

GEOTECHNICAL UNIT

SOIL AND ROCK CLASSIFICATION, LEGEND, AND ABBREVIATIONS

SOIL LEGEND AND AASHTO CLASSIFICATION				CONSISTENCY OR DENSENESS				
GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)	SILT-CLAY MATERIALS (> 35% PASSING #200)	ORGANIC MATERIALS	PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N - VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (q _u) (kN / m ²)	
GROUP CLASS.	A-1 A-3 A-2	A-4 A-5 A-6 A-7	A-1-A-2 A-4-A-5 A-3 A-6-A-7	GENERALLY GRANULAR MATERIAL	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A	
SYMBOL				GENERALLY SILT-CLAY MATERIAL	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 25 25 TO 50 50 TO 100 100 TO 200 200 TO 400 > 400	
% PASSING	#10 50 MX #40 30 MX 50 MX 51 MN #200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MN 36 MN 36 MN 36 MN	#10 50 MX #40 30 MX 50 MX 51 MN #200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MN 36 MN 36 MN 36 MN	GRANULAR SOILS SILT-CLAY SOILS MUCK, PEAT	GROUND WATER				
(PASSING #40)	LL PI	LL PI	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER	WATER LEVEL IN BORE HOLE [IMMEDIATELY AFTER DRILLING (I.A.D.) SOON AFTER DRILLING (V) HRS.] STATIC WATER LEVEL (AFTER 24 HRS.) PERCHED WATER (PW), SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEPAGE				
GROUP INDEX	0 0 0 4 MX	8 MX 12 MX 16 MX NO MX	HIGHLY ORGANIC SOILS	MISCELLANEOUS SYMBOLS AND ABBREVIATIONS				
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL & SAND SAND	FINE SILTY OR CLAYEY GRAVEL AND SAND	SILT CLAYEY SOILS	ROADWAY EMBANKMENT WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS INFERRED SOIL BOUNDARIES STRIKE AND DIP APPARENT DIP (NORMAL TO _____) ROD SOUNDING				
TEXTURE OR GRAIN SIZE				ABBREVIATIONS				
BOULDER	COBBLE	GRAVEL	COARSE SAND MED. SAND FINE SAND	SILT	CLAY	SPT TEST BORING AUGER BORING CORE BORING PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE MONITORING WELL		
GRAIN (mm)	305	75	2 0.6 0.425 0.2 0.075 0.005	ALLUV. ALLUVIUM AR AUGER REFUSAL BLDR. BOULDER CALC. CALCAREOUS CL. CLAY CLY. CLAYEY COB. COBBLE CSE. COARSE DPT DYNAMIC PENETRATION TEST EST. ESTIMATED F. FINE FOSS. FOSSILIFEROUS FRAC. FRACTURED FRAG(S). FRAGMENT(S) GR. GRAVEL GS. SPECIFIC GRAVITY GW. GROUND WATER MED. MEDIUM MIC. MICACEOUS MOT. MOTTLED N. BLOWS / 30 CM NS. NO SAMPLE TAKEN ORG. ORGANIC REF. REFER TO RES. RESIDUAL S. SOFT SAT. SATURATED SD. SAND SDY. SANDY SED(S). SEDIMENT(S) SL. SILT, SILTY SLI. SLIGHTLY SPT STANDARD PENETRATION TEST TS. TOPSOIL VST. VANE SHEAR TEST V. VERY W/ WITH				
SIZE (IN)	12	3	SOIL MOISTURE - CORRELATION OF TERMS				BENCH MARK: BL-6 IRON PIN WITH CAP AT -BL- STA 12+50.957; EL= 665.982m	
SOIL MOISTURE - CORRELATION OF TERMS				STATE PROJECT NO. 8.1900401 T.I.P. NO. B-1443 F.A. NO. COUNTY MITCH-YANCEY ROUTE NC-197 SITE DESCRIPTION BRIDGE NO.61 OVER NORTH TOE RIVER PROJECT GEOLOGIST CAD SUBMITTED BY GLASS PERSONNEL LOCKAMY CHEEK SMITH DATE SUBMITTED FEB '00				
SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION		CORE RECOVERY (REC.) - TOTAL LENGTH OF ROCK RECOVERED IN THE CORE BARREL DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%. ROCK QUALITY DESIGNATION (ROD) - TOTAL LENGTH OF SOUND ROCK SEGMENTS RECOVERED THAT ARE LONGER THAN OR EQUAL TO 10 cm DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.				
LL LIQUID LIMIT	-SATURATED- (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE		SEAL 1004 GEOLOGIST CHARLES ANDREWS DUNNAGAN Signature				
PLASTIC RANGE (PI) PL PLASTIC LIMIT	-WET- (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE		SEAL 1004 GEOLOGIST CHARLES ANDREWS DUNNAGAN Signature				
OM OPTIMUM MOISTURE	-MOIST- (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE		SEAL 1004 GEOLOGIST CHARLES ANDREWS DUNNAGAN Signature				
SL SHRINKAGE LIMIT	-DRY- (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		SEAL 1004 GEOLOGIST CHARLES ANDREWS DUNNAGAN Signature				
ROCK DESCRIPTION				HARD ROCK (HR) CORED ROCK WEATHERED ROCK (WR) HARD WEATHERED ROCK (HWR) WEATHERED ROCK (WR) SOFT WEATHERED ROCK (SWR)				

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.

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.

LEGEND SUPPLEMENT

In addition to the terms and abbreviations listed on the Legend Sheet, the following will be used to further describe rock quality on this project. Because of limited space on the logs, abbreviations are in parenthesis.

WEATHERING

Fresh	Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer in crystalline.
Very Slight (V. SLI.)	Rock generally fresh, joints stained, some joints may show thin clay coatings if open, crystals on a broken specimen face shine brightly. Rock rings under hammer blows if of a crystalline nature.
Slight (SLI.)	Rock generally fresh, joints stained and discoloration extends into rock up to 0.025 m (1 in.). Open joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored.
Moderate (MOD.)	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored, some show clay. Rock has dull sound under hammer blows and show significant loss of strength as compared with fresh rock.
Moderately Severe (MOD. SEV.)	All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and a majority show kaolinization. Rock shows severe loss of strength & can be excavated with geologist's pick. Rock gives "clunk" sound when struck. <u>Comparable to hard weathered rock.</u>
Severe (SEV.)	All rocks except quartz discolored or stained. Rock "fabric" clear and evident but reduced in strength to strong soil. In granitoid rocks all feldspars are kaolinized to some extent. Some fragments of strong rock usually remain. <u>Comparable to soft weathered rock.</u>
Very Severe (V. SEV.)	All rock except quartz discolored or stained. Rock fabric elements are discernible but the mass is effectively reduced to soil status, with only fragments of strong rock remaining. Saprolite is an example of rock weathered to a degree such that only minor vestiges of the original rock fabric remain. <u>Comparable to soil.</u>
Complete	Rock reduced to soil. Rock fabric not discernible only in small and scattered concentrations. Quartz may be present as dikes or stringers. Saprolite is also an example. <u>Comparable to soil.</u>

ROCK CONTINUITY

Sound	Core pieces larger than 0.20 m.
Slightly Fractured (SLI. FRAC.)-	Core pieces between 0.10 m and 0.20m.
Moderately Fractured (MOD. FRAC.) -	Core pieces between 0.025 m and 0.10 m.
Extremely Fractured (EXT. FRAC.) -	Core pieces less than 0.025 m.

JOINT SPACING

Average Discontinuity Spacing (ADS)

The average measured distance (in meters) between joints in the same set. Will not apply to individual joints.

JOINT THICKNESS

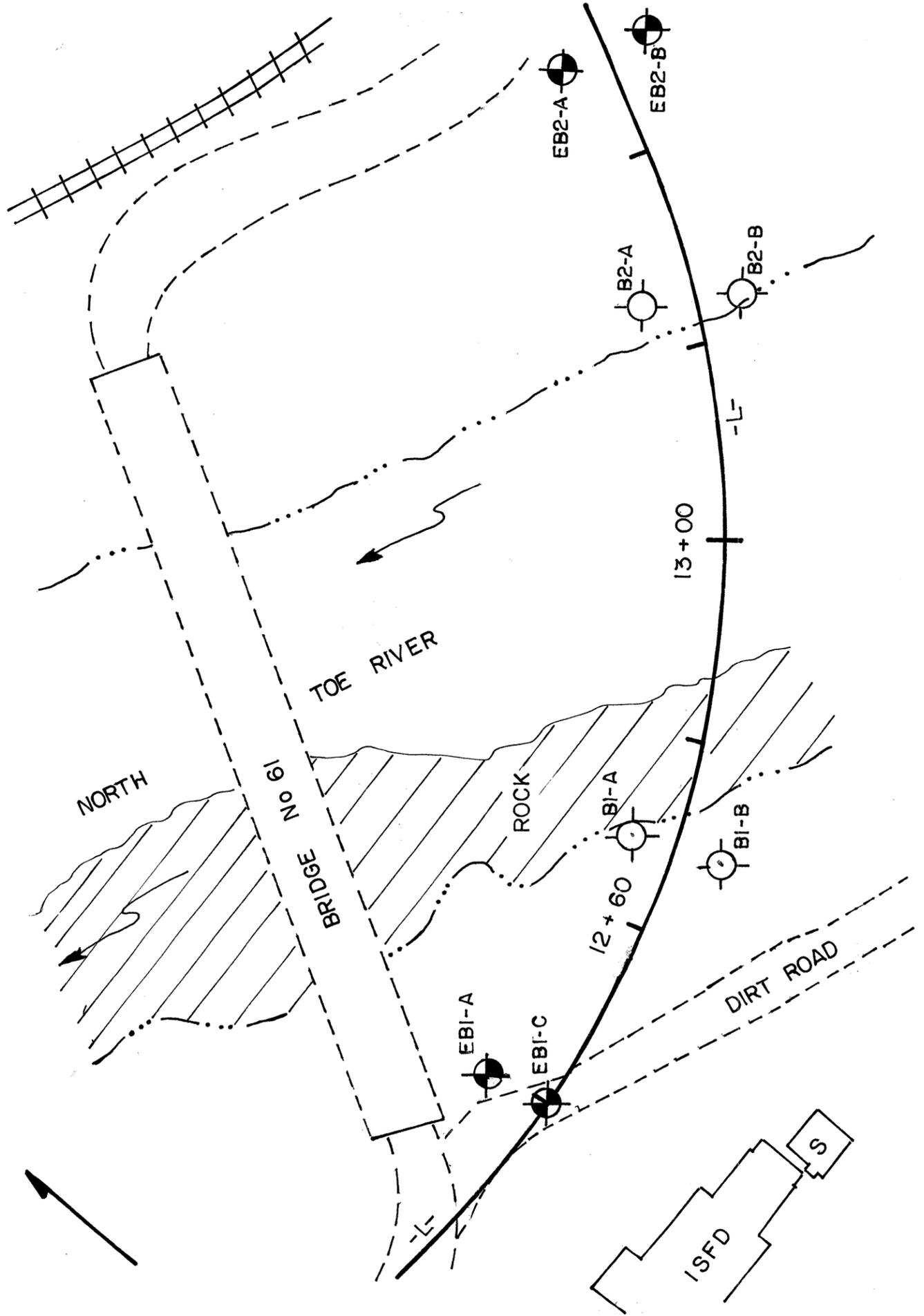
Average Discontinuity Thickness (ADT)

The average thickness or width of gap in the joint (in meters).

BRIDGE No 61 ON NC-197 OVER NORTH TOE RIVER

8.1900401 B-1443
MITCHELL-YANCEY CO

4 OF 25



CROSS SECTION THROUGH END BENT I

8.1900401
B-1443
50P25

E BI-B

12+40.000, Q

12+39.200
6.2mLT

FILL: RED-BRN
SANDY CLAY W/
BOULDERS FROM
1.96m.

3

SAPROLITE:
DARK BROWN SANDY
SILT

22

100+

REC's = 87% - 100%
RQD's = 60% - 100%

SAPROLITE: BROWN
SILTY SAND WITH
MICA AND OCC SEAMS
OF SWR

24

100+

SOFT TO HARD WEATHERED
ROCK

REC's = 47% - 100%
RQD's = 32% - 100%



666
664
662
660
658
656
654

CROSS SECTION ~~THROUGH~~ INTERIOR BENT 1
NEAR*

8.1900401
B-1443

60F25

12+69.200
4.90m RT

12+65.800,
♀

12+69.500
4.50m LT

ALLUVIUM: BROWN
SILTY SAND

3/00

3/00

660

658

656

654

652

REC's = 93% - 100%
RQD's = 78% - 100%

REC's = 75% - 100%
RQD's = 41% - 100%

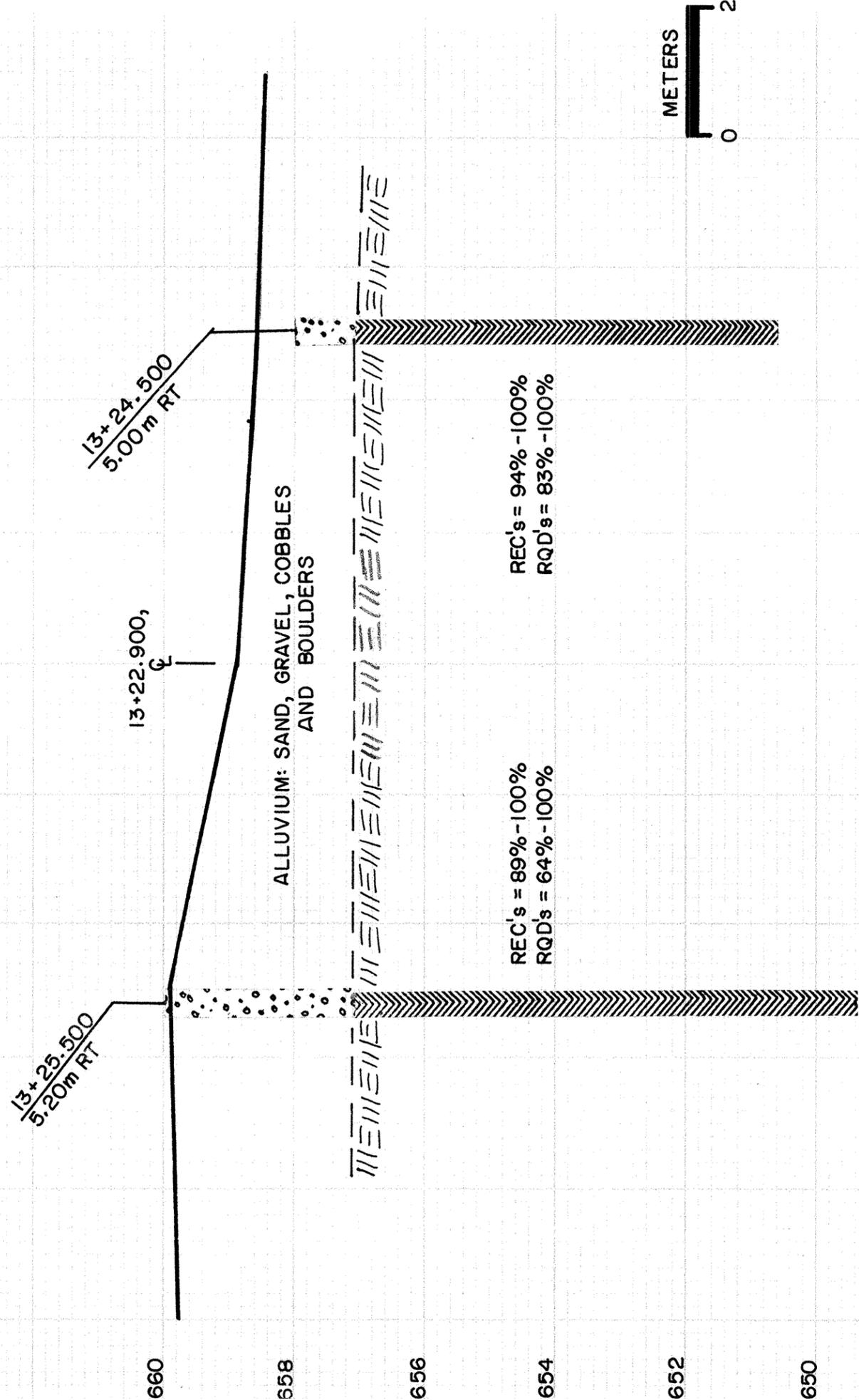


* BENT LOCATION WAS MOVED AFTER THE COMPLETION OF THE FIELD WORK

CROSS SECTION ~~THROUGH~~ INTERIOR BENT 2
NEAR*

8.1900401
B-1443

7 OF 25

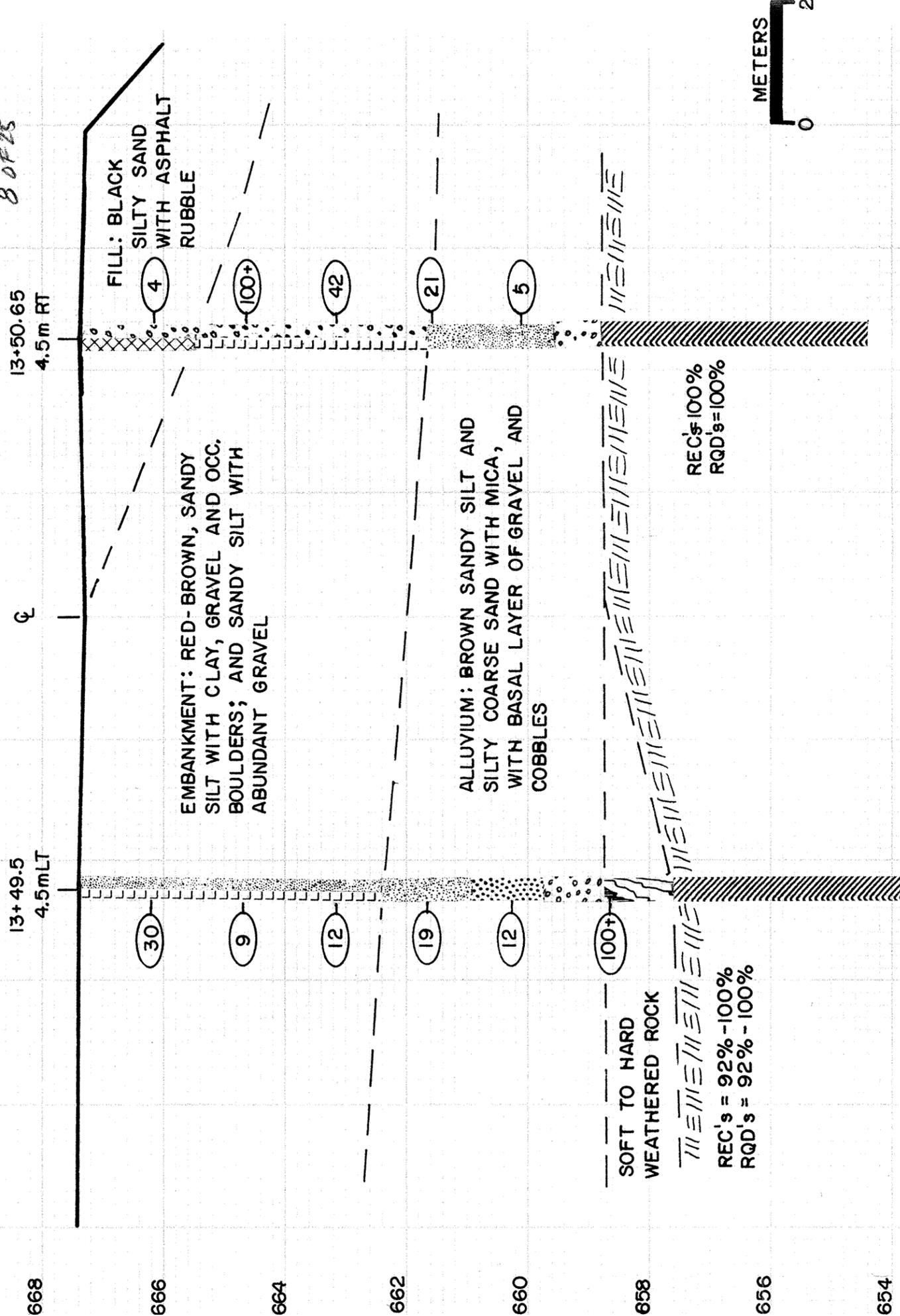


*BENT LOCATION WAS MOVED AFTER THE COMPLETION OF THE FIELD WORK

CROSS SECTION THROUGH END BENT 2

8.1900401 B-1443

80P25



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

9 OF 25

PROJECT NO 8.1900401		ID B-1443		COUNTY YANCEY-MITCHELL		GEOLOGIST P Q LOCKAMY							
SITE DESCRIPTION BRIDGE NO.61 ON NC-197 OVER NORTH TOE RIVER							GND WATER						
BORING NO EB1-A		NORTHING 0.00		EASTING 0.00			0 HR N/A						
ALIGNMENT -L-		BORING LOCATION 12+39.200		OFFSET 6.20m LT			24 HR N/A						
COLLAR ELEV 665.20m		TOTAL DEPTH 11.63m		START DATE 3/03/00		COMPLETION DATE 03/03/00							
DRILL MACHINE CME 550			DRILL METHOD CORE BORING			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log EB1-A, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN (m)	BLOWS PER 30cm				SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
		15cm	15cm	15cm		0	25	50	75				
665.20													
664.00	1.06	0	1	2	0.3								FILL: RED-BROWN SANDY CLAY WITH BOULDERS FROM 1.96M.
662.00	2.58	21	13	9	0.3					SS-2			SAPROLITE: ORAN TO DK GREEN-BLACK SANDY SILT.
660.00	4.11	100	0	0	0.1								SOFT WEATHERED ROCK
													CORE 1: 4.63 - 5.53 REC=87% RQD=60%
													CORE 2: 5.53 - 7.02 REC=100% RQD=100%
													CORE 3: 7.02 - 8.35 REC=100% RQD=100%
													CORE 4: 8.35 - 8.61 REC=100% RQD=100%
													CORE 5: 8.61 - 10.13 REC=95% RQD=95%
													CORE 6: 10.13 - 11.63 REC=100% RQD=100%
653.57													BORING TERMINATED AT ELEV 653.57 IN ROCK.

DATE 10-Mar-00

CORE BORING REPORT

PROJECT: 8.1900401 I. D. NO: B-1443 BORING NO: EB1-A GEOLOGIST: C. A. Dunnagan

DESCRIPTION: Bridge No.61 on NC-197 over North Toe River

COUNTY: Yancey-Mitchell COLLAR ELEVATION: 665.20 m TOTAL DEPTH: 11.63 m

ELEV. (m)	DEPTH (m)	DRILL RATE MIN./3 m	RUN (m)	REC. METERS %	RQD. METERS %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
660.57	4.63		0.90	0.78	0.54		Interlayers of wh granite gneiss and dk green-gray, fine grained amphibolite-biotite gneiss. Very slightly weathered. a) 2 parts along fol @ 35°, ADS=).53m ADT<0.001m w/ tr FeO stain. b) Run-time = 7.93min.
				87	60		
659.67	5.53		1.49	1.49	1.49		Fresh, dark green-gray amphibolite-biotite gneiss. Weakly foliated. a) Run-time = 8.38min.
659.67	5.53			100	100		
658.18	7.02		1.33	1.33	1.33		Interlayers of dk grn-gry, f grn amph-bio gneiss and lt gry granite gneiss. Very sli weath. Weakly foliated. (a) 1 part along fol @ 25°, ADS=NA ADT<0.001m w/ FeO stains. (b) 1 jnt @ 20°, ADS=NA ADT<0.001m. (c) 1 jnt @ 35°, ADS=NA ADT<0.001m w/ FeO stains. (d) Run-time = 7.85min.
658.18	7.02			100	100		
656.85	8.35		0.26	0.26	0.26		Fresh, light gray granite gneiss w/ interlayers of fine grained amphibolite-biotite gneiss. a) Run-time = 1.87min.
656.85	8.35			100	100		
656.59	8.61		1.52	1.44	1.44		Fresh interlayers of lt gry granite gneiss and dk grn-gry amph-bio gneiss. Trace pyrite on fol surfaces. a) 1 part along fol @ 25°, ADS=NA ADT<0.001m w/ tr pyr. b) Run-time = 8.73min.
656.59	8.61			95	95		
655.07	10.13		1.50	1.50	1.50		Fresh, light gray granite gneiss w/ occasional biotite-rich layers. a) Run-time = 6.62min.
655.07	10.13			100	100		
653.57	11.63						

CORING TERMINATED AT
ELEVATION 653.57 m

DRILLER: D. O. Cheek

CORE SIZE: NXWL

EQUIPMENT: CME-550

DATE 23-Feb-00

CORE BORING REPORT

PROJECT: 8.1900401 I. D. NO: B-1443 BORING NO: EB1-C GEOLOGIST: C. A. Dunnagan

DESCRIPTION: Bridge No. 61 on NC-197 over North Toe River

COUNTY: Yancey-Mitchell COLLAR ELEVATION: 666.40 m TOTAL DEPTH: 11.67 m

ELEV. (m)	DEPTH (m)	DRILL RATE MIN./3 m	RUN (m)	REC. METERS %	RQD. METERS %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
663.13	3.27		0.85	0.68	0.27		Hard sap from 3.35m to 3.57m. Sli to mod weath, dk grn-gry amph-bio gneiss. V weakly fol. Med grain. (a) 2 jnts @ 30°, ADS=0.21m ADT=0.001m w/ clay infill. b) 2 jnts @ 10°, ADS=0.20m ADT=0.001 w/ clay infilling. c) 1 jnt @ 0°, ADS=NA ADT<0.001m. d) Run-time = 2.00min.
662.28	4.12			80	32		
662.28	4.12		1.52	1.11	0.83		Sli to mod weath, dk grn-gry amphibole-biotite gneiss. Weakly foliated. Medium grained. a) 4 jnts @ 30°, ADS=0.41m ADT<0.001m. b) 1 jnt @ 0°, ADS=NA ADT<0.001m. c) Run-time = 4.62min.
660.76	5.64			73	55		
660.76	5.64		1.52	0.72	0.60		Sli to mod weath, dk grn-gry, medium grained amph-bio gneiss to 7.07m. From 7.07m sli to mod weath, lt gry diorite gneiss. a) 3 parts along fol @ 40°, ADS=0.30m ADT=0.001m w/ clay infilling. b) 1 jnt @ 20°, ADS=NA ADT<0.001m. c) Run-time = 5.35min.
659.24	7.16			47	39		
659.24	7.16		1.52	1.10	0.59		Sli to mod weath, lt gry, med to coarse grained granite gneiss to 8.08m. From 8.08m sli to mod weath, lt gry, fine grained diorite gneiss. Mostly rubble to 8.08m. a) 2 jnts @ 35°, ADS=0.09m ADT<0.001m. (b) 1 part along foliation @ 10°, ADS=NA ADT<0.001m. (c) 8 joints @ 5°, ADS=0.05m ADT<0.001m. d) Run-time = 6.58min.
657.72	8.68			72	39		
657.72	8.68		1.47	1.47	1.47		Fresh, light gray, diorite gneiss. Fine grained. a) 3 partings along foliation @ 20°, ADS=0.020m ADT<0.001m. b) Run-time = 6.78min.
656.25	10.15			100	100		
656.25	10.15		1.52	1.52	1.52	RS-3	From 10.15m to 10.48m: fresh, lt gry, f grn diorite gneiss. From 10.48m to 11.67m: fresh, dk grn-gry, f-m grained amph-bio gneiss w/ tr pyr along fol. a) 1 jnt @ 10°, ADS=NA ADT<0.001m (b) 1 jnt @ 80°, ADS=NA ADT<0.001m w/ tr FeO. (c) 1 part along fol @ 25°, ADS=NA ADT<0.001m w/ tr pyrite. d) Run-time = NA.
654.73	11.67			100	100		

CORING TERMINATED AT
ELEVATION 654.73 m

DRILLER: D. O. Cheek

CORE SIZE: NXWL

EQUIPMENT: CME-550

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

13 of 25

PROJECT NO 8.1900401		ID B-1443		COUNTY YANCEY-MITCHELL		GEOLOGIST P Q LOCKAMY								
SITE DESCRIPTION BRIDGE NO.61 ON NC-197 OVER NORTH TOE RIVER							GND WATER							
BORING NO B1-A		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT -L-		BORING LOCATION 12+69.500		OFFSET 4.50m LT		24 HR N/A								
COLLAR ELEV 658.34m		TOTAL DEPTH 7.02m		START DATE 3/07/00		COMPLETION DATE 03/07/00								
DRILL MACHINE CME 550			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B1-A, Page 1 of 1								
ELEV	DEPTH	BLOW CT			PEN (m)	BLOWS PER 30cm					SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION	
		15cm	15cm	15cm		0	25	50	75	100				
658.34														
														Ground Surface
657.00														CORE 1: 0.0 - 1.07 REC=93% RQD=93%
														CORE 2: 1.07 - 2.55 REC=94% RQD=78%
655.00														CORE 3: 2.55 - 4.11 REC=99% RQD=75%
														CORE 4: 4.11 - 5.59 REC=100% RQD=100%
653.00														CORE 5: 5.59 - 7.02 REC=100% RQD=100%
651.32														BORING TERMINATED AT ELEV 651.32 IN ROCK

DATE 10-Mar-00

CORE BORING REPORT

PROJECT: 8.1900401 I. D. NO: B-1443 BORING NO: B1-A GEOLOGIST: C. A. Dunnagan

DESCRIPTION: Bridge No.61 on NC-197 over North Toe River

COUNTY: Yancey-Mitchell COLLAR ELEVATION: 658.34 m TOTAL DEPTH: 7.02 m

ELEV. (m)	DEPTH (m)	DRILL RATE MIN./3 m	RUN (m)	REC. METERS %	RQD. METERS %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
658.34	0.00		1.07	1.00	0.99		Sli weath interlayers of lt gry granite gneiss and dk gry, fine grained amphibolite-biotite gneiss. a) 1 jnt @ 35°, ADS=NA ADT<0.001m w/ FeO stains. b) Run-time = 4.62min.
				93	93		
657.27	1.07		1.48	1.39	1.16		Sli weath interlayers of lt gry granite gneiss and dk grn-gry amphibolite-biotite gneiss. a) 1 jnt @ 40°, ADS=NA ADT<0.001m w/FeO stains. b) 3 parts along fol @ 28°, ADS=0.30m ADT<0.001m w/ tr FeO stains. c) Run-time = 6.90min.
657.27	1.07			94	78		
655.79	2.55		1.56	1.54	1.17		Mod to sli weath, tan to lt gray granite gneiss w/ occ interlayers of dk grn-gry amph-bio gneiss. a) 7 parts along fol @ 35°-50°, ADS=0.14m ADT<0.001m w/ occ FeO stains. b) 1 jnt @ 10°, ADS=NA ADT<0.001m. c) Run-time = 10.53min.
655.79	2.55			99	75		
654.23	4.11		1.48	1.48	1.48		Sli weath to fresh, gray granite gneiss w/ dk grn-gry, f grn amph-bio gneiss from 5.16m. (a) 1 jnt @ 20°, ADS=NA ADT<0.001m w/ trace pyrite. b) 1 jnt @ 30°, ADS=NA ADT<0.001m. c) 1 part along fol @ 20°, ADS=NA ADT<0.001m. d) Run-time = 9.03min.
654.23	4.11			100	100		
652.75	5.59		1.43	1.43	1.43		Fresh interlayers of light gray granite gneiss and dark green-gray amphibolite-biotite gneiss. a) Run-time = 8.70min.
652.75	5.59			100	100		
651.32	7.02						

CORING TERMINATED AT
ELEVATION 651.32 m

DRILLER: D. O. Cheek

CORE SIZE: NXWL

EQUIPMENT: CME-550

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

15 OF 25

PROJECT NO 8.1900401		ID B-1443		COUNTY YANCEY-MITCHELL		GEOLOGIST P Q LOCKAMY								
SITE DESCRIPTION BRIDGE NO.61 ON NC-197 OVER NORTH TOE RIVER							GND WATER							
BORING NO B1-B		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT -L-		BORING LOCATION 12+69.200		OFFSET 4.90m RT		24 HR 2.00m								
COLLAR ELEV 660.65m		TOTAL DEPTH 8.59m		START DATE 3/03/00		COMPLETION DATE 03/03/00								
DRILL MACHINE CME 550			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B1-B, Page 1 of 1								
ELEV	DEPTH	BLOW CT			PEN (m)	BLOWS PER 30cm					SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION	
		15cm	15cm	15cm		0	25	50	75	100				
660.65														
660.00														Ground Surface
658.00														ALLUVIUM: BROWN SILTY SAND
														CORE 1: 0.33 - 0.99 REC=100% RQD=100%
														CORE 2: 0.99 - 2.51 REC=74% RQD=41%
656.00														CORE 3: 2.51 - 4.03 REC=75% RQD=46%
														CORE 4: 4.03 - 5.55 REC=93% RQD=53%
654.00														CORE 5: 5.55 - 7.07 REC=97% RQD=82%
														CORE 6: 7.07 - 8.59 REC=97% RQD=90%
652.06														BORING TERMINATED AT ELEV 652.06 IN ROCK.

160F25

DATE 06-Mar-00

CORE BORING REPORT

PROJECT: 8.1900401 I. D. NO: B-1443 BORING NO: B1-B GEOLOGIST: C. A. Dunnagan

DESCRIPTION: Bridge No.61 on NC-197 over North Toe River

COUNTY: Yancey-Mitchell COLLAR ELEVATION: 660.65 m TOTAL DEPTH: 8.59 m

ELEV. (m)	DEPTH (m)	DRILL RATE MIN./3 m	RUN (m)	REC. METERS %	RQD. METERS %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
660.32	0.33		0.66	0.66	0.66	RS-4	Dark grn-gry amphibolite-biotite gneiss. Very slightly weathered. Weakly foliated. a) 1 part along fol @ 30°, ADS=NA ADT<0.001m w/ FeO stains. b) Run-time = 4.70min.
659.66	0.99			100	100		
659.66	0.99		1.52	1.13	0.62		Sli weath, dk grn-gry amph-bio gneiss. Weakly foliated w/ mod sev weatherde seam from 1.54m to 1.85m. a) 7 parts along fol @ 30°, ADS=0.07m ADT<0.001m w/ FeO stains. b) 1 jnt @ 20°, ADS=NA ADT<0.001m w/ FeO stains. c) Run-time = 7.75min.
658.14	2.51			74	41		
658.14	2.51		1.52	1.14	0.70		Dk grn-gry, f grn amph-bio granulite (occ weakly foliated) and white granite gneiss. Slightly weathered. Contact btween two at 3.00m. a) 5 parts along fol @ 35°, ADS=0.10m ADT<0.001m w/ FeO stains. b) 2 jnts @ 10°, ADS=0.18m ADT<0.001m. c) Run-time = 8.35min.
656.62	4.03			75	46		
656.62	4.03		1.52	1.41	0.81		Moderately weathered, light gray granite gneiss. a) 3 jnts @ 35°, ADS=0.09m ADT=0.001m w/ FeO infill. b) 5 parts along fol @ 40°, ADS=0.17m ADT<0.001m. c) Run-time = 9.18min.
655.10	5.55			93	53		
655.10	5.55		1.52	1.48	1.25		Sli weath, dk grn-gry amph-bio gneiss w/ occ granulite interlayers. a) 1 part along fol @ 50°, ADS=NA ADT<0.001m. b) 2 jnts @ 25°, ADS=0.10m ADT<0.001m w/ tr FeO stain. c) 2 jnts @ 0°, ADS=0.07m ADT<0.001m w/ tr FeO stains. d) Run-time = 6.25min.
653.58	7.07			97	82		
653.58	7.07		1.52	1.48	1.37		Sli weath, dk grn-gry amph-bio gneiss grading to lt gray granite gneiss. a) 1 jnt @ 40°, ADS=NA ADT<0.001m w/ FeO stains. b) 3 parts along fol @ 25°, ADS=.17m ADT<0.001m w/ FeO stains. c) Run-time = 6.63min.
652.06	8.59			97	90		

CORING TERMINATED AT
ELEVATION 652.06 m

DRILLER: D. O. Cheek

CORE SIZE: NXWL

EQUIPMENT: CME-550

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

17 OF 25

PROJECT NO 8.1900401		ID B-1443		COUNTY YANCEY-MITCHELL		GEOLOGIST P Q LOCKAMY								
SITE DESCRIPTION BRIDGE NO.61 ON NC-197 OVER NORTH TOE RIVER							GND WATER							
BORING NO B2-A		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT -L-		BORING LOCATION 13+25.500		OFFSET 5.20m LT		24 HR N/A								
COLLAR ELEV 659.85m		TOTAL DEPTH 10.60m		START DATE 2/14/00		COMPLETION DATE 02/14/00								
DRILL MACHINE CME 550			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B2-A, Page 1 of 1								
ELEV	DEPTH	BLOW CT			PEN (m)	BLOWS PER 30cm					SAMPLE NO	LOG MOI	SOIL AND ROCK DESCRIPTION	
		15cm	15cm	15cm		0	25	50	75	100				
659.85														
659.00														ALLUVIUM: SAND, GRAVEL AND BOULDERS.
657.00														CORE 1: 2.84 - 3.02 REC=89% RQD=89%
														CORE 2: 3.02 - 4.54 REC=90% RQD=64%
655.00														CORE 3: 4.54 - 6.04 REC=100% RQD=100%
653.00														CORE 4: 6.04 - 7.56 REC=98% RQD=94%
651.00														CORE 5: 7.56 - 9.08 REC=99% RQD=93%
649.25														CORE 6: 9.08 - 10.60 REC=100% RQD=100%
														BORING TERMINATED AT ELEV 649.25 IN ROCK.

180F25

DATE 16-Feb-00

CORE BORING REPORT

PROJECT: 8.1900401 I. D. NO: B-1443 BORING NO: B2-A GEOLOGIST: C. A. Dunnagan

DESCRIPTION: Bridge No. 61 on NC-197 over North Toe River

COUNTY: Yancey/Mitchell COLLAR ELEVATION: 659.85 m TOTAL DEPTH: 10.60 m

ELEV. (m)	DEPTH (m)	DRILL RATE MIN / 3 m	RUN (m)	REC. METERS %	RQD. METERS %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
657.01	2.84		0.18	0.16	0.16		Dark gray, fresh amphibole granulite. Fine grained. a) Run-time = 1.35min.
				89	89		
656.83	3.02						
656.83	3.02		1.52	1.37	0.97		Gray to dark gray, v sli weath amphibole granulite. Predominately medium grained. Minor amts of pyrite; occ quartz veins. (a) 3 jnts @ 20°, ADS=0.08m ADT<0.001m w/ FeO stains. (b) 2 jnts @ 30°, ADS=0.24m ADT<0.001m w/ FeO staining. (c) Run-time = 5.10min.
				90	64		
655.31	4.54						
655.31	4.54		1.50	1.50	1.50		Dk green-gray, fresh amphibole granulite. Gneissic in places. Predominately medium grained w/ occ fine grained layers and quartz veins. a) 1 jnt @ 35°, ADS=NA ADT<0.001m. b) 1 part along fol(ilt?) @ 60°, ADS=NA ADT<0.001m. c) Run-time = 4.33min.
				100	100		
653.81	6.04						
653.81	6.04		1.52	1.49	1.43		Dk gray amph granulite. Med to coarse grained from 6.04m to 6.16m; otherwise fine grained. Occ qtz veins. V sli weath (a) 1 jnt @ 40°, ADS = NA ADT<0.001m. b) 1 jnt @ 25°, ADS=NA ADT<0.001m. (c) 2 jnts @ 5°, ADS=0.03m ADS<0.001m w/ Mn stains. (d) Run-time = 6.00min.
				98	94		
652.29	7.56						
652.29	7.56		1.52	1.50	1.42		Dark gray amphibole granulite. Very slightly weathered with fine and medium grained zones interlayered. a) 6 joints @ 0°- 20°, ADS = 0.15m ADT<0.001m w/ occ Mn staining. b) 1 joint @ 55°, ADS=NA ADT<0.001m. c) Run-time = 5.75min.
				99	93		
650.77	9.08						
650.77	9.08		1.52	1.52	1.52		Interlayers of dark gray fine grained amphibole granulite and dark green-gray medium grained amphibole/biotite granulite. Fresh and occasionally gneissic. a) 1 joint @ 45°, ADS=NA ADT<0.001m. b) Run-time = 5.00min.
				100	100		
649.25	10.60						

CORING TERMINATED AT
ELEVATION 649.25 m

DRILLER: D. O. Cheek

CORE SIZE: NXWL

EQUIPMENT: CME-550

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

19 OF 25

PROJECT NO 8.1900401		ID B-1443		COUNTY YANCEY-MITCHELL		GEOLOGIST P Q LOCKAMY							
SITE DESCRIPTION BRIDGE NO.61 OVER NORTH TOE RIVER							GND WATER						
BORING NO B2-B		NORTHING 0.00		EASTING 0.00		0 HR N/A							
ALIGNMENT -L-		BORING LOCATION 13+24.500		OFFSET 5.00m RT		24 HR N/A							
COLLAR ELEV 658.01m		TOTAL DEPTH 7.44m		START DATE 2/17/00		COMPLETION DATE 02/17/00							
DRILL MACHINE CME 550			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC							
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B2-B, Page 1 of 1							
ELEV	DEPTH	BLOW CT			PEN (m)	BLOWS PER 30cm				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION	
		15cm	15cm	15cm		0	25	50	75				100
658.01													
													Ground Surface
657.00										RS-2			ALLUVIUM: SAND, GRAVEL AND COBBLES.
													CORE 1: 0.92 - 1.38 REC=96% RQD=96%
													CORE 2: 1.38 - 2.90 REC=94% RQD=83%
655.00													CORE 3: 2.90 - 4.24 REC=99% RQD=94%
													CORE 4: 4.24 - 5.67 REC=98% RQD=98%
653.00													CORE 5: 5.67 - 5.97 REC=100% RQD=100%
													CORE 6: 5.97 - 7.44 REC=99% RQD=92%
651.00													
650.57													BORING TERMINATED AT ELEV 650.57 IN ROCK.

200P25

DATE 21-Feb-00

CORE BORING REPORT

PROJECT: 8.1900401 I. D. NO: B-1443 BORING NO: B2-B GEOLOGIST: C. A. Dunnagan

DESCRIPTION: Bridge No. 61 on NC-197 over North Toe River

COUNTY: Yancey-Mitchell COLLAR ELEVATION: 658.01 m TOTAL DEPTH: 7.44 m

ELEV. (m)	DEPTH (m)	DRILL RATE MIN./3 m	RUN (m)	REC. METERS %	RQD. METERS %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
657.09	0.92		0.46	0.44 96	0.44 96	RS-2	Fresh, dark green-gray amphibole-biotite gneiss. Medium to fine grained w/ trace amounts of pyrite. A quartz vein is present. a) 1 parting along fol @ 50°, ADS=NA ADT<0.001m. b) Run-time = NA.
656.63	1.38						
656.63	1.38		1.52	1.43 94	1.26 83		V sli weath, dk gry amph-bio gneiss. V weakly foliated. Coarse graine from 1.38m to 1.56m, otherwise f to m grained. Pyr abun on some disc faces. (a) 5 jnts @ 20°, ADS=0.24m ADT<0.001m w/ tr FeO. (b) 1 jnt @ 65°, ADS=NA ADT<0.001m. (c) 1 jnt @ 80°, ADS=NA ADT=0 to 0.010m w/ qtz infil and abun pyr on face. (d) Run-time = 4.97min.
655.11	2.90						
655.11	2.90		1.34	1.32 99	1.26 94		V sli weath, dk grn-gray amphibole-biotite gneiss. Very weakly foliated. Coarse grained. a) 1 jnt @ 40°, ADS=NA ADT=0.001m w/ FeO staining. b) 1 jnt (flt?) @ 50°, ADS=NA ADT=0.001m. c) Run-time = 5.35min.
653.77	4.24						
653.77	4.24		1.43	1.40 98	1.40 98		Fresh, dark gray amphibole granulite w/ biotite. Fine grained with trace of pyrite. a) 1 jnt @ 10°, ADS=NA ADT<0.001m. b) Run-time = 7.35min.
652.34	5.67						
652.34	5.67		0.30	0.30 100	0.30 100		Fresh, dark green-gray amphibole-biotite granulite. Fine to coarse grained. a) 1 joint @ 20°, ADS=NA ADT<0.001m. b) Run-time = 1.35min.
652.04	5.97						
652.04	5.97		1.47	1.45 99	1.35 92		Fresh, dk grn-gray amphibole-biotite granulite. Occasionally weakly foliated. Interlayers of fine and coarse grained zones. Trace of pyrite. a) 3 joints @ 30°, ADS=0.13m ADT<0.001m w/ trace pyrite. b) 1 jnt @ 50°, ADS=NA ADT=0.001m w/ qtz infilling. c) Run-time = 6.40min.
650.57	7.44						

CORING TERMINATED AT
ELEVATION 650.57 m

DRILLER: D. O. Cheek CORE SIZE: NXWL EQUIPMENT: CME-550

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

21 OF 25

PROJECT NO 8.1900401		ID B-1443		COUNTY YANCEY-MITCHELL		GEOLOGIST P Q LOCKAMY								
SITE DESCRIPTION BRIDGE NO.61 ON NC-197 OVER NORTH TOE RIVER							GND WATER							
BORING NO EB2-A		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT -L-		BORING LOCATION 13+49.650		OFFSET 4.50m LT		24 HR N/A								
COLLAR ELEV 667.46m		TOTAL DEPTH 13.66m		START DATE 2/08/00		COMPLETION DATE 02/08/00								
DRILL MACHINE CME 550			DRILL METHOD CORE BORING			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log EB2-A, Page 1 of 1								
ELEV	DEPTH	BLOW CT			PEN (m)	BLOWS PER 30cm					SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION	
		15cm	15cm	15cm		0	25	50	75	100				
667.46														
667.00														
	1.18	15	23	7	0.3									EMBANKMENT: RED-BROWN SANDY SILT WITH CLAY, GRAVEL AND OCC BOULDERS.
665.00	2.70	4	5	4	0.3									SS-1
663.00	4.23	4	6	6	0.3									
661.00	5.74	3	12	7	0.3									ALLUVIUM: BROWN SANDY SILT W/ TR GRAVEL
	7.26	4	6	6	0.3									ALLUVIUM: SILTY COARSE SAND WITH MICA
659.00	8.79	100	0	0	0.1									ALLUVIUM: GRAVEL AND COBBLES
														SOFT TO HARD WEATHERED ROCK
657.00														CORE 1: 9.80 - 10.73 REC=92% RQD=92%
														CORE 2: 10.73 - 12.18 REC=100% RQD=100%
655.00														CORE 3: 12.18 - 13.66 REC=100% RQD=100%
653.80														
														BORING TERMINATED AT ELEV 653.80 IN ROCK.

DATE 15-Feb-00

CORE BORING REPORT

PROJECT: 8.1900401 I. D. NO: B-1443 BORING NO: EB2-A GEOLOGIST: C. A. Dunnagan

DESCRIPTION: Bridge No. 61 on NC-197 over North Toe River

COUNTY: Yancey-Mitchell COLLAR ELEVATION: 667.46 m TOTAL DEPTH: 13.66 m

ELEV. (m)	DEPTH (m)	DRILL RATE MIN./3 m	RUN (m)	REC. METERS %	RQD. METERS %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
657.66	9.80		0.93	0.86	0.86	RS-1	Fresh, dark green-gray biotite-amphibole gneiss with zones that appear brecciated. Medium grained with occasional fine grained layers.
				92	92		
656.73	10.73		1.45	1.45	1.45		Fresh, dark green-gray biotite-amphibole gneiss with zones that appear brecciated. Medium grained with occasional fine grained layers. Trace pyrite.
656.73	10.73			100	100		
655.28	12.18		1.48	1.48	1.48		Fresh, dark green-gray biotite biotite-amphibole with zones that appear brecciated. Medium grained with occasional fine grained layers.
655.28	12.18			100	100		
653.80	13.66						

CORING TERMINATED AT
ELEVATION 653.80 m

DRILLER: D. O. Cheek CORE SIZE: NXWL EQUIPMENT: CME-550

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

23 OF 25

PROJECT NO 8.1900401		ID B-1443		COUNTY YANCEY-MITCHELL		GEOLOGIST P Q LOCKAMY						
SITE DESCRIPTION BRIDGE NO.61 ON NC-197 OVER NORTH TOE RIVER							GND WATER					
BORING NO EB2-B		NORTHING 0.00		EASTING 0.00		0 HR N/A						
ALIGNMENT -L-		BORING LOCATION 13+50.650		OFFSET 4.50m RT		24 HR N/A						
COLLAR ELEV 667.43m		TOTAL DEPTH 13.05m		START DATE 2/09/00		COMPLETION DATE 02/09/00						
DRILL MACHINE CME 550			DRILL METHOD CORE BORING			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log EB2-B, Page 1 of 1						
ELEV	DEPTH	BLOW CT			PEN (m)	BLOWS PER 30cm				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION
		15cm	15cm	15cm		0	25	50	75			
667.43												
667.00												
	1.18	5	2	2	0.3							FILL: BLACK SILTY SAND WITH ASPHALT RUBBLE.
665.00	2.70	100	0	0	0.1							EMBANKMENT: RED-BROWN SANDY SILT WITH ABUN GRAVEL.
663.00	4.23	9	15	27	0.3							
661.00	5.74	6	6	15	0.3							ALLUVIUM: BROWN SANDY SILT WITH GRAVEL AND MICA.
659.00	7.26	2	3	2	0.3							ALLUVIUM: GRAVEL AND COBBLES.
												CORE 1: 8.65 - 10.10 REC=100% RQD=100%
657.00												CORE 2: 10.10 - 11.54 REC=100% RQD=100%
655.00												CORE 3: 11.54 - 13.05 REC=100% RQD=100%
654.38												BORING TERMINATED AT ELEV 654.38 IN ROCK.

24 OF 25

SHEET 1 OF 1

DATE 15-Feb-00

CORE BORING REPORT

PROJECT: 8.1900401 I. D. NO: B-1443 BORING NO: EB2-B GEOLOGIST: C. A. Dunnagan

DESCRIPTION: Bridge No. 61 on NC-197 over North Toe River

COUNTY: Yancey-Mitchell COLLAR ELEVATION: 667.43 m TOTAL DEPTH: 13.05 m

ELEV. (m)	DEPTH (m)	DRILL RATE MIN./3 m	RUN (m)	REC. METERS %	RQD. METERS %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
659.39	8.04		0.61	N/A	N/A		Alluvial cobbles and boulders with sand. Possible contact between alluvium and moderately severely weathered rock at 8.60m.
				#####	#####		
658.78	8.65		1.45	1.45	1.45		Fresh, dark greenish-gray biotite-amphibole gneiss. Predominately medium grained with fine grained layer from 8.89m to 9.16m.
658.78	8.65			100	100		
657.33	10.10		1.44	1.44	1.44		Fresh, dark greenish-gray biotite-amphibole gneiss; medium grained.
657.33	10.10			100	100		
655.89	11.54		1.51	1.51	1.51		Fresh, dark greenish-gray biotite-amphibolite gneiss. Medium grained from 11.54m to 11.82m; fine grained from 11.82m to 13.05m.
655.89	11.54			100	100		
654.38	13.05						

CORING TERMINATED AT
ELEVATION 654.38 m

DRILLER: D. O. Cheek

CORE SIZE: NXWL

EQUIPMENT: CME-550

PROJECT: 8.1900401 ID: B-1443 COUNTY: YANCEY-MITCHELL

DESCRIPTION(1): BRIDGE NO. 61 ON NC-197 OVER NORTH TOE RIVER

INFORMATION ON EXISTING BRIDGES Information obtained from field inspection
 microfilm (Reel: Position:)
 other HYDRAULIC DESIGN REPORT

COUNTY BRIDGE NO. 61 BRIDGE LENGTH 81.5m NO. BENTS 4 NO. BENTS IN: CHANNEL 2, FLOOD PLAIN 2

FOUNDATION TYPE: FOOTINGS

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: NONE

INTERIOR BENTS: NONE

CHANNEL BED: NONE

CHANNEL BANKS: MINOR AMOUNTS

EXISTING SCOUR PROTECTION:

TYPE(3): BOULDER RIP-RAP ON END BENT 2 SLOPES.

EXTENT(4): APPROXIMATELY 30 METERS UPSTREAM AND DOWN.

EFFECTIVENESS(5): VERY GOOD

OBSTRUCTIONS(6) (DAMS, DEBRIS, ETC.): LOG(S) PILED AGAINST UPSTREAM SIDE OF INTERIOR BENT 2.

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): IN-PLACE ROCK INTERSPERSED WITH AREAS OF ALLUVIAL GRAVEL, COBBLES AND BOULDERS.

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED):

FOUNDATION BEARING MATERIAL(9): ROCK

CHANNEL BANK COVER(10): TREES AND SHRUBS.

FLOOD PLAIN WIDTH(11): LESS THAN 50 METERS ON EITHER SIDE OF RIVER.

FLOOD PLAIN COVER(12): SHRUBS, ROADWAY AND OCCASIONAL TREES.

STREAM IS DEGRADING AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS: THE EXISTING BRIDGE IS IN AN ADVANCED STATE OF DECAY AND
CRUMBLING.

CHANNEL MIGRATION TENDENCY(14): TOWARDS THE NORTH.

CRITICAL SCOUR ELEVATIONS(15):

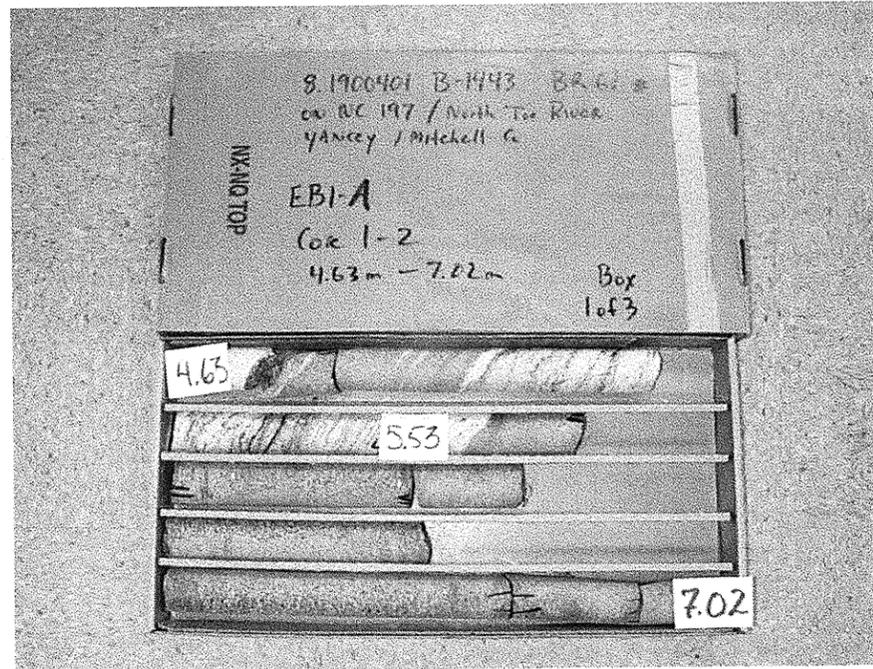
EB1-A:	661.0	B2-A:	657.0
EB1-B:	664.0	B2-B:	657.0
B1-A:	658.2	EB2-A:	658.7
B1-B:	660.2	EB2-B:	658.7

REPORTED BY: C. A. DUNNAGAN, TEG-III

DATE 2-2-00

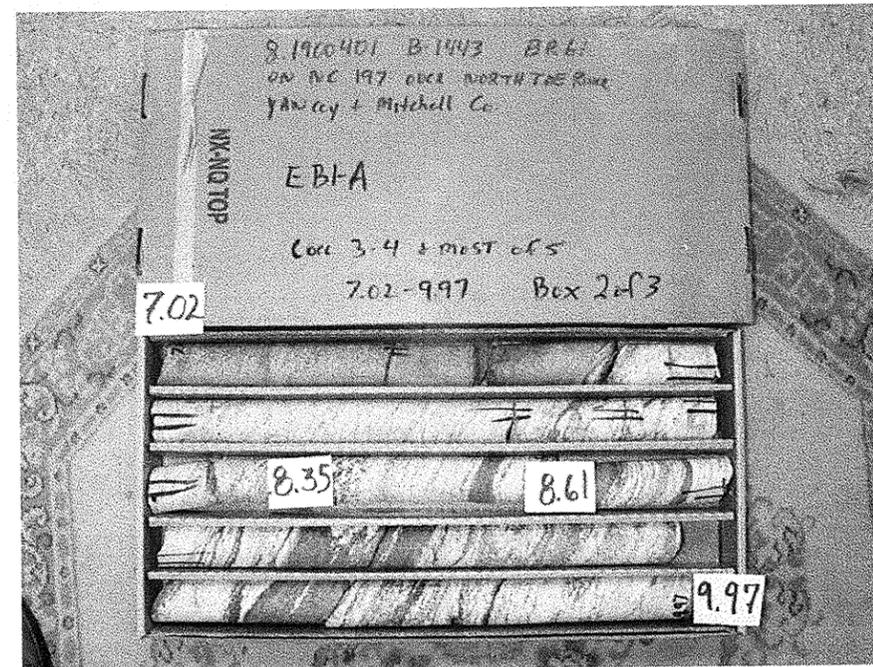
INSTRUCTIONS

- (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 (RIPRAP, 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 FOUNDATION BEARING MATERIAL
- (10) DESCRIBE THE BANK COVERING (GRASS, TREES, RIPRAP, NONE, ETC.)
- (11) GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE).
- (12) DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.)
- (13) CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING.
- (14) DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE Laterally DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS).
- (15) GIVE THE CRITICAL 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 CRITICAL SCOUR ELEVATION. IF THE CRITICAL SCOUR ELEVATION IS DEPENDENT ON SCOUR COUNTER MEASURES; EXPLAIN. (RIPRAP ARMORING ON SLOPES, ETC.) THE CRITICAL SCOUR ELEVATION IS BASED ON THE ERODABILITY OF MATERIALS WITH CONSIDERATION FOR JOINTING, FOLIATION, BEDDING ORIENTATION AND FREQUENCY; CORE RECOVERY PERCENTAGE; PERCENT RQD; DIFFERENTIAL WEATHERING; SHEAR STRENGTH; OBSERVATIONS AT EXISTING STRUCTURES; OTHER TESTS DEEMED APPROPRIATE; AND OVERALL GEOLOGIC CONDITIONS AT THE SITE.

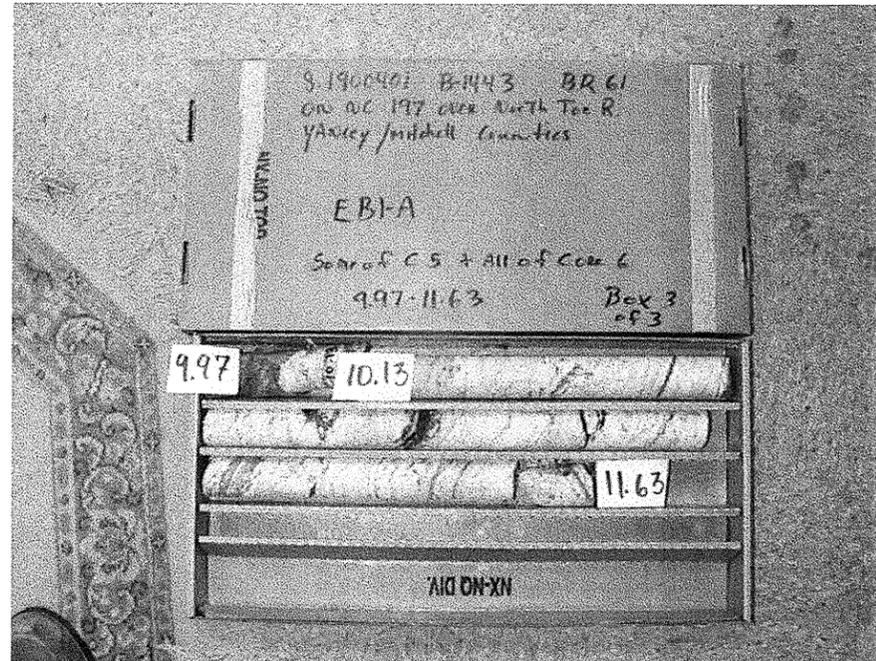


8.1900401 B-1443
BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
YANCEY AND
MITCHELL
COUNTIES

EB1-A
BOX 1 OF 3

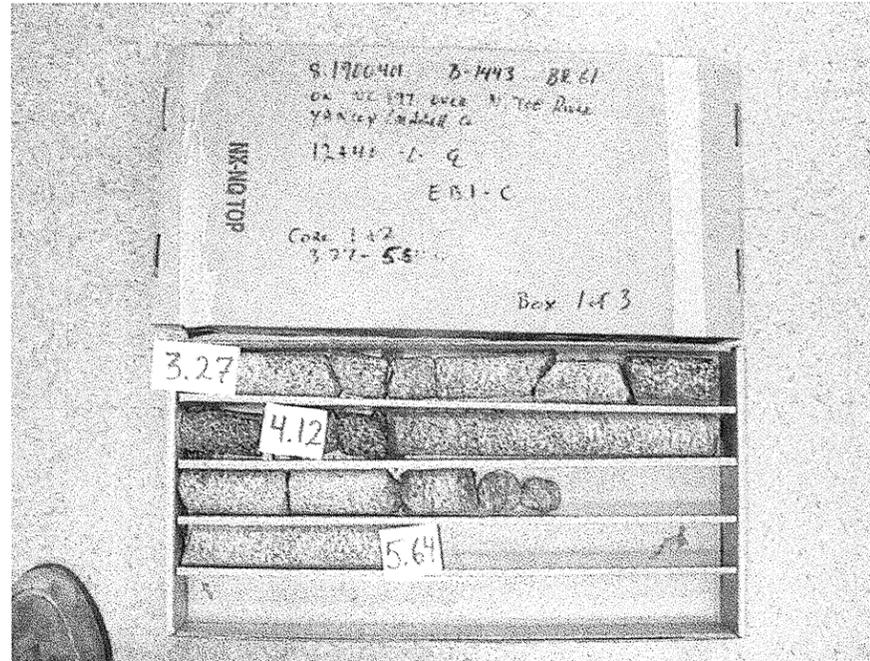


EB1-A
BOX 2 OF 3



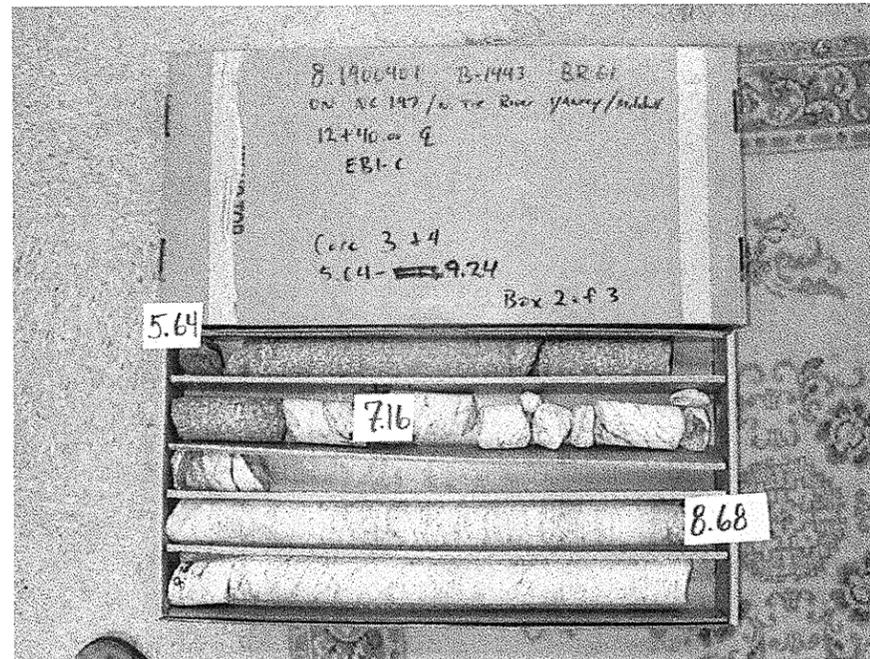
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BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
YANCEY AND
MITCHELL
COUNTIES

EB1-A
BOX 3 OF 3

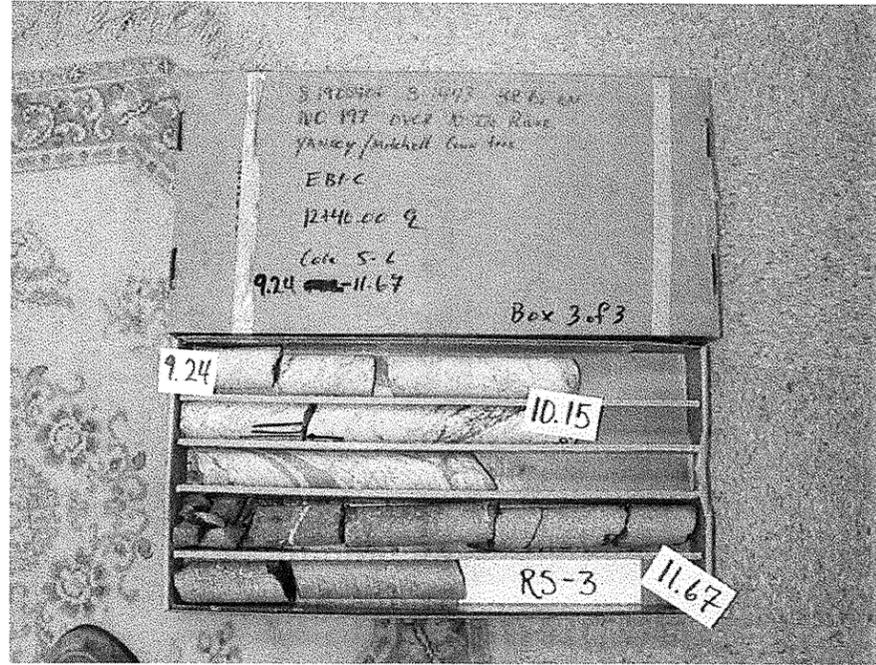


8.1900401 B-1443
BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
YANCEY AND
MITCHELL
COUNTIES

EB1-C
BOX 1 OF 3

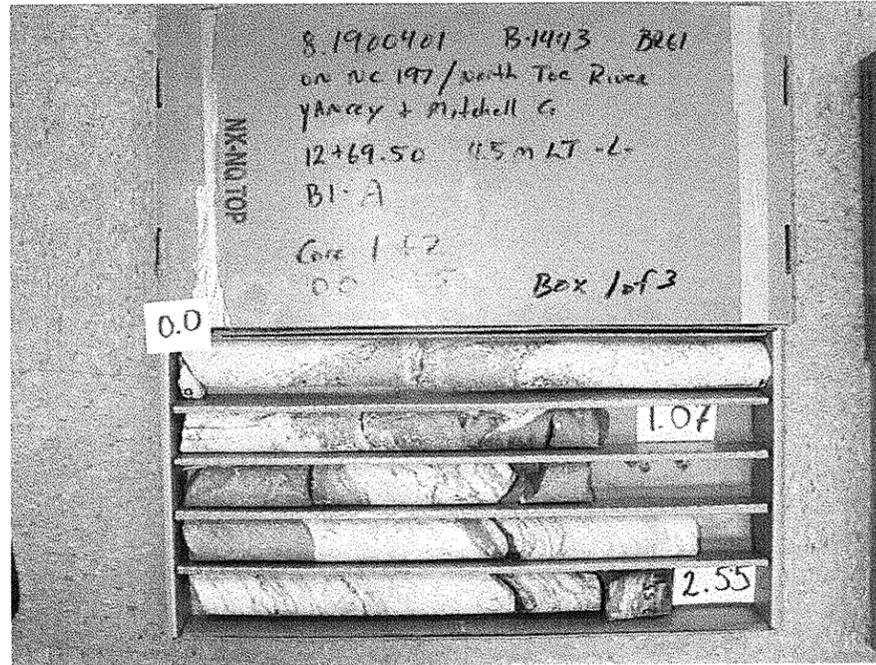


EB1-C
BOX 2 OF 3



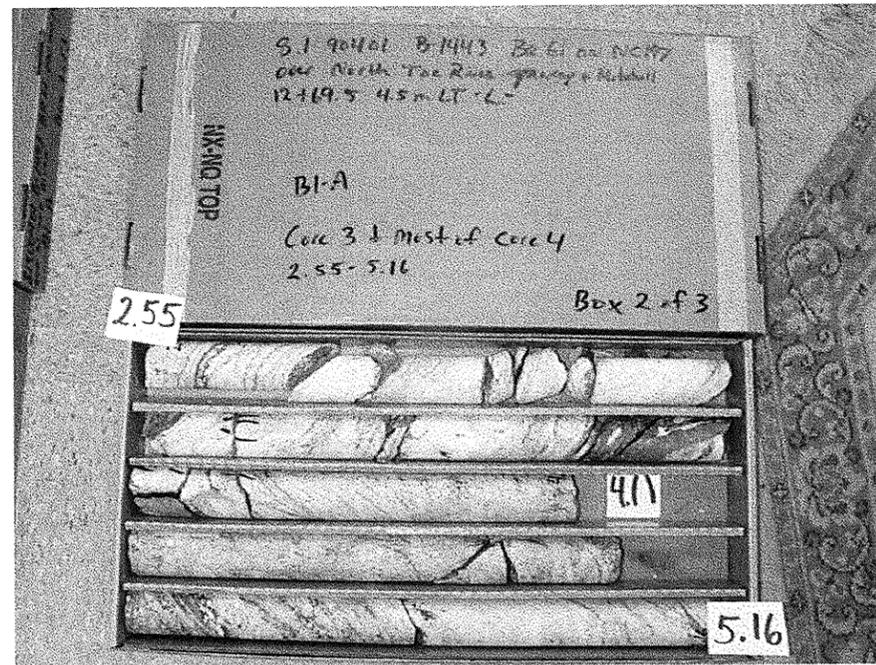
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BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
YANCEY AND
MITCHELL
COUNTIES

EB1-C
BOX 3 OF 3

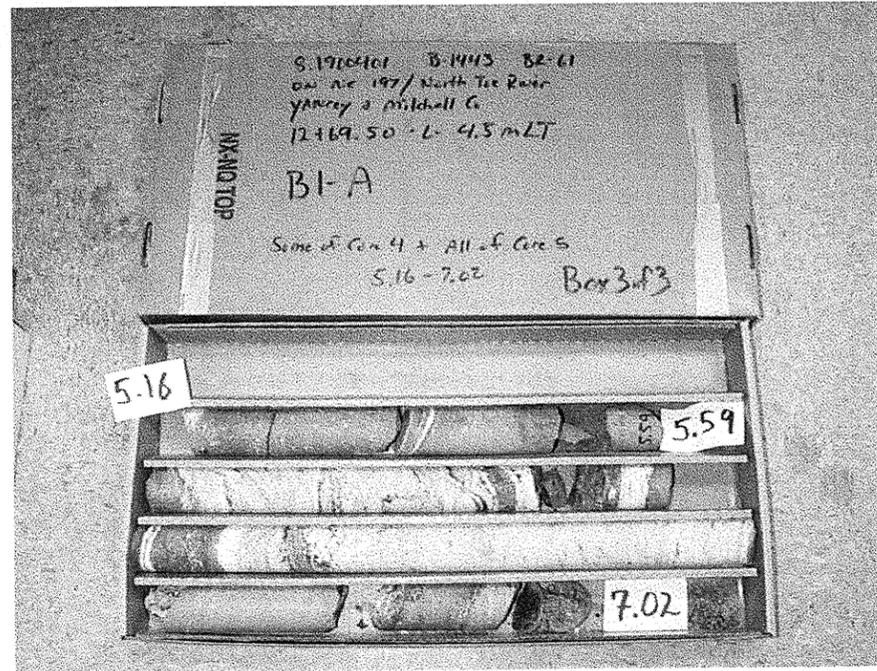


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BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
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B1-A
BOX 1 OF 3

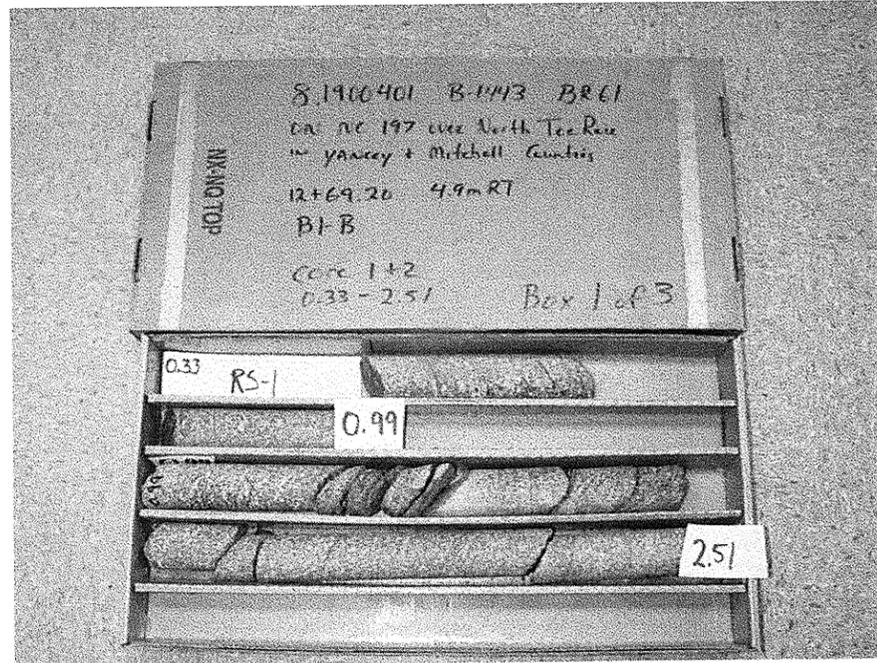


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BOX 2 OF 3



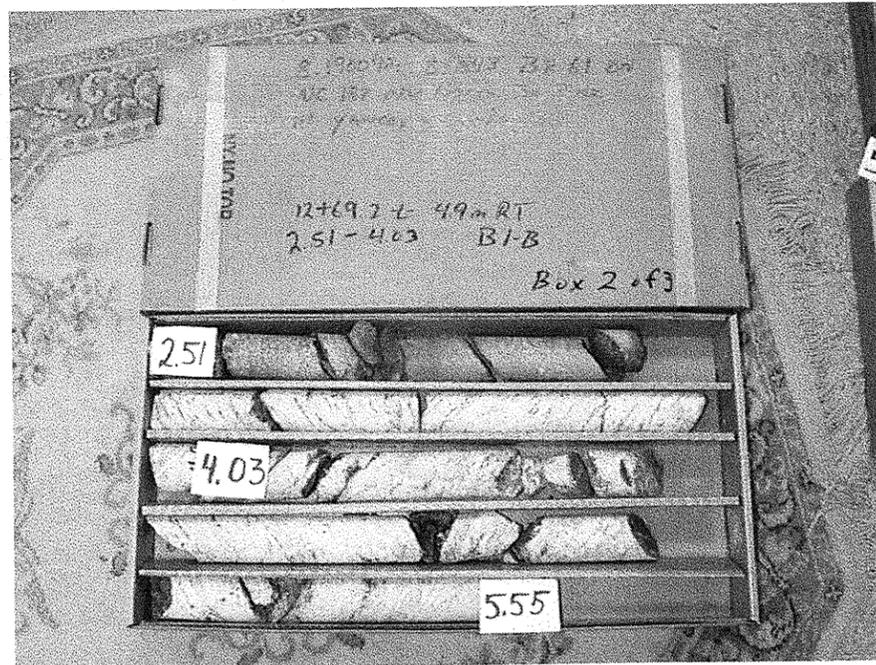
8.1900401 B-1443
BRIDGE 61 ON NC 197
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TOE RIVER IN
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B1-A
BOX 3 OF 3



8.1900401 B-1443
BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
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B1-B
BOX 1 OF 3

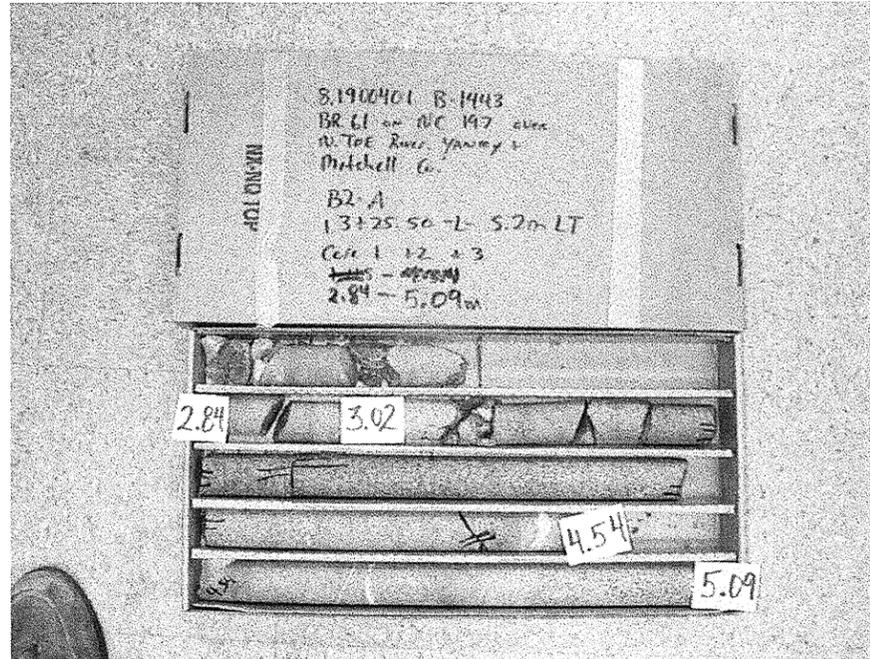


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BOX 2 OF 3



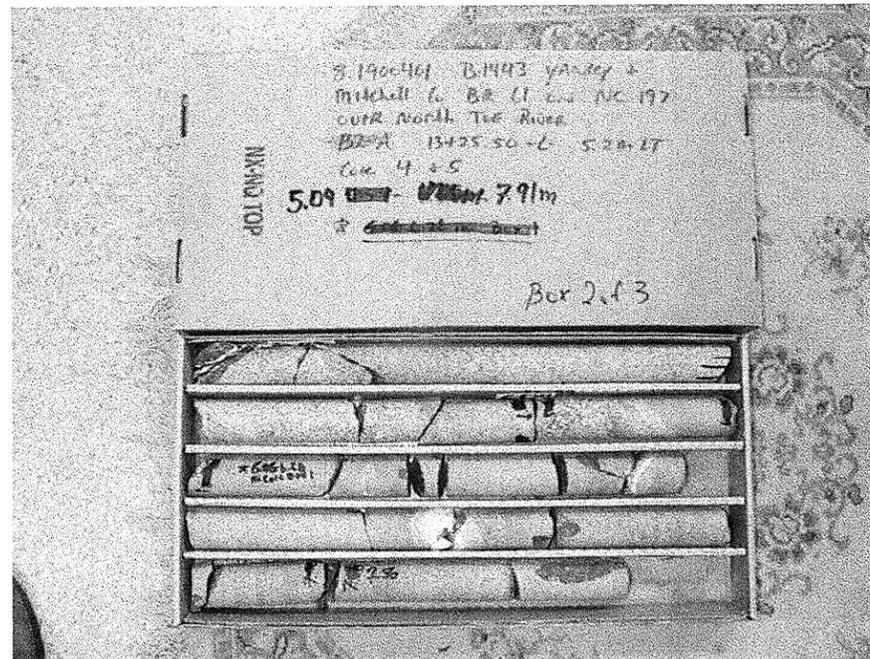
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BRIDGE 61 ON NC 197
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COUNTIES

B1-B
BOX 3 OF 3

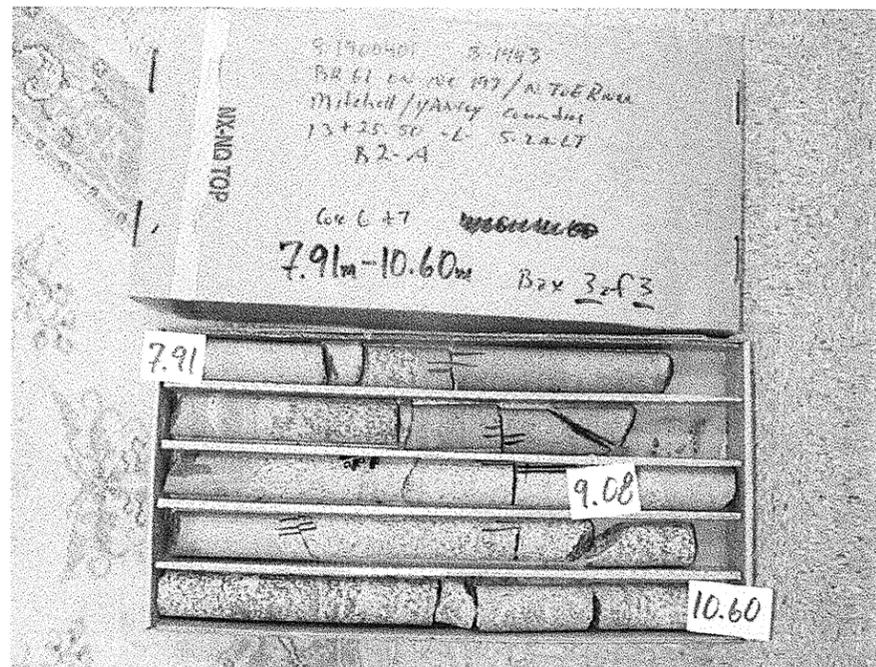


8.1900401 B-1443
BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
YANCEY AND
MITCHELL
COUNTIES

B2-A
BOX 1 OF 3



B2-A
BOX 2 OF 3



8.1900401 B-1443
BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
YANCEY AND
MITCHELL
COUNTIES

B2-A
BOX 3 OF 3

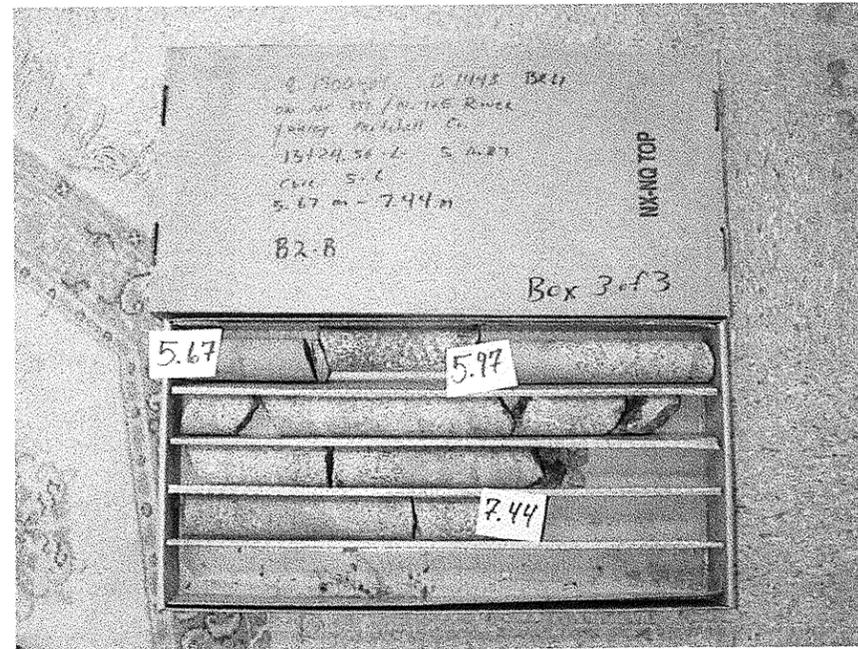


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BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
YANCEY AND
MITCHELL
COUNTIES

B2-B
BOX 1 OF 3

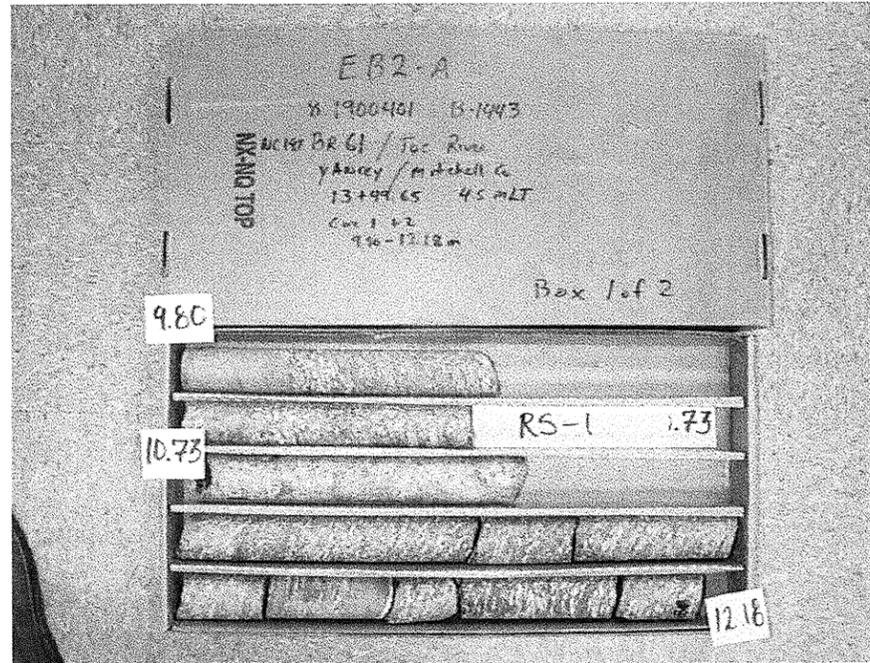


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BOX 2 OF 3



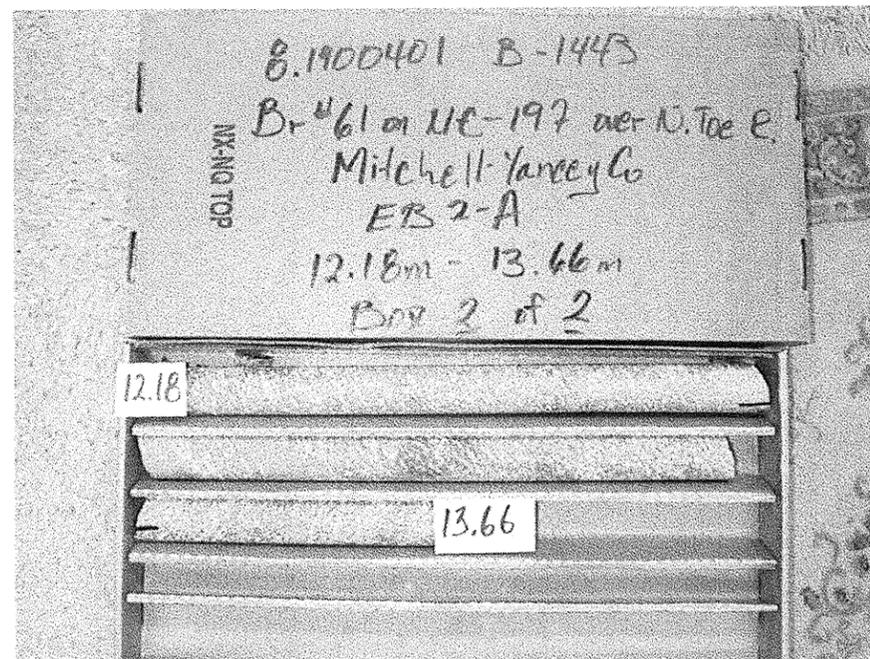
8.1900401 B-1443
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TOE RIVER IN
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B2-B
BOX 3 OF 3



8.1900401 B-1443
BRIDGE 61 ON NC 197
OVER THE NORTH
TOE RIVER IN
YANCEY AND
MITCHELL
COUNTIES

EB2-A
BOX 1 OF 2

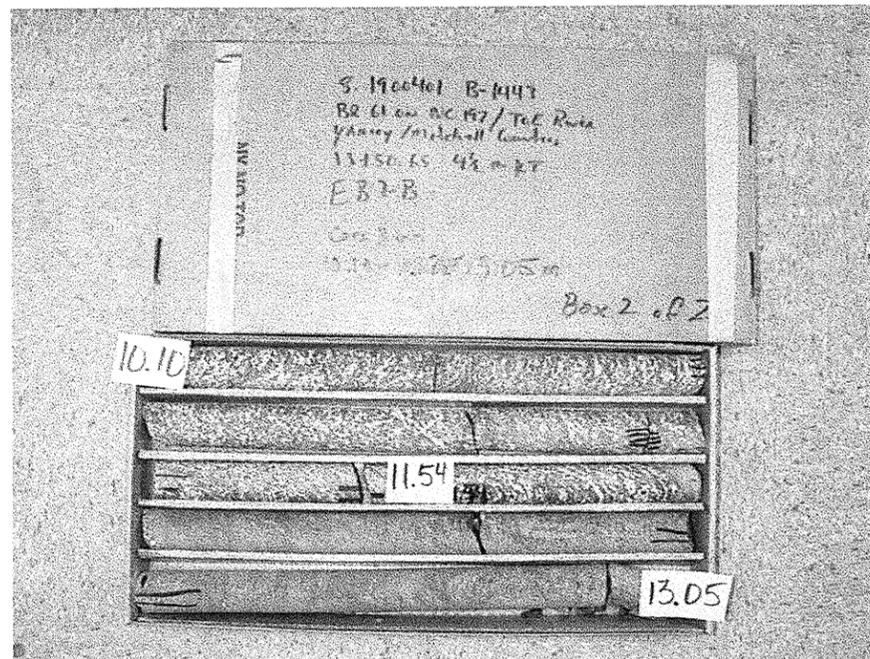


EB2-A
BOX 2 OF 2



8.1900401 B-1443
BRIDGE 61 ON NC 197
OVER THE NORTH
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YANCEY AND
MITCHELL
COUNTIES

EB2-B
BOX 1 OF 2



EB2-B
BOX 2 OF 2

PROJECT DATA TRANSMITTAL FORM
GEOTECHNICAL UNIT

Project B.1900401 ID# B-1443 County MITCHELL/YANLEY
Description BRIDGE No. 61 ON NC-197 OVER N. TOE RIVER

MEMORANDUM TO: Mr. W. L. Moore, III

Transmitted herewith is project data for the above project.

- Inventory Subsurface Written Report** _____ # pages
- Inventory Subsurface Plans** _____ # sheets

- Recommendations Subsurface Written Report** _____ # pages
- Recommendations Subsurface Plans** _____ # sheets

- Bridge Foundation Investigation Written Report** 4 # pages
- Bridge Foundation Investigation Data Sheets** 25 # sheets

- Retaining Wall Report** _____ # pages
- Culvert Survey Report** _____ # pages
- Water Well Survey Report** _____ # pages
- Seismic Monitoring Report** _____ # pages
- Boring Logs** _____ # sheets

- Rock Sounding Data Sheets** _____ # sheets
- Original Structure Investigation Logs and Levels** _____ # sheets
- Original Roadway Investigation Field Notes** _____ # sheets
- Original Field Notes (other)** _____
- Project Productivity Summary Report** _____
- Field Scour Reports** _____
- Other** PHOTOS 14 pages (1 set)

Remarks: DO RIGHT - BE CALM

Transmitted by: FRB Date 3-24-00 Area Office Soils
Received by: _____ Date _____ Unit _____



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

June 16, 2005

LYNDO TIPPETT
SECRETARY

STATE PROJECT: 32728.1.1 (B-2848)
FEDERAL PROJECT: BRZ-1304(4)
COUNTY: Mitchell/Yancy

DESCRIPTION: Bridge No. 143 on SR 1417 over North Toe River

SUBJECT: Addendum to Inventory

At the request of the Bridge Construction Engineer, Cameron Cochran, P.E., the Geotechnical Engineering Unit performed one boring through the bridge deck to investigate the void contents above the arches. The results of this boring are included for your use. We call attention to the fine-grained soils and debris that must be kept out of the waterway.

Respectfully Submitted,

Shane C. Clark, P.E.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO		ID B-2848		COUNTY MITCHELL/YANCEY		GEOLOGIST T.B. DANIEL								
SITE DESCRIPTION BR# 143 ON SR 1417 OVER NORTH TOE RIVER							GND WATER							
BORING NO BORING #1		NORTHING 0.00		EASTING 0.00		0 HR N/A	24 HR N/A							
ALIGNMENT CENTERLINE		BORING LOCATION 0+00.000		OFFSET 0.00ft										
COLLAR ELEV 100.00ft		TOTAL DEPTH 5.00ft		START DATE 5/16/05		COMPLETION DATE 05/16/05								
DRILL MACHINE CME- 550			DRILL METHOD CASING			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log BORING #1, 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					100
100.00														
														Ground Surface
95.00														ASPHALT
														COARSE SAND AND GRAVEL BASE
														REBAR MAT
														MAY BE SETTLEMENT OF SOIL DUE TO BOTTOM .5 OF CONCRETE SPAULDING OFF
														RED SILTY FINE SANDY CLAY OR CLAYEY FINE SANDY SILT SOFT-FILL

PROJECT: 8.2880401 ID: B-2848

CONTENTS: -L-

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 8.2880401 I.D. NO. B-2848
F.A. PROJECT BRZ-1304(4)
COUNTY YANCEY/MITCHELL
PROJECT DESCRIPTION _____

SITE DESCRIPTION BRIDGE #143 ON SR-1304
OVER NORTH TOE RIVER

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-2848	1	27
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
A5880401	BRZ-1304(4)	P.E.	
		CONST.	

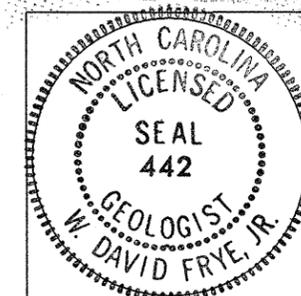
CAUTION NOTICE

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.

INVESTIGATED BY J.W. MANN PERSONNEL T.B. DANIEL
CHECKED BY W.D. FRYE J.T. WILLIAMS
SUBMITTED BY W.D. FRYE L.E. LANKFORD
DATE APRIL 2003



W. David Frye, Jr.
SIGNATURE

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.

DRAWN BY: R.E. RIDDLE

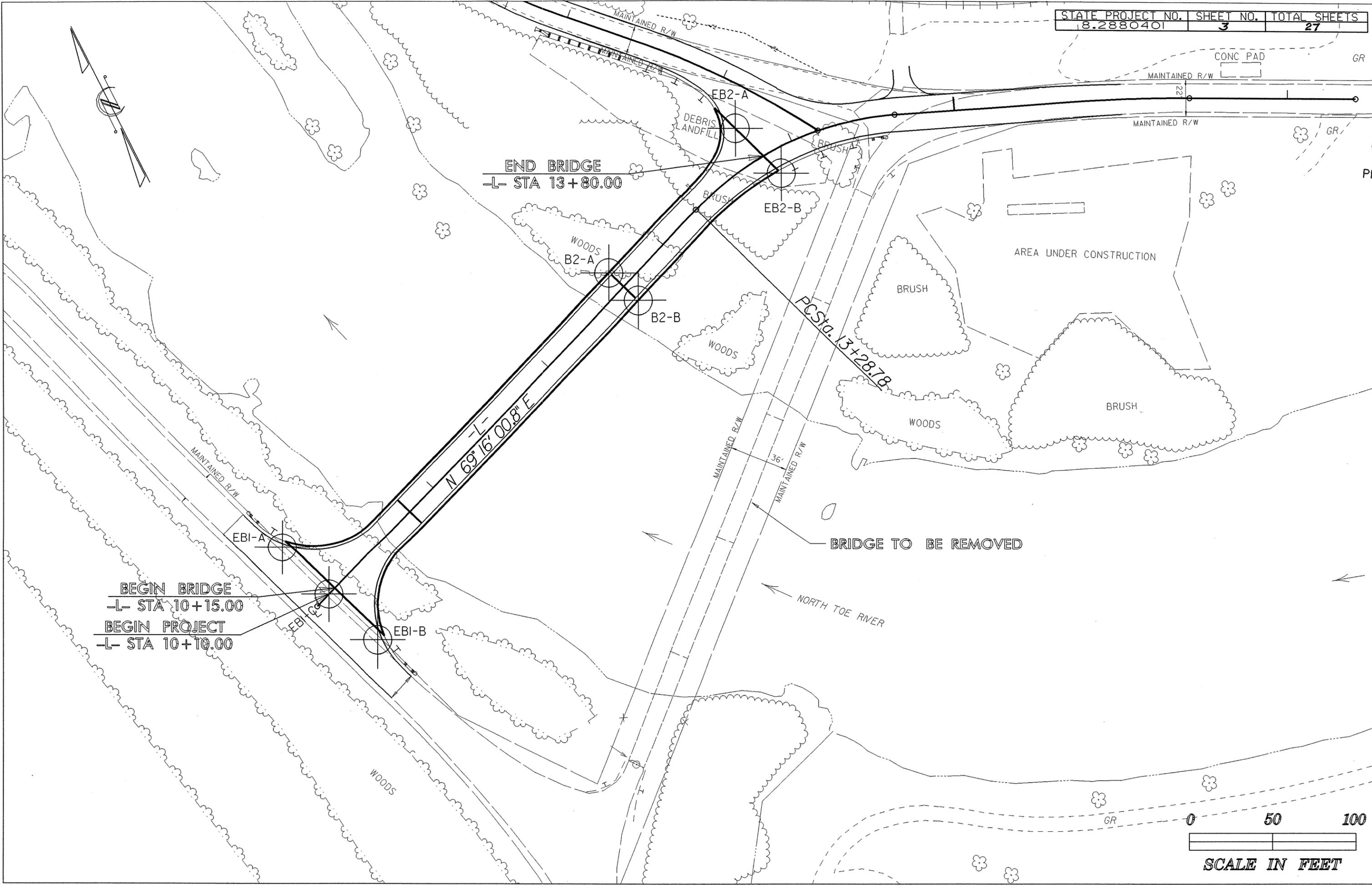
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-2848	8.2880401	2	27

SUBSURFACE INVESTIGATION

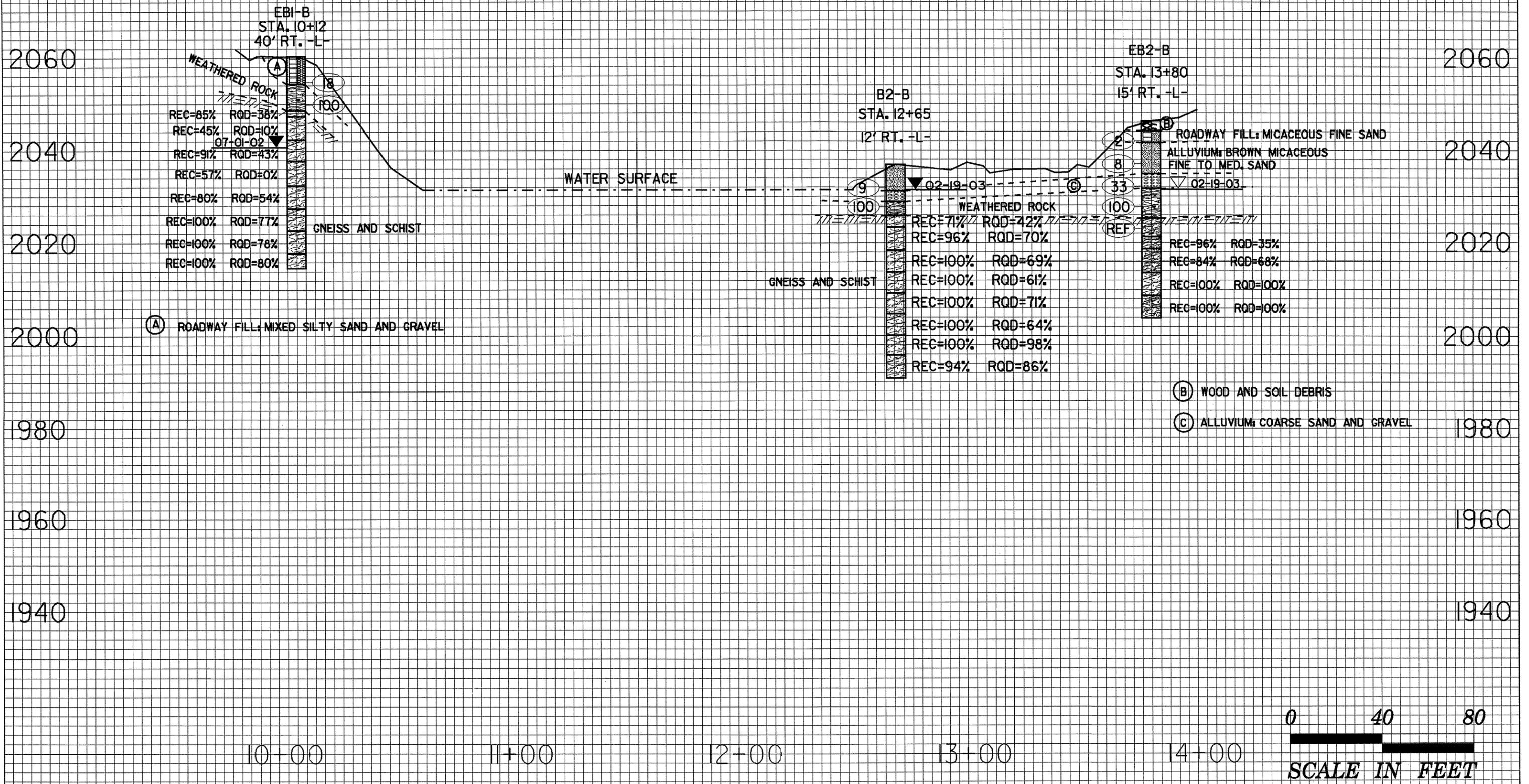
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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 (AASHTO 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, 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)</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: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</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 - A NOTABLE 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 ROCK.</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 IN 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 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p>TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																					
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (<math>75\%</math> PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (<math>75\%</math> PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> <td>A-7</td> <td>A-1, A-2</td> <td>A-3</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td>A-1, A-2</td> <td>A-3</td> <td>A-4, A-5</td> <td>A-6, A-7</td> </tr> <tr> <td>SYMBOL</td> <td></td> </tr> <tr> <td>% PASSING</td> <td>50</td> <td>30</td> <td>40</td> </tr> <tr> <td>LIQUID LIMIT</td> <td>6</td> <td>N.P.</td> <td>10</td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS, GRAVEL AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td colspan="3">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="3">HIGHLY ORGANIC SOILS</td> <td colspan="3">MUCK, PEAT</td> </tr> <tr> <td>GEN. 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A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	SYMBOL																			% PASSING	50	30	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	LIQUID LIMIT	6	N.P.	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	GROUP INDEX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER			HIGHLY ORGANIC SOILS			MUCK, PEAT			GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR			FAIR TO POOR			POOR			UNSUITABLE			<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> <p>SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30 MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p> <p style="text-align: center;">PERCENTAGE OF MATERIAL</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> <p>FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V. SLI.) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</p> <p>SLIGHT (SLI.) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.</p> <p>MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.</p> <p>MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.) - ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i></p> <p>VERY SEVERE (V. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i></p> <p>COMPLETE - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.</p>
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<p style="text-align: center;">TERMS AND DEFINITIONS</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 - A NOTABLE 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 ROCK.</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 IN 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 4 INCHES 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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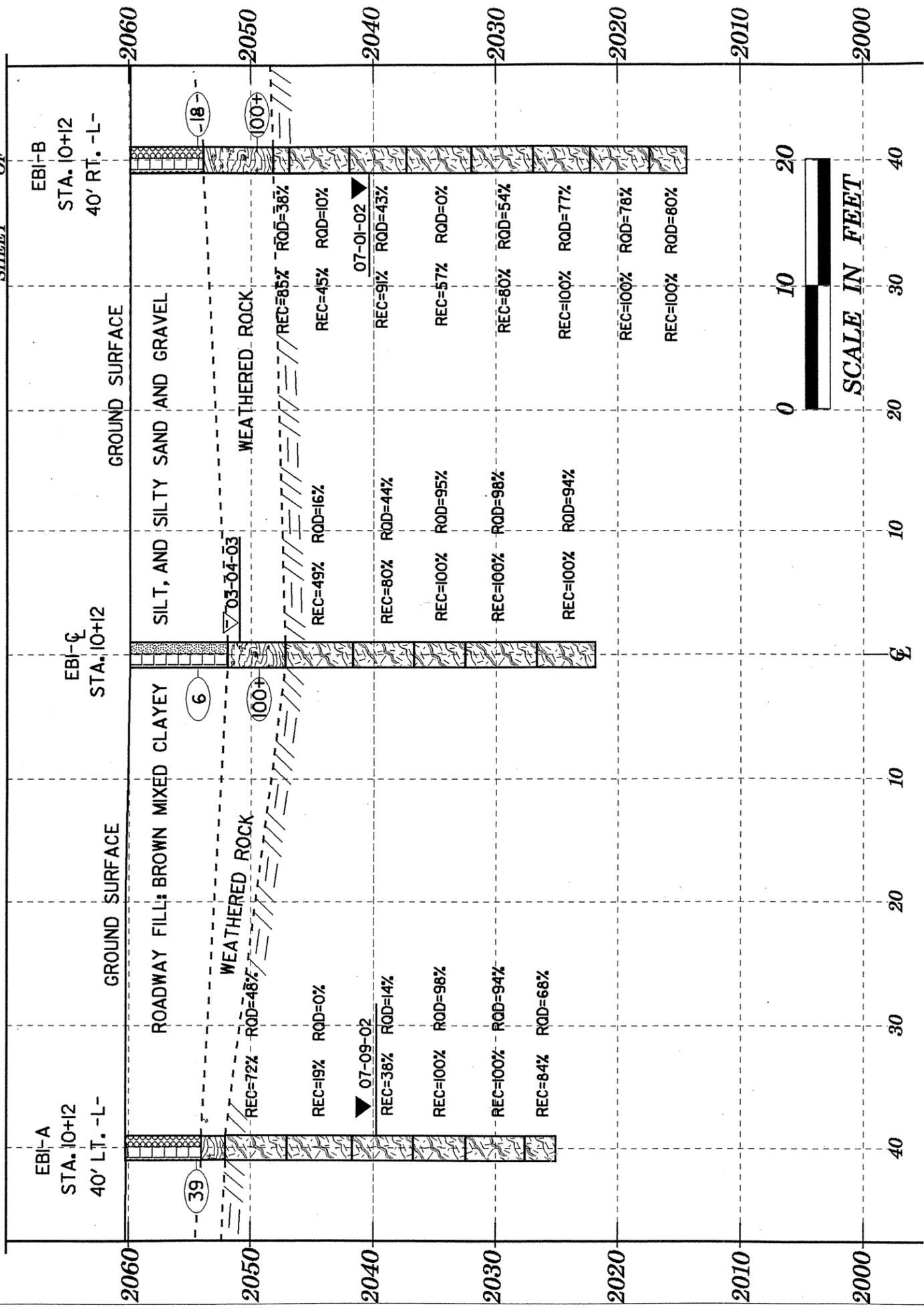
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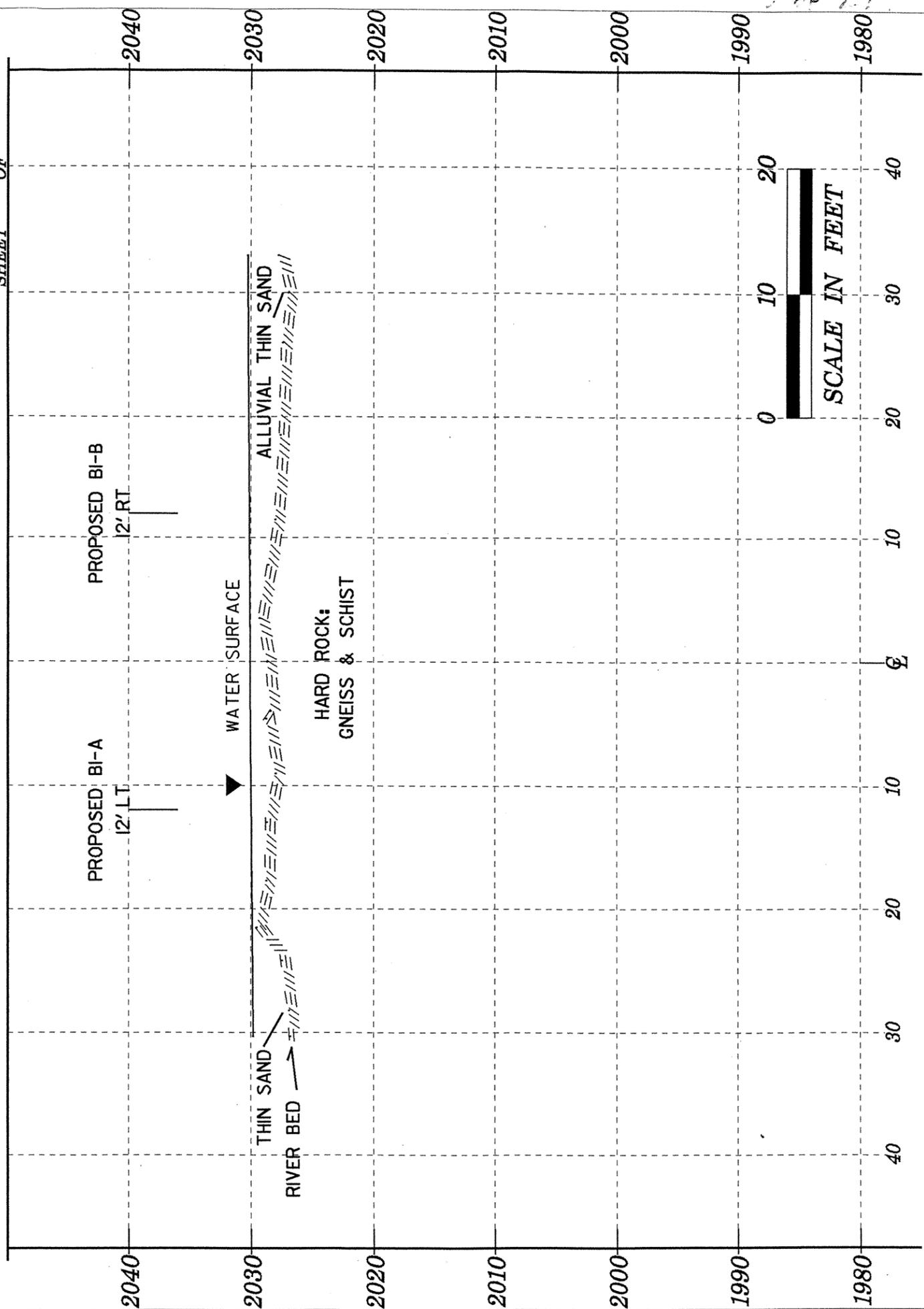
SECTION THROUGH EB-1 BORINGS

PROJECT 8.2880401 B-2848
COUNTY YANCEY/MITCHELL
SHEET OF



SECTION THROUGH B1

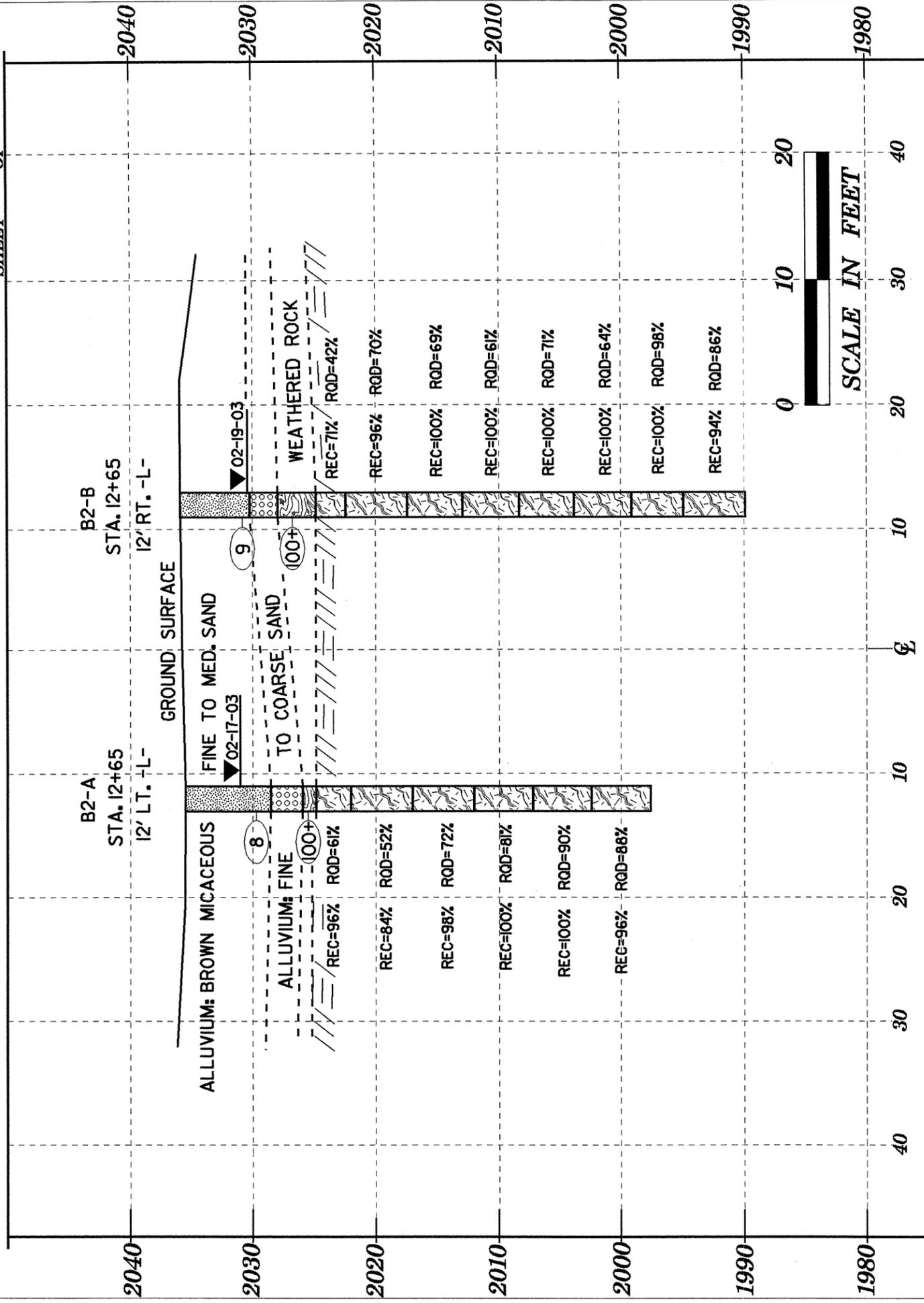
PROJECT 8.2880401 (B-2848)
COUNTY MITCHELL/YANCEY
SHEET OF



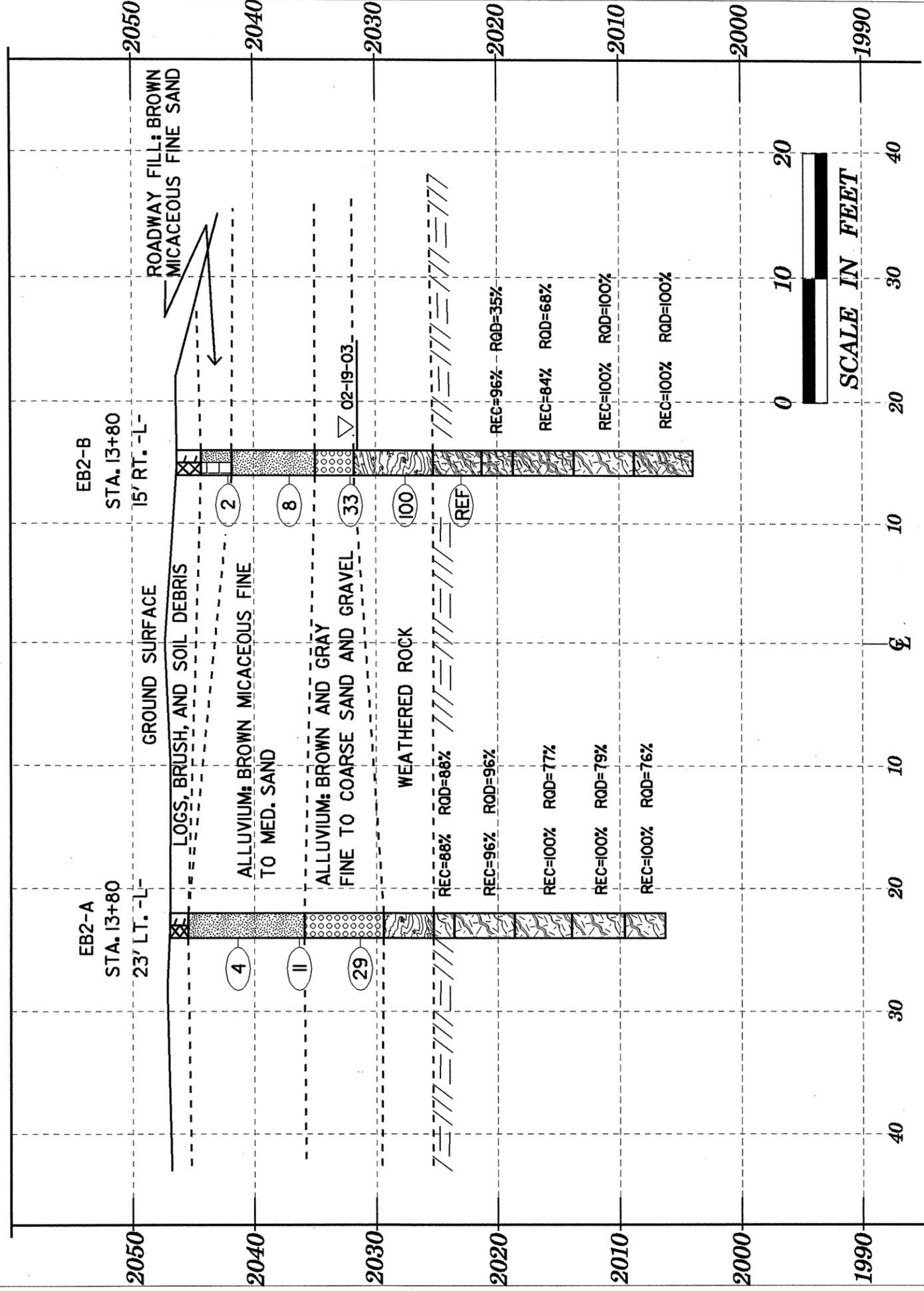
3 OF 7

SECTION THROUGH B2 BORINGS

PROJECT 8.2880401 B-2848
COUNTY YANCEY/MITCHELL
SHEET OF



SECTION THROUGH EB-2 BORINGS



**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG**

PROJECT NO 8.2880401		ID B-2848		COUNTY MITCHELL/YANCEY		GEOLOGIST T.B. DANIEL						
SITE DESCRIPTION BRIDGE #143 ON SR1304 OVER THE NORTH TOE RIVER						GND WATER						
BORING NO EB1-A		NORTHING 0.00		EASTING 0.00		0 HR 20.50ft						
ALIGNMENT -L-		BORING LOCATION 10+12.000		OFFSET 40.00ft LT		24 HR 20.00ft						
COLLAR ELEV 2060.24ft		TOTAL DEPTH 35.10ft		START DATE 7/09/02		COMPLETION DATE 07/09/02						
DRILL MACHINE CME-550 X			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK 8.20ft			Log EB1-A, 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			
2060.24												Ground Surface
2050.00	4.80	3	18	21	1.5				39	SS-4	W	ROADWAY FILL: BROWN CLAYEY SILT AND GRAVEL FILL
										CORE #1		WEATHERED ROCK
												REC=72% RQD=48%
										CORE #2		REC=19% RQD=0%
										CORE #3	▼	REC=38% RQD= 14%
										CORE #4		REC=100% RQD=98%
										CORE #5		REC=100% RQD=94%
										CORE #6		REC=84 % RQD=68%
2025.14												BORING TERMINATED IN ROCK AT ELEV. 2025.1 FT.

CORE BORING REPORT							DATE 4/29/03
PROJECT:	8.2880401	I. D. NO:	B-2848	BORING NO:	EB1-A	GEOLOGIST:	T.B. DANIEL
DESCRIPTION:	BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER						
COUNTY:	MITCHELL/YANCEY	COLLAR ELEVATION:	2060.2 FT.	TOTAL DEPTH:	35.1 FT.		
ELEV. (FEET)	DEPTH (FEET)	DRILL RATE (MIN./FT.)	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
2052.0	8.2		5.0	3.6 %	2.4 %		8.2'-23.5' GNEISS & SCHIST WITH UNRECOVERED WEATHERED ROCK ZONES.
				72 %	48 %		
2047.0	13.2			1.0 %	0.0 %		23.5'-35.1' HARD, VERY SLIGHTLY WEATHERED TO FRESH GNEISS WITH QUARTZ & FELDSPATHIC SEAMS. SOME VERTICAL FRACTURES. FRACTURE SPACING GENERALLY CLOSE TO MODERATELY CLOSE.
2047.0	13.2		5.3	19 %	0 %		
2041.7	18.5			1.9 %	0.7 %		
2041.7	18.5		5.0	38 %	14 %		
2036.7	23.5			4.3 %	4.2 %		
2036.7	23.5		4.3	100 %	98 %		
2032.4	27.8			4.8 %	4.5 %		
2032.4	27.8		4.8	100 %	94 %		
2027.6	32.6			2.1 %	1.7 %		
2027.6	32.6		2.5	84 %	68 %		
2025.1	35.1						
CORING TERMINATED AT ELEVATION 2025.1 FT.							
DRILLER:	J.T. WILLIAMS	CORE SIZE:	NXWL	EQUIPMENT:	CME-550		

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG**

PROJECT NO 8.2880401		ID B-2848		COUNTY MITCHELL/YANCEY		GEOLOGIST T.B.DANIEL						
SITE DESCRIPTION BR. #143 ON SR 1304 OVER THE NORTH TOE RIVER						GND WATER						
BORING NO EB1-C		NORTHING 0.00		EASTING 0.00		0 HR 9.00ft						
ALIGNMENT -L-		BORING LOCATION 10+12.000		OFFSET 0.00ft		24 HR N/A						
COLLAR ELEV 2059.91ft		TOTAL DEPTH 38.00ft		START DATE 3/04/03		COMPLETION DATE 03/04/03						
DRILL MACHINE CME-550 X			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK 12.70ft			Log EB1-C, 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			
2059.91												Ground Surface
	4.60	5	4	2	1.5	6				SS-24	W	ROADWAY FILL: BROWN SANDY SILT
2050.00	9.60	29	43	61	1.5				100	SS-25	M	WEATHERED ROCK
										CORE #1		REC = 49 % RQD = 16 %
										CORE #2		REC = 80 % RQD = 44 %
2040.00										CORE #3		REC = 100 % RQD = 95 %
										CORE #4		REC = 100 % RQD = 98 %
2030.00										CORE #5		REC = 100 % RQD = 94 %
2021.91												BORING TERMINATED AT ELEVATION 2021.91 IN HARD ROCK

CORE BORING REPORT

PROJECT: 8.2880401 I. D. NO: B-2848 BORING NO: EB1-C GEOLOGIST: T.B. DANIEL

DESCRIPTION: BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

COUNTY: MITCHELL/YANCEY COLLAR ELEVATION: 2059.9 FT. TOTAL DEPTH: 38.0 FT.

ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
2047.2	12.7		5.5	2.7	0.9		12.7'-18.2': SREC=49% SRQD=16% HARD, SLIGHTLY WEATHERED, THINLY FOLIATED GNEISS. VERY CLOSE FRACTURE SPACING. JOINTING IS AT ~45° ALONG FOLIATION PLANES. SOME HORIZONTAL JOINTS.
2041.7	18.2			49	16		
2041.7	18.2		5.0	4.0	2.2		18.2'-22.7': SREC=56% SRQD=29% MEDIUM HARD, MODERATELY SEVERELY WEATHERED, VERY THINLY FOLIATED SCHIST. CLOSE TO VERY CLOSE FRACTURE SPACING. LAST 1.2' IS VERY HARD, VERY SLIGHTLY WEATHERED, VERY THINLY FOLIATED GNEISS WITH MODERATELY CLOSE FRACTURE SPACING.
2036.7	23.2			80	44		
2036.7	23.2		4.2	4.2	4.0		
2032.5	27.4			100	95	RS-6	
2032.5	27.4		5.8	5.8	5.7		22.7'-38.0': SREC=98% SRQD=93% HARD, VERY SLIGHTLY WEATHERED TO FRESH, THINLY FOLIATED GNEISS. MODERATELY CLOSE TO WIDE FRACTURE SPACING. JOINTING IS ALONG FOLIATION AT 30-40°.
2026.7	33.2			100	98		
2026.7	33.2		4.8	4.8	4.5		
2021.9	38.0			100	94		

CORING TERMINATED AT ELEVATION 2021.9 FT.

DRILLER: J.T. WILLIAMS CORE SIZE: NXWL EQUIPMENT: CME-550

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG**

PROJECT NO 8.2880401	ID B-2848	COUNTY YANCEY/MITCHELL	GEOLOGIST T. B. DANIEL
SITE DESCRIPTION BR.#143 ON SR 1304 OVER THE NORTH TOE RIVER			GND WATER
BORING NO EB1-B	NORTHING 0.00	EASTING 0.00	0 HR N/A
ALIGNMENT -L-	BORING LOCATION 10+12.000	OFFSET 40.00ft RT	24 HR 19.50ft
COLLAR ELEV 2059.89ft	TOTAL DEPTH 45.50ft	START DATE 7/01/02	COMPLETION DATE 07/01/02
DRILL MACHINE CME-550 X	DRILL METHOD SPT CORE BORING	HAMMER TYPE AUTOMATIC	
SURFACE WATER DEPTH N/A	DEPTH TO ROCK 11.70ft	Log EB1-B, Page 1 of 1	

SHEET 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			
2059.89												Ground Surface
	4.50	2	8	10	1.5				18			ROADWAY FILL: BROWN MIXED SILTY SAND AND GRAVEL FILL
2050.00	9.50	23	100		0.9				100			WEATHERED ROCK
												REC=85% RQD=38% REC=45% RQD=10%
												REC=91% RQD=43%
												REC=57% RQD=0%
												REC=80% RQD=54%
												REC=100% RQD=77%
												REC=100% RQD=78%
												REC=100% RQD=80%
2014.39												BORING TERMINATED IN ROCK AT ELEV. 2014.4 FT.

CORE BORING REPORT

DATE 4/29/03

PROJECT: 8.2880401 I. D. NO: B-2848 BORING NO: EB1-B GEOLOGIST: T.B. DANIEL

DESCRIPTION: BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

COUNTY: MITCHELL/YANCEY COLLAR ELEVATION: 2059.9 FT. TOTAL DEPTH: 45.5 FT.

ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
2048.2	11.7			1.1	0.5		11.7'-31.2' GNEISS & SCHIST WITH UNRECOVERED WEATHERED ROCK ZONES.
			1.3	85	38		
2046.9	13.0						
2046.9	13.0		4.9	2.2	0.5		
				45	10		
2042.0	17.9						
2042.0	17.9		4.7	4.3	2.0		
				91	43		
2037.3	22.6						
2037.3	22.6		5.3	3.0	0.0		
				57	0		
2032.0	27.9						31.2'-45.5' HARD, SLIGHTLY WEATHERED TO FRESH GNEISS. THINLY FOLIATED. FRACTURES OFTEN OBLIQUE TO FOLIATION. CLOSE TO MODERATELY CLOSE FRACTURE SPACING.
2032.0	27.9		5.0	4.0	2.7		
				80	54		
2027.0	32.9						
2027.0	32.9		4.7	4.7	3.6		
				100	77		
2022.3	37.6						

CORING TERMINATED AT
ELEVATION 2014.4 FT.

DRILLER: J.T. WILLIAMS CORE SIZE: NXWL EQUIPMENT: CME-550

DATE 4/29/03

CORE BORING REPORT

PROJECT: 8.2880401 I. D. NO: B-2848 BORING NO: EB1-B GEOLOGIST: T.B. DANIEL

DESCRIPTION: BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

COUNTY: MITCHELL/YANCEY COLLAR ELEVATION: 2059.9 FT. TOTAL DEPTH: 45.5 FT.

ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
2022.3	37.6			4.9	3.8		31.2'-45.5' HARD, SLIGHTLY WEATHERED TO FRESH GNEISS. THINLY FOLIATED. FRACTURES OFTEN OBLIQUE TO FOLIATION. CLOSE TO MODERATELY CLOSE FRACTURE SPACING.
			4.9	100	78		
2017.4	42.5			3.0	2.4		
2017.4	42.5		3.0	100	80		

CORING TERMINATED AT
ELEVATION 2014.4 FT.

DRILLER: J.T. WILLIAMS CORE SIZE: NXWL EQUIPMENT: CME-550

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG**

PROJECT NO 8.2880401	ID B-2848	COUNTY MITCHELLYANCEY	GEOLOGIST T.B.DANIEL
SITE DESCRIPTION BR. #143 ON SR 1304 OVER THE NORTH TOE RIVER			GND WATER
BORING NO B2-A	NORTHING 0.00	EASTING 0.00	0 HR 4.00ft
ALIGNMENT -L-	BORING LOCATION 12+65.000	OFFSET 12.00ft LT	24 HR 4.50ft

SHEET 1 OF 1

COLLAR ELEV 2035.51ft	TOTAL DEPTH 37.90ft	START DATE 2/17/03	COMPLETION DATE 02/17/03
DRILL MACHINE CME-550 X		DRILL METHOD SPT CORE BORING	HAMMER TYPE AUTOMATIC
SURFACE WATER DEPTH		DEPTH TO ROCK 9.80ft	

DATE 4/29/03

ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION
		6in	6in	6in		0	25	50	75			
2035.51												Ground Surface
2030.00	4.80	1	2	6	1.5					SS-20	SAT	ALLUVIUM: BROWN SLI. MICACEOUS FINE TO MED. SAND
	9.80	50			0.2					SS-21	M	ALLUVIUM: FINE TO COARSE SAND AND GRAVEL WITH BOULDERS (CORED) WEATHERED ROCK REC = 96 % RQD = 61 % REC = 84 % RQD = 52 %
2020.00										CORE #3		REC = 98 % RQD = 72 %
										CORE #4		REC = 100 % RQD = 81 %
2010.00										CORE #5		REC = 100 % RQD = 90 %
										CORE #6		REC = 96 % RQD = 88 %
2000.00										CORE #7		
1997.61												BORING TERMINATED AT ELEVATION 1997.61 IN HARD ROCK

CORE BORING REPORT

PROJECT: 8.2880401 I. D. NO: B-2848 BORING NO: B2-A GEOLOGIST: T.B. DANIEL

DESCRIPTION: BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

COUNTY: MITCHELLYANCEY COLLAR ELEVATION: 2035.5 FT. TOTAL DEPTH: 37.9 FT.

ELEV. (FEET)	DEPTH (FEET)	DRILL RATE (MIN./FT.)	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
2024.8	10.7			2.7	1.7	RS-5	6.6'-8.6': CORED ALLUVIAL BOULDER 8.6'-10.7': CORED WEATHERED ROCK 10.7'-13.5': HARD, SLIGHTLY WEATHERED GNEISS W/ CLOSE FRACTURE SPACING.
2022.0	13.5			96	61		
2022.0	13.5			4.2	2.6		13.5'-15.0': SREC=100% SRQD=0% MODERATELY HARD, MODERATELY WEATHERED SCHIST/GNEISS WITH VERY CLOSE FRACTURE SPACING. SOME JOINTS ALONG FOLIATION.
2017.0	18.5			84	52		15.0'-20.0': SREC=86% SRQD=86% HARD, VERY SLIGHTLY WEATHERED GNEISS WITH MODERATELY CLOSE FRACTURE SPACING. JOINTING ALONG FOLIATION PLANES @ 45-55°.
2017.0	18.5			4.9	3.6		
				98	72		20.0'-31.0': SREC=99% SRQD=87% HARD, VERY SLIGHTLY WEATHERED SCHIST. THINLY FOLIATED WITH MOST ALL JOINTING ALONG FOLIATION @ 30-50°.
2012.0	23.5			4.8	3.9		
2012.0	23.5			100	81		
2007.2	28.3			4.8	4.3		
2007.2	28.3			100	90		31.0'-34.9': SREC=100% SRQD=100% HARD, FRESH GNEISS. THICKLY FOLIATED WITH FEW JOINTS.
2002.4	33.1			4.6	4.2		
2002.4	33.1			96	88		34.9'-37.9': SREC=90% SRQD=80% HARD, VERY SLIGHTLY WEATHERED SCHIST. THINLY FOLIATED WITH JOINTING ALONG FOLIATION @ 45-50°.
1997.6	37.9						

CORING TERMINATED AT ELEVATION 1997.6 FT.

DRILLER: J.T. WILLIAMS CORE SIZE: NXWL EQUIPMENT: CME-550

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG**

PROJECT NO 8.2880401		ID B-2848		COUNTY MITCHELL/YANCEY		GEOLOGIST T.B.DANIEL						
SITE DESCRIPTION BR. #143 ON SR 1304 OVER THE NORTH TOE RIVER							GND WATER					
BORING NO B2-B		NORTHING 0.00		EASTING 0.00		0 HR 4.20ft						
ALIGNMENT -L-		BORING LOCATION 12+65.000		OFFSET 12.00ft RT		24 HR 5.50ft						
COLLAR ELEV 2035.89ft		TOTAL DEPTH 46.00ft		START DATE 2/18/03		COMPLETION DATE 02/19/03						
DRILL MACHINE CME-550 X			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK 8.00ft			Log B2-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			
2035.89												Ground Surface
	4.10	2	4	5	1.5	9						ALLUVIUM: BROWN MICACEOUS FINE TO MED. SAND
2030.00	9.10	60			0.2		60					ALLUVIUM: COARSE SAND AND GRAVEL
												WEATHERED ROCK
												REC = 71 % RQD = 42 %
												REC = 96 % RQD = 70 %
												CORE #1
												CORE #2
												CORE #3
												REC = 100 % RQD = 69 %
												CORE #4
												REC = 100 % RQD = 61 %
												CORE #5
												REC = 100 % RQD = 71 %
												CORE #6
												REC = 100 % RQD = 64 %
												CORE #7
												REC = 100 % RQD = 98 %
												CORE #8
												REC = 94% RQD = 86 %
1999.89												BORING TERMINATED AT ELEVATION 1989.89 IN HARD ROCK

CORE BORING REPORT							DATE
PROJECT: 8.2880401 I. D. NO: B-2848 BORING NO: B2-B GEOLOGIST: T.B. DANIEL							4/29/03
DESCRIPTION: BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER							
COUNTY: MITCHELL/YANCEY COLLAR ELEVATION: 2035.9 FT. TOTAL DEPTH: 46.0 FT.							
ELEV. (FEET)	DEPTH (FEET)	DRILL RATE (MIN./FT.)	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
2024.8	11.1		2.4	1.7	1.0		11.1'-18.8': SREC=88% SRQD=62% HARD, SLIGHTLY WEATHERED, THINLY FOLIATED SCHIST. FRACTURE SPACING IS CLOSE. JOINTS MOSTLY OCCUR ALONG FOLIATION @ 70-80°
2022.4	13.5			71	42		
2022.4	13.5		5.0	4.8	3.5		18.8'-36.1': SREC=100% SRQD=66% HARD, FRESH TO SLIGHTLY WEATHERED GNEISS.
2017.4	18.5			96	70		
2017.4	18.5		4.5	4.5	3.1	RS-3	
2012.9	23.0			100	69		
2012.9	23.0		4.6	4.6	2.8		
2008.3	27.6			100	61		
2008.3	27.6		4.5	4.5	3.2		
2003.8	32.1			100	71		
2003.8	32.1		4.7	4.7	3.0		
1999.1	36.8			100	64		
							CORING TERMINATED AT ELEVATION 1989.9 FT.
DRILLER: J.T. WILLIAMS		CORE SIZE: NXWL		EQUIPMENT: CME-550			

DATE 4/29/03

CORE BORING REPORT

PROJECT: 8.2880401 I. D. NO: B-2848 BORING NO: B2-B GEOLOGIST: T,B, DANIEL

DESCRIPTION: BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

COUNTY: MITCHELL/YABCEY COLLAR ELEVATION: 2035.9 FT. TOTAL DEPTH: 46.0 FT.

ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
1999.1	36.8						36.1'-46.0': SREC=98% SRQD=96% HARD, FRESH TO VERY SLIGHTLY WEATHERED, THINLY FOLIATED GNEISS. FRACTURE SPACING IS WIDE. JOINTS ALONG FOLIATION.
			4.2	4.2	4.1		
				100	98		
1994.9	41.0						
1994.9	41.0			4.7	4.3		
			5.0				
				94	86	RS-4	
1989.9	46.0						

CORING TERMINATED AT
ELEVATION 1989.9 FT.

DRILLER: J.T. WILLIAMS CORE SIZE: NXWL EQUIPMENT: CME-550

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG**

PROJECT NO 8.2880401		ID B-2848		COUNTY MITCHELL/YANCEY		GEOLOGIST T.B.DANIEL								
SITE DESCRIPTION BR. #143 ON SR 1304 OVER THE NORTH TOE RIVER						GND WATER								
BORING NO EB2-A		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT -L-		BORING LOCATION 13+80.000		OFFSET 23.00ft LT		24 HR N/A								
COLLAR ELEV 2046.91ft		TOTAL DEPTH 40.60ft		START DATE 2/20/03		COMPLETION DATE 02/24/03								
DRILL MACHINE CME-550 X			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK 17.50ft			Log EB2-A, 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				
2046.91														Ground Surface
	4.60	0	2	2	1.5	4								LOGS AND SOIL DEBRIS
2040.00														ALLUVIUM: BROWN MICACEOUS SILTY FINE TO MED. SAND
	9.60	3	4	7	1.5	11								
	14.60	26	16	13	1.5	29								ALLUVIUM: BROWN AND GRAY FINE TO COARSE SAND AND GRAVEL
2030.00														WEATHERED ROCK
														REC = 88 % RQD = 88 %
														REC = 96 % RQD = 96 %
2020.00														CORE #3
														REC = 100 % RQD = 77 %
														CORE #4
														REC = 100 % RQD = 79 %
2010.00														CORE #5
														REC = 100 % RQD = 76 %
2006.31														BORING TERMINATED AT ELEVATION 2006.31 IN HARD ROCK

CORE BORING REPORT							DATE	4/28/03
PROJECT: 8.2880401		I. D. NO: B-2848		BORING NO: EB2-A		GEOLOGIST: T.B. DANIEL		
DESCRIPTION: BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER								
COUNTY: MITCHELL/YANCEY		COLLAR ELEVATION: 2046.9 FT.		TOTAL DEPTH: 40.6 FT.				
ELEV. (FEET)	DEPTH (FEET)	DRILL RATE (MIN./FT.)	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS	
2025.3	21.6		1.7	1.5	1.5		21.6'-40.6': SREC=98% SRQD=98% HARD, VERY SLIGHTLY WEATHERED, THINLY FOLIATED SCHIST. MODERATELY CLOSE FRACTURE SPACING. JOINTING IS PREDOMINATELY ALONG SCHISTOSE FOLIATION @ 50-60°.	
				88	88			
2023.6	23.3							
2023.6	23.3		5.0	4.8	4.8			
				96	96	RS-1		
2018.6	28.3							
2018.6	28.3		4.7	4.7	3.6			
				100	77			
2013.9	33.0							
2013.9	33.0		4.3	4.3	3.4			
				100	79			
2009.6	37.3							
2009.6	37.3		3.3	3.3	2.5			
				100	76			
2006.3	40.6							
CORING TERMINATED AT ELEVATION 2006.3 FT.								
DRILLER: J.T. WILLIAMS		CORE SIZE: NXWL		EQUIPMENT: CME-550				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 8.2880401	ID B-2848	COUNTY MITCHELL/YANCEY	GEOLOGIST T.B.DANIEL
SITE DESCRIPTION BR. #143 ON SR 1304 OVER THE NORTH TOE RIVER			GND WATER
BORING NO EB2-B	NORTHING 0.00	EASTING 0.00	0 HR 14.80ft
ALIGNMENT -L-	BORING LOCATION 13+80.000	OFFSET 15.00ft RT	24 HR N/A
COLLAR ELEV 2046.27ft	TOTAL DEPTH 42.30ft	START DATE 2/19/03	COMPLETION DATE 02/19/03
DRILL MACHINE CME-550 X	DRILL METHOD SPT CORE BORING	HAMMER TYPE AUTOMATIC	
SURFACE WATER DEPTH N/A	DEPTH TO ROCK 14.50ft	Log EB2-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			
2046.27												Ground Surface
	3.20	0	1	1	1.5							LOGS, BRUSH AND SOIL DEBRIS
2040.00	8.20	3	4	4	1.5					SS-22	M	ROADWAY FILL: BROWN MICACEOUS FINE SAND
	13.20	7	13	20	1.5					SS-23	W	ALLUVIUM: BROWN MICACEOUS SILTY FINE SAND
2030.00	18.20	80			0.5							ALLUVIUM: BROWN/TAN MICACEOUS SILTY FINE SAND AND PEA GRAVEL
	23.20	60			0.1							WEATHERED ROCK
2020.00												HARD ROCK
										CORE #1		REC = 96 % RQD = 35 %
										CORE #2		REC = 84 % RQD = 68 %
										CORE #3		REC = 100 % RQD = 100 %
										CORE #4		REC = 100 % RQD = 100 %
2003.97												BORING TERMINATED AT ELEVATION 2003.97 IN HARD ROCK

CORE BORING REPORT

PROJECT: 8.2880401 I. D. NO: B-2848 BORING NO: EB2-B GEOLOGIST: T.B. DANIEL
 DESCRIPTION: BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER
 COUNTY: MITCHELL/YANCEY COLLAR ELEVATION: 2046.3 FT. TOTAL DEPTH: 42.3 FT.

ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
2021.3	25.0			2.5	0.9		25.0'-29.2': SREC=83% SRQD=45% HARD, MODERATELY SEVERELY WEATHERED, TINLY FOLIATED GNEISS. CLOSE TO VERY CLOSE FRACTURE SPACING. JOINTING OCCURS ALONG FOLIATION @ ~40°. JOINTS SHOW CONSIDERABLE STAINING. A SEVERELY WEATHERED LAYER (0.4') OCCURS AT 28.8'.
2018.7	27.6		2.6	96	35		
2018.7	27.6			4.2	3.4		29.2'-32.6': SREC=79% SRQD=79% HARD, SLIGHTLY WEATHERED SCHIST WITH WIDE FRACTURE SPACING.
2013.7	32.6		5.0	84	68		
2013.7	32.6			4.9	4.9	RS-2	
2008.8	37.5		4.9	100	100		32.6'-42.3': SREC=100% SRQD=100% HARD, VERY SLIGHTLY WEATHERED GNEISS WITH WIDE FRACTURE SPACING.
2008.8	37.5			4.8	4.8		
2004.0	42.3			100	100		

CORING TERMINATED AT ELEVATION 2004.0 FT.

DRILLER: J.T. WILLIAMS CORE SIZE: NXWL EQUIPMENT: CME-550

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 8.2880401 ID: B-2848 COUNTY: Mitchell/Yancey

DESCRIPTION(1): Bridge No. 143 on SR-1304 over North Toe River

INFORMATION ON EXISTING BRIDGES Information obtained from: X field inspection microfilm(Reel: Pos:) X other Hydraulic Design Report

COUNTY BRIDGE NO. 143 BRIDGE LENGTH 367 ft. NO. BENTS IN: CHANNEL 3 FLOOD PLAIN 3

FOUNDATION TYPE: Concrete abutments and piers on footings.

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: None

INTERIOR BENTS: None: visible bedrock.

CHANNEL BED: None: visible bedrock.

CHANNEL BANKS: None

EXISTING SCOUR PROTECTION:

TYPE(3): None

EXTENT(4): N/A

EFFECTIVENESS(5): N/A

OBSTRUCTIONS(6) (DAMS,DEBRIS,ETC.): Concrete parapet that has fallen into river.

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): Cobbles, boulders, bedrock.

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): Alluvial sand and gravel.

FOUNDATION BEARING MATERIAL(9): Hard rock.

CHANNEL BANK COVER(10): Grass, trees, bramble.

FLOOD PLAIN WIDTH(11): Approximately 450 ft.

FLOOD PLAIN COVER(12): Grass, trees, bramble.

DESIGN INFORMATION CONT.

STREAM IS X DEGRADING AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS:

CHANNEL MIGRATION TENDENCY (14): Toward End Bent One (to the west).

GEOTECHNICALLY ADJUSTED SCOUR ELEVATION (15):

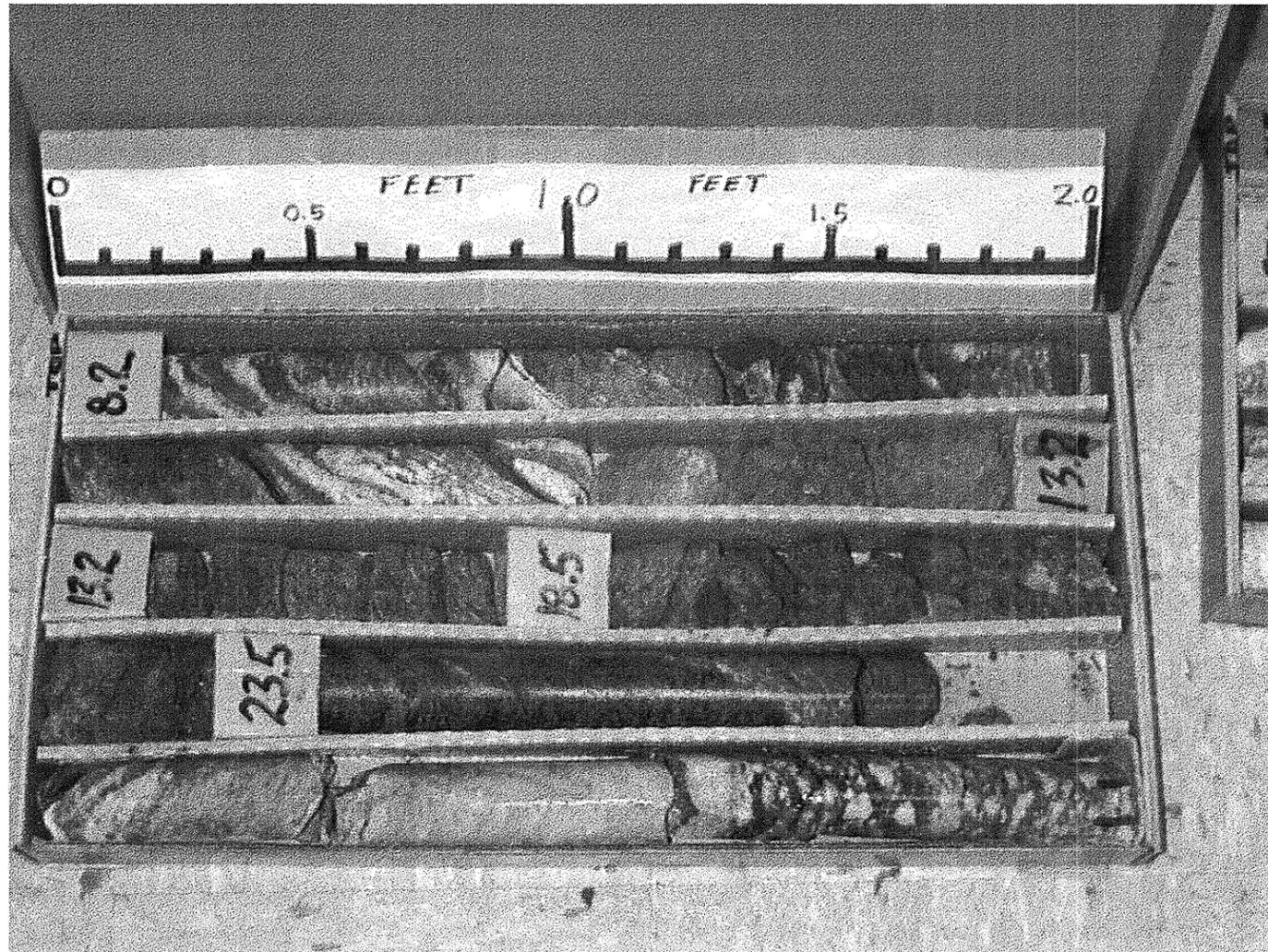
Interior Bent One: 2028 feet - elevation of hard rock.

Interior Bent Two: 2025 feet

REPORTED BY: J. W. Mann, TEG-III DATE: 3/7/2003

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 FOUNDATION BEARING MATERIAL, (10) DESCRIBE THE BANK COVERING (GRASS, TREES, RIP RAP, NONE, ETC. (11) GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE). (12) DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.) (13) CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING (14) DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE Laterally DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS). (15) 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.

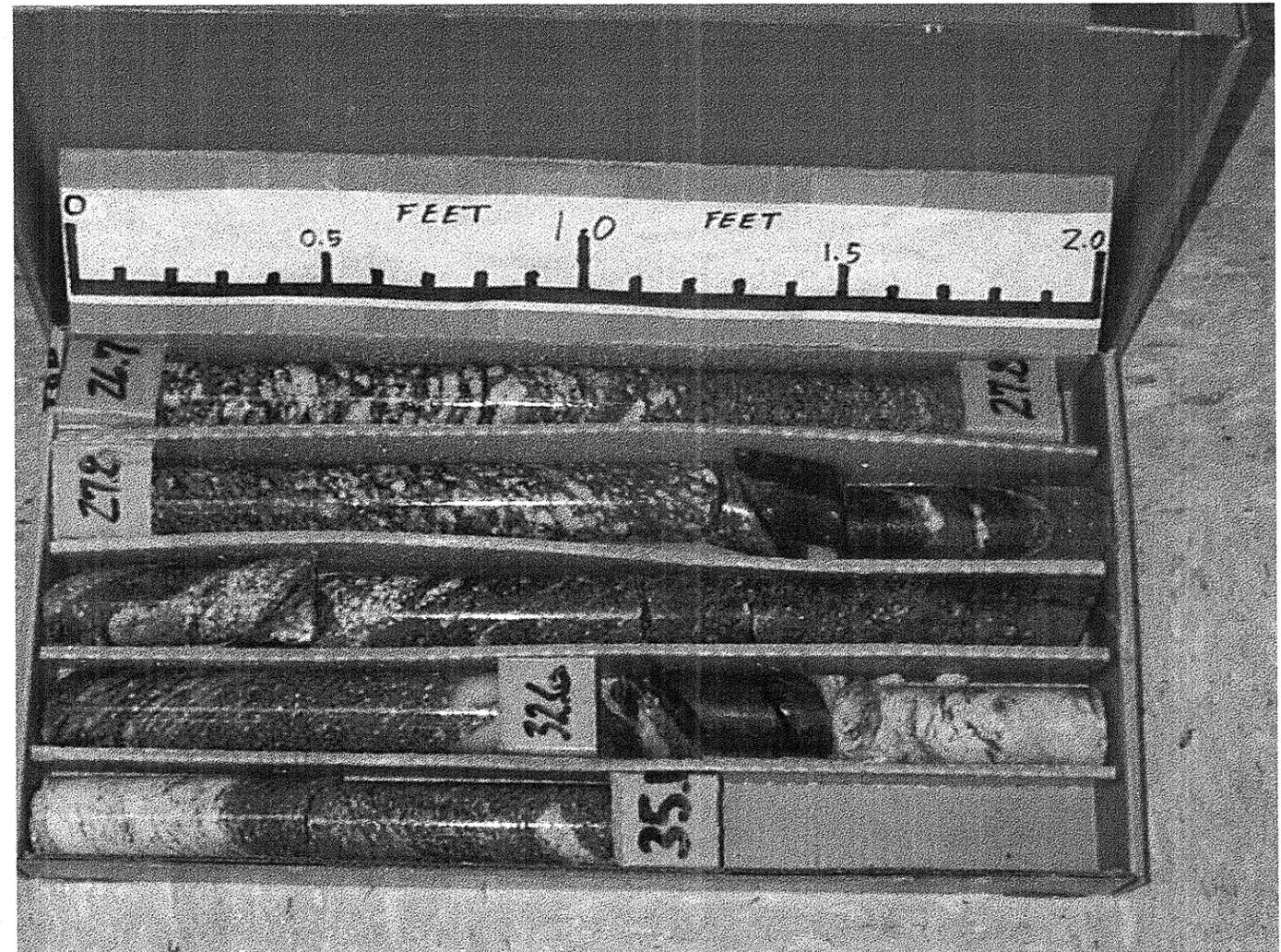


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB1-A@ STATION 10+12, 40' LT (-L-)

BOX 1 OF 2

DEPTH: 8.2-26.7'

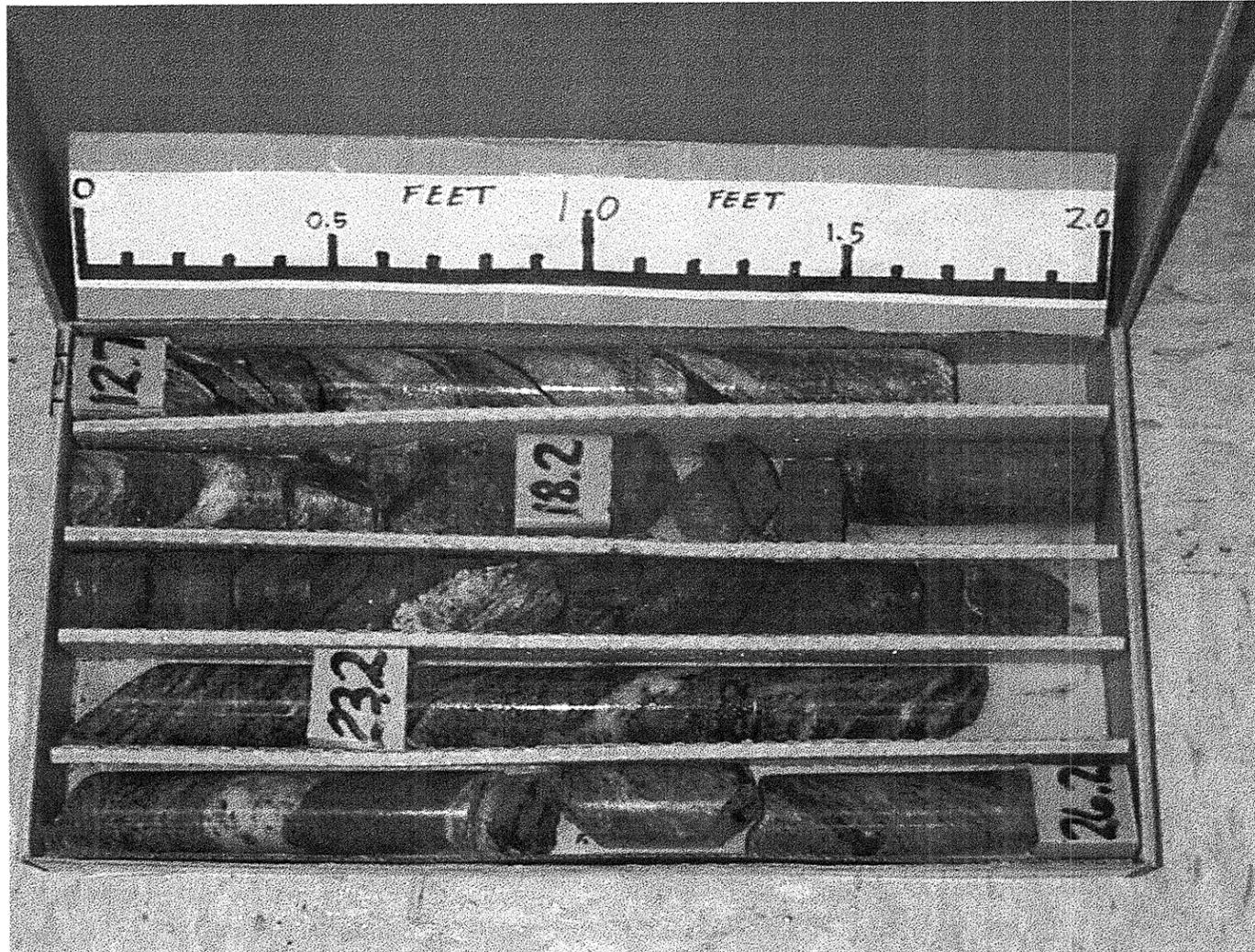


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB1-A@ STATION 10+12, 40' LT (-L-)

BOX 2 OF 2

DEPTH: 26.7-35.1'

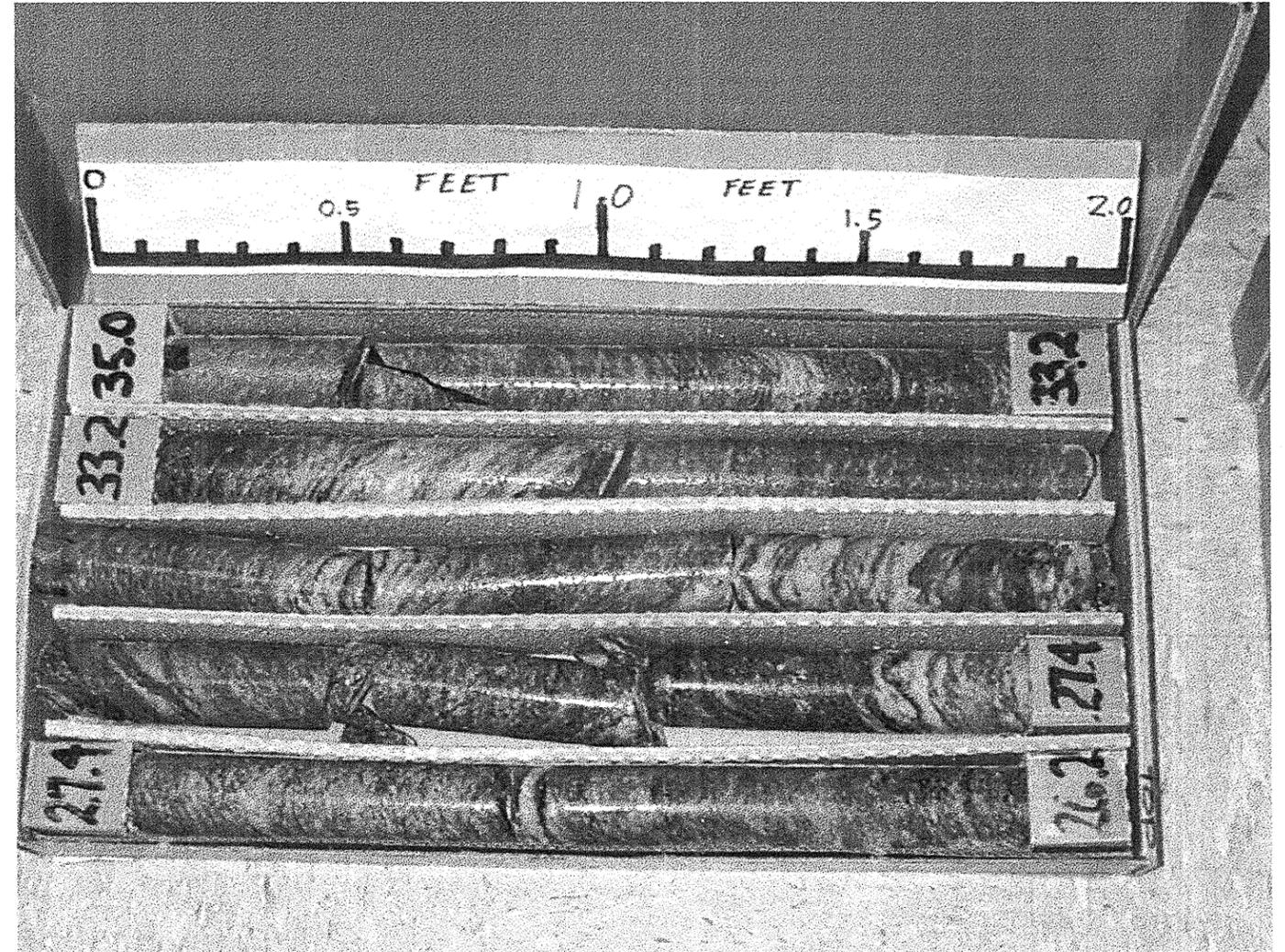


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB1-C@ STATION 10+12, CL (-L-)

BOX 1 OF 3

DEPTH: 12.7-26.2'

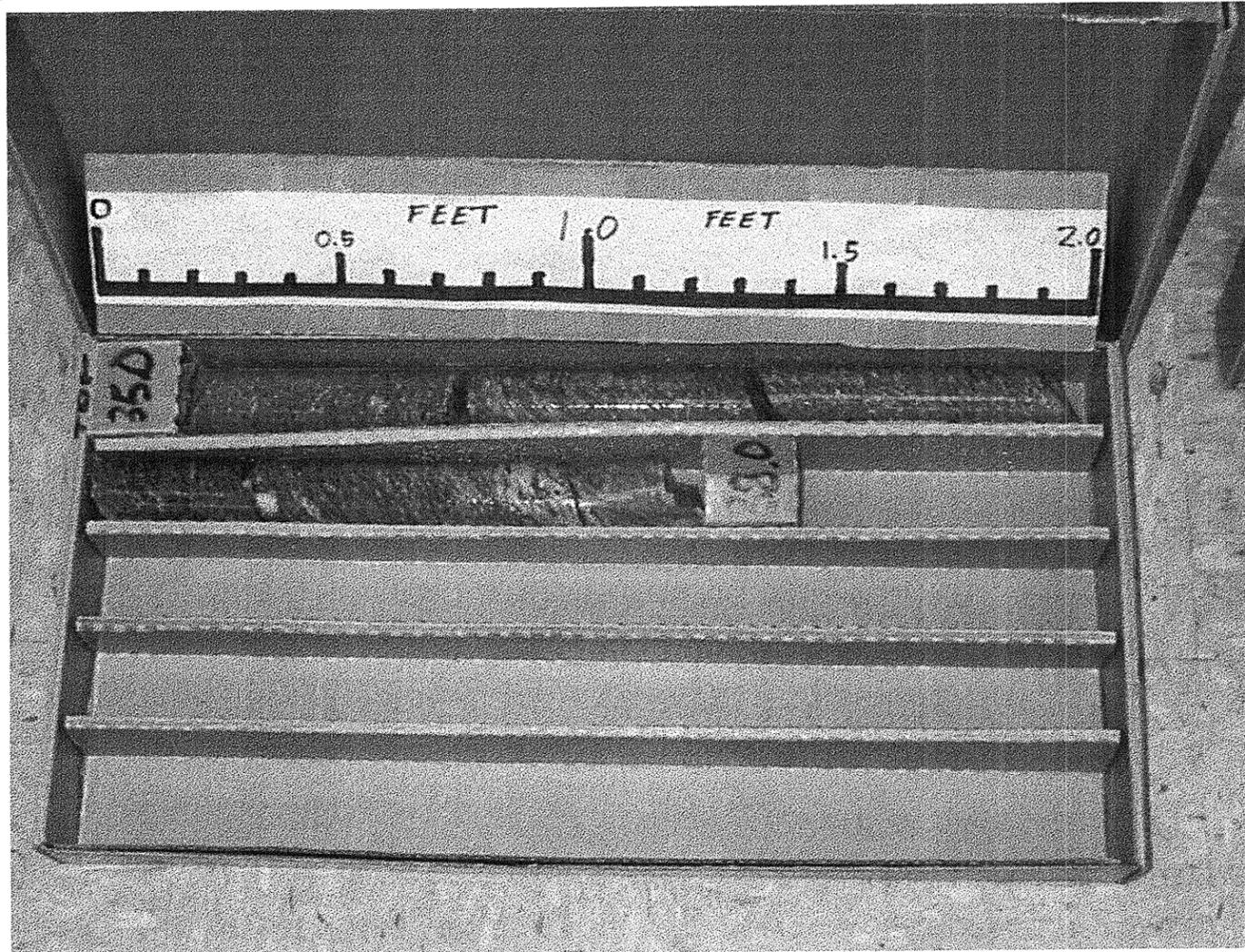


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB1-C@ STATION 10+12, CL (-L-)

BOX 2 OF 3

DEPTH: 26.2-35.0'

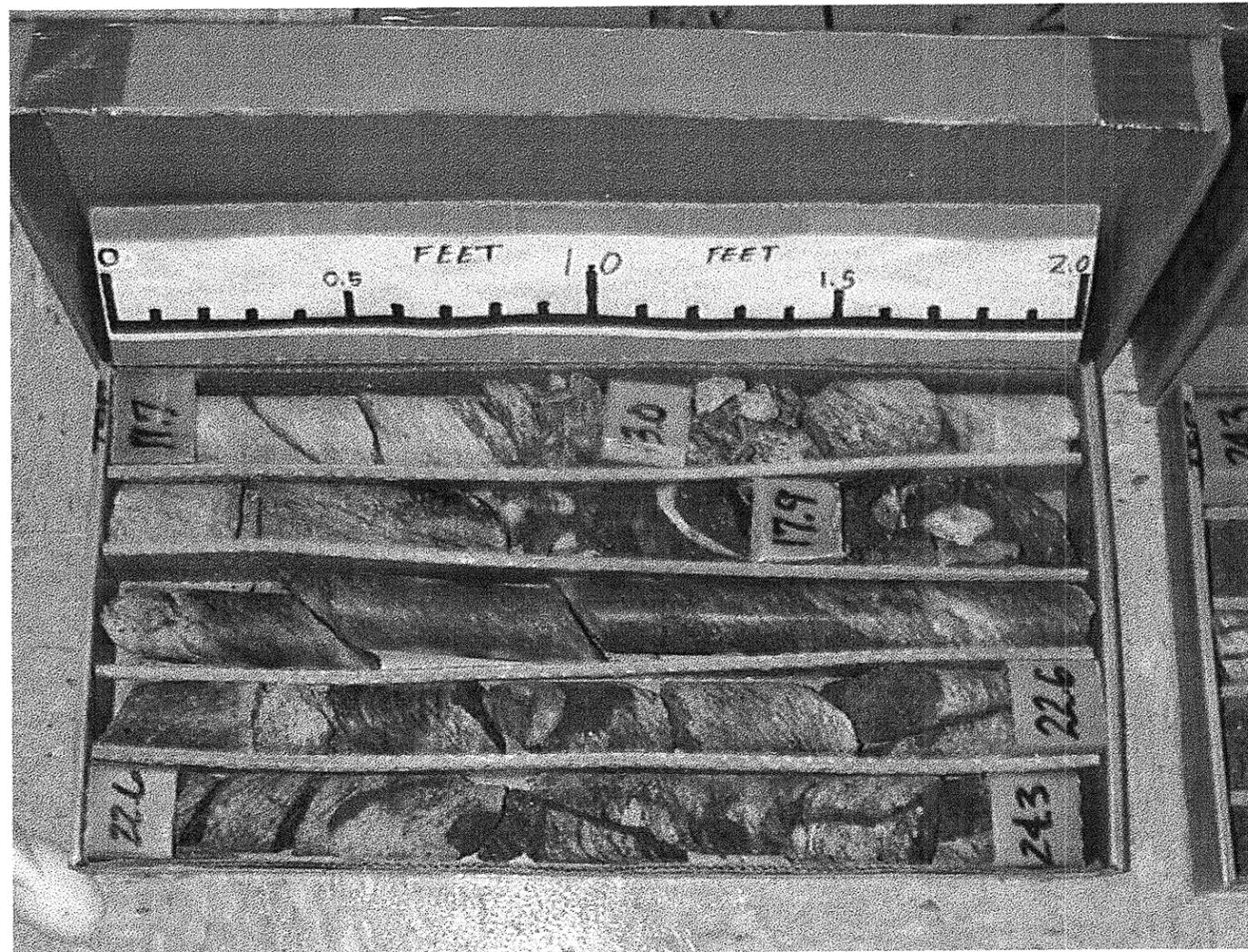


8.2880401 (B-2848)
MITCHELL/YANCEY COUNTY
BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB1-C@ STATION 10+12, CL (-L-)

BOX 3 OF 3

DEPTH: 35.0-38.0'

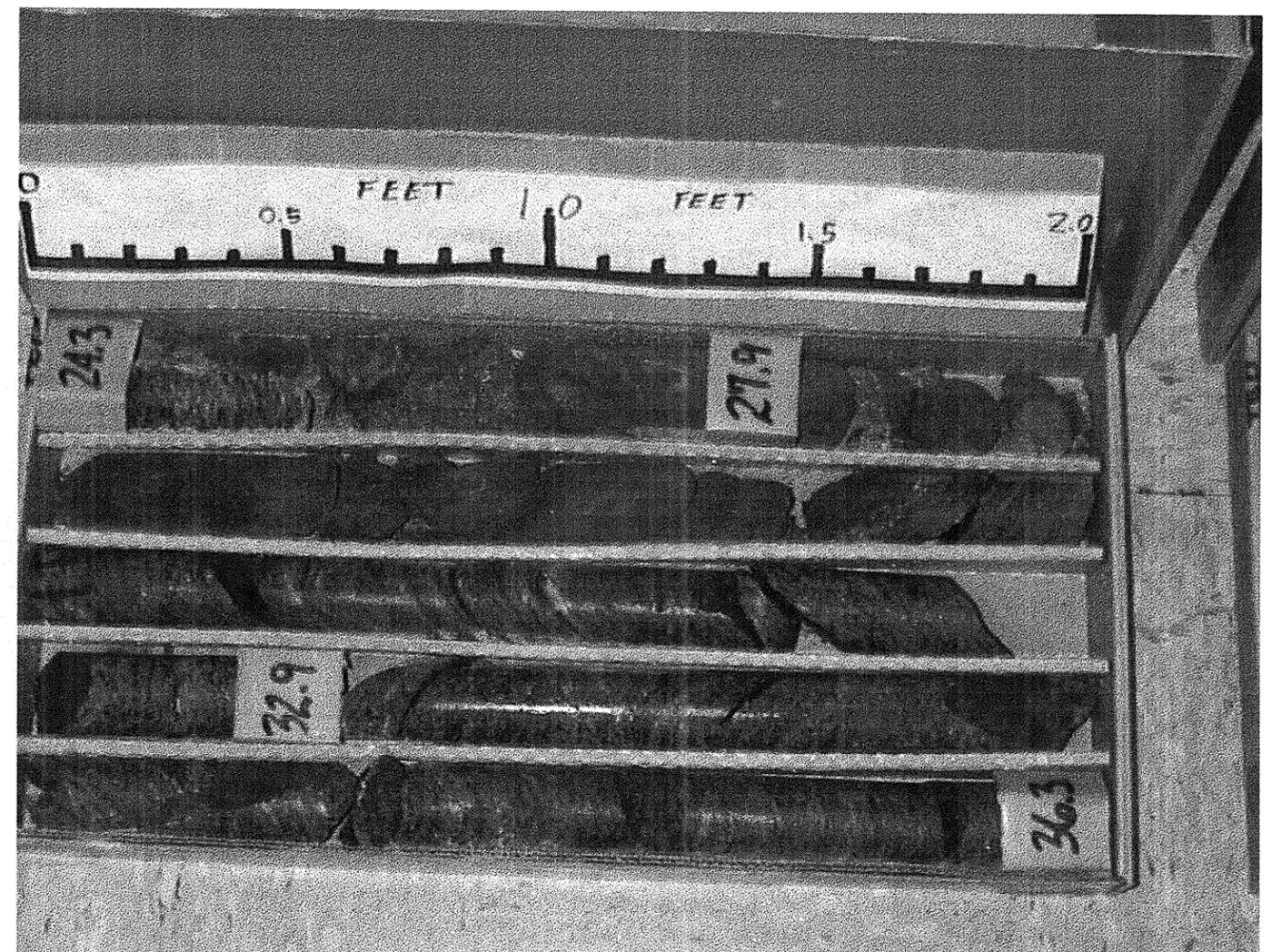


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB1-B@ STATION 10+12, 40' RT (-L-)

BOX 1 OF 3

DEPTH: 11.7-24.3'

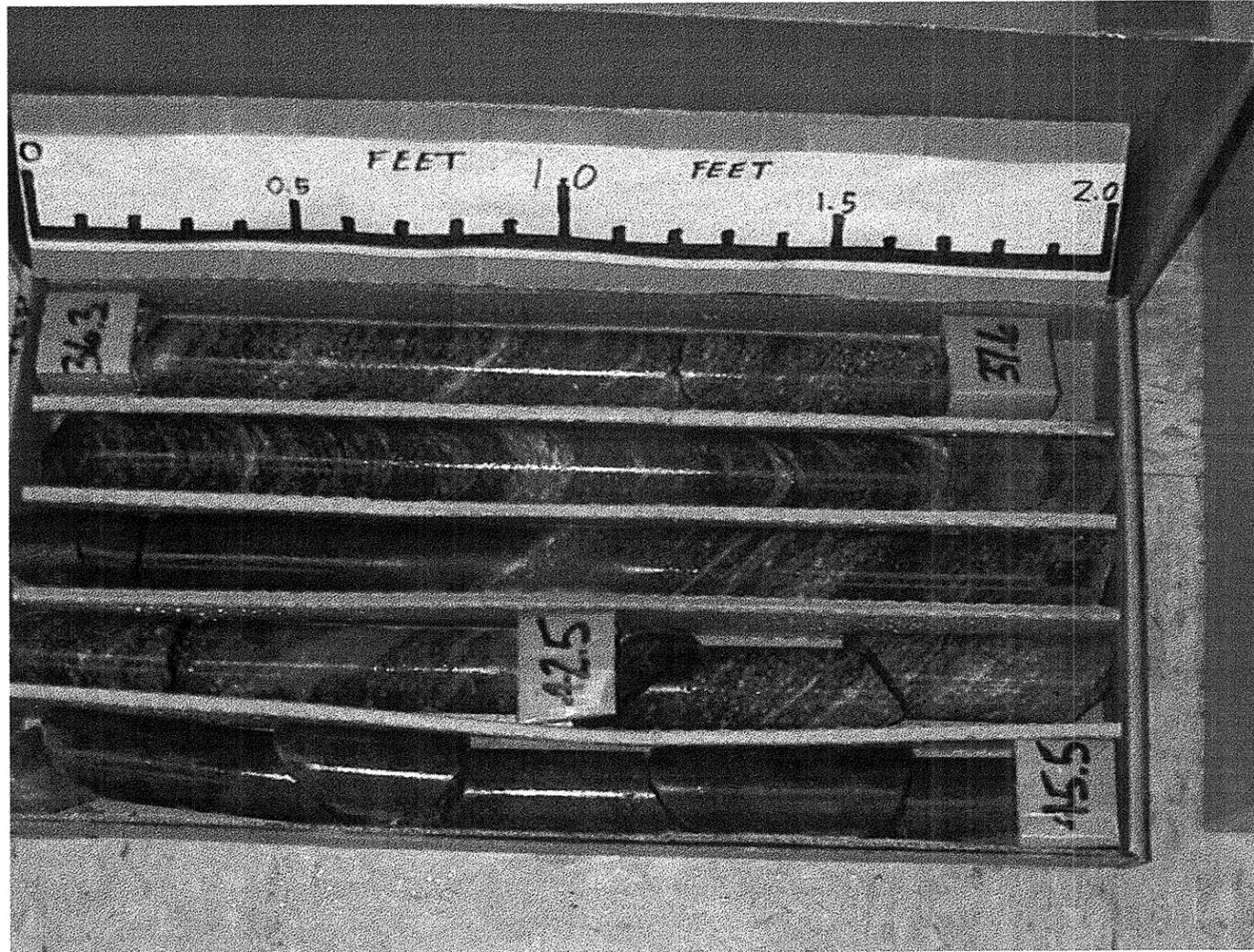


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB1-B@ STATION 10+12, 40' RT (-L-)

BOX 2 OF 3

DEPTH: 24.3-36.3'

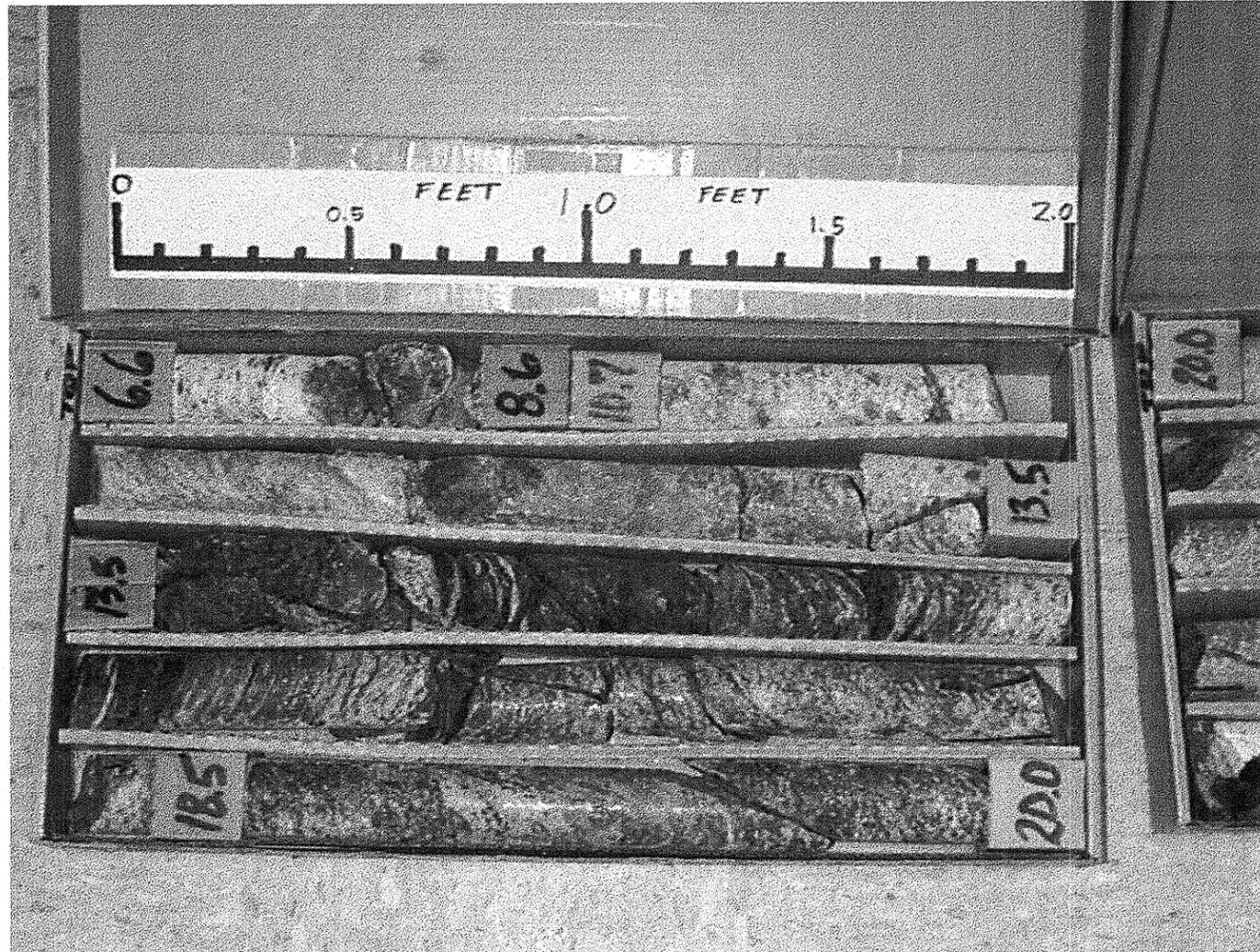


8.2880401 (B-2848)
MITCHELL/YANCEY COUNTY
BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB1-B@ STATION 10+12, 40' RT (-L-)

BOX 3 OF 3

DEPTH: 36.3-45.5'



8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

B2-A@ STATION 12+65, 12' LT (-L-)

BOX 1 OF 3

DEPTH: 6.6-20.0'

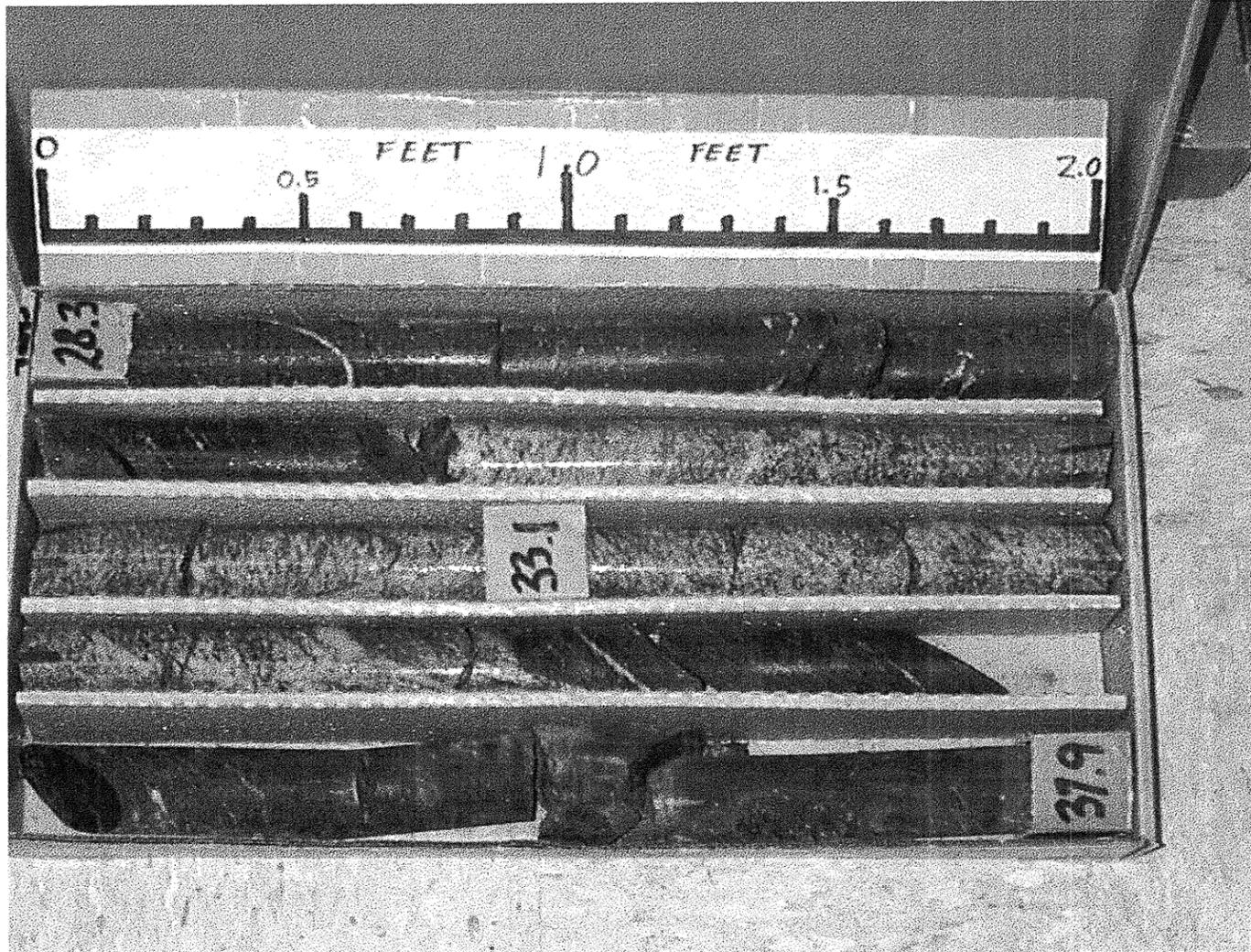


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

B2-A@ STATION 12+65, 12' LT (-L-)

BOX 2 OF 3

DEPTH: 20.0-28.3'



8.2880401 (B-2848)
MITCHELL/YANCEY COUNTY
BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

B2-A@ STATION 12+65, 12' LT (-L-)

BOX 3 OF 3

DEPTH: 28.3-37.9'

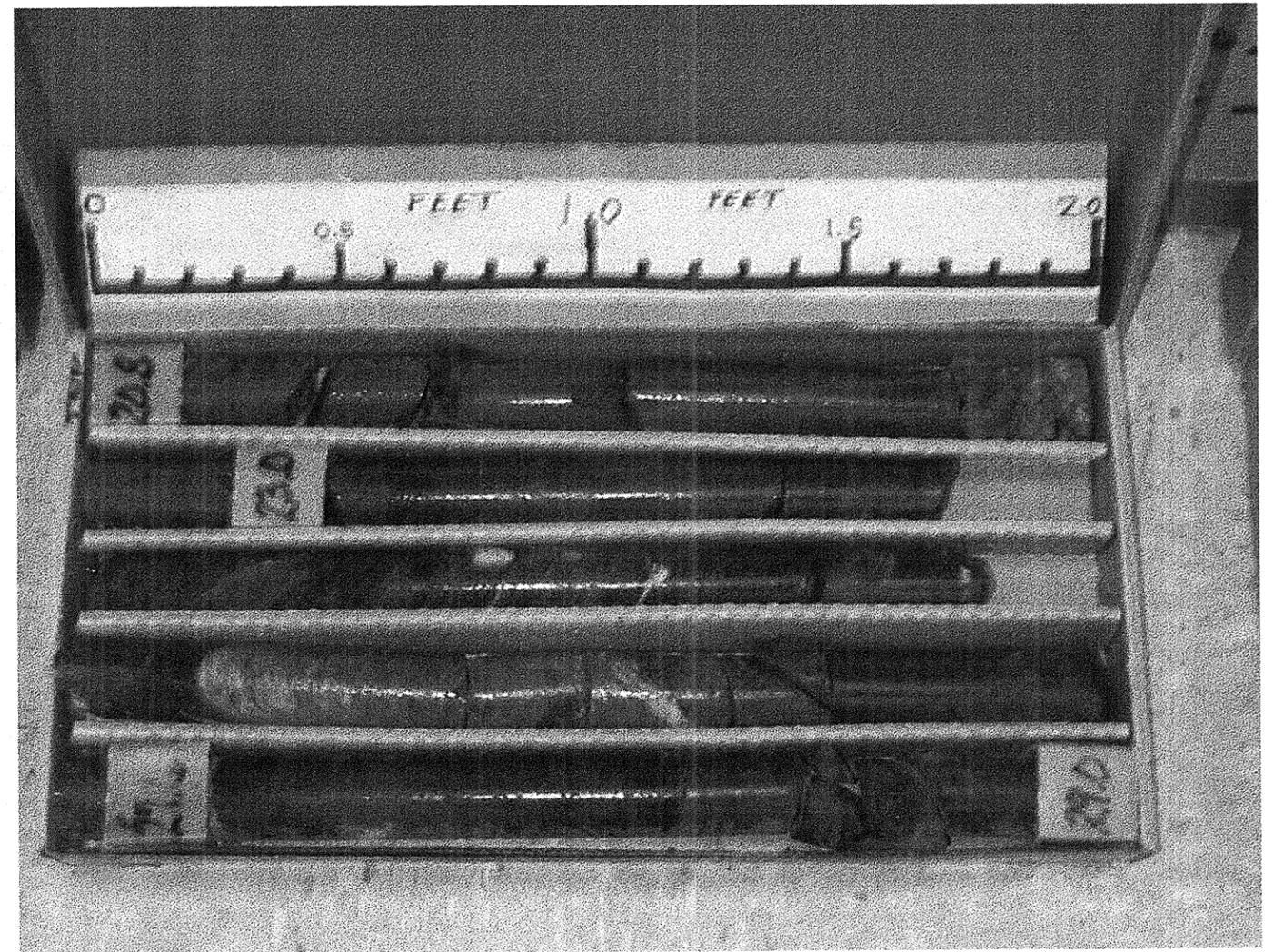


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

B2-B@ STATION 12+65, 12' RT (-L-)

BOX 1 OF 4

DEPTH: 11.1-20.8'

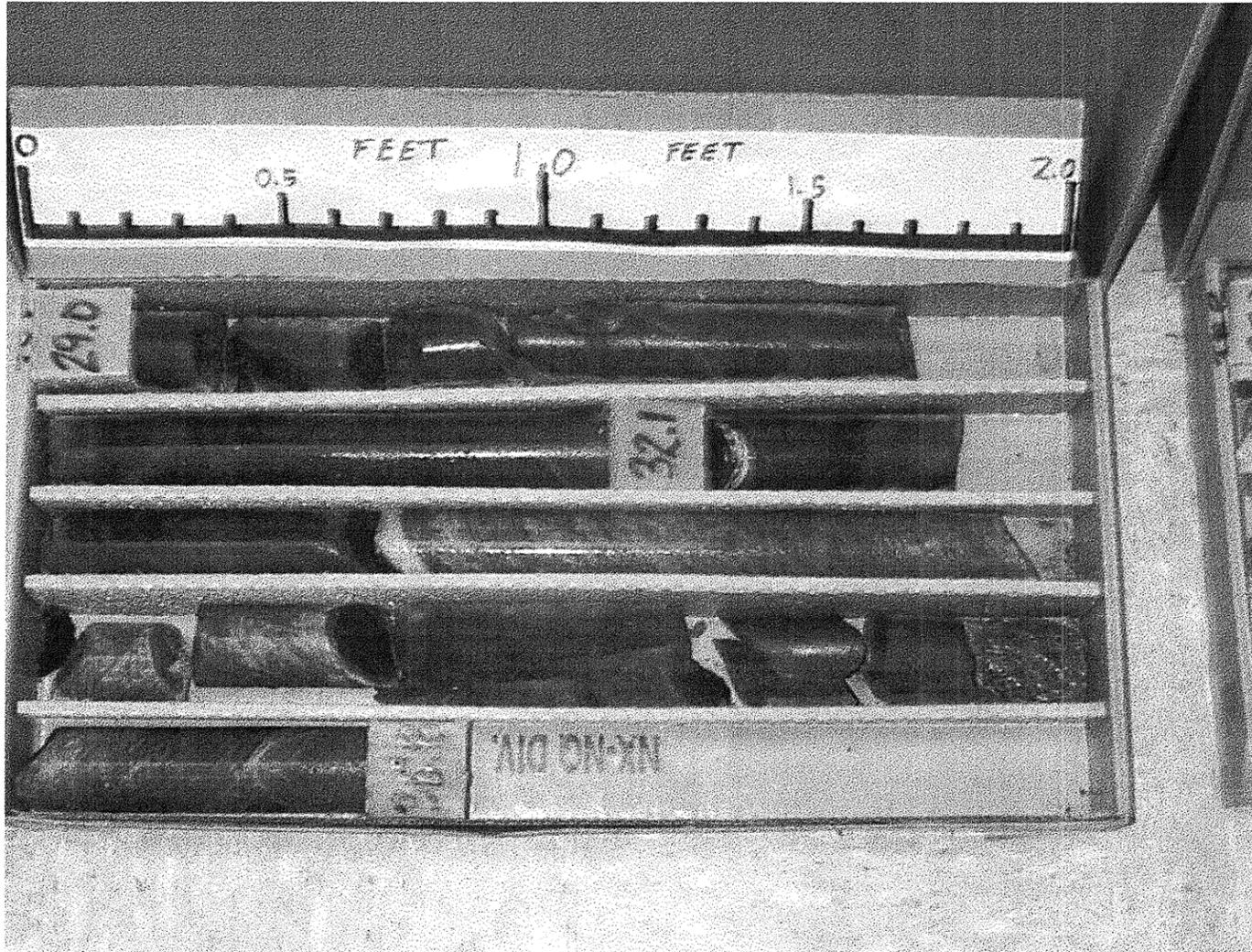


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

B2-B@ STATION 12+65, 12' RT (-L-)

BOX 2 OF 4

DEPTH: 20.8-29.0'

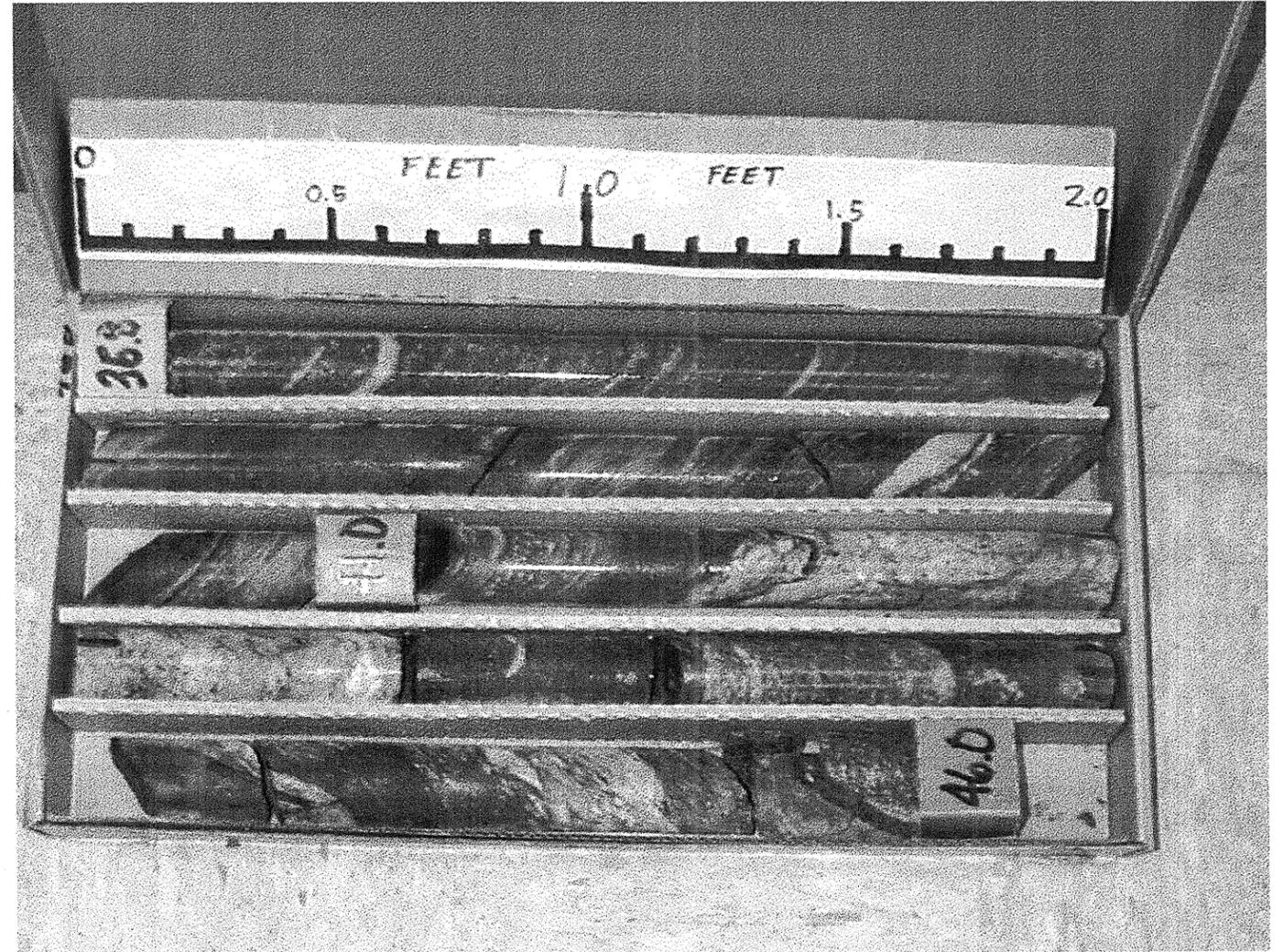


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

B2-B@ STATION 12+65, 12' RT (-L-)

BOX 3 OF 4

DEPTH: 29.0-36.8'

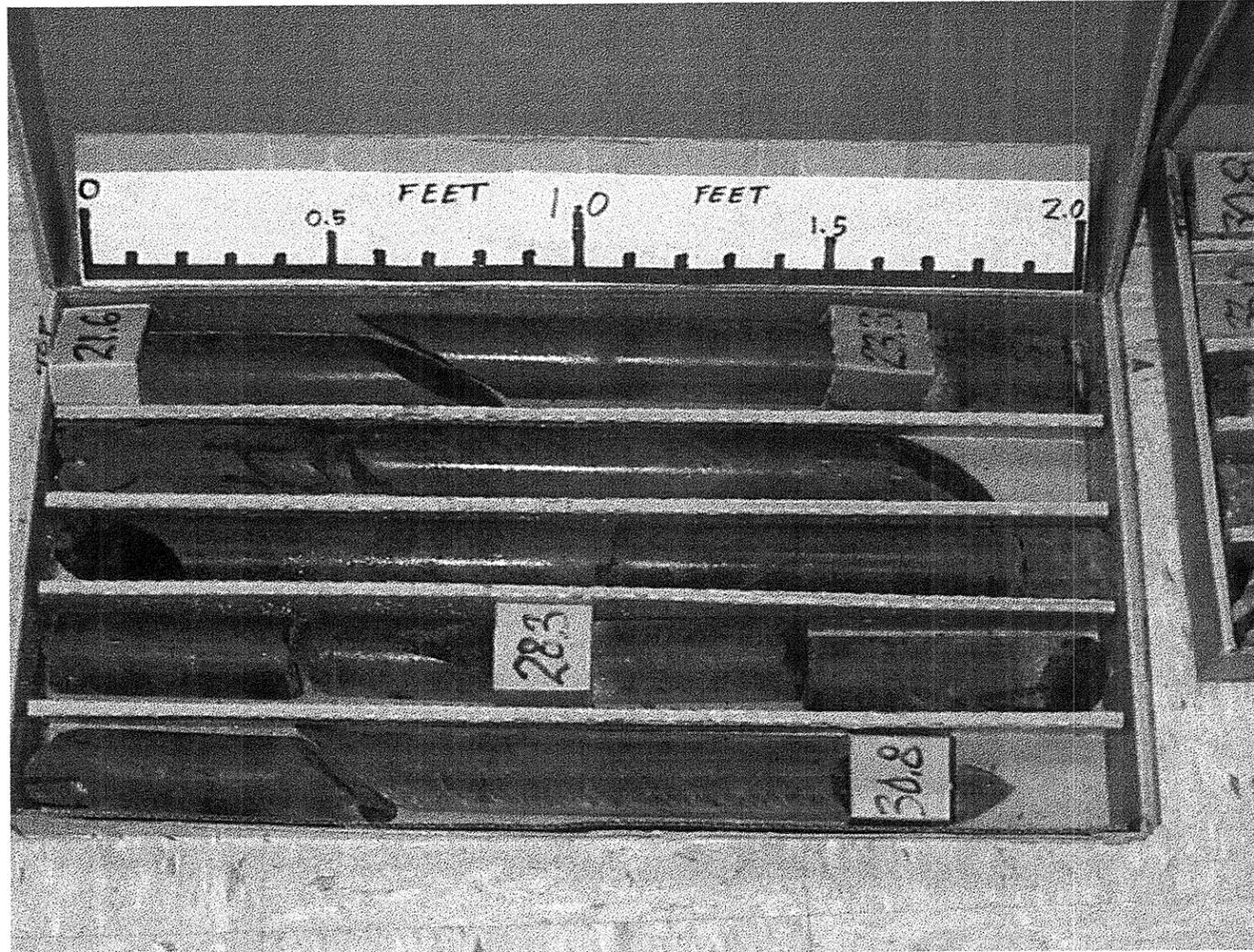


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

B2-B@ STATION 12+65, 12' RT (-L-)

BOX 4 OF 4

DEPTH: 36.8-46.0'

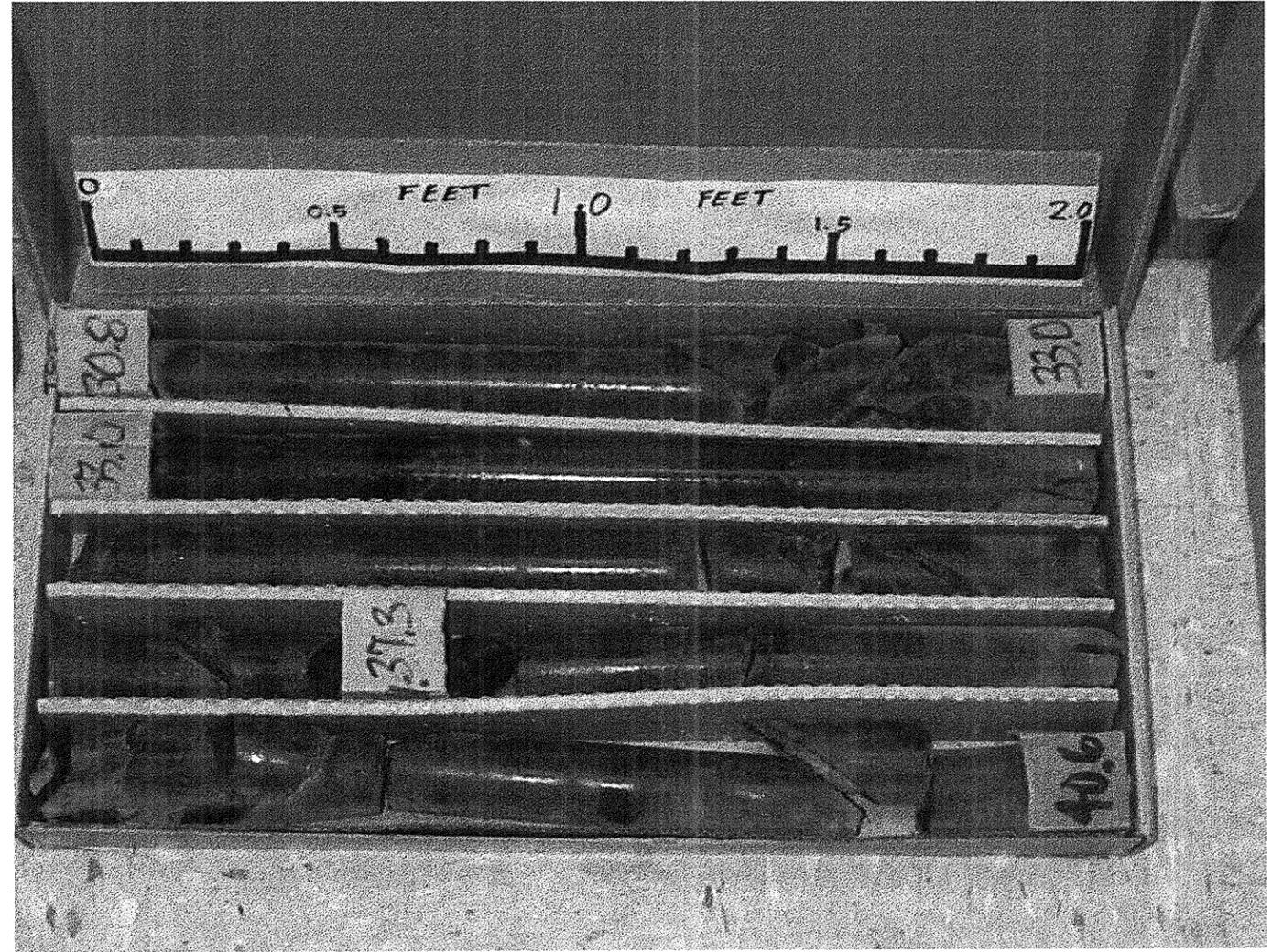


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB2-A@ STATION 13+80, 23' LT (-L-)

BOX 1 OF 2

DEPTH: 21.6-30.8'

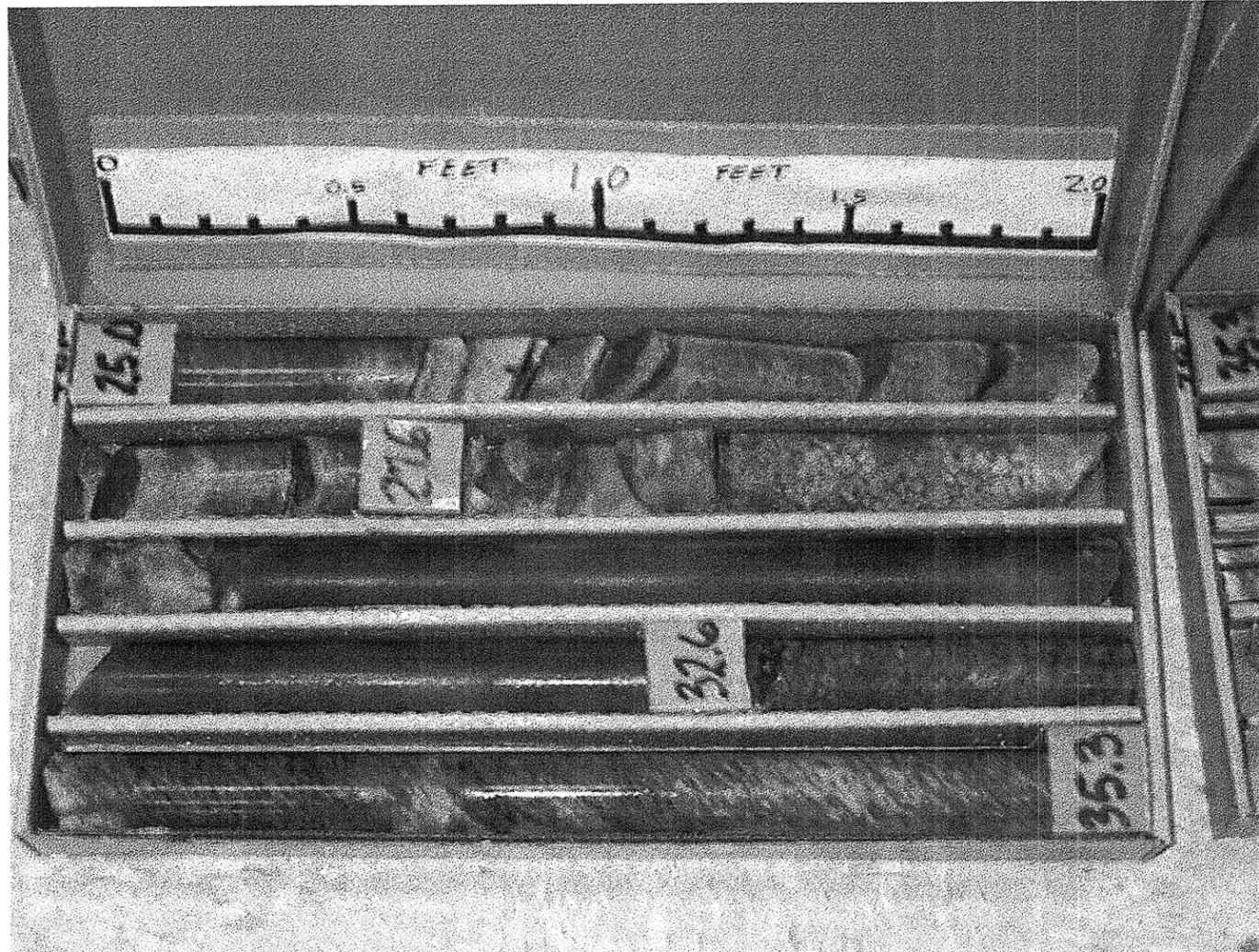


8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB2-A@ STATION 13+80, 23' LT (-L-)

BOX 2 OF 2

DEPTH: 30.8-40.6'



8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB2-B@ STATION 13+80, 15' RT (-L-)

BOX 1 OF 2

DEPTH: 25.0-35.3'



8.2880401 (B-2848)
 MITCHELL/YANCEY COUNTY
 BRIDGE NO. 143 ON SR-1304 OVER NORTH TOE RIVER

EB2-B@ STATION 13+80, 15' RT (-L-)

BOX 2 OF 2

DEPTH: 35.3-42.3'