

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33555.1.1 (B-4209)	1	14

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 33555.1.1 (B-4209) F.A. PROJ. BRZ-1131 (6)  
COUNTY NASH  
PROJECT DESCRIPTION BRIDGE NO. 17 ON -L- (SR 1131)  
OVER TURKEY CREEK AT STATION 17+47.5

**CONTENTS**

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-6	CROSS SECTIONS
7-10	BORE LOGS & CORE REPORT
11	SOIL TEST RESULTS
12	SCOUR REPORT
13	CORE PHOTOGRAPH
14	SITE PHOTOGRAPH

**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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

**PROJECT: 33555.1.1 ID: B-4209**

PERSONNEL

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DATE JULY 2007



7/18/07

DRAWN BY: J. L. PEDRO

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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

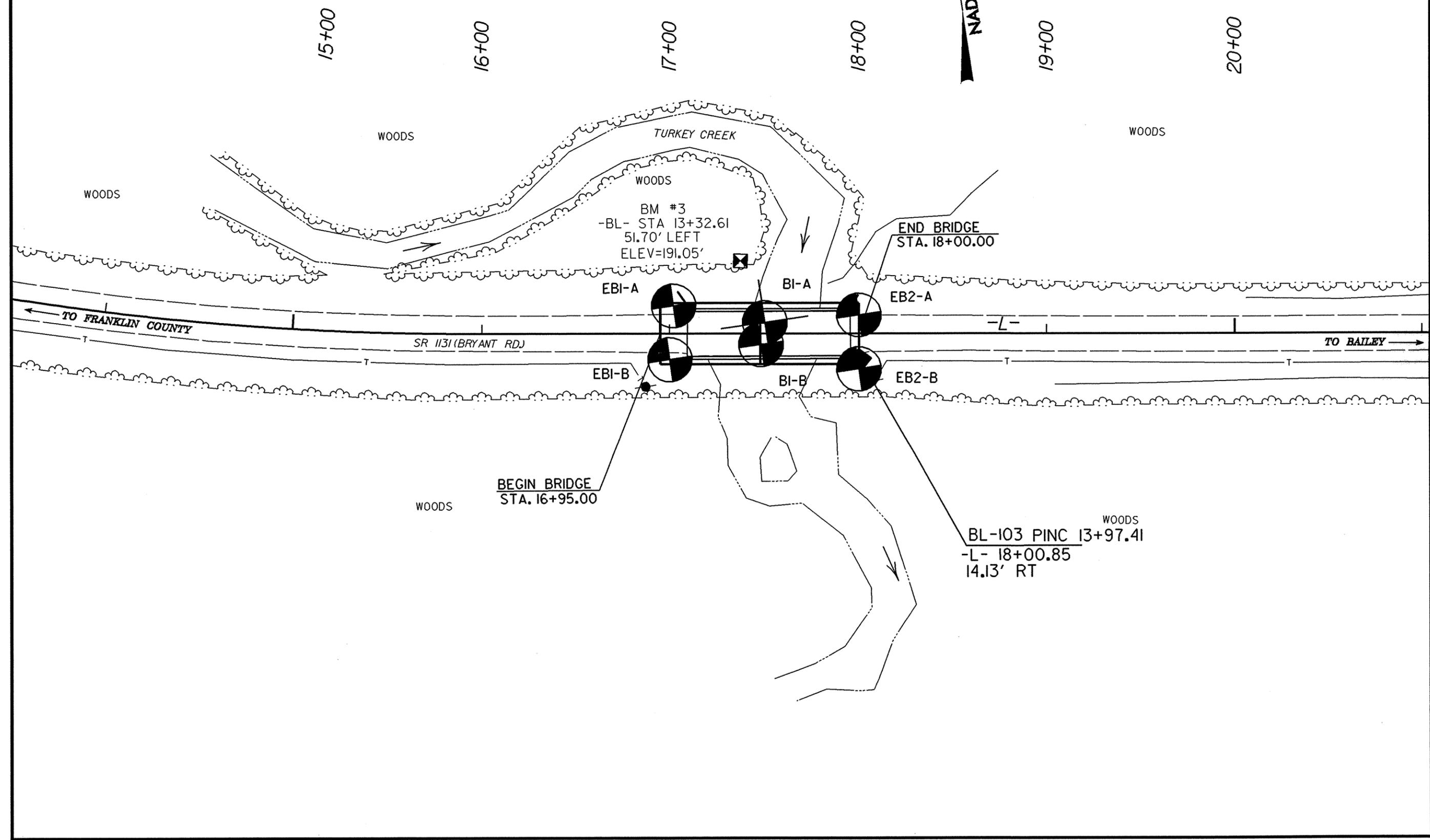
PROJECT REFERENCE NO. 33555.I.I (B-4209) SHEET NO. 2

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: <b>VERY STIFF, DARK, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HARD PLASTIC, A-7-6</b>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED). GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 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:										ALLUVIUM (ALLOUV.) - 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 (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.																			
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION										WEATHERING										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.										ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.																			
GROUP CLASS. A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-3 A-4, A-5 A-6, A-7										COMPRESSIBILITY										NON-CRYSTALLINE ROCK (NCR)										NON-CRYSTALLINE ROCK (NCR)																			
SYMBOL										SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50										FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.										FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.																			
% PASSING										PERCENTAGE OF MATERIAL										COASTAL PLAIN SEDIMENTARY ROCK (CP)										WEATHERING																			
LIQUID LIMIT PLASTIC INDEX										ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL										VERY SLIGHT (V SLI)										VERY SLIGHT (V SLI)																			
GROUP INDEX										GROUND WATER										SLIGHT (SLI)										SLIGHT (SLI)																			
USUAL TYPES OF MAJOR MATERIALS										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING										MODERATE (MOD)										MODERATE (MOD)																			
GENERATING AS A SUBGRADE										STATIC WATER LEVEL AFTER 24 HOURS										MODERATELY SEVERE (MOD. SEV.)										MODERATELY SEVERE (MOD. SEV.)																			
PI OF A-7-5 SUBGROUP IS <= LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30										PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA										SEVERE (SEV.)										SEVERE (SEV.)																			
CONSISTENCY OR DENSENESS										MISCELLANEOUS SYMBOLS										VERY SEVERE (V SEV.)										VERY SEVERE (V SEV.)																			
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD										SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL										COMPLETE										COMPLETE									
TEXTURE OR GRAIN SIZE										ABBREVIATIONS										ROCK HARDNESS										ROCK HARDNESS																			
U.S. STD. SIEVE SIZE OPENING (MM)										AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST V - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS										VERY HARD										VERY HARD																			
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F. SD.) SILT (SL.) CLAY (CL.)										HI. - HIGHLY MED. - MEDIUM MICA. - MICACEOUS MOD. - MODERATELY NP. - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLL. - SLIGHTLY TCR - TRICONE REFUSAL										HARD										HARD																			
GRAIN SIZE										MO - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT Wd - DRY UNIT WEIGHT										MODERATELY HARD										MODERATELY HARD																			
SOIL MOISTURE - CORRELATION OF TERMS										EQUIPMENT USED ON SUBJECT PROJECT										MEDIUM HARD										MEDIUM HARD																			
SOIL MOISTURE SCALE (ATTEBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CORE SIZE: HAND TOOLS:										SOFT										SOFT																			
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT										MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST CME-750										VERY CLOSE										VERY CLOSE																			
PLASTICITY										CLAY BITS 6" CONTINUOUS FLIGHT AUGER 6" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING W/ ADVANCER TRICONE STEEL TEETH TRICONE TUNG-CARB. CORE BIT										MODERATELY HARD										MODERATELY HARD																			
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY										POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST										VERY SOFT										VERY SOFT																			
COLOR										INDURATION										INDURATED										INDURATED																			
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.										FRAGILE MODERATELY INDURATED INDURATED EXTREMELY INDURATED										INDURATED										INDURATED																			

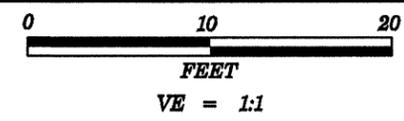
ELEVATION: 194.80 FT.

NOTES:

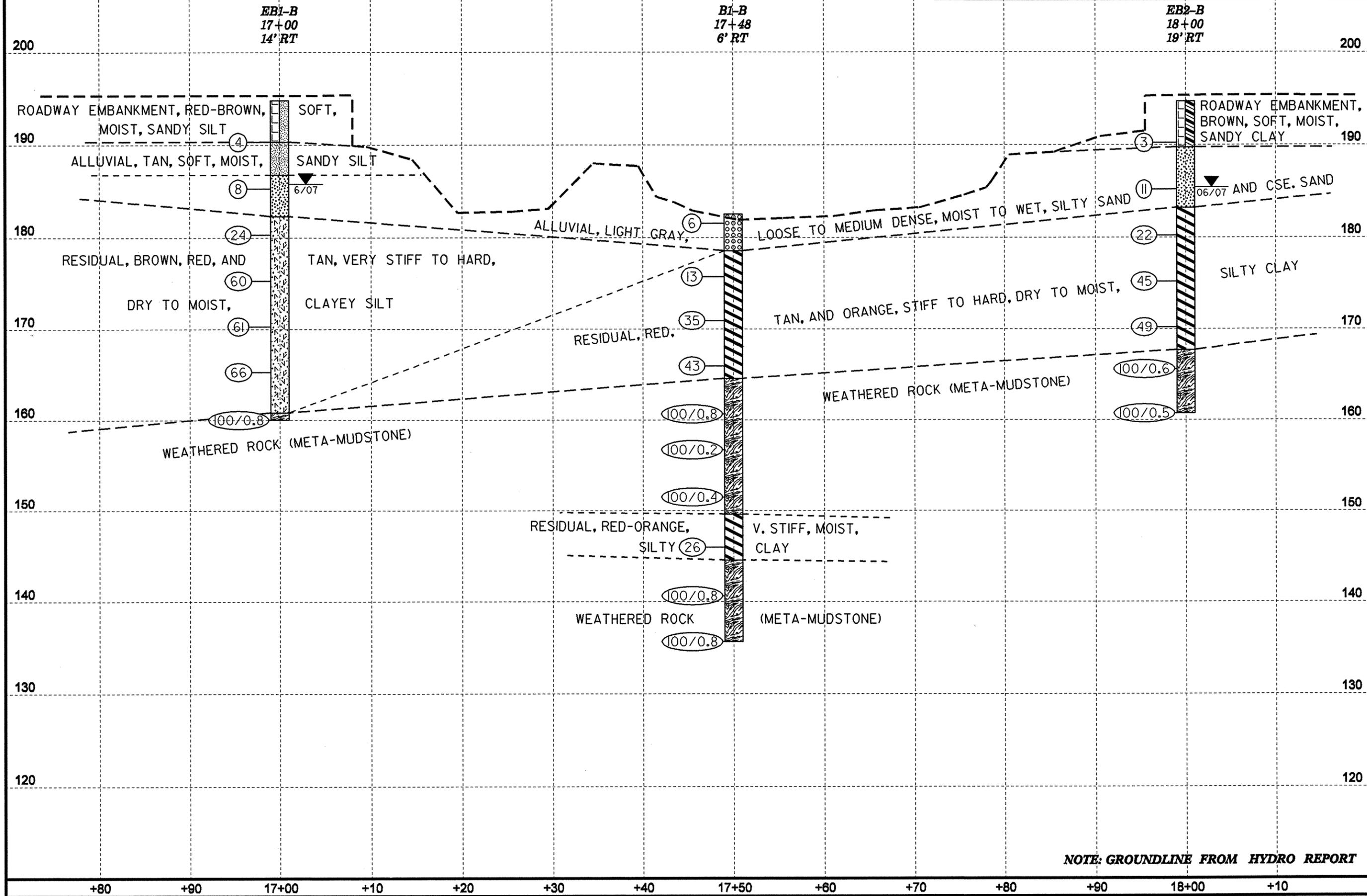
**SKREW ANGLE = 90**



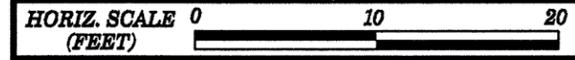
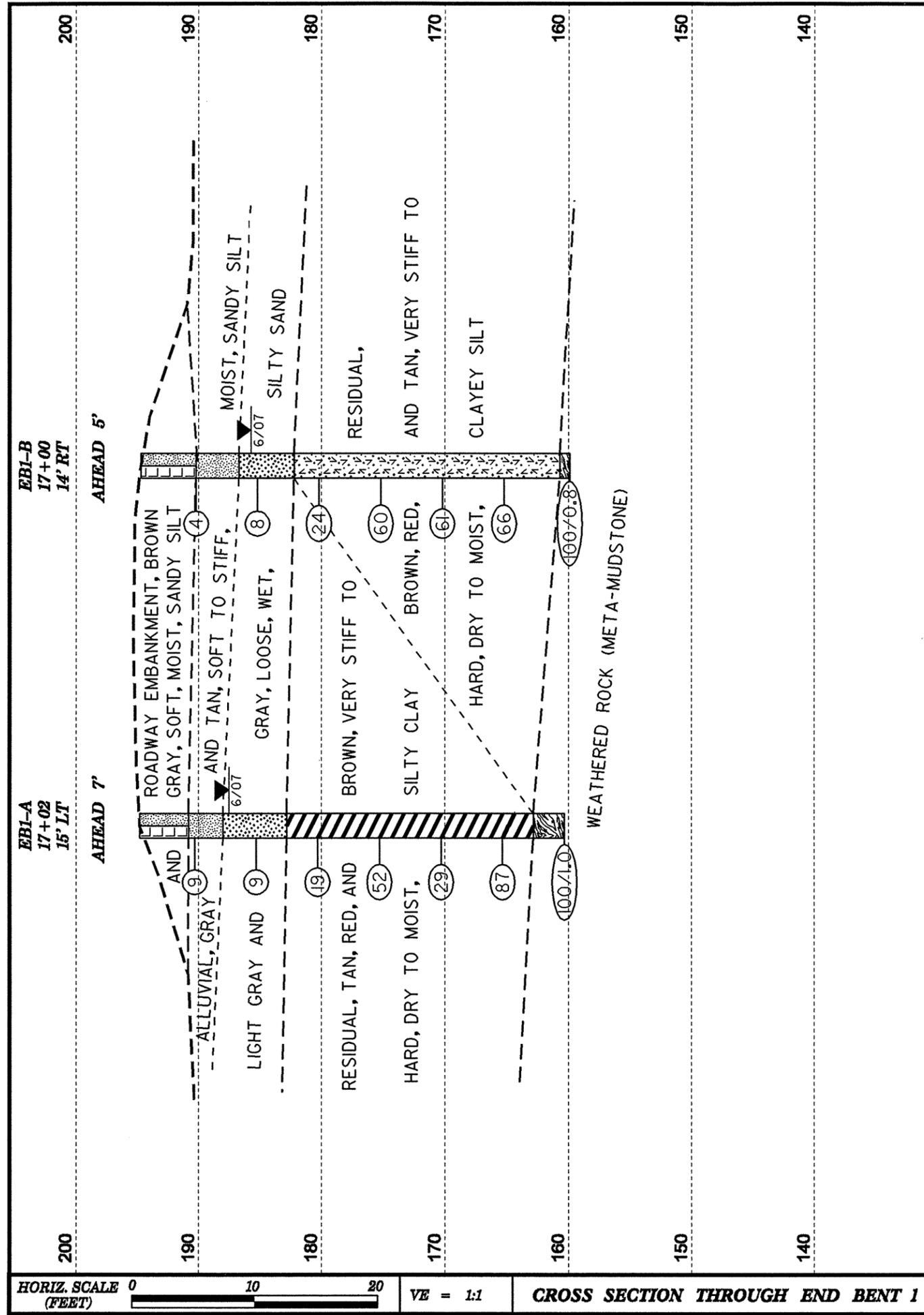
# FENCE DIAGRAM THROUGH BORINGS ALONG -L-



PROJECT REFERENCE NO.	SHEET
33555.1.1 (B-4209)	4

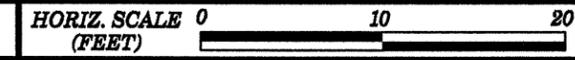
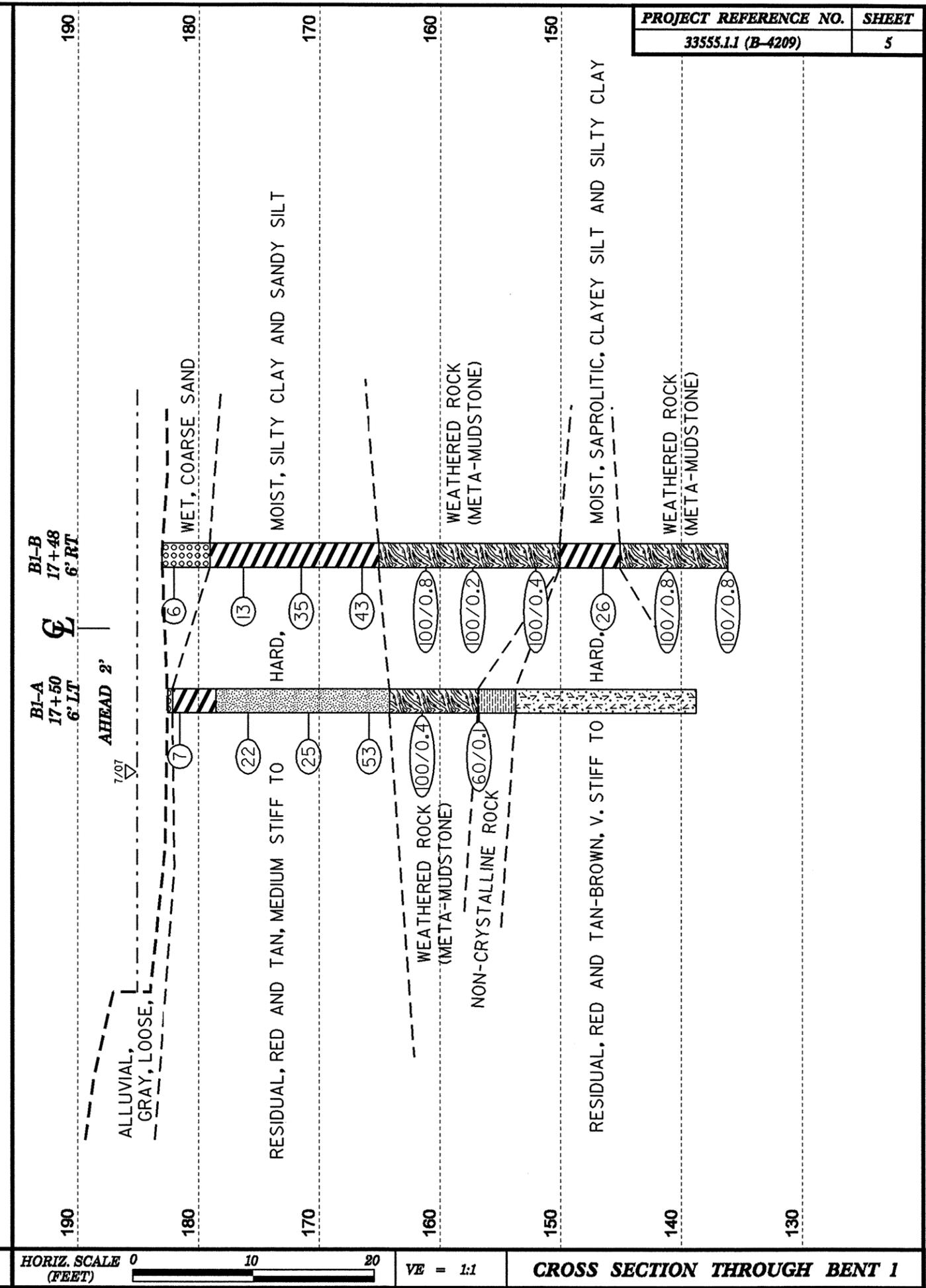


**NOTE: GROUNDLINE FROM HYDRO REPORT**



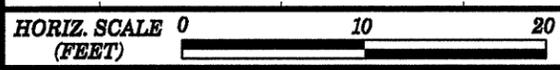
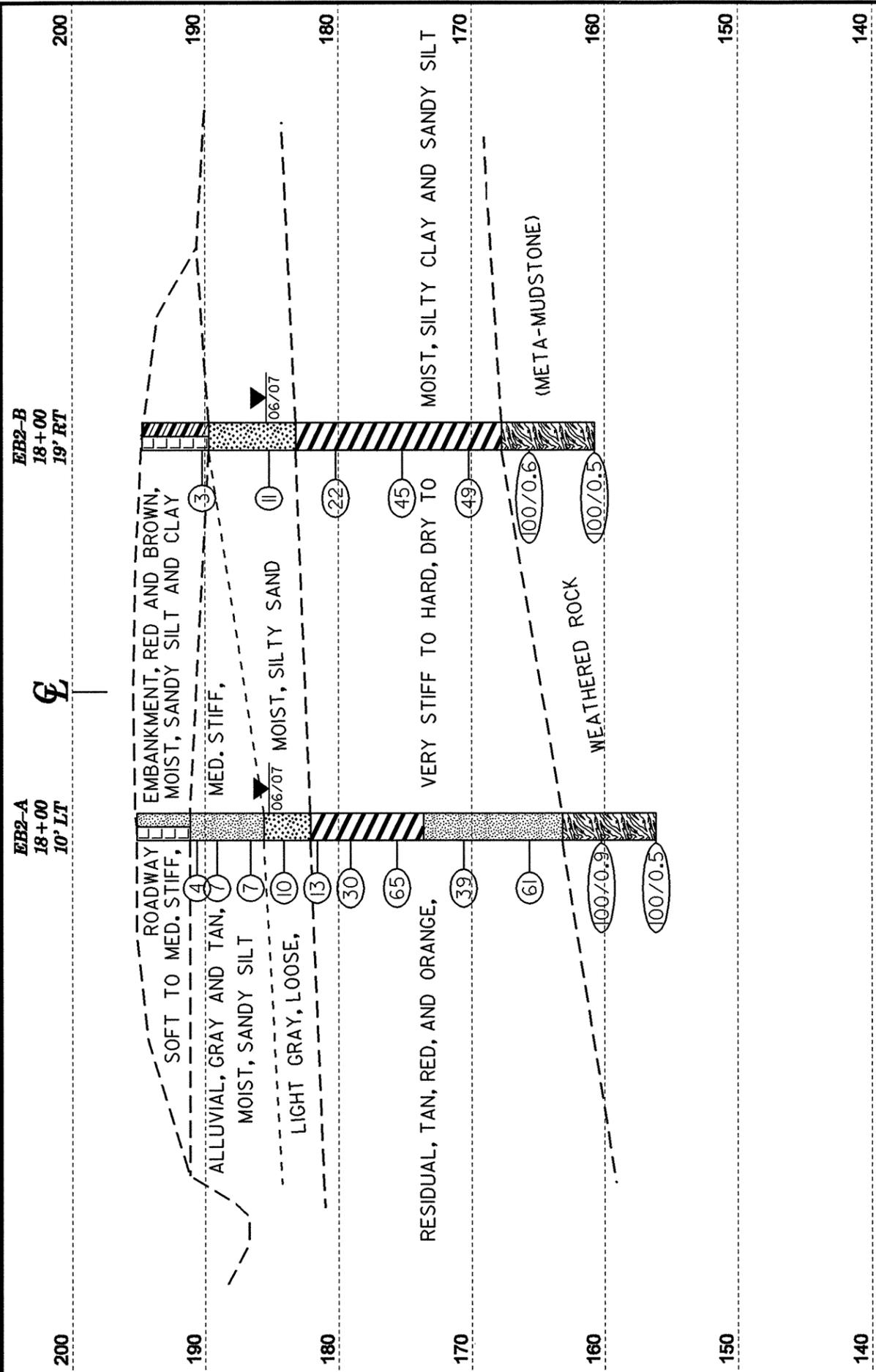
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**CROSS SECTION THROUGH END BENT 1**



VE = 1:1

**CROSS SECTION THROUGH BENT 1**



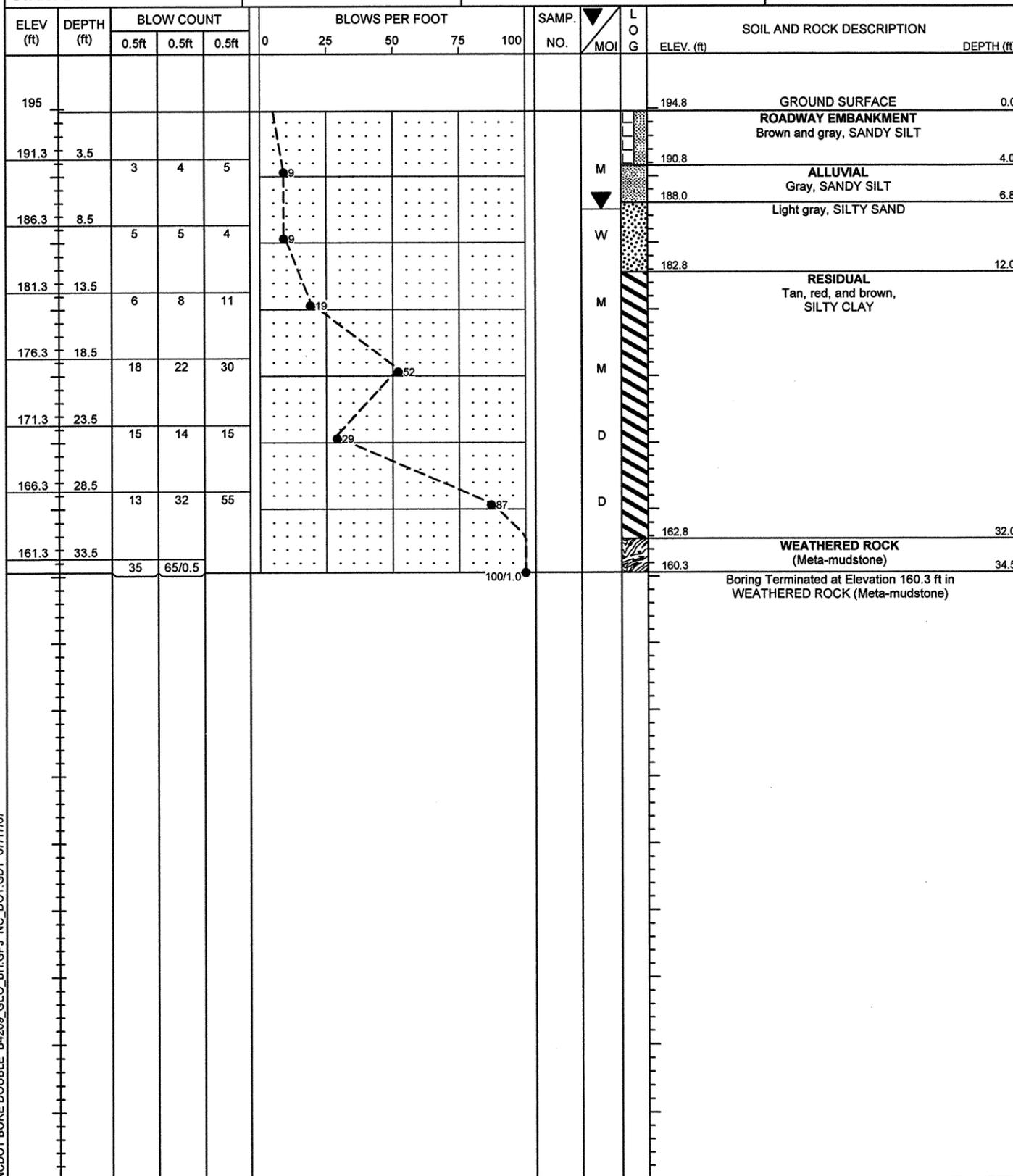
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CROSS SECTION THROUGH END BENT 2

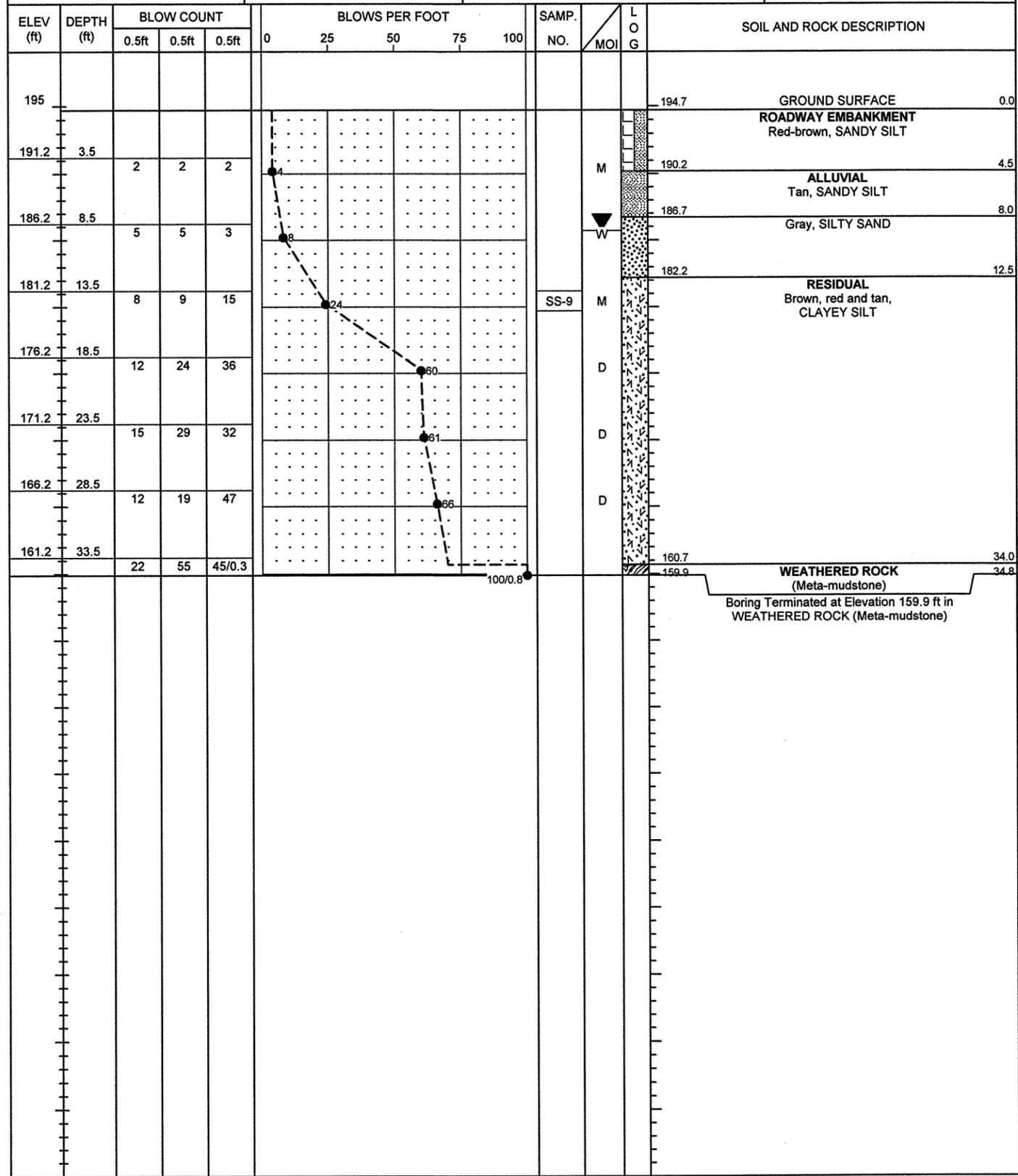


**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

PROJECT NO. 33555.1.1	ID. B-4209	COUNTY Nash	GEOLOGIST Kuntukova, Y
SITE DESCRIPTION Bridge No. 17 on -L- (SR 1131) over Turkey Creek			GROUND WTR (ft)
BORING NO. EB1-A	STATION 17+02	OFFSET 15ft LT	ALIGNMENT -L-
COLLAR ELEV. 194.8 ft	TOTAL DEPTH 34.5 ft	NORTHING 759,356	EASTING 2,247,081
DRILL MACHINE CME-750	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 06/28/07	COMP. DATE 06/28/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



PROJECT NO. 33555.1.1	ID. B-4209	COUNTY Nash	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION Bridge No. 17 on -L- (SR 1131) over Turkey Creek			GROUND WTR (ft)
BORING NO. EB1-B	STATION 17+00	OFFSET 14ft RT	ALIGNMENT -L-
COLLAR ELEV. 194.7 ft	TOTAL DEPTH 34.8 ft	NORTHING 759,327	EASTING 2,247,075
DRILL MACHINE CME-750	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 06/28/07	COMP. DATE 06/28/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE B4209\_GEO\_BH.GPJ NC\_DOT.GDT 07/17/07



PROJECT NO. 33555.1.1		ID. B-4209		COUNTY Nash		GEOLOGIST Kuntukova, Y							
SITE DESCRIPTION Bridge No. 17 on -L- (SR 1131) over Turkey Creek							GROUND WTR (ft)						
BORING NO. B1-B		STATION 17+48		OFFSET 6ft RT		ALIGNMENT -L-	0 HR. N/A						
COLLAR ELEV. 183.1 ft		TOTAL DEPTH 46.9 ft		NORTHING 759,328		EASTING 2,247,124	24 HR. N/A						
DRILL MACHINE CME-750		DRILL METHOD Mud Rotary				HAMMER TYPE Automatic							
START DATE 07/02/07		COMP. DATE 07/02/07		SURFACE WATER DEPTH 2.0ft		DEPTH TO ROCK N/A							
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				
185													WATER SURFACE (07/02/07)
183.1	0.0												183.1 GROUND SURFACE 0.0
		3	4	2	6						W	OOO	ALLUVIAL Light gray, COARSE SAND
177.3	5.8				13							OOO	179.1 4.0
		2	5	8							SS-12	M	RESIDUAL Red and tan, SILTY CLAY
172.5	10.6											M	
167.5	15.6											M	
		10	14	21								M	
162.5	20.6											M	165.1 18.0
		10	18	25								M	WEATHERED ROCK (Meta-mudstone)
157.5	25.6											M	100/0.8
		21	40	60/0.3								M	100/0.2
152.5	30.6											M	100/0.4
		100/0.2										M	
147.5	35.6											M	150.1 33.0
		100/0.4										M	RESIDUAL Red-orange, SILTY CLAY
142.5	40.6											M	145.1 38.0
		6	8	18								M	WEATHERED ROCK (Meta-mudstone)
137.5	45.6											M	100/0.8
		25	35	65/0.3								M	100/0.4
		15	55	45/0.3								M	100/0.8
												M	136.2 46.9
												M	Boring Terminated at Elevation 136.2 ft in WEATHERED ROCK (Meta-mudstone)



# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

PROJECT NO. 33555.1.1	ID. B-4209	COUNTY Nash	GEOLOGIST Kuntukova, Y
SITE DESCRIPTION Bridge No. 17 on -L- (SR 1131) over Turkey Creek			GROUND WTR (ft)
BORING NO. EB2-A	STATION 18+00	OFFSET 10ft LT	ALIGNMENT -L-
COLLAR ELEV. 195.1 ft	TOTAL DEPTH 39.0 ft	NORTHING 759,337	EASTING 2,247,178
DRILL MACHINE CME-750	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 06/28/07	COMP. DATE 06/28/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
		0.5ft	0.5ft	0.5ft	0	25	50	75	100						
200															
195.1													GROUND SURFACE	0.0	
													ROADWAY EMBANKMENT Red-brown, SANDY SILT		
191.6	3.5									SS-1	M		ALLUVIAL Gray and tan, SANDY SILT	4.0	
190.1	5.0	1	2	2						SS-2	M		ALLUVIAL Light gray, SILTY SAND	9.5	
187.6	7.5	1	3	4						SS-3	M		RESIDUAL Tan-yellow and red, SILTY CLAY	13.0	
185.1	10.0	2	4	3						SS-4	M		RESIDUAL Tan, red, and orange, SILTY CLAY	21.5	
182.6	12.5	4	5	5						SS-5	M		WEATHERED ROCK (Meta-mudstone)	32.0	
180.1	15.0	3	4	9									WEATHERED ROCK (Meta-mudstone)	39.0	
176.6	18.5	11	15	15									Boring Terminated at Elevation 156.1 ft in WEATHERED ROCK (Meta-mudstone)		
171.6	23.5	20	35	30											
166.6	28.5	18	17	22											
161.6	33.5	7	23	38											
156.6	38.5	34	45	55/0.4											
		100/0.5													

PROJECT NO. 33555.1.1	ID. B-4209	COUNTY Nash	GEOLOGIST Kuntukova, Y
SITE DESCRIPTION Bridge No. 17 on -L- (SR 1131) over Turkey Creek			GROUND WTR (ft)
BORING NO. EB2-B	STATION 18+00	OFFSET 19ft RT	ALIGNMENT -L-
COLLAR ELEV. 194.7 ft	TOTAL DEPTH 34.0 ft	NORTHING 759,308	EASTING 2,247,173
DRILL MACHINE CME-750	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 06/28/07	COMP. DATE 06/28/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
		0.5ft	0.5ft	0.5ft	0	25	50	75	100					
194.7													GROUND SURFACE	0.0
													ROADWAY EMBANKMENT Brown, SANDY CLAY	
191.2	3.5	2	1	2						SS-7	M		ALLUVIAL Light gray, SILTY SAND	5.0
186.2	8.5	7	6	5						SS-8	M		RESIDUAL Tan, red, and orange, SILTY CLAY	11.5
181.2	13.5	16	11	11									WEATHERED ROCK (Meta-mudstone)	27.0
176.2	18.5	14	22	23									WEATHERED ROCK (Meta-mudstone)	34.0
171.2	23.5	18	20	29										
166.2	28.5	75	25/0.1											
161.2	33.5	100/0.5												
		100/0.5												

NCDOT BORE DOUBLE B4209\_GEO\_BH.GPJ NC\_DOT\_GDT 07/18/07

**PROJ. NO. - 33555.1.1**  
**ID NO. - B-4209**  
**COUNTY - Nash**

**EB1-B**

<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-9	14' RT	17+00	13.5-15.0	A-5(9)	43	8	2.0	22.7	51.2	24.1	100	99	83	-	-

**B1-A**

<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-10	6' LT	17+50	0.4-1.5	A-7-5(21)	55	15	0.6	11.0	60.2	28.1	100	100	95	-	-
SS-11	6' LT	17+50	5.7-7.2	A-4(6)	39	6	3.6	26.7	51.6	18.1	94	92	76	-	-
S-13	6' LT	17+50	34.3-34.8	A-5(9)	44	9	3.0	23.9	50.7	22.3	100	99	81	-	-

**B1-B**

<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-12	6' RT	17+48	5.8-7.3	A-7-5(22)	54	19	1.8	12.4	57.6	28.1	100	99	91	-	-

**EB2-A**

<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	10' LT	18+00	3.5-4.0	A-4(0)	18	3	24.9	29.5	29.5	16.1	92	77	49	-	-
SS-2	10' LT	18+00	5.0-6.5	A-4(2)	22	4	0.6	18.7	56.6	24.1	100	100	89	-	-
SS-3	10' LT	18+00	7.5-9.0	A-4(4)	26	9	10.6	28.1	33.1	28.1	100	95	68	-	-
SS-4	10' LT	18+00	10.0-11.5	A-2-4(0)	19	NP	43.4	42.0	6.6	8.0	100	79	18	-	-
SS-5	10' LT	18+00	13.0-14.0	A-7-5(15)	54	13	2.4	9.4	50.0	38.2	90	89	83	-	-
SS-6	10' LT	18+00	23.5-25.0	A-4(6)	39	6	6.8	21.9	49.2	22.1	100	96	81	-	-

**EB2-B**

<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-7	19' RT	18+00	3.5-5.0	A-6(5)	30	11	9.4	29.1	35.3	26.1	100	96	68	-	-
SS-8	19' RT	18+00	8.5-10.0	A-2-4(0)	18	NP	15.7	62.0	14.3	8.0	100	95	29	-	-



**FIELD  
 SCOUR REPORT**

WBS: 33555.1.1 TIP: B-4209 COUNTY: Nash

DESCRIPTION(1): Bridge No. 17 on -L- (SR 1131) over Turkey Creek at Sta. 17+47.5

**EXISTING BRIDGE**

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

Bridge No.: 17 Length: 85' Total Bents: 6 Bents in Channel: 4 Bents in Floodplain: 2  
 Foundation Type: Timber Piles

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: End Bent 1 has abundant local scour at base of wingwall

Interior Bents: None visible

Channel Bed: None visible

Channel Bank: Contraction scour along both banks

**EXISTING SCOUR PROTECTION**

Type(3): Wing walls

Extent(4): 40'L x 12'H

Effectiveness(5): Effective

Obstructions(6): Several limbs are caught in cross braces on the interior bents

**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): Alluvial, light gray, v. loose to med. dense, silty sand and coarse sand (SS-8)

Channel Bank Material(8): Alluvial, gray and tan, medium stiff, sandy silt (SS-2)

Channel Bank Cover(9): Grass, trees and brush

Floodplain Width(10): +/- 300 feet

Floodplain Cover(11): Grass, trees and brush

Stream is(12): Aggrading  Degrading  Static

Channel Migration Tend.(13): West towards End Bent 1

Observations and Other Comments: Timber piles from the previous structure are visible

**DESIGN SCOUR ELEVATIONS(14)**

Feet  Meters

BENT 1 = 174.7

Comparison of DSE to Hydraulics Unit theoretical scour:  
 The Geotechnical Engineering Unit raised the Design scour elevation 13.2 feet from the Hydraulic Unit's theoretical scour elevation for the 100 year/overtopping event.

**SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL**

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

See Sheet 11,  
 "Soil Test Results",  
 for samples:  
 SS-8 (Bed)  
 SS-2 (Bank)

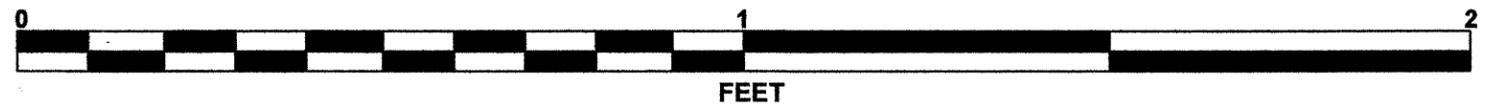
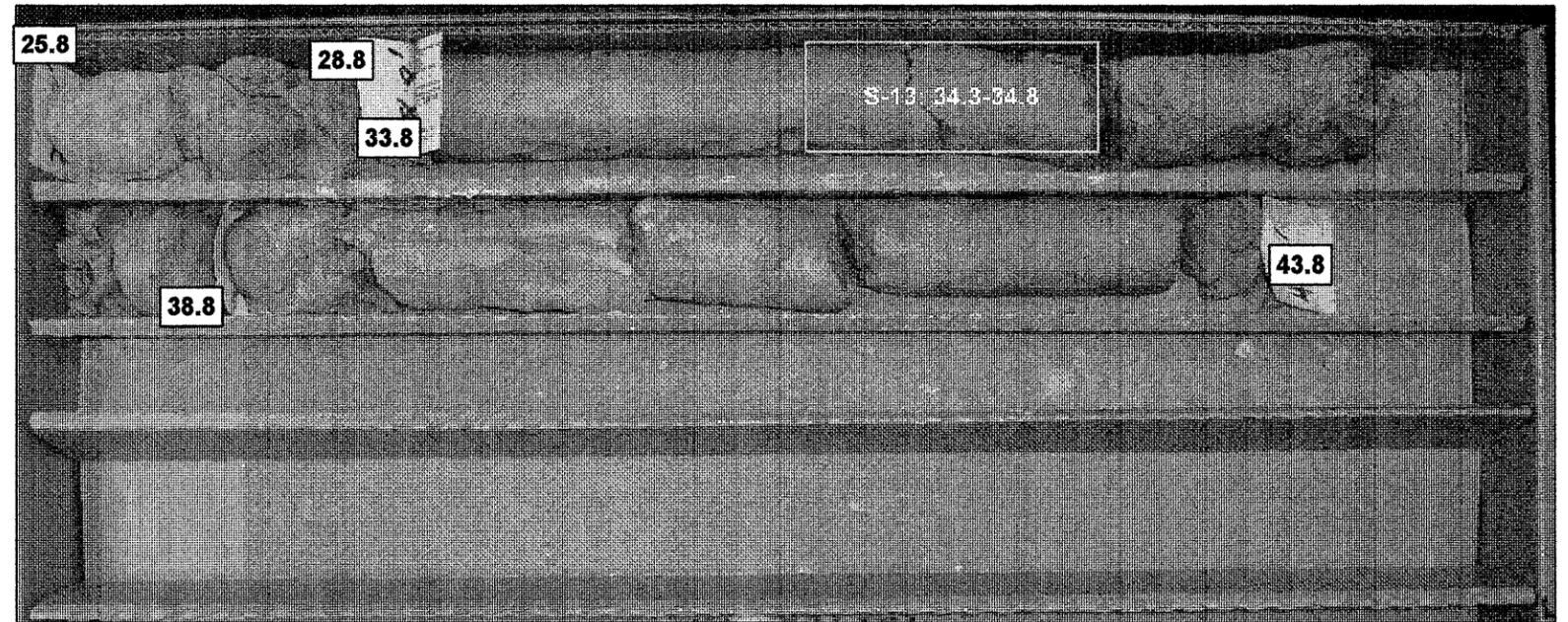
Reported by: Jaime Love Pedro  
 Jaime Love Pedro

Date: 6/19/2007

# CORE PHOTOGRAPHS

## B1-A

BOX 1: 25.8 - 43.8 FEET



# SITE PHOTOGRAPH

Bridge No. 17 on -L- (SR 1131) over Turkey Creek

