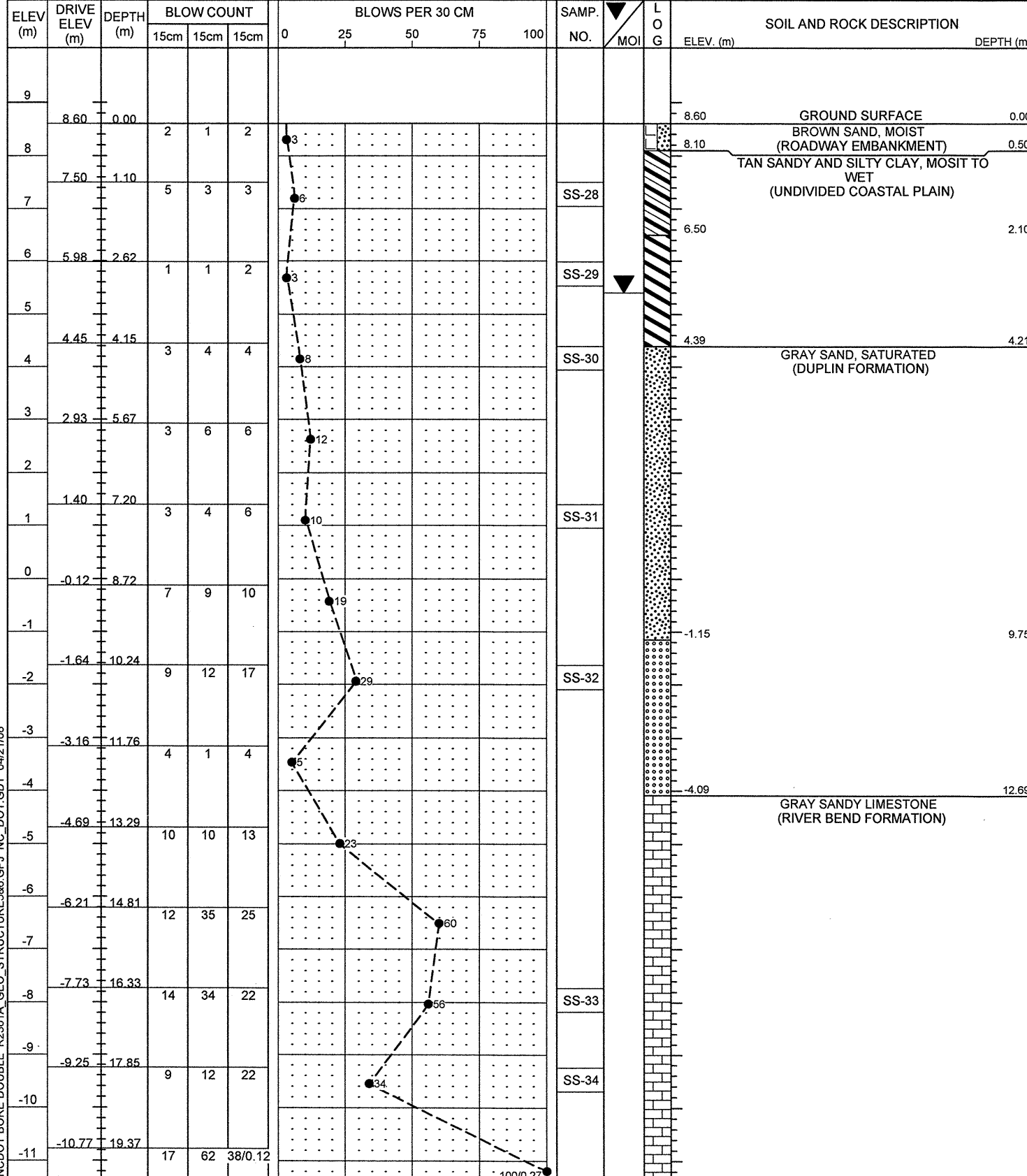
ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT			BLOWS PER 30 CM					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (m)
			15cm	15cm	15cm	0	25	50	75	100				
9	8.88	0.00											GROUND SURFACE	0.00
8	7.66	1.22	2	3	2								BROWN SAND, MOIST (ROADWAY EMBANKMENT)	0.62
7	6.14	2.74	3	4	6								GRAY SANDY SILT, MOIST TO WET (UNDIVIDED COASTAL PLAIN)	
6	4.70	4.18	2	3	4								GRAY SANDY CLAY, WET	2.30
5	3.18	5.70	5	6	9								GRAY SAND, SATURATED (DUPLIN FORMATION)	4.24
4	1.66	7.22	WOH	1	5									
3	0.13	8.75	7	8	8									
2	-1.39	10.27	2	4	6									
1	-2.92	11.80	3	3	1									
0	-4.44	13.32	5	7	5									
-1	-5.96	14.84	11	42	12									
-2	-7.49	16.37	12	13	20									
-3	-9.01	17.89	23	26	28									
-4	-10.54	19.42	29	36	35									

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				
-11														
-12	-12.06	20.94	41	33	28								GRAY SANDY LIMESTONE (RIVER BEND FORMATION)(continued)	
-13													Boring Terminated at Elevation -12.51 m in soft sandy limestone	21.39
-14														
-15														
-16														
-17														
-18														
-19														
-20														
-21														
-22														
-23														
-24														
-25														
-26														
-27														
-28														
-29														
-30														
-31														

NCDOT BORE DOUBLE R2301A GEO_STRUCTURES&6.GPJ NC_DOT.GDT 04/21/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 5 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. EB2-A	STATION 97+30.5	OFFSET 19.0m LT	ALIGNMENT -L-
COLLAR ELEV. 8.60 m	TOTAL DEPTH 21.35 m	NORTHING 778,025.0	EASTING 154,947.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/24/08	COMP. DATE 03/25/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 12.7 m

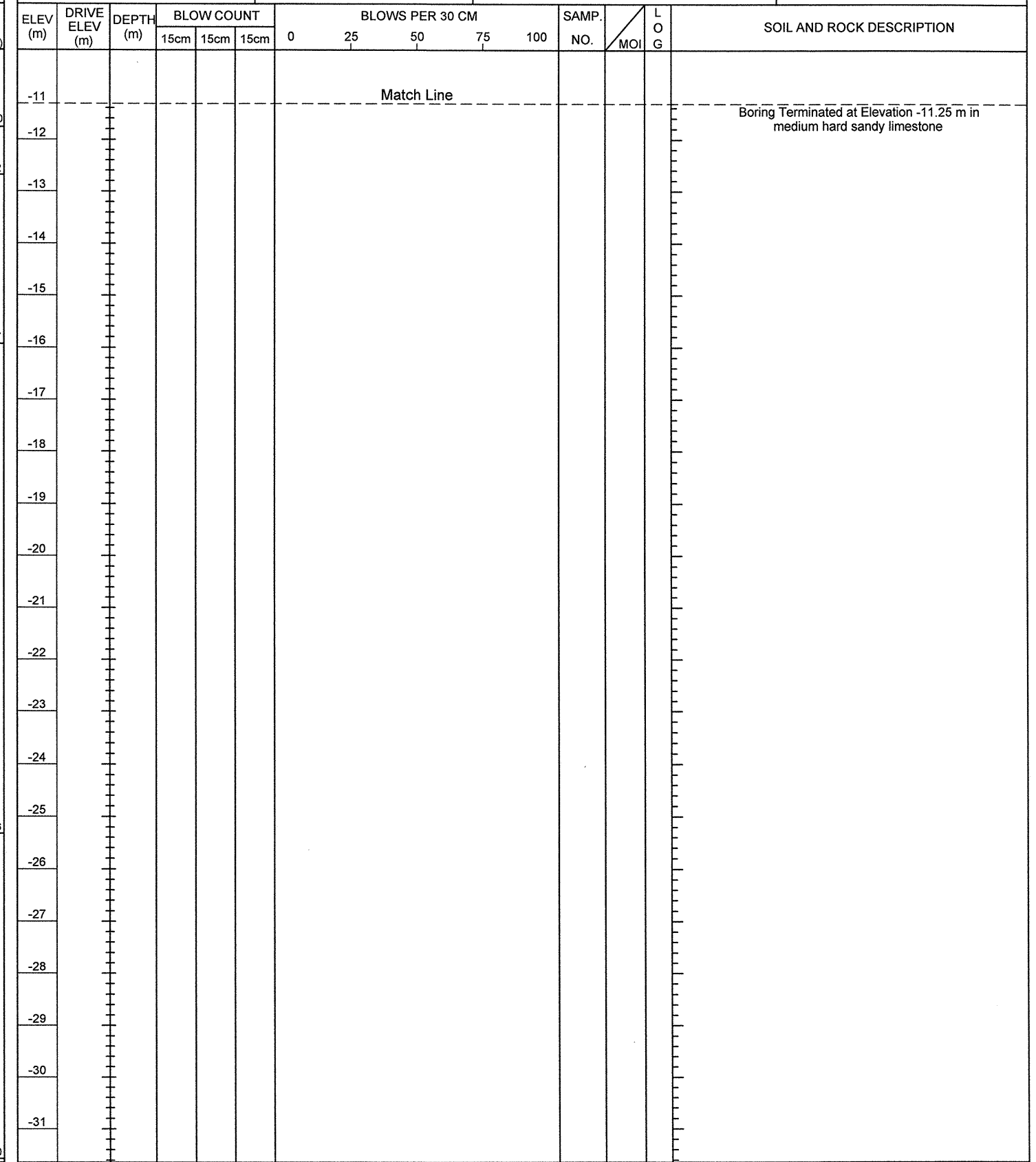
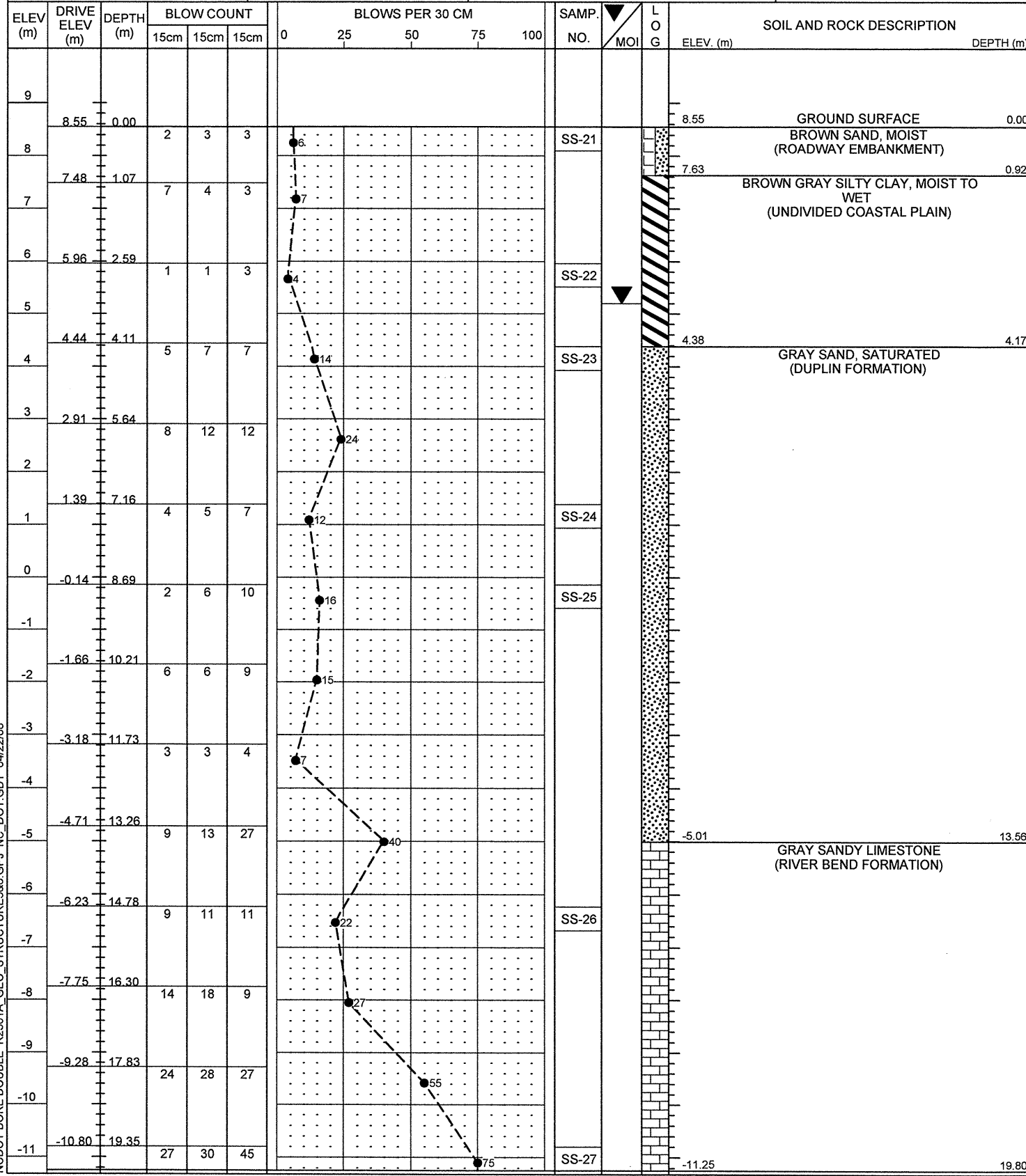
PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 5 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. EB2-A	STATION 97+30.5	OFFSET 19.0m LT	ALIGNMENT -L-
COLLAR ELEV. 8.60 m	TOTAL DEPTH 21.35 m	NORTHING 778,025.0	EASTING 154,947.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/24/08	COMP. DATE 03/25/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 12.7 m



NCDOT BORE DOUBLE R2301A_GEO_STRUCTURES&6.GPJ_NC_DOT.GDT 04/21/08

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 6 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. EB2-B	STATION 97+26.0	OFFSET 19.0m RT	ALIGNMENT -L-
COLLAR ELEV. 8.55 m	TOTAL DEPTH 19.80 m	NORTHING 778,060.0	EASTING 154,932.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/24/08	COMP. DATE 03/24/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 13.6 m

PROJECT NO. 34414.1.1	ID. R-2301A	COUNTY CRAVEN	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION STRUCTURE NO. 6 ON -L- (US 17 BYPASS) OVER -Y4- (US 70)			GROUND WTR (m)
BORING NO. EB2-B	STATION 97+26.0	OFFSET 19.0m RT	ALIGNMENT -L-
COLLAR ELEV. 8.55 m	TOTAL DEPTH 19.80 m	NORTHING 778,060.0	EASTING 154,932.0
DRILL MACHINE CME-750	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 03/24/08	COMP. DATE 03/24/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 13.6 m



NCDOT BORE DOUBLE R2301A GEO. STRUCTURES&6.GPJ NC_DOT.GDT 04/22/08

R-2301A

Structure No.s 5 and 6 on -L- (US 17 Bypass) over -Y4- (US 70)

HOLE #	SAMPLE #	PASS 2mm	PASS 425µm	PASS 75µm	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST.	ORG.	
EB1-A	SS-1	100	92	10	35.0	56.1	1.8	7.0	13	NP	A-3(0)	2.74-3.19			
	SS-2	100	84	44	32.4	31.6	17.9	18.1	33	16	A-6(3)	4.27-4.72	34.0		
	SS-3	100	98	8	18.0	75.5	2.5	4.0	21	NP	A-3(0)	7.16-7.61			
	SS-4			NOT ENOUGH SAMPLE									10.21-10.66		
	SS-5	70	43	15	49.3	32.6	14.1	4.0	19	NP	A-1-b(0)	13.26-13.71			
	SS-6	98	96	17	3.8	86.3	5.8	4.0	19	NP	A-2-4(0)	17.83-18.22			
	SS-7	51	23	9	65.2	19.5	9.3	6.0	18	NP	A-1-b(0)	19.35-19.80			
EB1-B	SS-8	100	88	34	35.2	33.2	9.5	22.1	19	6	A-2-4(0)	0.30-0.45			
	SS-9	100	97	18	27.6	55.6	2.8	14.1	19	NP	A-2-4(0)	1.22-1.67			
	SS-10	98	74	9	51.5	40.4	2	6.0	20	NP	A-3(0)	4.11-4.56			
	SS-11	100	95	40	8.7	55.3	30.0	6.0	19	NP	A-4(0)	7.16-7.61			
	SS-12	63	38	15	46.9	32.8	14.3	6.0	18	NP	A-1-b(0)	10.21-10.66			
	SS-13	70	47	15	40.2	40.4	13.3	6.0	21	NP	A-1-b(0)	14.78-15.23			
B1-B	SS-14	100	89	53	28.2	24.5	21.1	26.2	24	7	A-4(1)	1.22-1.67			
	SS-15	100	93	68	15.7	20.1	26.0	38.2	35	20	A-6(11)	2.74-3.19			
	SS-16	100	91	16	30.2	54.9	4.8	10.1	18	NP	A-2-4(0)	4.24-4.63			
	SS-17	98	72	31	47.7	24.3	9.9	18.1	27	NP	A-2-4(0)	7.22-7.67			
	SS-18	100	97	18	5.4	83.7	4.8	6.0	24	NP	A-2-4(0)	10.27-10.72			
	SS-19	82	51	20	46.9	32.8	14.3	6.0	20	NP	A-2-4(0)	13.32-13.77			
	SS-20	78	54	18	39.8	39.4	14.7	6.0	18	NP	A-2-4(0)	17.89-18.34			
EB2-B	SS-21	100	90	34	24.5	46.1	9.3	20.1	20	5	A-2-4(0)	0.30-0.45			
	SS-22	100	98	85	5.4	11.9	26.4	56.3	54	25	A-7-6(24)	2.59-3.04			
	SS-23	100	89	14	50.7	35.9	3.3	10.1	18	NP	A-2-4(0)	4.17-4.56			
	SS-24	94	62	11	66.6	22.6	3.7	7.0	20	NP	A-2-4(0)	7.16-7.61			
	SS-25	100	98	24	12.4	69.0	5.5	13.1	24	NP	A-2-4(0)	8.69-9.14			
	SS-26			NOT ENOUGH SAMPLE									14.78-15.23		
	SS-27	65	37	12	52.3	32.0	9.7	6.0	18	NP	A-1-b(0)	19.35-19.80			
EB2-A	SS-28	100	91	64	22.1	19.3	20.3	38.2	32	12	A-6(6)	1.10-1.55			
	SS-29	100	98	87	5.8	17.7	30.2	46.3	55	36	A-7-6(33)	2.62-3.07			
	SS-30	100	88	19	47.6	33.8	2.4	16.2	17	2	A-2-4(0)	4.21-4.60			
	SS-31	98	66	12	49.2	40.0	0.7	10.1	18	NP	A-2-4(0)	7.20-7.65			
	SS-32	100	99	9	2.2	91.5	4.2	2.0	20	NP	A-3(0)	10.24-10.69			
	SS-33	83	75	13	13.2	74.0	3.6	9.1	19	NP	A-2-4(0)	16.33-16.78			
	SS-34	75	62	13	22.8	62.2	5.9	9.1	19	NP	A-2-4(0)	17.85-18.30			
B1-A	SS-1A	100	98	79	6.9	19.4	21.4	52.4	43	22	A-7-6(17)	0.30-0.45	35.2		
	SS-2A	100	97	73	12.7	18.8	22.2	46.4	50	34	A-7-6(23)	2.53-2.98			

Structure No.s 5 and 6 on -L- (US 17 Bypass) over -Y4- (US 70)

HOLE #	SAMPLE #	PASS 2mm	PASS 425µm	PASS 75µm	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST.	ORG.
B1-A	SS-3A	99	85	9	40.5	51.1	0.3	8.1	19	NP	A-3(0)	4.20-4.50		
	SS-4A	99	58	14	73.2	13.5	1.2	12.1	21	5	A-2-4(0)	7.10-7.55		
	SS-5A	100	100	16	1.2	90.1	4.6	4.0	24	NP	A-2-4(0)	10.15-10.60		
	SS-6A	100	100	13	1.0	90.6	3.3	5.0	24	NP	A-2-4(0)	13.20-13.65		
	SS-7A	50	33	9	42.3	42.1	7.5	8.1	17	NP	A-1-b(0)	16.25-16.70		
	SS-8A	40	23	7	56.0	28.8	7.1	8.1	17	NP	A-1-a(0)	19.29-19.74		

<u>Bent/End</u>		<u>Load</u>	<u>Bearing</u>	<u>Shaft</u>	<u>Avg. Bearing</u>	<u>Shaft</u>	<u>Avg.</u>		
<u>Bent No.</u>	<u>Type of Pile</u>	<u>(kN)</u>	<u>Elevation</u>	<u>Length</u>	<u>Per Meter</u>	<u>Length in</u>	<u>Bearing per</u>		
			<u>(m)</u>	<u>(m)</u>	<u>(kN/m)</u>	<u>feet</u>	<u>Foot (kN/ft)</u>		
EB1-A	HP12x53	630	-9.10	23.10	27.27	75.79	8.31		
EB1-B	HP12x53	630	-2.10	16.10	39.13	52.82	11.93		
B1-A	HP12x53	630	-15.20	22.60	27.88	74.15	8.50		
B1-B	HP12x53	630	-10.60	18.00	35.00	59.05	10.67		
EB2-A	HP12x53	630	-2.70	16.70	37.72	54.79	11.50		
								Average	
								Cost per	
EB2-B	HP12x53	630	-10.70	24.70	25.51	81.04	7.77	Average: 66.27 Pile:	\$3,186.37 Galvanized
EB1-A	HP12x53	540	-6.40	20.40	26.47	66.93	8.07		\$3,912.05 Regular
EB1-B	HP12x53	540	-1.50	15.50	34.84	50.85	10.62		
B1-A	HP12x53	540	-10.30	17.70	30.51	58.07	9.30		
B1-B	HP12x53	540	-9.40	16.80	32.14	55.12	9.80		
EB2-A	HP12x53	540	-1.80	15.80	34.18	51.84	10.42		
								Average	
								Cost per	
EB2-B	HP12x53	540	-9.70	23.70	22.78	77.75	6.94	Average: 60.09 Pile:	\$2,889.29 Galvanized
EB1-A	HP12x53	450	-5.80	19.80	22.73	64.96	6.93		\$3,547.31 Regular
EB1-B	HP12x53	450	-1.50	15.50	29.03	50.85	8.85		
B1-A	HP12x53	450	-9.40	16.80	26.79	55.12	8.16		
B1-B	HP12x53	450	-8.50	15.90	28.30	52.16	8.63		
EB2-A	HP12x53	450	-1.20	15.20	29.61	49.87	9.02		
								Average	
								Cost per	
EB2-B	HP12x53	450	-9.10	23.10	19.48	75.79	5.94	Average: 58.12 Pile:	\$2,794.64 Galvanized
EB1-A	12" PRSTRD CONC	630	2.80	11.20	56.25	36.74	17.15		\$3,431.11 Regular
EB1-B	12" PRSTRD CONC	630	1.90	12.10	52.07	39.70	15.87		
B1-A	12" PRSTRD CONC	630	-9.10	16.50	38.18	54.13	11.64		
B1-B	12" PRSTRD CONC	630	-6.00	13.40	47.01	43.96	14.33		
EB2-A	12" PRSTRD CONC	630	2.80	11.20	56.25	36.74	17.15		
								Cost per	
EB2-B	12" PRSTRD CONC	630	2.50	11.50	54.78	37.73	16.70	Average: 41.50 Pile:	\$3,359.18
EB1-A	12" PRSTRD CONC	540	2.80	11.20	48.21	36.74	14.70		
EB1-B	12" PRSTRD CONC	540	3.10	10.90	49.54	35.76	15.10		
B1-A	12" PRSTRD CONC	540	-7.50	14.90	36.24	48.88	11.05		
B1-B	12" PRSTRD CONC	540	-6.00	13.40	40.30	43.96	12.28		
EB2-A	12" PRSTRD CONC	540	2.80	11.20	48.21	36.74	14.70		
								Cost per	
EB2-B	12" PRSTRD CONC	540	2.80	11.20	48.21	36.74	14.70	Average: 39.81 Pile:	\$3,221.98
EB1-A	12" PRSTRD CONC	450	5.50	8.50	52.94	27.89	16.14		
EB1-B	12" PRSTRD CONC	450	3.10	10.90	41.28	35.76	12.58		
B1-A	12" PRSTRD CONC	450	-7.50	14.90	30.20	48.88	9.21		
B1-B	12" PRSTRD CONC	450	-6.00	13.40	33.58	43.96	10.24		
EB2-A	12" PRSTRD CONC	450	4.60	9.40	47.87	30.84	14.59		
								Cost per	
EB2-B	12" PRSTRD CONC	450	3.70	10.30	43.69	33.79	13.32	Average: 36.85 Pile:	\$2,982.99