

PROJECT: 6.503446 ID: BR#114

CONTENTS: -L-

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 6.503446 I.D. NO. BR#114

F.A. PROJECT _____

COUNTY GRAHAM

PROJECT DESCRIPTION BRIDGE #114

ON SR-1237 OVER STECOAH CREEK

SITE DESCRIPTION _____

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR#114	1	18
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
6.503446		P.E.	

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-PLACED) 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.

**PRELIMINARY
NOT FOR LETTING**

INVESTIGATED BY P.O. LOCKAMY PERSONNEL P.O. LOCKAMY

CHECKED BY W.D. FRYE E.A. SMITH

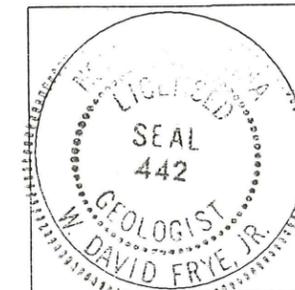
SUBMITTED BY W.D. FRYE G.K. ROSE

DATE JUNE 2002

DRAWN BY: R.E. RIDDLE

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.



SEAL
W. David Frye, Jr.
SIGNATURE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

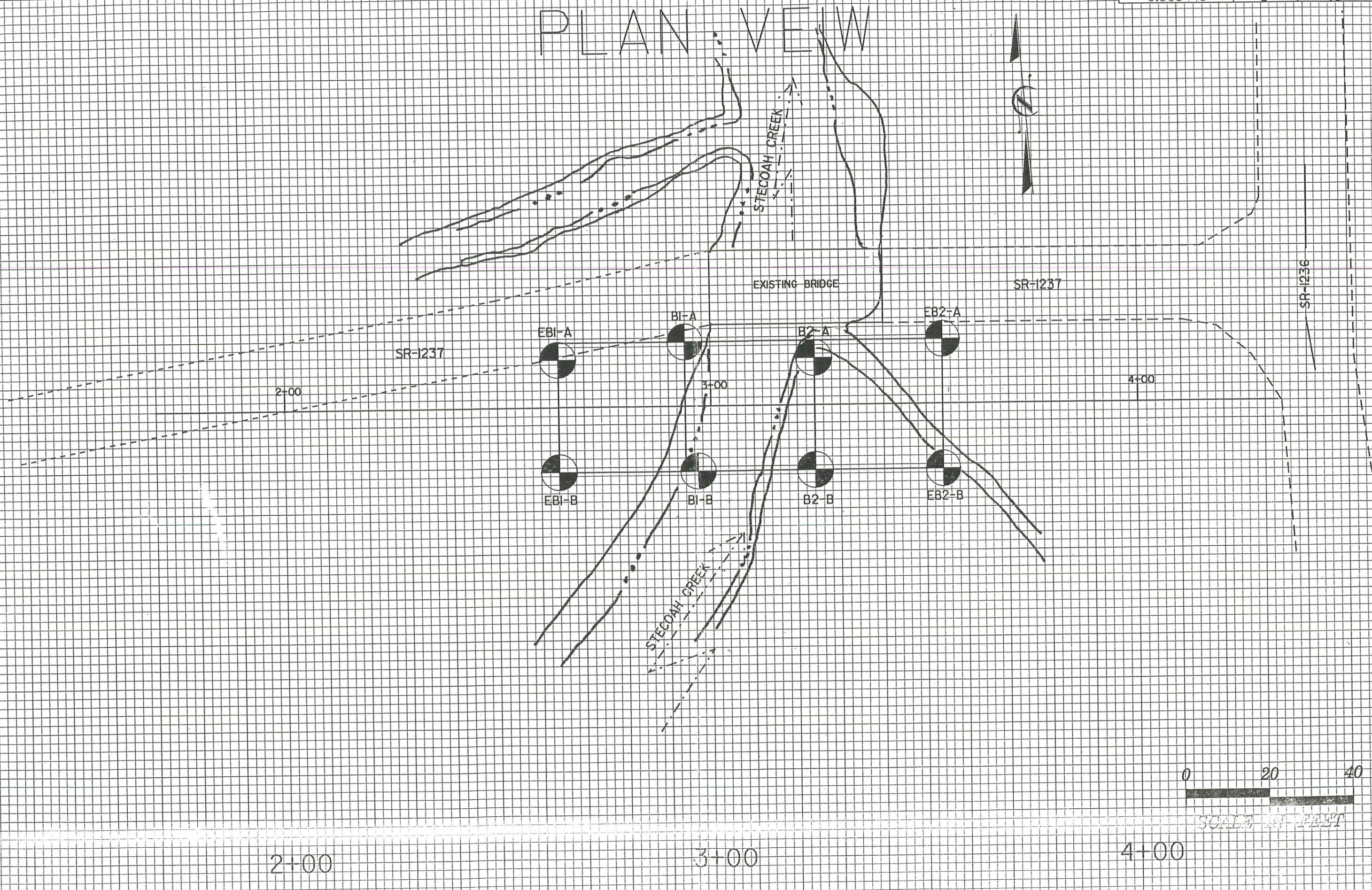
ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
	6.503446	2	18

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: VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</p>				<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>				<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>				<p>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 IT IS ENCOUNTERED, 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 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																															
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th>GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th>SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th>ORGANIC MATERIALS</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1, A-3, A-2, A-4, A-5, A-6, A-7</td> <td>A-1, A-2, A-4, A-5, A-6, A-7</td> <td>A-1, A-2, A-4, A-5, A-6, A-7</td> </tr> <tr> <td>SYMBOL</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> </tr> <tr> <td>% PASSING</td> <td>50, 30, 15, 10, 5, 2, 1</td> <td>40, 30, 20, 15, 10, 5, 2, 1</td> <td>GRANULAR SOILS, SILT-CLAY SOILS, MUCK, PEAT</td> </tr> <tr> <td>LIQUID LIMIT PLASTIC INDEX</td> <td>6, 4, 3, 2, 1</td> <td>10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100</td> <td>SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER, HIGHLY ORGANIC SOILS</td> </tr> <tr> <td>GROUP INDEX</td> <td>0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30</td> <td></td> <td></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS, GRAVEL AND SAND, FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND, SILTY SOILS, CLAYEY SOILS</td> <td></td> </tr> <tr> <td>GEN. RATING AS A SUBGRADE</td> <td>EXCELLENT TO GOOD</td> <td>FAIR TO POOR</td> <td>FAIR TO POOR, POOR, UNSUITABLE</td> </tr> </table> <p>P.I. OF A-7-5 L.L. - 30 + P.I. OF A-7-6 L.L. - 30</p>				GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)	SILT-CLAY MATERIALS (> 35% PASSING #200)	ORGANIC MATERIALS	GROUP CLASS.	A-1, A-3, A-2, A-4, A-5, A-6, A-7	A-1, A-2, A-4, A-5, A-6, A-7	A-1, A-2, A-4, A-5, A-6, A-7	SYMBOL	[Symbol]	[Symbol]	[Symbol]	% PASSING	50, 30, 15, 10, 5, 2, 1	40, 30, 20, 15, 10, 5, 2, 1	GRANULAR SOILS, SILT-CLAY SOILS, MUCK, PEAT	LIQUID LIMIT PLASTIC INDEX	6, 4, 3, 2, 1	10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER, HIGHLY ORGANIC SOILS	GROUP INDEX	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30			USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL AND SAND, FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND, SILTY SOILS, CLAYEY SOILS		GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD	FAIR TO POOR	FAIR TO POOR, POOR, UNSUITABLE	<p>MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p>COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30 MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p> <p>PERCENTAGE OF MATERIAL</p> <table border="1"> <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 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table> <p>GROUND WATER</p> <p>▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING. ▽ STATIC WATER LEVEL AFTER 24 HOURS. ▽ PV PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA ○ SPRING OR SEEPAGE</p>				ORGANIC MATERIAL	GRANULAR SOILS	SILT-CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%	HIGHLY ORGANIC	>10%	>20%	HIGHLY 35% AND ABOVE
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<p>SOIL MOISTURE - CORRELATION OF TERMS</p> <table border="1"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET. USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PL - PLASTIC LIMIT</td> <td>- WET - (W)</td> <td>SEMI-SOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table>				SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION	LL - LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET. USUALLY FROM BELOW THE GROUND WATER TABLE	PL - PLASTIC LIMIT	- WET - (W)	SEMI-SOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	OM - OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE	SL - SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	<p>EQUIPMENT USED ON SUBJECT PROJECT</p> <p>DRILL UNITS: <input type="checkbox"/> MOBILE B- <input type="checkbox"/> BK-51 <input type="checkbox"/> CHE-45 <input checked="" type="checkbox"/> CHE-550 <input type="checkbox"/> PORTABLE HOIST <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER</p> <p>ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG. CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE <input type="checkbox"/> STEEL TEETH <input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> TUNG. CARB. <input checked="" type="checkbox"/> CORE BIT <input type="checkbox"/> OTHER</p> <p>HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE: <input type="checkbox"/> B <input checked="" type="checkbox"/> N <input type="checkbox"/> H</p> <p>HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> OTHER</p>																																								
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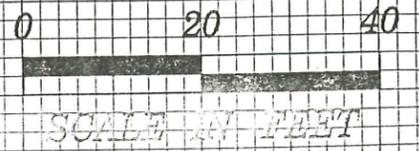
PLAN VIEW



2+00

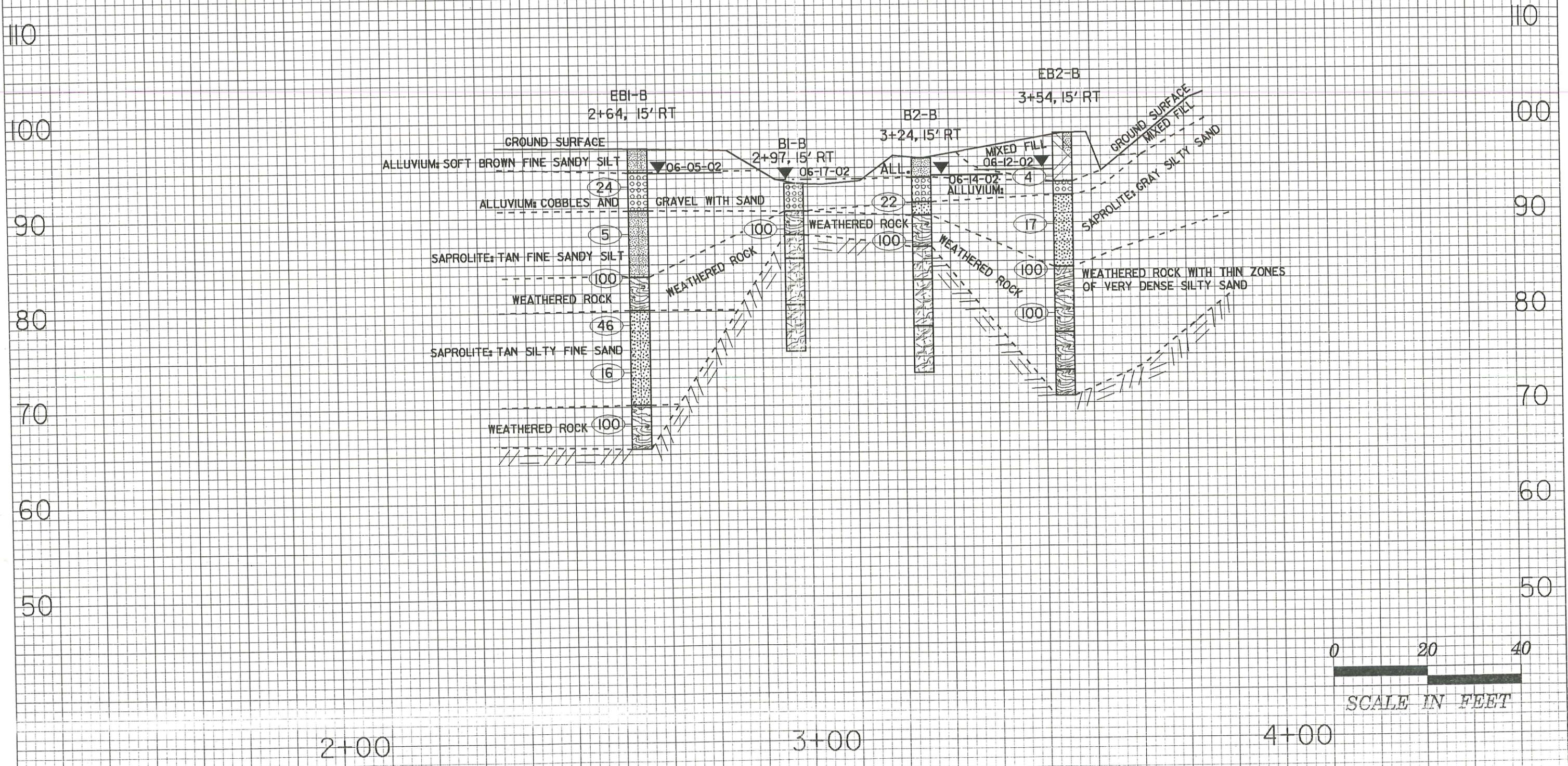
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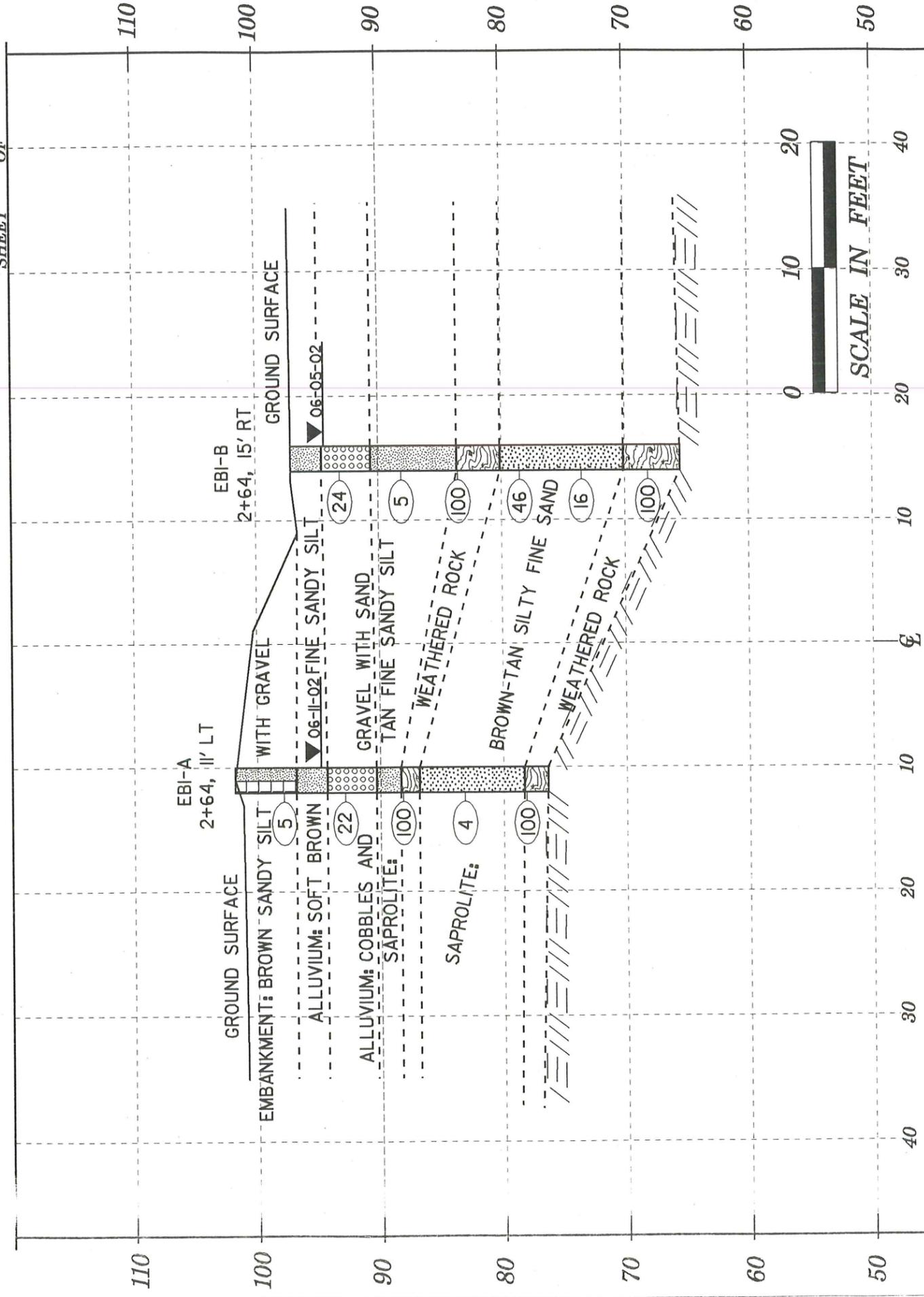
SCALE IN FEET

PROFILE THRU EB1-B AND EB2-B BORINGS



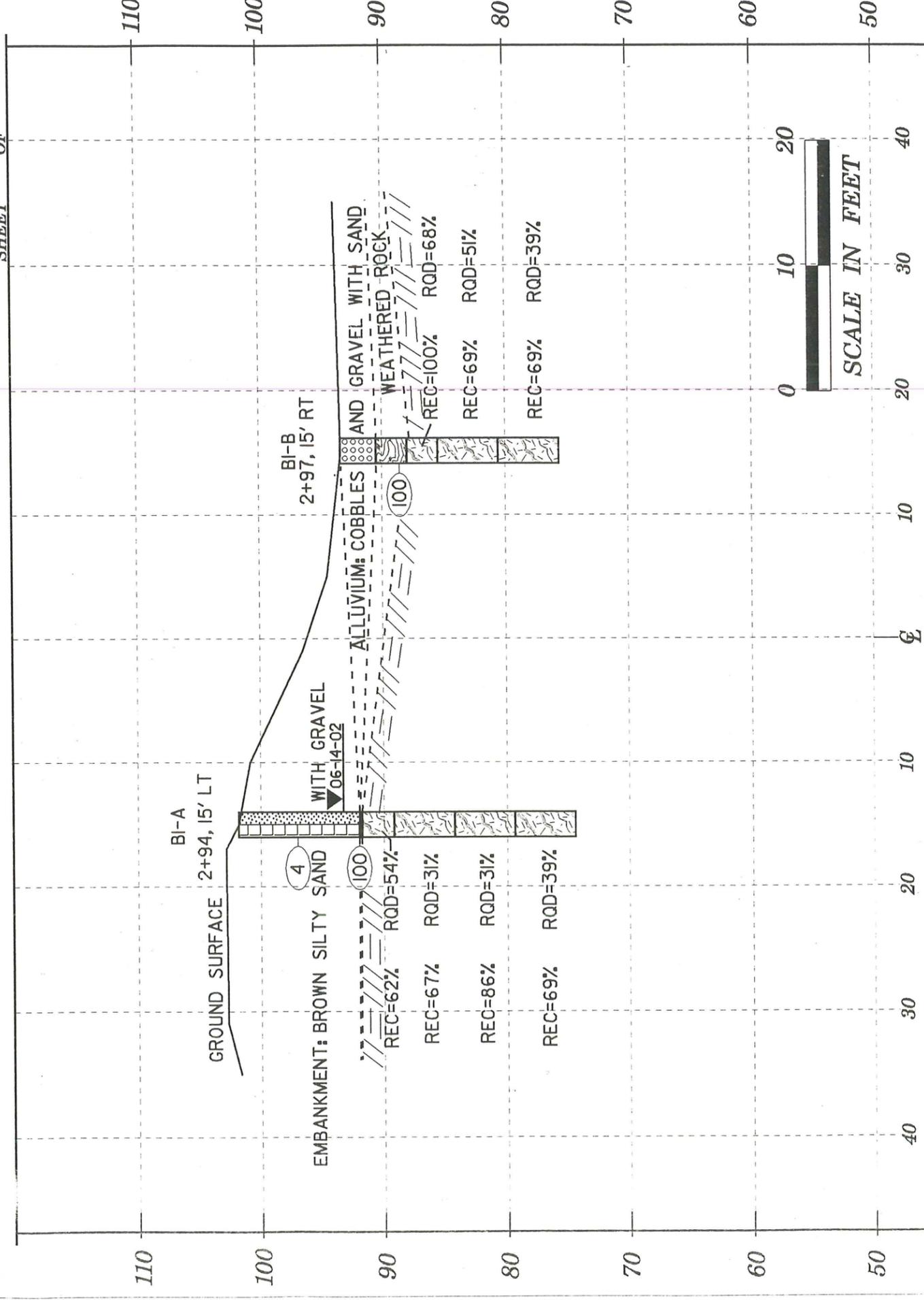
SECTION THROUGH EB-1 BORINGS

PROJECT 6.503446 BR#114
COUNTY GRAHAM
SHEET OF



SECTION THROUGH B1 BORINGS

PROJECT 6.503446 BR#114
COUNTY GRAHAM
SHEET OF



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 6.503446		ID		COUNTY GRAHAM		GEOLOGIST P. Q. LOCKAMY						
SITE DESCRIPTION BR. NO. 114 ON SR-1237 OVER STECOAH CREEK						GND WATER						
BORING NO B1-A		NORTHING 0.00		EASTING 0.00		0 HR N/A						
ALIGNMENT L		BORING LOCATION 2+94.000		OFFSET 15.00ft LT		24 HR 8.50ft						
COLLAR ELEV 101.80ft		TOTAL DEPTH 27.30ft		START DATE 6/13/02		COMPLETION DATE 06/13/02						
DRILL MACHINE CME-550			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B1-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			
101.80												
100.00	3.80	2	2	2	1.0							EMBANKMENT: BROWN SILTY SAND WITH GRAVEL
90.00	8.80	8	14	86	0.7							WEATHERED ROCK REC=62% RQD=54% REC=67% RQD=31%
80.00												REC=86% RQD=31
74.50												REC=69% RQD=39%
												CORING TERMINATED AT ASSUMED ELEVATION 74.5 FEET IN METAGREYWACKEY ROCK

CORE BORING REPORT							DATE	6/21/02			
PROJECT:		6.503446		I. D. NO:				BORING NO: B1-A		GEOLOGIST: PQ LOCKAMY	
DESCRIPTION:		BRIDGE NO. 114 ON S.R. 1237 OVER STACOA CREEK									
COUNTY:		GRAHAM		COLLAR ELEVATION:		101.8 FT.		TOTAL DEPTH: 27.3 FT.			
ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS				
91.8	10.0			1.6	1.4		HARD, VERY SLIGHTLY WEATHERED METAGREYWACKE				
			2.6	62	54						
89.2	12.6			3.3	1.5		MEDIUM HARD TO HARD, MODERATELY TO VERY SLIGHTLY WEATHERED METAGREYWACKE. COMPLETELY WEATHERED FROM 13.1 TO 14.9 FT. STEEPLY DIPPING BREAKS ALONG FOLIATION AT 70 TO 80 DEGREES.				
			4.9	67	31						
84.3	17.5			4.2	1.5		MODERATELY HARD, MODERATELY WEATHERED MEATGREYWACKE BREAKS GENERALLY ALONG FOLIATION AT 45 TO 65 DEGREES.				
			4.9	86	31						
79.4	22.4			3.4	1.9		SOFT TO MODERATELY HARD, SEVERELY TO MODERATELY WEATHERED METAGREYWACKE. BREAKS GENERALLY ALONG FOLIATION AT 45 TO 65 DEGREES.				
			4.9	69	39						
74.5	27.3										
							CORING TERMINATED AT ELEVATION 74.5 FT.				
DRILLER:		E.A. SMITH		CORE SIZE:		NXWL		EQUIPMENT: CME-550			

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 6.503446		ID		COUNTY GRAHAM		GEOLOGIST P. Q. LOCKAMY								
SITE DESCRIPTION BR. NO. 114 ON SR-1237 OVER STECOAH CREEK						GND WATER								
BORING NO B1-B		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT L		BORING LOCATION 2+97.000		OFFSET 15.00ft RT		24 HR N/A								
COLLAR ELEV 93.30ft		TOTAL DEPTH 17.70ft		START DATE 6/15/02		COMPLETION DATE 06/15/02								
DRILL MACHINE CME-550			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B1-B, Page 1 of 1								
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT					SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION	
		6in	6in	6in		0	25	50	75	100				
93.30														
90.00	4.40	100			0.4									Ground Surface
80.00														ALLUVIUM: COBBLES AND GRAVEL WITH SAND
														WEATHERED ROCK
														REC=100 RQD=68%
														REC=69% RQD=51%
75.60														REC=69% RQD=39%
CORING TERMINATED AT ASSUMED ELEVATION 75.6 FEET IN METAGREYWACKEY ROCK														

CORE BORING REPORT							DATE 6/21/02
PROJECT: 6.503446		I. D. NO:		BORING NO: B1-B		GEOLOGIST: PQ LOCKAMY	
DESCRIPTION: BRIDGE NO. 114 ON S.R. 1237 OVER STACOAH CREEK							
COUNTY: GRAHAM		COLLAR ELEVATION: 93.3 FT.		TOTAL DEPTH: 17.7 FT.			
ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
87.9	5.4		2.5	2.5	1.7		MEDIUM TO MODERATELY HARD, MODERATELY WEATHERED. BREAKS GENERALLY ALONG FOLIATION OF 50 TO 70 DEGREES. METAGREYWACKE
85.4	7.9		4.9	3.4	2.5		MEDIUM TO MODERATELY HARD, MODERATELY WEATHERED. BREAKS GENERALLY ALONG FOLIATION OF 50 TO 60 DEGREES. METAGREYWACKE
80.5	12.8		4.9	3.4	1.9		MEDIUM TO MODERATELY HARD, MODERATELY WEATHERED. BREAKS GENERALLY ALONG FOLIATION OF 70 DEGREES WITH HORIZONTAL JOINTS METAGREYWACKE
75.6	17.7						
CORING TERMINATED AT ELEVATION 75.6 FT.							
DRILLER: E.A. SMITH		CORE SIZE: NXWL		EQUIPMENT: CME-550			

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 6.503446		ID		COUNTY GRAHAM		GEOLOGIST P. Q. LOCKAMY						
SITE DESCRIPTION BR. NO. 114 ON SR-1237 OVER STECOAH CREEK						GND WATER						
BORING NO B2-A		NORTHING 0.00		EASTING 0.00		0 HR N/A						
ALIGNMENT L		BORING LOCATION 3+24.000		OFFSET 11.00ft LT		24 HR 1.50ft						
COLLAR ELEV 94.80ft		TOTAL DEPTH 21.30ft		START DATE 6/14/02		COMPLETION DATE 06/14/02						
DRILL MACHINE CME-550			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			Log B2-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			
94.80												
90.00	3.40	8	13	9	1.0							
80.00	8.40	75	25		0.6							
73.50												

Ground Surface

22

100

CORING TERMINATED AT ASSUMED ELEVATION 73.5 FEET IN METAGREYWACKEY ROCK

ALLUVIUM: SOFT BROWN CLAYEY SILT

ALLUVIUM: COBBLES AND GRAVEL WITH SAND

SAPROLITE: GRAY AND TAN SILTY SAND WITH LAYERS OF WEATHERED ROCK

WEATHERED ROCK

REC=72% RQD=28%

REC=61% RQD=31%

REC=100% RQD=60%

CORE BORING REPORT

DATE 6/21/02

PROJECT: 6.503446 I. D. NO: _____ BORING NO: B2-A GEOLOGIST: PQ LOCKAMY

DESCRIPTION: BRIDGE NO. 114 ON S.R. 1237 OVER STACOAH CREEK

COUNTY: GRAHAM COLLAR ELEVATION: 94.8 FT. TOTAL DEPTH: 21.3 FT.

ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
85.8	9.0			2.3	0.9		SOFT TO MEDIUM HARD, MODERATELY SEVERELY WEATHERED. METASILTSTONE WITH SOME METAGREYWACKE. HIGHLY FRACTURED
82.6	12.2		3.2	72	28		
82.6	12.2			3.0	1.5		SOFT TO MEDIUM HARD, MODERATELY SEVERELY WEATHERED. METASILTSTONE WITH SOME METAGREYWACKE. HIGHLY FRACTURED
77.7	17.1		4.9	61	31		
77.7	17.1			4.2	2.5		MEDIUM HARD TO HARD, MODARATE TO SLIGHTLY WEATHERED METAGREYWACKE AND METASILTSTONE. MOST BREAKS ALONG FOLIATION FROM 45 TO 60 DEGREES.
73.5	21.3			100	60		

CORING TERMINATED AT ELEVATION 73.5 FT.

DRILLER: E.A. SMITH CORE SIZE: NXWL EQUIPMENT: CME-550

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 6.503446		ID		COUNTY GRAHAM		GEOLOGIST P. Q. LOCKAMY								
SITE DESCRIPTION BR. NO. 114 ON SR-1237 OVER STECOAH CREEK						GND WATER								
BORING NO B2-B		NORTHING 0.00		EASTING 0.00		0 HR N/A								
ALIGNMENT L		BORING LOCATION 3+24.000		OFFSET 15.00ft RT		24 HR 1.80ft								
COLLAR ELEV 95.80ft		TOTAL DEPTH 22.60ft		START DATE 6/13/02		COMPLETION DATE 06/13/02								
DRILL MACHINE CME-550			DRILL METHOD SPT CORE BORING			HAMMER TYPE AUTOMATIC								
SURFACE WATER DEPTH				DEPTH TO ROCK N/A										
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	100				
95.80														
	3.60	12	14	8	1.0									
90.00	8.60	100			0.2									
80.00														
73.20														
CORING TERMINATED AT ASSUMED ELEVATION 73.2 FEET IN METAGREYWACKEY ROCK														

CORE BORING REPORT							DATE
PROJECT: 6.503446 I. D. NO: _____ BORING NO: B2-B GEOLOGIST: PQ LOCKAMY							6/21/02
DESCRIPTION: BRIDGE NO. 114 ON S.R. 1237 OVER STACOAH CREEK							
COUNTY: GRAHAM		COLLAR ELEVATION: 95.8 FT.		TOTAL DEPTH: 22.6 FT.			
ELEV. (FEET)	DEPTH (FEET)	DRILL RATE MIN./FT.	RUN (FEET)	REC. FEET %	RQD. FEET %	SAMP. #	FIELD CLASSIFICATION AND REMARKS
86.5	9.3			3.0	3.0		HARD AND FRESH METAGREYWACKE. SOME BREAKS ALONG HORIZONTAL JOINTS AND ALONG FOLIATION AT 45 DEGREES.
			3.5	86	86		
83.0	12.8			4.6	4.2		HARD AND FRESH METAGREYWACKE. SOME BREAKS ALONG HORIZONTAL JOINTS AND ALONG FOLIATION AT 45 DEGREES.
83.0	12.8		4.9	94	86		
78.1	17.7			4.4	2.0		MEDIUM HARD TO HARD, MODERATE TO SLIGHTLY WEATHERED METAGREYWACKE. MOST BREAKS ALONG FOLIATION FROM 45 TO 80 DEGREES.
78.1	17.7		4.9	90	41		
73.2	22.6						
							CORING TERMINATED AT ELEVATION 73.2 FT.
DRILLER: E.A. SMITH		CORE SIZE: NXWL		EQUIPMENT: CME-550			

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 6.503446		ID		COUNTY GRAHAM		GEOLOGIST P. Q. LOCKAMY						
SITE DESCRIPTION BR. NO. 114 ON SR-1237 OVER STECOAH CREEK						GND WATER						
BORING NO EB2-A		NORTHING 0.00		EASTING 0.00		0 HR N/A						
ALIGNMENT L		BORING LOCATION 3+54.000		OFFSET 15.00ft LT		24 HR 9.00ft						
COLLAR ELEV 102.30ft		TOTAL DEPTH 17.20ft		START DATE 6/11/02		COMPLETION DATE 06/11/02						
DRILL MACHINE CME-550			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC						
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			
102.30												
100.00	2.80	2	2	2	1.0	4						EMBANKMENT: RED & BROWN SANDY SILT WITH GRAVEL
	7.80	0	0	6	1.0	8						ALLUVIUM: DARK GREY SLI. ORGANIC FINE SANDY CLAYEY SILT
90.00	12.80	100			0.3				100			ALLUVIUM: COBBLES AND GRAVEL WITH SAND
												WEATHERED ROCK
85.10												BORING TERMINATED BY AUGER REFUSAL AT ASSUMED ELEVATION OF 85.1 FEET ON METAGREYWACKEY ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 6.503446		ID		COUNTY GRAHAM		GEOLOGIST P. Q. LOCKAMY						
SITE DESCRIPTION BR. NO. 114 ON SR-1237 OVER STECOAH CREEK						GND WATER						
BORING NO EB2-B		NORTHING 0.00		EASTING 0.00		0 HR N/A						
ALIGNMENT L		BORING LOCATION 3+54.000		OFFSET 15.00ft RT		24 HR 3.80ft						
COLLAR ELEV 98.30ft		TOTAL DEPTH 27.70ft		START DATE 6/11/02		COMPLETION DATE 06/11/02						
DRILL MACHINE CME-550			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK N/A			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			
98.30												
	3.60	1	1	3	1.0	4						MIXED FILL SILT AND SAND
90.00	8.60	5	8	9	1.0	7						ALLUVIUM: COBBLES AND GRAVEL WITH SAND
	13.60	20	60	40	0.8				100			SAPROLITE: GRAY SILTY SAND
80.00	18.60	100			0.4				100			WEATHERED ROCK WITH ZONES OF VERY DENSE SILTY SAND
70.60												BORING TERMINATED BY AUGER REFUSAL AT ASSUMED ELEVATION ON 70.6 FEET ON METAGREYWACKEY ROCK

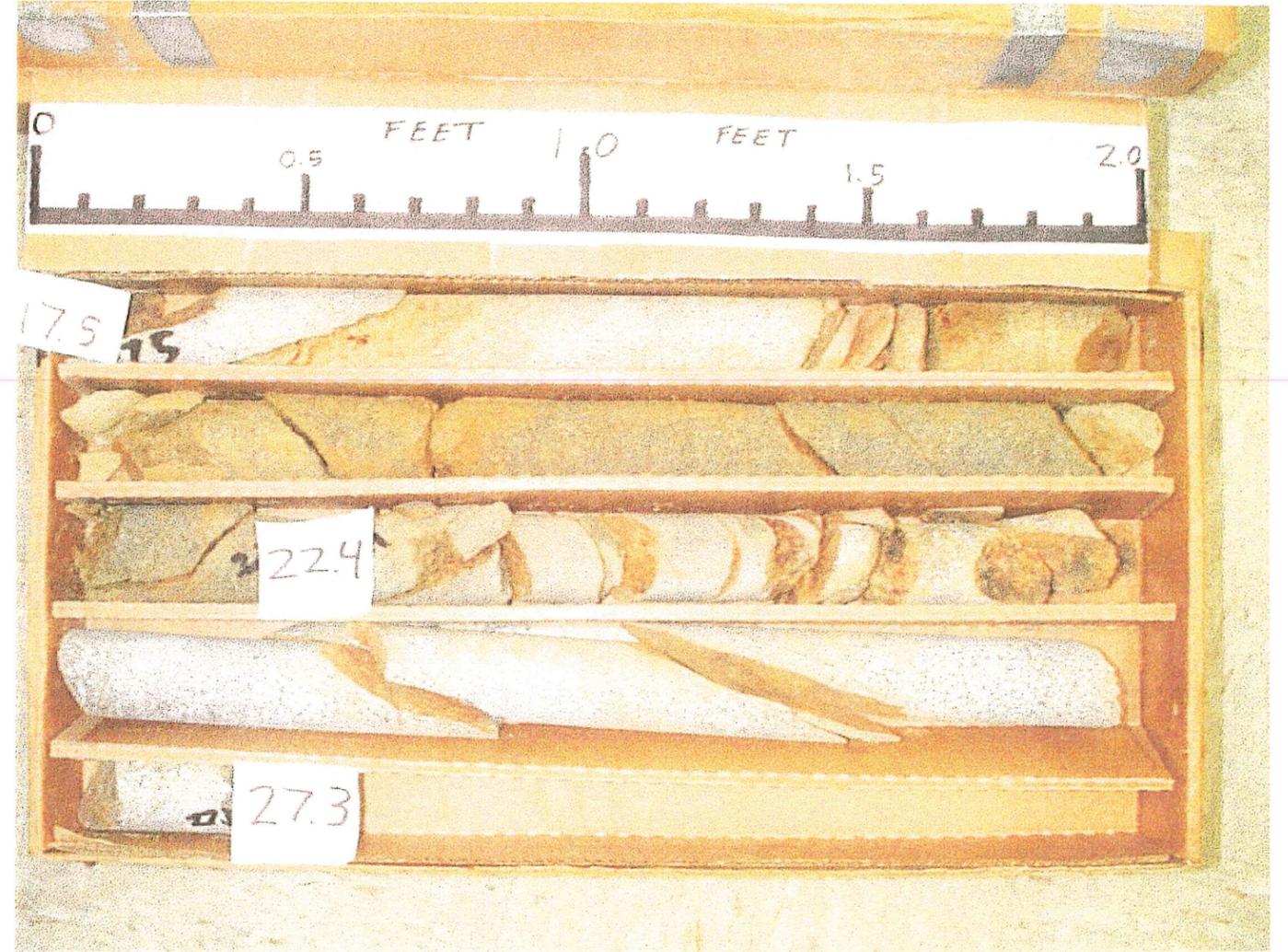


6.503446
 GRAHAM COUNTY
 BRIDGE NO. 114 ON SR-1237 OVER STECOAH CREEK

B1-A @ STATION 2+94, 15'LT (-L-)

BOX 1 OF 2

DEPTH: 10.0 - 17.5 ft.



6.503446
 GRAHAM COUNTY
 BRIDGE NO. 114 ON SR-1237 OVER STECOAH CREEK

B1-A @ STATION 2+94, 15.0 ft. LT (-L-)

BOX 2 OF 2

DEPTH: 17.5 - 27.3 ft.



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 BRIDGE NO. 114 ON SR-1237 OVER STECOAH CREEK

B1-B @ STATION 2+97, 15'RT (-L-)

BOX 1 OF 2

DEPTH: 5.4 - 12.8ft.



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 BRIDGE NO. 114 ON SR-1237 OVER STECOAH CREEK

B1-B @ STATION 2+97, 15.0 ft. RT (-L-)

BOX 2 OF 2

DEPTH: 12.8 - 17.7 ft.



6.503446
 GRAHAM COUNTY
 BRIDGE NO. 114 ON SR-1237 OVER STECOAH CREEK

B2-A @ STATION 3+24, 11'LT (-L-)

BOX 1 OF 2

DEPTH: 9.0 – 17.1ft.



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 GRAHAM COUNTY
 BRIDGE NO. 114 ON SR-1237 OVER STECOAH CREEK

B2-A @ STATION 3+24, 11.0 ft. LT (-L-)

BOX 2 OF 2

DEPTH: 17.1 – 21.3 ft.



6.503446
 GRAHAM COUNTY
 BRIDGE NO. 114 ON SR-1237 OVER STECOAH CREEK

B2-B @ STATION 3+24, 15'RT (-L-)

BOX 1 OF 2

DEPTH: 9.3 - 17.7 ft.



6.503446
 GRAHAM COUNTY
 BRIDGE NO. 114 ON SR-1237 OVER STECOAH CREEK

B2-B @ STATION 3+24, 15.0 ft. RT (-L-)

BOX 2 OF 2

DEPTH: 17.7 - 22.6 ft.

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 6.503446 ID: COUNTY: Graham

DESCRIPTION(1): Bridge 114 on SR 1237 (Everit Jenkins Road) over Stecoah Creek

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

COUNTY BRIDGE NO. 114 BRIDGE LENGTH 41 NO. BENTS IN: CHANNEL 0 FLOOD PLAIN 2

FOUNDATION TYPE: concrete strip footings

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: Some stone rip rap placed on NW side by wing wall and side creek.

INTERIOR BENTS: N/A

CHANNEL BED: None

CHANNEL BANKS: None

EXISTING SCOUR PROTECTION:

TYPE(3): Timber abutment and Wing Walls

EXTENT(4): Abutment walls from footing to deck, Wings on all four corners approx. 9' H X 12' W and tapered

EFFECTIVENESS(5): very Good

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

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): Cobbles and gravel with some sand

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): Brown sandy silt approximately 2 1/2 feet thick overlies basal cobbles and gravel.

FOUNDATION BEARING MATERIAL(9): Weathered Rock to Fresh Rock

CHANNEL BANK COVER(10): Brush and weeds

FLOOD PLAIN WIDTH(11): approximately 275 feet wide.

FLOOD PLAIN COVER(12): Pasture and crops

DESIGN INFORMATION CONT.

STREAM IS XXX DEGRADING AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS: Mr. Marion Lail said that some time ago that a

stone crusher occupied the property where his house is built and that some of the large boulders there are imported.

CHANNEL MIGRATION TENDENCY (14): To the East

GEOTECHNICALLY ADJUSTED SCOUR ELEVATION (15): are as follows

Table with 4 columns: EB1-A = 88.0 FEET, B1-A = 91.0 FEET, B2-A = 86.5 FEET, EB2-A = 88.5 FEET; EB1-B = 85.0 FEET, B1-B = 89.5 FEET, B2-B = 88.5 FEET, EB2-B = 86.0 FEET

REPORTED BY: DATE: 6/17/02

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.

6.503446
GRAHAM CO.
Bridge 114 ON
SR-1237 OVER
STECOAH CREEK



UPSTREAM LOOKING
NNE AT EXISTING
BRIDGE FROM NEAR
PROPOSED EB1-B

JUNE 2002



ON SR-1237
LOOKING EAST TO
INTERSECTION WITH
SR-1236