

CONTRACT: 33584.1.1 ID: B-4241

W.D. Frye, Jr.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33584.1.1 (B-4241)	1	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
		P.E.	
		CONST.	

# STATE OF NORTH CAROLINA

## DEPARTMENT OF TRANSPORTATION

### DIVISION OF HIGHWAYS

### GEOTECHNICAL UNIT

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# STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 33584.1.1 I.D. NO. B-4241

F.A. PROJECT \_\_\_\_\_

COUNTY POLK

PROJECT DESCRIPTION BRIDGE NO. 24 ON  
SR-1520 OVER HOOPER CREEK

SITE DESCRIPTION \_\_\_\_\_

#### 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 M.A. HAGER

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

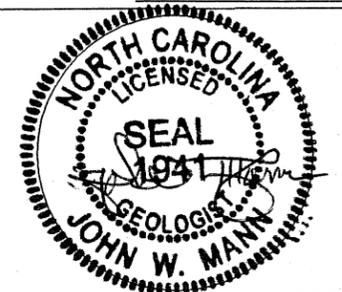
SUBMITTED BY W.D. FRYE R.D. CHILDERS

DATE 9/30/05

DRAWN BY: J.W. MANN

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR 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  
GEOTECHNICAL UNIT

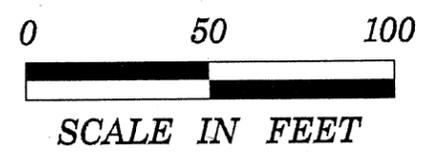
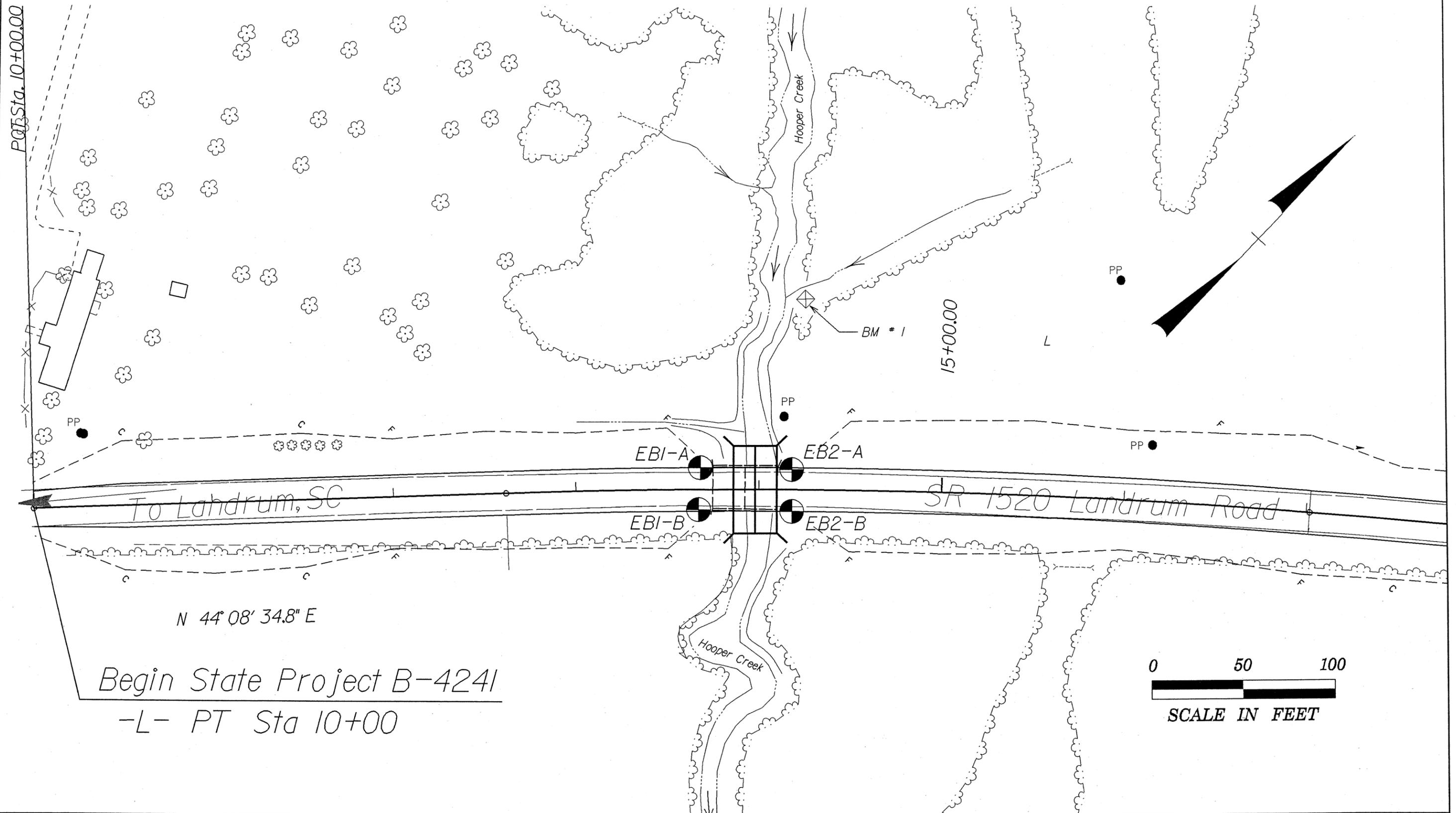
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-4241	33584.1.1	2	11

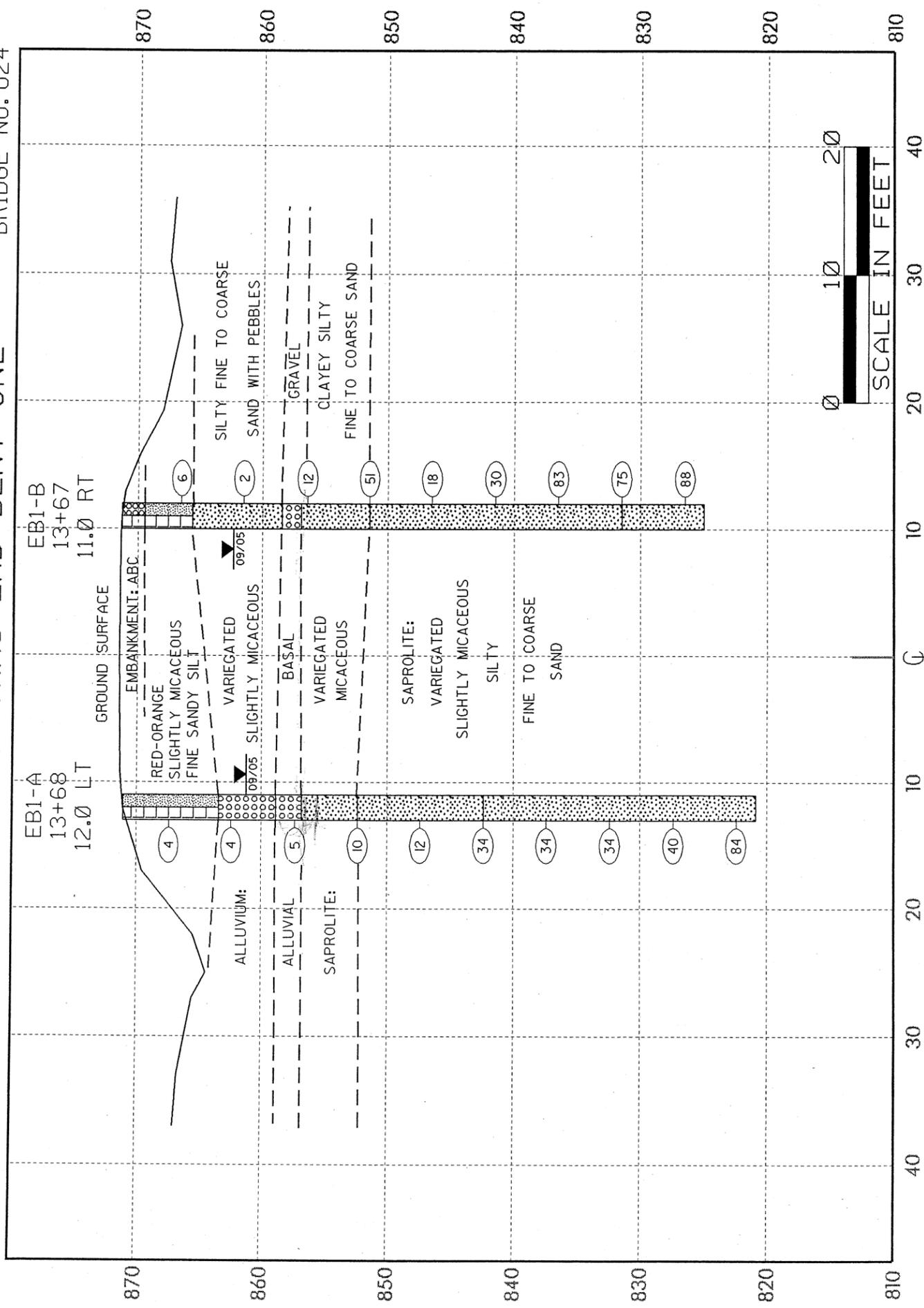
SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																				
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE ASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, ASHTO 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, HIGHLY PLASTIC, A-7-6</i></p>		<p><b>WELL GRADED:</b> INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE <b>UNIFORM:</b> INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) <b>GAP-GRADED:</b> INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;"><b>ANGULARITY OF GRAINS</b></p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: <b>ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</b></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><b>WEATHERED ROCK (WR)</b> </p> <p><b>CRYSTALLINE ROCK (CR)</b> </p> <p><b>NON-CRYSTALLINE ROCK (NCR)</b> </p> <p><b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b> </p>		<p><b>ALLUVIUM (ALLUV.)</b> - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. <b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. <b>CALCAREOUS (CALC.)</b> - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (F.P.)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM.)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOTL.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (R.Q.D.)</b> - 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. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - 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 INTRODUCED ROCKS. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - 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. <b>STRATA CORE RECOVERY (SPEC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.)</b> - 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. <b>TOPSOIL (T.S.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																				
<b>SOIL LEGEND AND ASHTO CLASSIFICATION</b>		<b>MINERALOGICAL COMPOSITION</b>		<b>WEATHERING</b>																																						
<p>GENERAL CLASS. GRANULAR MATERIALS (&lt;35% PASSING #200) SILT-CLAY MATERIALS (&gt;35% PASSING #200) ORGANIC MATERIALS</p> <p>GROUP CLASS. A-1, A-1-b, A-2, 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</p> <p>SYMBOL </p> <p>% PASSING: 10, 40, 200</p> <p>LIQUID LIMIT PLASTIC INDEX: 6 MX, N.P., 10 MX, 11 MX, 12 MX, 13 MX, 14 MX, 15 MX, 16 MX, 17 MX, 18 MX, 19 MX, 20 MX, 21 MX, 22 MX, 23 MX, 24 MX, 25 MX, 26 MX, 27 MX, 28 MX, 29 MX, 30 MX, 31 MX, 32 MX, 33 MX, 34 MX, 35 MX, 36 MX, 37 MX, 38 MX, 39 MX, 40 MX, 41 MX, 42 MX, 43 MX, 44 MX, 45 MX, 46 MX, 47 MX, 48 MX, 49 MX, 50 MX, 51 MX, 52 MX, 53 MX, 54 MX, 55 MX, 56 MX, 57 MX, 58 MX, 59 MX, 60 MX, 61 MX, 62 MX, 63 MX, 64 MX, 65 MX, 66 MX, 67 MX, 68 MX, 69 MX, 70 MX, 71 MX, 72 MX, 73 MX, 74 MX, 75 MX, 76 MX, 77 MX, 78 MX, 79 MX, 80 MX, 81 MX, 82 MX, 83 MX, 84 MX, 85 MX, 86 MX, 87 MX, 88 MX, 89 MX, 90 MX, 91 MX, 92 MX, 93 MX, 94 MX, 95 MX, 96 MX, 97 MX, 98 MX, 99 MX, 100 MX</p> <p>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, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100</p> <p>USUAL TYPES OF MAJOR MATERIALS: GRAVEL AND SAND, FINE SAND, SILTY OR CLAYEY GRAVEL AND SAND, SILTY SOILS, CLAYEY SOILS, GRANULAR SOILS, SILT-CLAY SOILS, MUCK, PEAT, HIGHLY ORGANIC SOILS</p> <p>GEN. RATING AS A SUBGRADE: EXCELLENT TO GOOD, FAIR TO POOR, FAIR TO POOR, POOR, UNSUITABLE</p> <p>P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 &gt; L.L. - 30</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;"><b>COMPRESSIBILITY</b></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;"><b>PERCENTAGE OF MATERIAL</b></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>&gt;10%</td> <td>&gt;20%</td> <td>HIGHLY</td> </tr> <tr> <td></td> <td></td> <td></td> <td>35% AND ABOVE</td> </tr> </table> <p style="text-align: center;"><b>GROUND WATER</b></p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.  STATIC WATER LEVEL AFTER 24 HOURS.  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	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY				35% AND ABOVE	<p><b>FRESH</b> ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. <b>VERY SLIGHT (V. SL.)</b> 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. <b>SLIGHT (SL.)</b> 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. <b>MODERATE (MOD.)</b> 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. <b>MODERATELY SEVERE (MOD. SEV.)</b> 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> <b>SEVERE (SEV.)</b> 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 &gt; 100 BPF.</i> <b>VERY SEVERE (V. SEV.)</b> 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 &lt; 100 BPF.</i> <b>COMPLETE</b> 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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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (IN-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT<sup>2</sup>)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE</td> <td>4 4 TO 10 10 TO 30 30 TO 50 &gt;50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD</td> <td>2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 &gt;30</td> <td>&lt;0.25 0.25 TO 0.5 0.5 TO 1 1 TO 2 2 TO 4 &gt;4</td> </tr> </table>		PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (IN-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )	GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	4 4 TO 10 10 TO 30 30 TO 50 >50	N/A	GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.5 0.5 TO 1 1 TO 2 2 TO 4 >4	<p> ROADWAY EMBANKMENT WITH SOIL DESCRIPTION  SOIL SYMBOL  ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS  INFERRED SOIL BOUNDARIES  INFERRED ROCK LINE  ALLUVIAL SOIL BOUNDARY  DIP/DIP DIRECTION OF ROCK STRUCTURES  SOUNDING ROD</p> <p> TEST BORING  AUGER BORING  CORE BORING  MONITORING WELL  PIEZOMETER INSTALLATION  SLOPE INDICATOR INSTALLATION  SPT N-VALUE  SPT REFUSAL</p> <p> SAMPLE DESIGNATIONS S - BULK SAMPLE SS - SPLIT SPOON SAMPLE ST - SHELBY TUBE SAMPLE RS - ROCK SAMPLE RT - RECOMPACTED TRIAXIAL SAMPLE CBR - CBR SAMPLE</p>		<p><b>VERY HARD</b> CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. <b>HARD</b> CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. <b>MODERATELY HARD</b> CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. <b>MEDIUM HARD</b> CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. <b>SOFT</b> CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. <b>VERY SOFT</b> CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.</p>																										
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GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.5 0.5 TO 1 1 TO 2 2 TO 4 >4																																							
<b>TEXTURE OR GRAIN SIZE</b>		<b>ABBREVIATIONS</b>		<b>EQUIPMENT USED ON SUBJECT PROJECT</b>																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE</th> <th>4</th> <th>10</th> <th>40</th> <th>60</th> <th>200</th> <th>270</th> </tr> <tr> <th>OPENING (MM)</th> <td>4.76</td> <td>2.0</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE, SD.)</th> <th>FINE SAND (F, SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td>MM 305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> <td></td> </tr> <tr> <td>IN. 12"</td> <td>3"</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		U.S. STD. SIEVE SIZE	4	10	40	60	200	270	OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053	BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE, SD.)	FINE SAND (F, SD.)	SILT (SL.)	CLAY (CL.)	MM 305	75	2.0	0.25	0.05	0.005		IN. 12"	3"						<p>AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS - FOSSILIFEROUS FRAC. - FRACTURED FRAGS. - FRAGMENTS MED. - MEDIUM</p> <p>PMT - PRESSUREMETER TEST SD - SAND, SANDY SL - SILT, SILTY SLI - SLIGHTLY TCR - TRICONE REFUSAL γ - UNIT WEIGHT γ<sub>d</sub> - DRY UNIT WEIGHT w - MOISTURE CONTENT v - VERY VST - VANE SHEAR TEST</p>		<p><input type="checkbox"/> MOBILE B- <input type="checkbox"/> BK-51 <input type="checkbox"/> CME-45C <input checked="" type="checkbox"/> CME-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 checked="" type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE * STEEL TEETH <input type="checkbox"/> TRICONE * TUNG-CARB. <input 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_XML <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>		<p><b>VERY HARD</b> CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. <b>HARD</b> CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. <b>MODERATELY HARD</b> CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. <b>MEDIUM HARD</b> CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. <b>SOFT</b> CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. <b>VERY SOFT</b> CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.</p>	
U.S. STD. SIEVE SIZE	4	10	40	60	200	270																																				
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<b>SOIL MOISTURE - CORRELATION OF TERMS</b>		<b>FRACTURE SPACING</b>		<b>BEDDING</b>																																						
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### BRIDGE NO.24 SITE PLAN

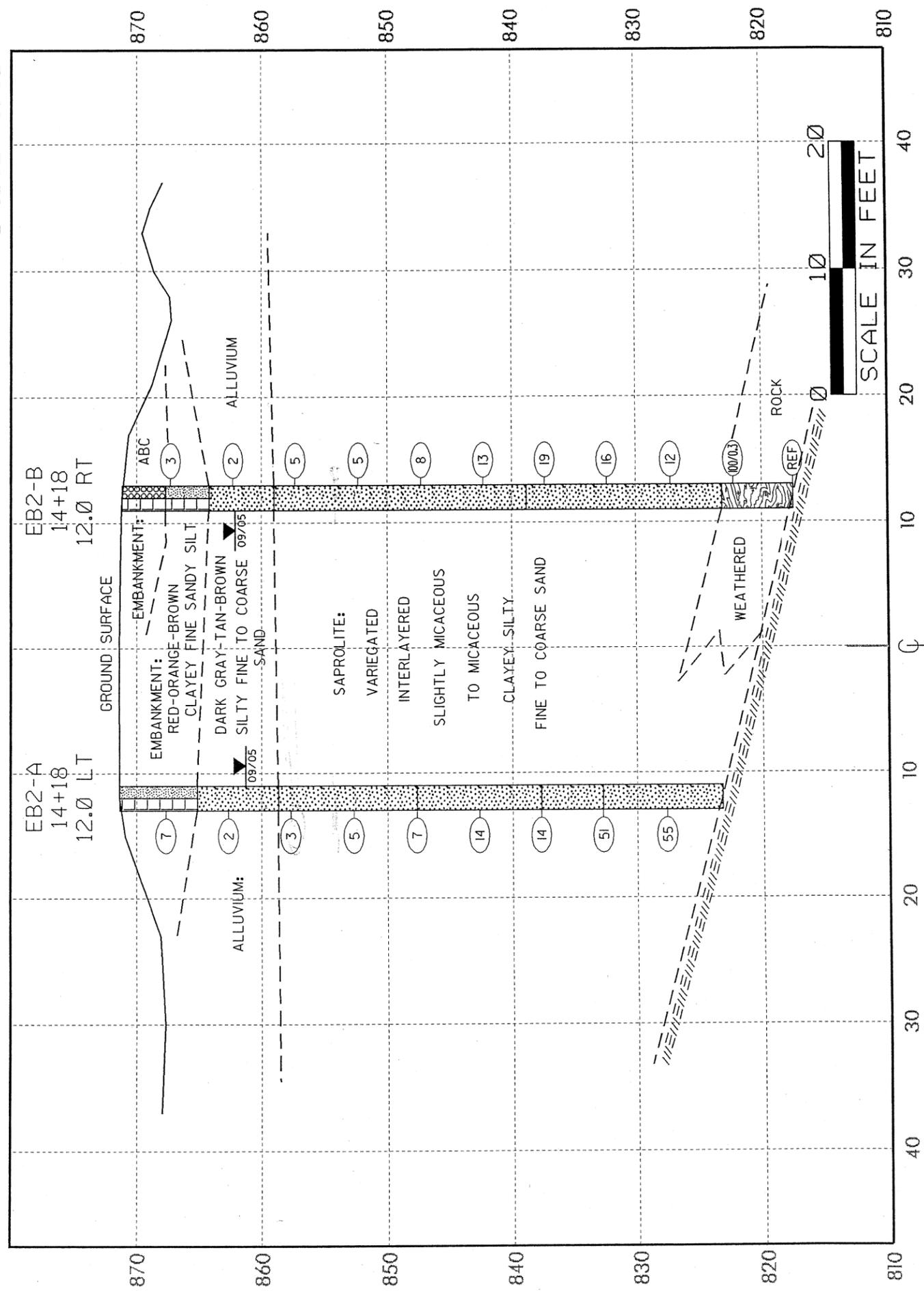


Begin State Project B-4241  
 -L- PT Sta 10+00

### CROSS SECTION THRU END BENT ONE



### CROSS SECTION THRU END BENT TWO







NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33584.1.1		ID B-4241		COUNTY POLK		GEOLOGIST M.M. HAGAR						
SITE DESCRIPTION BRIDGE NO. 24 ON SR-1520 OVER HOOPER CREEK							GND WATER					
BORING NO EB2-A		NORTHING 0.00		EASTING 0.00		0 HR N/A						
ALIGNMENT -L-		BORING LOCATION 14+18.000		OFFSET 12.00ft LT		24 HR 10.10ft						
COLLAR ELEV 871.37ft		TOTAL DEPTH 48.10ft		START DATE 9/19/05		COMPLETION DATE 09/19/05						
DRILL MACHINE CME-550			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK 48.10ft			Log EB2-A, Page 1 of 2						
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION
		6in	6in	6in		0	25	50	75			
871.37												Ground Surface
	3.70	2	3	4	1.0							SS-1 EMBANKMENT: BROWN-ORANGE SANDY CLAYEY SILT
	8.70	3	1	1	1.0							SS-2 ALLUVIUM: GRAY-TAN SILTY FINE TO COARSE SAND
860.00	13.70	1	2	1	1.0							SS-3 SAPROLITE: ORANGE-TAN MICACEOUS SILTY SAND
	18.70	1	2	3	1.0							SS-4 SAPROLITE: WHITE-GRAY SLIGHTLY MICACEOUS SILTY FINE TO COARSE SAND
850.00	23.70	2	3	4	1.0							SS-5 SAPROLITE: GRAY-TAN-WHITE MICACEOUS CLAYEY SILTY SAND
	28.70	4	5	9	1.0							SS-6 SAPROLITE: SLIGHTLY MICACEOUS SILTY SAND
840.00	33.70	3	5	9	1.0							
	38.70	12	16	35	1.0							
	43.70	31	33	22	1.0							
823.27												Continued on the next page.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33584.1.1		ID B-4241		COUNTY POLK		GEOLOGIST M.M. HAGAR						
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COLLAR ELEV 871.37ft		TOTAL DEPTH 48.10ft		START DATE 9/19/05		COMPLETION DATE 09/19/05						
DRILL MACHINE CME-550			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK 48.10ft			Log EB2-A, Page 2 of 2						
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION
		6in	6in	6in		0	25	50	75			
823.27												BORING TERMINATED AT ELEV. 823.3' ON HARD ROCK.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33584.1.1		ID B-4241		COUNTY POLK		GEOLOGIST M.M. HAGAR						
SITE DESCRIPTION BRIDGE NO. 24 ON SR-1520 OVER HOOPER CREEK							GND WATER					
BORING NO EB2-B		NORTHING 0.00		EASTING 0.00		0 HR N/A						
ALIGNMENT -L-		BORING LOCATION 14+18.000		OFFSET 12.00ft RT		24 HR 9.10ft						
COLLAR ELEV 871.19ft		TOTAL DEPTH 53.70ft		START DATE 9/20/05		COMPLETION DATE 09/20/05						
DRILL MACHINE CME-550			DRILL METHOD H.S. AUGERS			HAMMER TYPE AUTOMATIC						
SURFACE WATER DEPTH			DEPTH TO ROCK 53.70ft			Log EB2-B, Page 1 of 2						
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION
		6in	6in	6in		0	25	50	75			
871.19												Ground Surface
	3.90	1	2	1	1.0							EMBANKMENT: SILT & ABC
	8.90	0	1	1	1.0							RED-ORANGE CLAYEY FINE SANDY SILT
860.00	13.90	1	2	3	1.0							ALLUVIUM: DARK GRAY-BROWN SILTY FINE TO COARSE SAND
	18.90	3	2	3	1.0							SAPROLITE: ORANGE-BROWN-GRAY MICACEOUS SILTY FINE TO COARSE SAND
850.00	23.90	1	3	5	1.0							SS-19
	28.90	3	5	8	1.0							SS-20
840.00	33.90	5	8	11	1.0							
	38.90	3	6	10	1.0							
	43.90	2	5	7	1.0							SAPROLITE: ORANGE-BROWN-GRAY SILTY FINE TO COARSE SAND
823.19												Continued on the next page.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33584.1.1		ID B-4241		COUNTY POLK		GEOLOGIST M.M. HAGAR						
SITE DESCRIPTION BRIDGE NO. 24 ON SR-1520 OVER HOOPER CREEK							GND WATER					
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SURFACE WATER DEPTH			DEPTH TO ROCK 53.70ft			Log EB2-B, Page 2 of 2						
ELEV	DEPTH	BLOW CT			PEN (ft)	BLOWS PER FOOT				SAMPLE NO	LOG	SOIL AND ROCK DESCRIPTION
		6in	6in	6in		0	25	50	75			
	48.90				0.3							WEATHERED ROCK
823.19	820.00											
	817.49				0.0							BORING TERMINATED AT ELEV. 817.5' ON HARD ROCK

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

M&T 503E

T.I.P. ID #: B-4241

REPORT ON SAMPLES OF: Soils for Classification

PROJECT:	33584.1.1	COUNTY:	Polk	Owner:	--
DATE SAMPLED:	9.20.05	DATE RECEIVED:	9.21.05	DATE REPORTED:	9.26.05
SAMPLED FROM:	Bridge	SAMPLED BY:	J. W. Mann		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

**TEST RESULTS**

Project Sample No.	SS-12	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19
Lab Sample No. A	150418	150419	150420	150421	150422	150423	150424	150425
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	--	--	--	--	--	--	--	--
Passing #10 Sieve %	100	100	94	99	98	80	99	100
Passing #40 Sieve %	98	98	59	73	78	59	75	69
Passing #200 Sieve %	50	26	15	27	27	13	20	21

**MINUS #10 FRACTION**

Soil Mortar - 100%								
Coarse Sand -Ret. #60	10	11	58	44	38	46	47	51
Fine Sand - Ret. #270	46	67	30	35	43	41	38	34
Silt 0.05-0.005 mm %	20	12	10	17	15	9	13	13
Clay < 0.005 mm %	24	10	2	4	4	4	2	2
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	32	29	27	30	25	24	45	41
Plastic Index	5	NP						
AASHTO Classification	A-4 (3)	A-2-4 (0)	A-2-5 (0)	A-2-5 (0)				
Quantity								
Texture								
Station	13+67	13+67	13+67	13+67	13+67	14+18	14+18	14+18
Hole No.								
Depth (ft) From:	4.8	5.7	19.8	24.8	39.8	8.9	13.9	23.9
To:	5.7	6.3	21.3	26.3	41.3	10.4	15.1	25.1

**Remarks:**

A-150418 - 150425

CC:

J. W. Mann	
File	

SOILS ENGINEER:

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

T.I.P. ID #: B4241

REPORT ON SAMPLES OF: Soils for Classification

PROJECT:	33584.1.1	COUNTY:	Polk	Owner:	--
DATE SAMPLED:	9.20.05	DATE RECEIVED:	9.21.05	DATE REPORTED:	9.26.05
SAMPLED FROM:	Bridge	SAMPLED BY:	J. W. Mann		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

**TEST RESULTS**

Project Sample No.	SS-20							
Lab Sample No. A	150426							
HiCAMS Sample #	--							
Retained #4 Sieve %	--							
Passing #10 Sieve %	95							
Passing #40 Sieve %	75							
Passing #200 Sieve %	25							

**MINUS #10 FRACTION**

Soil Mortar - 100%								
Coarse Sand -Ret. #60	38							
Fine Sand - Ret. #270	42							
Silt 0.05-0.005 mm %	16							
Clay < 0.005 mm %	4							
Passing # 40 Sieve %	--							
Passing # 200 Sieve %	--							

Liquid Limit	25							
Plastic Index	NP							
AASHTO Classification	A-2-4 (0)							
Quantity								
Texture								
Station	14+18							
Hole No.								
Depth (ft) From:	38.9							
To:	40.4							

**Remarks:**

A-150426

CC:

J. W. Mann	
File	

SOILS ENGINEER:

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

M&T 503E

T.I.P. ID #: B-4241

REPORT ON SAMPLES OF: Soils for Classification

PROJECT:	33584.1.1	COUNTY:	Polk	Owner:	--
DATE SAMPLED:	9.19.05	DATE RECEIVED:	9.20.05	DATE REPORTED:	9.23.05
SAMPLED FROM:	Bridge	SAMPLED BY:	J. W. Mann		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

**TEST RESULTS**

Project Sample No.	S-1	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7
Lab Sample No. A	150392	150393	150394	150395	150396	150397	150398	150399
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	--	--	--	--	--	--	--	--
Passing #10 Sieve %	90	94	84	98	100	99	100	70
Passing #40 Sieve %	72	89	67	76	74	71	86	27
Passing #200 Sieve %	13	64	22	34	21	20	28	4

**MINUS #10 FRACTION**

Soil Mortar - 100%								
Coarse Sand -Ret. #60	48	9	40	36	46	49	33	79
Fine Sand - Ret. #270	40	31	37	38	38	36	51	17
Silt 0.05-0.005 mm %	2	24	11	16	8	9	10	0
Clay < 0.005 mm %	10	36	12	10	8	6	6	4
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	20	39	29	44	42	41	34	20
Plastic Index	NP	9	NP	NP	NP	NP	NP	NP
AASHTO Classification	A-2-4 (0)	A-4 (6)	A-2-4 (0)	A-2-5 (0)	A-2-4 (0)	A-2-5 (0)	A-2-4 (0)	A-1-b (0)
Quantity								
Texture								
Station	14+18	14+18	14+18	14+18	14+18	14+18	14+18	13+68
Hole No.								
Depth (ft) From:	6.2	3.7	9.7	13.7	23.7	33.7	38.7	8.7
To:	8.7	5.2	10.2	14.9	25.2	35.2	40.2	10.2

**Remarks:**

A-150392 - 150399

**CC:**

J. W. Mann	
File	

SOILS ENGINEER:

10 OF 11  
M&T 503E

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

T.I.P. ID #: B-4241

REPORT ON SAMPLES OF: Soils for Classification

PROJECT:	33584.1.1	COUNTY:	Polk	Owner:	--
DATE SAMPLED:	9.19.05	DATE RECEIVED:	9.20.05	DATE REPORTED:	9.23.05
SAMPLED FROM:	Bridge	SAMPLED BY:	J. W. Mann		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

**TEST RESULTS**

Project Sample No.	SS-8	SS-9	SS-10	SS-11				
Lab Sample No. A	150400	150401	150402	150403				
HiCAMS Sample #	--	--	--	--				
Retained #4 Sieve %	--	--	--	--				
Passing #10 Sieve %	99	95	100	100				
Passing #40 Sieve %	73	64	76	74				
Passing #200 Sieve %	16	17	22	19				

**MINUS #10 FRACTION**

Soil Mortar - 100%								
Coarse Sand -Ret. #60	48	52	44	48				
Fine Sand - Ret. #270	41	35	41	38				
Silt 0.05-0.005 mm %	7	11	13	12				
Clay < 0.005 mm %	4	2	2	2				
Passing # 40 Sieve %	--	--	--	--				
Passing # 200 Sieve %	--	--	--	--				

Liquid Limit	44	28	33	28				
Plastic Index	NP	NP	NP	NP				
AASHTO Classification	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)				
Quantity								
Texture								
Station	13+68	13+68	13+68	13+68				
Hole No.								
Depth (ft) From:	18.7	28.7	38.7	48.7				
To:	20.2	30.2	40.2	50.2				

**Remarks:**

A-150400 - 150403

**CC:**

J. W. Mann	
File	

SOILS ENGINEER:



**FIELD  
 SCOUR REPORT**

PROJECT: 33584.1.1 ID: B-4241 COUNTY: POLK

DESCRIPTION(1): BRIDGE NO. 24 ON SR-1520 OVER HOOPER CREEK

**EXISTING BRIDGE**

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

Bridge No.: 24 Length: 35.5' Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 1  
 Foundation Type: Timber pile

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: End Bent Two Vertical Abutment

Interior Bents: Eroding bank on End Bent One Side of Interior Bent One

Channel Bed: None noted

Channel Bank: Minor slump on both banks

**EXISTING SCOUR PROTECTION**

Type(3): Rip rap

Extent(4): Placed at foot of End Bent Two vertical abutment

Effectiveness(5): Fair

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): Silt, Sand, Cobbles, Boulders

Channel Bank Material(8): Alluvial Sand (A-2-4)

Channel Bank Cover(9): Grass, Trees

Floodplain Width(10): 600'

Floodplain Cover(11): Trees, Grass

Stream is(12): Aggrading Degrading  Static

Channel Migration Tendency(13): Toward End Bent One

Observations and Other Comments:

**GEOTECHNICALLY ADJUSTED SCOUR ELEVATIONS(14)** Feet Meters

**BENTS**

	B1	B2	B3	B4						
SB Lanes, Lt	N/A	N/A	N/A	N/A						
SB Lanes, Rt										
NB Lanes, Lt										
NB Lanes, Rt										

Comparison of GASE to Hydraulics Unit theoretical scour:

**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							

Reported by: J.W. Mann

Date: 9/29/2005