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REFERENCE: B-5304

PROJECT: 46018

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY PENDER
PROJECT DESCRIPTION BRIDGE NO. 203 ON SR 1324
OVER SILL'S CREEK

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
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5 - 8	BORE LOGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5304	1	8

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) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

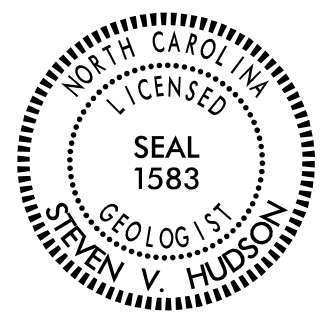
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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 THE 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.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. 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.

PERSONNEL
LYNDSAY PUGH
D. T. CHALMERS, CWC

INVESTIGATED BY CATLIN
DRAWN BY STEVEN HUDSON
CHECKED BY J. LEE STONE, LG
SUBMITTED BY STEVEN HUDSON, LG
DATE SEPTEMBER 2016



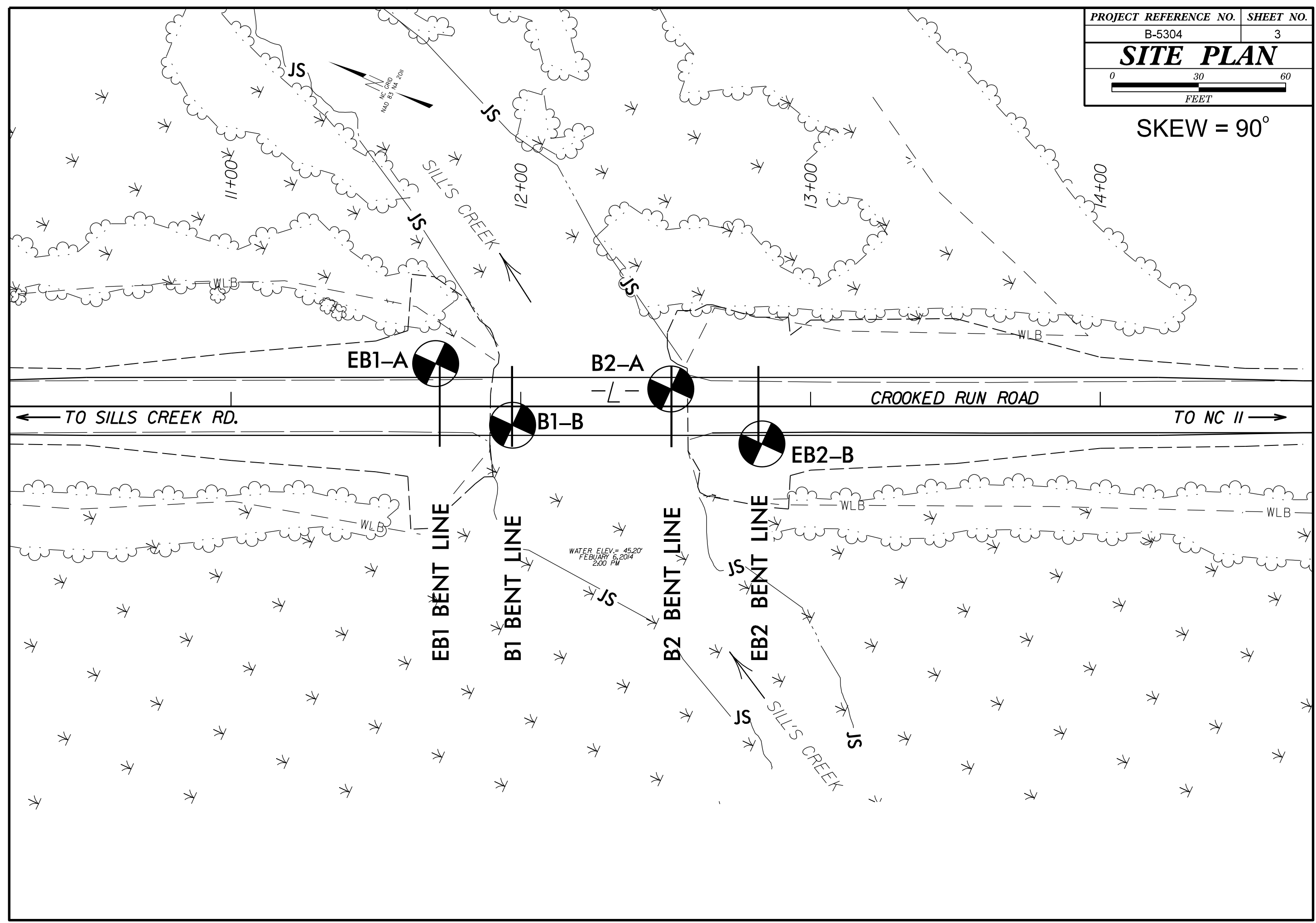
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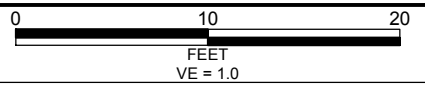
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

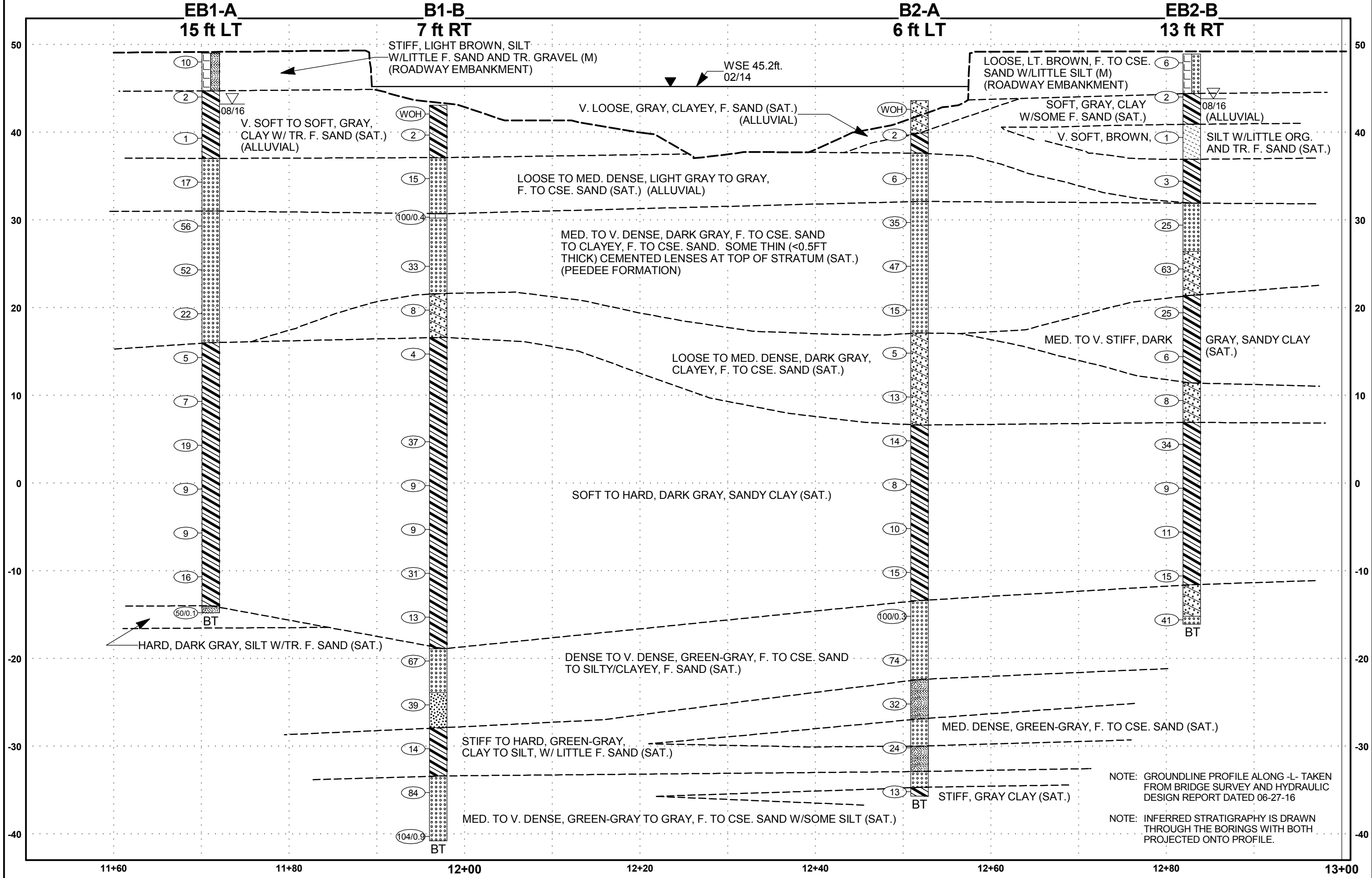
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																												
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>										<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH 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 DISLOGGED 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 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																												
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										CRYSTALLINE ROCK (CR)																																																												
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MINERALOGICAL COMPOSITION										COMPRESSION										NON-CRYSTALLINE ROCK (NCR)										COASTAL PLAIN SEDIMENTARY ROCK (CP)																																																												
<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>										<p>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 SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>																																																												
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GROUND WATER										MISCELLANEOUS SYMBOLS										MODERATE (MOD.)										MODERATELY SEVERE (MOD. SEV.)																																																												
<p>▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ▽ STATIC WATER LEVEL AFTER 24 HOURS ▽ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○ SPRING OR SEEP</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</p>										<p>DIP & DIP DIRECTION OF ROCK STRUCTURES SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION</p>										<p>SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE</p>										<p>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</p>										<p>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, WOULD YIELD SPT N VALUES > 100 BPF</p>																																								
TEXTURE OR GRAIN SIZE										RECOMMENDATION SYMBOLS										SEVERE (SEV.)										VERY SEVERE (IV SEV.)																																																												
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td>NON PLASTIC</td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </table>										PLASTICITY INDEX (PI)		DRY STRENGTH	NON PLASTIC	0-5	VERY LOW	SLIGHTLY PLASTIC	6-15	SLIGHT	MODERATELY PLASTIC	16-25	MEDIUM	HIGHLY PLASTIC	26 OR MORE	HIGH	<p>DRILL UNITS: <input checked="" type="checkbox"/> CME-45B <input type="checkbox"/> CME-55 <input type="checkbox"/> CME-550 <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST</p>										<p>ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> 2 7/8" STEEL TEETH <input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB. <input type="checkbox"/> CORE BIT</p>										<p>HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p>										<p>CAN BE GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p>										<p>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.</p>																									
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COLOR										FRACTURE SPACING										SOFT										VERY SOFT																																																												
<p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>										<p>TERM SPACING VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FOOT VERY CLOSE LESS THAN 0.16 FEET</p>										<p>TERM THICKNESS VERY THICKLY BEDDED 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET</p>										<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p>										<p>FRAGILE 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.</p>																																																		
FRACURE SPACING										BEDDING										INDURATION										NOTES:																																																												
FRACURE SPACING										BEDDING										INDURATION										<p>FIAD = FILLED IMMEDIATELY AFTER DRILLING</p>																																																												
FRACURE SPACING										BEDDING										INDURATION										ELEVATION: FEET																																																												
FRACURE SPACING										BEDDING										INDURATION										DATE: 8-15-14																																																												

SKEW = 90°



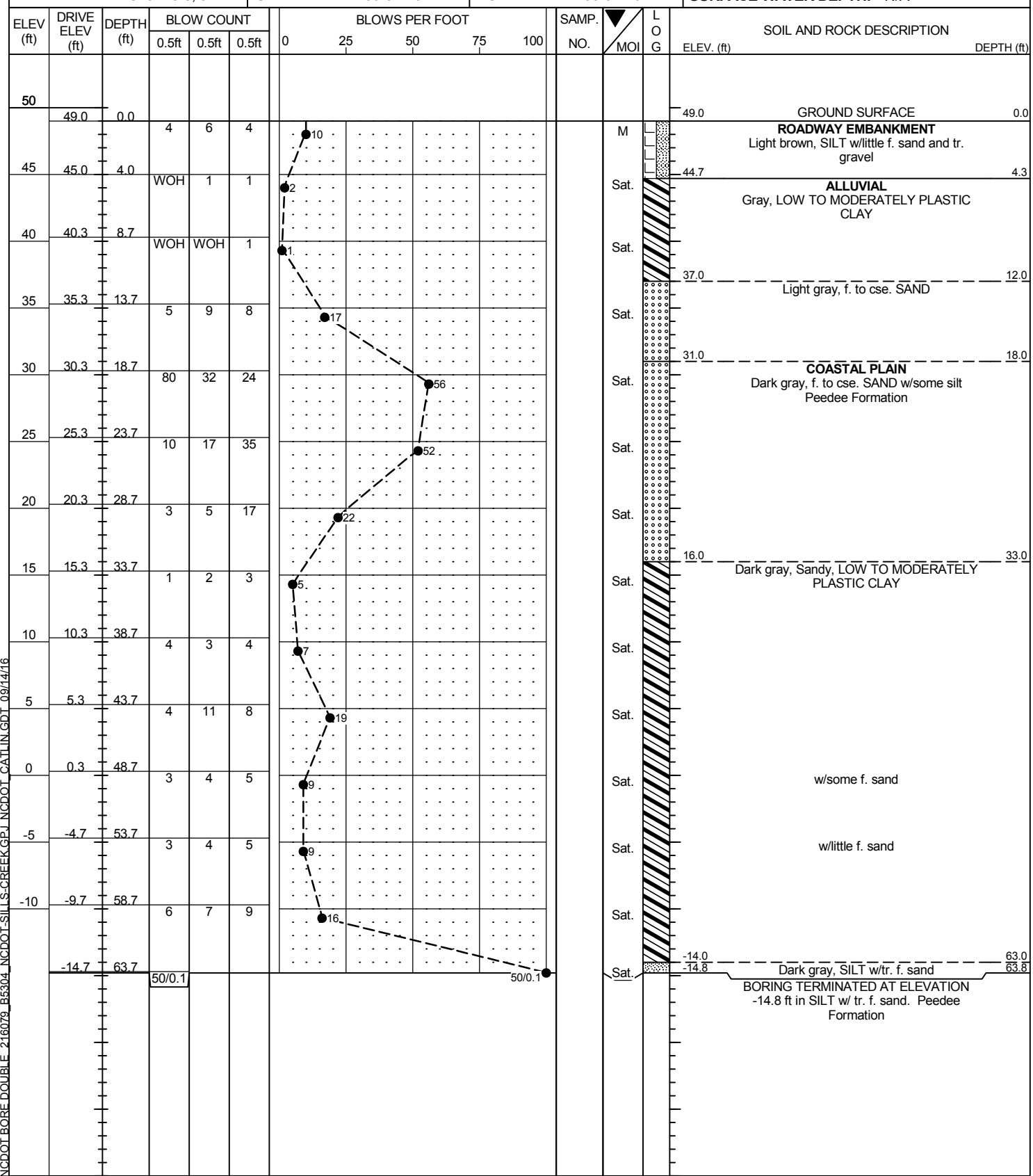


PROFILE THROUGH BORINGS PROJECTED ALONG -L-



GEOTECHNICAL BORING REPORT BORE LOG

WBS: 46018.1.1		TIP: B-5304		COUNTY: PENDER		GEOLOGIST: Lindsay Pugh	
SITE DESCRIPTION BRIDGE NO. 203 ON SR 1324 OVER SILL'S CREEK							GROUND WTR (ft)
BORING NO.: EB1-A		STATION: 11+71		OFFSET: 15 ft LT		ALIGNMENT: -L-	
COLLAR ELEV.: 49.0 ft		TOTAL DEPTH: 63.8 ft		NORTHING: 337,041		EASTING: 2,288,045	
DRILL RIG/HAMMER EFF./DATE: CAT1314 CME-45B 81.7% 04/15/2016				DRILL METHOD: Mud Rotary		HAMMER TYPE: AUTOMATIC	
DRILLER: D.T. Chalmers, Jr.		START DATE: 09/01/16		COMP. DATE: 09/01/16		SURFACE WATER DEPTH: N/A	

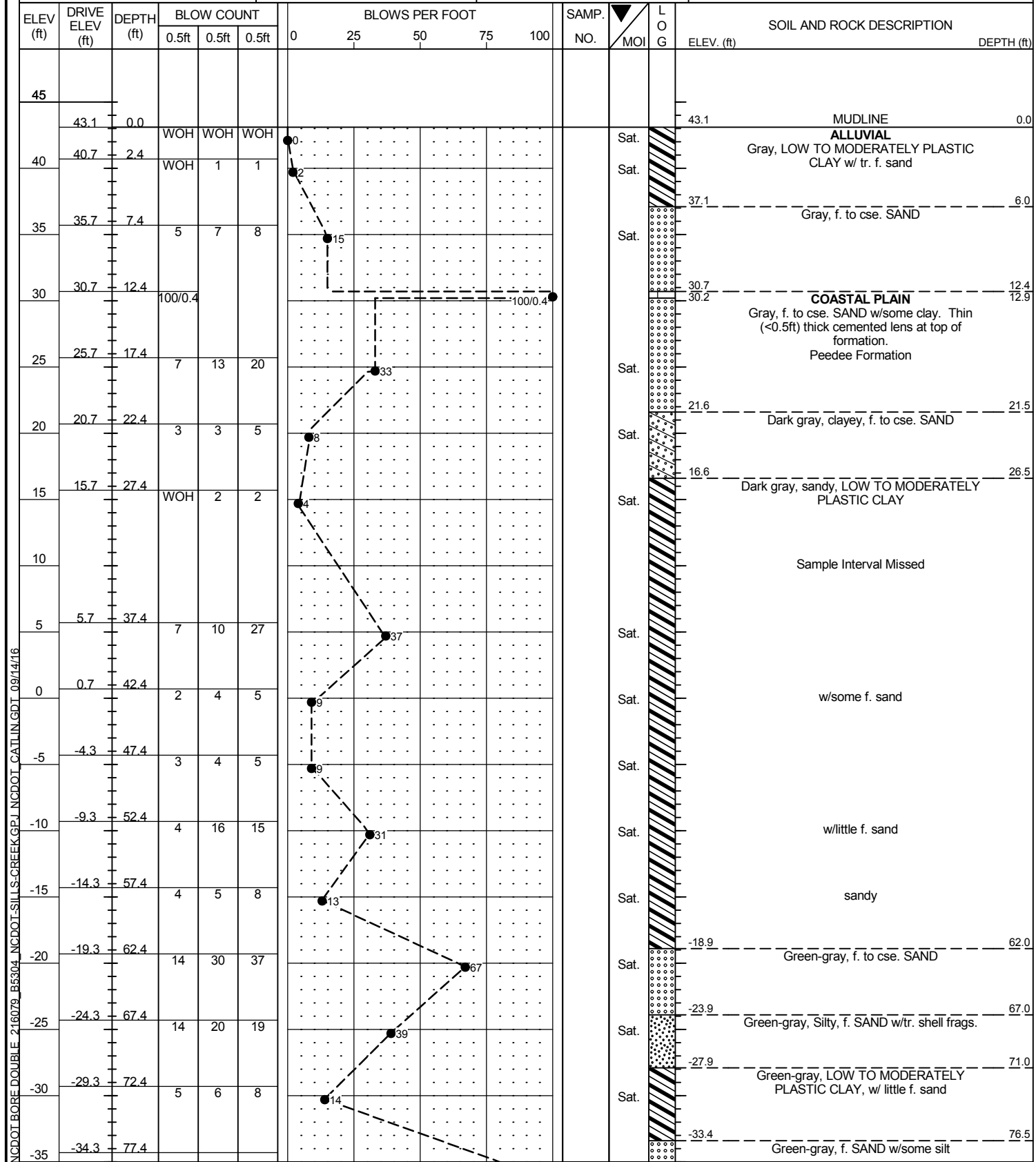


NCDOT BORE DOUBLE 216079_B5304_NCDOT-SILL'S-CREEK-GPI.NCDOT-CATLIN.GDI_09/14/16

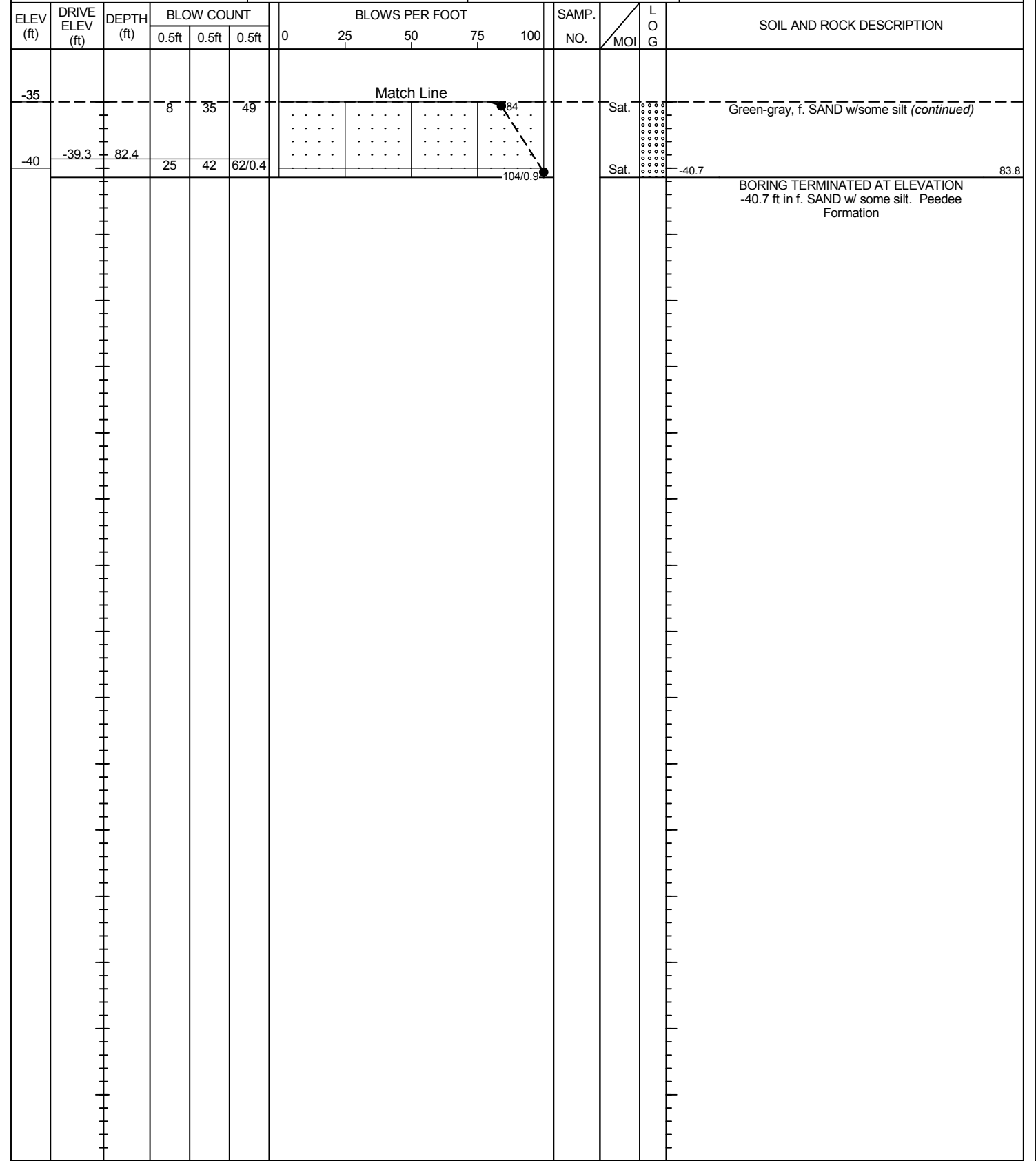
GEOTECHNICAL BORING REPORT BORE LOG



WBS: 46018.1.1	TIP: B-5304	COUNTY: PENDER	GEOLOGIST: Lindsay Pugh
SITE DESCRIPTION BRIDGE NO. 203 ON SR 1324 OVER SILL'S CREEK			GROUND WTR (ft)
BORING NO.: B1-B	STATION: 11+97	OFFSET: 7 ft RT	ALIGNMENT: -L-
COLLAR ELEV.: 43.1 ft	TOTAL DEPTH: 83.8 ft	NORTHING: 337,008	EASTING: 2,288,037
DRILL RIG/HAMMER EFF./DATE: CAT1314 CME-45B 81.7% 04/15/2016		DRILL METHOD: Mud Rotary	HAMMER TYPE: AUTOMATIC
DRILLER: D.T. Chalmers, Jr.	START DATE: 08/30/16	COMP. DATE: 08/30/16	SURFACE WATER DEPTH: 0.7ft



WBS: 46018.1.1	TIP: B-5304	COUNTY: PENDER	GEOLOGIST: Lindsay Pugh
SITE DESCRIPTION BRIDGE NO. 203 ON SR 1324 OVER SILL'S CREEK			GROUND WTR (ft)
BORING NO.: B1-B	STATION: 11+97	OFFSET: 7 ft RT	ALIGNMENT: -L-
COLLAR ELEV.: 43.1 ft	TOTAL DEPTH: 83.8 ft	NORTHING: 337,008	EASTING: 2,288,037
DRILL RIG/HAMMER EFF./DATE: CAT1314 CME-45B 81.7% 04/15/2016		DRILL METHOD: Mud Rotary	HAMMER TYPE: AUTOMATIC
DRILLER: D.T. Chalmers, Jr.	START DATE: 08/30/16	COMP. DATE: 08/30/16	SURFACE WATER DEPTH: 0.7ft



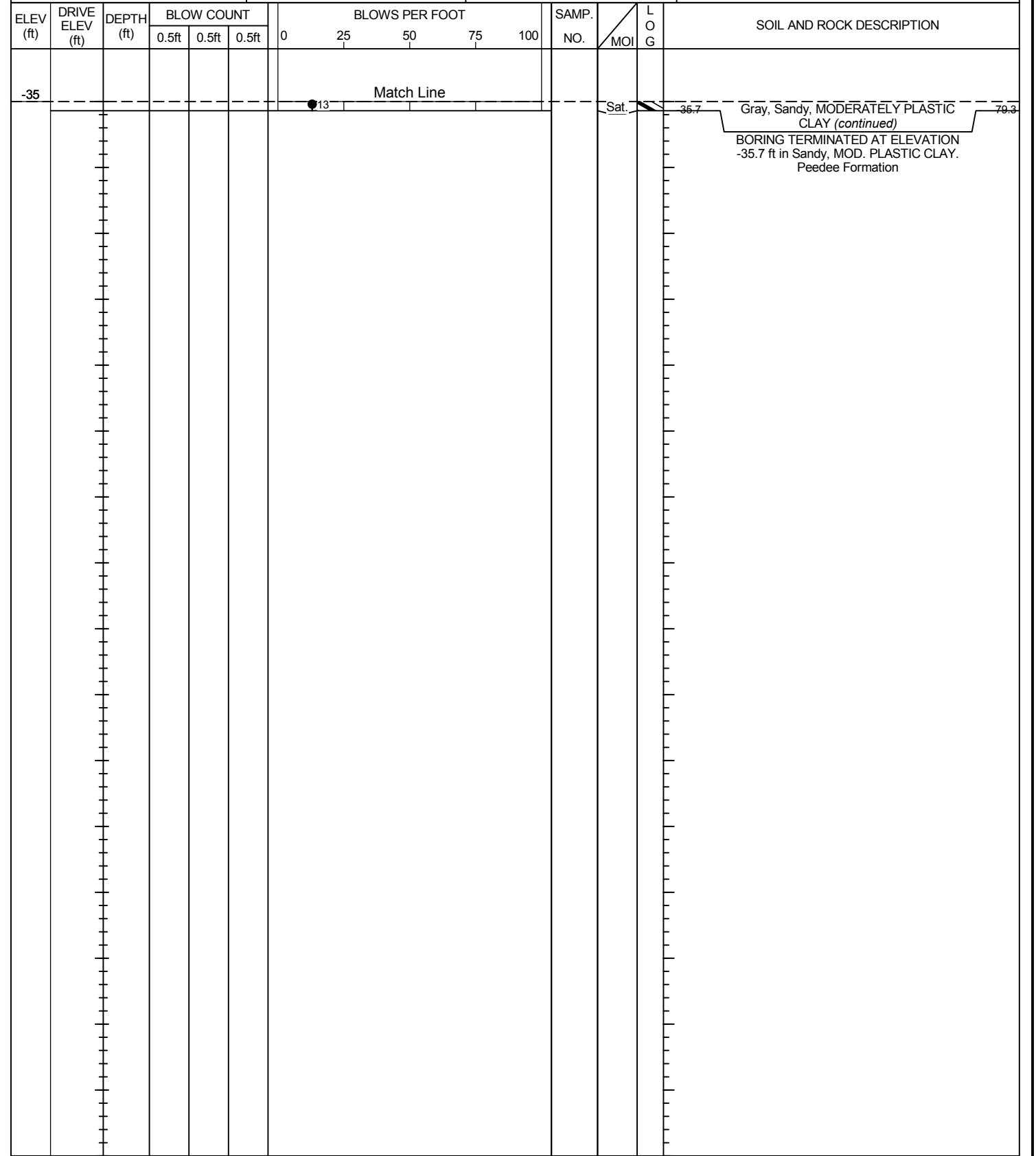
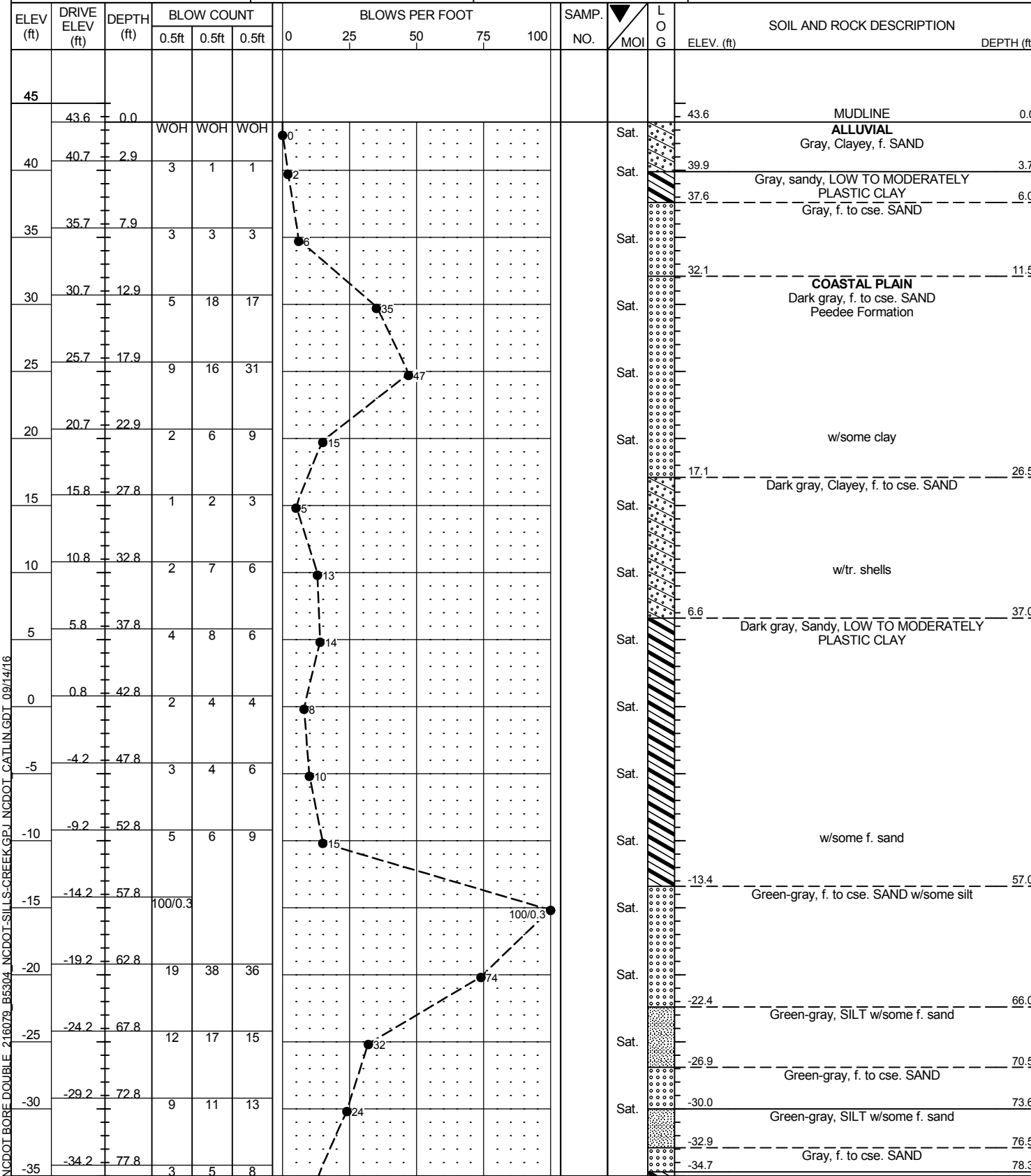
NCDOT BORE DOUBLE 216079_B5304_NCDOT-SILL'S-CREEK-GPI-NCDOT-CATLIN.GDI_08/14/16

GEOTECHNICAL BORING REPORT BORE LOG



WBS: 46018.1.1	TIP: B-5304	COUNTY: PENDER	GEOLOGIST: Lindsay Pugh
SITE DESCRIPTION BRIDGE NO. 203 ON SR 1324 OVER SILL'S CREEK			GROUND WTR (ft)
BORING NO.: B2-A	STATION: 12+52	OFFSET: 6 ft LT	ALIGNMENT: -L-
COLLAR ELEV.: 43.6 ft	TOTAL DEPTH: 79.3 ft	NORTHING: 336,964	EASTING: 2,288,071
DRILL RIG/HAMMER EFF./DATE: CAT1314 CME-45B 81.7% 04/15/2016		DRILL METHOD: Mud Rotary	HAMMER TYPE: AUTOMATIC
DRILLER: D.T. Chalmers, Jr.	START DATE: 08/29/16	COMP. DATE: 08/29/16	SURFACE WATER DEPTH: 0.3ft

WBS: 46018.1.1	TIP: B-5304	COUNTY: PENDER	GEOLOGIST: Lindsay Pugh
SITE DESCRIPTION BRIDGE NO. 203 ON SR 1324 OVER SILL'S CREEK			GROUND WTR (ft)
BORING NO.: B2-A	STATION: 12+52	OFFSET: 6 ft LT	ALIGNMENT: -L-
COLLAR ELEV.: 43.6 ft	TOTAL DEPTH: 79.3 ft	NORTHING: 336,964	EASTING: 2,288,071
DRILL RIG/HAMMER EFF./DATE: CAT1314 CME-45B 81.7% 04/15/2016		DRILL METHOD: Mud Rotary	HAMMER TYPE: AUTOMATIC
DRILLER: D.T. Chalmers, Jr.	START DATE: 08/29/16	COMP. DATE: 08/29/16	SURFACE WATER DEPTH: 0.3ft



NCDOT BORE DOUBLE 216079 B5304 NCDOT-SILL'S-CREEK-GPI-NCDOT-CATLIN.GDI 08/14/16

GEOTECHNICAL BORING REPORT BORE LOG

WBS: 46018.1.1		TIP: B-5304		COUNTY: PENDER		GEOLOGIST: Lindsay Pugh	
SITE DESCRIPTION BRIDGE NO. 203 ON SR 1324 OVER SILL'S CREEK							GROUND WTR (ft)
BORING NO.: EB2-B		STATION: 12+83		OFFSET: 13 ft RT		ALIGNMENT: -L-	
COLLAR ELEV.: 48.9 ft		TOTAL DEPTH: 65.0 ft		NORTHING: 336,928		EASTING: 2,288,067	
DRILL RIG/HAMMER EFF./DATE: CAT1314 CME-45B 81.7% 04/15/2016				DRILL METHOD: Mud Rotary		HAMMER TYPE: AUTOMATIC	
DRILLER: D.T. Chalmers, Jr.		START DATE: 09/01/16		COMP. DATE: 09/01/16		SURFACE WATER DEPTH: N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
50	48.9	0.0											48.9	0.0	GROUND SURFACE	
			2	4	2							M				ROADWAY EMBANKMENT Lt. brown, f. to cse. SAND w/little silt
45	45.0	3.9	1	1	1							Sat.	44.4	4.5		
															ALLUVIAL Gray, LOW TO MODERATELY PLASTIC CLAY, w/some f. sand	
40	40.4	8.5	WOH	WOH	1							Sat.	40.9	8.0		
															Brown, SILT w/little organics and tr. f. sand	
35	35.4	13.5	3	1	2							Sat.	36.9	12.0		
															Gray, LOW TO MODERATELY PLASTIC CLAY	
30	30.4	18.5	11	12	13							Sat.	31.9	17.0		
															COASTAL PLAIN Dark gray, f. to cse. SAND Pee Dee Formation	
25	25.4	23.5	10	23	40							Sat.	26.4	22.5		
															Dark gray, Clayey, f. to cse. SAND	
20	20.4	28.5	4	11	14							Sat.	21.4	27.5		
															Dark gray, Sandy, LOW TO MODERATELY PLASTIC CLAY	
15	15.4	33.5	2	3	3							Sat.				
10	10.4	38.5	3	3	5							Sat.	11.4	37.5		
															Dark gray, Clayey, f. SAND	
5	5.4	43.5	18	19	15							Sat.	6.9	42.0		
															Dark gray, Sandy, LOW TO MODERATELY PLASTIC CLAY	
0	0.4	48.5	3	4	5							Sat.				
															w/some f. sand	
-5	-4.6	53.5	3	5	6							Sat.				
-10	-9.6	58.5	3	7	8							Sat.	-11.6	60.5		
															Dark gray, Clayey, f. SAND	
-15	-14.6	63.5	4	11	30							Sat.	-15.2	64.1		
													-16.1	65.0		
															Green-gray, f. SAND w/little silt	
															BORING TERMINATED AT ELEVATION -16.1 ft in f. SAND w/ little silt. Pee Dee Formation	

NCDOT BORE DOUBLE 216079_B5304_NCDOT-SILL'S-CREEK-GPI-NCDOT-CATLIN.GDI_09/14/16