

**CONTRACT: ID: B-3635**

# STATE OF NORTH CAROLINA

## DEPARTMENT OF TRANSPORTATION

### DIVISION OF HIGHWAYS

### GEOTECHNICAL UNIT

# STRUCTURE SUBSURFACE INVESTIGATION

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STATE PROJECT 33183.1.1 I.D. NO. B-3635  
 F.A. PROJECT BRSTP-1505(1)  
 COUNTY CHEROKEE  
 PROJECT DESCRIPTION BRIDGE NO. 26  
OVER JUNALUSKA CREEK ON SR  
1505 AT PROJECT STATION 17+32.5 -L-  
 SITE DESCRIPTION \_\_\_\_\_

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3635	1	10
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33183.1.1	BRSTP-1505(1)	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 @ 1909/250-4088. 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.

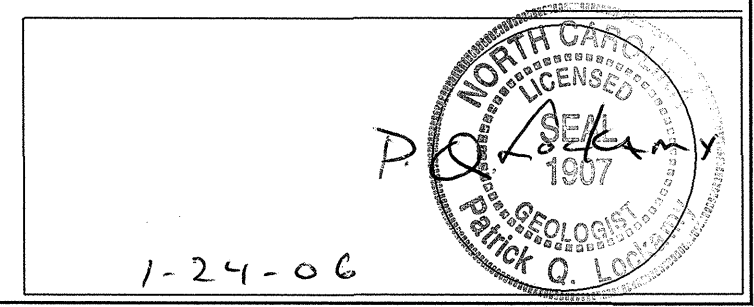
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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 P.O. LOCKAMY PERSONNEL M.M. HAGER  
 CHECKED BY W.D. FRYE R.D. CHILDERS  
 SUBMITTED BY W.D. FRYE G.K. ROSE  
 DATE 01.24.06

DRAWN BY: J.T. WILLIAMS

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

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



**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
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B-3635	33183.1.1	2	10

**SUBSURFACE INVESTIGATION**

**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION												GRADATION												ROCK DESCRIPTION												TERMS AND DEFINITIONS																																																																																																																																																																															
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: <i>VERY STIFF, GRN SATY CLM, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>												WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE <u>UNIFORM</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) <u>GAP GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.												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. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:												ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS ENCOUNTED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. 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. SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																																																																																																																																																															
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<b>FRACTURE SPACING</b> <table border="1" style="width: 100%; font-size: x-small;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table>												TERM	SPACING	VERY WIDE	MORE THAN 10 FEET	WIDE	3 TO 10 FEET	MODERATELY CLOSE	1 TO 3 FEET	CLOSE	0.16 TO 1 FEET	VERY CLOSE	LESS THAN 0.16 FEET	<b>BEDDING</b> <table border="1" style="width: 100%; font-size: x-small;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>&gt; 4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>&lt; 0.008 FEET</td> </tr> </table>												TERM	THICKNESS	VERY THICKLY BEDDED	> 4 FEET	THICKLY BEDDED	1.5 - 4 FEET	THINLY BEDDED	0.16 - 1.5 FEET	VERY THINLY BEDDED	0.03 - 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET	THINLY LAMINATED	< 0.008 FEET																																																																																																																																																																		
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<b>INDURATION</b> FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.												<b>BENCH MARK: BM #2 : CHISELED SQUARE ON EAST END OF HEADWALL</b> <b>10.34' RT OF -BL- STA. 8+57.23</b> <b>ELEVATION: 2029.49</b>																																																																																																																																																																																																							
<b>COLOR</b> DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.												<b>NOTES:</b>																																																																																																																																																																																																							



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

January 23, 2006

STATE PROJECT: 33183.1.1 (B-3635)  
COUNTY: Cherokee  
DESCRIPTION: Bridge No. 26 on SR-1505 over Junaluska Creek  
SUBJECT: Geotechnical Report – Foundation Investigation

#### Site Description

This proposed bridge replacement project is located on SR-1505 upstream of Andrews in Cherokee County. The proposed bridge is a single 45' long 21" cored slab on a 70-degree skew at Station 17+32.5 -L-. The replacement structure will be built on new alignment.

A previous alignment at this site included excavation of hot rock and the alignment has been modified accordingly to reduce rock cut. A boring from a previous investigation (Boring 1, now EB1-C) is incorporated into this investigation.

At this site, Junaluska Creek has a moderately steep gradient with a narrow floodplain and steep, somewhat rocky valley walls. The creek is a conveyor belt for rocks. Down cutting by the creek has nearly kept up with weathering of bedrock at this local.

#### Foundation Materials

Excellent shallow foundation material below shallow alluvium are present across the site and consist predominantly of 4 to 5 feet of weathered rock underlain by hard phyllitic rock with high recovery and RQD rates. Scattered areas of hard sarpolitic sandy silt cap the weathered rock just below the basal alluvial contact.

Parent material for the country rock includes fine-grained sediments, mostly fine sandy silts with some organic matter and some silty fine sand. The recycled organic material occurs as graphite and pyrite. Pyrite appears to be mobilized somewhat as it has formed flat crystals along foliation as seen on some breaks. The graphite stains the small clear

micas dark grey. Finding graphite in the rocks is as close as it gets to finding fossils in the Blue Ridge.

Biotite facies metamorphism (rather low temperature) has produced the rock we know today as graphitic phyllite. Phyllite is composed of very small crystals grown into partially altered sediments. This rock has an abundance of sericite (seed micas, usually muscovite) which are aligned parallel and form smooth flat surfaces in the rock which correspond to foliation. Phyllite can be easily broken along micaceous foliation.

#### Geotechnical Descriptive Analysis

The bridge site has a layer cake arrangement of materials. The top layer – alluvium - is approximately 6.5 feet thick. Alluvium consists predominantly of cobbles and boulders with a silty sand matrix and discontinuous lenses of medium stiff sandy silt. The second layer is 4 to 8 feet of weathered rock with occasional layers of hard sandy silt saprolite and layers of hard rock. The third and bottom layer, below 11 to 14 feet, is moderately hard, fresh phyllite with high recovery and RQD rates.

#### Groundwater

Groundwater was recorded at elevations 2036.3 and 2038.0 feet in 2004 and 2005.

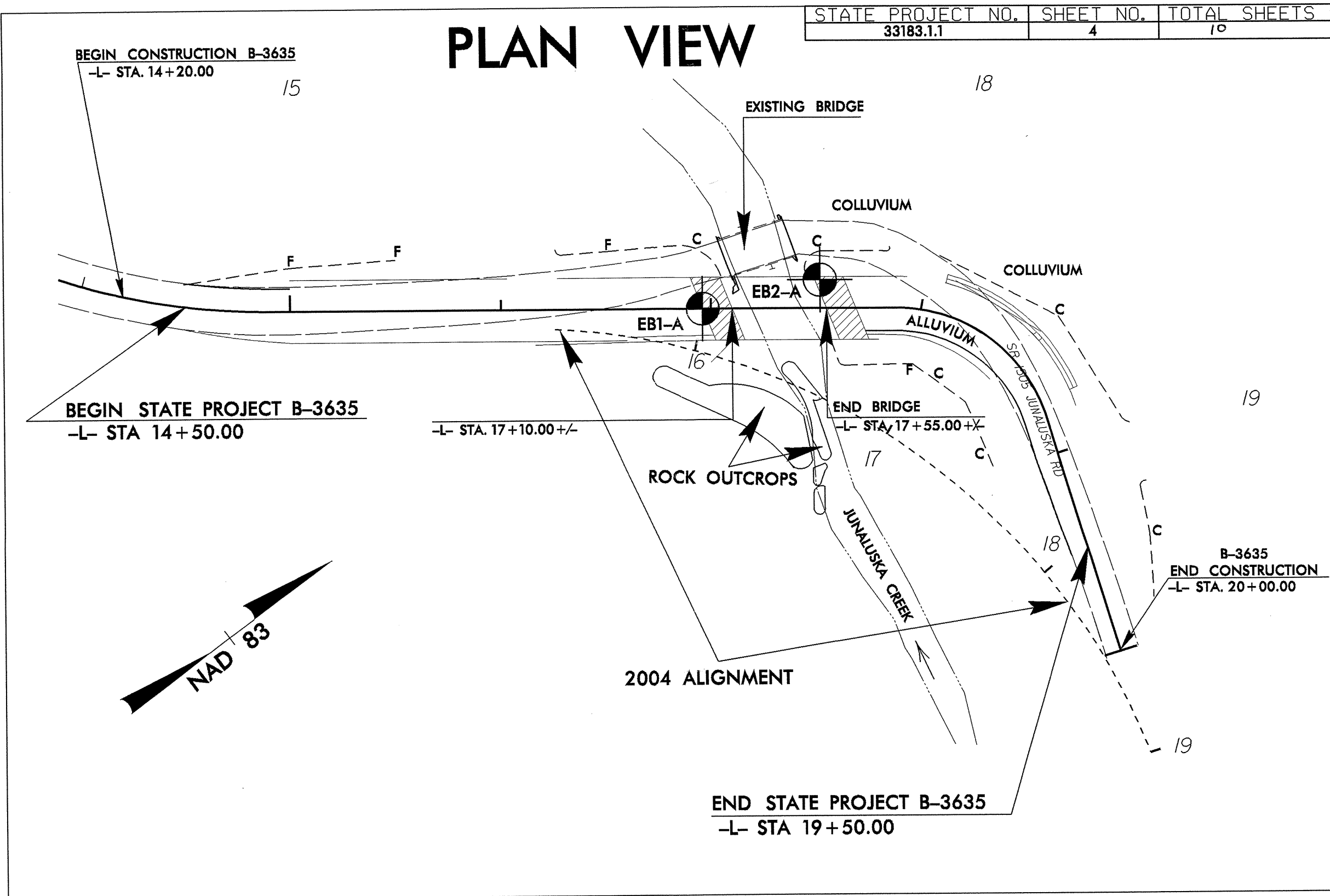
Respectfully Submitted,

*P. Q. Lockamy*

P. Q. Lockamy, LG

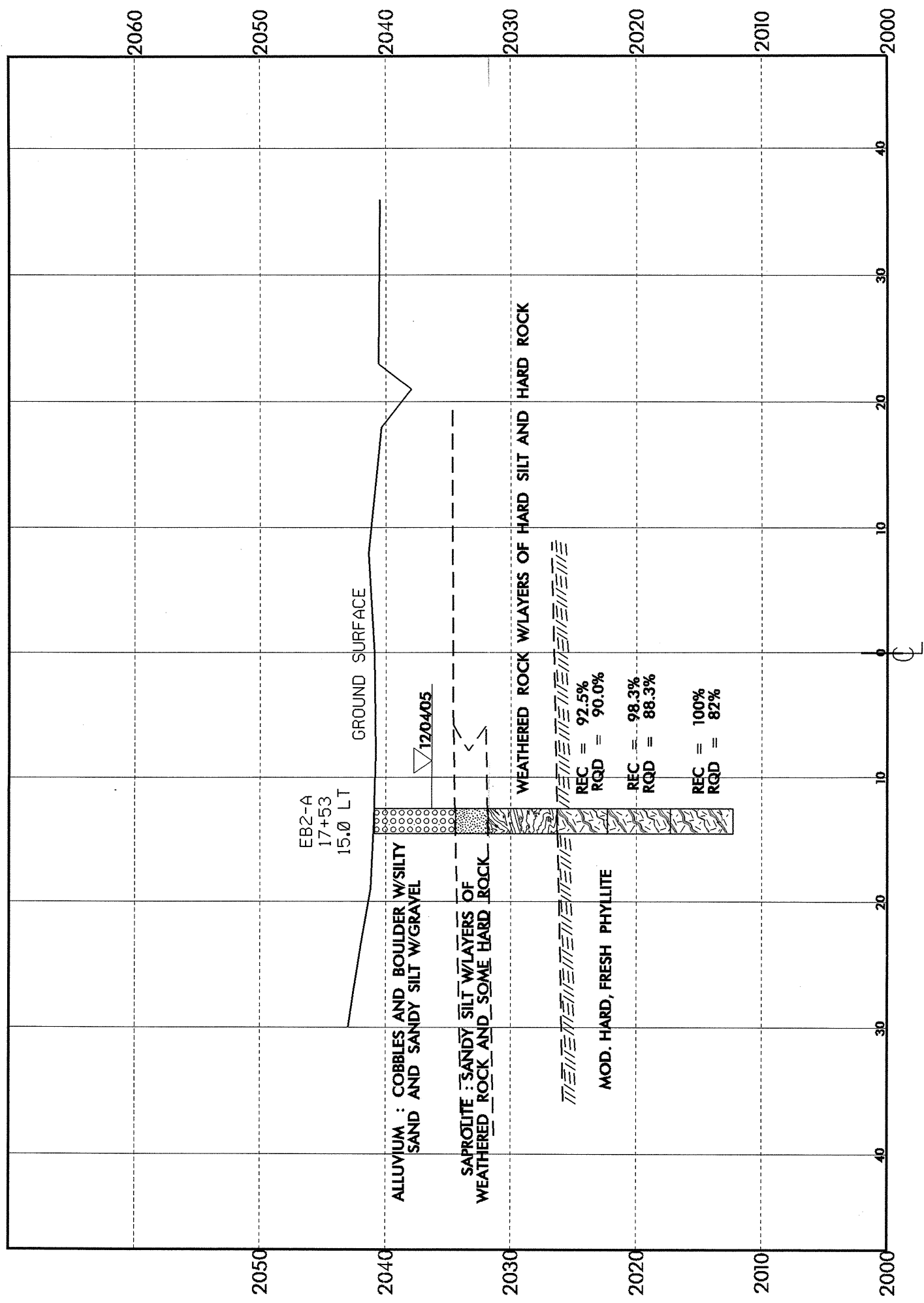
STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
33183.1.1	4	10

# PLAN VIEW



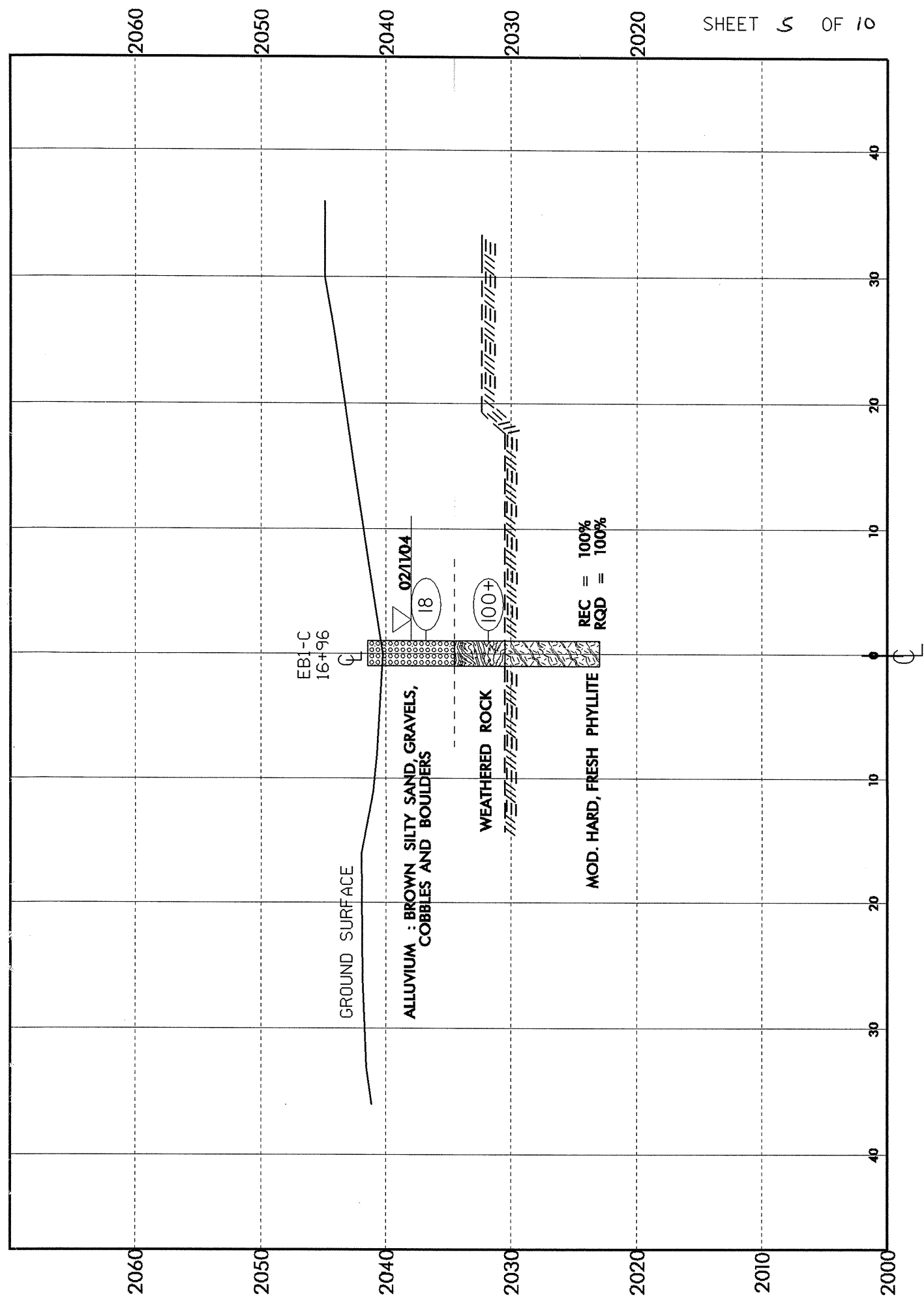
CROSS SECTION EB2

BRIDGE NO. 26, 33183.1.1 (B3635)



CROSS SECTION EBI

BRIDGE NO. 26, 33183.1.1 (B3635)



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 GEOTECHNICAL UNIT BORING LOG

SHEET 6 OF 10  
 DATE 2/11/2004

CORE BORING REPORT

PROJECT NO 33183.1.1		ID B-3635		COUNTY CHEROKEE		GEOLOGIST DP MURPHY								
SITE DESCRIPTION BRIDGE 26 ON SR-1505 OVER JUNALUSKA CREEK						GND WATER								
BORING NO EB1-C		NORTHING 0.00		EASTING 0.00		0 HR 3.50ft								
ALIGNMENT -L- REV 6-22-05		BORING LOCATION 16+96.000		OFFSET 0.00ft		24 HR N/A								
COLLAR ELEV 2041.47ft		TOTAL DEPTH 19.00ft		START DATE 2/11/04		COMPLETION DATE 02/11/04								
DRILL MACHINE CME-550X				DRILL METHOD SPT CORE BORING		HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH				DEPTH TO ROCK N/A		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	100				
2041.47														
2040.00														
	5.00	12	8	10	1.0									
	10.00	20	80		0.8									
2030.00														
2022.47														
CORING TERMINATED AT A DEPTH OF 19.0 FEET IN MODERATELY HARD, FRESH PHYLLITE.														

PROJECT: 33183.1.1		I. D. NO: B-3635		BORING NO: EB1-C		GEOLOGIST: DP MURPHY	
DESCRIPTION: BRIDGE NO.26 ON SR-1505 OVER JUNALUSKA CREEK IN CHEROKEE CO. 16+96 CL -L- REV 2005							
COUNTY: CHEROKEE		COLLAR ELEVATION: 2041.5 FT.		TOTAL DEPTH: 19.0 FT.			
ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
2030.0	11.5		2.5	2.5	2.5		MODERATELY HARD, FRESH, DARK GREY MICA PHYLLITE WITH GRAPHITE AND PYRITE. WELL FOLIATED AT 35 DEGREES ON SMOOTH PLANES PARTLY COATED WITH PYRITE. 2 JOINTS AT 60 DEGREES, MODERATELY ROUGH OR STEPPED, COATED WITH CHLORITE AND ALUM.
2027.5	14.0		100	100			
2027.5	14.0		5.0	5.0	5.0		MODERATELY HARD, FRESH, DARK GREY MICA PHYLLITE WITH GRAPHITE AND PYRITE. WELL FOLIATED AT 35 DEGREES ON SMOOTH PLANES PARTLY COATED WITH PYRITE. 2 JOINTS AT 60 DEGREES, MODERATELY ROUGH OR STEPPED, COATED WITH CHLORITE AND ALUM.
2022.5	19.0		100	100			
CORING TERMINATED AT ELEVATION 2022.5 FT.							
DRILLER: DO CHEEK		CORE SIZE: NXWL		EQUIPMENT: CME-550			

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

SHEET 7 OF 10

DATE 12/14/2005

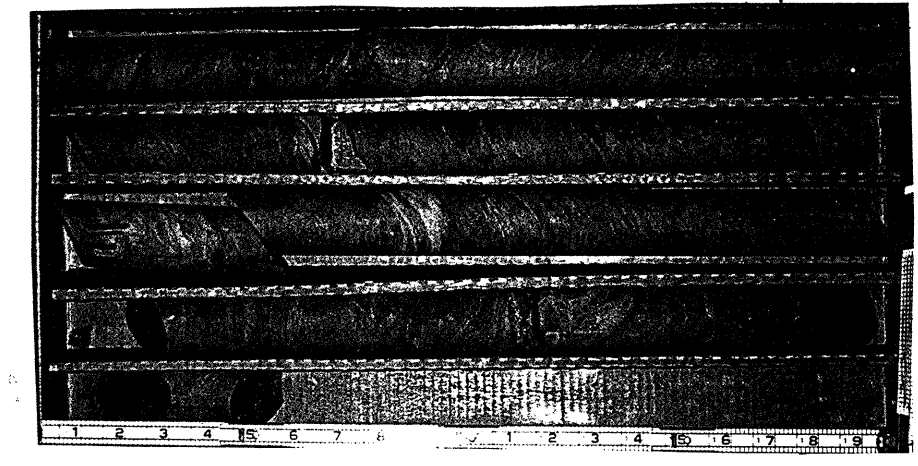
**CORE BORING REPORT**

PROJECT NO 33183.1.1		ID B-3635		COUNTY CHEROKEE		GEOLOGIST MM HAGER								
SITE DESCRIPTION BRIDGE 26 ON SR-1505 OVER JUNALUSKA CREEK						GND WATER								
BORING NO EB2-A		NORTHING 0.00		EASTING 0.00		0 HR 4.60ft								
ALIGNMENT -L- REV 6-22-05		BORING LOCATION 17+53.000		OFFSET 15.00ft LT		24 HR N/A								
COLLAR ELEV 2040.90ft		TOTAL DEPTH 28.60ft		START DATE 12/14/05		COMPLETION DATE 12/14/05								
DRILL MACHINE CME-550X			DRILL METHOD SPT CORE BORING			HAMMER TYPE								
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			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				
2040.90														
	2.70	0	3	2	1.0	5								Ground Surface
	7.70	20	29	33	1.0									ALLUVIUM: COBBLES & BOULDERS W/ SILTY SAND AND SANDY SILT
2030.00	12.70	60			0.1									SAPRILITE: SANDY SILT WITH LAYERS OF WEATHERED ROCK AND SOME HARD ROCK
														WEATHERED ROCK WITH LAYERS OF HARD SILT AND HARD ROCK
														HARD ROCK: MODERATELY HARD AND FRESH PHYLLITE, HIGH REC AND RQD
2012.30														CORING TERMINATED IN MODERATELY HARD, FRESH, PHYLLITE AT A DEPTH OF 28.6 FEET.

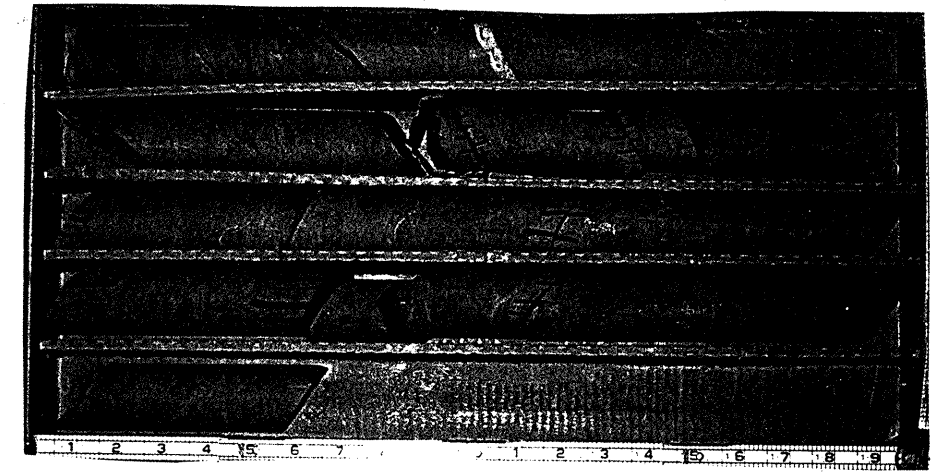
PROJECT: 33183.1.1		I. D. NO: B-3635		BORING NO: EB2-A		GEOLOGIST: MM Hager	
DESCRIPTION: BRIDGE NO.26 ON SR-1505 OVER JUNALUSKA CREEK IN CHEROKEE CO. 17+53 15 LT -L- REV 2005							
COUNTY: CHEROKEE		COLLAR ELEVATION: 2040.9 FT.			TOTAL DEPTH: 28.6 FT.		
ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
2026.3	14.6		4.0	3.7	3.6		MOD. HARD, FRESH, DARK GREY MICA PHYLLITE WITH GRAPHITE. WELL FOLIATED AT 35 DEGREES ON SMOOTH PLANES. OCCASIONAL SMALL IRON SULFIDE MINERALS IN BREAKS. TWO WAVEY BREAKS, ONE WITH WEATHERED ROCK 1/4 INCH WIDE, SEVERAL OTHER BREAKS, ALL WITH UNWEATHERED SURFACES ALONG FOLIATION.
2022.3	18.6			93	90		
2022.3	18.6		5.0	4.9	4.4		
				98	88		
2017.3	23.6						
2017.3	23.6		5.0	5.0	4.1		
				100	82		
2012.3	28.6						
CORING TERMINATED AT ELEVATION 2012.3 FT.							
DRILLER: GK ROSE		CORE SIZE: NXWL		EQUIPMENT: CME-550			

PROJECT NO: 33183.1.1 (B-3635)  
CHEROKEE COUNTY

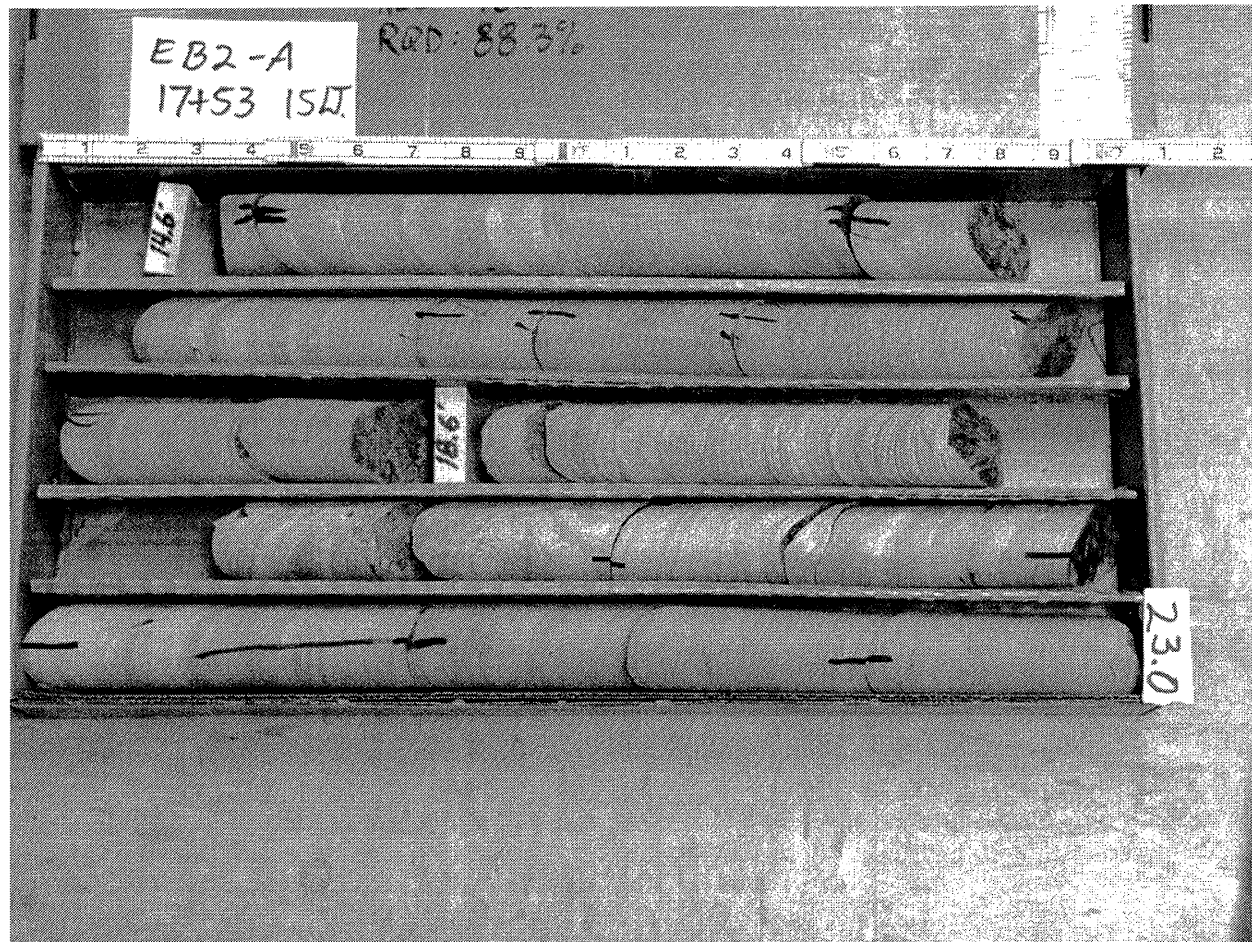
BORING B1 *EB1-C*  
16+00, 20' LT *16+96 E*



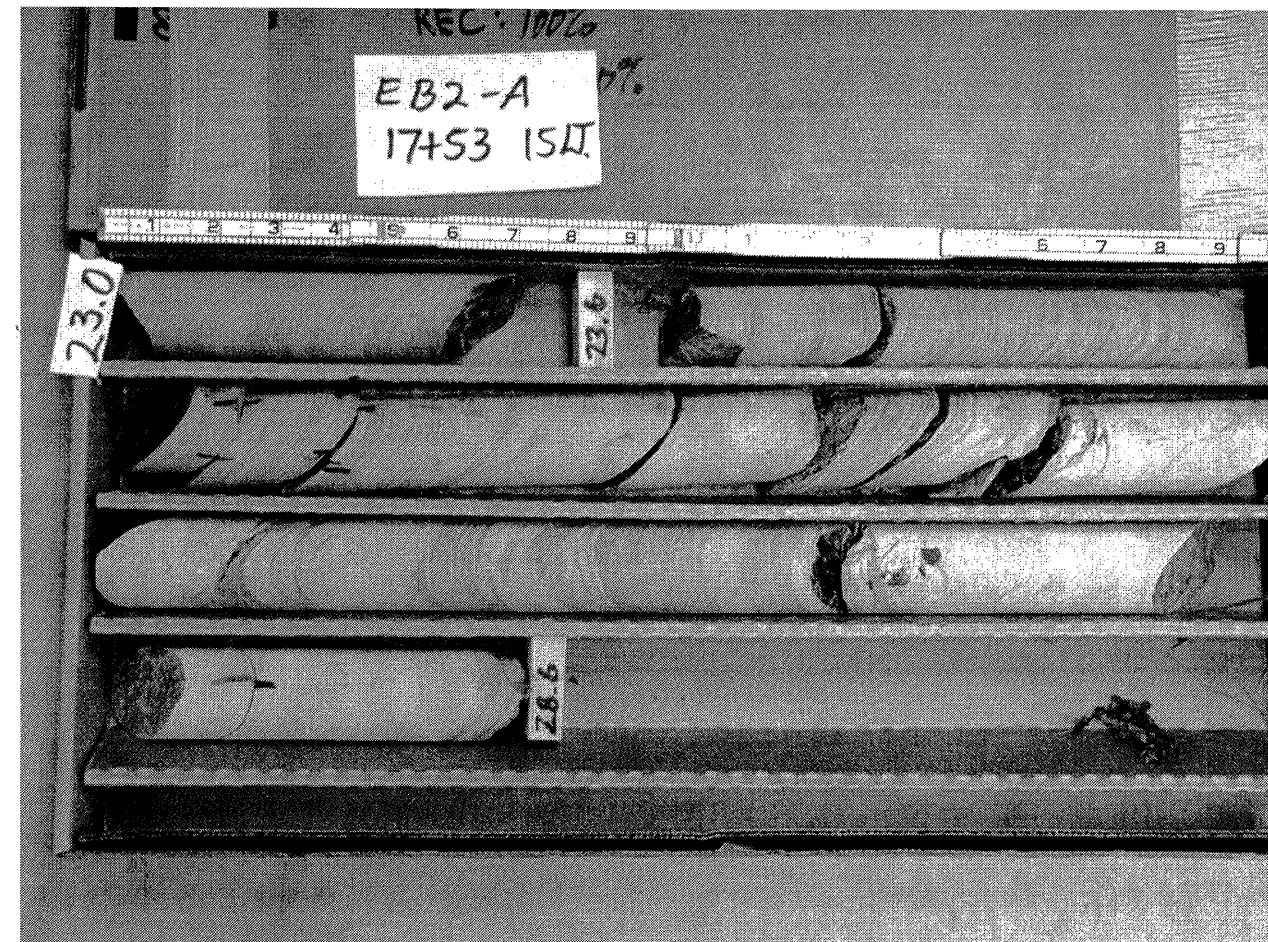
BORING B2  
17+00, 18' RT







EB2-A box 1 of 2  
 B-3635 33183.1.1  
 Cherokee Co. Br. 26  
 SR-1505 over Junaluska Creek



EB2-A box 2 of 2  
 B-3635 33183.1.1  
 Cherokee Co. Br. 26  
 SR-1505 over Junaluska Creek



**FIELD  
 SCOUR REPORT**

WBS: 33183.1.1 TIP: B-3635 COUNTY: Cherokee

DESCRIPTION(1): Bridge 26 on SR-1505 over Junaluska Creek.

**EXISTING BRIDGE**

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

Bridge No.: 26 Length: 32.5 Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 2  
 Foundation Type: Concrete and stone.

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: Scour hole in embankment on downstream side of existing EB1 has been backfilled with boulders and concrete.

Interior Bents: Some undermining on downstream end of horizontal pier footing timber.

Channel Bed: Undulating and stony. Channel bed is armored.

Channel Bank: Both sides up and downstream scoured.

**EXISTING SCOUR PROTECTION**

Type(3): Stone abutment walls.

Extent(4): From creek bed to roadway, no wings.

Effectiveness(5): Very good.

Obstructions(6): None.

**INSTRUCTIONS**

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the geotechnically adjusted scour elevation (GASE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the GASE. If the GASE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The GASE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

**DESIGN INFORMATION**

Channel Bed Material(7): Sand, gravel, and cobbles with boulders.

Channel Bank Material(8): Same: sand, gravel, and cobbles with boulders.

Channel Bank Cover(9): Mostly bare cobbles.

Floodplain Width(10): Less than 100 feet.

Floodplain Cover(11): Mostly grass and brush with a few trees.

Stream is(12): Aggrading \_\_\_ Degrading XXX Static \_\_\_

Channel Migration Tendency(13): Any direction during flood event.

Observations and Other Comments: Thin alluvial soils dominated by stone over mostly weathered rock indicating furious erosion possible during extreme flood events.

GEOTECHNICALLY ADJUSTED SCOUR ELEVATIONS(14) Feet XXX Meters

**BENTS**

EB1		EB2								
2034		2034								

Comparison of GASE to Hydraulics Unit theoretical scour:  
 Ys Hydraulics Unit = 0 GASE = about 2 feet - from streambed to base of historic alluvium at contact with weathered rock or hard saprolite.

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

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

Template Revised 08/22/05

Reported by: *P. Q. Lockamy*

Date: 1-06