

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33496.1.1 (B-4147)	1	13

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

STRUCTURE
SUBSURFACE INVESTIGATION

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5	CROSS SECTIONS
7	BORE LOG & CORE REPORTS
11	SCOUR REPORT
13	CORE PHOTOGRAPHS

PROJ. REFERENCE NO. 33496.1.1 F.A. PROJ. B-4147
COUNTY HENDERSON
PROJECT DESCRIPTION BRIDGES No. 75 AND No. 76 ON SR-1123
OVER MUD CREEK AND GREER CREEK

SITE DESCRIPTION _____

CAUTION NOTICE

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

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

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

PROJECT: 33496.1.1 ID: B-4147

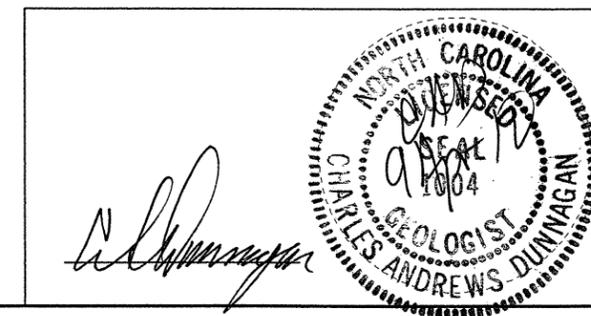
PERSONNEL
M M HAGER
G K ROSE
R D CHILDERS
D O CHEEK
T B DANIEL

INVESTIGATED BY C A DUNNAGAN
CHECKED BY W D FRYE, Jr
SUBMITTED BY W D FRYE, Jr
DATE APRIL 2010

DRAWN BY: C A DUNNAGAN

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.



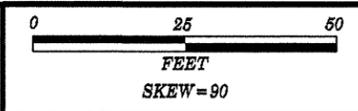
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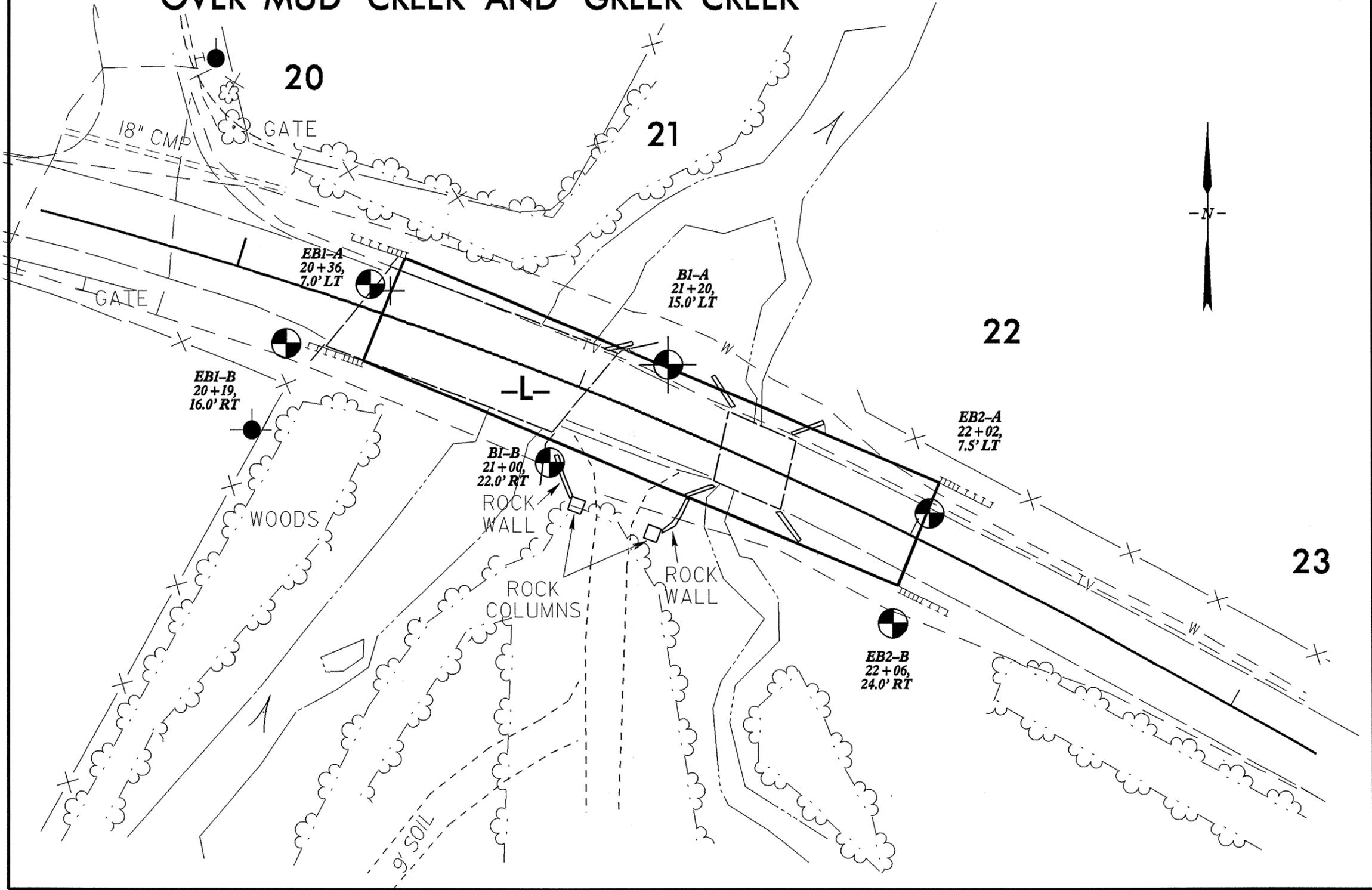
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																			
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 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 style="text-align: center;"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i></p>	<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>	<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>	<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (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.</p>																																																																																			
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="2">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="2">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="2">ORGANIC MATERIALS</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1</td> <td>A-3</td> <td>A-2</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> </tr> <tr> <td>LIQUID LIMIT</td> <td>6</td> <td>NP</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> </tr> <tr> <td>PLASTIC INDEX</td> <td>6</td> <td>NP</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> </tr> </table>	GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)		SILT-CLAY MATERIALS (> 35% PASSING #200)		ORGANIC MATERIALS		GROUP CLASS.	A-1	A-3	A-2	A-4	A-5	A-6	SYMBOL							% PASSING	10	10	10	10	10	10	LIQUID LIMIT	6	NP	40	40	40	40	PLASTIC INDEX	6	NP	10	10	10	10	GROUP INDEX	0	0	4	8	12	16	<p style="text-align: center;">MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p style="text-align: center;">COMPRESSIBILITY</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> </table>	ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY	<p style="text-align: center;">WEATHERING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>WEATHERED ROCK (WR)</th> <th>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</th> </tr> <tr> <th>CRYSTALLINE ROCK (CR)</th> <th>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</th> </tr> <tr> <th>NON-CRYSTALLINE ROCK (NCR)</th> <th>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.</th> </tr> <tr> <th>COASTAL PLAIN SEDIMENTARY ROCK (CP)</th> <th>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEGS, ETC.</th> </tr> </table>	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 BEGS, ETC.	<p style="text-align: center;">GROUND WATER</p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p>						
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<p style="text-align: center;">SOIL MOISTURE - CORRELATION OF TERMS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PL - PLASTIC LIMIT</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table>	SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION	LL - LIQUID LIMIT	- SATURATED - (SAT.)	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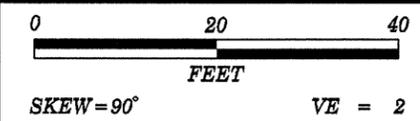
BRIDGES NO. 75 AND NO. 76 ON SR-1123 OVER MUD CREEK AND GREER CREEK



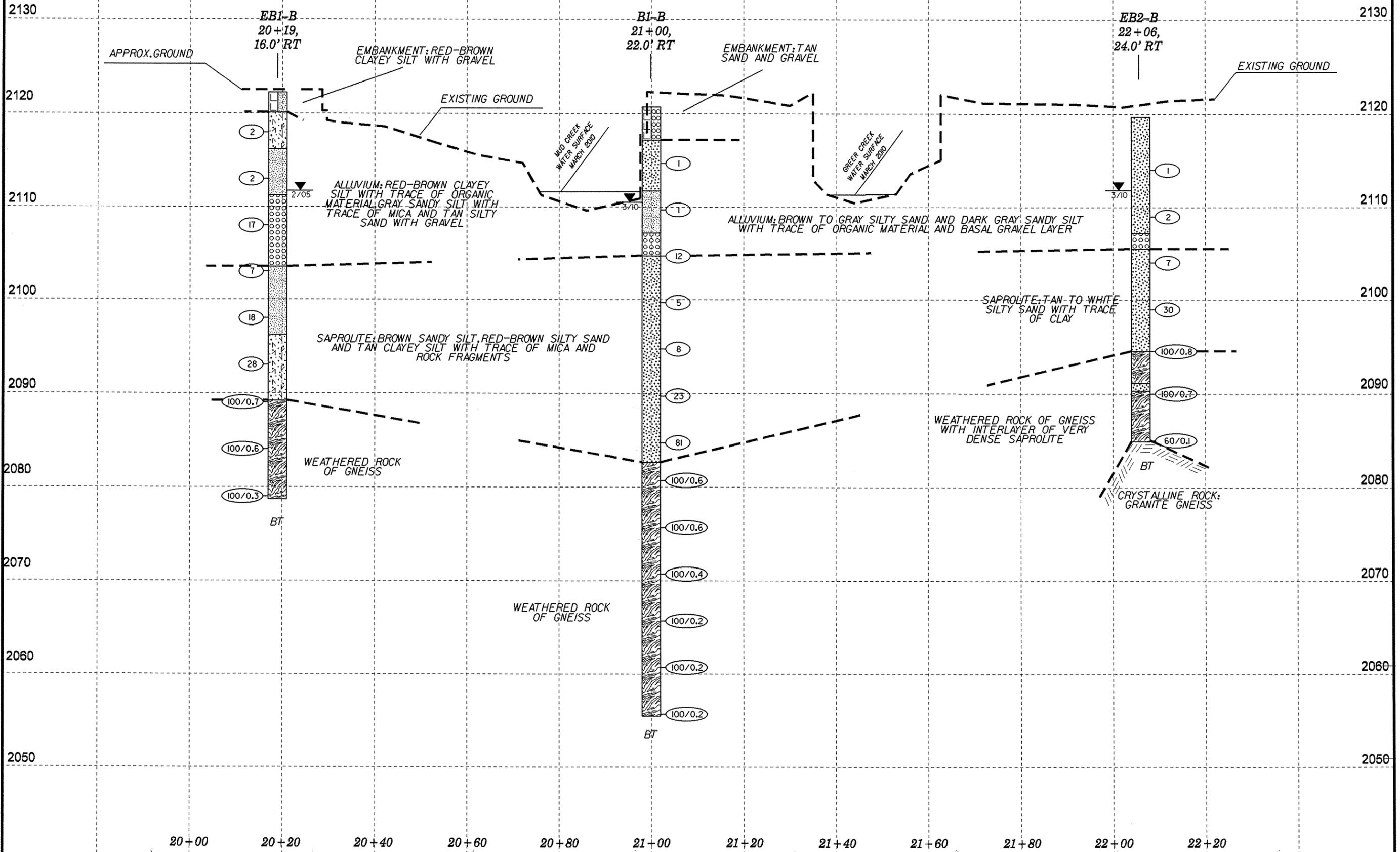
PROJECT REFERENCE NO.	SHEET
33496.1.1 (B-4147)	
PLAN VIEW	

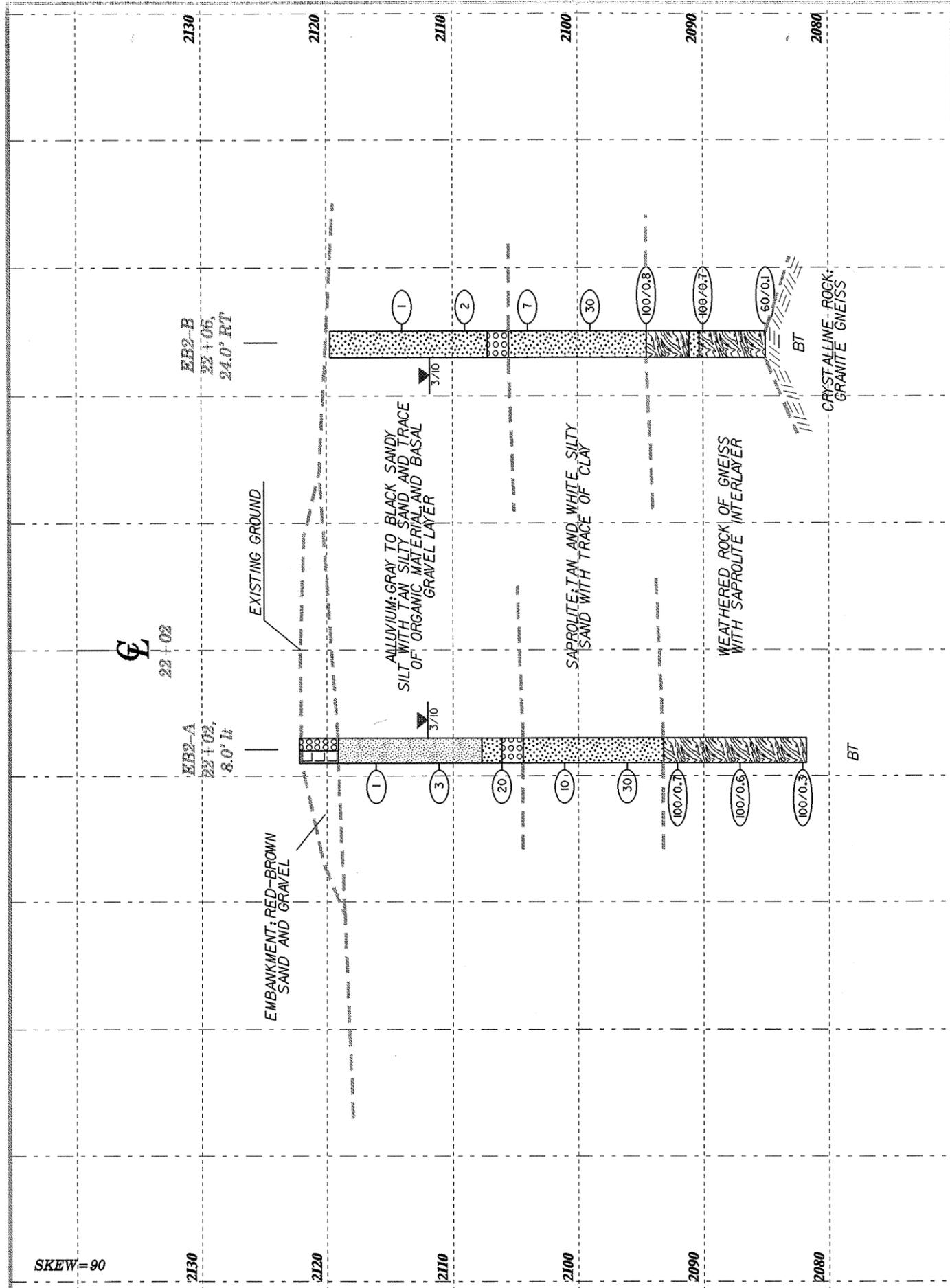


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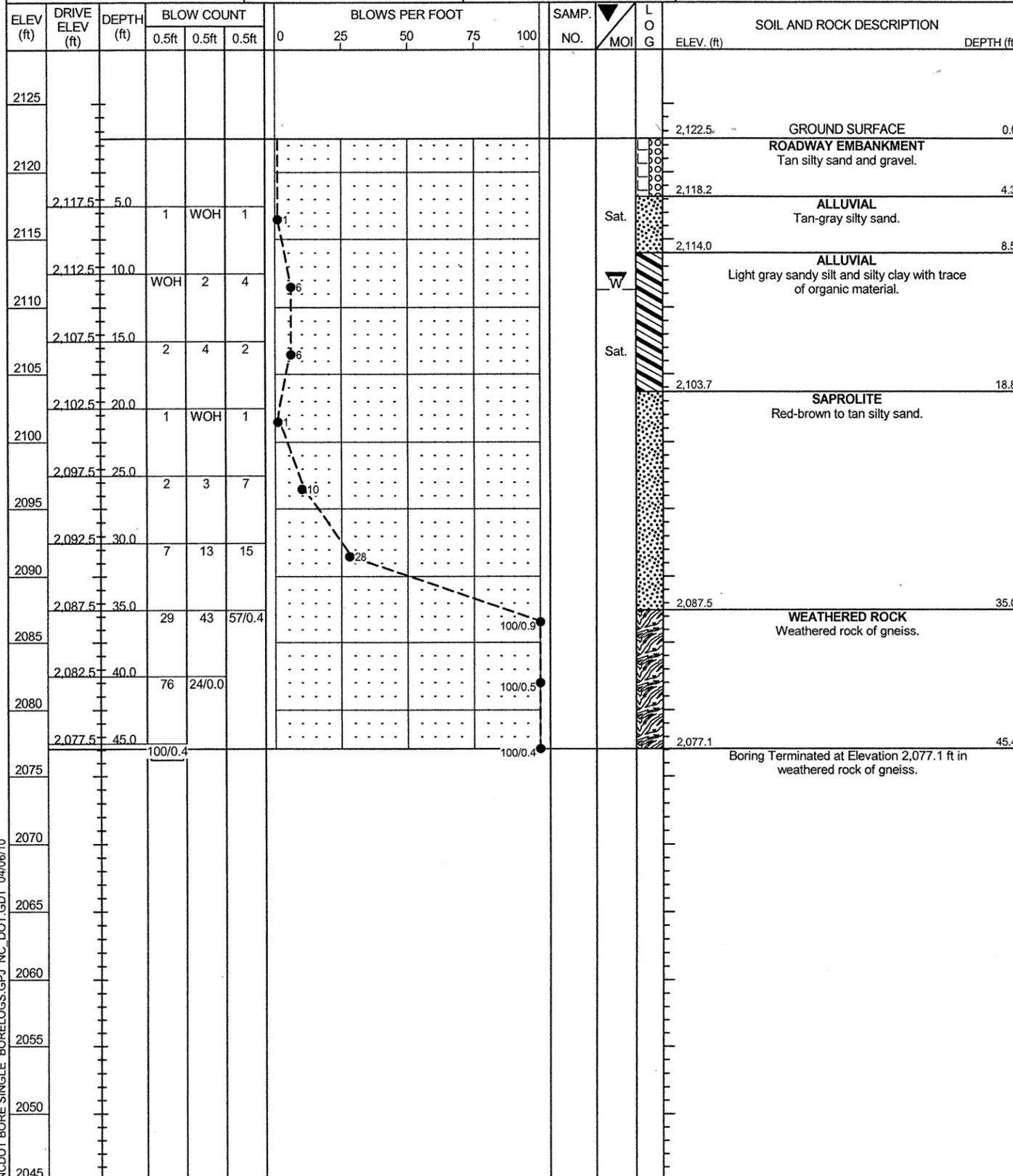


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33469.1.1 (B-4147)	4/13
PROFILE 16.0' RIGHT OF CENTERLINE	



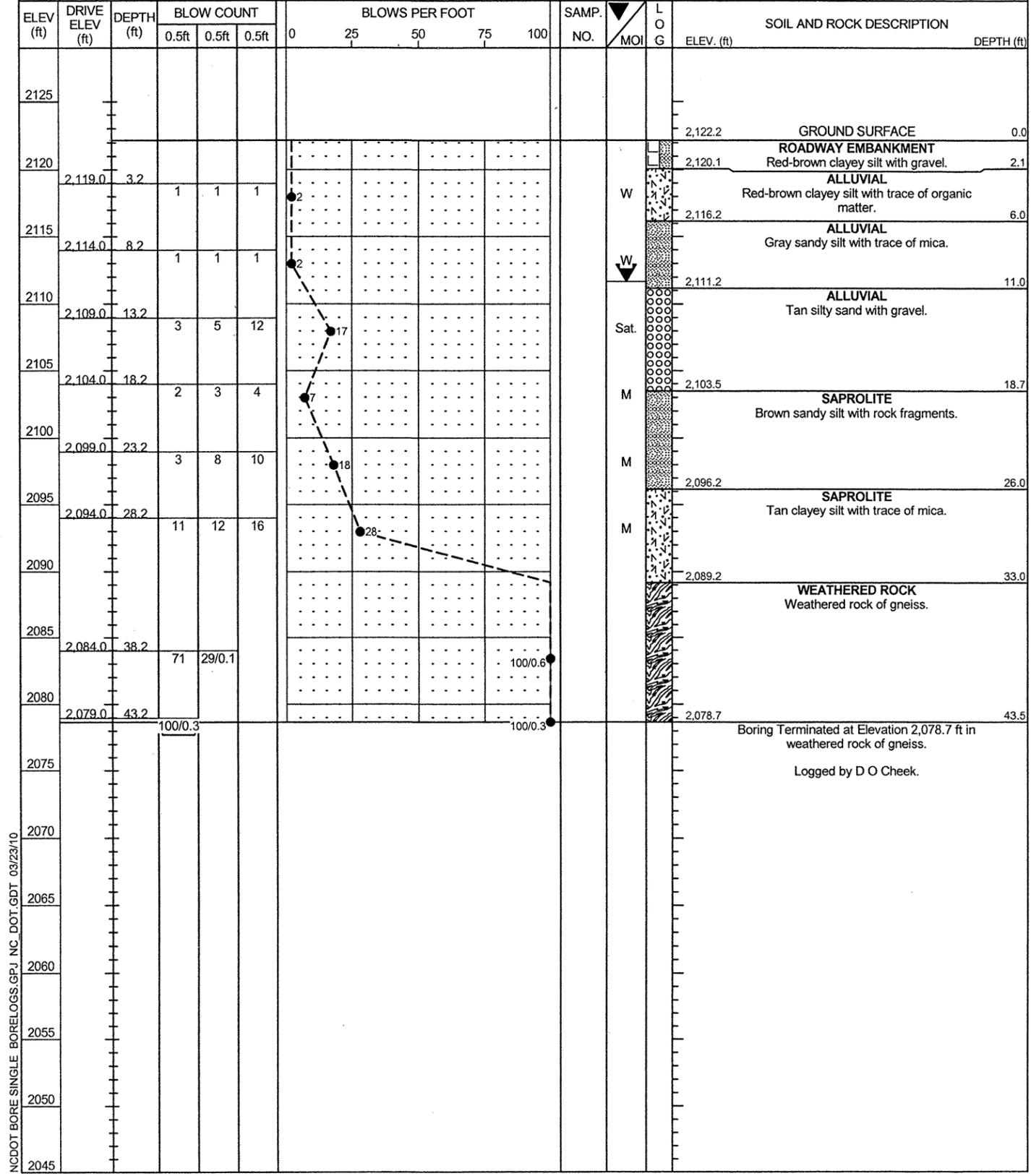


PROJECT NO. 33496.1.1	ID. B-4147	COUNTY Henderson	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 75 and No. 76 on SR-1123 over Mud Creek and Greer Creek.			GROUND WTR (ft)
BORING NO. EB1-A	STATION 20+36	OFFSET 7 ft LT	ALIGNMENT -L-
COLLAR ELEV. 2,122.5 ft	TOTAL DEPTH 45.4 ft	NORTHING 569,587	EASTING 959,560
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 03/29/10	COMP. DATE 03/29/10	SURFACE WATER DEPTH N/A



NCDOT BORE SINGLE BORELOGS.GPJ NC_DOT_GDT_04/06/10

PROJECT NO. 33496.1.1	ID. B-4147	COUNTY Henderson	GEOLOGIST N/A
SITE DESCRIPTION Bridge No. 75 and No. 76 on SR-1123 over Mud Creek and Greer Creek.			GROUND WTR (ft)
BORING NO. EB1-B	STATION 20+19	OFFSET 16 ft RT	ALIGNMENT -L-
COLLAR ELEV. 2,122.2 ft	TOTAL DEPTH 43.5 ft	NORTHING 569,571	EASTING 959,537
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 02/08/05	COMP. DATE 02/08/05	SURFACE WATER DEPTH N/A



NCDOT BORE SINGLE BORELOGS.GPJ NC_DOT_GDT_03/23/10

PROJECT NO. 33496.1.1	ID. B-4147	COUNTY Henderson	GEOLOGIST N/A
SITE DESCRIPTION Bridge No. 75 and No. 76 on SR-1123 over Mud Creek and Greer Creek.			GROUND WTR (ft)
BORING NO. B1-A	STATION 21+20	OFFSET 15 ft LT	ALIGNMENT -L-
COLLAR ELEV. 2,121.0 ft	TOTAL DEPTH 64.2 ft	NORTHING 569,565	EASTING 959,643
DRILL MACHINE CME-550	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 02/07/05	COMP. DATE 02/08/05	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE 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					
2125															
2120														2,121.0 GROUND SURFACE	0.0
														2,118.0 ROADWAY EMBANKMENT Tan sandy silt and gravel.	3.0
2115	2,116.0	5.0	1	1	1								M	2,113.5 ALLUVIAL Gray sandy silt with little amounts of organic material.	7.5
2110	2,111.0	10.0	WOH	WOH	1								M	2,107.1 ALLUVIAL Grey sandy clay with trace of mica.	13.9
2105	2,106.0	15.0	6	5	3								W	2,103.3 ALLUVIAL Grey silty sand with gravel and cobbles.	17.7
2100	2,101.0	20.0	2	2	4								W	SAPROLITE Orange-brown sandy silt.	
2095	2,096.0	25.0	2	6	8								M		
2090	2,091.0	30.0	15	18	32								M		
2085	2,086.0	35.0	25	75	25/0.15									2,087.5 WEATHERED ROCK Weathered rock of gneiss.	33.5
2080	2,081.0	40.0	60/0.05											2,081.0 CRYSTALLINE ROCK	40.0
2075															
2070															
2065														2,062.6 CRYSTALLINE ROCK	58.4
2060															
2055														2,056.8 Boring Terminated at Elevation 2,056.8 ft in granite gneiss. Logged by D O Cheek.	64.2
2050															
2045															

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ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	ROD (%)		REC. (%)	ROD (%)			
2080.13											Begin Coring @ 40.9 ft	
	2,080.1	40.9	3.3		(2.8)	(0.4)					CRYSTALLINE ROCK Brown granite gneiss. Very severely to severely weathered. Soft with occasional quartz seams. a) Parts along foliation @ 10° b) Joints @ 75°. (continued)	
2075	2,076.8	44.2	5.0		(0.6)	(0.0)						
	2,071.8	49.2	5.0		(2.3)	(0.0)						
2070												
	2,066.8	54.2	5.0		(4.1)	(1.8)						
2065												
	2,061.8	59.2	5.0		(5.0)	(1.7)						
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2010												
2005												

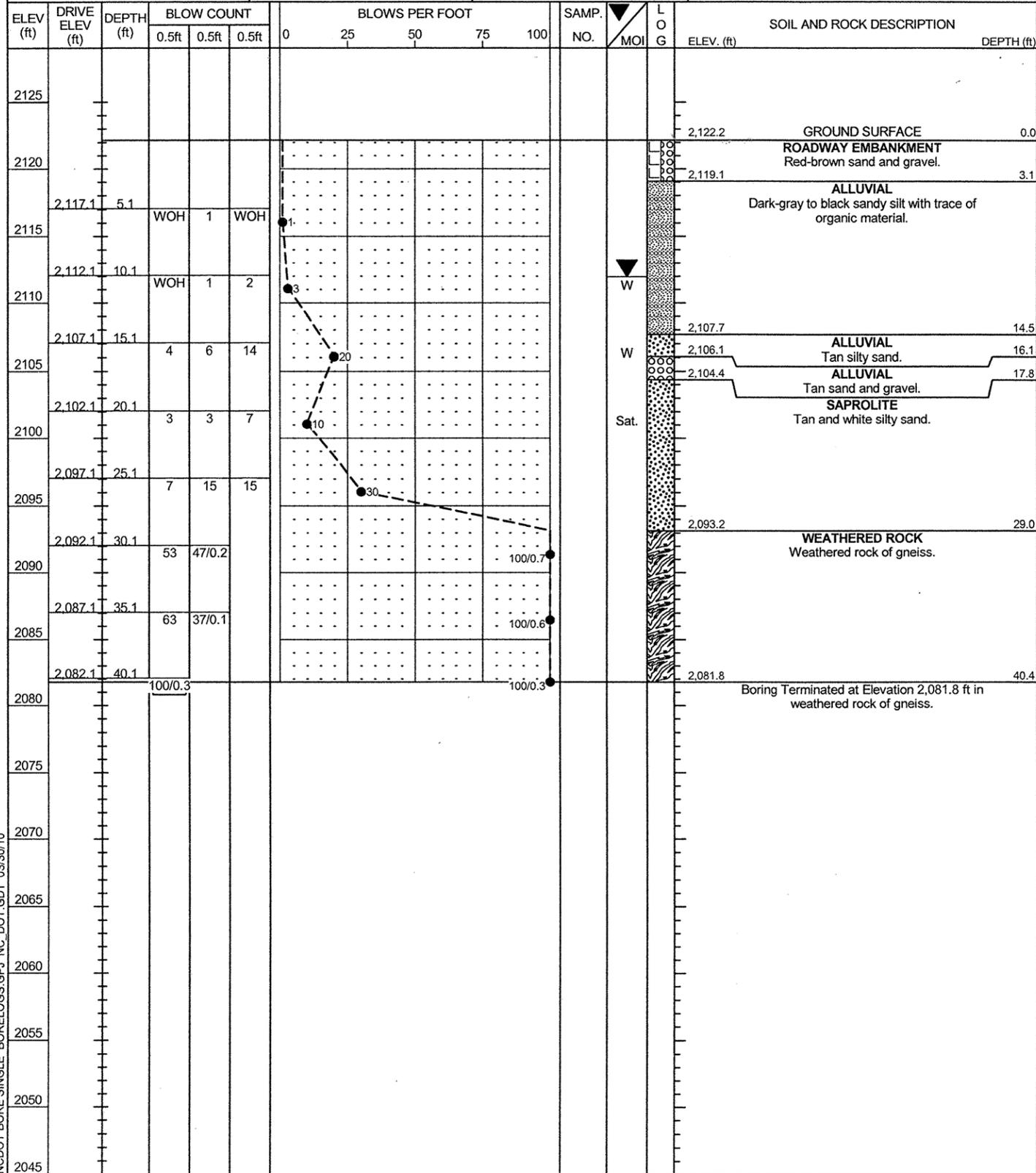


NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

PROJECT NO. 33496.1.1		ID. B-4147		COUNTY Henderson		GEOLOGIST Hager, M. M.										
SITE DESCRIPTION Bridge No. 75 and No. 76 on SR-1123 over Mud Creek and Greer Creek.							GROUND WTR (ft)									
BORING NO. B1-B		STATION 21+00		OFFSET 22 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 2,120.7 ft		TOTAL DEPTH 65.2 ft		NORTHING 569,539		EASTING 959,610										
DRILL MACHINE CME-550		DRILL METHOD NW Casing w/ SPT				HAMMER TYPE Automatic										
DRILLER Rose, G. K.		START DATE 03/24/10		COMP. DATE 03/25/10		SURFACE WATER DEPTH N/A										
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						
2125																
2120														2,120.7	GROUND SURFACE	0.0
														2,117.2	ARTIFICIAL FILL Tan sandy gravel.	3.5
2115	2,115.7	5.0	1	1	WOH								W	2,111.7	ALLUVIAL Brown to gray silty sand with trace of organic material.	9.0
2110	2,110.7	10.0			WOH								W	2,107.2	ALLUVIAL Dark gray sandy silt.	13.5
2105	2,105.7	15.0	7	9	3								Sat.	2,104.7	ALLUVIAL Brown sand and gravel.	16.0
2100	2,100.7	20.0	1	2	3								W		SAPROLITE Light gray to red-brown silty sand.	
2095	2,095.7	25.0	1	3	5								W			
2090	2,090.7	30.0	7	9	14								W			
2085	2,085.7	35.0	18	36	45								W			
2080	2,080.7	40.0	73	27/0.1									W	2,082.6	WEATHERED ROCK Weathered rock of gneiss.	38.1
2075	2,075.7	45.0	85	15/0.1									W			
2070	2,070.7	50.0											W			
2065	2,065.7	55.0											W			
2060	2,060.7	60.0											W			
2055	2,055.7	65.0											W	2,055.5	Boring Terminated at Elevation 2,055.5 ft in weathered rock of gneiss.	65.2
2050																
2045																

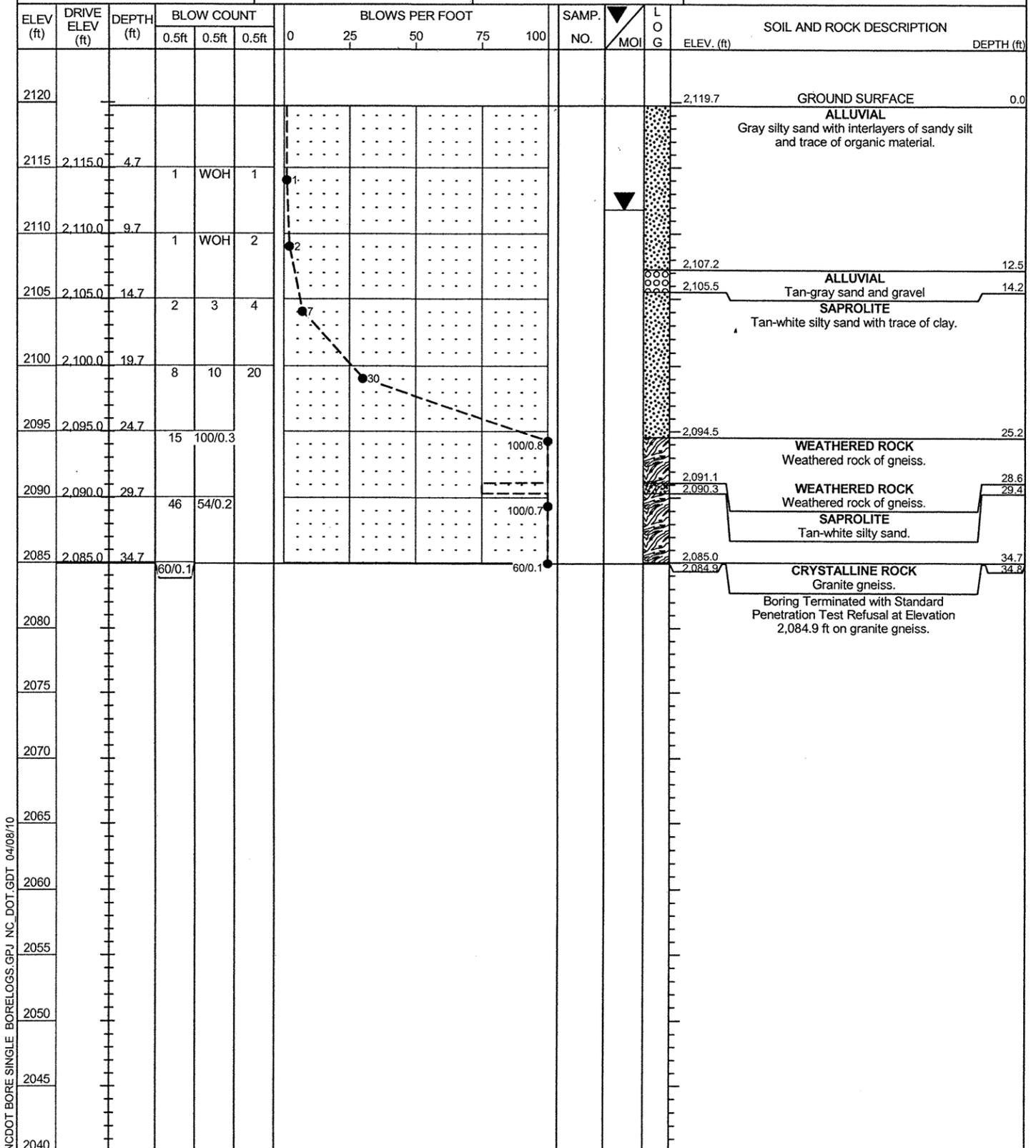
NCDOT BORE SINGLE BORELOGS.GPJ NC_DOT_GDT 03/30/10

PROJECT NO. 33496.1.1	ID. B-4147	COUNTY Henderson	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 75 and No. 76 on SR-1123 over Mud Creek and Greer Creek.			GROUND WTR (ft)
BORING NO. EB2-A	STATION 22+02	OFFSET 8 ft LT	ALIGNMENT -L-
COLLAR ELEV. 2,122.2 ft	TOTAL DEPTH 40.4 ft	NORTHING 569,525	EASTING 959,715
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 03/29/10	COMP. DATE 03/29/10	SURFACE WATER DEPTH N/A



NCDOT BORE SINGLE BORELOGS.GPJ NC_DOT.GDT 03/30/10

PROJECT NO. 33496.1.1	ID. B-4147	COUNTY Henderson	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 75 and No. 76 on SR-1123 over Mud Creek and Greer Creek.			GROUND WTR (ft)
BORING NO. EB2-B	STATION 22+06	OFFSET 24 ft RT	ALIGNMENT -L-
COLLAR ELEV. 2,119.7 ft	TOTAL DEPTH 34.8 ft	NORTHING 569,495	EASTING 959,704
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 03/23/10	COMP. DATE 03/23/10	SURFACE WATER DEPTH N/A



NCDOT BORE SINGLE BORELOGS.GPJ NC_DOT.GDT 04/08/10



FIELD SCOUR REPORT

WBS: 33496.1.1 TIP: B-4147 COUNTY: Henderson

DESCRIPTION(1): Bridge No.75 on Sr-1123 over Mud Creek

EXISTING BRIDGE

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

Bridge No.: 75 Length: 68.5 Total Bents: 4 Bents in Channel: 1 Bents in Floodplain: 3
 Foundation Type: Piles(?)

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: Minor amount at EB2.

Interior Bents: None noted.

Channel Bed: None noted.

Channel Bank: Some undercutting of trees upstream of bridge.

EXISTING SCOUR PROTECTION

Type(3): Endbent walls and wingwalls.

Extent(4): Wingwalls extend 6.0 feet beyond endbent walls.

Effectiveness(5): Good.

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): Silty sand and gravel.

Channel Bank Material(8): Silty sand.

Channel Bank Cover(9): Trees and grass.

Floodplain Width(10): >100 feet.

Floodplain Cover(11): Grass.

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): East.

Observations and Other Comments: _____

Reported by: C A Dunnagan Date: 3/12/2010

DESIGN SCOUR ELEVATIONS(14)

Feet _____ Meters _____

BENTS

B1										
2104										

Comparison of DSE to Hydraulics Unit theoretical scour:
 The end-bents will not be affected. For the interior bent, we concur with the Bridge Survey and Hydraulic Design Report dated December 7, 2009.

DSE determined by: C A Dunnagan Date: 4/8/2010

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										



FIELD SCOUR REPORT

WBS: 33496.1.1 TIP: B-4147 COUNTY: Henderson

DESCRIPTION(1): Bridge No. 76 on SR-1123 over Greer Creek.

EXISTING BRIDGE

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

Bridge No.: 76 Length: 20 Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 2
 Foundation Type: Piles(?)

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: Minor amount at EB1.

Interior Bents: None noted.

Channel Bed: None noted.

Channel Bank: Immediately upstream of EB@ is a 10ft diameter scour feature.

EXISTING SCOUR PROTECTION

Type(3): Endbent walls and wingwalls.

Extent(4): Wingwalls extend 10 feet beyond endbent walls.

Effectiveness(5): Fair.

Obstructions(6): A small tree is snagged upstream of 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): Silty sand and gravel.

Channel Bank Material(8): Silty sand.

Channel Bank Cover(9): Trees and grass.

Floodplain Width(10): > 100 feet.

Floodplain Cover(11): Grass.

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): West.

Observations and Other Comments: Erosional features at EB1-B pavement subsidence and cracking, and soil washed out from behind the wingwall.

Reported by: C A Dunnagan Date: 3/12/2010

DESIGN SCOUR ELEVATIONS(14)

Feet _____ Meters _____

BENTS

	B1	B2	B3	B4						
SB Lanes, Lt										
SB Lanes, Rt										
NB Lanes, Lt										
NB Lanes, Rt										

Comparison of DSE to Hydraulics Unit theoretical scour:
See Scour Report for Bridge No. 75.

DSE determined by: _____ Date: _____

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										

CORE PHOTOS
UNAVAILABLE

33496.1.1 (B-4147)
Henderson County
Bridges No. 75 and No. 76
On SR-1123 over Mud
Creek and Greer Creek