

CONTRACT: 33264.1.1 ID: B-3809

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33264.1.1 (B-3809) F.A. PROJ. BRSTP-99(2)
 COUNTY BEAUFORT
 PROJECT DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER
PUNGO CREEK AT -L- STA. 28+50

INVENTORY

STATE	STATS PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3809	1	32

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.

FIELD OFFICE

PERSONNEL

SOME PERSONNEL

TCB

JRS

SCD

RES

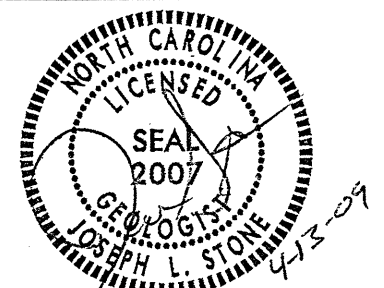
JME

INVESTIGATED BY J.L. STONE

CHECKED BY DN ARGENBRIGHT

SUBMITTED BY DN ARGENBRIGHT

DATE APRIL, 2009



DRAWN BY: C.R. SUMNER, J.L. STONE

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

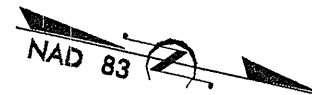
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

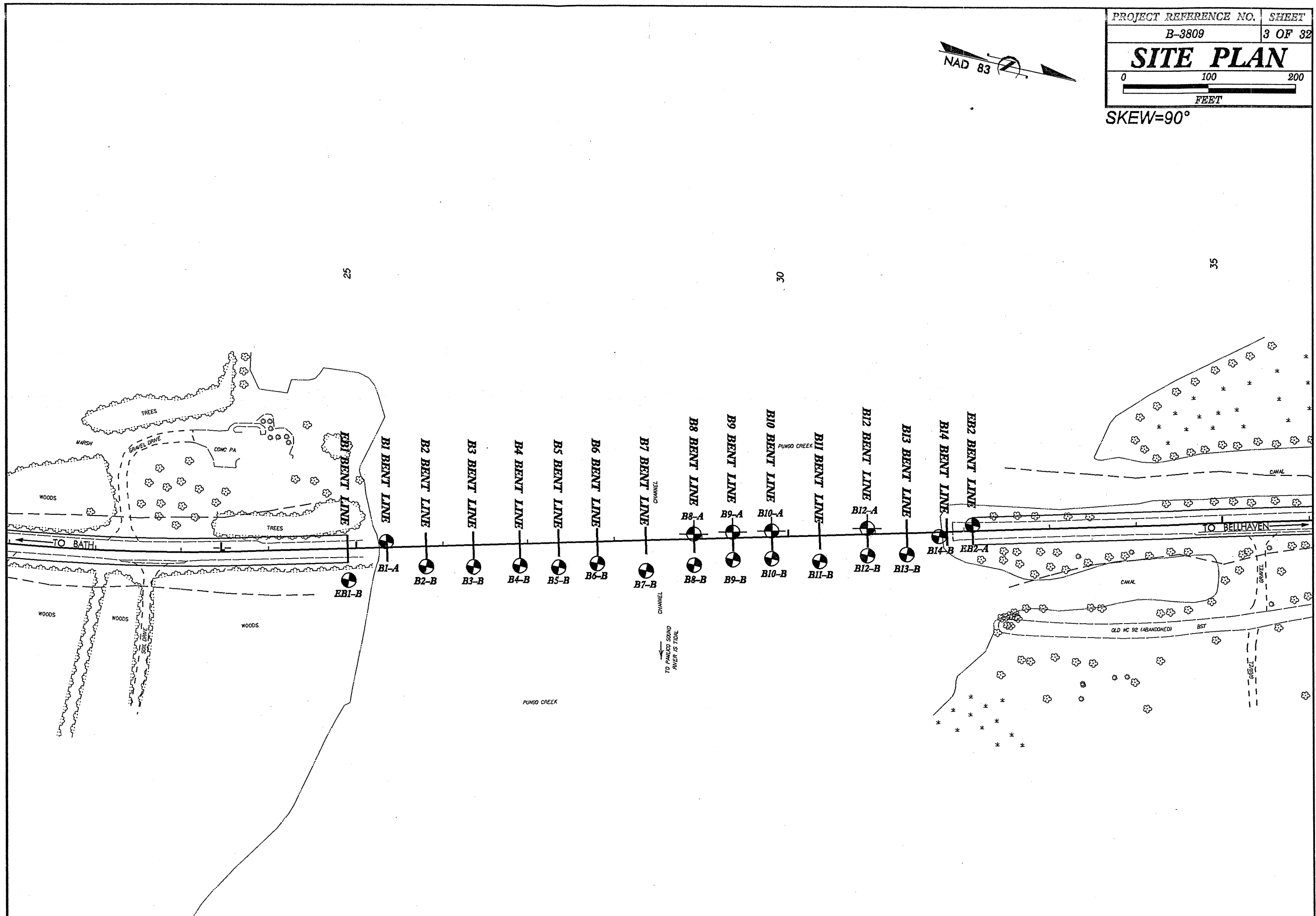
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. B-3809 SHEET NO. 2

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 FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</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) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>ANGULARITY OF GRAINS 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 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>WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)</p>		<p>ALLUVIUM (ALLUVJ) - 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 (CALCJ) - 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 (RECJ) - 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 (FMJ) - 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 (MDIJ) - 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 (RESJ) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RODJ) - 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 (SAPJ) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRODUCED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS 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 (SRECJ) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRODJ) - 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 (TSJ) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING		ROCK HARDNESS	
<p>GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS</p> <p>GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-4, A-5, A-6, A-7</p> <p>SYMBOL</p> <p>% PASSING: 10, 40, 200</p> <p>LIQUID LIMIT PLASTIC INDEX</p> <p>GROUP INDEX</p> <p>USUAL TYPES OF MAJOR MATERIALS</p> <p>GENERAL RATINGS AS A SUBGRADE</p>		<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p>COMPRESSIBILITY</p> <p>PERCENTAGE OF MATERIAL</p> <p>GROUND WATER</p>		<p>FRESH: ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SLJ): 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 (SLJ): ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.</p> <p>MODERATE (MODJ): 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. SEVJ): 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>SEVERE (SEVJ): ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BPF.</p> <p>VERY SEVERE (V SEVJ): ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF.</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>VERY HARD: CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>HARD: CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>MODERATELY HARD: CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</p> <p>MEDIUM HARD: CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p>SOFT: CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</p> <p>VERY SOFT: CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p>	
CONSISTENCY OR DENSENESS		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		FRACTURE SPACING	
<p>PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</p> <p>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</p> <p>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</p>		<p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</p> <p>SOIL SYMBOL</p> <p>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</p> <p>INFERRED SOIL BOUNDARY</p> <p>INFERRED ROCK LINE</p> <p>ALLUVIAL SOIL BOUNDARY</p> <p>DIP & DIP DIRECTION OF ROCK STRUCTURES</p> <p>SOUNDING ROD</p> <p>SPT TEST BORING</p> <p>AUGER BORING</p> <p>CORE BORING</p> <p>MONITORING WELL</p> <p>PIEZOMETER INSTALLATION</p> <p>SLOPE INDICATOR INSTALLATION</p> <p>SPT N-VALUE</p> <p>SPT REFUSAL</p>		<p>VERY HARD: CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>HARD: CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>MODERATELY HARD: CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</p> <p>MEDIUM HARD: CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p>SOFT: CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</p> <p>VERY SOFT: CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p>		<p>TERM SPACING THICKNESS</p> <p>VERY WIDE MORE THAN 10 FEET > 4 FEET</p> <p>WIDE 3 TO 10 FEET 1.5 - 4 FEET</p> <p>MODERATELY CLOSE 1 TO 3 FEET 0.16 - 1.5 FEET</p> <p>CLOSE 0.16 TO 1 FEET 0.03 - 0.16 FEET</p> <p>VERY CLOSE LESS THAN 0.16 FEET < 0.008 FEET</p>	
TEXTURE OR GRAIN SIZE		ABBREVIATIONS		INDURATION		BEDDING	
<p>U.S. STD. SIEVE SIZE OPENING (MM)</p> <p>BOULDER (BLDRJ) COBBLE (COBJ) GRAVEL (GRJ) COARSE SAND (CSE, SDJ) FINE SAND (F SDJ) SILT (SLJ) CLAY (CLJ)</p> <p>GRAIN SIZE</p>		<p>AR - AUGER REFUSAL</p> <p>BT - BORING TERMINATED</p> <p>CL - CLAY</p> <p>CPT - CONE PENETRATION TEST</p> <p>CSE - COARSE</p> <p>DMT - DILATOMETER TEST</p> <p>DPT - DYNAMIC PENETRATION TEST</p> <p>o - VOID RATIO</p> <p>F - FINE</p> <p>FOSS - FOSSILIFEROUS</p> <p>FRAC - FRACTURED, FRACTURES</p> <p>FRAGS - FRAGMENTS</p> <p>HL - HIGHLY</p> <p>MD - MEDIUM</p> <p>MICA - MICAEOUS</p> <p>MOD - MODERATELY</p> <p>NP - NON PLASTIC</p> <p>ORG - ORGANIC</p> <p>PMT - PRESSUREMETER TEST</p> <p>SAP - SAPROLITIC</p> <p>SD - SAND, SANDY</p> <p>SL - SILT, SILTY</p> <p>SLI - SLIGHTLY</p> <p>TCR - TRICONE REFUSAL</p> <p>w - MOISTURE CONTENT</p> <p>v - VERY</p> <p>VST - VANE SHEAR TEST</p> <p>WEA - WEATHERED</p> <p>% - UNIT WEIGHT</p> <p>%_d - DRY UNIT WEIGHT</p>		<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE: RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED: GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED: GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED: SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>		<p>TERM SPACING THICKNESS</p> <p>VERY WIDE MORE THAN 10 FEET > 4 FEET</p> <p>WIDE 3 TO 10 FEET 1.5 - 4 FEET</p> <p>MODERATELY CLOSE 1 TO 3 FEET 0.16 - 1.5 FEET</p> <p>CLOSE 0.16 TO 1 FEET 0.03 - 0.16 FEET</p> <p>VERY CLOSE LESS THAN 0.16 FEET < 0.008 FEET</p>	
SOIL MOISTURE - CORRELATION OF TERMS		EQUIPMENT USED ON SUBJECT PROJECT		INDURATION		BEDDING	
<p>SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION</p> <p>LL - LIQUID LIMIT</p> <p>PL - PLASTIC LIMIT</p> <p>OM - OPTIMUM MOISTURE</p> <p>SL - SHRINKAGE LIMIT</p> <p>- SATURATED - (SATJ) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</p> <p>- WET - (WJ) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</p> <p>- MOIST - (MJ) SOLID; AT OR NEAR OPTIMUM MOISTURE</p> <p>- DRY - (DJ) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</p>		<p>DRILL UNITS: MOBILE B-57, BK-51, CME-45B, CME-550, PORTABLE HOIST</p> <p>ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE 2 1/8" STEEL TEETH, TRICONE TUNG-CARB., CORE BIT</p> <p>HAMMER TYPE: AUTOMATIC, MANUAL</p> <p>CORE SIZE: B, N, WD4, H</p> <p>HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST</p>		<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE: RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED: GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED: GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED: SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>		<p>TERM SPACING THICKNESS</p> <p>VERY WIDE MORE THAN 10 FEET > 4 FEET</p> <p>WIDE 3 TO 10 FEET 1.5 - 4 FEET</p> <p>MODERATELY CLOSE 1 TO 3 FEET 0.16 - 1.5 FEET</p> <p>CLOSE 0.16 TO 1 FEET 0.03 - 0.16 FEET</p> <p>VERY CLOSE LESS THAN 0.16 FEET < 0.008 FEET</p>	
PLASTICITY		EQUIPMENT USED ON SUBJECT PROJECT		INDURATION		BEDDING	
<p>PLASTICITY INDEX (PI) DRY STRENGTH</p> <p>NONPLASTIC 0-5 VERY LOW</p> <p>LOW PLASTICITY 6-15 SLIGHT</p> <p>MED. PLASTICITY 16-25 MEDIUM</p> <p>HIGH PLASTICITY 26 OR MORE HIGH</p>		<p>DRILL UNITS: MOBILE B-57, BK-51, CME-45B, CME-550, PORTABLE HOIST</p> <p>ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE 2 1/8" STEEL TEETH, TRICONE TUNG-CARB., CORE BIT</p> <p>HAMMER TYPE: AUTOMATIC, MANUAL</p> <p>CORE SIZE: B, N, WD4, H</p> <p>HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST</p>		<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE: RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED: GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED: GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED: SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>		<p>TERM SPACING THICKNESS</p> <p>VERY WIDE MORE THAN 10 FEET > 4 FEET</p> <p>WIDE 3 TO 10 FEET 1.5 - 4 FEET</p> <p>MODERATELY CLOSE 1 TO 3 FEET 0.16 - 1.5 FEET</p> <p>CLOSE 0.16 TO 1 FEET 0.03 - 0.16 FEET</p> <p>VERY CLOSE LESS THAN 0.16 FEET < 0.008 FEET</p>	
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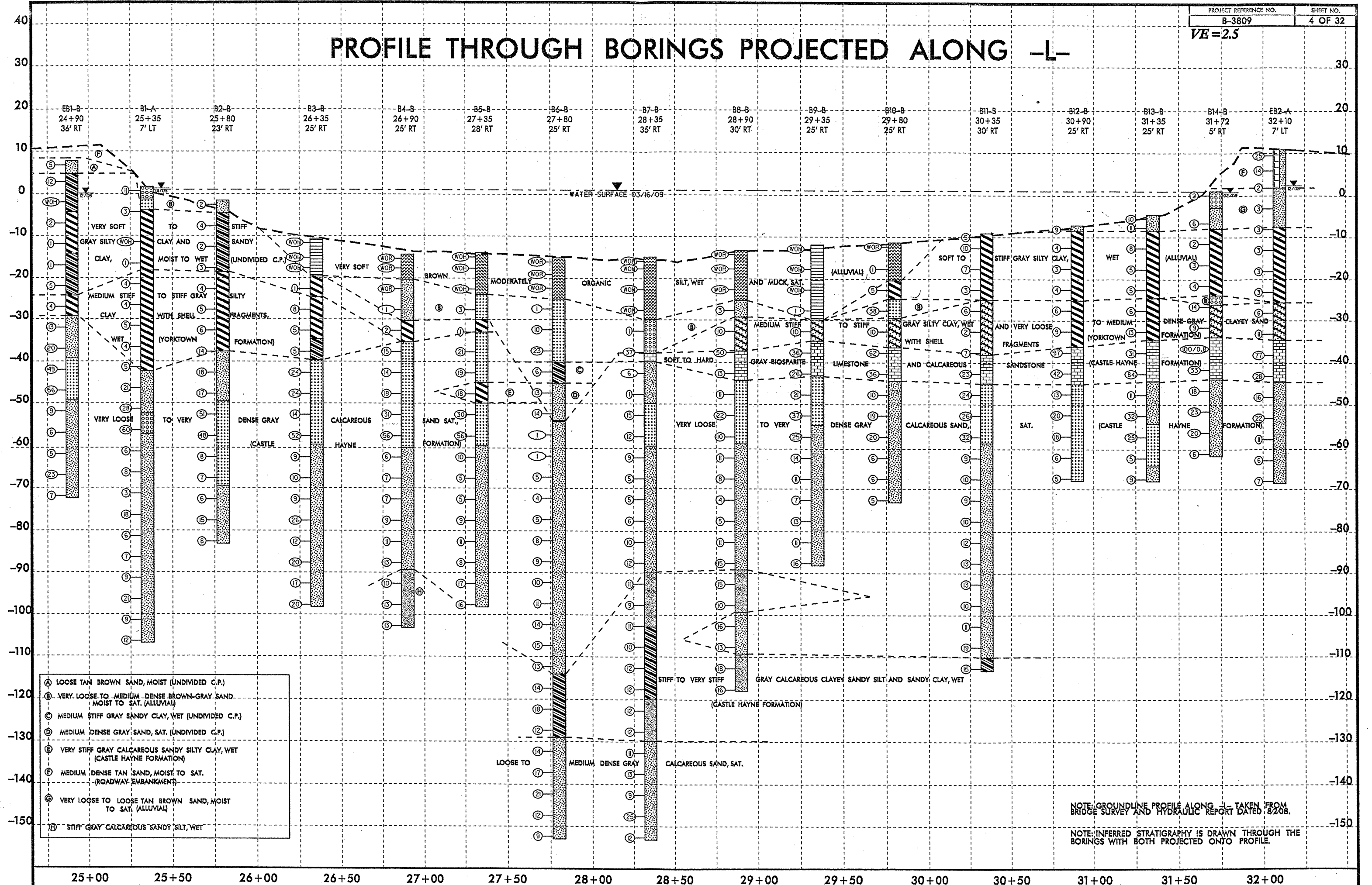
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PROFILE THROUGH BORINGS PROJECTED ALONG -L-

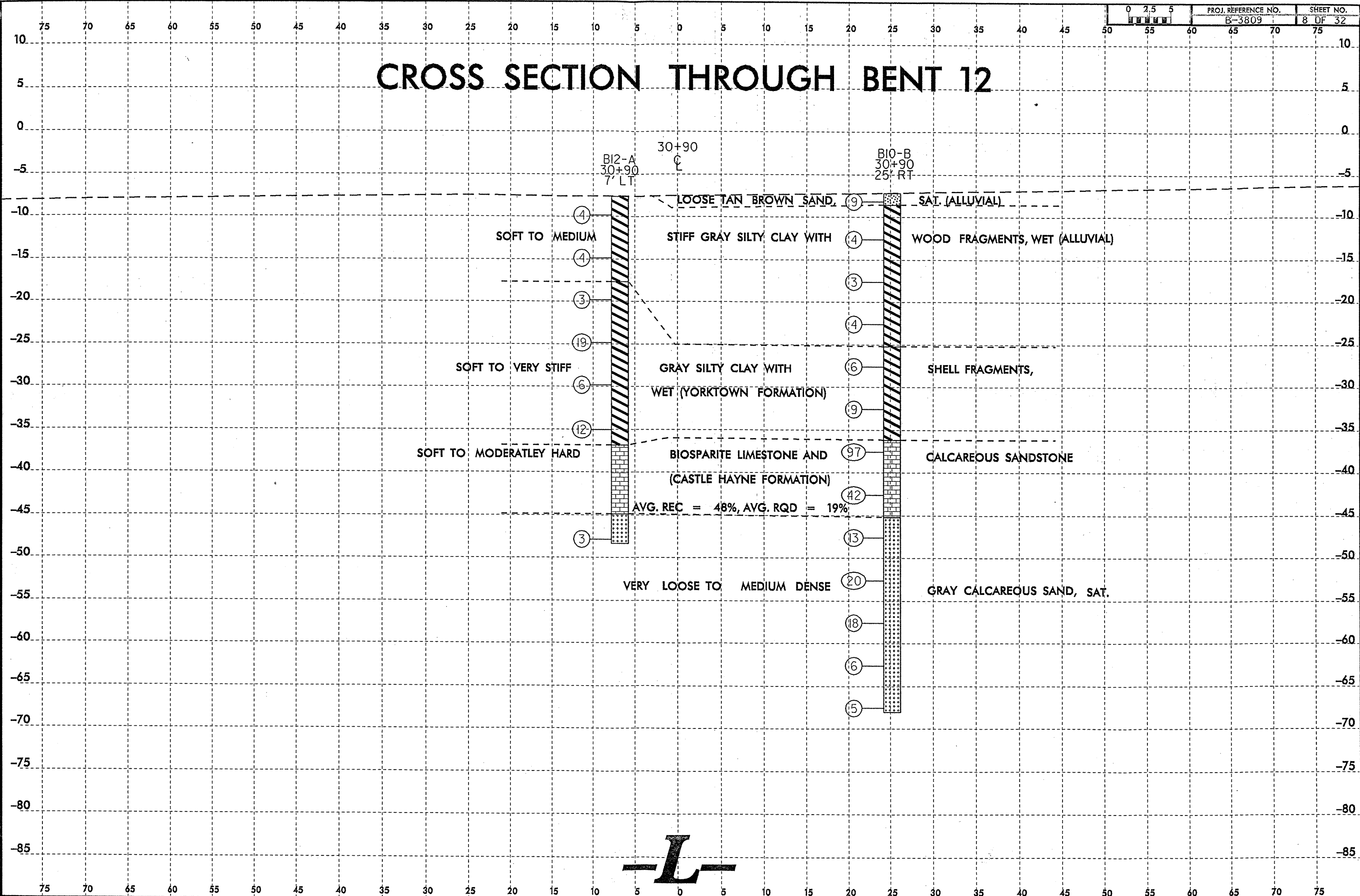
VE=2.5



- A LOOSE TAN BROWN SAND, MOIST (UNDIVIDED C.P.)
- B VERY LOOSE TO MEDIUM DENSE BROWN-GRAY SAND, MOIST TO SAT. (ALLUVIAL)
- C MEDIUM STIFF GRAY SANDY CLAY, WET (UNDIVIDED C.P.)
- D MEDIUM DENSE GRAY SAND, SAT. (UNDIVIDED C.P.)
- E VERY STIFF GRAY CALCAREOUS SANDY SILTY CLAY, WET (CASTLE HAYNE FORMATION)
- F MEDIUM DENSE TAN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT)
- G VERY LOOSE TO LOOSE TAN BROWN SAND, MOIST TO SAT. (ALLUVIAL)
- H STIFF GRAY CALCAREOUS SANDY SILT, WET

NOTE: GROUNDLINE PROFILE ALONG -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC REPORT DATED 8/208.
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

CROSS SECTION THROUGH BENT 12

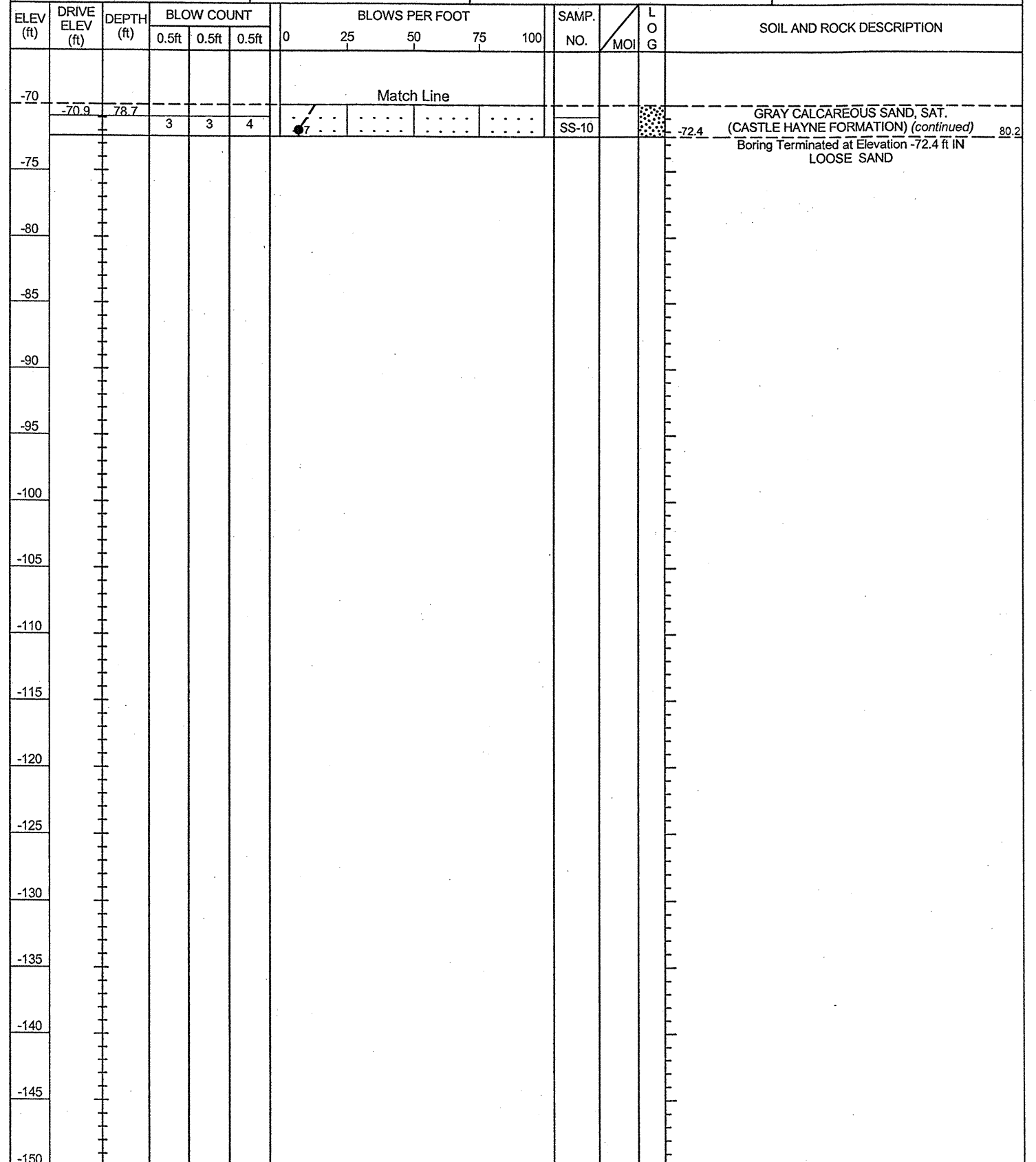
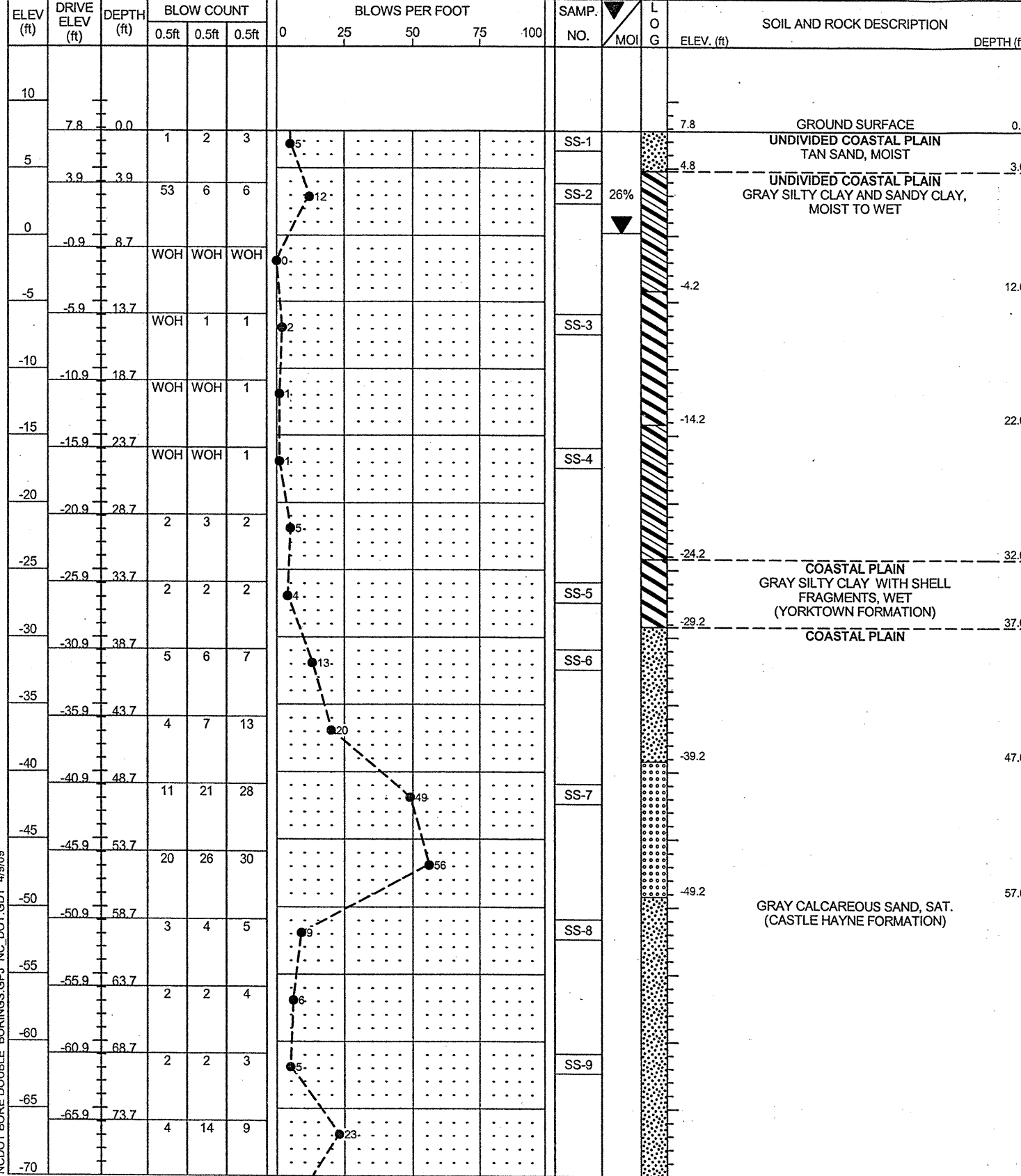


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PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Dillard, S. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 24+90	OFFSET 36ft RT	ALIGNMENT -L-
COLLAR ELEV. 7.8 ft	TOTAL DEPTH 80.2 ft	NORTHING 644,348	EASTING 2,692,863
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 12/16/08	COMP. DATE 12/16/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Dillard, S. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
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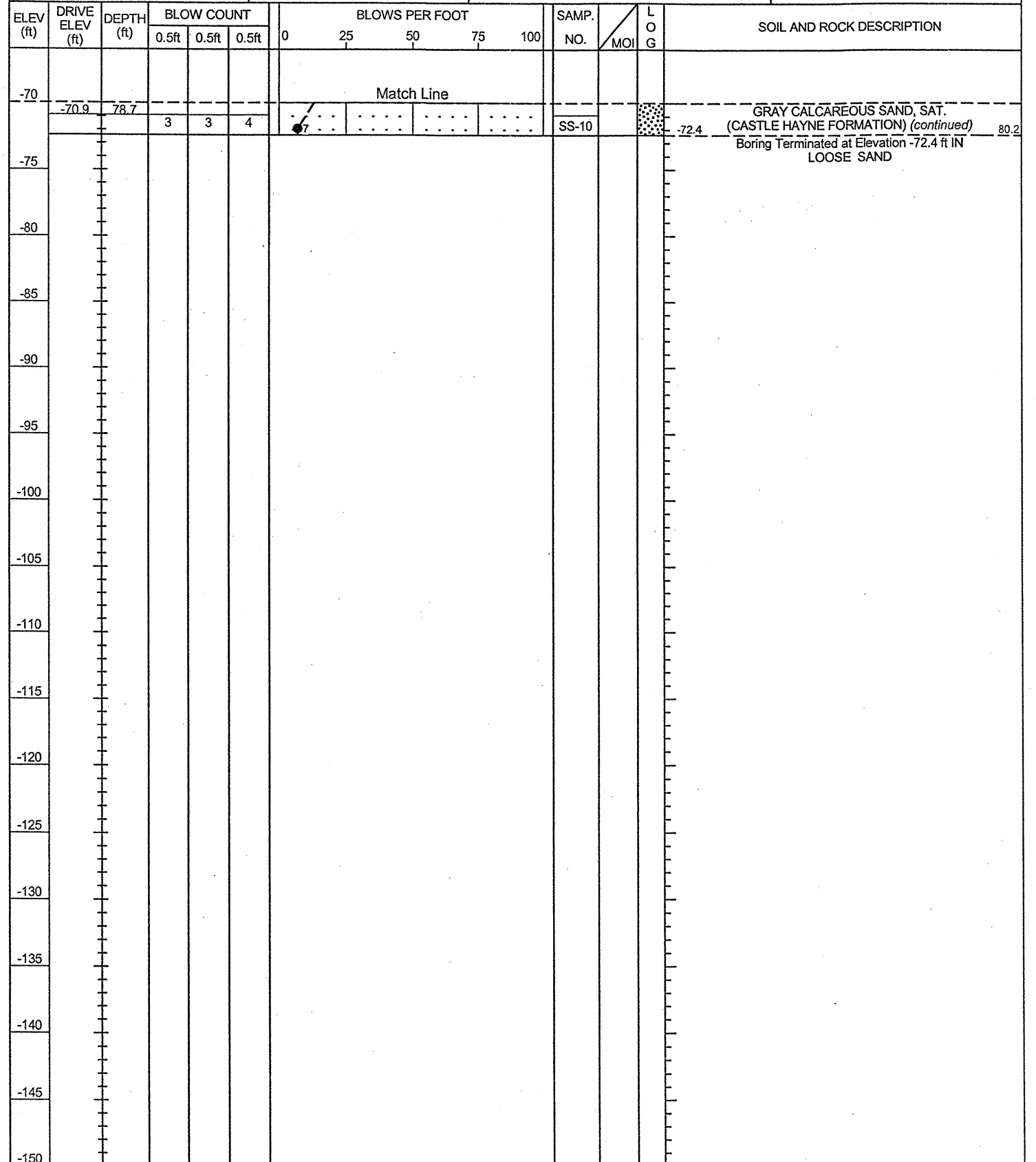
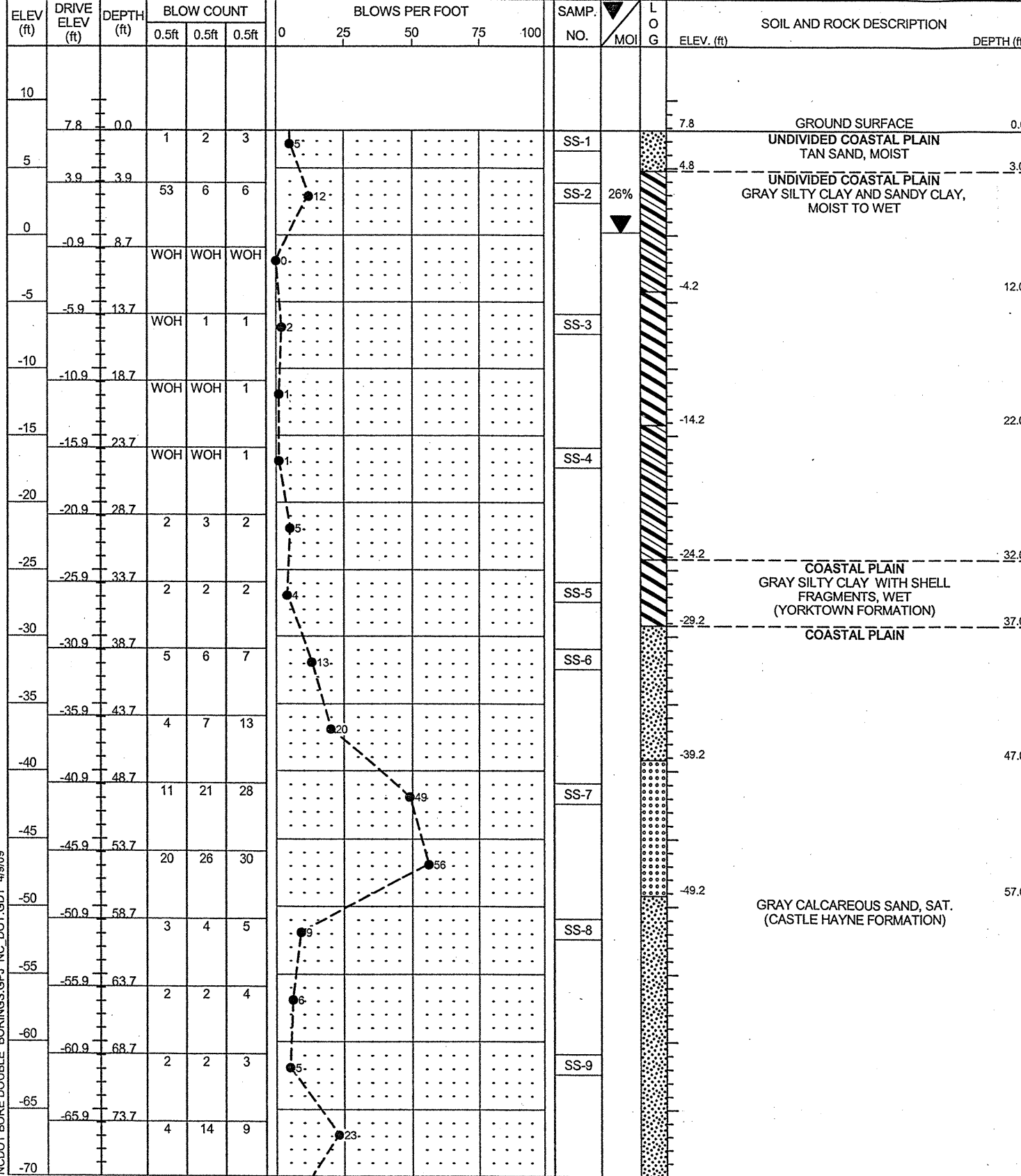
NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/9/09



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Dillard, S. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 24+90	OFFSET 36ft RT	ALIGNMENT -L-
COLLAR ELEV. 7.8 ft	TOTAL DEPTH 80.2 ft	NORTHING 644,348	EASTING 2,692,863
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 12/16/08	COMP. DATE 12/16/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Dillard, S. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 24+90	OFFSET 36ft RT	ALIGNMENT -L-
COLLAR ELEV. 7.8 ft	TOTAL DEPTH 80.2 ft	NORTHING 644,348	EASTING 2,692,863
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 12/16/08	COMP. DATE 12/16/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



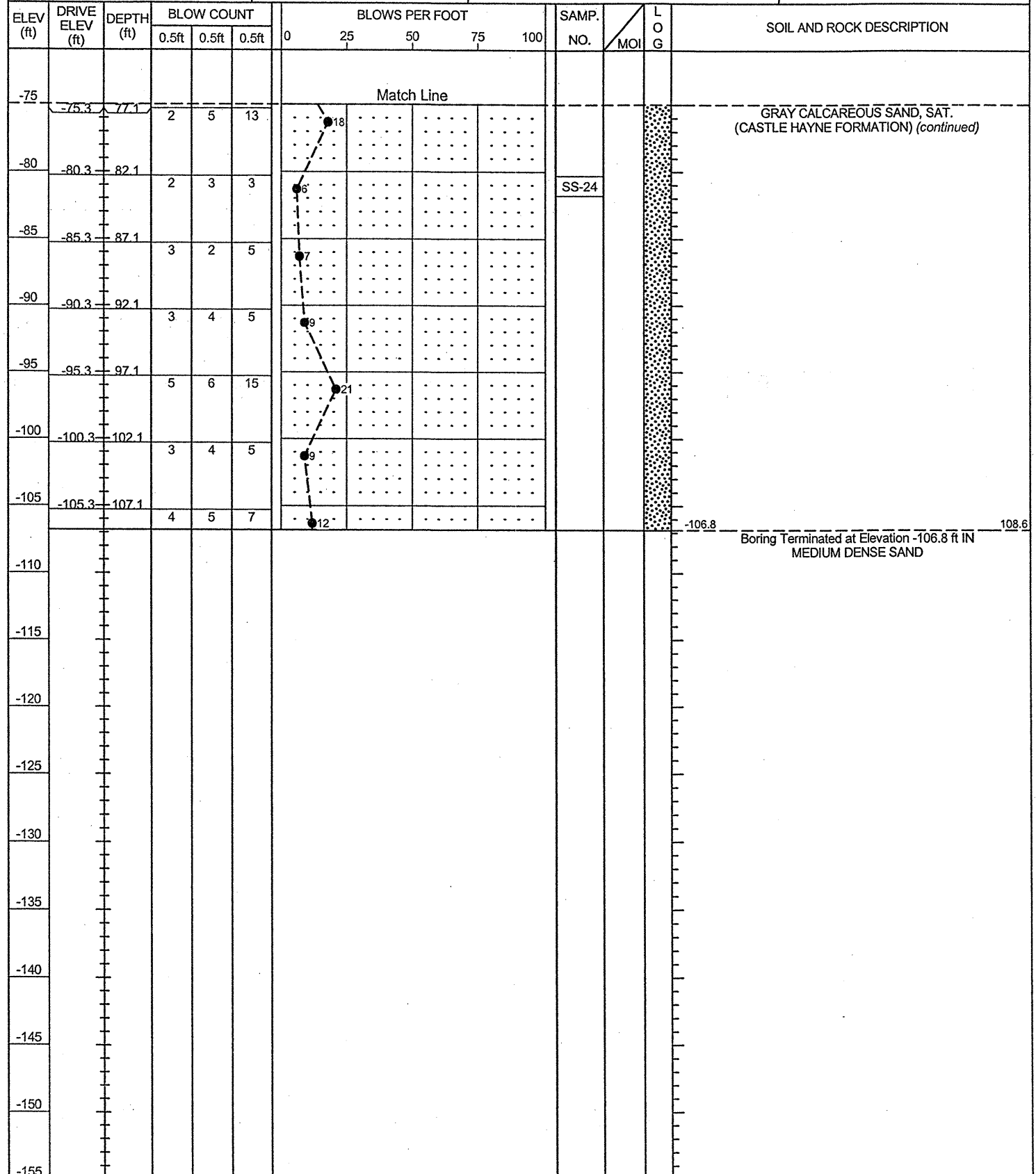
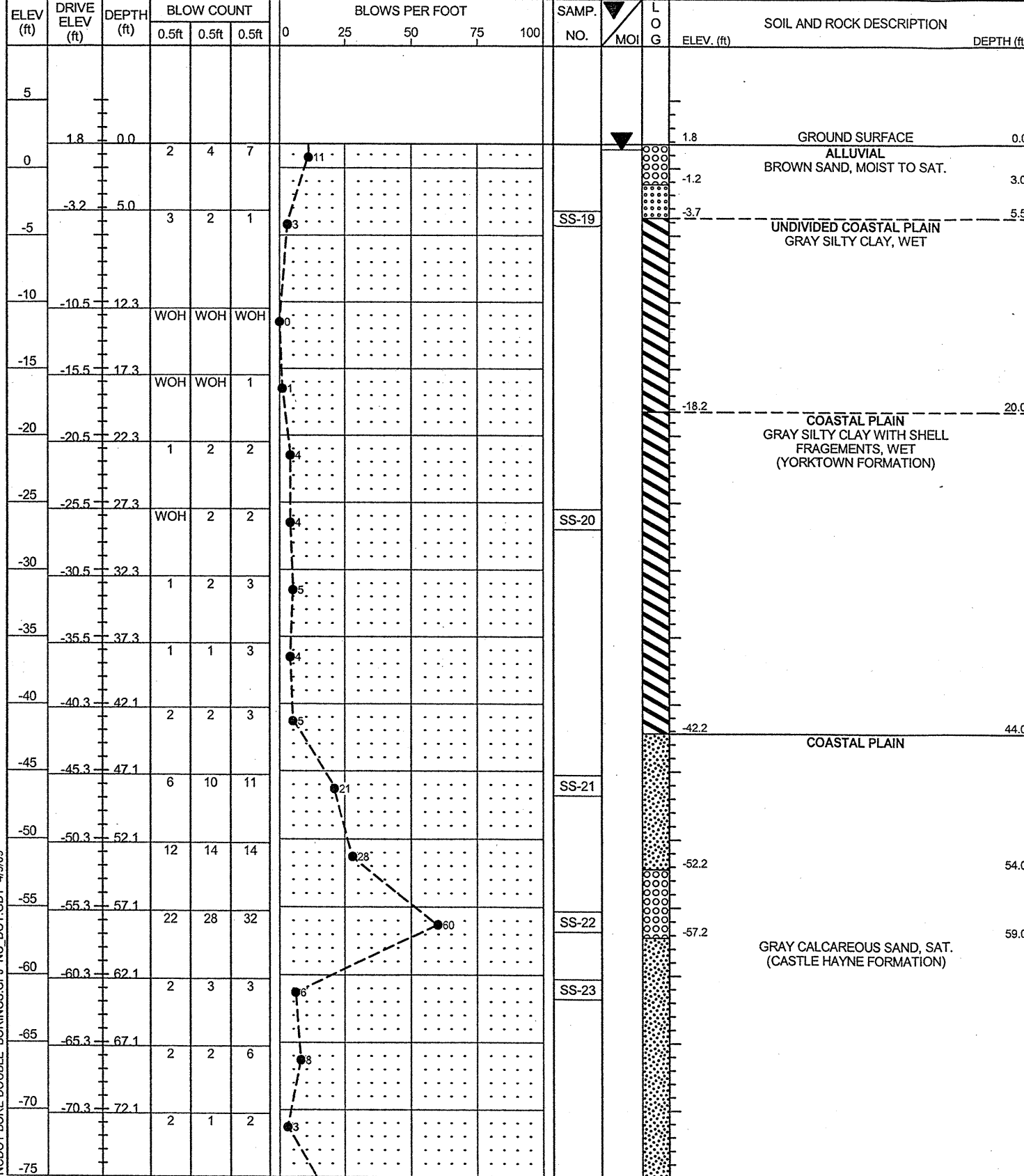
NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/9/09



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Dillard, S. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B1-A	STATION 25+35	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. 1.8 ft	TOTAL DEPTH 108.6 ft	NORTHING 644,381	EASTING 2,692,811
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 12/18/08	COMP. DATE 01/28/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Dillard, S. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B1-A	STATION 25+35	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. 1.8 ft	TOTAL DEPTH 108.6 ft	NORTHING 644,381	EASTING 2,692,811
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 12/18/08	COMP. DATE 01/28/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

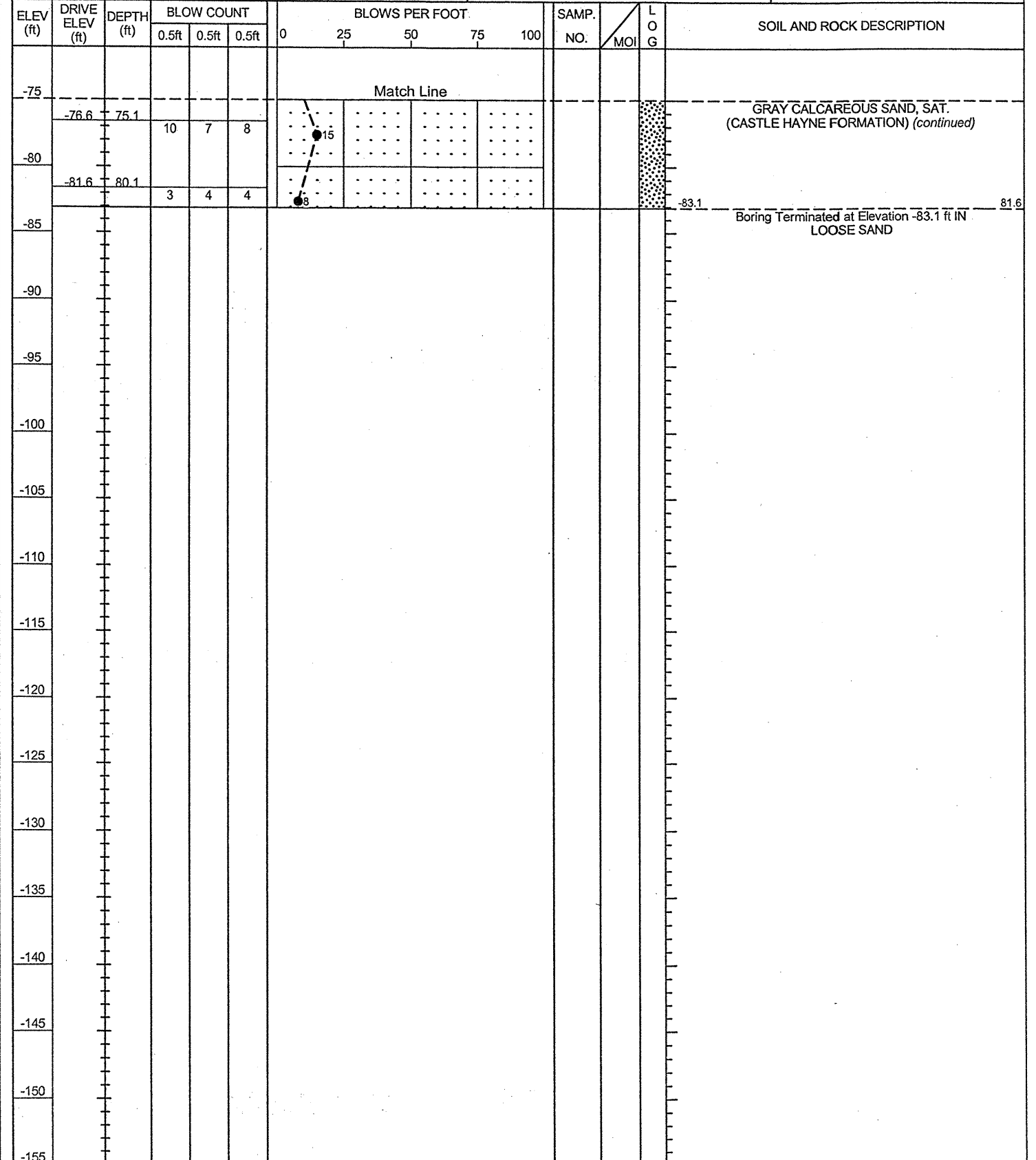
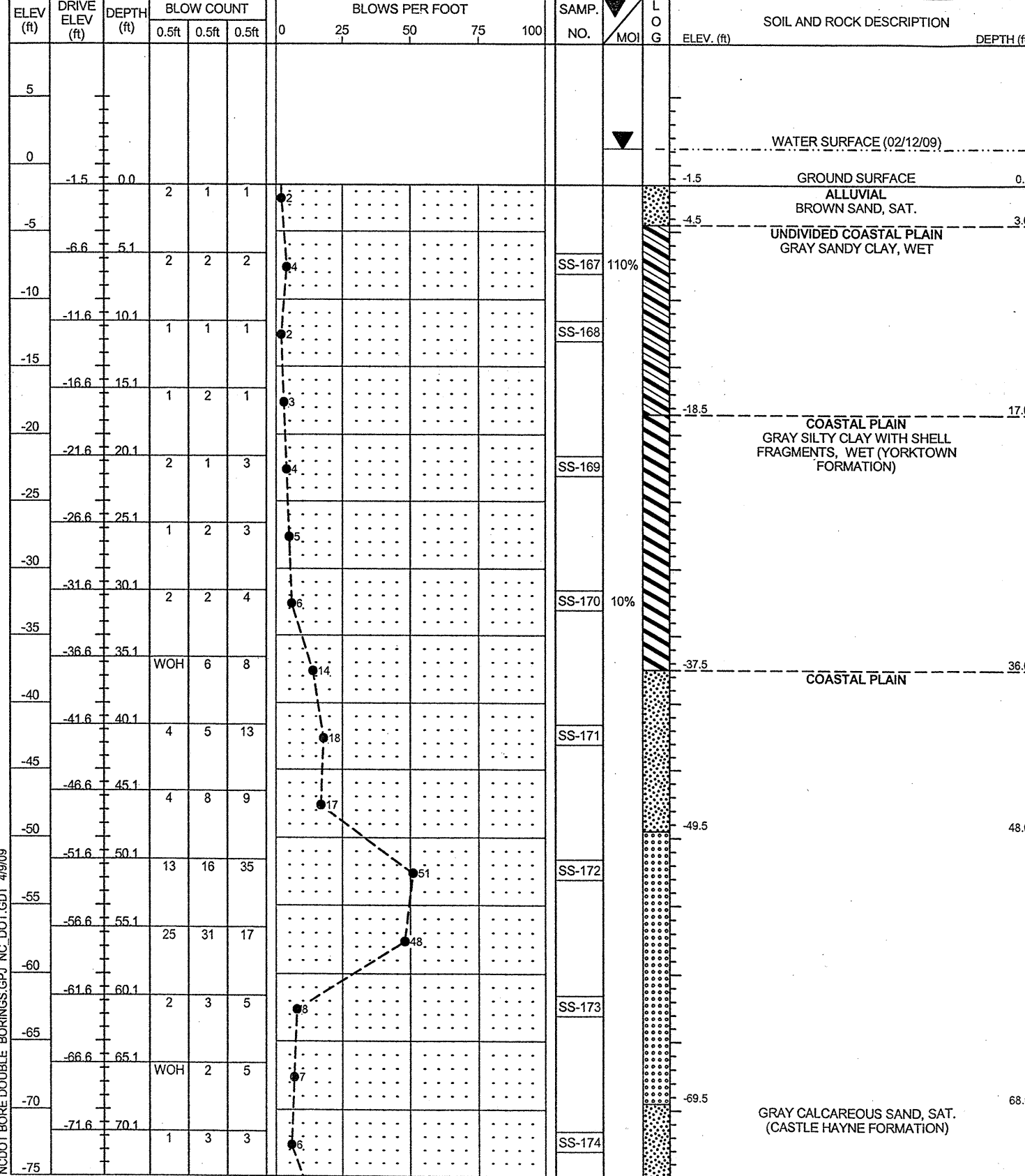


NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/9/09

Boring Terminated at Elevation -106.8 ft IN
MEDIUM DENSE SAND

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B2-B	STATION 25+80	OFFSET 23ft RT	ALIGNMENT -L-
COLLAR ELEV. -1.5 ft	TOTAL DEPTH 81.6 ft	NORTHING 644,432	EASTING 2,692,829
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/12/09	COMP. DATE 02/12/09	SURFACE WATER DEPTH 2.7ft	DEPTH TO ROCK N/A

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B2-B	STATION 25+80	OFFSET 23ft RT	ALIGNMENT -L-
COLLAR ELEV. -1.5 ft	TOTAL DEPTH 81.6 ft	NORTHING 644,432	EASTING 2,692,829
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/12/09	COMP. DATE 02/12/09	SURFACE WATER DEPTH 2.7ft	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/9/09

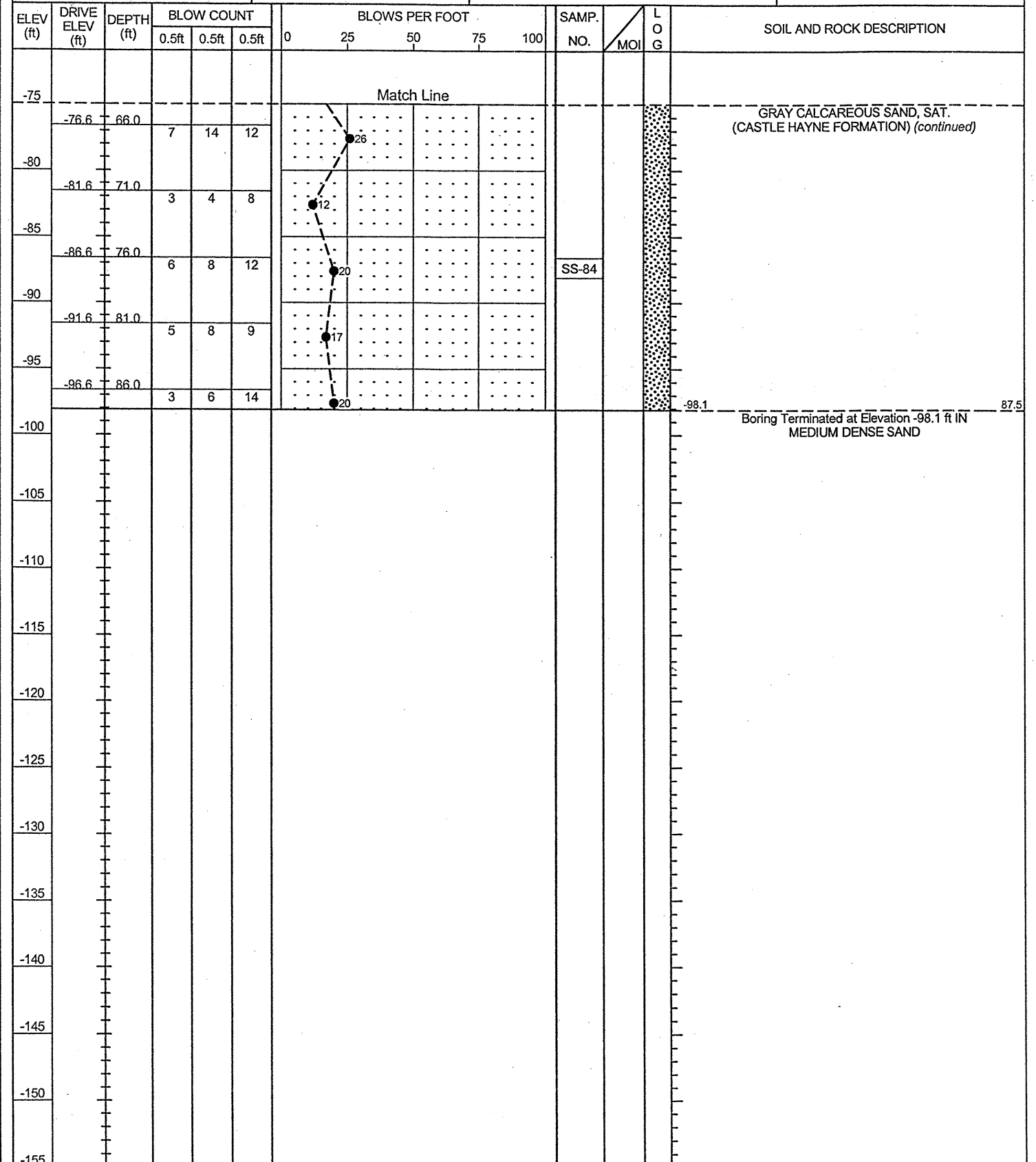
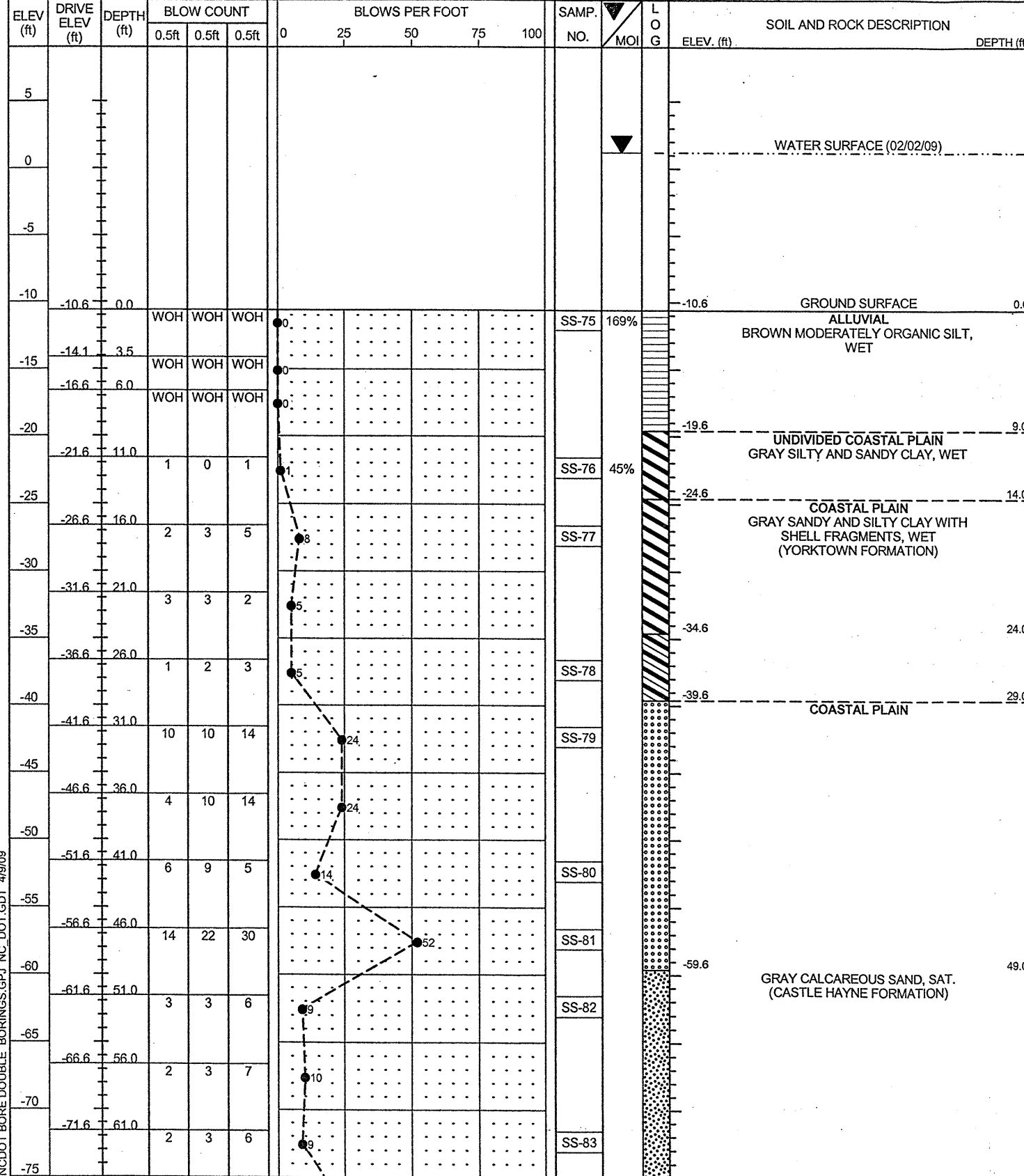


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B3-B	STATION 26+35	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -10.6 ft	TOTAL DEPTH 87.5 ft	NORTHING 644,486	EASTING 2,692,818
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/02/09	COMP. DATE 02/03/09	SURFACE WATER DEPTH 11.8ft	DEPTH TO ROCK N/A

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B3-B	STATION 26+35	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -10.6 ft	TOTAL DEPTH 87.5 ft	NORTHING 644,486	EASTING 2,692,818
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/02/09	COMP. DATE 02/03/09	SURFACE WATER DEPTH 11.8ft	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE BORINGS.GPJ, NC_DOT_GDT_4/9/09

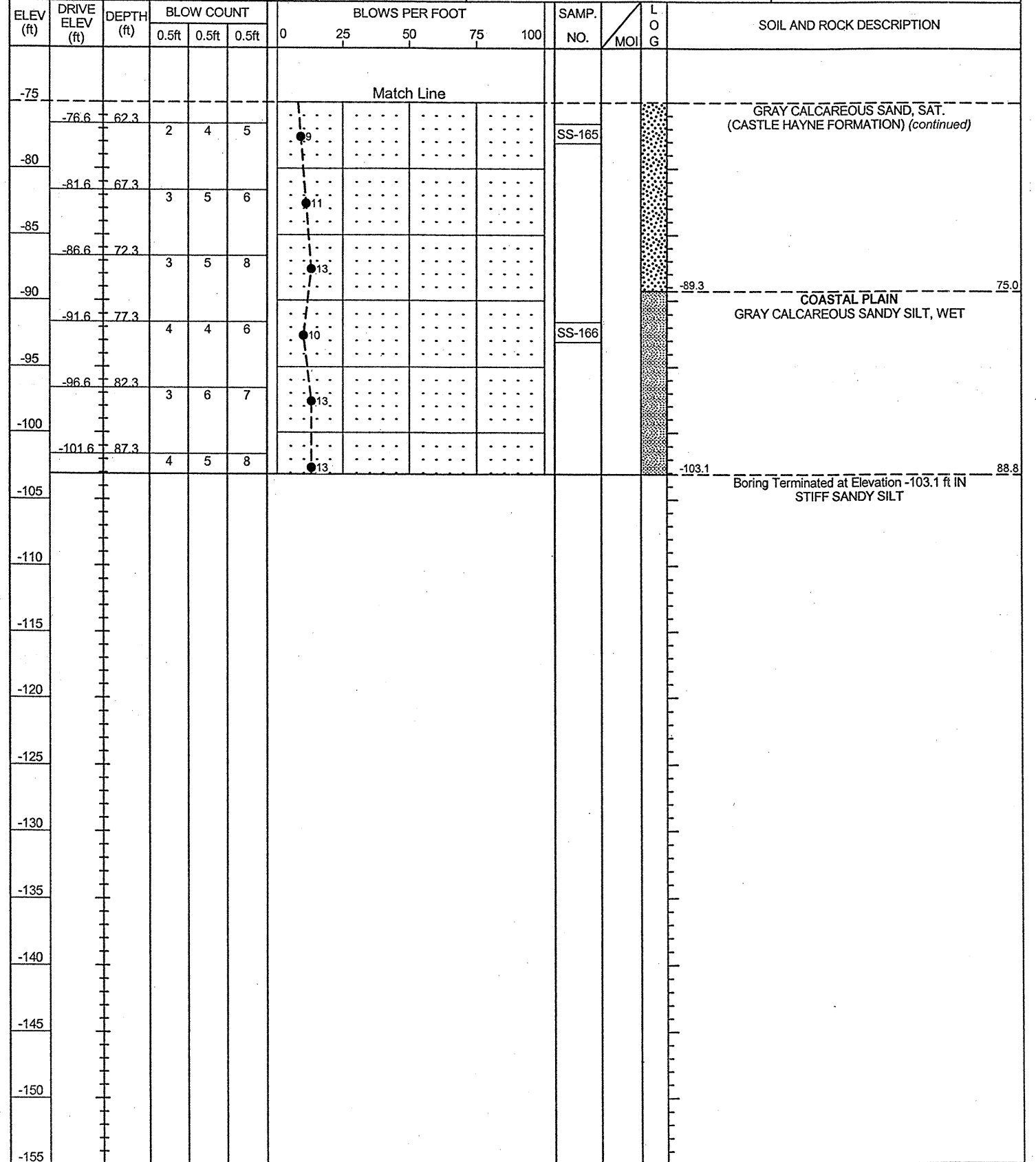
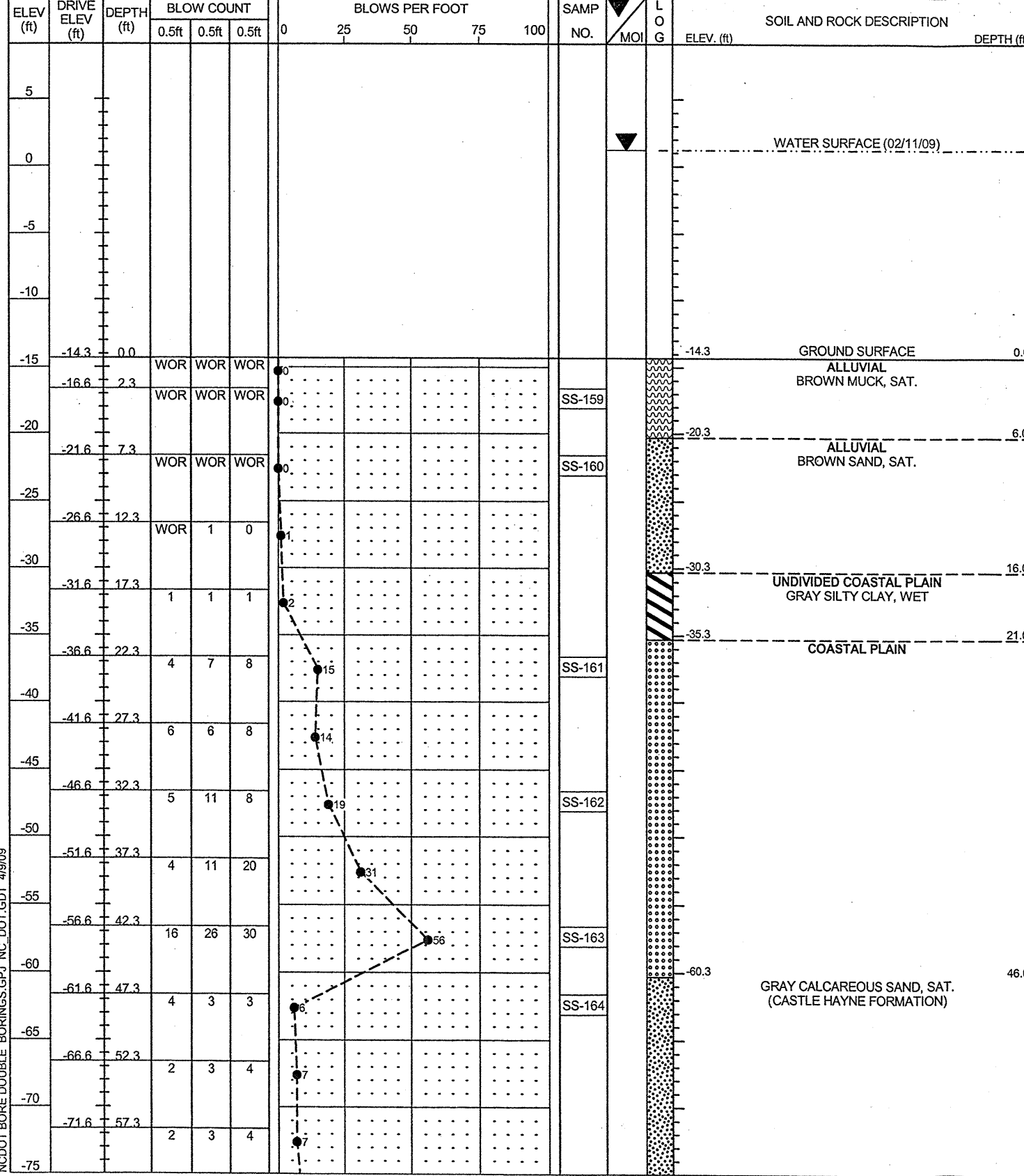
Boring Terminated at Elevation -98.1 ft IN MEDIUM DENSE SAND



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B4-B	STATION 26+90	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -14.3 ft	TOTAL DEPTH 88.8 ft	NORTHING 644,539	EASTING 2,692,805
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/11/09	COMP. DATE 02/11/09	SURFACE WATER DEPTH 15.5ft	DEPTH TO ROCK N/A

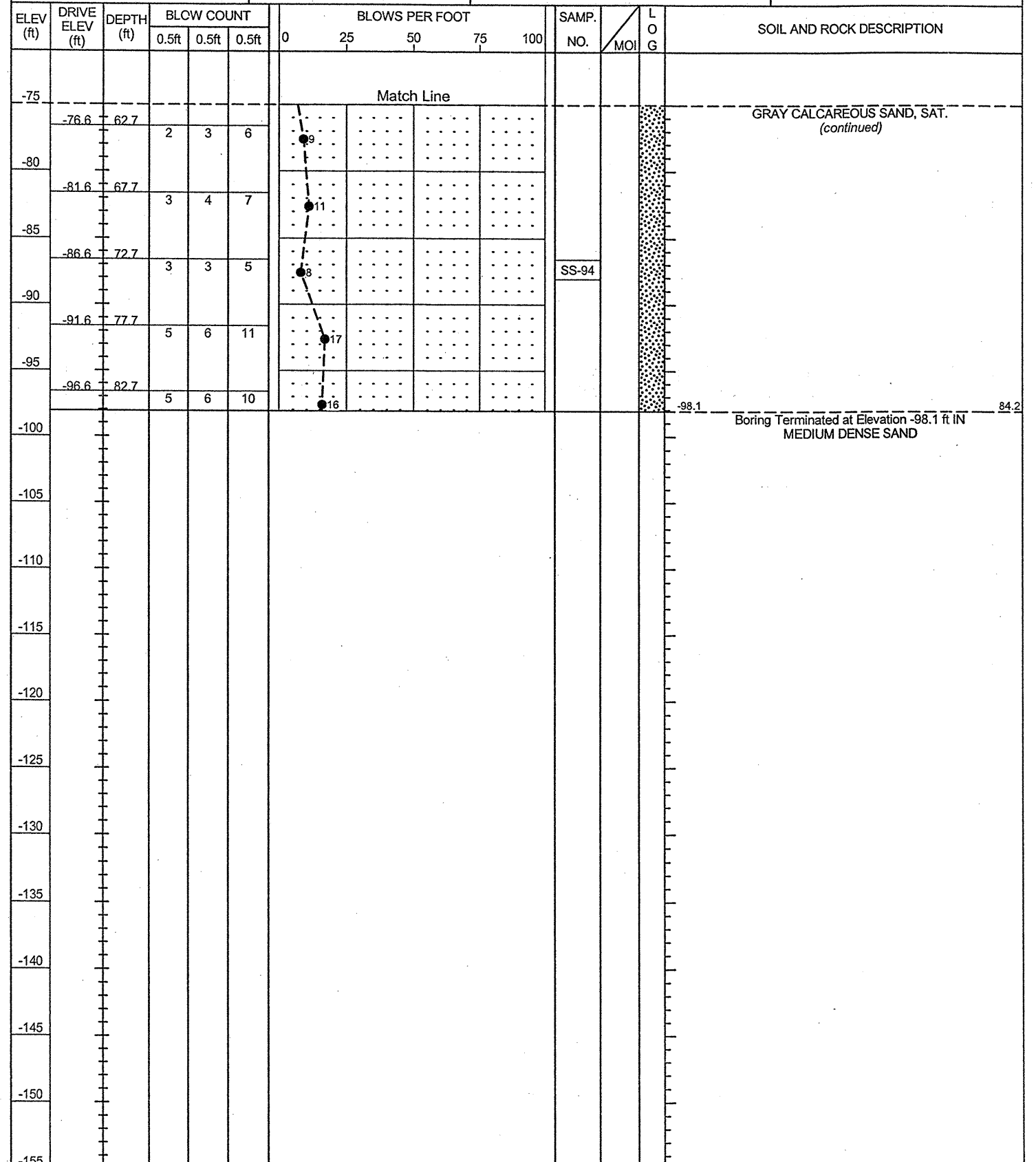
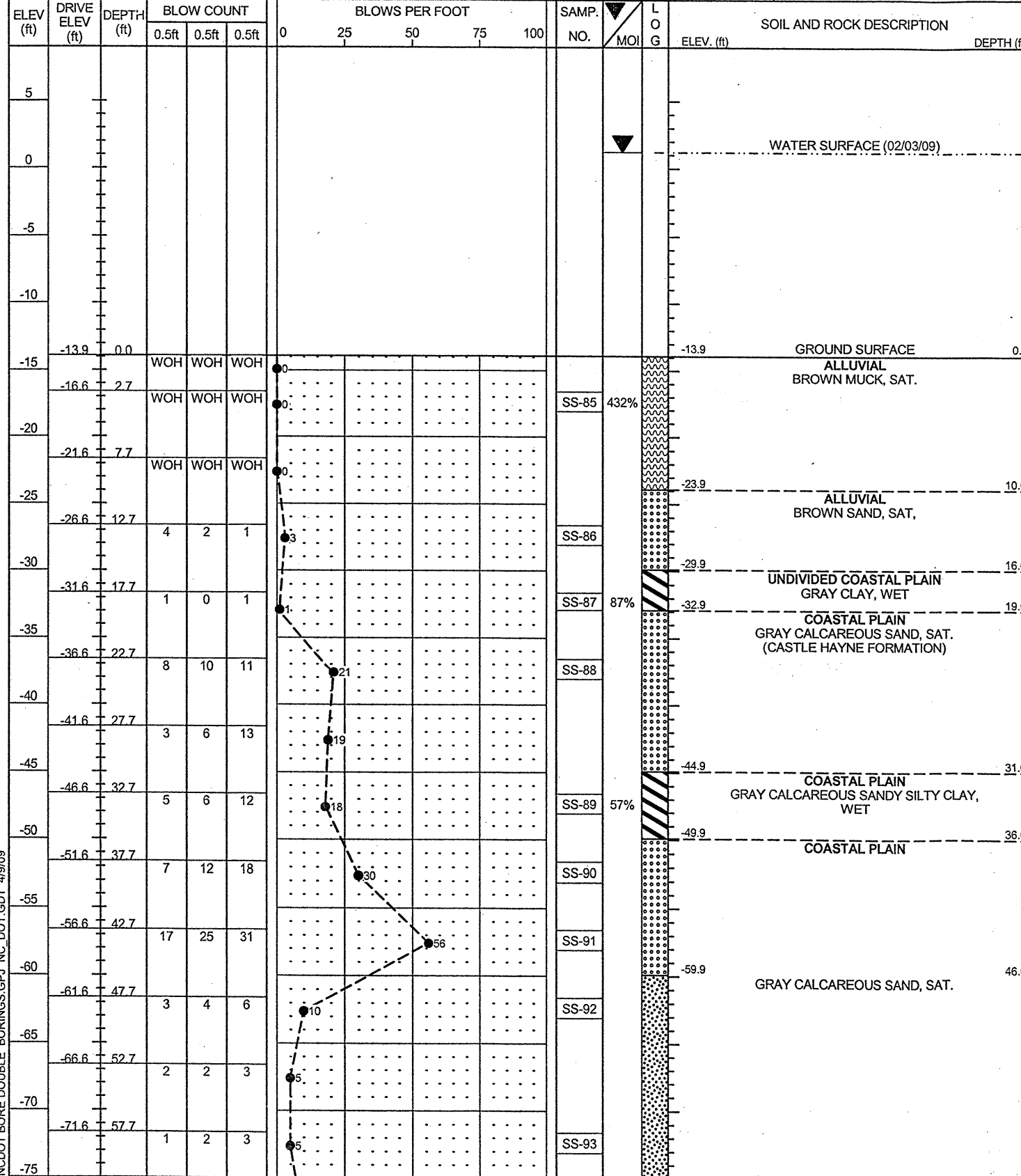
PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B4-B	STATION 26+90	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -14.3 ft	TOTAL DEPTH 88.8 ft	NORTHING 644,539	EASTING 2,692,805
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/11/09	COMP. DATE 02/11/09	SURFACE WATER DEPTH 15.5ft	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT_GDT_4/9/09

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B5-B	STATION 27+35	OFFSET 28ft RT	ALIGNMENT -L-
COLLAR ELEV. -13.9 ft	TOTAL DEPTH 84.2 ft	NORTHING 644,583	EASTING 2,692,797
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/03/09	COMP. DATE 02/03/09	SURFACE WATER DEPTH 15.1ft	DEPTH TO ROCK N/A

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B5-B	STATION 27+35	OFFSET 28ft RT	ALIGNMENT -L-
COLLAR ELEV. -13.9 ft	TOTAL DEPTH 84.2 ft	NORTHING 644,583	EASTING 2,692,797
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/03/09	COMP. DATE 02/03/09	SURFACE WATER DEPTH 15.1ft	DEPTH TO ROCK N/A

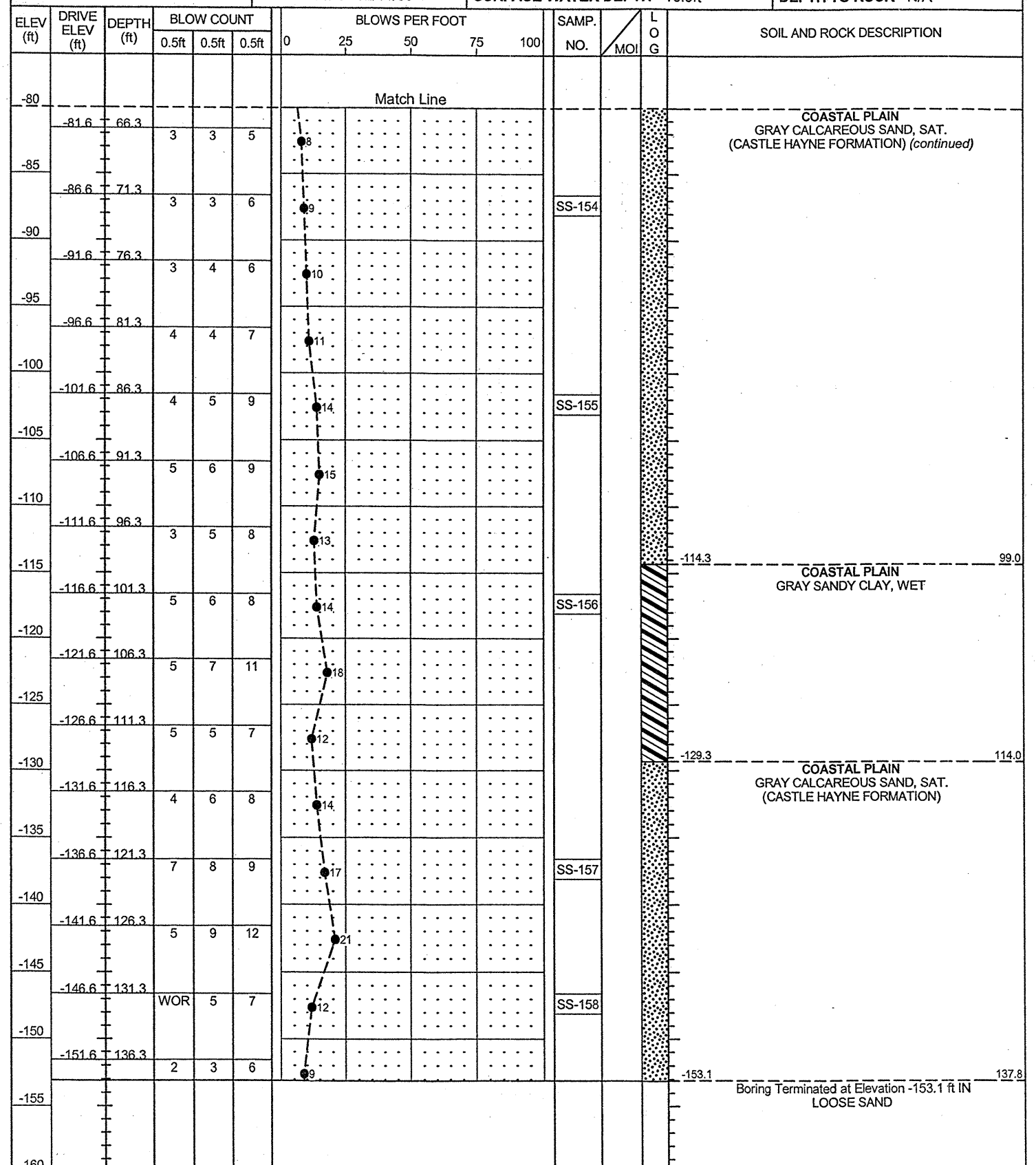
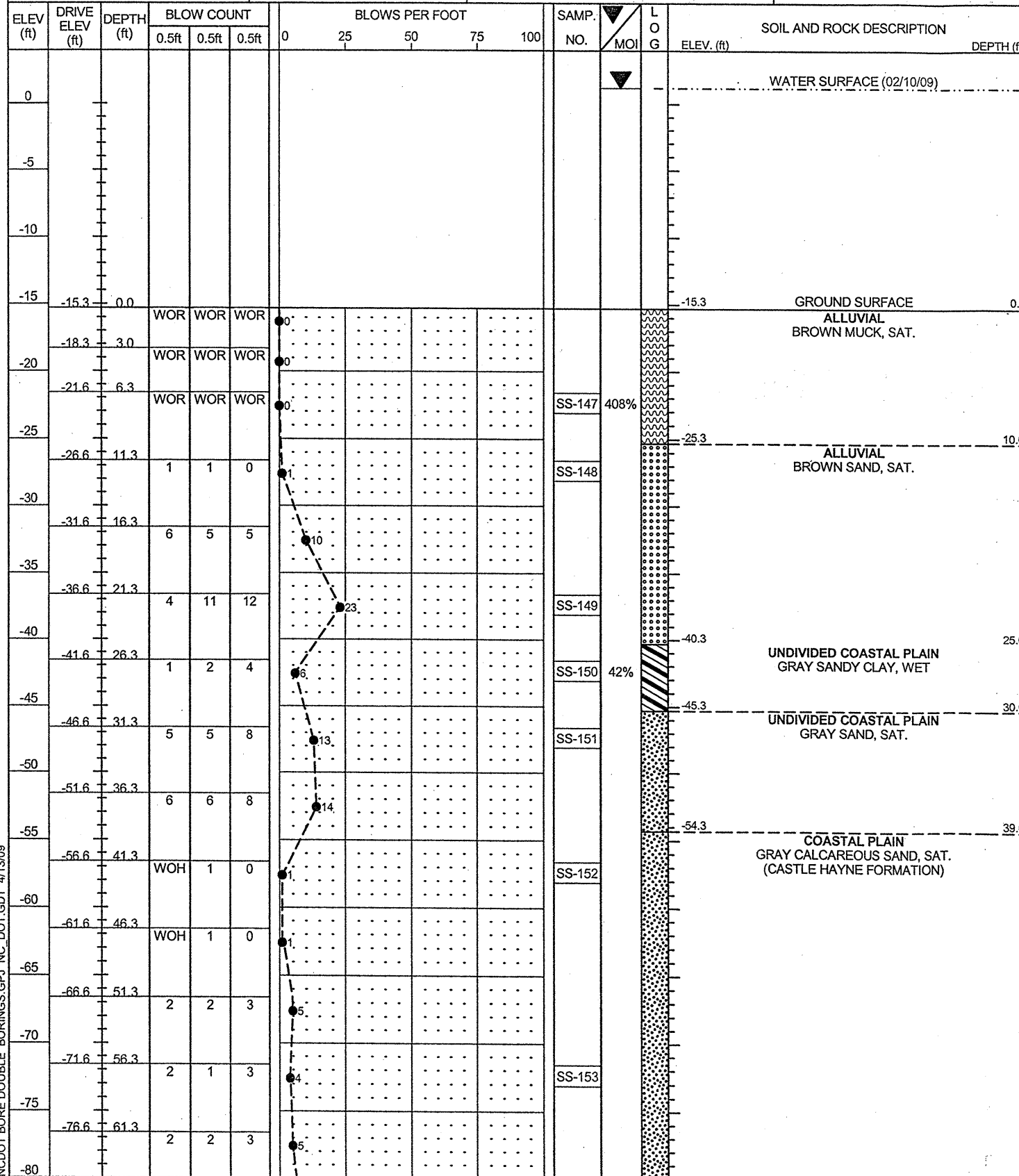


NCDOT BORE DOUBLE BORINGS.GPJ NC DOT.GDT 4/9/09

Boring Terminated at Elevation -98.1 ft IN MEDIUM DENSE SAND

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B6-B	STATION 27+80	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -15.3 ft	TOTAL DEPTH 137.8 ft	NORTHING 644,626	EASTING 2,692,783
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/10/09	COMP. DATE 02/11/09	SURFACE WATER DEPTH 16.5ft	DEPTH TO ROCK N/A

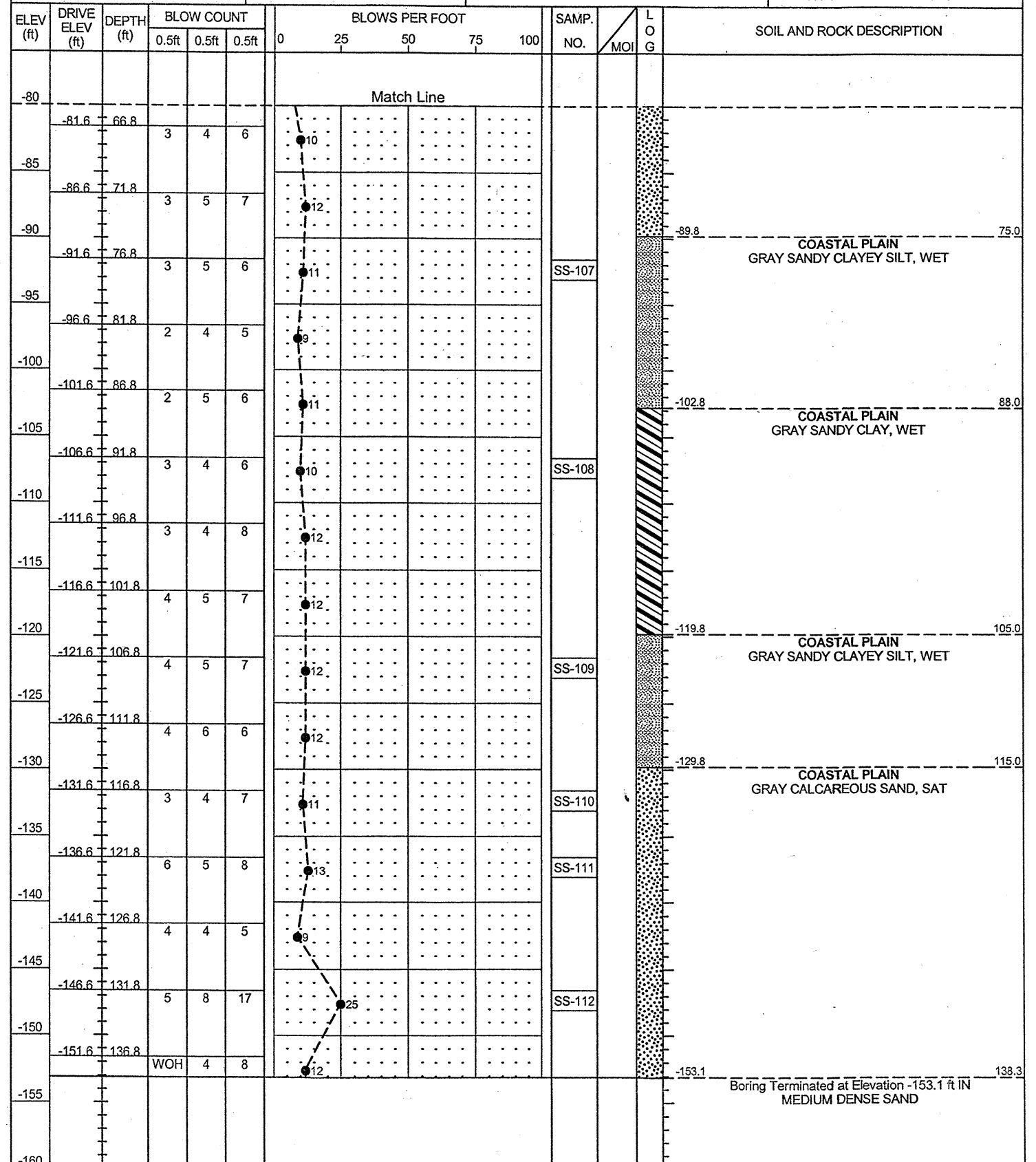
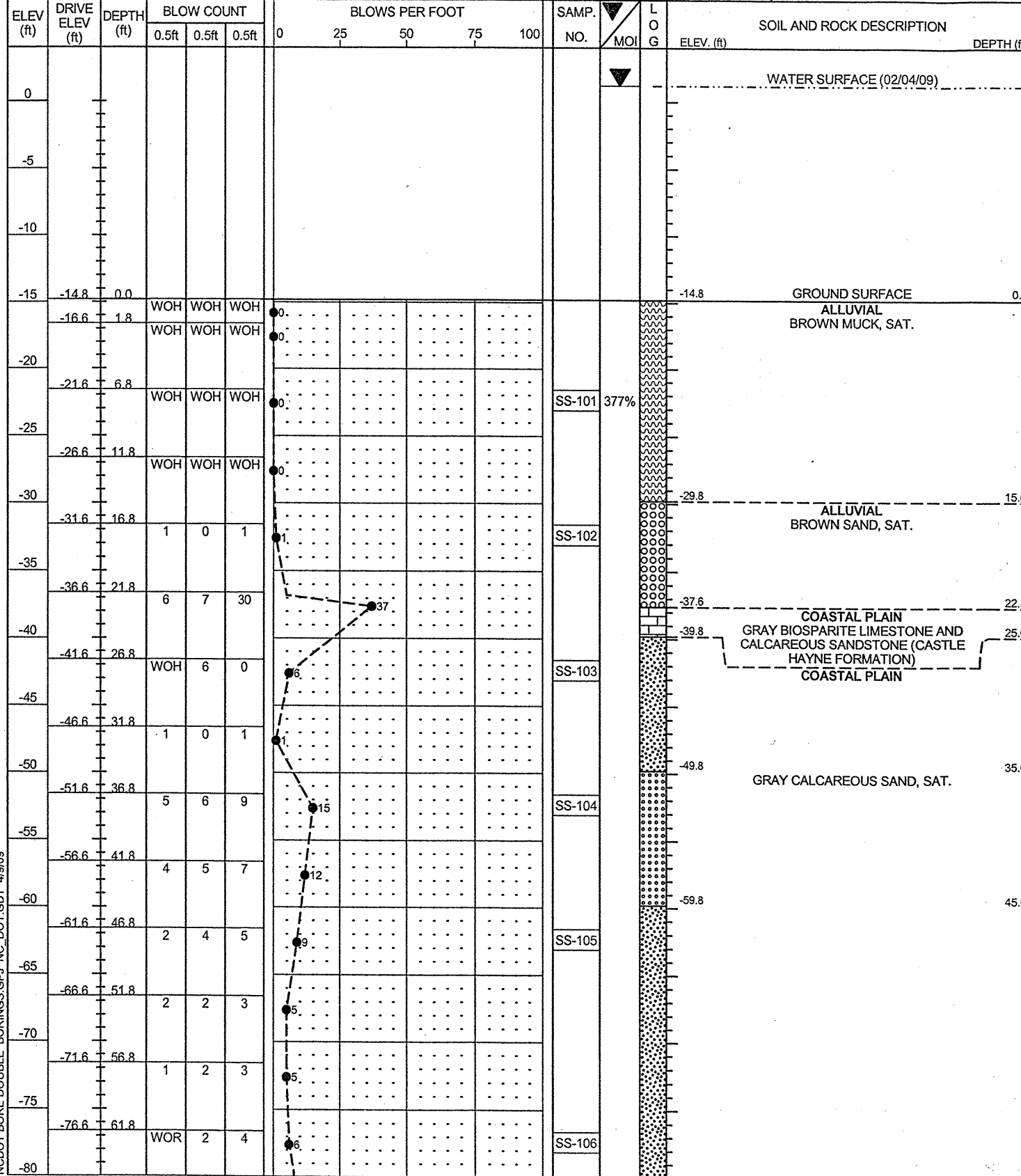
PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B6-B	STATION 27+80	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -15.3 ft	TOTAL DEPTH 137.8 ft	NORTHING 644,626	EASTING 2,692,783
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/10/09	COMP. DATE 02/11/09	SURFACE WATER DEPTH 16.5ft	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE BORINGS.GPJ NC DOT GDT 4/13/09

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B7-B	STATION 28+35	OFFSET 35ft RT	ALIGNMENT -L-
COLLAR ELEV. -14.8 ft	TOTAL DEPTH 138.3 ft	NORTHING 644,682	EASTING 2,692,779
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/04/09	COMP. DATE 02/04/09	SURFACE WATER DEPTH 16.0ft	DEPTH TO ROCK 22.8 ft

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B7-B	STATION 28+35	OFFSET 35ft RT	ALIGNMENT -L-
COLLAR ELEV. -14.8 ft	TOTAL DEPTH 138.3 ft	NORTHING 644,682	EASTING 2,692,779
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/04/09	COMP. DATE 02/04/09	SURFACE WATER DEPTH 16.0ft	DEPTH TO ROCK 22.8 ft

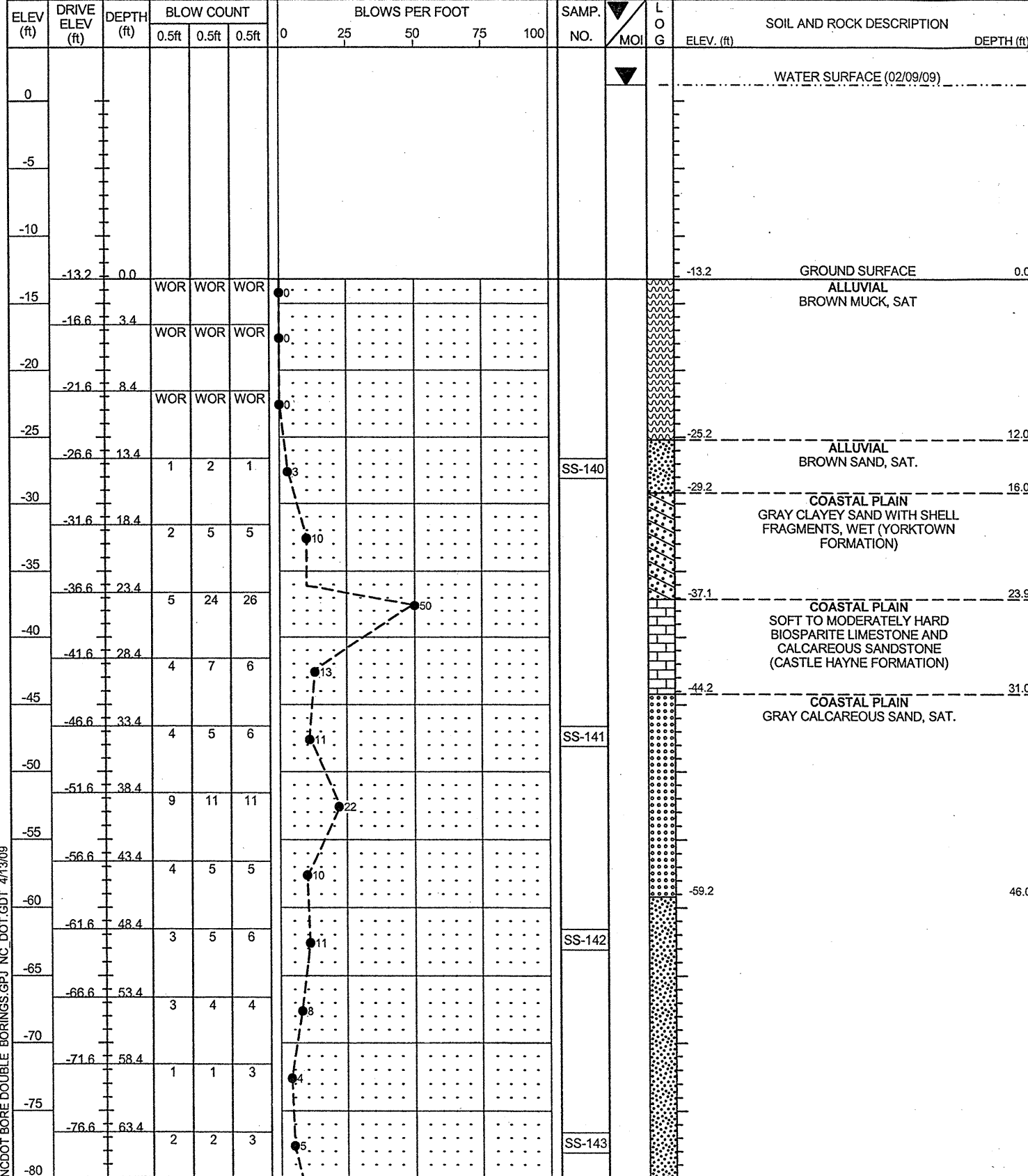


NCDOT BORE DOUBLE BORINGS.GPJ, NC_DOT_GDT_4/9/09

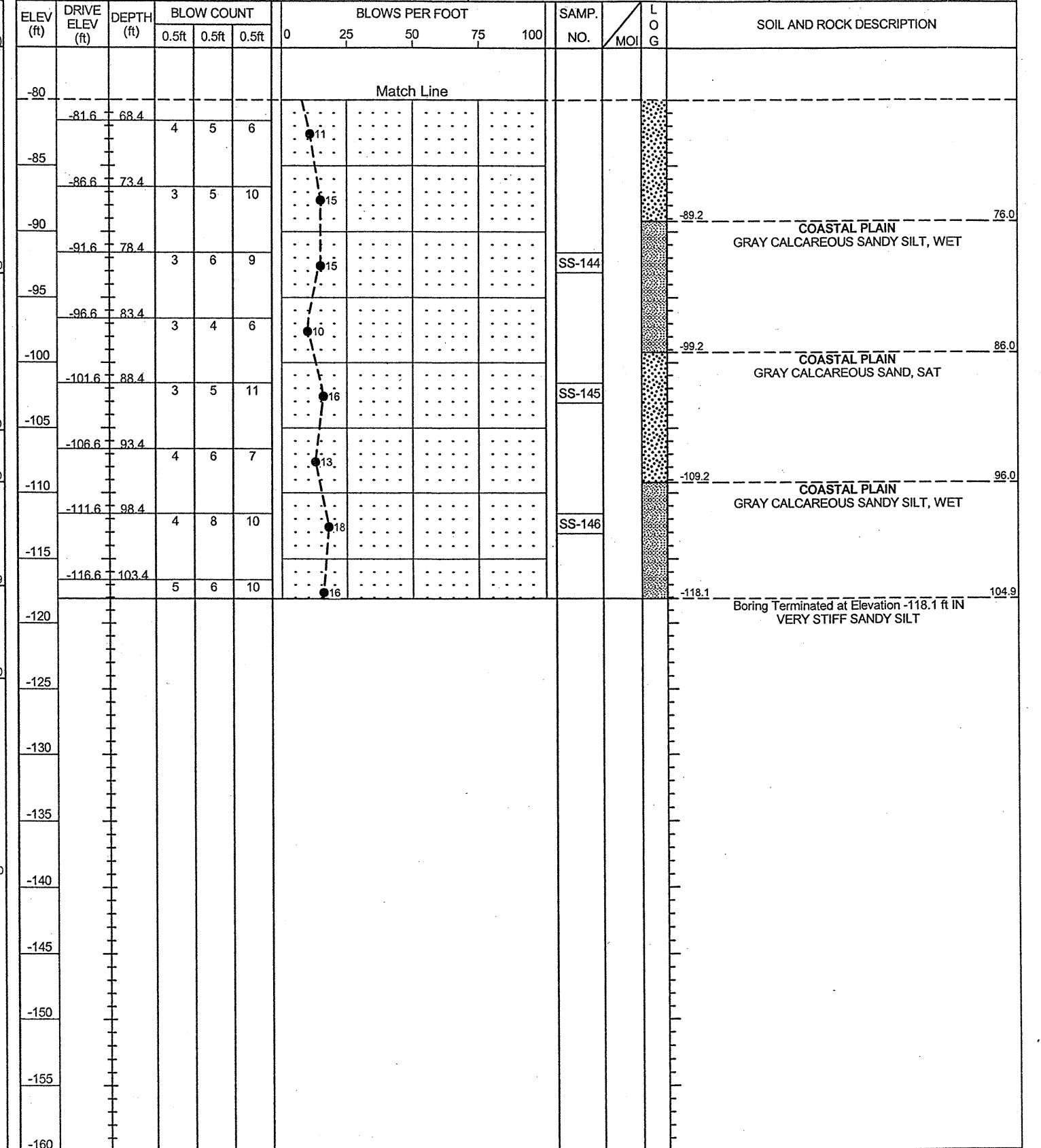
PROJECT NO. 33264.1.1		ID. B-3809		COUNTY BEAUFORT		GEOLOGIST Bottoms, T. C.									
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK							GROUND WTR (ft)								
BORING NO. B8-A		STATION 28+90		OFFSET 6ft LT		ALIGNMENT -L-									
COLLAR ELEV. -13.1 ft		TOTAL DEPTH 34.7 ft		NORTHING 644,726		EASTING 2,692,726									
DRILL MACHINE Mobile B-57		DRILL METHOD Mud Rotary			HAMMER TYPE Automatic										
START DATE 03/25/09		COMP. DATE 03/25/09		SURFACE WATER DEPTH 14.3ft		DEPTH TO ROCK 26.0 ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
5															
0														WATER SURFACE (03/25/09)	
-5															
-10															
-13.1	0.0													GROUND SURFACE	0.0
-15			WOH	WOH	WOH									ALLUVIAL BROWN MUCK, SAT.	
-16.6	3.5		WOR	WOR	WOR										
-20			WOR	WOR	WOR										
-21.6	8.5		WOR	WOR	WOR										
-25			WOR	WOR	WOR										
-26.6	13.5		WOR	WOR	WOR										
-30			WOR	WOR	WOR										
-31.6	18.5		5	6	5									COASTAL PLAIN GRAY CLAYEY SAND WITH SHELL FRAGMENTNS, SAT. (YORKTOWN FORMATION)	
-35			3	5	8										
-36.3	23.2		5	4	5										
-40			5	4	5									COASTAL PLAIN SOFT TO MODERATELY HARD BIOSPARITE LIMESTONE AND CALCAREOUS SANDSTONE (CASTLE HAYNE FORMATION)	
-41.3	28.2		6	7	12										
-45			6	7	12									COASTAL PLAIN GRAY CALCAREOUS SAND, SAT.	
-46.3	33.2														
-47.8														Boring Terminated at Elevation -47.8 ft IN MEDIUM DENSE SAND	34.7
-50															
-55															
-60															
-65															
-70															
-75															

NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/9/09

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B8-B	STATION 28+90	OFFSET 30ft RT	ALIGNMENT -L-
COLLAR ELEV. -13.2 ft	TOTAL DEPTH 104.9 ft	NORTHING 644,734	EASTING 2,692,761
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/09/09	COMP. DATE 02/10/09	SURFACE WATER DEPTH 14.4ft	DEPTH TO ROCK 23.9 ft



PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B8-B	STATION 28+90	OFFSET 30ft RT	ALIGNMENT -L-
COLLAR ELEV. -13.2 ft	TOTAL DEPTH 104.9 ft	NORTHING 644,734	EASTING 2,692,761
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/09/09	COMP. DATE 02/10/09	SURFACE WATER DEPTH 14.4ft	DEPTH TO ROCK 23.9 ft



NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/13/09

PROJECT NO. 33264.1.1		ID. B-3809		COUNTY BEAUFORT		GEOLOGIST Bottoms, T. C.									
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK						GROUND WTR (ft)									
ORING NO. B9-A		STATION 29+35		OFFSET 7ft LT		ALIGNMENT -L-									
COLLAR ELEV. -13.0 ft		TOTAL DEPTH 36.6 ft		NORTHING 644,770		EASTING 2,692,714									
DRILL MACHINE Mobile B-57		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic											
START DATE 03/27/09		COMP. DATE 03/27/09		SURFACE WATER DEPTH 14.2ft		DEPTH TO ROCK 22.0 ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
5															
0															
-5															
-10															
-13.0	0.0														
-15			WOR	WOR	WOR										
-16.3	3.3		WOR	WOR	WOR										
-20															
-21.3	8.3		WOR	WOR	WOR										
-25															
-26.3	13.3		1	2	2										
-30															
-31.3	18.3		6	7	7										
-35															
-36.6	23.6		10	37	4										
-40															
-45															
-48.1	35.1		2	3	7										
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-70															
-75															

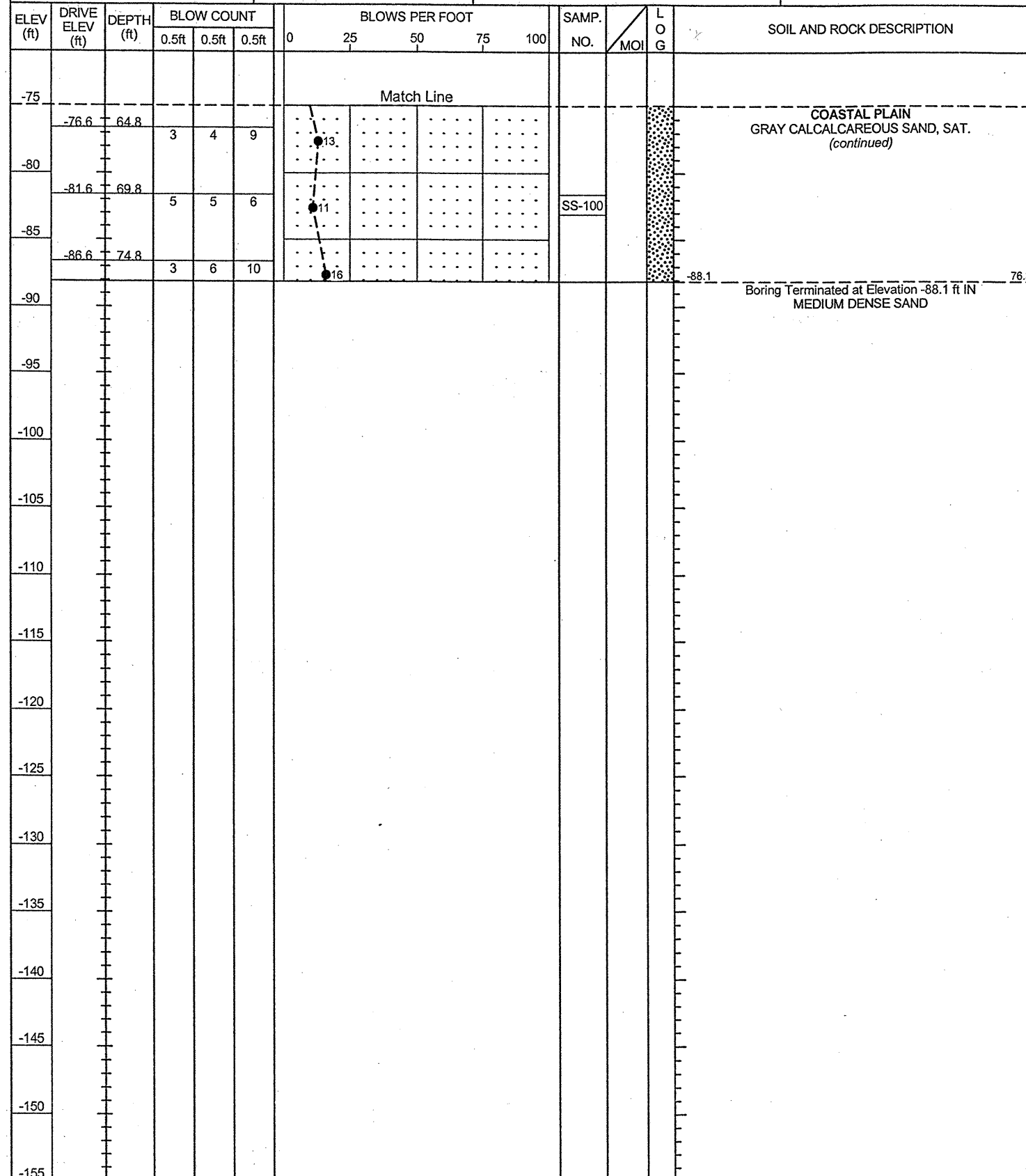
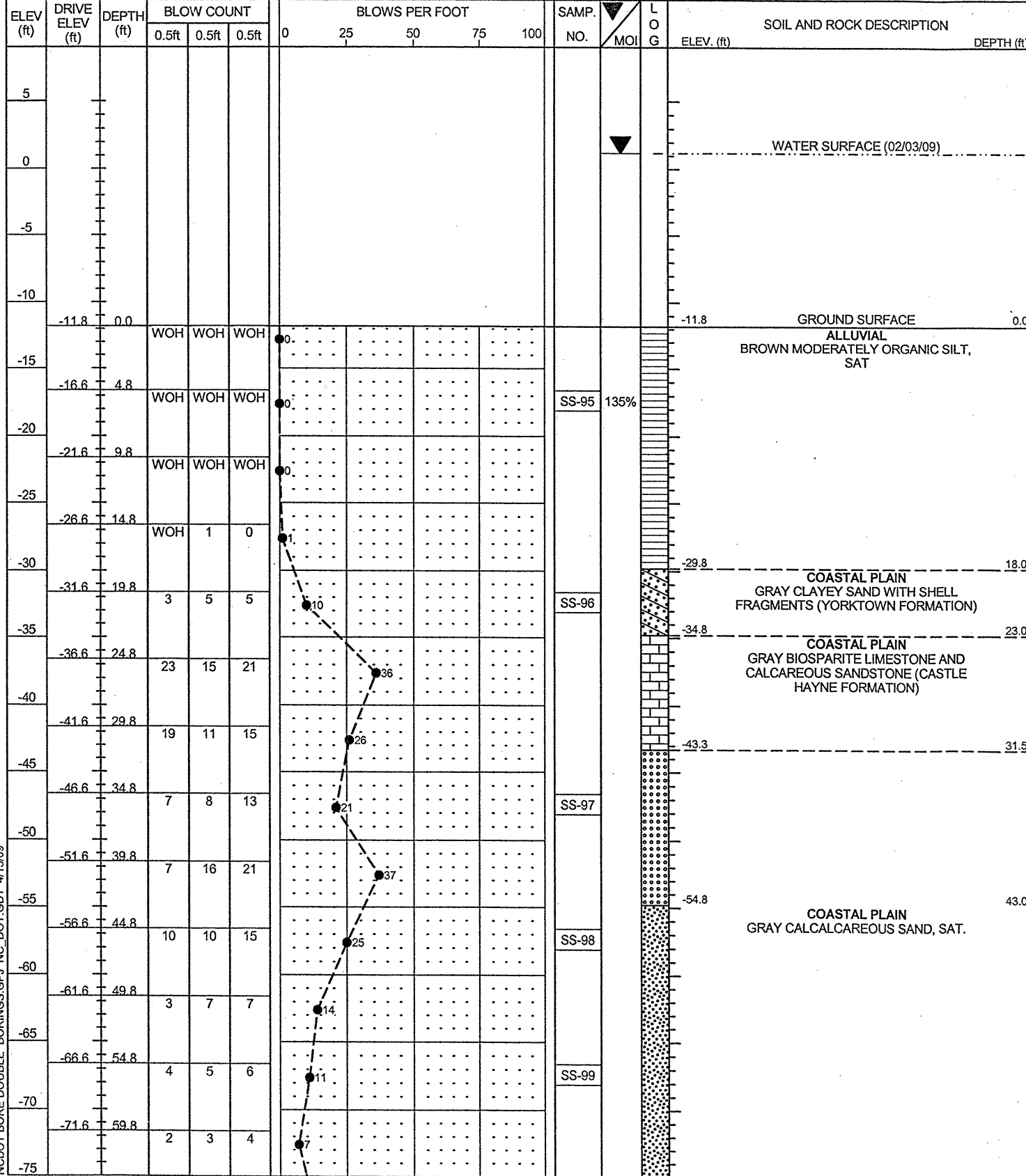
NCDOT BORE SINGLE
 1INGS.GPJ NC_DOT.GDT 4/9/09

PROJECT NO. 33264.1.1		ID. B-3809		COUNTY BEAUFORT		GEOLOGIST Bottoms, T. C.					
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK						GROUND WTR (ft)					
BORING NO. B9-A		STATION 29+35		OFFSET 7ft LT		ALIGNMENT -L-					
COLLAR ELEV. -13.0 ft		TOTAL DEPTH 36.6 ft		NORTHING 644,770		EASTING 2,692,714					
DRILL MACHINE Mobile B-57		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic							
START DATE 03/27/09		COMP. DATE 03/27/09		SURFACE WATER DEPTH 14.2ft		DEPTH TO ROCK 22.0 ft					
CORE SIZE NW			TOTAL RUN 10.0 ft			DRILLER Contract Driller					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	ROD (%)	REC. (%)	ROD (%)			
-38.1											
-40	-38.1	25.1	5.0	0.2/1.0 0.43/1.0 0.55/1.0 0.93/1.0 0.57/1.0	(3.9) 78%	(2.1) 42%					
-45	-43.1	30.1	5.0	0.28/1.0 0.13/1.0 0.13/1.0 0.15/1.0 0.18/1.0	(0.0) 0%	(0.0) 0%	RS-1				
-50	-48.1	35.1		N=10							
-55											
-60											
-65											
-70											
-75											
-80											
-85											
-90											
-95											
-100											
-105											
-110											
-115											

NCDOT CORE SINGLE BORINGS.GPJ NC_DOT.GDT 4/9/09

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B9-B	STATION 29+35	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -11.8 ft	TOTAL DEPTH 76.3 ft	NORTHING 644,777	EASTING 2,692,746
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/03/09	COMP. DATE 02/03/09	SURFACE WATER DEPTH 13.0ft	DEPTH TO ROCK 23.0 ft

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B9-B	STATION 29+35	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -11.8 ft	TOTAL DEPTH 76.3 ft	NORTHING 644,777	EASTING 2,692,746
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/03/09	COMP. DATE 02/03/09	SURFACE WATER DEPTH 13.0ft	DEPTH TO ROCK 23.0 ft



NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT_GDT_4/13/09

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B10-A	STATION 29+80	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. -11.7 ft	TOTAL DEPTH 37.0 ft	NORTHING 644,813	EASTING 2,692,703
DRILL MACHINE Mobile B-57	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
START DATE 03/25/09	COMP. DATE 03/25/09	SURFACE WATER DEPTH 12.9ft	DEPTH TO ROCK 24.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
5														
0													WATER SURFACE (03/25/09)	
-5														
-10														
-11.7	0.0	0.0	WOR	WOR	WOR								GROUND SURFACE	0.0
-15													ALLUVIAL BROWN MUCK, SAT.	
-16.7	5.0	5.0	WOR	WOR	WOR									
-20														
-21.7	10.0	10.0	2	2	2								COASTAL PLAIN GRAY SILTY CLAY WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)	8.5
-25														
-26.7	15.0	15.0	WOR	WOR	1									
-30														
-32.1	20.4	20.4	6	6	4								COASTAL PLAIN GRAY CLAYEY SAND WITH SHELL FRAGMENTS, SAT.	18.0
-35														
-36.2													COASTAL PLAIN SOFT TO MODERATELY HARD BIOSPARITE LIMESTONE AND CALCAREOUS SANDSTONE (CASTLE HAYNE FORMATION) AVG. REC. = 57%, AVG. RQD = 35%	24.5
-40														
-45													COASTAL PLAIN GRAY CALCAREOUS SAND WITH SHELL FRAGMENTS, SAT	32.5
-47.2	35.5	35.5	8	9	10									
-50													Boring Terminated at Elevation -48.7 ft IN MEDIUM DENSE SAND	37.0

NCDOT BORE SINGLE INGS.GPJ NC_DOT.GDT 4/9/09

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B10-A	STATION 29+80	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. -11.7 ft	TOTAL DEPTH 37.0 ft	NORTHING 644,813	EASTING 2,692,703
DRILL MACHINE Mobile B-57	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
START DATE 03/25/09	COMP. DATE 03/25/09	SURFACE WATER DEPTH 12.9ft	DEPTH TO ROCK 24.5 ft

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)	
					REC. (%)	ROD (%)		REC. (%)	ROD (%)				
-36.2											Begin Coring @ 24.5 ft		
-36.2	24.5	24.5	5.0	0:16/1.0 0:27/1.0 0:23/1.0 0:22/1.0 0:28/1.0	(3.1) 62%	(1.8) 36%	RS-2				COASTAL PLAIN SOFT TO MODERATELY HARD BIOSPARITE LIMESTONE AND CALCAREOUS SANDSTONE (CASTLE HAYNE FORMATION)	24.5	
-40													
-41.2	29.5	29.5	5.0	0:27/1.0 0:19/1.0 0:19/1.0 0:9/1.0 0:9/1.0	(2.6) 52%	(1.7) 34%					COASTAL PLAIN GRAY CALCAREOUS SAND WITH SHELL FRAGMENTS, SAT	32.5	
-45													
-46.2	34.5	34.5											
-50													
-48.7												Boring Terminated at Elevation -48.7 ft IN MEDIUM DENSE SAND	37.0

NCDOT CORE SINGLE BORINGS.GPJ NC_DOT.GDT 4/9/09



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

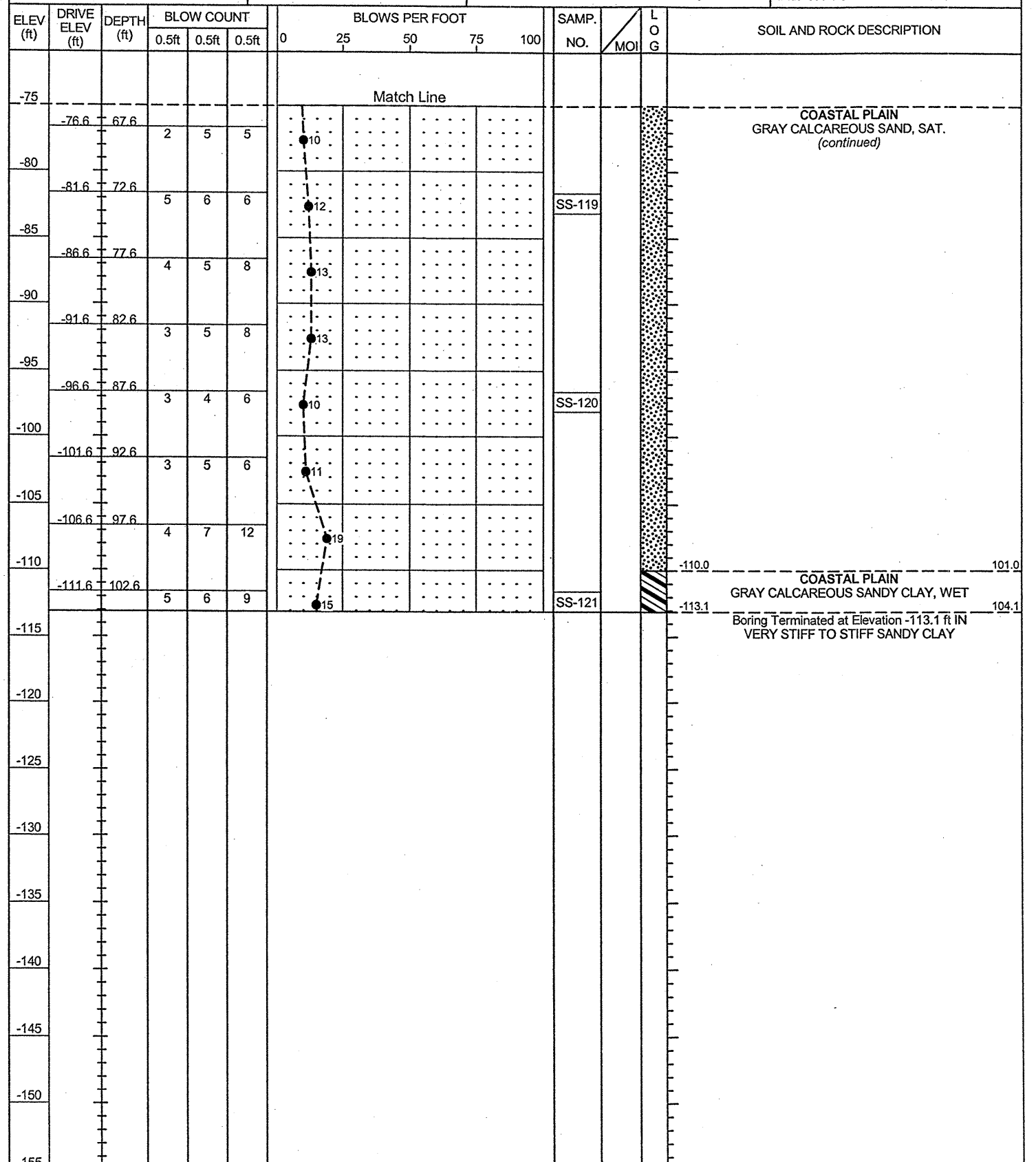
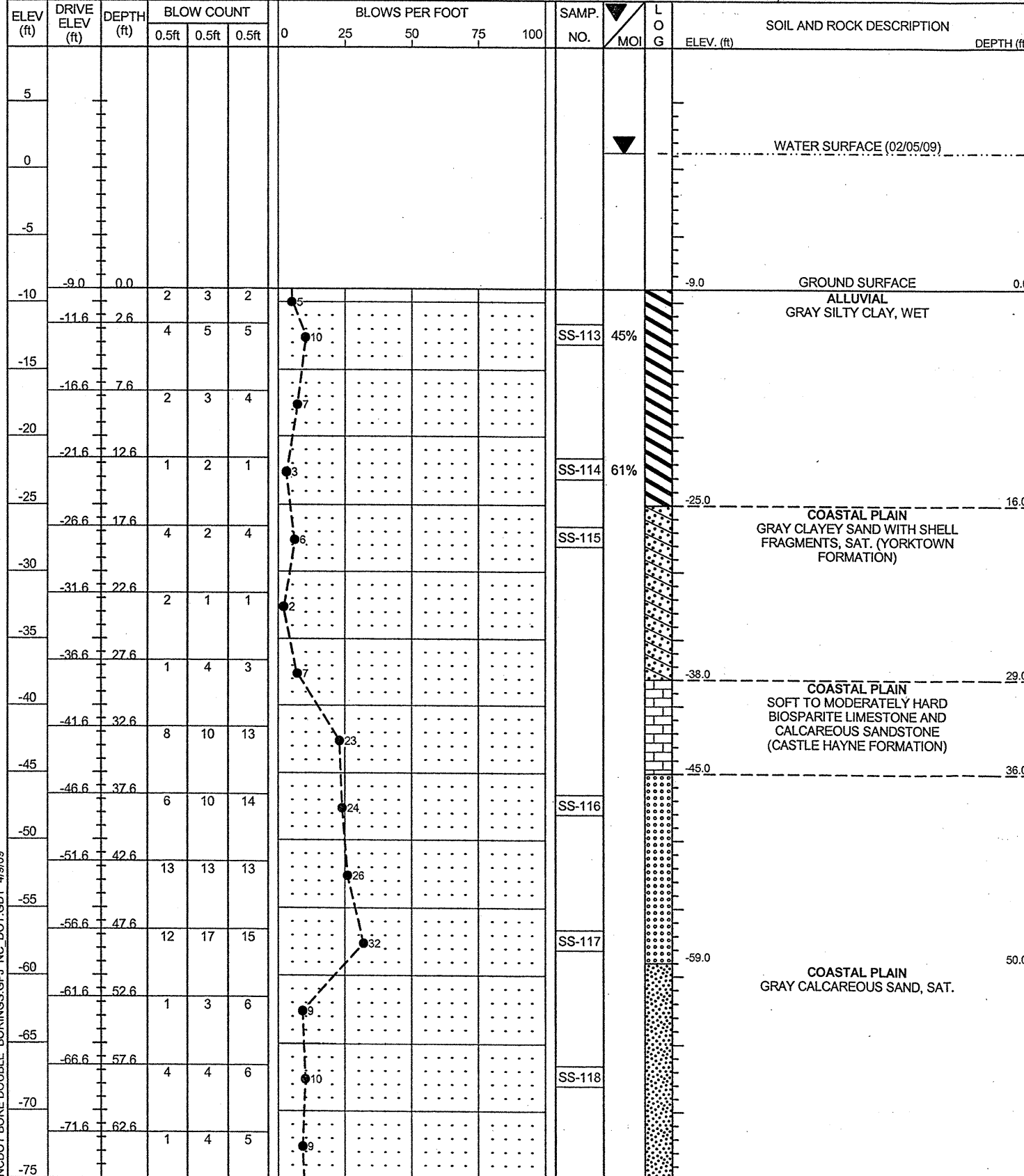
PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B10-B	STATION 29+80	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -11.3 ft	TOTAL DEPTH 61.8 ft	NORTHING 644,820	EASTING 2,692,735
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/06/09	COMP. DATE 02/06/09	SURFACE WATER DEPTH 12.5ft	DEPTH TO ROCK 25.0 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
0														
-5														
-10														
-11.3	-11.3	0.0											GROUND SURFACE	0.0
-15			WOR	WOR	WOR								ALLUVIAL BROWN MUCK, SAT.	
-16.6	-16.6	5.3	WOR	WOR	1									
-20	-21.6	10.3	2	2	3						SS-135	44%	ALLUVIAL GRAY SILTY CLAY, WET	9.0
-25	-26.6	15.3	9	22	16						SS-136		ALLUVIAL GRAY SAND, SAT.	13.5
-30	-31.6	20.3	4	5	5						SS-137		COASTAL PLAIN GRAYCLAYEY SAND, SAT. WITH SHELL FRAGMENTS, (YORKTOWN FORMATION)	18.0
-35	-36.6	25.3	4	52	10								COASTAL PLAIN SOFT TO MODERATELY HARD BIOSPARITE LIMESTONE AND CALCAREOUS SANDSTONE (CASTLE HAYNE FORMATION)	25.0
-40	-41.6	30.3	20	23	13									
-45	-46.6	35.3	3	6	4						SS-138		COASTAL PLAIN GRAY CALCAREOUS SAND, SAT.	33.0
-50	-51.6	40.3	8	7	12									
-55	-56.6	45.3	10	10	10									
-60	-61.6	50.3	2	2	4						SS-139			
-65	-66.6	55.3	2	3	3									
-70	-71.6	60.3	1	3	2									
-73.1													Boring Terminated at Elevation -73.1 ft IN LOOSE SAND	61.8

NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT_GDT 4/9/09

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B11-B	STATION 30+35	OFFSET 30ft RT	ALIGNMENT -L-
COLLAR ELEV. -9.0 ft	TOTAL DEPTH 104.1 ft	NORTHING 644,875	EASTING 2,692,726
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/05/09	COMP. DATE 02/05/09	SURFACE WATER DEPTH 10.2ft	DEPTH TO ROCK 29.0 ft

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B11-B	STATION 30+35	OFFSET 30ft RT	ALIGNMENT -L-
COLLAR ELEV. -9.0 ft	TOTAL DEPTH 104.1 ft	NORTHING 644,875	EASTING 2,692,726
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/05/09	COMP. DATE 02/05/09	SURFACE WATER DEPTH 10.2ft	DEPTH TO ROCK 29.0 ft



NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/9/03

PROJECT NO. 33264.1.1		ID. B-3809		COUNTY BEAUFORT		GEOLOGIST Bottoms, T. C.									
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK							GROUND WTR (ft)								
BORING NO. B12-A		STATION 30+90		OFFSET 7ft LT		ALIGNMENT -L-									
COLLAR ELEV. -7.7 ft		TOTAL DEPTH 40.7 ft		NORTHING 644,920		EASTING 2,692,677									
DRILL MACHINE Mobile B-57		DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Automatic										
START DATE 03/26/09		COMP. DATE 03/26/09		SURFACE WATER DEPTH 8.9ft		DEPTH TO ROCK 29.2 ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
5															
0															
-5															
-10	-8.9	1.2	1	2	2										
-15	-13.9	6.2	2	2	2										
-20	-18.9	11.2	1	1	2										
-25	-23.9	16.2	3	7	12										
-30	-28.9	21.2	3	3	3										
-35	-34.1	26.4	4	6	6										
-40															
-45															
-50	-46.9	39.2	2	1	2										
-55															
-60															
-65															
-70															
-75															

NCDOT BORE SINGLE 4/9/09

PROJECT NO. 33264.1.1		ID. B-3809		COUNTY BEAUFORT		GEOLOGIST Bottoms, T. C.						
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK							GROUND WTR (ft)					
BORING NO. B12-A		STATION 30+90		OFFSET 7ft LT		ALIGNMENT -L-						
COLLAR ELEV. -7.7 ft		TOTAL DEPTH 40.7 ft		NORTHING 644,920		EASTING 2,692,677						
DRILL MACHINE Mobile B-57		DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Automatic							
START DATE 03/26/09		COMP. DATE 03/26/09		SURFACE WATER DEPTH 8.9ft		DEPTH TO ROCK 29.2 ft						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
-36.9												
-40	-36.9	29.2	5.0	0:17/1.0 0:19/1.0 0:13/1.0	(2.7) 54%	(0.9) 18%	RS-3					
-45	-41.9	34.2	5.0	0:12/1.0 0:18/1.0 0:50/1.0 0:59/1.0 0:16/1.0 0:8/1.0 N=3	(2.1) 42%	(1.0) 20%						
-50	-46.9	39.2										
-55												
-60												
-65												
-70												
-75												
-80												
-85												
-90												
-95												
-100												
-105												
-110												
-115												

NCDOT CORE SINGLE BORINGS.GPJ NC_DOT.GDT 4/9/09

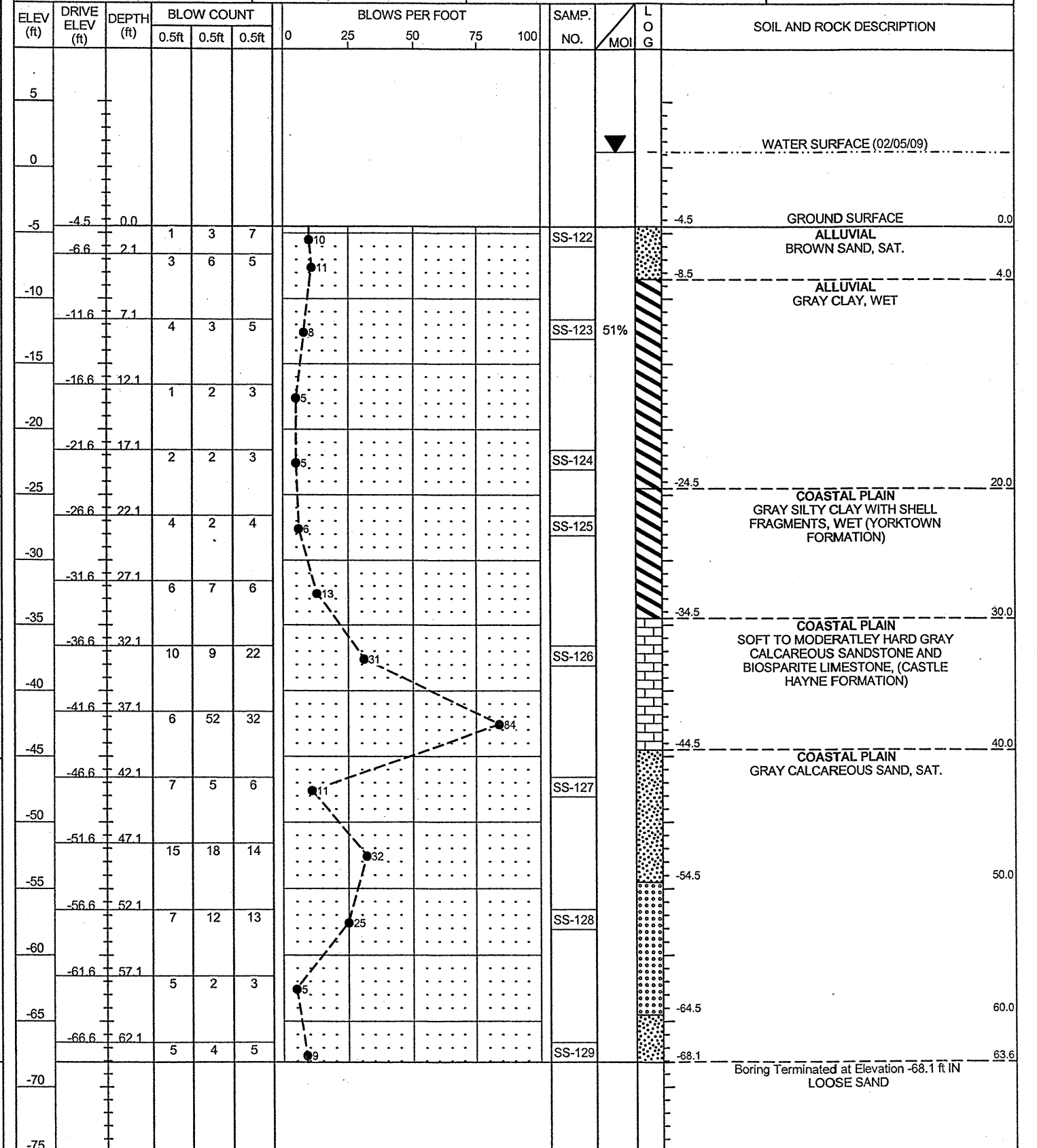
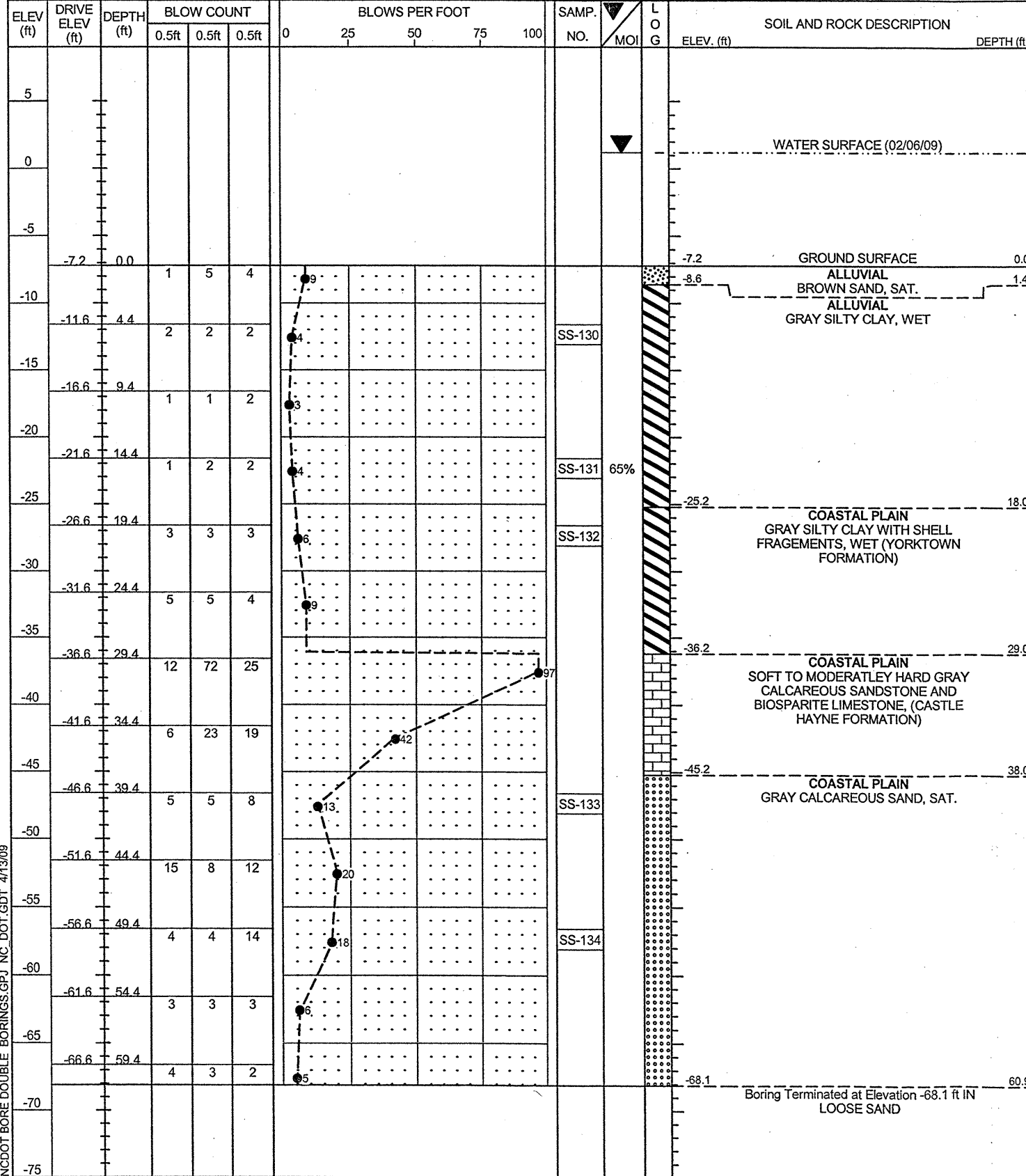


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B12-B	STATION 30+90	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -7.2 ft	TOTAL DEPTH 60.9 ft	NORTHING 644,927	EASTING 2,692,708
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/06/09	COMP. DATE 02/06/09	SURFACE WATER DEPTH 8.4ft	DEPTH TO ROCK 29.0 ft

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B13-B	STATION 31+35	OFFSET 25ft RT	ALIGNMENT -L-
COLLAR ELEV. -4.5 ft	TOTAL DEPTH 63.6 ft	NORTHING 644,971	EASTING 2,692,697
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 02/05/09	COMP. DATE 02/05/09	SURFACE WATER DEPTH 5.7ft	DEPTH TO ROCK 30.0 ft



NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/13/09

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Dillard, S. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. B14-B	STATION 31+72	OFFSET 5ft RT	ALIGNMENT -L-
COLLAR ELEV. 1.2 ft	TOTAL DEPTH 63.2 ft	NORTHING 645,002	EASTING 2,692,669
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 01/29/09	COMP. DATE 02/12/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 35.0 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G ELEV. (ft)	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
5															
0	1.2	0.0	4	1	1								1.2	GROUND SURFACE	0.0
														ALLUVIAL BROWN SAND, SAT.	
-5	-5.5	6.7	3	4	2								-2.8		4.0
-10	-10.5	11.7	1	1	1								-7.8	ALLUVIAL GRAY SILTY CLAY, WET	9.0
-15	-15.5	16.7	2	1	2										
-20	-20.5	21.7	1	2	2										
-25	-25.5	26.7	11	8	6								-23.8	ALLUVIAL GRAY SAND AND GRAVEL, SAT.	25.0
													-26.0	COASTAL PLAIN GRAY CLAYEY SAND WITH SHELL FRAGMENTS, SAT. (YORKTOWN FORMATION)	27.2
-30	-30.5	31.7	4	3	6										
-35	-35.5	36.7	17	11	89/0.3								-33.8	COASTAL PLAIN SOFT TO MODERATELY HARD GRAY CALCAREOUS SANDSTONE AND BIOSPARITE LIMESTONE, (CASTLE HAYNE FORMATION)	35.0
-40	-40.5	41.7	7	16	17										
-45	-45.5	46.7	15	8	10								-43.8	COASTAL PLAIN GRAY CALCAREOUS SAND, SAT.	45.0
-50	-50.5	51.7	11	11	12										
-55	-55.5	56.7	9	8	12										
-60	-60.5	61.7	3	3	3										
-65															
-70															
-75															

NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/9/09

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Dillard, S. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 32+10	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. 11.5 ft	TOTAL DEPTH 79.5 ft	NORTHING 645,036	EASTING 2,692,648
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 12/17/08	COMP. DATE 12/17/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 45.5 ft

PROJECT NO. 33264.1.1	ID. B-3809	COUNTY BEAUFORT	GEOLOGIST Dillard, S. C.
SITE DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 32+10	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. 11.5 ft	TOTAL DEPTH 79.5 ft	NORTHING 645,036	EASTING 2,692,648
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 12/17/08	COMP. DATE 12/17/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 45.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
15																
10	11.0	0.5	14	14	11									11.5	GROUND SURFACE ROADWAY EMBANKMENT TAN SAND, MOIST TO SAT	0.0
5	7.5	4.0	6	8	6									2.5	ALLUVIAL GRAY SAND, SAT	9.0
0	3.5	8.0	2	1	1									-2.5	ALLUVIAL GRAY SILTY CLAY, WET	18.5
-5	-1.5	13.0	1	1	2									-7.0	ALLUVIAL GRAY SILTY CLAY, WET	18.5
-10	-6.5	18.0	6	1	2									-25.0	COASTAL PLAIN GRAY CLAYEY SAND W/ SHELL FRAGMENTS (YORKTOWN FORMATION)	36.5
-15	-11.5	23.0	1	1	2									-34.0	COASTAL PLAIN GRAY BIOSPARITE LIMESTONE AND CALCAREOUS SANDSTONE (CASTLE HAYNE FORMATION)	45.5
-20	-16.5	28.0	1	1	2									-44.0	COASTAL PLAIN GRAY CALCAREOUS SAND, SAT	55.5
-25	-21.5	33.0	2	1	2											
-30	-26.5	38.0	4	3	3											
-35	-31.5	43.0	5	6	5											
-40	-36.5	48.0	8	60	17											
-45	-41.5	53.0	13	14	14											
-50	-46.5	58.0	5	5	11											
-55	-51.5	63.0	9	11	11											
-60	-56.5	68.0	8	5	6											
-65	-61.5	73.0	4	3	3											

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-65															
-70	-66.5	78.0	4	3	4										
-75															
-80															
-85															
-90															
-95															
-100															
-105															
-110															
-115															
-120															
-125															
-130															
-135															
-140															
-145															

NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 4/13/09

Match Line
 COASTAL PLAIN
 GRAY CALCAREOUS SAND, SAT
 (continued)
 Boring Terminated at Elevation -68.0 ft IN
 LOOSE SAND

BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK

E1-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., LL, P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-1 through SS-10.

B1-A

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., LL, P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-19 through SS-24.

B2-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., LL, P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-167 through SS-174.

B3-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., LL, P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-75 through SS-84.

B4-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., LL, P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-159 through SS-166.

B5-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., LL, P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-85 through SS-94.

B6-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., LL, P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-147 through SS-158.

B7-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., LL, P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-101 through SS-112.

BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK

B8-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-140 to SS-146.

B9-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-95 to SS-100.

B10-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-135 to SS-139.

B11-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-113 to SS-121.

B12-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-130 to SS-134.

B13-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-122 to SS-129.

B14-B

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-25 to SS-30.

EB2-A

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING (SIEVES) (10, 40, 200), % MOISTURE, % ORGANIC. Rows include samples SS-11 to SS-18.



**FIELD
 SCOUR REPORT**

WBS: 33264.1.1 TIP: B-3809 COUNTY: BEAUFORT

DESCRIPTION(1): BRIDGE NO.64 ON NC 99 OVER PUNGO CREEK

EXISTING BRIDGE

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

Bridge No.: 64 Length: 680 Total Bents: 18 Bents in Channel: 16 Bents in Floodplain: 1
 Foundation Type: TIMBER PILES

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: NONE NOTED

Interior Bents: NONE NOTED

Channel Bed: NONE NOTED

Channel Bank: NONE NOTED

EXISTING SCOUR PROTECTION

Type(3): RIP RAP

Extent(4): ALONG END SLOPES OF EB1 AND EB2, AND ALONG SIDE SLOPES OF EB2

Effectiveness(5): EFFECTIVE

Obstructions(6): NONE NOTED

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): MODERATELY ORGANIC SILT, MUCK, CLAY, AND SAND

Channel Bank Material(8): SAND AND CLAY

Channel Bank Cover(9): TREES AND SHRUBS

Floodplain Width(10): 850' (+/-)

Floodplain Cover(11): MARSH GRASS

Stream is(12): Aggrading _____ Degrading _____ Static

Channel Migration Tendency(13): VERY LOW TO THE SOUTH

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

BENTS

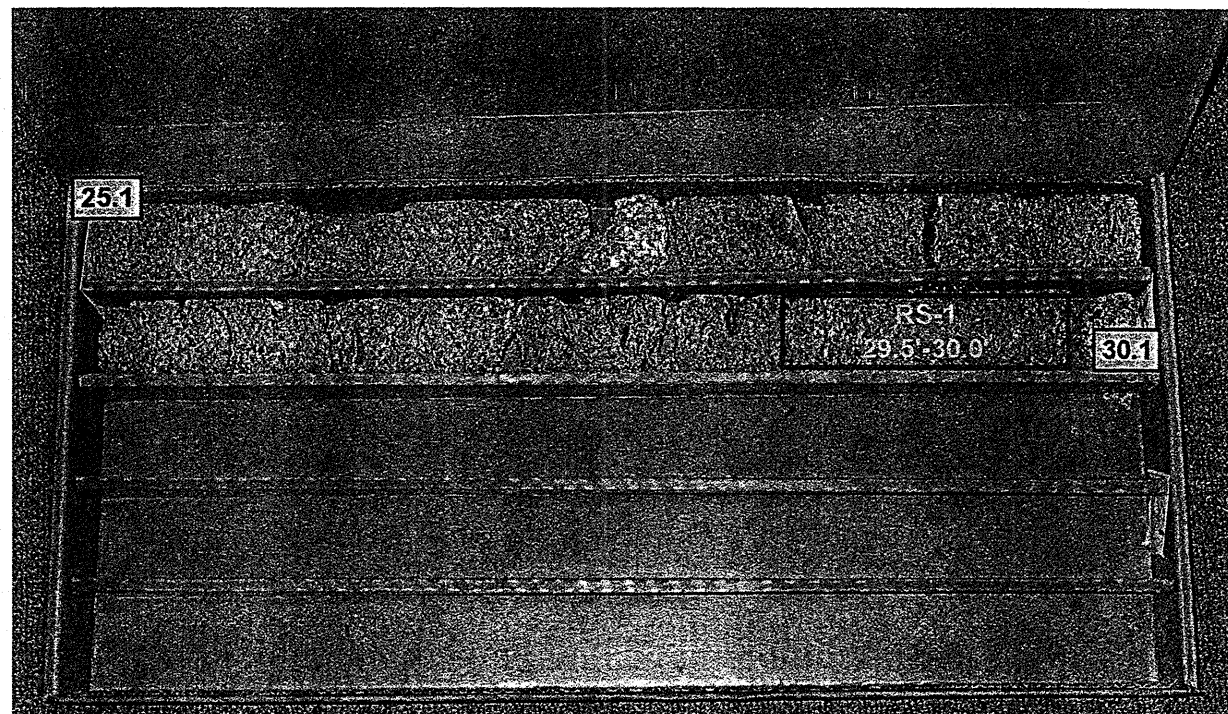
B1	B2	B3	B3	B5	B6	B7	B8	B9	B10	B11
-8	-13	-22	-25	-25	-26	-27	-25	-25	-23	-21
B12	B13	B14								
-17	-14	-3								

Comparison of DSE to Hydraulics Unit theoretical scour:
**GEOTECHNICAL ANALYSIS AGREES WITH THE MAXIMUM THEORETICAL SCOUR ELEVATIONS AS
 AS OUTLINED IN THE BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT.**

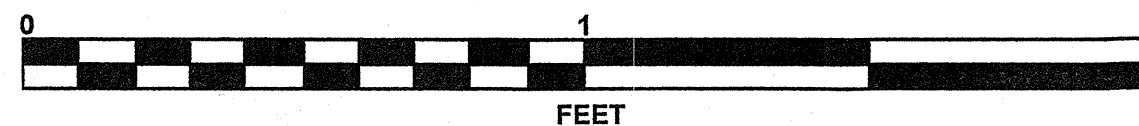
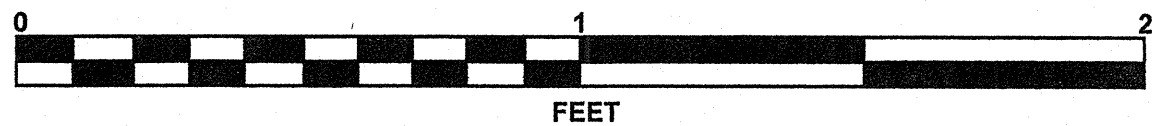
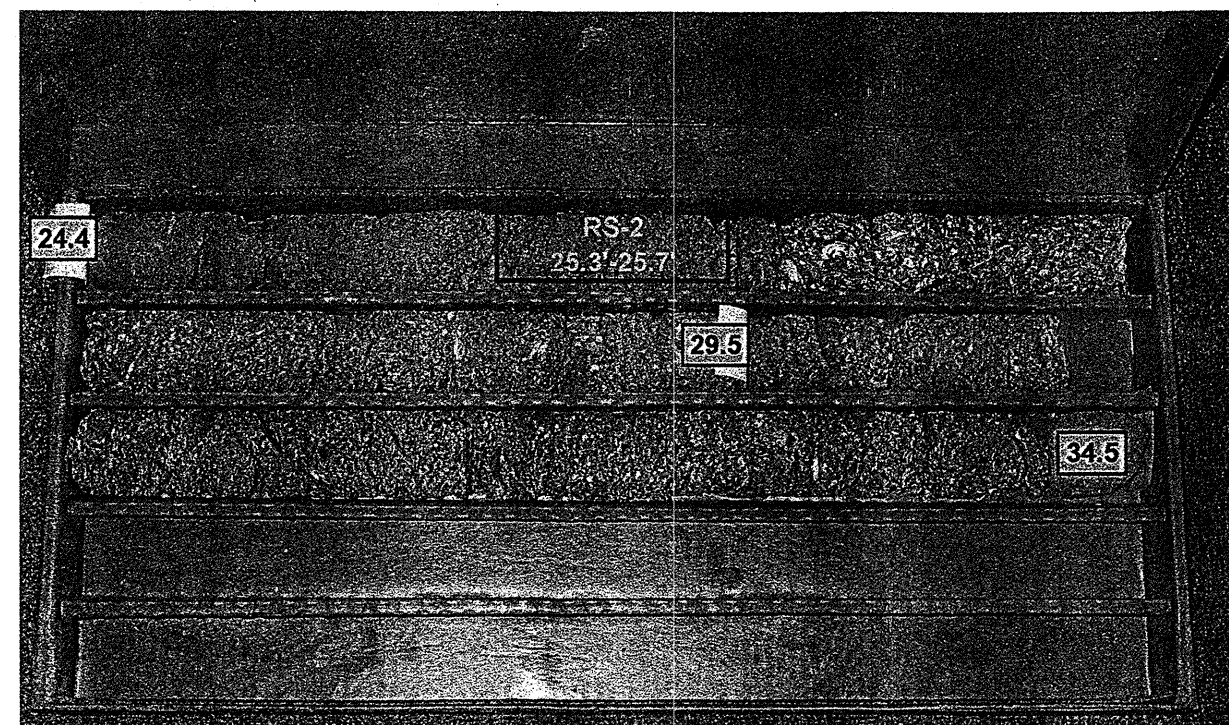
See Sheet 7
 "Soil Test Results",
 for samples:
 SS- 75, 85, 113, 25
 (CHANNEL BED)
 SS-1, 2 (CHANNEL BANK)

CORE PHOTOGRAPHS

B9-A BOX 1 OF 1
25.1' TO 30.1'



B10-A BOX 1 OF 1
24.4' TO TO 29.5'
29.5' TO 34.5'



CORE PHOTOGRAPH

B12-A BOX 1 OF 1
29.2' TO 34.2'
34.2' to 39.2'

