

CONTRACT: 33241.1.1 ID: B-3701

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33241.1.1 (B-3701)	1	13
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33241.1.1	BRZ-1309 (2)	P.E. CONST.	

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS 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.

STATE PROJECT 33241.1.1 I.D. NO. B-3701

F.A. PROJECT BRZ-1309 (2)

COUNTY SWAIN

PROJECT DESCRIPTION BRIDGE NO. 106
ON SR-1309 OVER ALARKA CREEK

SITE DESCRIPTION _____

INVESTIGATED BY J.W. MANN PERSONNEL M.M. HAGER

CHECKED BY W.D. FRYE D.O. CHEEK

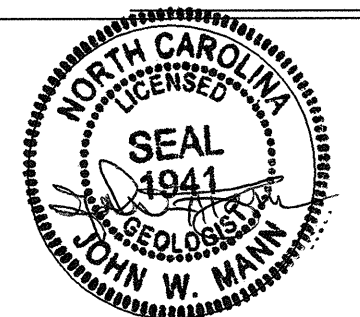
SUBMITTED BY W.D. FRYE L.A. LANKFORD

DATE 052605 R.D. CHILDERS

DRAWN BY: J.W. MANN

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 UNIT

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B-3701	33241.1.1	2	13

SUBSURFACE INVESTIGATION

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 WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND 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, HEAVY 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)</p> <p>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 ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>		<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>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.</p> <p>ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.</p> <p>CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE STRATA.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>ROCK QUALITY DESIGNATION (R.Q.D.) - 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>SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) 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 LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p>TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																
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<p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>						<p>BENCH MARK: BM #3 -L- STA. 17+02 ~132' RT.: 8" NAIL IN BASE OF 10" SYCAMORE TREE ELEVATION: 1795.02'</p>																																																																



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

June 2, 2005

STATE PROJECT: 33241.1.1 (B-3701)
F. A. PROJECT: BRZ-1309(2)
COUNTY: Swain

DESCRIPTION: Bridge No. 106 on SR-1303 over Alarka Creek

SUBJECT: Geotechnical Report – Foundation Investigation

Site Description

This project is located in central Swain County approximately six miles southwest of Bryson City between SR-1303 and SR-1308. Existing Bridge No. 106 is to be replaced with a 100 foot single-span structure constructed on a 140 degree skew. The proposed bridge is to be located approximately 80 feet upstream from the present crossing.

The subsurface investigation was completed with the use of a CME-45C track drill equipped with NXWL rock coring apparatus and automatic hammer for Standard Penetration Testing. Both soil and rock core specimens were collected and analyzed.

Physiography and Geology

The project area is located in a rural area of the Blue Ridge Belt of the Mountain Physiographic Province. The topography of the area is steep with local relief approaching 200 feet. Alarka Creek is incised in its bed and has developed a minimal floodplain. Normal water flow at the site is approximately one foot in depth.

The area is situated in a thrust fault window which lies unconformably upon younger rock units. Locally, retrieved core specimens revealed the rock to be of granitic gneiss composition with varying degrees of mylonitization. This rock has a phyllitic texture due to its proximity to the thrust fault.

Foundation Materials

Colluvium, embankment, alluvium, and hard rock comprise the foundation materials encountered in the test borings conducted at the site. The colluvium is confined to End Bent One. Embankment has only been placed at End Bent Two. Alluvial deposits over hard rock are present at both bent locations.

End Bent One

Colluvial boulders and gravel 4.5 feet thick has migrated upon alluvial beds at this bent. The alluvium consists of medium dense to very dense brown-gray sand and gravel, lying between 4.5 to 9.3 feet beneath the ground surface. The alluvium has been deposited upon hard rock at approximate elevation 1771 feet. Recovered rock is slightly weathered to fresh, hard, with close to moderately close fracture spacing. Average recovery values are 94 percent. RQD values yielded an average of 78 percent.

End Bent Two

Eight feet of embankment consisting of loose to medium dense silty sand and gravel has been placed upon alluvial soils at this locale. The alluvial soils are very loose to loose sand, gravel, and cobbles with boulders occurring sporadically along the proposed bent. The alluvial horizon was found between seven and seventeen feet beneath the existing ground surface. Hard rock was encountered beneath the alluvium at elevation 1775±. Core specimens revealed fresh, hard, granitic gneiss with wide fracture spacing. Both recoveries and rock quality designation values averaged 99 percent.

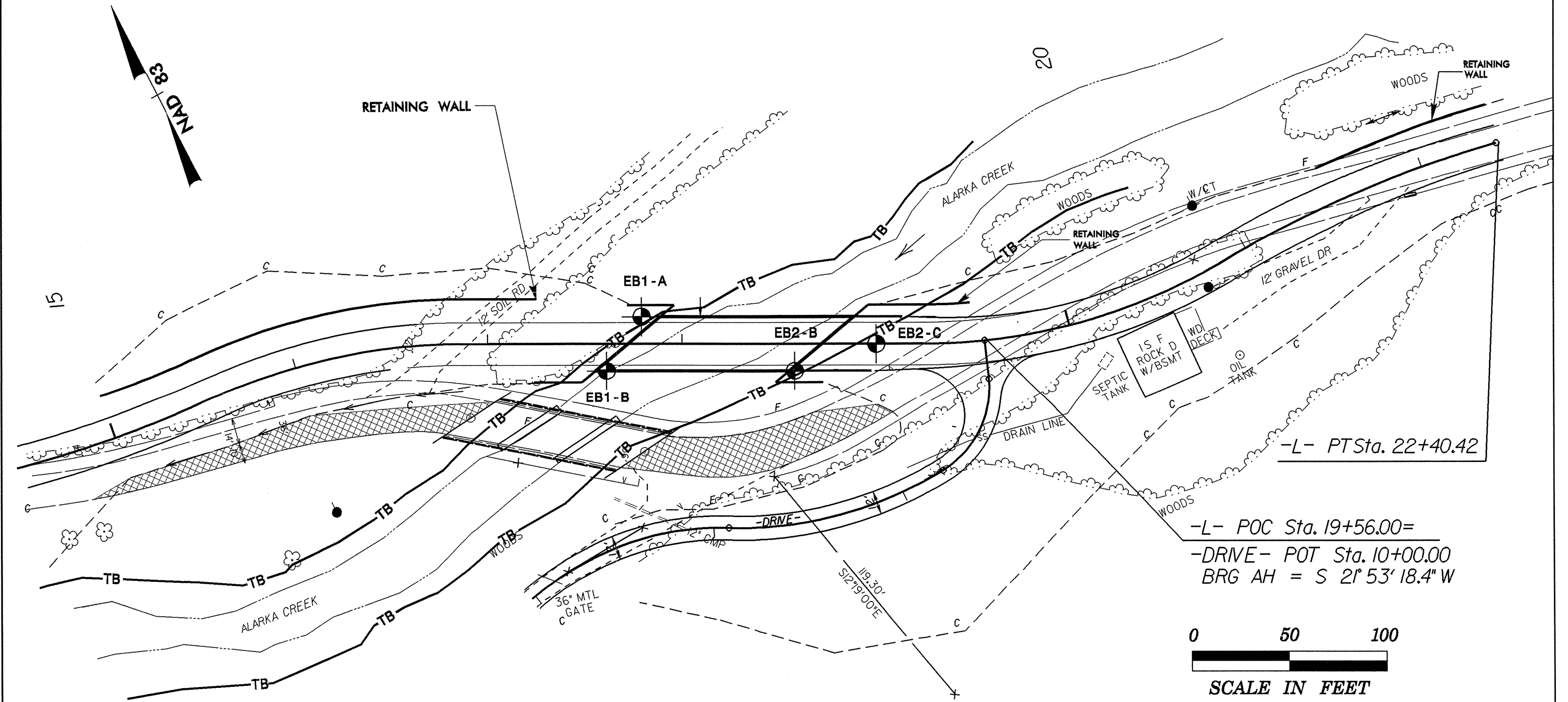
Groundwater

Groundwater was measured in borings EB1-A and EB2-B in the alluvial horizons. The top of the water surface was found between elevations 1776± and 1778 feet.

Respectfully Submitted,

John W. Mann, LG
Project Engineering Geologist

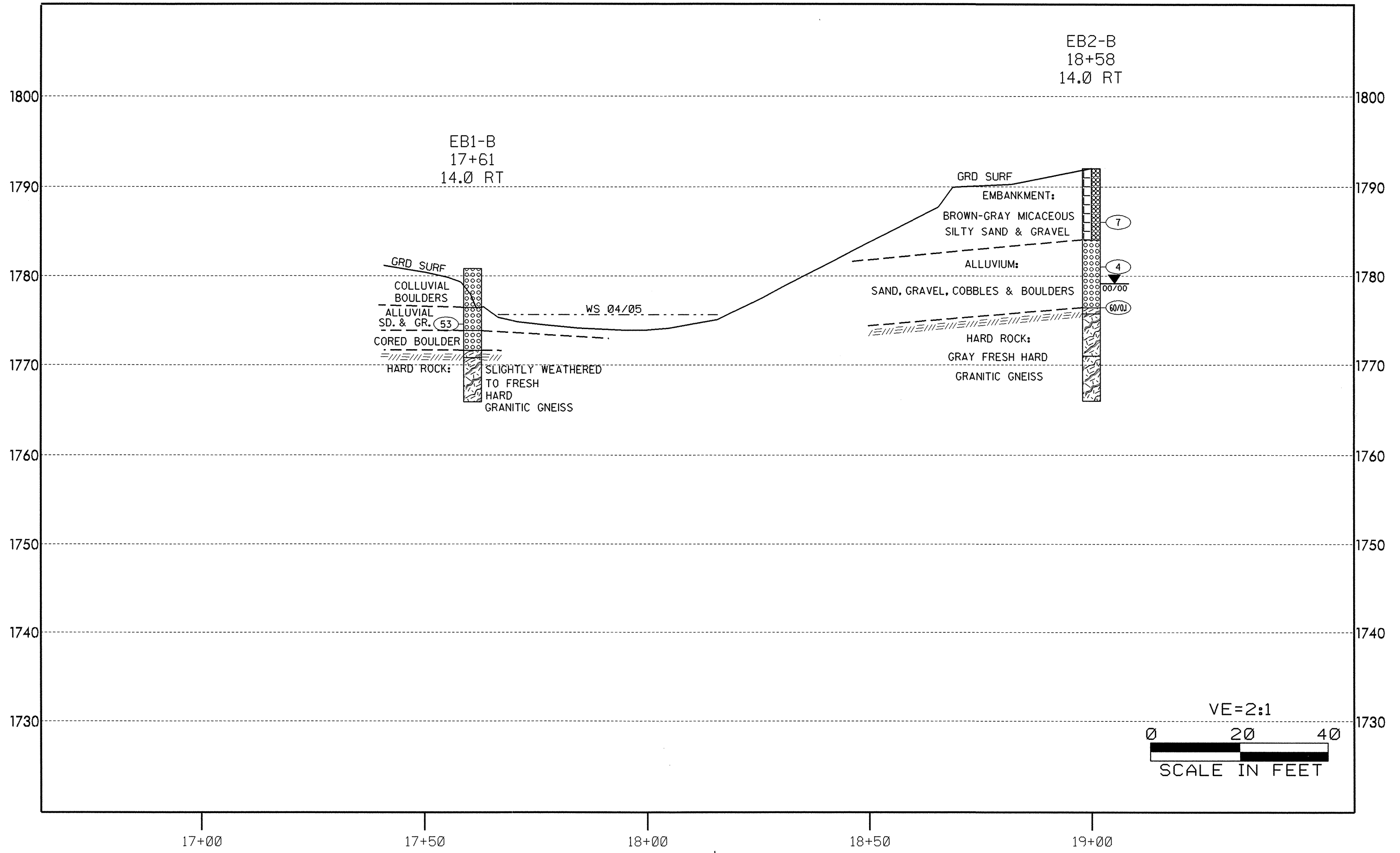
BRIDGE NO. 106 SITE PLAN



0 50 100

SCALE IN FEET

PROFILE 14' RIGHT OF -L-



EB1-B
17+61
14.0 RT

EB2-B
18+58
14.0 RT

GRD SURF

EMBANKMENT:
BROWN-GRAY MICACEOUS
SILTY SAND & GRAVEL

ALLUVIUM:

SAND, GRAVEL, COBBLES & BOULDERS

HARD ROCK:
GRAY FRESH HARD
GRANITIC GNEISS

GRD SURF

COLLUVIAL
BOULDERS
ALLUVIAL
SD. & GR. 53
CORED BOULDER

HARD ROCK:
SLIGHTLY WEATHERED
TO FRESH
HARD
GRANITIC GNEISS

WS 04/05

7

4

00/00

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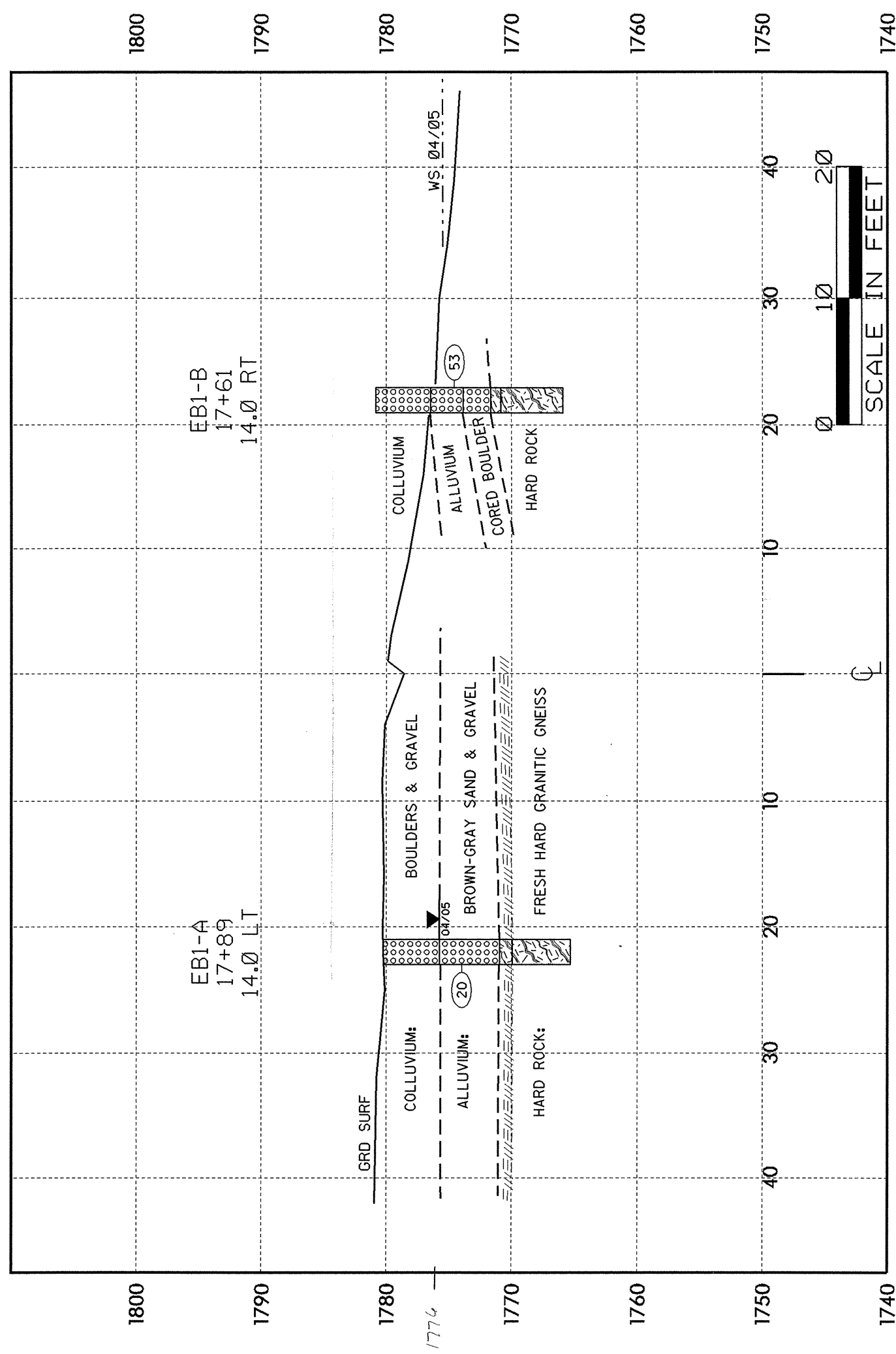
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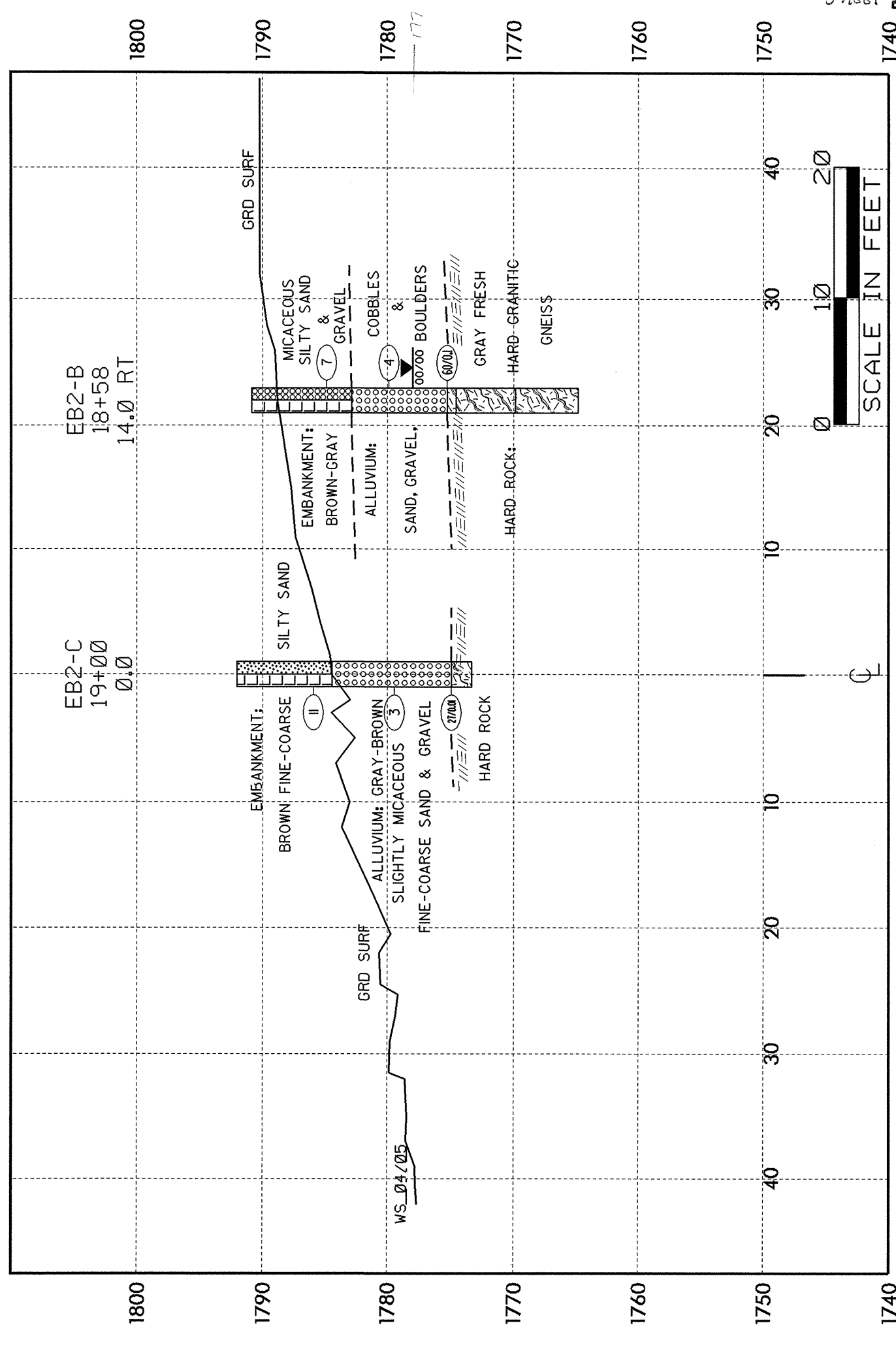
SCALE IN FEET

-L-

CROSS SECTION THRU END BENT ONE



CROSS SECTION THRU END BENT TWO



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33241.1.1		ID B-3701		COUNTY SWAIN		GEOLOGIST M.M. HAGAR							
SITE DESCRIPTION BRIDGE NO. 106 ON SR-1309 OVER ALARKA CREEK							GND WATER						
BORING NO EB1-B		NORTHING 0.00		EASTING 0.00		0 HR N/A	24 HR N/A						
ALIGNMENT -L-		BORING LOCATION 17+61.000		OFFSET 14.00ft RT		0 HR N/A	24 HR N/A						
COLLAR ELEV 1780.83ft		TOTAL DEPTH 14.90ft		START DATE 4/20/05		COMPLETION DATE 04/20/05							
DRILL MACHINE CME-45 TRACK			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH			DEPTH TO ROCK 9.20ft			Log EB1-B, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION	
		6in	6in	6in		0	25	50	75				100
1780.83													
	5.30	6	8	45	1.0								
1770.00													
1765.93													

CORE BORING REPORT

PROJECT: 33241.1.1 I. D. NO: B-3701 BORING NO: EB1-B GEOLOGIST: J.W. MANN

DESCRIPTION: BRIDGE NO. 106 ON SR-1309 OVER ALARKA CREEK

COUNTY: SWAIN COLLAR ELEVATION: 1780.8 FT. TOTAL DEPTH: 14.9 FT.

ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
1773.8	7.0		3.0	100	63		7.0-9.2': CORED ALLUVIAL BOULDER 9.2-10.0': HARD ROCK: SLIGHTLY WEATHERED HARD GRANITIC GNEISS.
1770.8	10.0						
1770.8	10.0		4.9	4.8	3.6		DARK GRAY, FRESH, HARD GRANITIC GNEISS WITH MYLONITIZATION. CLOSE TO MODERATELY CLOSE FRACTURING ALONG FOLIATION AT 40-50°.
1765.9	14.9			97	72		

COLLUVIAL BOULDERS

ALLUVIUM: GRAY SILTY FINE-COARSE SAND & GRAVEL

CORED ALLUVIAL BOULDER

HARD ROCK RUN=0.8 HARD ROCK REC=100% HARD ROCK REC=63%

RUN=10.0-14.9 REC=97% RQD=72%

BORING TERMINATED AT ELEV. 1765.93 IN HARD ROCK

CORING TERMINATED AT ELEVATION 1765.9 FT.

DRILLER: D.O. CHEEK CORE SIZE: NXWL EQUIPMENT: CME-45 TRACK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33241.1.1		ID B-3701		COUNTY SWAIN		GEOLOGIST M.M. HAGAR							
SITE DESCRIPTION BRIDGE NO. 106 ON SR-1309 OVER ALARKA CREEK							GND WATER						
BORING NO EB2-C		NORTHING 0.00		EASTING 0.00		0 HR N/A							
ALIGNMENT -L-		BORING LOCATION 19+00.000		OFFSET 0.00ft		24 HR N/A							
COLLAR ELEV 1792.03ft		TOTAL DEPTH 18.70ft		START DATE 4/18/08		COMPLETION DATE 04/19/85							
DRILL MACHINE CME-45 TRACK			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH			DEPTH TO ROCK 17.10ft			Log EB2-C, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
		6in	6in	6in		0	25	50	75				
1792.03													
1790.00	5.10	2	8	3	1.0								EMBANKMENT: BROWN FINE-COARSE SILTY SAND WITH OCCASIONAL BOULDERS
1780.00	11.60	1	1	2	1.0								ALLUVIUM: GRAY-BROWN SLIGHTLY MICACEOUS FINE-COARSE SAND & GRAVEL
1773.33	16.60	73	27	0.5					100				HARD ROCK (SPT REFUSAL)
						BORING TERMINATED AT ELEV. 1773.33' IN HARD ROCK							

JLJ
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	B-3701
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REPORT ON SAMPLES OF:	Soils for Classification
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PROJECT:	33241.1.1	COUNTY:	Swain	Owner:	--
DATE SAMPLED:	4-5-05	DATE RECEIVED:	4-26-05	DATE REPORTED:	4-29-05
SAMPLED FROM:	Bridge	SAMPLED BY:	J. W. Mann		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-1	SS-2	SS-3				
Lab Sample No. A	148848	148849	148850				
HiCAMS Sample #	--	--	--				
Retained #4 Sieve %	--	--	--				
Passing #10 Sieve %	42	94	43				
Passing #40 Sieve %	30	74	33				
Passing #200 Sieve %	15	25	18				

MINUS #10 FRACTION

Soil Mortar - 100%							
Coarse Sand -Ret. #60	41	41	35				
Fine Sand - Ret. #270	30	38	32				
Silt 0.05-0.005 mm %	21	17	23				
Clay < 0.005 mm %	.8	4	10				
Passing # 40 Sieve %	--	--	--				
Passing # 200 Sieve %	--	--	--				

Liquid Limit	35	36	34				
Plastic Index	NP	NP	NP				
AASHTO Classification	A-1-a (0)	A-2-4 (0)	A-1-b (0)				
Quantity							
Texture							
Station	18+58	19+00	19+00				
Hole No.							
Depth (ft) From:	5.0	5.1	11.6				
To:	6.5	6.6	13.1				

Remarks:

A-148848 - 148850

CC:

J. W. Mann	
File	

SOILS ENGINEER:	
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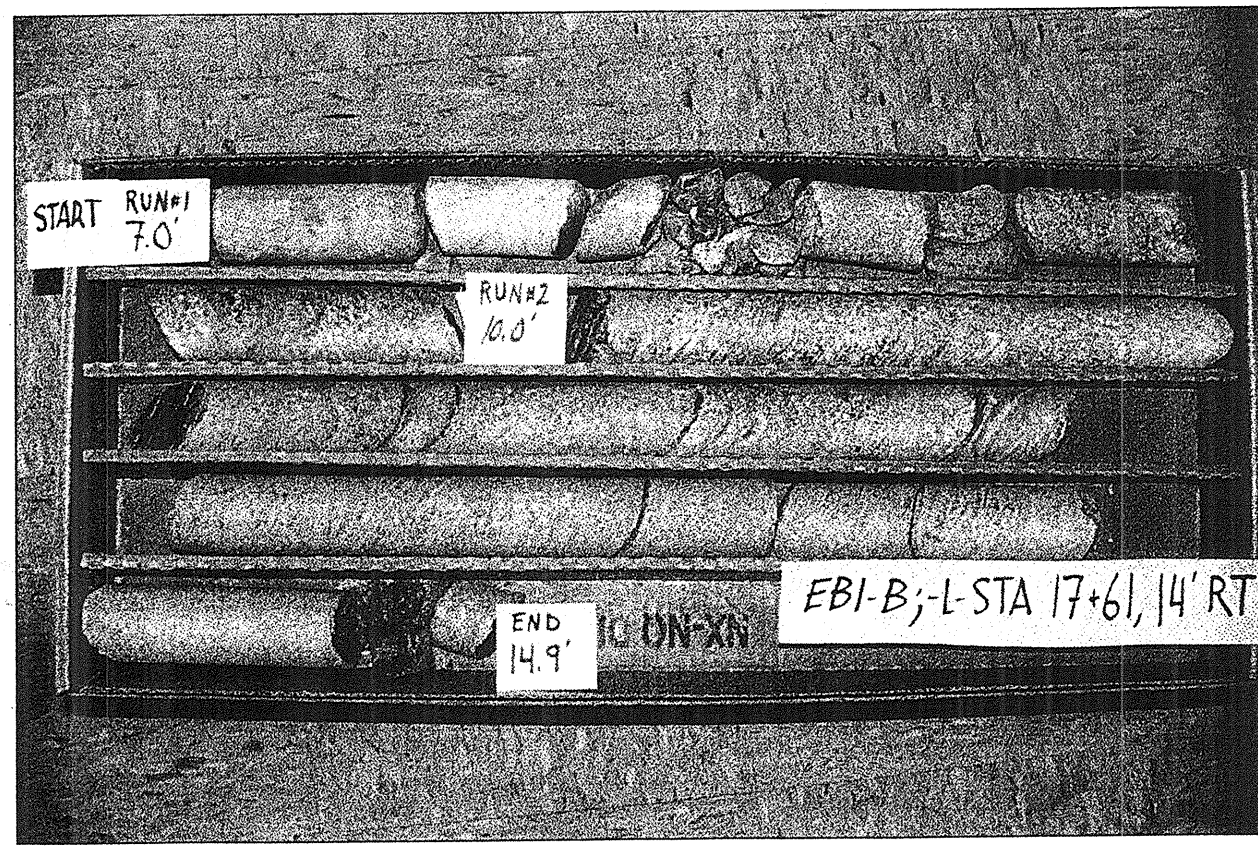
33241.1.1 (B-3701) Swain County Bridge No. 106 on SR-1309 over Alarka Creek.

33241.1.1 (B-3701) Swain County Bridge No. 106 on SR-1309 over Alarka Creek.

EB1-A -L- STA 17+89, 14' LT



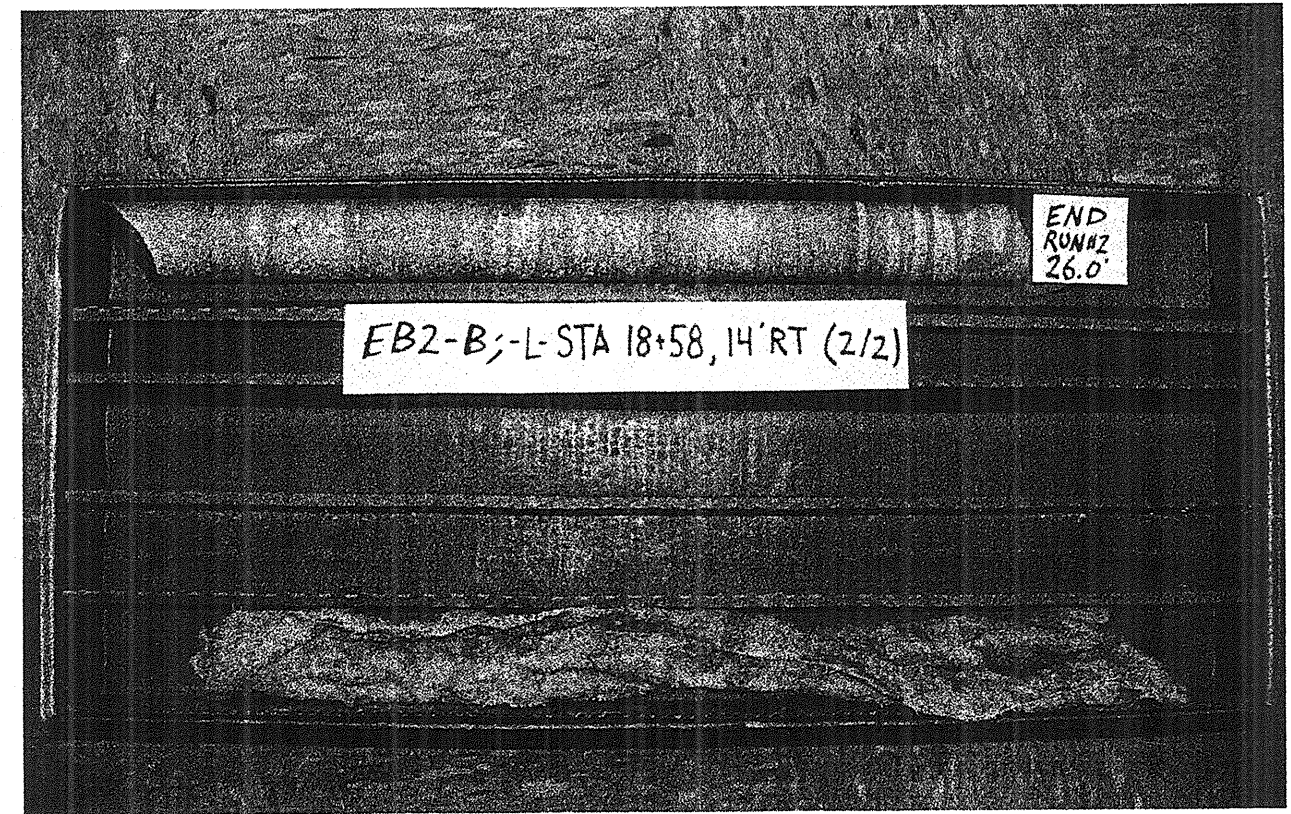
EB1-B -L- STA 17+61, 14' RT



EB2-B -L- STA 18+58, 14' RT (1/2)



EB2-B -L- STA 18+58, 14' RT (2/2)



GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 33241.1.1 ID: B-3701 COUNTY: SWAIN

DESCRIPTION(1): BRIDGE NO. 106 ON SR-1309 OVER ALARKA CREEK

INFORMATION ON EXISTING BRIDGES Information obtained from: [X] field inspection [] microfilm(Reel: Pos:) [X] other HYDRAULIC REPORT

COUNTY BRIDGE NO. 106 BRIDGE LENGTH 90' NO. BENTS IN: CHANNEL 2 FLOOD PLAIN 2

FOUNDATION TYPE: TIMBER PILE BENTS ON FOOTINGS

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: NONE

INTERIOR BENTS: BENT ONE: IN FRONT OF FOOTING DUE TO THALWEG

CHANNEL BED: NONE

ROCKS: NONE

EXISTING SCOUR PROTECTION:

TYPE(3): RIP RAP & BOULDERS

EXTENT(4): PLACED ON ABUTMENT SLOPES

EFFECTIVENESS(5): GOOD

OBSTRUCTIONS(6) (DAMS,DEBRIS,ETC.): NONE

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): BOULDERS, SAND

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): SAND, GRAVEL, COBBLES, BOULDERS

FOUNDATION BEARING MATERIAL(9): ROCK

FLOOD PLAIN WIDTH(10): ~55' CREEK IS INCISED

FLOOD PLAIN COVER(11): BRAMBLE, TREES

DESIGN INFORMATION CONT.

STREAM IS [X] DEGRADING [] AGGRADING (12)

OTHER OBSERVATIONS AND COMMENTS:

CHANNEL MIGRATION TENDENCY (13): TOWARD END BENT ONE

GEOTECHNICALLY ADJUSTED SCOUR ELEVATION (14): N/A: SINGLE SPAN

SCOUR ELEVATIONS = HARD ROCK ELEVATIONS

REPORTED BY: J.W. MANN DATE: 4/21/2005

INSTRUCTIONS

- (1) GIVE THE DESCRIPTION OF THE SPECIFIC SITE GIVING ROUTE NUMBER AND BODY OF WATER CROSSED.
(2) NOTE ANY EVIDENCE OF SCOUR AT THE EXISTING END BENTS OR ABUTMENTS (UNDERMINING, SLOUGHING, SCOUR LOCATIONS, DEGRADATIONS, ETC.)
(3) NOTE ANY EXISTING SCOUR PROTECTION (RIP RAP, ETC.)
(4) DESCRIBE THE EXTENT OF ANY EXISTING SCOUR PROTECTION.
(5) DESCRIBE WHETHER OR NOT THE SCOUR PROTECTION APPEARS TO BE WORKING.
(6) NOTE ANY DAMS, FALLEN TREES, DEBRIS AT BENTS, ETC.
(7) DESCRIBE THE CHANNEL BED MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
(8) DESCRIBE THE CHANNEL BANK MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
(9) DESCRIBE THE BANK COVERING (GRASS, TREES, RIP RAP, NONE, ETC.)
(10) GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE).
(11) DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.)
(12) CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING
(13) DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE Laterally DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS).
(14) GIVE THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION EXPECTED OVER THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS). THIS CAN BE GIVEN AS AN ELEVATION RANGE ACROSS THE SITE, OR ON A BENT BY BENT BASIS WHERE VARIATIONS EXIST. DISCUSS RELATIONSHIP BETWEEN THE HYDRAULICS THEORETICAL SCOUR AND THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION. THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION IS BASED ON THE ERODABILITY OF MATERIALS WITH CONSIDERATION FOR JOINTING, FOLIATION, BEDDING ORIENTATION AND FREQUENCY; CORE RECOVERY PERCENTAGE; PERCENTAGE RQD; DIFFERENTIAL WEATHERING, SHEAR STRENGTH; OBSERVATIONS AT EXISTING STRUCTURES; OTHER TESTS DEEMED APPROPRIATE; AND OVERALL GEOLOGIC CONDITIONS AT THE SITE.