

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5 - 6	BORELOGS
7	SOIL TEST RESULTS
8	SCOUR REPORT

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33827.1.1 (B-4672) F.A. PROJ. BRZ-1537(4)
 COUNTY WAYNE
 PROJECT DESCRIPTION BRIDGE NO. 37 ON SR 1537 (AIRPORT RD.)
OVER NAHUNTA SWAMP AT STA. 16+54

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33827.1.1 (B-4672)	1	8
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33827.1.1	BRZ-1537(4)	P.E.	
		RW & UTIL.	

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.

PERSONNEL

CMW

JME

RES

SCD

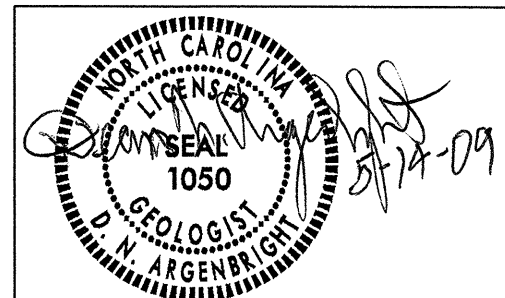
DNA

INVESTIGATED BY C.M. WRIKE

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE MAY 2009



DRAWN BY: C.R. SUMNER, C.W. WRIKE

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.

ID: B-4672

PROJECT: 33827.1.1

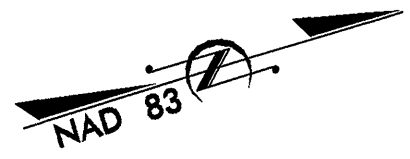
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. B-4672	SHEET NO. 2 OF 8
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SUBSURFACE INVESTIGATION

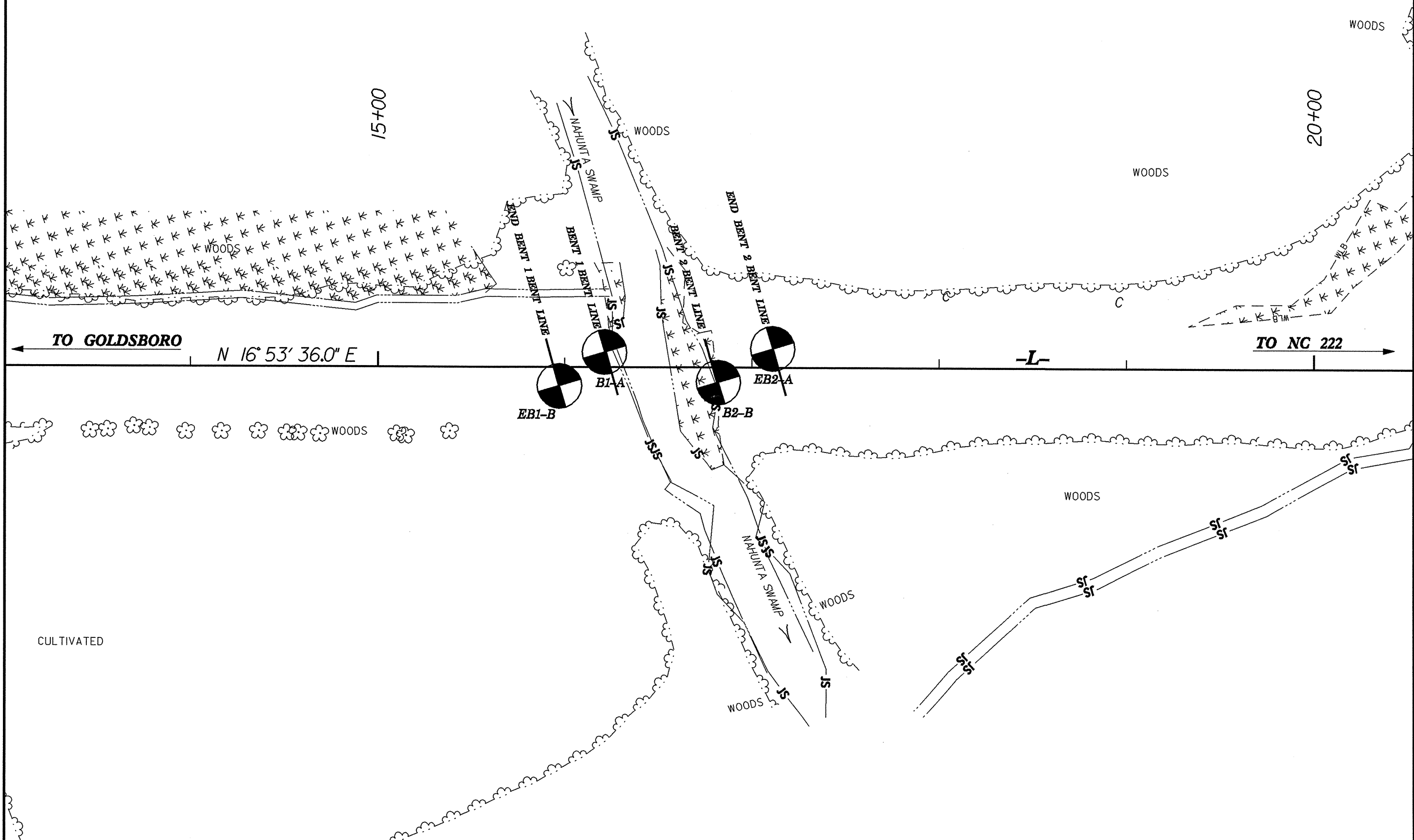
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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 FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY, SAT. CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-6</i>	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR , SUBANGULAR , SUBROUNDED , OR ROUNDED .	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 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: WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. 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. 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. 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.	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 (RQD) - 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 (N 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 (SRQD) - 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.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	WEATHERING	
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> 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 BPF</i> 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 BPF</i> 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.	
COMPRESSION	PERCENTAGE OF MATERIAL	GROUND WATER	
SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE	GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP	
MISCELLANEOUS SYMBOLS	ABBREVIATIONS	ROCK HARDNESS	
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 DMT 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	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING	
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)	DRILL UNITS: MOBILE B- BK-51 CME-45 CME-750 PORTABLE HOIST 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 HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST	TERM SPACING THICKNESS VERY WIDE MORE THAN 10 FEET > 4 FEET WIDE 3 TO 10 FEET 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET 0.16 - 1.5 FEET CLOSE 0.16 TO 1 FEET 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	
TEXTURE OR GRAIN SIZE		BEDDING	
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		VERY THICKLY BEDDED THICKLY BEDDED MODERATELY BEDDED VERY THINLY BEDDED THICKLY LAMINATED THINLY LAMINATED	BENCH MARK: BL-102 @ -L- STA. 16+13.08, 16.96' RT ELEVATION: 95.5 FT.
SOIL MOISTURE - CORRELATION OF TERMS		INDURATION	
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION		FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED	NOTES: SAT. : SATURATED
LL LIQUID LIMIT PL PLASTIC LIMIT OM OPTIMUM MOISTURE SL SHRINKAGE LIMIT		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.	
PLASTICITY			
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY			
COLOR			
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.			



SKEW = 75°

PROJECT REFERENCE NO.	SHEET
B-4672	3 OF 8
SITE PLAN	
0 50 100 FEET	

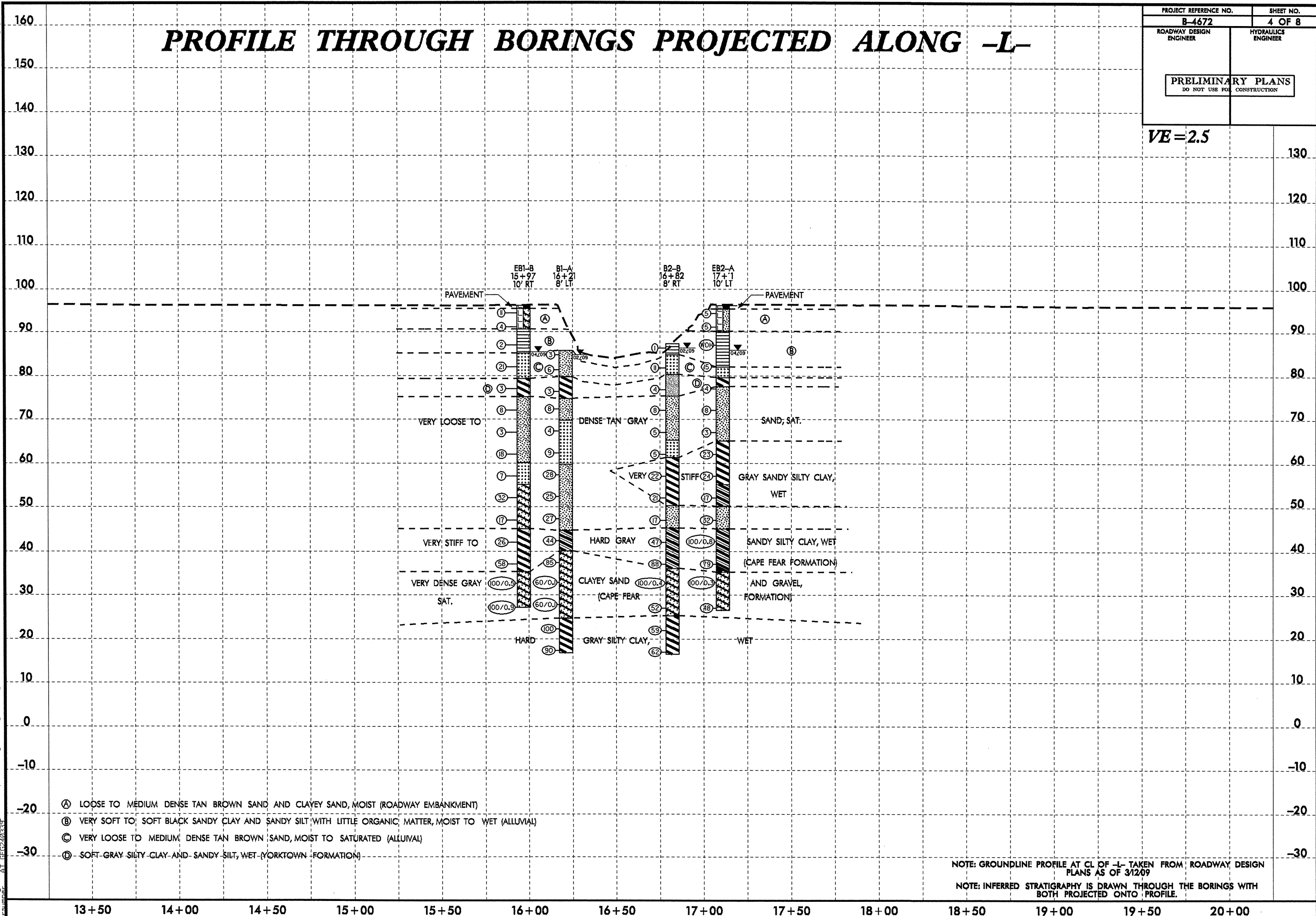


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PROFILE THROUGH BORINGS PROJECTED ALONG -L-

PROJECT REFERENCE NO. B-4672	SHEET NO. 4 OF 8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

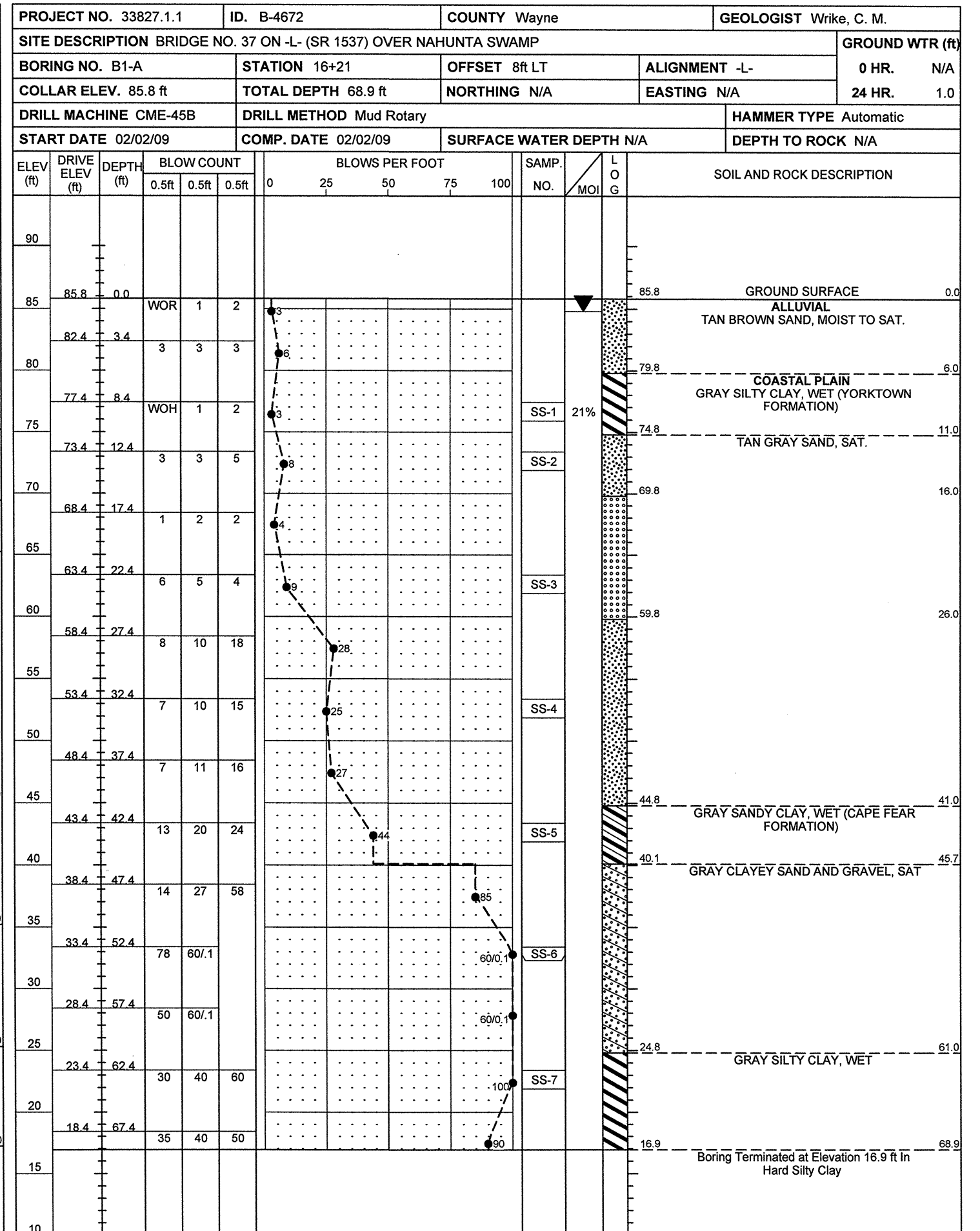
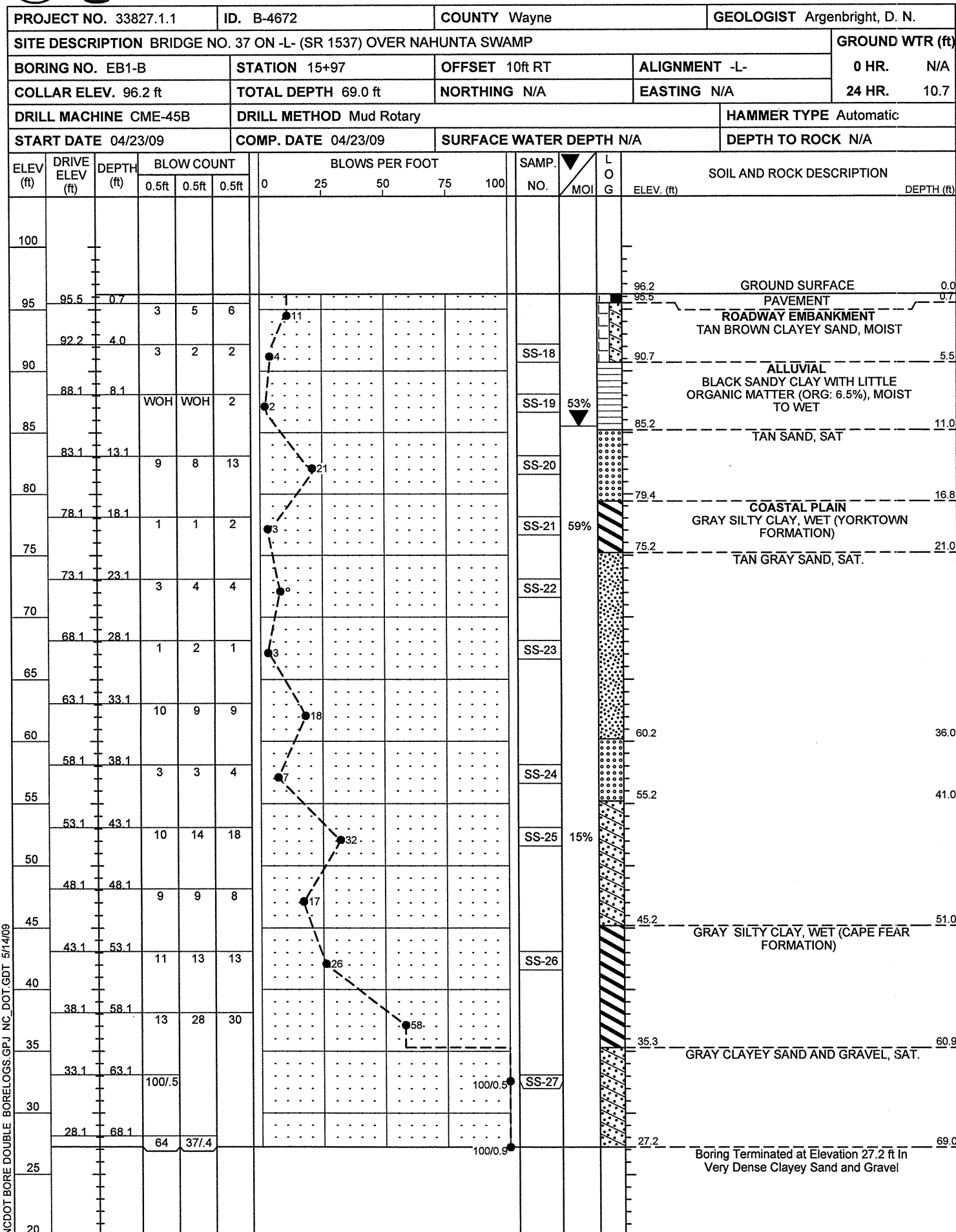
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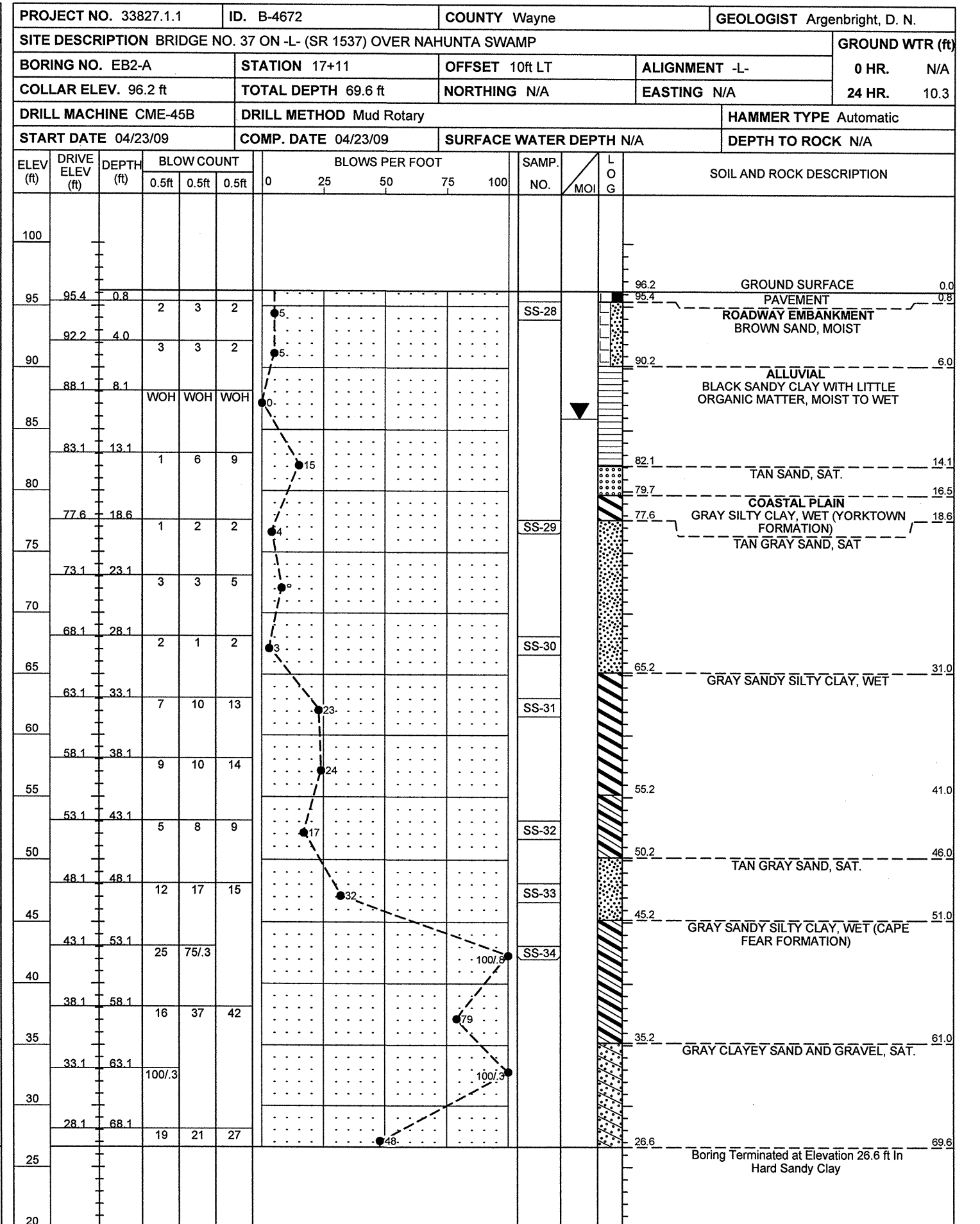
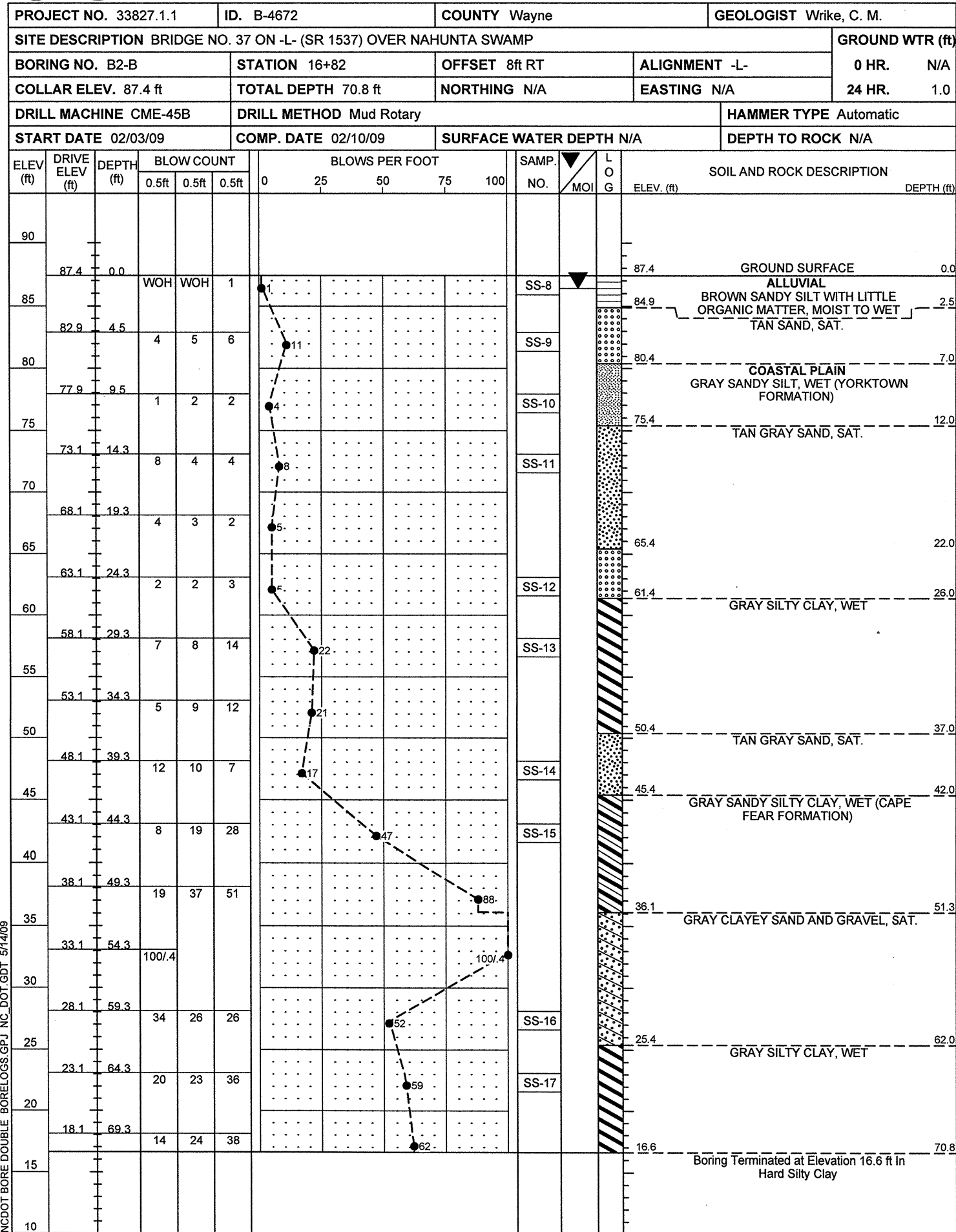
- Ⓐ LOOSE TO MEDIUM DENSE TAN BROWN SAND AND CLAYEY SAND, MOIST (ROADWAY EMBANKMENT)
- Ⓑ VERY SOFT TO SOFT BLACK SANDY CLAY AND SANDY SILT WITH LITTLE ORGANIC MATTER, MOIST TO WET (ALLUVIAL)
- Ⓒ VERY LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SATURATED (ALLUVIAL)
- Ⓓ SOFT GRAY SILTY CLAY AND SANDY SILT, WET (YORKTOWN FORMATION)

NOTE: GROUNDLINE PROFILE AT CL OF -L- TAKEN FROM ROADWAY DESIGN PLANS AS OF 3/12/09
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

13+50 14+00 14+50 15+00 15+50 16+00 16+50 17+00 17+50 18+00 18+50 19+00 19+50 20+00



NC DOT BORE DOUBLE BORELOGS.GPJ NC_DOT_GDT_5/14/09



NCDOT BORE DOUBLE BORELOGS.GPJ, NC_DOT_GDT_5/14/09

B-4672

33827.1.1

BRIDGE NO. 37 ON SR 1537 OVER
NAHUNTA SWAMP

SOIL TEST RESULTS EB1-B

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-18	10' RT	15+97	4.0-5.5	A-2-7(3)	50	29	58.3	11.4	5.1	25.2	97	56	31	-	-
SS-19	10' RT	15+97	8.1-9.6	A-6(3)	32	12	12.7	45.8	21.4	20.2	100	96	48	53.2	6.5
SS-20	10' RT	15+97	13.1-14.6	A-3(0)	20	NP	71.9	23.2	2.9	2.0	97	52	7	-	-
SS-21	10' RT	15+97	18.1-19.6	A-7-6(23)	49	32	2.4	32.5	18.8	46.4	100	99	76	58.7	-
SS-22	10' RT	15+97	23.1-24.6	A-2-4(0)	22	2	64.5	18.3	7.1	10.1	100	87	20	-	-
SS-23	10' RT	15+97	28.1-29.6	A-2-4(0)	30	8	48.3	33.4	5.2	13.1	93	64	18	-	-
SS-24	10' RT	15+97	38.1-39.6	A-3(0)	26	NP	70.7	22.7	1.6	5.0	100	81	7	-	-
SS-25	10' RT	15+97	43.1-44.6	A-2-6(0)	26	11	30.8	41.3	6.7	21.2	98	80	30	14.6	-
SS-26	10' RT	15+97	53.1-54.6	A-7-6(23)	44	30	6.9	18.5	32.3	42.3	100	96	80	-	-
SS-27	10' RT	15+97	63.1-63.6	A-2-6(1)	36	21	48.0	12.5	9.3	30.2	48	29	20	-	-

SOIL TEST RESULTS B1-A

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	8' LT	16+21	8.4-9.9	A-7-6(23)	48	31	4.5	29.9	22.9	42.7	99	96	77	21.2	-
SS-2	8' LT	16+21	12.4-13.9	A-2-4(0)	24	5	76.5	11.8	1.5	10.2	100	78	13	-	-
SS-3	8' LT	16+21	22.4-23.9	A-3(0)	19	NP	56.2	37.8	1.9	4.1	99	83	7	-	-
SS-4	8' LT	16+21	32.4-33.9	A-2-4(0)	25	7	14.6	55.7	1.1	28.5	100	96	34	-	-
SS-5	8' LT	16+21	42.4-43.9	A-6(6)	25	15	14.4	29.7	23.3	32.6	94	86	62	-	-
SS-6	8' LT	16+21	52.4-53.0	A-2-6(0)	32	12	43.5	18.3	13.7	24.4	50	33	21	-	-
SS-7	8' LT	16+21	62.4-63.9	A-7-6(10)	43	18	9.6	38.5	29.6	22.4	95	91	65	-	-

SOIL TEST RESULTS B2-B

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-8	8' RT	16+82	1.0-1.5	A-4(1)	26	6	6.7	40.5	36.5	16.3	84	81	58	-	-
SS-9	8' RT	16+82	4.5-6.0	A-3(0)	17	NP	60.6	34.0	1.3	4.1	98	62	7	-	-
SS-10	8' RT	16+82	9.5-11.0	A-4(2)	31	9	15.5	48.4	11.7	24.4	98	86	53	-	-
SS-11	8' RT	16+82	14.3-15.8	A-2-4(0)	22	2	68.6	15.3	10.1	6.1	92	71	18	-	-
SS-12	8' RT	16+82	24.3-25.8	A-3(0)	20	NP	61.4	31.7	0.7	6.1	94	71	7	-	-
SS-13	8' RT	16+82	29.3-30.8	A-7-6(22)	45	32	7.5	23.0	36.9	32.6	94	90	74	-	-
SS-14	8' RT	16+82	39.3-40.8	A-2-4(0)	20	NP	29.5	52.9	5.4	12.2	100	90	20	-	-
SS-15	8' RT	16+82	44.3-45.8	A-6(13)	36	20	9.2	20.8	23.3	46.8	98	94	75	-	-
SS-16	8' RT	16+82	59.3-60.8	A-2-6(1)	36	21	27.7	31.3	14.5	26.4	49	39	25	-	-
SS-17	8' RT	16+82	64.3-65.8	A-7-6(9)	43	15	11.4	37.2	31.0	20.3	97	90	67	-	-

SOIL TEST RESULTS EB2-B

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-28	10' LT	17+11	1.0-2.3	A-2-4(0)	22	6	35.9	32.5	13.5	18.1	100	76	35	-	-
SS-29	10' LT	17+11	18.6-19.6	A-2-4(0)	28	8	62.1	21.6	5.2	11.1	96	56	19	-	-
SS-30	10' LT	17+11	28.1-29.6	A-2-4(0)	29	NP	40.8	42.5	5.5	11.1	95	74	17	-	-
SS-31	10' LT	17+11	33.1-34.6	A-7-6(17)	44	31	16.5	23.2	20.0	40.3	100	91	65	-	-
SS-32	10' LT	17+11	43.1-44.6	A-6(8)	34	17	5.8	44.8	31.3	18.1	100	97	62	-	-
SS-33	10' LT	17+11	48.1-49.6	A-2-4(0)	21	NP	48.6	34.9	2.4	14.1	100	86	17	-	-
SS-34	10' LT	17+11	53.1-53.9	A-6(5)	31	14	36.3	12.1	21.4	30.2	100	82	55	-	-



FIELD SCOUR REPORT

WBS: 33827.1.1 TIP: B-4672 COUNTY: WAYNE

DESCRIPTION(1): BRIDGE NO. 37 ON SR 1537 OVER NAHUNTA SWAMP

EXISTING BRIDGE

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

Bridge No.: 37 Length: 87' Total Bents: 6 Bents in Channel: 3 Bents in Floodplain: 3

Foundation Type: Timber piles with timber caps

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: EB1, erosion 1-3 feet under existing bridge

Interior Bents: Scour pocket 1-2 feet deep around concrete collar, west side of Bent 1

Channel Bed: scour pockets 1-2 feet deep

Channel Bank: 1-3 feet of erosion of stream bank under bridge between EB1 and B1

EXISTING SCOUR PROTECTION

Type(3): Rip Rap

Extent(4): On EB1 end slope under existing bridge

Effectiveness(5): Effective

Obstructions(6): Debris upstream against B1

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): Sandy silt with little organic matter

Channel Bank Material(8): Sandy clay with little organic matter

Channel Bank Cover(9): Grass, shrubs

Floodplain Width(10): 1700 feet

Floodplain Cover(11): Trees and shrubs

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): South toward EB1

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

BENTS

B1	B2										
77.1	75.6										

Comparison of DSE to Hydraulics Unit theoretical scour:
 Geotechnical analysis agrees with the Hydraulic Unit's overtopping theoretical scour.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

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

See Sheet 7,
 "Soil Test Results",
 for samples:
 Channel bed: SS-8
 Channel bank: SS-19

Reported by: C.M. Wrike

Date: _____