

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33625.1.1 (B-4286) F.A. PROJ. BRNHF-0019(7)
COUNTY SWAIN
PROJECT DESCRIPTION REPLACE BRIDGE NO.3 OVER NANTAHALA RIVER ON US 19-74

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CAUTION NOTICE

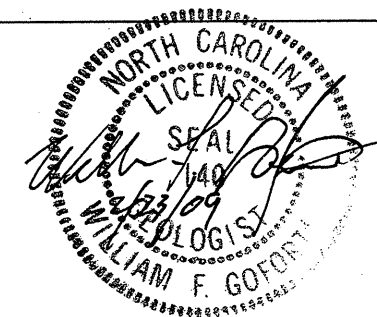
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING 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 (ON-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
CONSULTANTS**

INVESTIGATED BY C. M. WHALEN
CHECKED BY W. F. GOFORTH
SUBMITTED BY K. B. MILLER
DATE FEBRUARY, 2009



PROJECT: 33625.1.1 ID: B-4286

DRAWN BY: W.D. FIELDS

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

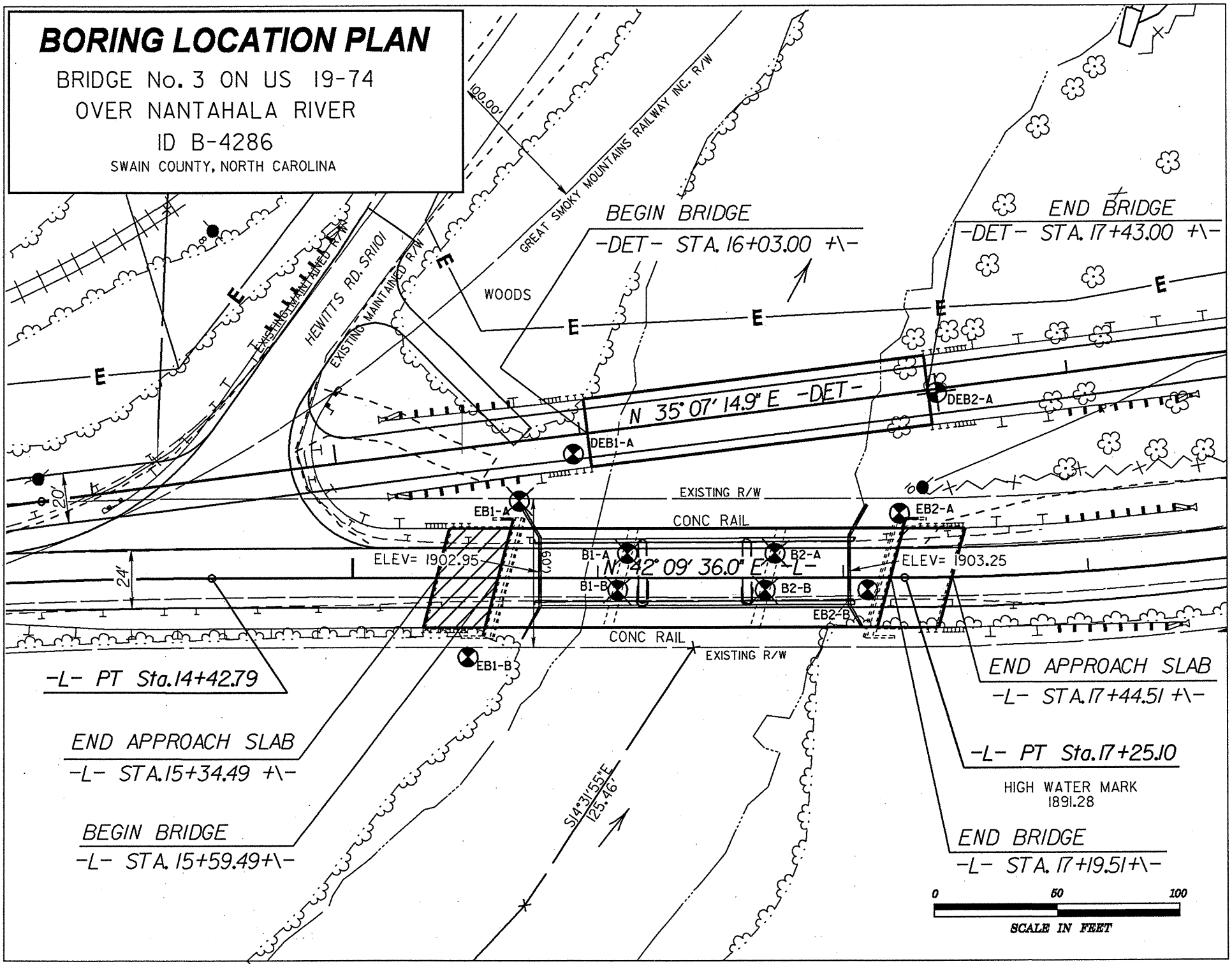
GEOTECHNICAL ENGINEERING UNIT

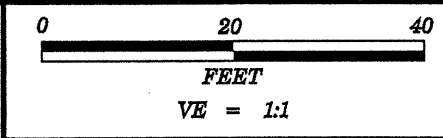
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, INDURATION, PLASTICITY, COLOR.

PROJECT REFERENCE NO.		SHEET	
33625.1.1 (B-4286)		3	
GEOTECHNICAL ENGINEER		ENGINEER	
SIGNATURE	DATE	SIGNATURE	DATE

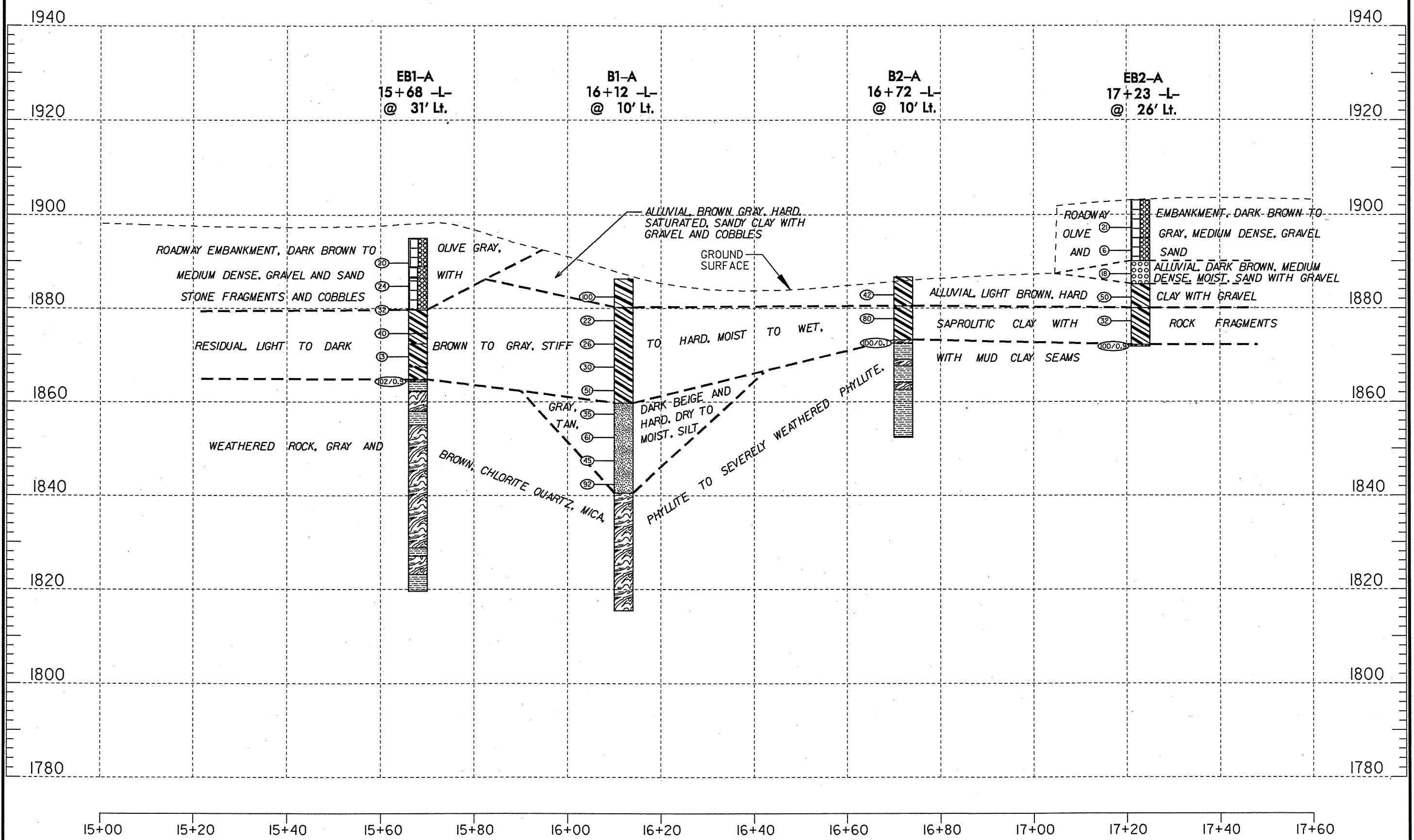


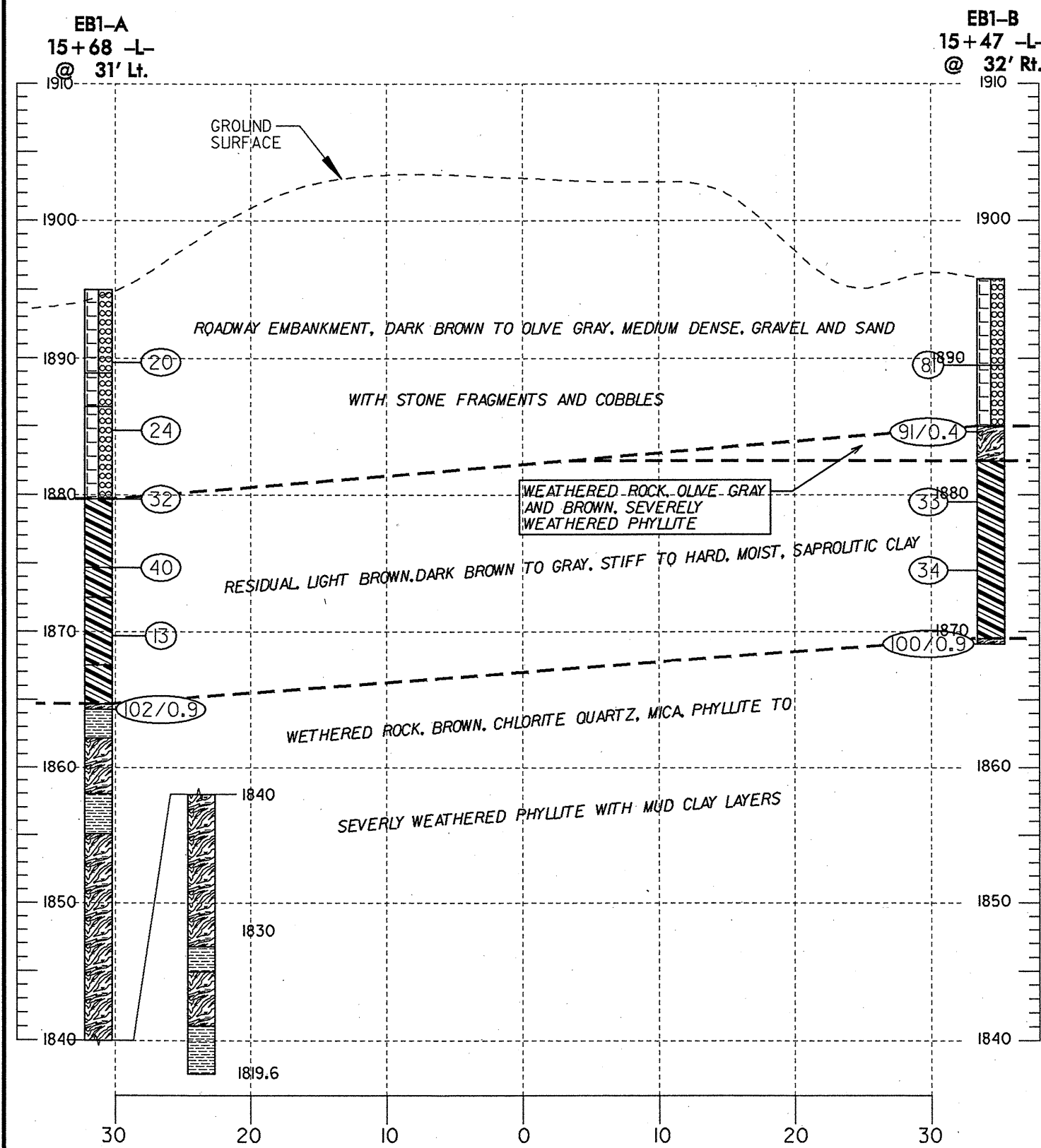


PROJECT REFERENCE NO.	SHEET
33625.1.1 (B-4286)	4
PROFILE ON -L- 24' LEFT	

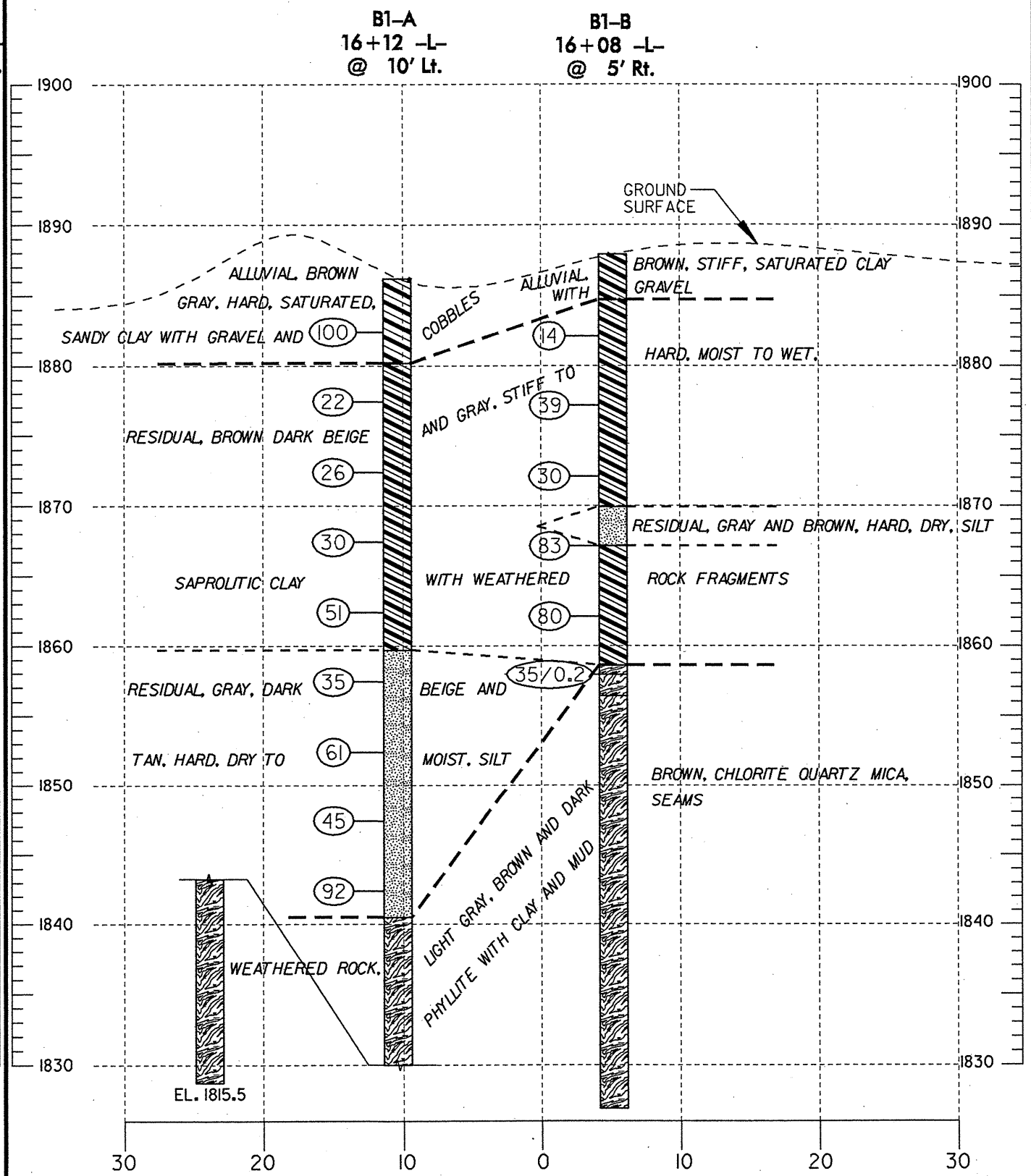
GENERALIZED SUBSURFACE PROFILE 24' Lt. of -L-

GROUNDLINE PROFILE SURVEYED BY FLORENCE & HUTCHESON, INC. AT 24' LT. OF -L- ON 12/16/08

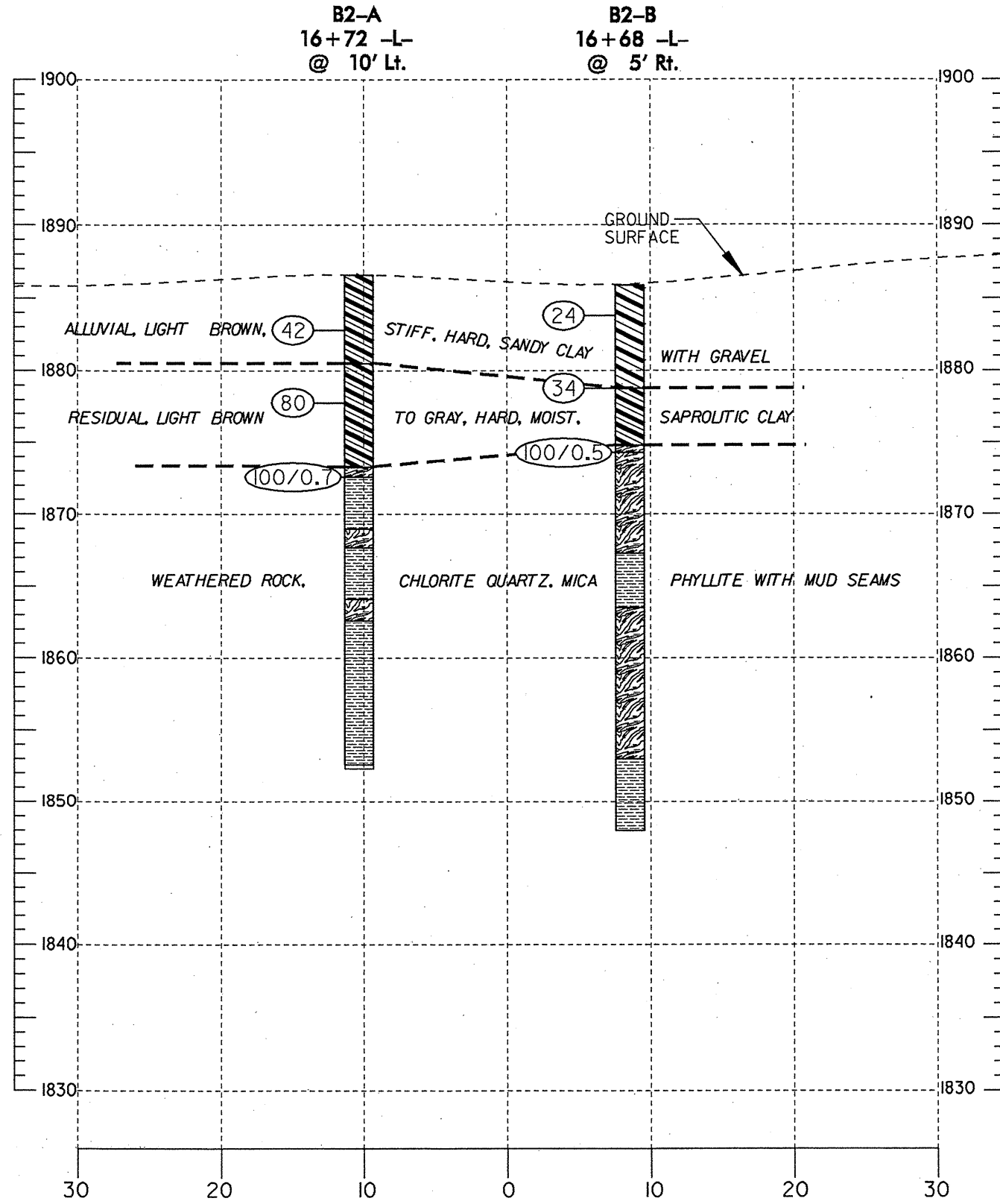




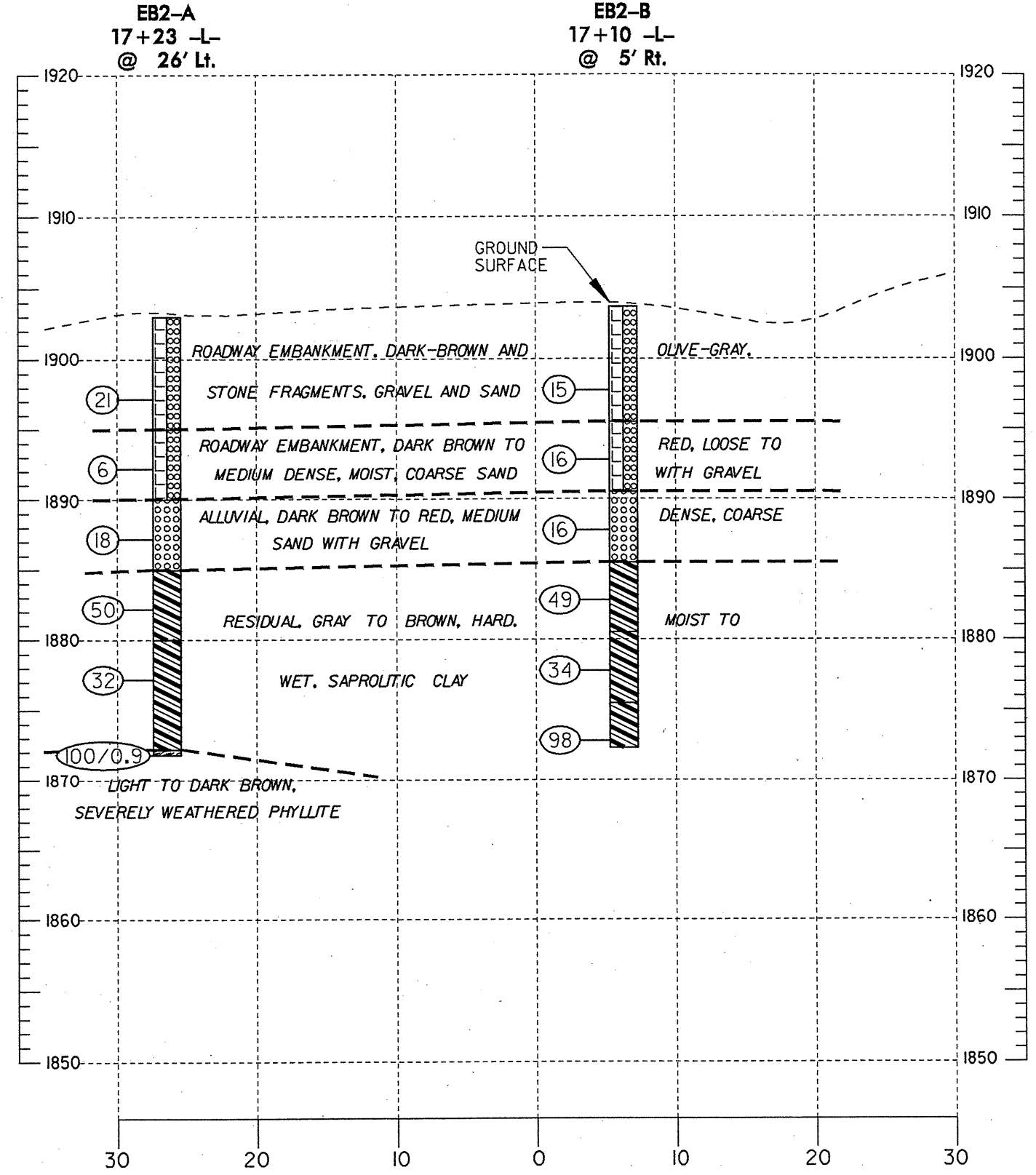
CROSS SECTION @ END BENT 1



CROSS SECTION @ BENT 1



CROSS SECTION @ BENT 2



CROSS SECTION @ END BENT 2

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.									
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 15+68		OFFSET 31ft LT		ALIGNMENT -L-									
COLLAR ELEV. 1,895.0 ft		TOTAL DEPTH 75.4 ft		NORTHING 597,256		EASTING 611,970									
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core				HAMMER TYPE Automatic									
START DATE 12/07/08		COMP. DATE 12/09/08		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 30.7 ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1895	1895.0													GROUND SURFACE	0.0
1890	1,890.7	4.3	4	4	16									ROADWAY EMBANKMENT Dark brown & olive gray, medium dense, stone fragments, gravel & sand (A-1-a).	6.1
1885	1,885.7	9.3	1	2	22									ROADWAY EMBANKMENT Gravel & cobbles of amphibolite & phyllite (A-1-a).	8.6
1880	1,880.7	14.3	11	17	15									ROADWAY EMBANKMENT Dark brown, medium dense stone fragments, gravel & sand (A-1-a). Base roadway embankment/top residual 15.3' (Elev. 1879.7).	15.3
1875	1,875.7	19.3	10	19	21									RESIDUAL Dark brown, hard, moist, saprolitic clay (A-6).	20.3
1870	1,870.7	24.3	8	8	5									RESIDUAL Dark brown & gray, hard, moist, saprolitic clay (A-6).	22.5
1865	1,865.7	29.3	8	37	65/0.4									RESIDUAL Gray, stiff, moist, saprolitic clay (A-6).	27.5
1860														RESIDUAL Light brown to gray, hard saprolitic clay (A-6).	30.3
1855														WEATHERED ROCK Brown severely weathered phyllite.	30.7
1850														NON-CRYSTALLINE ROCK Chlorite quartz mica phyllite.	32.8
1845														WEATHERED ROCK Chlorite quartz mica phyllite w/mud/clay seams.	37.0
1840														NON-CRYSTALLINE ROCK Chlorite quartz mica phyllite.	39.9
1835														WEATHERED ROCK Chlorite quartz mica phyllite w/mud/clay seams.	
1830															
1825														NON-CRYSTALLINE ROCK Chlorite quartz mica phyllite.	66.2
1820														WEATHERED ROCK Chlorite quartz mica phyllite.	68.0
														NON-CRYSTALLINE ROCK Chlorite quartz mica phyllite.	71.9
														NON-CRYSTALLINE ROCK Chlorite quartz mica phyllite.	75.4
														Boring Terminated at Elevation 1,819.6 ft in chlorite quartz mica phyllite (NCR).	
1815															

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT.GDT 2/5/09

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.									
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 15+68		OFFSET 31ft LT		ALIGNMENT -L-									
COLLAR ELEV. 1,895.0 ft		TOTAL DEPTH 75.4 ft		NORTHING 597,256		EASTING 611,970									
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core				HAMMER TYPE Automatic									
START DATE 12/07/08		COMP. DATE 12/09/08		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 30.7 ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
	1815													Match Line	
1810														Moved 6.6' Lt. from original location. SS 1&2 blow counts inflated due to gravel & cobbles wedged in spoon. Final casing depth = 29.3'. Drilling fluid = native water.	
1805															
1800															
1795															
1790															
1785															
1780															
1775															
1770															
1765															
1760															
1755															
1750															
1745															
1740															
1735															

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT.GDT 2/5/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.						
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)					
BORING NO. EB1-A		STATION 15+68		OFFSET 31ft LT		ALIGNMENT -L-						
COLLAR ELEV. 1,895.0 ft		TOTAL DEPTH 75.4 ft		NORTHING 597,256		EASTING 611,970						
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core				HAMMER TYPE Automatic						
START DATE 12/07/08		COMP. DATE 12/09/08		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 30.7 ft						
CORE SIZE NQ2		TOTAL RUN 47.2 ft		DRILLER Woodard, F.								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (%)	RQD (%)	SAMP. NO.	STRATA REC. (%)	RQD (%)	LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
	1888.9										Begin Coring @ 6.1 ft	
	1,888.9	6.1	2.5	0:52	(1.2)	N/A		(1.2)	N/A		ROADWAY EMBANKMENT	6.1
	1,886.4	8.6		0:39/0.5	48%			48%			Gravel to cobbles composed of fresh to mod. weathered amphibolite & phyllite.	8.6
1885											ROADWAY EMBANKMENT	
1880											RESIDUAL	15.3
1875											RESIDUAL	20.3
1870											RESIDUAL	22.5
1865											RESIDUAL	27.5
1860											WEATHERED ROCK	30.3
1855											NON-CRYSTALLINE ROCK	32.8
											Moderately sev. weathered, med. hard, brown, olive green, dk. red/black chlorite quartz mica phyllite w/v. close to close frac. spacing, heavy iron oxide staining & precipitation.	
1850											schistosity = 70°, 7 frac. @ 70° w/heavy iron oxide precipitation, 5 frac. @ 25° w/heavy iron oxide precipitation	37.0
1845											WEATHERED ROCK	39.9
											Very sev. to completely weathered, soft to v. soft, olive green, brown, red & black chlorite mica phyllite w/mud/clay seams.	
1840											NON-CRYSTALLINE ROCK	
											Moderately sev. weathered, med. hard to soft, brown, olive green, red/orange, black, chlorite quartz mica phyllite w/v. close to close frac. spacing, iron oxide stain.	
1835											9 frac @ 70° w/heavy iron oxide precipitation, 11+ frac. @ 0° to 40° w/heavy iron oxide precipitation	
1830											WEATHERED ROCK	
											Severely to completely weathered, med. hard to v. soft, brown, olive green, dk. brown, scattered red/orange chlorite quartz mica phyllite & mud/clay seams w/scattered traces talc.	
1825											NON-CRYSTALLINE ROCK	66.2
											Moderately sev. weathered, med. hard to v. soft, brown, olive green, black, red/orange, chlorite quartz mica phyllite w/v. close to close frac. spacing & iron oxide stain.	
1820											8 frac. @ 45°-65° w/heavy iron oxide precipitation and/or clay (0.015' thick), 4 frac. @ 10°-20° w/iron oxide stain	71.9
1815											WEATHERED ROCK	75.4
											Severely to completely weathered, soft to v. soft, brown, olive gray, olive green, red/orange, chlorite quartz mica phyllite w/iron oxide stain.	
1810											NON-CRYSTALLINE ROCK	
											Moderately sev. weathered, med. hard to soft, close to v. close frac. spacing, brown, olive gray scattered red/orange, chlorite quartz mica phyllite w/thin WR seams & iron oxide stain.	
											6 frac. @ 60°-70° w/clay infill &/or iron oxide precipitation, 8 frac @ 10°-25° w/iron oxide precipitation	
											Boring Terminated at Elevation 1,819.6 ft in chlorite quartz mica phyllite (NCR).	

NCDOT CORE SINGLE BRIDGE OVER NANTAHALA RIVER, GP. J. NC. DOT/GDT 2/5/09



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 33625.1.1	ID. B-4286	COUNTY Swain	GEOLOGIST Conci, J. M.
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River			GROUND WTR (ft)
BORING NO. EB1-B	STATION 15+47	OFFSET 32ft RT	ALIGNMENT -L-
COLLAR ELEV. 1,895.8 ft	TOTAL DEPTH 26.7 ft	NORTHING 597,198	EASTING 612,002
DRILL MACHINE CME-45C	DRILL METHOD NW Casing Advancer/SPT	HAMMER TYPE Automatic	
START DATE 12/13/08	COMP. DATE 12/13/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1900															
1895														GROUND SURFACE	0.0
1890	1,890.5	5.3												ROADWAY EMBANKMENT Olive gray stone fragments, gravel & sand (A-1-a).	6.3
1885	1,885.5	10.3	6	6	75									ROADWAY EMBANKMENT Olive gray stone fragments, gravel & sand (A-1-a).	10.8
1880	1,880.5	15.3	9	91/0.4										WEATHERED ROCK Top WR 10.8' (Elev. 1885.0). Olive gray & brown sev. weathered phyllite.	13.3
1875	1,875.5	20.3	6	10	23									RESIDUAL Top residual 13.3' (Elev. 1882.5). Light brown, gray & dark brown, hard, moist, saprolitic clay (A-6).	26.3
1870	1,870.5	25.3	15	11	23									WEATHERED ROCK Top WR 26.3' (Elev. 1869.5). Brown, severely weathered phyllite.	26.7
1865			26	33	67/0.4									Boring Terminated with Standard Penetration Test Refusal at Elevation 1,869.1 ft in phyllite (WR).	
1860														SS 1&2 blow counts inflated due to gravel wedged in spoon. Final casing depth = 25.3'. Drilling fluid = native water.	
1855															
1850															
1845															
1840															
1835															
1830															
1825															
1820															

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT.GDT 2/5/09

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.									
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)								
BORING NO. B1-A		STATION 16+12		OFFSET 10ft LT		ALIGNMENT -L-									
COLLAR ELEV. 1,886.2 ft		TOTAL DEPTH 70.7 ft		NORTHING 597,275		EASTING 612,015									
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core				HAMMER TYPE Automatic									
START DATE 12/08/08		COMP. DATE 12/09/08		SURFACE WATER DEPTH 0.2ft		DEPTH TO ROCK N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1890															
1885	1,883.4	2.8	19	43	57/0.5									WATER SURFACE (12/08/08)	0.0
1880	1,878.4	7.8	12	14	8									ALLUVIAL	6.0
1875	1,873.4	12.8	11	14	12									Brown & gray, very stiff to hard, moist to wet, saprolitic clay w/sev. weathered rock fragments (A-6).	
1870	1,868.4	17.8	17	20	10										
1865	1,863.4	22.8	18	24	27										
1860	1,858.4	27.8	8	14	21									RESIDUAL	26.5
1855	1,853.4	32.8	17	32	29									Gray, dark beige & tan, hard, dry to moist, silt (A-4).	
1850	1,848.4	37.8	7	21	24										
1845	1,843.4	42.8	27	33	59									WEATHERED ROCK	45.7
1840														Chlorite quartz mica phyllite w/clay & mud seams.	
1835															
1830															
1825															
1820															
1815															
1810															

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT_GDT_2/5/08

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.						
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)					
BORING NO. B1-A		STATION 16+12		OFFSET 10ft LT		ALIGNMENT -L-						
COLLAR ELEV. 1,886.2 ft		TOTAL DEPTH 70.7 ft		NORTHING 597,275		EASTING 612,015						
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core				HAMMER TYPE Automatic						
START DATE 12/08/08		COMP. DATE 12/09/08		SURFACE WATER DEPTH 0.2ft		DEPTH TO ROCK N/A						
CORE SIZE NQ2		TOTAL RUN 25.0 ft		DRILLER Woodard, F.								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
	1840.5	45.7	5.0	1:57 1:38 1:43 1:15 1:47	(3.6) 72%	(0.0) 0%		(17.3) 69%	(0.8) 3%		Begin Coring @ 45.7 ft	45.7
1835	1,835.5	50.7	5.0	0:56 1:06 1:33 1:08 1:18	(2.2) 44%	(0.0) 0%					Severely weathered w/intervals very sev. to completely weathered, soft to v. soft, chlorite quartz mica phyllite w/clay & mud seams & layers (0.3'-1.2') of NCR mod. sev. weathered, med. hard, close to v. close frac. spacing, brown, chlorite quartz mica phyllite. Foliation = 40°-50° Numerous frac. @ 45°-90° & 0°-20° w/iron oxide stain	
1830	1,830.5	55.7	5.0	1:30 1:44 1:45 2:03 2:27	(4.9) 98%	(0.4) 8%						
1825	1,825.5	60.7	5.0	1:58 1:27 1:39 2:23	(3.4) 68%	(0.4) 8%						
1820	1,820.5	65.7	5.0	1:18 1:27 1:38 1:49 2:40	(3.2) 64%	(0.0) 0%						
1815	1,815.5	70.7									Boring Terminated at Elevation 1,815.5 ft in chlorite quartz mica phyllite (WR)	70.7
1810											Final casing depth = 61.8'. Drilling fluid = native water. Drilled thru bridge deck.	
1805												
1800												
1795												
1790												
1785												
1780												
1775												
1770												
1765												

NCDOT CORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT_GDT_2/5/08

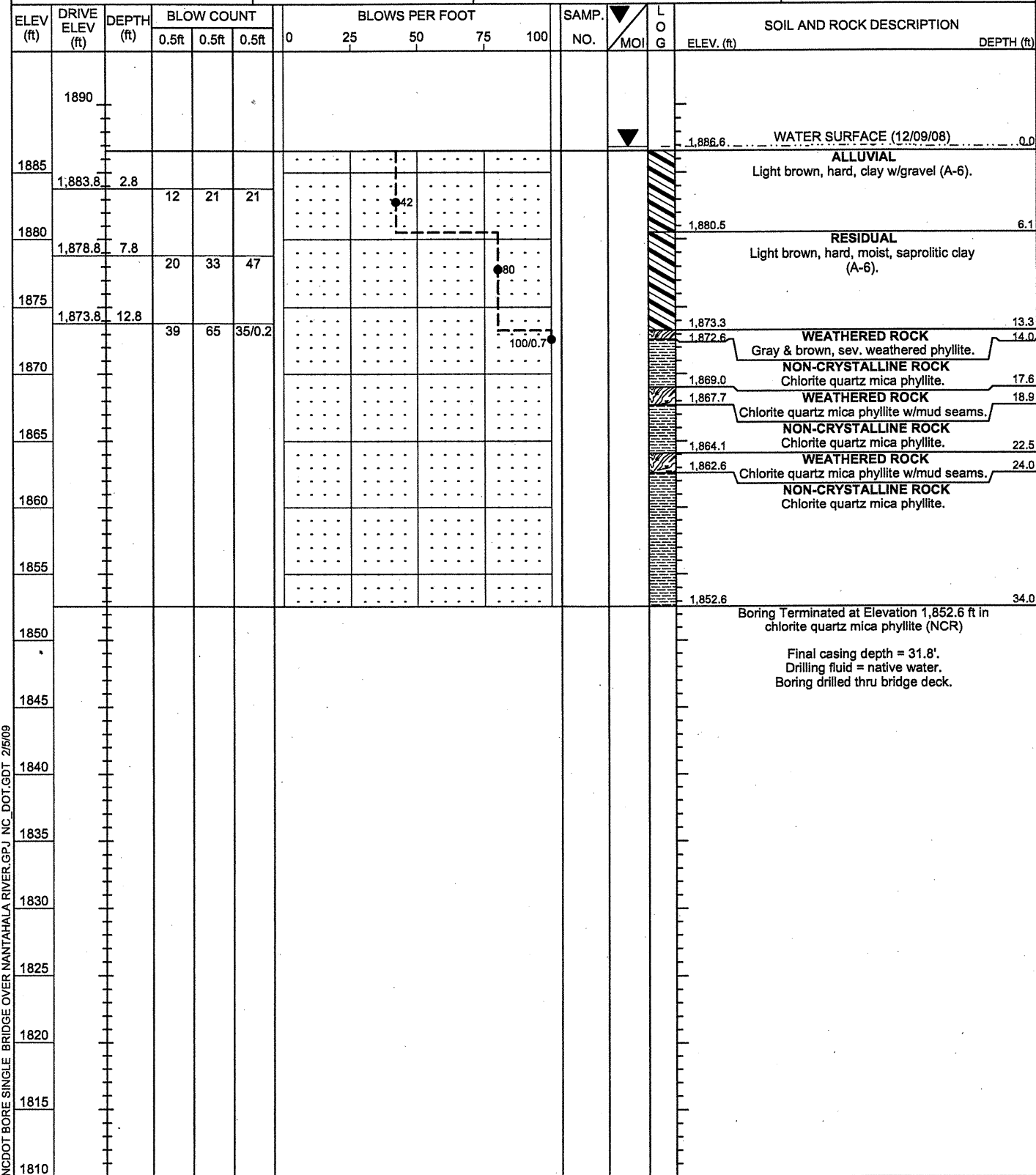
PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.										
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)									
BORING NO. B1-B		STATION 16+08		OFFSET 5ft RT		ALIGNMENT -L-										
COLLAR ELEV. 1,887.9 ft		TOTAL DEPTH 61.0 ft		NORTHING 597,261		EASTING 612,023										
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core			HAMMER TYPE Automatic											
START DATE 12/06/08		COMP. DATE 12/07/08		SURFACE WATER DEPTH 0.2ft		DEPTH TO ROCK N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
1890														1,887.9	0.0	WATER SURFACE (12/06/08)
1885	1,883.1	4.8	5	6	8									1,884.7	3.2	ALLUVIAL Brown, stiff, saturated clay with gravel (A-6).
1880	1,878.1	9.8	10	16	23											RESIDUAL Brown, dark beige & gray, stiff to hard, moist to wet, saprolitic clay (A-6).
1875	1,873.1	14.8	12	13	17											
1870	1,868.1	19.8	23	57	26									1,869.9	18.0	RESIDUAL Gray & brown, hard, dry silt (A-4).
1865	1,863.1	24.8	41	34	46									1,867.1	20.8	RESIDUAL Brown, light brown & gray, hard, dry, saprolitic clay (A-6).
1860	1,858.6	29.3	65	35/0.2										1,858.6	29.3	WEATHERED ROCK Light gray, brown & dark brown, sev. weathered phyllite.
1855														1,857.9	30.0	WEATHERED ROCK Chlorite quartz mica phyllite.
1850														1,856.4	31.5	WEATHERED ROCK Chlorite quartz mica phyllite & clay/mud seams.
1845																
1840																
1835																
1830																
1825														1,826.9	61.0	Boring Terminated at Elevation 1,826.9 ft in chlorite quartz mica phyllite (WR) Final casing depth = 46.8'. Drilling fluid = native water. Boring drilled thru bridge deck.
1820																
1815																
1810																

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ, NC_DOT.GDT, 2/5/09

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.						
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)					
BORING NO. B1-B		STATION 16+08		OFFSET 5ft RT		ALIGNMENT -L-						
COLLAR ELEV. 1,887.9 ft		TOTAL DEPTH 61.0 ft		NORTHING 597,261		EASTING 612,023						
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core			HAMMER TYPE Automatic							
START DATE 12/06/08		COMP. DATE 12/07/08		SURFACE WATER DEPTH 0.2ft		DEPTH TO ROCK N/A						
CORE SIZE NQ2		TOTAL RUN 31.0 ft		DRILLER Woodard, F.								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
	1,857.9	30.0	1.0	1:32	(0.6)	N/A		(1.1)	N/A		Begin Coring @ 30.0 ft	30.0
1855	1,856.9	31.0	5.0	1:44	60%	(0.0)		73%	(0.0)		Severely weathered w/mod. weathered intervals, soft to med. hard, chlorite quartz mica phyllite w/iron oxide stain.	31.5
	1,851.9	36.0		1:31	78%	0%		72%	0%		WEATHERED ROCK Severe to completely weathered w/mod. weathered layers, soft to v.soft, brown, olive gray, trace red/orange, chlorite quartz mica phyllite & clay/mud seams w/intervals (0.2'-1.0') NCR composed of mod. weathered, med. hard to soft, v. close frac. spacing, chlorite quartz mica phyllite w/iron oxide stain. Foliation = 50°-70° within NCR layers Numerous frac. of 55°-70°, 90° & 20°	
1850			5.0	1:09	(4.0)	(0.0)						
	1,846.9	41.0		0:57	80%	0%						
1845			5.0	1:20	(3.1)	(0.0)						
	1,841.9	46.0		1:12	62%	0%						
1840			5.0	1:03	(2.2)	(0.0)						
	1,836.9	51.0		1:15	44%	0%						
1835			5.0	1:25	(3.5)	(0.0)						
	1,831.9	56.0		1:34	70%	0%						
1830			5.0	1:33	(5.0)	(0.0)						
	1,826.9	61.0		1:50	100%	0%						
1825				1:44								
				1:57								
				4:23								
1820												
1815												
1810												
1805												
1800												
1795												
1790												
1785												
1780												

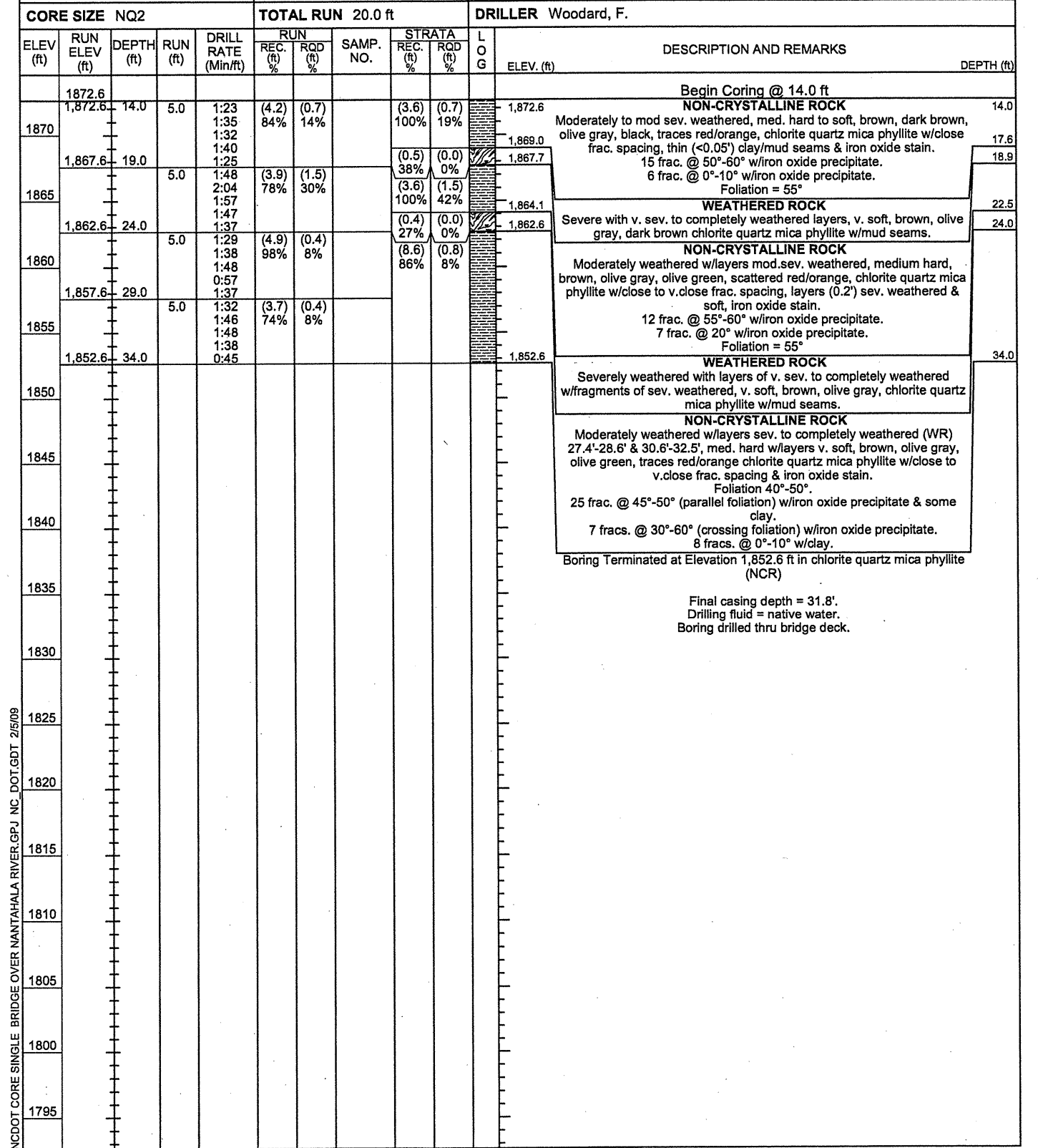
NCDOT CORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ, NC_DOT.GDT, 2/5/09

Table with project details: PROJECT NO. 33625.1.1, ID. B-4286, COUNTY Swain, GEOLOGIST Conci, J. M., SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River, BORING NO. B2-A, STATION 16+72, OFFSET 10ft LT, ALIGNMENT -L-, COLLAR ELEV. 1,886.6 ft, TOTAL DEPTH 34.0 ft, NORTHING 597,319, EASTING 612,055, DRILL MACHINE CME-45C, DRILL METHOD NW Casing Advancer/SPT/Core, HAMMER TYPE Automatic, START DATE 12/09/08, COMP. DATE 12/12/08, SURFACE WATER DEPTH 0.3ft, DEPTH TO ROCK 14.0 ft.



NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT.GDT 2/5/09

Table with project details: PROJECT NO. 33625.1.1, ID. B-4286, COUNTY Swain, GEOLOGIST Conci, J. M., SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River, BORING NO. B2-A, STATION 16+72, OFFSET 10ft LT, ALIGNMENT -L-, COLLAR ELEV. 1,886.6 ft, TOTAL DEPTH 34.0 ft, NORTHING 597,319, EASTING 612,055, DRILL MACHINE CME-45C, DRILL METHOD NW Casing Advancer/SPT/Core, HAMMER TYPE Automatic, START DATE 12/09/08, COMP. DATE 12/12/08, SURFACE WATER DEPTH 0.3ft, DEPTH TO ROCK 14.0 ft.



NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT.GDT 2/5/09

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.									
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)								
BORING NO. B2-B		STATION 16+68		OFFSET 5ft RT		ALIGNMENT -L-									
COLLAR ELEV. 1,885.9 ft		TOTAL DEPTH 37.9 ft		NORTHING 597,306		EASTING 612,063									
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core			HAMMER TYPE Automatic										
START DATE 12/08/08		COMP. DATE 12/08/08		SURFACE WATER DEPTH 0.3ft		DEPTH TO ROCK 18.6 ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1890															
1885	1,884.8	1.1												1,885.9	0.0
			3	7	17										
1880	1,879.8	6.1												1,878.8	7.1
			22	20	14									1,874.8	11.1
1875	1,874.8	11.1												1,874.3	11.6
			100/0.5											1,867.3	18.6
1870														1,863.5	22.4
1865														1,853.0	32.9
1860														1,848.0	37.9
1855															
1850															
1845															
1840															
1835															
1830															
1825															
1820															
1815															
1810															

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT.GDT 2/5/09

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.						
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)					
BORING NO. B2-B		STATION 16+68		OFFSET 5ft RT		ALIGNMENT -L-						
COLLAR ELEV. 1,885.9 ft		TOTAL DEPTH 37.9 ft		NORTHING 597,306		EASTING 612,063						
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core			HAMMER TYPE Automatic							
START DATE 12/08/08		COMP. DATE 12/08/08		SURFACE WATER DEPTH 0.3ft		DEPTH TO ROCK 18.6 ft						
CORE SIZE NQ2		TOTAL RUN 26.2 ft		DRILLER Woodard, F.								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
	1874.3											
	1,874.3	11.6	1.3	0:22/0.3	(0.4)	(0.0)		(3.7)	(0.4)		1,874.3	11.6
	1,873.0	12.9	5.0	0:47	31%	0%		53%	6%			
1870				1:06	(2.9)	(0.4)						
				1:09	58%	8%						
				1:23								
				1:20								
				1:16								
1865				1:49	(4.7)	(0.7)		(3.8)	(0.7)		1,867.3	18.6
				1:36	94%	14%		100%	18%			
				1:33								
1860				1:39								
				1:58				(7.9)	(0.0)		1,863.5	22.4
				1:15	(4.4)	(0.0)		75%	0%			
1855				1:15	88%	0%						
				1:43								
				1:33								
				1:24								
1850				1:25	(3.1)	(0.0)						
				0:58	62%	0%						
				1:26								
				1:49								
				2:21								
1845				2:03	(5.0)	(2.5)		(5.0)	(0.0)		1,853.0	32.9
				1:36	102%	51%		100%	0%			
				1:43								
				1:38								
				1:45								
1840												
1835												
1830												
1825												
1820												
1815												
1810												
1805												
1800												
1795												

NCDOT CORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT.GDT 2/5/09

Final casing depth = 31.8'.
Drilling fluid = native water.
Boring drilled thru bridge deck.



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 33625.1.1	ID. B-4286	COUNTY Swain	GEOLOGIST Conci, J. M.
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River			GROUND WTR (ft)
BORING NO. EB2-A	STATION 17+23	OFFSET 26ft LT	ALIGNMENT -L-
COLLAR ELEV. 1,903.0 ft	TOTAL DEPTH 31.2 ft	NORTHING 597,367	EASTING 612,077
DRILL MACHINE CME-45C	DRILL METHOD NW Casing Advancer/SPT		HAMMER TYPE Automatic
START DATE 12/12/08	COMP. DATE 12/12/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
1905													GROUND SURFACE	0.0
1900	1,898.2	4.8	21	11	10	21	11	10					ROADWAY EMBANKMENT Dark brown & olive gray, medium dense, stone fragments, gravel & sand (A-1-a).	8.0
1895	1,893.2	9.8	5	3	3	6							ROADWAY EMBANKMENT Red, loose, moist, coarse sand w/gravel (A-1-b).	13.0
1890	1,888.2	14.8	4	8	10	18							ALLUVIAL Top alluvium 13.0 (Elev. 1890.0). Dark brown, medium dense, moist, coarse sand w/gravel (A-1-b).	18.0
1885	1,883.2	19.8	16	22	28	50					SS-3		RESIDUAL Top residual 18.0' (Elev. 1885.0). Light brown to dark brown, gray, hard, moist, saprolitic clay (A-6).	23.0
1880	1,878.2	24.8	8	12	20	32							RESIDUAL Top in-situ material. Brown & gray, hard, moist, saprolitic clay (A-6).	30.8
1875	1,873.2	29.8	20	40	60/0.4	100/0.9							WEATHERED ROCK Light brown & dark brown, sev. weathered phyllite. Boring Terminated at Elevation 1,871.8 ft in phyllite (WR)	31.2
1870													Final casing depth = 29.8'. Drilling fluid = native water.	
1865														
1860														
1855														
1850														
1845														
1840														
1835														
1830														
1825														

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT_GDT_2/5/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33625.1.1	ID. B-4286	COUNTY Swain	GEOLOGIST Conci, J. M.
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River			GROUND WTR (ft)
BORING NO. EB2-B	STATION 17+10	OFFSET 5ft RT	ALIGNMENT -L-
COLLAR ELEV. 1,903.7 ft	TOTAL DEPTH 31.4 ft	NORTHING 597,337	EASTING 612,091
DRILL MACHINE CME-45C	DRILL METHOD NW Casing Advancer/SPT	HAMMER TYPE Automatic	
START DATE 12/12/08	COMP. DATE 12/12/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 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						
1905														1,903.7	GROUND SURFACE	0.0
1900	1,898.8	4.9													ROADWAY EMBANKMENT Dark brown, medium dense, moist, stone fragments, gravel & sand (A-1-a).	
1895	1,893.8	9.9	12	7	8									1,895.5	ROADWAY EMBANKMENT Dark brown, medium dense, wet, coarse sand w/gravel & tree roots (A-1-b).	8.2
1890	1,888.8	14.9	4	6	10									1,890.5	ALLUVIAL Top alluvium 13.2' (Elev. 1890.5). Red, medium dense, moist, coarse sand w/gravel & traces small roots (A-1-b).	13.2
1885	1,883.8	19.9	3	5	11									1,885.5	RESIDUAL Top residual 18.2' (Elev 1885.5). Gray to brown, hard, moist saprolitic clay (A-6).	18.2
1880	1,878.8	24.9	22	23	26							SS-4		1,880.5	RESIDUAL Light brown to dark brown, hard, wet, saprolitic clay (A-6).	23.2
1875	1,873.8	29.9	9	16	18									1,875.5	RESIDUAL Light brown, dark brown, black, hard, moist saprolitic clay (A-6).	28.2
1870			31	46	52									1,872.3	RESIDUAL Light brown, dark brown, black, hard, moist saprolitic clay (A-6). Boring Terminated at Elevation 1,872.3 ft in	31.4
1865															Moved 21.4' Lt. from original location. Final casing depth = 29.9'. Drilling fluid = native water.	
1860																
1855																
1850																
1845																
1840																
1835																
1830																
1825																

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT.GDT 2/5/09



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

PROJECT NO. 33625.1.1	ID. B-4286	COUNTY Swain	GEOLOGIST Conci, J. M.
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River			GROUND WTR (ft)
BORING NO. EB1B	STATION 15+97	OFFSET 8ft RT	ALIGNMENT -DET-
COLLAR ELEV. 1,894.8 ft	TOTAL DEPTH 30.6 ft	NORTHING 597,286	EASTING 611,971
DRILL MACHINE CME-45C	DRILL METHOD NW Casing Advancer/SPT	HAMMER TYPE Automatic	
START DATE 12/13/08	COMP. DATE 12/13/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
	1895												1,894.8	GROUND SURFACE	0.0
														ALLUVIAL Dark brown & olive gray, medium dense, dry, cobbles, gravel and sand (A-1a).	
1890	1,890.2	4.6													
			2	3	14										
1885	1,885.2	9.6													
			10	19	73										
1880	1,880.2	14.6													
			25	6	4										
1875	1,875.2	19.6													
			6	16	20										
1870	1,870.0	24.8													
			6	10	12										
1865	1,865.2	29.6													
			33	67/0.5											
1860															
1855															
1850															
1845															
1840															
1835															
1830															
1825															
1820															
1815															

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ NC_DOT_GDT_2/5/09

WEATHERED ROCK
Brown to dark brown, sev. weathered phyllite.
Boring Terminated at Elevation 1,864.2 ft in (WR).

Final casing depth = 29.6'.
Drilling fluid = native water.

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.										
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)									
BORING NO. EB2B	STATION 17+46	OFFSET 1ft RT	ALIGNMENT -DET-			0 HR.	N/A									
COLLAR ELEV. 1,902.0 ft	TOTAL DEPTH 31.3 ft	NORTHING 597,412	EASTING 612,051			24 HR.	N/A									
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core			HAMMER TYPE Automatic											
START DATE 12/12/08		COMP. DATE 12/13/08		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
1905														1,902.0	GROUND SURFACE	0.0
1900															ALLUVIAL Gray, loose, dry, cobbles, gravel & sand (A-1-a).	
1895	1,897.2	4.8												1,895.7	ALLUVIAL Gray, very dense, moist, cobbles, gravel & sand (A-1-a).	6.3
1890	1,892.2	9.8	3	2	4									1,891.6	COLLUVIUM/ALLUVIUM Quartz schist (A-1-a).	10.4
1885	1,887.2	14.8	23	50/0.1										1,890.3	ALLUVIAL Gray, red, loose to medium dense, moist, coarse sand (A-1-b).	11.7
1880	1,882.2	19.8	0	3	7									1,884.5	RESIDUAL Dark brown, hard, wet saprolitic clay (A-6).	17.5
1875	1,877.2	24.8	22	17	17									1,879.0	RESIDUAL Light brown to dark brown, hard, wet saprolitic clay (A-6).	23.0
1870	1,872.2	29.8	16	16	17									1,873.5	RESIDUAL Light brown to dark brown, hard, wet saprolitic clay (A-6).	28.5
			13	14	22									1,870.7	RESIDUAL Light brown to dark brown, hard, wet saprolitic clay (A-6).	31.3
Boring Terminated at Elevation 1,870.7 ft in																
Final casing depth = 29.8'. Drilling fluid = native water.																

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ_NC_DOT.GDT_2/5/09

PROJECT NO. 33625.1.1		ID. B-4286		COUNTY Swain		GEOLOGIST Conci, J. M.						
SITE DESCRIPTION Bridge No. 3 on -L- (U.S. 19-74) over Nantahala River							GROUND WTR (ft)					
BORING NO. EB2B	STATION 17+46	OFFSET 1ft RT	ALIGNMENT -DET-			0 HR.	N/A					
COLLAR ELEV. 1,902.0 ft	TOTAL DEPTH 31.3 ft	NORTHING 597,412	EASTING 612,051			24 HR.	N/A					
DRILL MACHINE CME-45C		DRILL METHOD NW Casing Advancer/SPT/Core			HAMMER TYPE Automatic							
START DATE 12/12/08		COMP. DATE 12/13/08		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A						
CORE SIZE NQ2		TOTAL RUN 1.3 ft		DRILLER Woodard, F.								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
	1891.6											
1890	1,891.6	10.4	1.3	3:10/0.8	(0.4)	N/A		(0.4)	N/A		Begin Coring @ 10.4 ft COLLUVIUM/ALLUVIUM Cobble composed of fresh, v. hard, close frac. spacing, faintly calc. quartz schist w/feldspar phenocrysts & traces fine pyrite interpreted as colluvium/alluvium.	10.4
	1,890.3	11.7		5:30/0.5	31%			31%				11.7
1885						N=10					ALLUVIAL	17.5
1880						N=34					RESIDUAL	23.0
1875						N=33					RESIDUAL	28.5
1870						N=36					RESIDUAL	31.3
Boring Terminated at Elevation 1,870.7 ft in												
Final casing depth = 29.8'. Drilling fluid = native water.												

NCDOT BORE SINGLE BRIDGE OVER NANTAHALA RIVER.GPJ_NC_DOT.GDT_2/5/09

STATE PROJECT NO.: 33625.1.1
TIP NO.: B-4286
COUNTY: Swain
PROJECT DESC.: Bridge No. 3 over Nantahala River on US 19-74

SUMMARY OF SOIL CLASSIFICATIONS AND GRADATIONS																	
Boring No.	Sample No.	Depth Interval (ft.)	AASHTO Class.	N	Soil No.	Percent Passing No.10	Percent Passing No.40	Percent Passing No.200	Percent Retained No. 60	SOIL MORTAR				LL	PI	PL	Percent Moisture
										Coarse Sand	Fine Sand	Silt	Clay				
EB1B	SS-1	4.6'-6.1'	A-1-a (0)	17	1	39	25	14	79	18	9	9	3	24	NP	NP	9.9
EB2-A	SS-3	14.8'-16.3'	A-1-b (0)	18	2	49	35	23	69	18	11	14	7	26	4	22	18.4
EB2-B	SS-4	19.9'-21.4'	A-6 (6)	18	3	100	98	67	5	5	37	45	13	31	12	19	16.9
B1-A	SS-8	37.8'-39.3'	A-4 (4)	45	4	100	92	65	12	12	33	45	10	29	9	20	15.9



FIELD SCOUR REPORT

WBS: 33625.1.1 TIP: B-4286 COUNTY: Swain

DESCRIPTION(1): Bridge No. 3 Over Nantahala River on US 19-74

EXISTING BRIDGE

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

Bridge No.: 3 Length: 125' Total Bents: 4 Bents in Channel: 2 Bents in Floodplain: 2
 Foundation Type: Concrete

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: West end bent is not scoured.
East end bent slopes are scoured behind wing walls

Interior Bents: Existing bent 1 and bent 2 on up river end - no visible deterioration of concrete
On down river end, past concrete buffer - some visible deterioration

Channel Bed: None

Channel Bank: None

EXISTING SCOUR PROTECTION

Type(3): Concrete

Extent(4): Poured from W.End bent to water's edge under bridge; behind both wing walls on E. End bent

Effectiveness(5): Appears to be working

Obstructions(6): One small tree upriver of existing bent 2

INSTRUCTIONS

- Describe the specific site's location, including route number and body of water crossed.
- Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- Note existing scour protection (e.g. rip rap).
- Describe extent of existing scour protection.
- Describe whether or not the scour protection appears to be working.
- Note obstructions such as dams, fallen trees, debris at bents, etc.
- Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- Determine the approximate floodplain width from field observation or a topographic map.
- Describe the material covering the floodplain (e.g. grass, trees, crops).
- Use professional judgement to specify if the stream is degrading, aggrading, or static.
- Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 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): Alluvium with boulders and cobbles composed of phyllite, schist, and quartzite

Channel Bank Material(8): East bank - in place rock
West bank - alluvium with sand, gravel, and cobbles

Channel Bank Cover(9): trees and grass

Floodplain Width(10): 325'

Floodplain Cover(11): trees and grass

Stream is(12): Aggrading _____ Degrading _____ Static

Channel Migration Tendency(13): toward East end of bridge

Observations and Other Comments: _____

Reported by: Jan Conci Date: 12/12/2008

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

BENTS

	B1	B2								
	1877.5	1876.5								

Comparison of DSE to Hydraulics Unit theoretical scour:
 NCDOT Geotechnical Engineering Unit scour calculations indicate scour depths to the elevations noted above for the interior bents. End bents should not be affected by scour processes.

DSE determined by: Chad m. White Date: 2/3/2009

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank	Bed	Bank					
Sample No.	1	2					
Retained #4	16.7	59.4					
Passed #10	76.5	30.9					
Passed #40	40.2	9					
Passed #200	12	2					
Coarse Sand	53.5	25.8					
Fine Sand	12.5	3.5					
Silt	7.4	1.1					
Clay	3.1	0.5					
LL	37	29					
PI	NP	NP					
AASHTO	A-1-b (0)	A-1-a (0)					
Station							
Offset							
Depth							

CORE PHOTOGRAPHIC RECORD

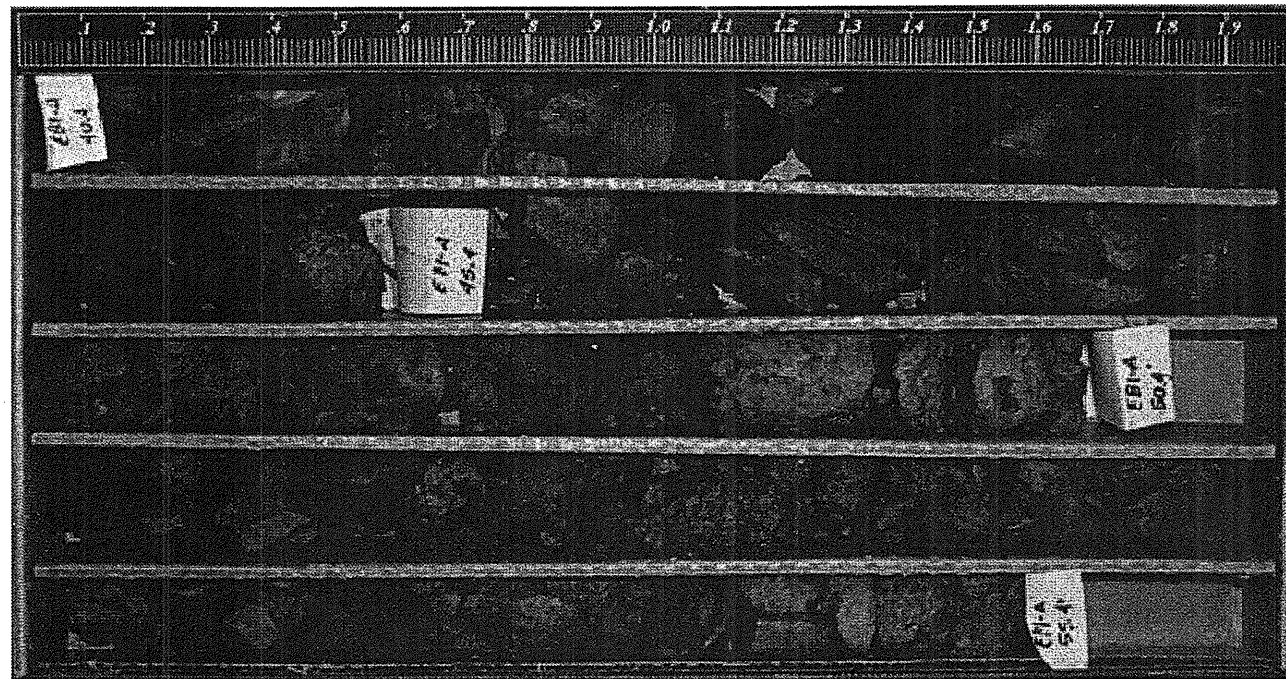
Replacement of Bridge No. 3 on US 19 / 74 Over Nantahla River



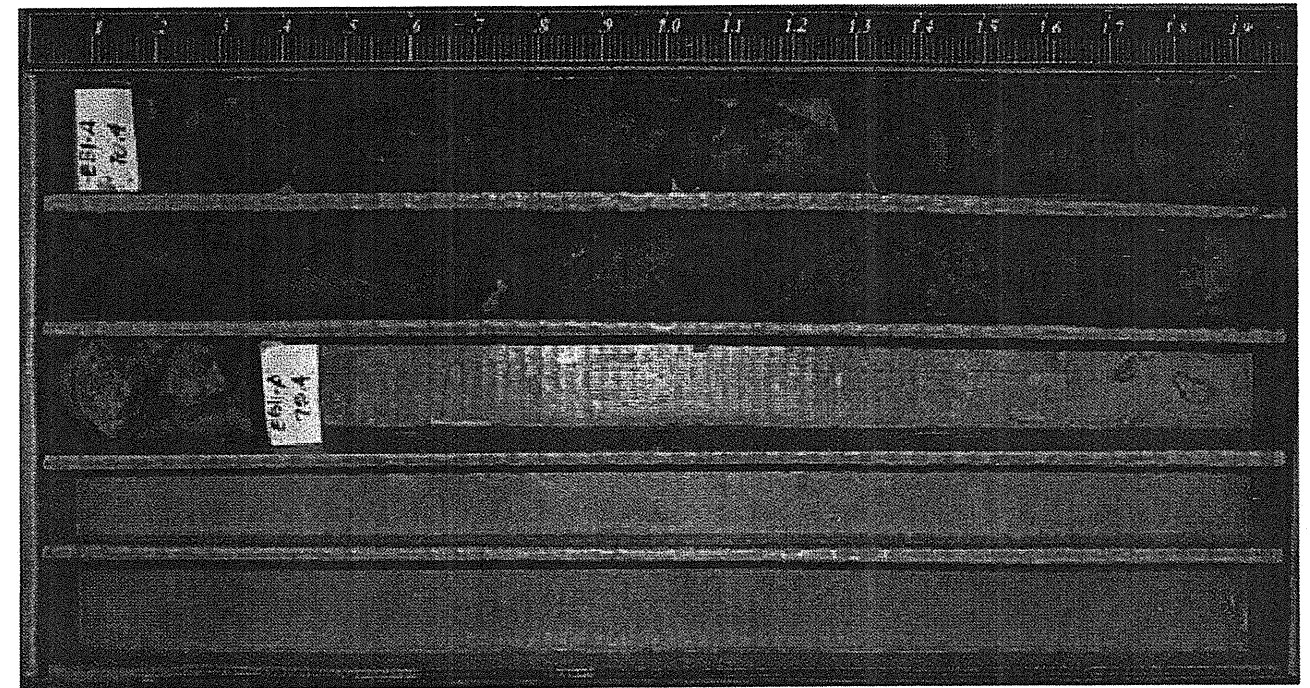
Boring EB1-A – Station 15+68 @ 31' Lt. Box 1 of 4



Boring EB1-A – Station 15+68 @ 31' Lt. Box 3 of 4



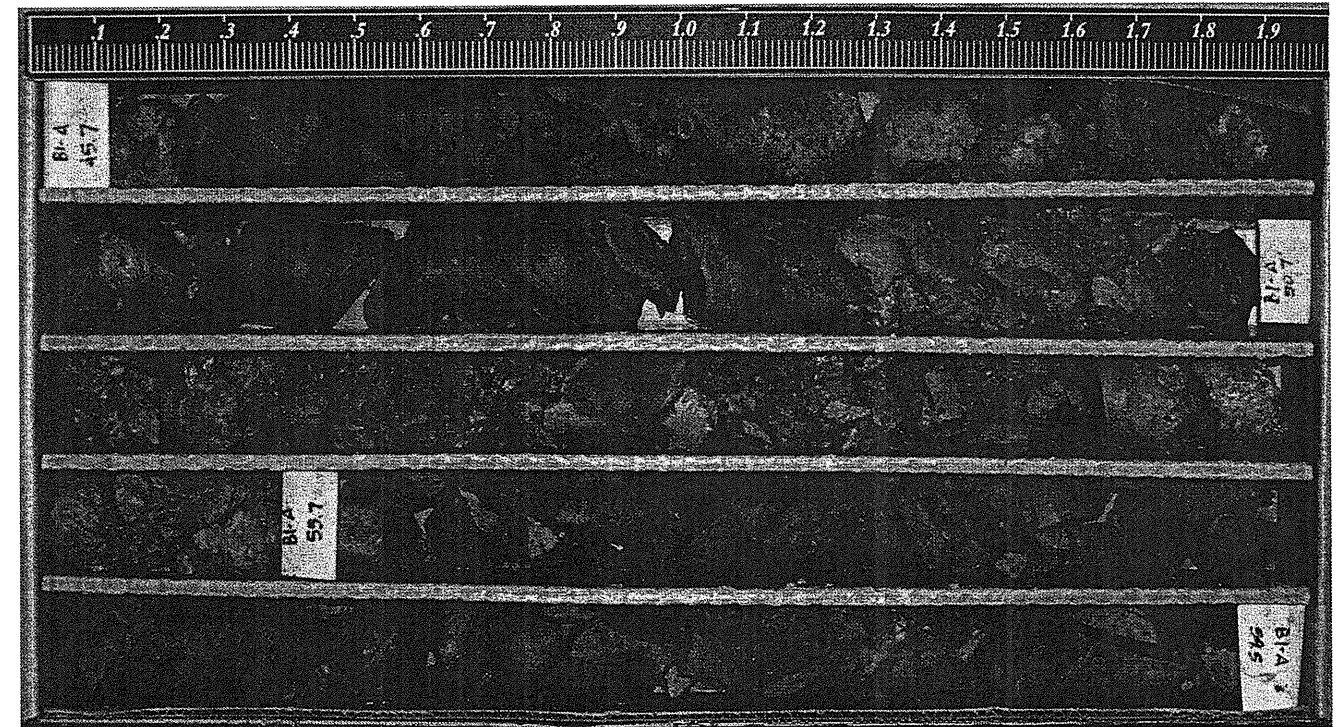
Boring EB1-A – Station 15+68 @ 31' Lt. Box 2 of 4



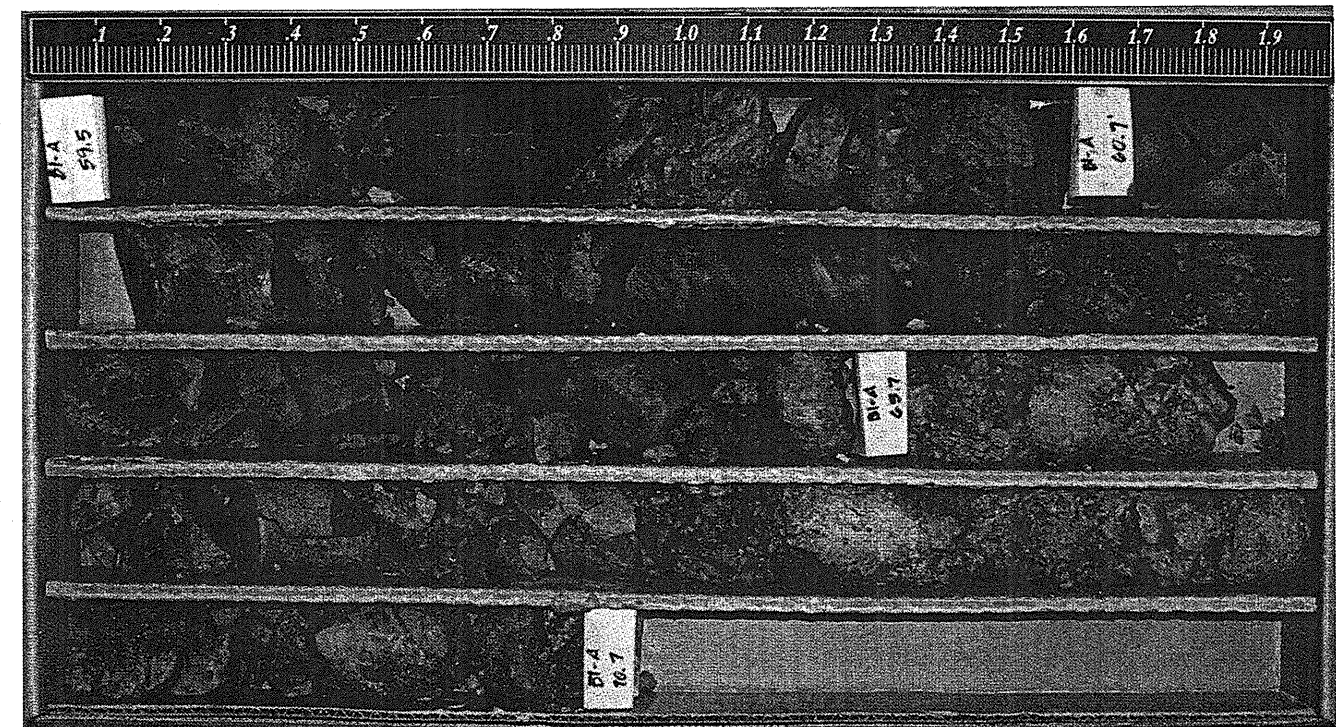
Boring EB1-A – Station 15+68 @ 31' Lt. Box 4 of 4

CORE PHOTOGRAPHIC RECORD

Replacement of Bridge No. 3 on US 19 / 74 Over Nantahla River



Boring B1- A – Station 16+12 @ 10' Lt. Box 1 of 2



Boring B1 – A – Station 16+12 @ 10' Lt. Box 2 of 2

CORE PHOTOGRAPHIC RECORD

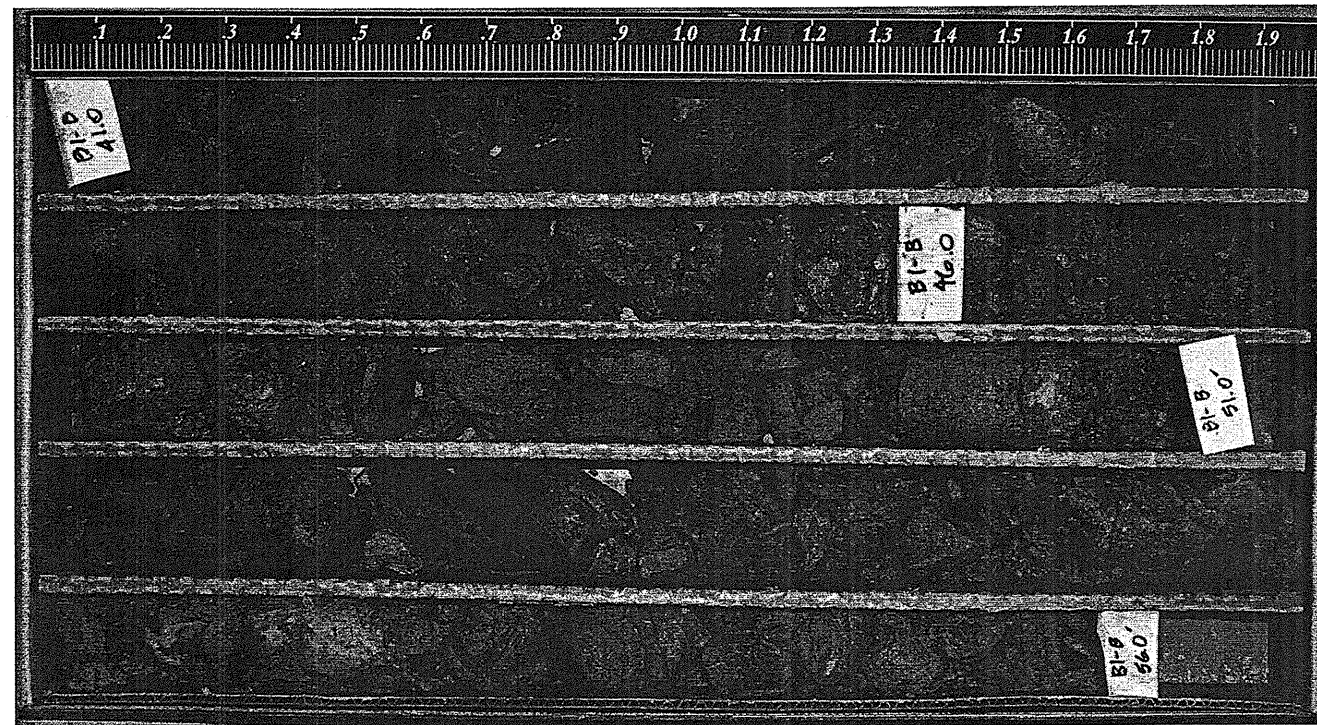
Replacement of Bridge No. 3 on US 19 / 74 Over Nantahla River



Boring B1 - B – Station 16+08 @ 5' Rt. Box 1 of 3



Boring B1 - B – Station 16+08 @ 5' Rt. Box 3 of 3



Boring B1 - B – Station 16+08 @ 5' Rt. Box 2 of 3

CORE PHOTOGRAPHIC RECORD

Replacement of Bridge No. 3 on US 19 / 74 Over Nantahla River



Boring B2 - A – Station 16+72 @ 10' Lt. Box 1 of 2



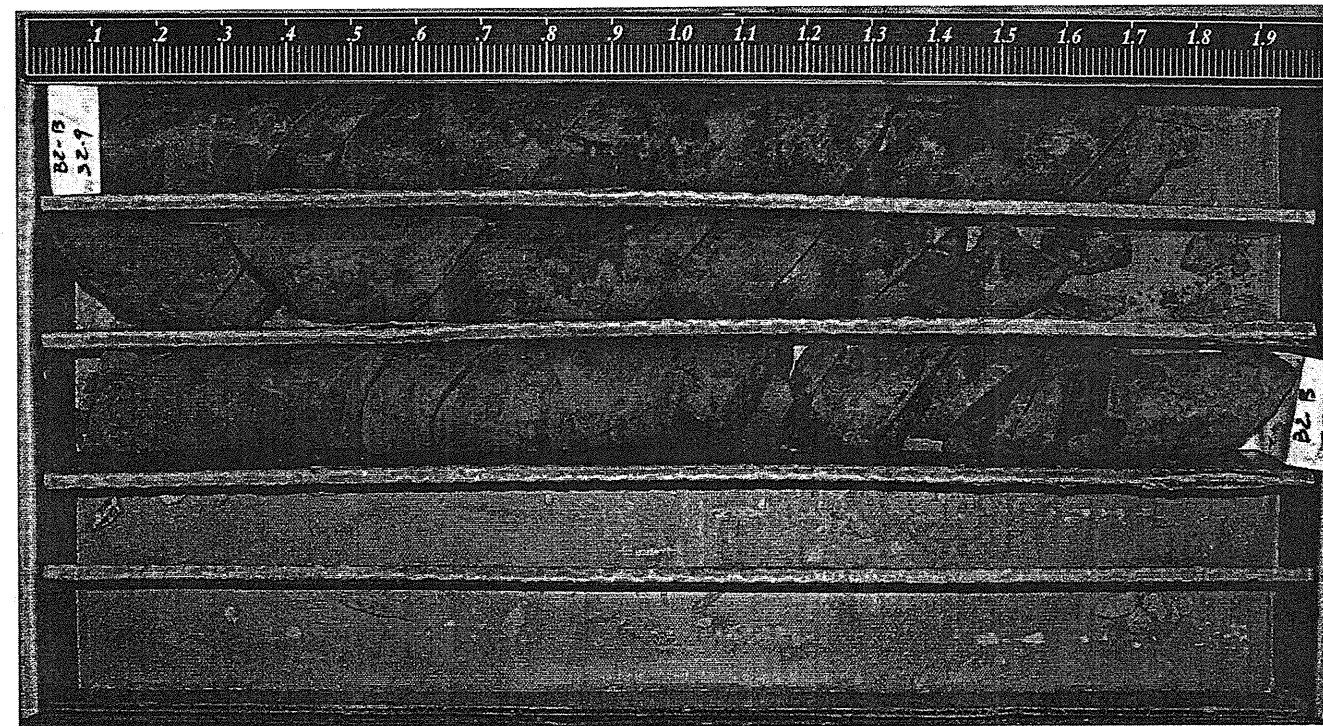
Boring B2 - A – Station 16+72 @ 10' Lt. Box 2 of 2

CORE PHOTOGRAPHIC RECORD

Replacement of Bridge No. 3 on US 19 / 74 Over Nantahla River



Boring B2 - B – Station 16+68 @ 5' Rt. Box 1 of 3



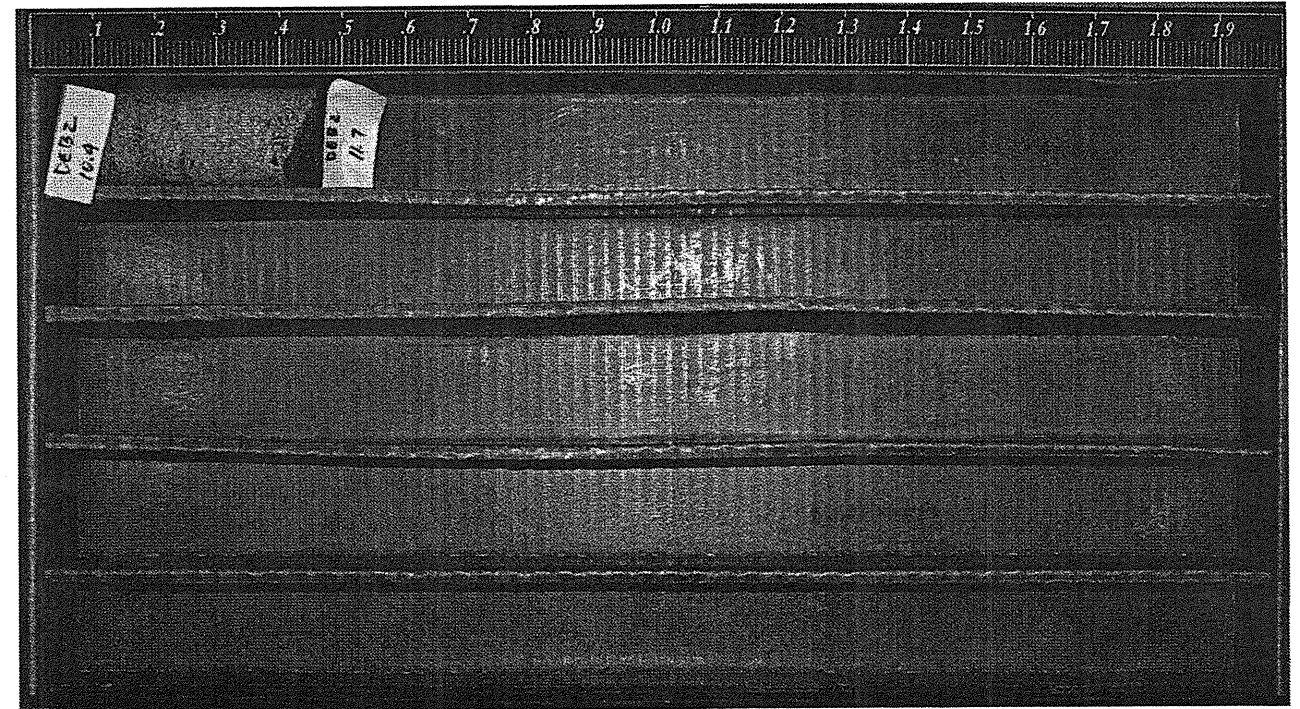
Boring B2 - B – Station 16+68 @ 5' Rt. Box 3 of 3



Boring B2 - B – Station 16+68 @ 5' Rt. Box 2 of 3

CORE PHOTOGRAPHIC RECORD

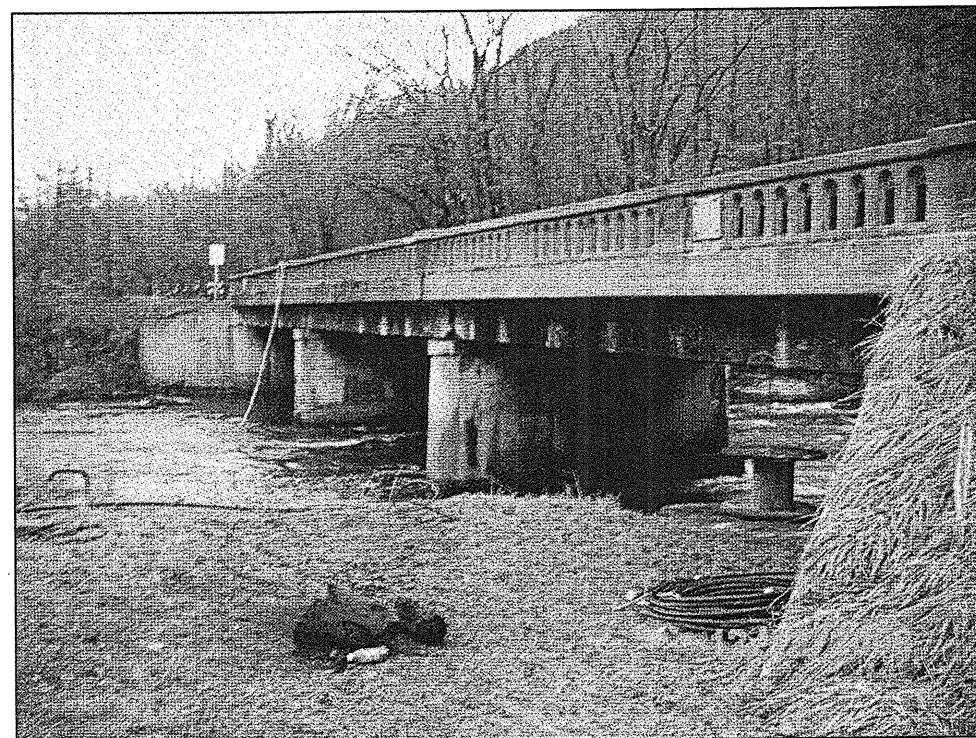
Replacement of Bridge No. 3 on US 19 / 74 Over Nantahla River



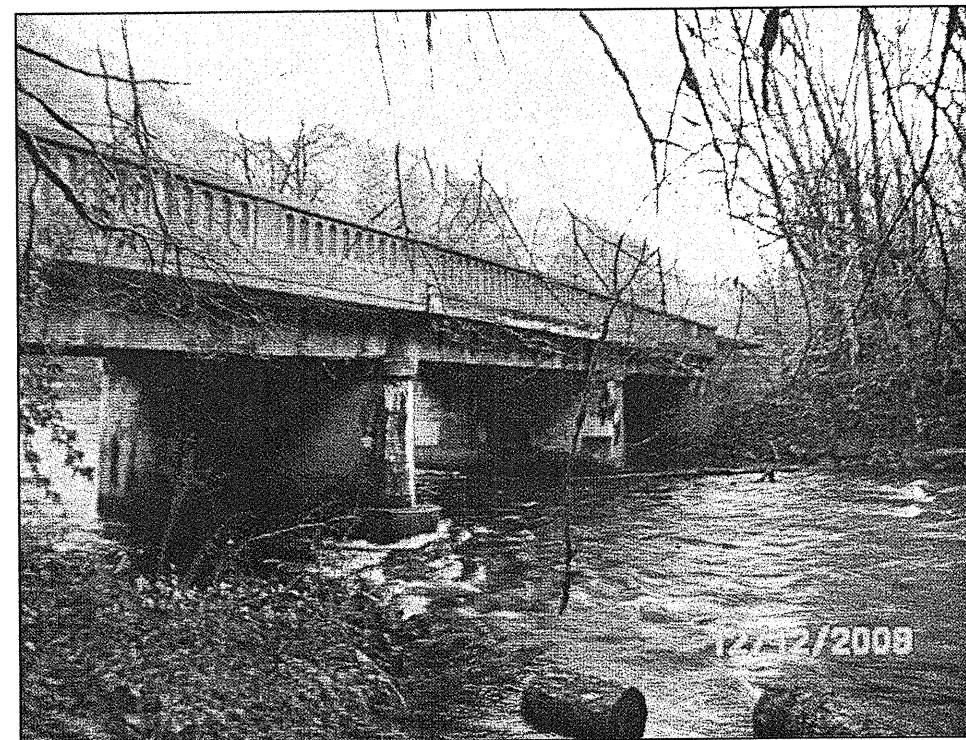
Boring DEB -2 – Station 17+39 @ 75' Lt. Box 1 of 1

SITE PHOTOGRAPHIC RECORD

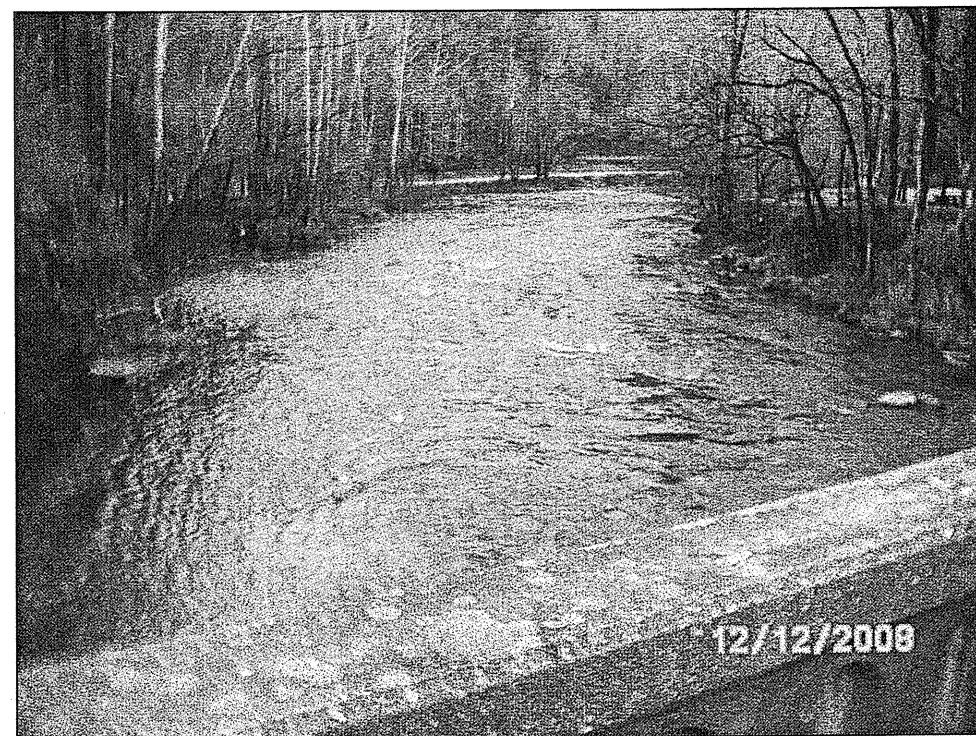
Replacement of Bridge No. 3 on US 19 / 74 Over Nantahla River



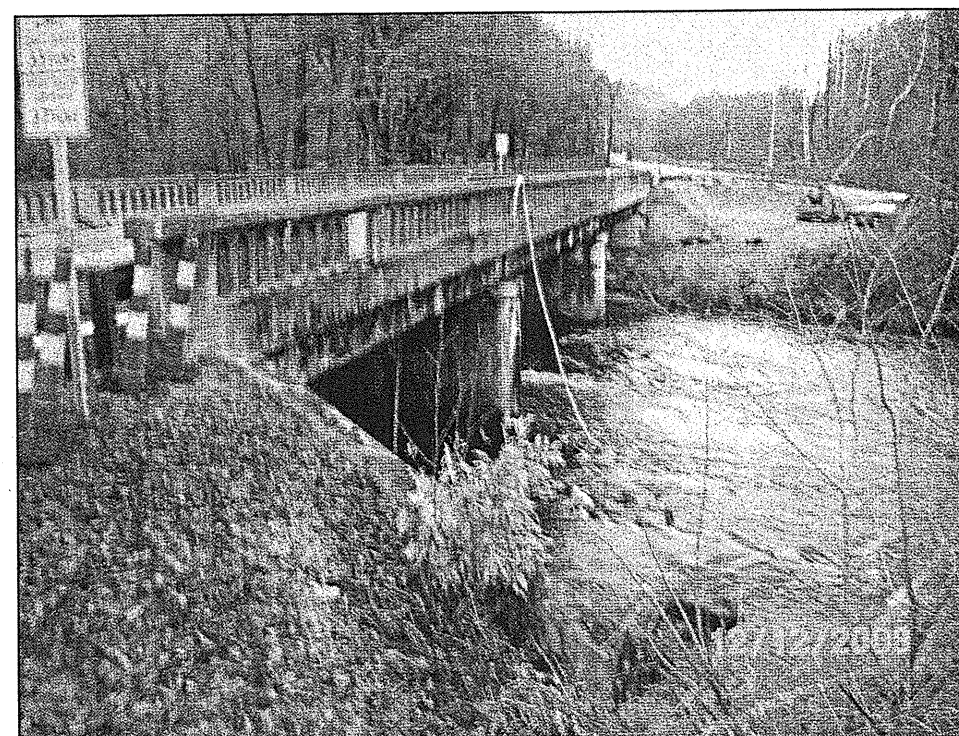
Photograph No. 1 – North Side of Bridge Looking East
(EB1-A looking at EB2-A)



Photograph No. 3 – Looking North (Toward Detour Bridge)
from Existing Bridge



Photograph No. 2 - South Side of Bridge Looking East
(EB1-B looking at EB2-B)



Photograph No. 4 - North Side of Bridge Looking West
(EB2-A Looking at EB1-A)