

REFERENCE: SF-170240

PROJECT: 17BP.12.R.55

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-170240	1	10

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

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**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

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COUNTY CATAWBA  
PROJECT DESCRIPTION BRIDGE NO. 240 ON SR 1858  
(N. OLIVERS CROSS RD.) OVER MAIDEN CREEK

**CONTENTS**

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2, 2A	LEGEND (SOIL & ROCK)
3	SITE PLAN
4-5	CROSS SECTION(S)
6-9	BORE LOG(S)

PERSONNEL  
J.E. BEVERLY  
J.K. STICKNEY  
C.L. SMITH  
M.R. MOORE

INVESTIGATED BY J.K. STICKNEY  
DRAWN BY T.T. WALKER, F&R Inc.  
CHECKED BY K.B. MILLER  
SUBMITTED BY K.B. MILLER  
DATE May 2017

**CAUTION NOTICE**

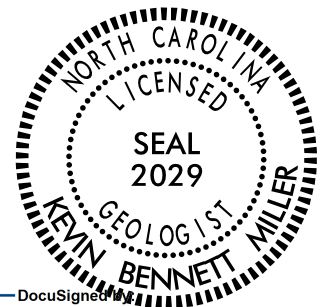
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

**NOTES:**

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



DocuSigned by  
  
957A789AED704CB... 5/5/2017

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SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT

**SUBSURFACE INVESTIGATION**





SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS  
(PAGE 1 OF 2)

SOIL DESCRIPTION										GRADATION																																																																																																																																																					
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.																																																																																																																																																					
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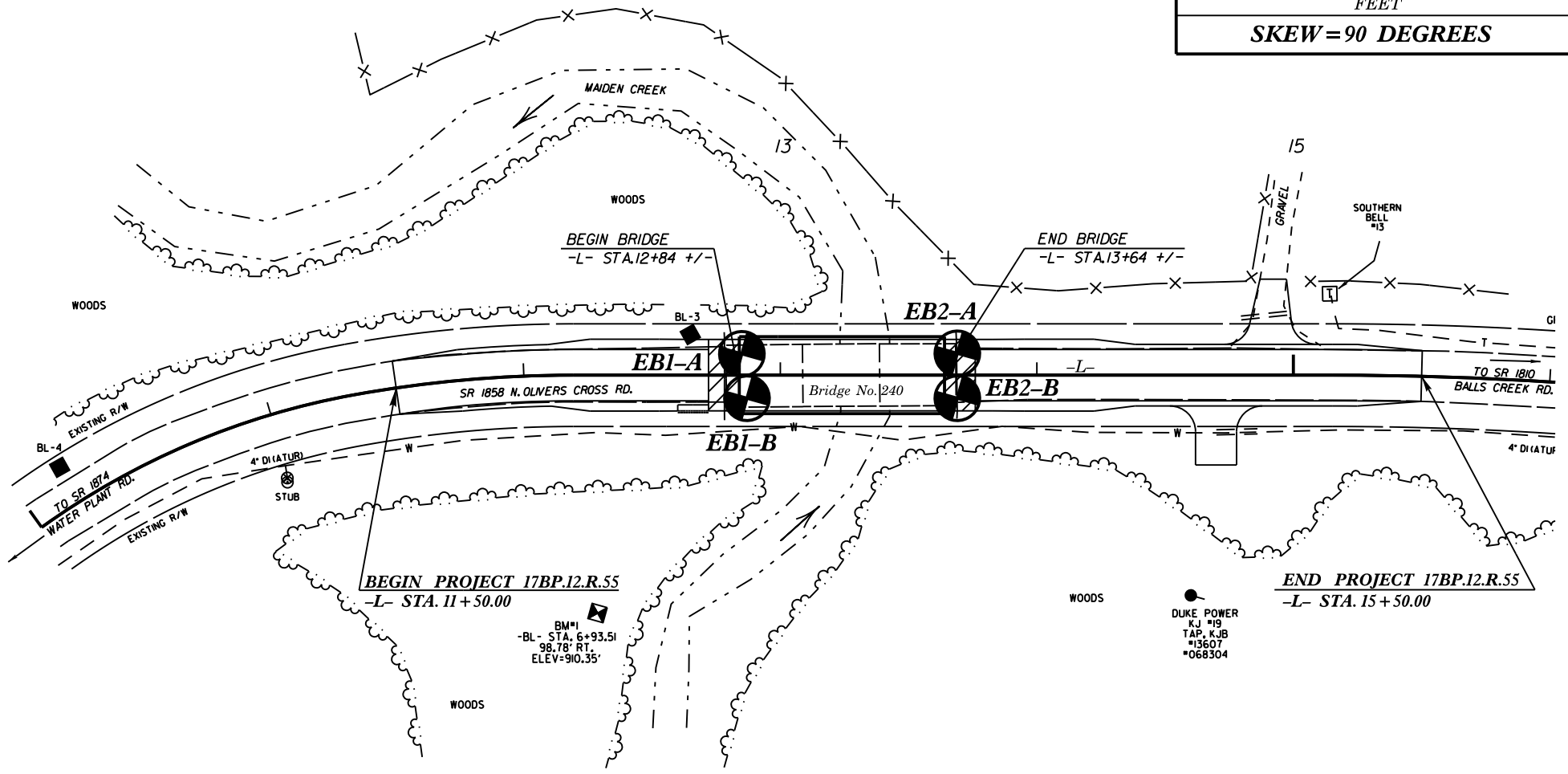
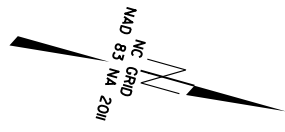
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
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GEOTECHNICAL ENGINEERING UNIT**

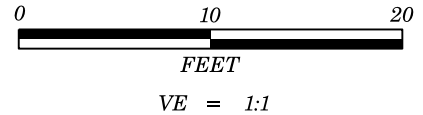
# SUBSURFACE INVESTIGATION

## SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 2 OF 2)

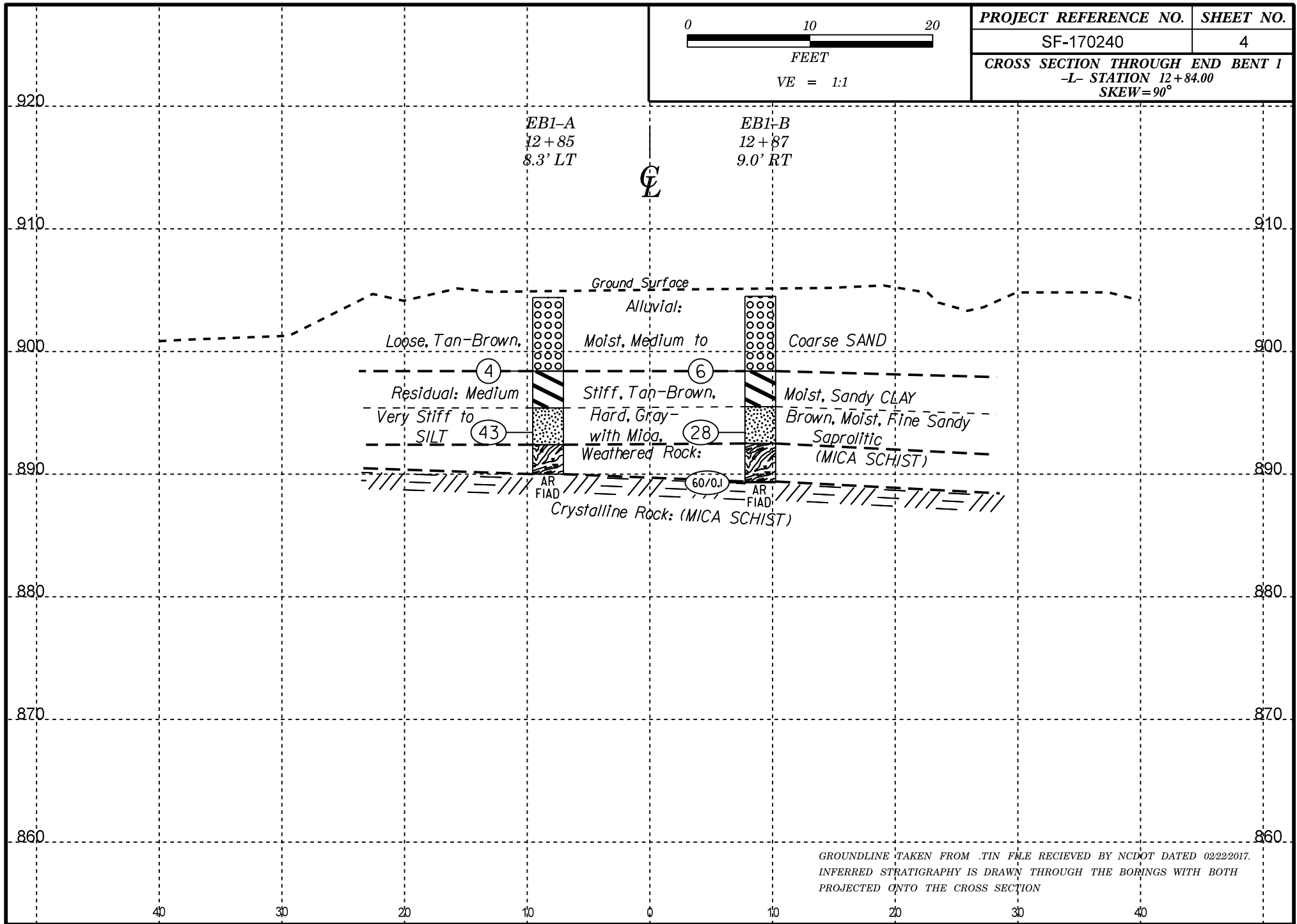
ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 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>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.</p> <p><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p><b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.</p> <p><b>ARTESIAN</b> - 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.</p> <p><b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p><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.</p> <p><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p><b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p><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.</p> <p><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p><b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p><b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p><b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p><b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p><b>ROCK QUALITY DESIGNATION (RQD)</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.</p> <p><b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p><b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.</p> <p><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p><b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS IN OR BPF 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 PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.</p> <p><b>STRATA CORE RECOVERY (SREC)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p><b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p><b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
<p><b>WEATHERED ROCK (WR)</b>  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES &gt; 100 BLOWS PER FOOT IF TESTED.</p> <p><b>CRYSTALLINE ROCK (CR)</b>  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p> <p><b>NON-CRYSTALLINE ROCK (NCR)</b>  FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</p> <p><b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b>  COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>			
WEATHERING			
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.		
VERY SLIGHT (V SL.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.		
SLIGHT (SL.)	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.		
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.		
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i>		
SEVERE (SEV.)	ALL ROCK 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, WOULD YIELD SPT N VALUES &gt; 100 BPF</i>		
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</i>		
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.		
ROCK HARDNESS			
VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.		
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.		
MODERATELY HARD	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.		
MEDIUM HARD	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.		
SOFT	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.		
VERY SOFT	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 FINGER NAIL.		
FRACTURE SPACING		BEDDING	
TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET
		THINLY LAMINATED	< 0.008 FEET
INDURATION			
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.			
FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.		
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.		
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.		
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.		
BENCH MARK: BM #1 RR SPIKE SET IN 38' OAK AT -L- STATION I2+28.75, 92.7' RT		ELEVATION: 910.35 FEET	
<b>NOTES:</b>			
NM= NOT MEASURED			
FIAD= FILLED IMMEDIATELY AFTER DRILLING			

PROJECT REFERENCE NO.	SHEET NO.
SF-170240	3
<b>SITE PLAN</b>	
 0                      60                      120 FEET	
<b>SKEW = 90 DEGREES</b>	

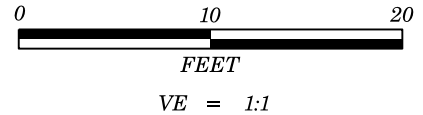




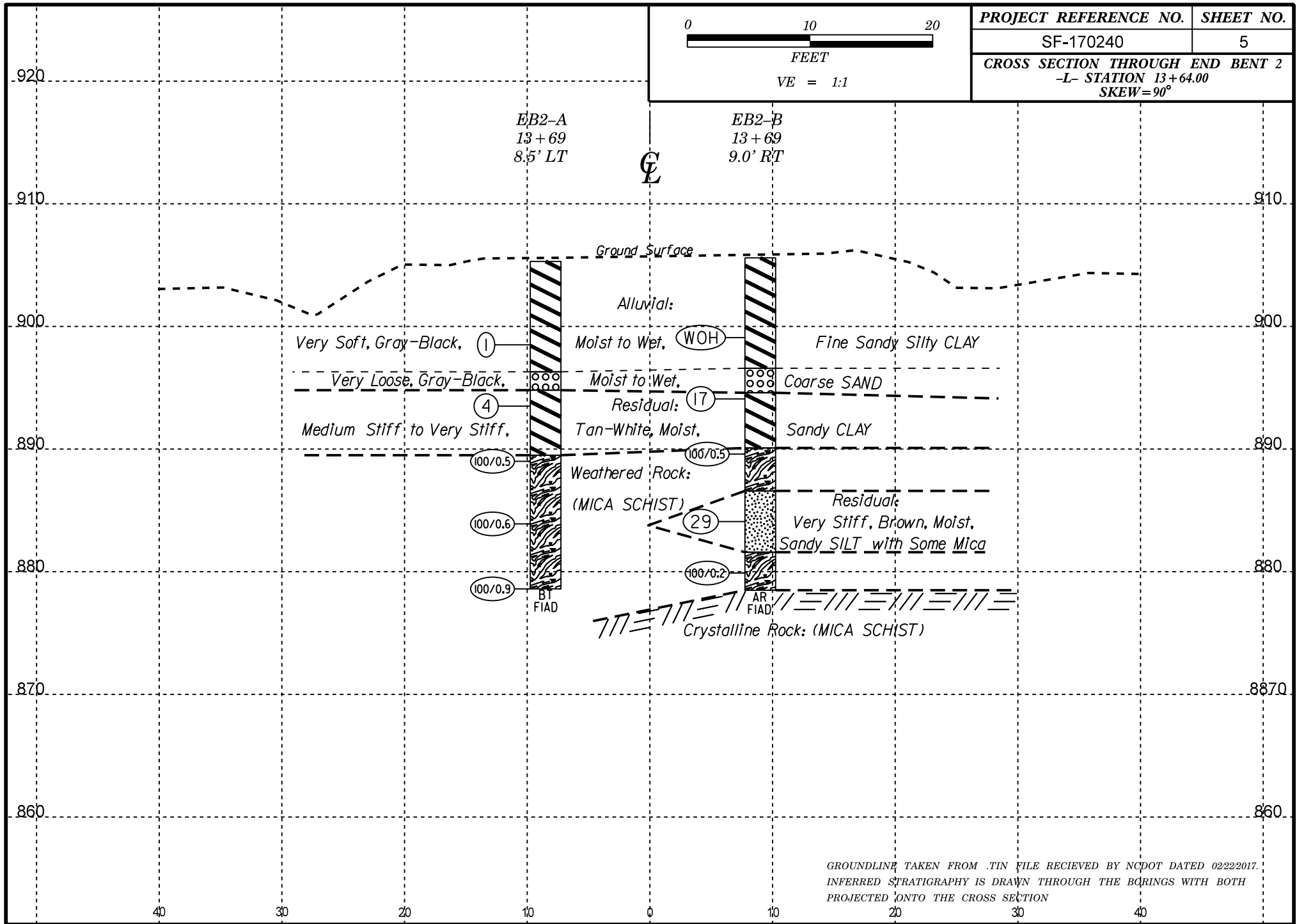
<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
SF-170240	4
<b>CROSS SECTION THROUGH END BENT 1</b>	
<b>-L- STATION 12+84.00</b>	
<b>SKEW=90°</b>	



GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY NCDOT DATED 02222017.  
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH  
 PROJECTED ONTO THE CROSS SECTION



<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
SF-170240	5
<b>CROSS SECTION THROUGH END BENT 2</b>	
<b>-L- STATION 13+64.00</b>	
<b>SKEW=90°</b>	



GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY NCDOT DATED 02222017.  
 INFERRERD STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH  
 PROJECTED ONTO THE CROSS SECTION

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.12.R.55		TIP SF-170240		COUNTY CATAWBA		GEOLOGIST Beverly, J. E.											
SITE DESCRIPTION Bridge No 240 on SR 1858 (N. Olivers Cross Rd.) over Maiden Creek							GROUND WTR (ft)										
BORING NO. EB1-A		STATION 12+85		OFFSET 8 ft LT		ALIGNMENT -L-											
COLLAR ELEV. 904.4 ft		TOTAL DEPTH 14.4 ft		NORTHING 682,725		EASTING 1,360,760											
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 85% 05/20/2016				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Smith, C. L.		START DATE 02/07/17		COMP. DATE 02/07/17		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
905															904.4	GROUND SURFACE	0.0
900	899.4	5.0	2	1	3										898.4	<b>ALLUVIAL</b> Tan-Brown, Medium to Coarse SAND	6.0
895	894.4	10.0	11	18	25										895.4	<b>RESIDUAL</b> Brown, Sandy CLAY	9.0
890															892.4	Gray, Fine Sandy SILT with Mica, Saprolitic	12.0
															890.0	<b>WEATHERED ROCK</b> (MICA SCHIST)	14.4
																Boring Terminated with Casing Advancer Refusal at Elevation 890.0 ft on Crystalline Rock (MICA SCHIST)	

NCDOT BORE SINGLE SF170240\_GEO\_BH\_BRD0240.GPJ NC\_DOT.GDT 5/1/17

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.12.R.55		TIP SF-170240		COUNTY CATAWBA		GEOLOGIST Beverly, J. E.									
SITE DESCRIPTION Bridge No 240 on SR 1858 (N. Olivers Cross Rd.) over Maiden Creek							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 12+87		OFFSET 9 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 904.5 ft		TOTAL DEPTH 15.2 ft		NORTHING 682,731		EASTING 1,360,776									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 85% 05/20/2016				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 02/07/17		COMP. DATE 02/07/17		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
905														GROUND SURFACE	0.0
900	899.4	5.1	5	4	2									ALLUVIAL Tan-Brown, Medium to Coarse SAND (A-1)	
895	894.4	10.1	3	4	24									RESIDUAL Tan-Brown, Sandy CLAY (A-7)	6.1
890	889.4	15.1												Brown-Gray, Fine Sandy SILT (A-4) with Mica	9.0
														WEATHERED ROCK (MICA SCHIST)	12.0
														CRYSTALLINE ROCK (MICA SCHIST)	15.1
														Boring Terminated with Standard Penetration Test Refusal at Elevation 889.3 ft in Crystalline Rock (MICA SCHIST)	15.2

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# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.12.R.55		TIP SF-170240		COUNTY CATAWBA		GEOLOGIST Beverly, J. E.											
SITE DESCRIPTION Bridge No 240 on SR 1858 (N. Olivers Cross Rd.) over Maiden Creek							GROUND WTR (ft)										
BORING NO. EB2-A		STATION 13+69		OFFSET 9 ft LT		ALIGNMENT -L-	0 HR. NM										
COLLAR ELEV. 905.3 ft		TOTAL DEPTH 26.7 ft		NORTHING 682,806		EASTING 1,360,737	24 HR. FIAD										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 85% 05/20/2016				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Smith, C. L.		START DATE 02/07/17		COMP. DATE 02/07/17		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
910																	
905															905.3	GROUND SURFACE	0.0
900	899.5	5.8	1	0	1												
895	894.5	10.8	2	3	1										896.3	Gray-Black, Coarse SAND	9.0
890	889.5	15.8	100/0.5												894.8	RESIDUAL Tan, Fine Sandy CLAY	10.5
885	884.5	20.8	66	24/0.1											889.5	WEATHERED ROCK (MICA SCHIST)	15.8
880	879.5	25.8	36	64/0.4													
															878.6	Boring Terminated at Elevation 878.6 ft in Weathered Rock (MICA SCHIST)	26.7

NCDOT BORE SINGLE SF170240\_GEO\_BH\_BRD0240.GPJ NC\_DOT.GDT 5/1/17

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.12.R.55		TIP SF-170240		COUNTY CATAWBA		GEOLOGIST Beverly, J. E.										
SITE DESCRIPTION Bridge No 240 on SR 1858 (N. Olivers Cross Rd.) over Maiden Creek							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 13+69		OFFSET 9 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 905.0 ft		TOTAL DEPTH 27.1 ft		NORTHING 682,810		EASTING 1,360,754										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 85% 05/20/2016				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/07/17		COMP. DATE 02/07/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
905														905.0	GROUND SURFACE	0.0
900	899.5	5.5	WOH	WOH	WOH								M		<b>ALLUVIAL</b> Black-Gray, Silty CLAY	
895	894.5	10.5	1	5	12								M		Black-Gray, Coarse SAND	9.0
890	889.5	15.5	100/0.5							100/0.5					<b>RESIDUAL</b> Tan-White, Sandy CLAY	11.0
885	884.5	20.5	6	16	13								M		<b>WEATHERED ROCK (MICA SCHIST)</b>	15.5
880	879.5	25.5	100/0.2							100/0.2					<b>RESIDUAL</b> Brown, Sandy SILT with Some Mica	19.0
															<b>WEATHERED ROCK (MICA SCHIST)</b>	24.0
															Boring Terminated with Casing Advancer Refusal at Elevation 877.9 ft on Crystalline Rock (MICA SCHIST)	27.1

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