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REFERENCE: B-5344

PROJECT: 46058

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

**STRUCTURE  
SUBSURFACE INVESTIGATION**

COUNTY GUILFORD  
PROJECT DESCRIPTION BRIDGE NO.161 ON SR 2821  
(HARVEST ROAD) OVER SOUTH BUFFALO CREEK

CONTENTS

SHEET NO.	DESCRIPTION
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2	LEGEND
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8-9	CORE PHOTOGRAPH(S)
10	SITE PHOTOGRAPH(S)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5344	1	10

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.

PERSONNEL

D. RACEY

S. DAVIS

M. RENZA

C. WANG

T. WALKER

INVESTIGATED BY F&R, Inc.

DRAWN BY D. RACEY

CHECKED BY P. ALTON

SUBMITTED BY P. ALTON

DATE JULY 2015



DocuSigned by: 10/20/2015

*Patrick Alton*

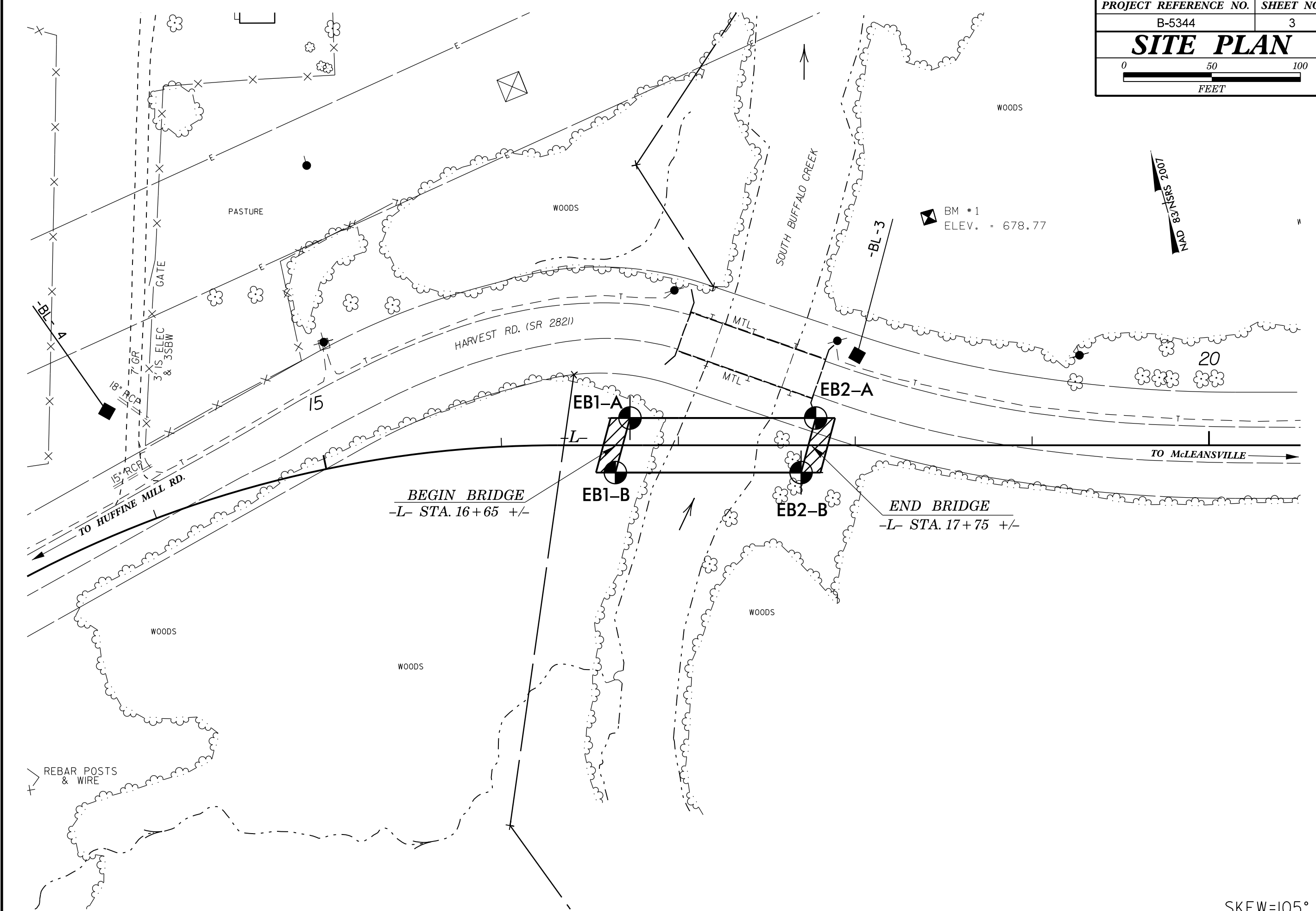
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DATE

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**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT  
SUBSURFACE INVESTIGATION  
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																													
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 (ASHTO 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, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6										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.										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:										ALLUVIUM (ALLUV.) - SOILS THAT 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, SUCH 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 THAT 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 DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - 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 (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - 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 THAT 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, THAT 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 (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. 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 (SRQD) - 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 (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																													
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>										<b>ANGULARITY OF GRAINS</b>										<b>WEATHERED ROCK (WR)</b>										<b>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES &gt; 100 BLOWS PER FOOT IF TESTED.</b>																													
<b>MINERALOGICAL COMPOSITION</b>										<b>CRYSTALLINE ROCK (CR)</b>										<b>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</b>										<b>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES &gt; 100 BLOWS PER FOOT IF TESTED.</b>																													
<b>COMPRESSIBILITY</b>										<b>NON-CRYSTALLINE ROCK (NCR)</b>										<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.</b>										<b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b>										<b>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</b>																			
<b>PERCENTAGE OF MATERIAL</b>										<b>WEATHERING</b>										<b>FRESH</b>										<b>ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</b>																													
<b>GROUND WATER</b>										<b>VERY SLIGHT (V SLI.)</b>										<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>										<b>SLIGHT (SLI.)</b>										<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>																			
<b>MISCELLANEOUS SYMBOLS</b>										<b>MODERATE (MOD.)</b>										<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>										<b>MODERATELY SEVERE (MOD. SEV.)</b>										<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. IF TESTED, WOULD YIELD SPT REFUSAL.</b>																			
<b>RECOMMENDATION SYMBOLS</b>										<b>SEVERE (SEV.)</b>										<b>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. IF TESTED, WOULD YIELD SPT N VALUES &gt; 100 BPF.</b>										<b>VERY SEVERE (V SEV.)</b>										<b>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. IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF.</b>																			
<b>ABBREVIATIONS</b>										<b>COMPLETE</b>										<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.</b>										<b>ROCK HARDNESS</b>										<b>VERY HARD</b>										<b>CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</b>									
<b>TEXTURE OR GRAIN SIZE</b>										<b>HARD</b>										<b>CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</b>										<b>MODERATELY HARD</b>										<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>																			
<b>SOIL MOISTURE - CORRELATION OF TERMS</b>										<b>MEDIUM HARD</b>										<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 PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</b>										<b>SOFT</b>										<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>																			
<b>PLASTICITY</b>										<b>VERY SOFT</b>										<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 FINGER NAIL.</b>										<b>FRACTURE SPACING</b>										<b>BEDDING</b>																			
<b>COLOR</b>										<b>EQUIPMENT USED ON SUBJECT PROJECT</b>										<b>INDURATION</b>										<b>INDURATION</b>																													
<b>DRILL UNITS:</b>										<b>ADVANCING TOOLS:</b>										<b>HAMMER TYPE:</b>										<b>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</b>																													
<b>INDURATION</b>										<b>INDURATION</b>										<b>INDURATION</b>										<b>INDURATION</b>																													



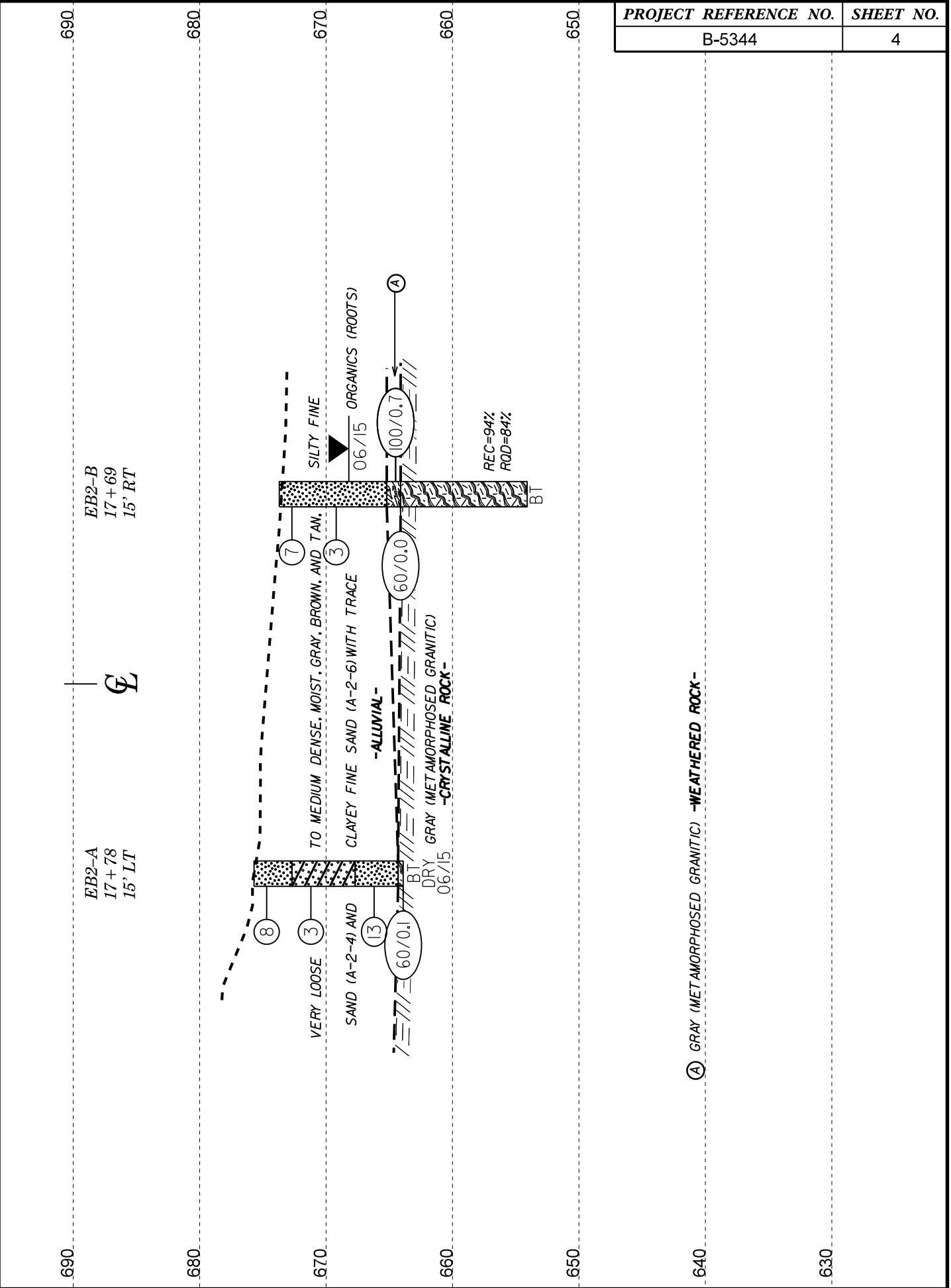
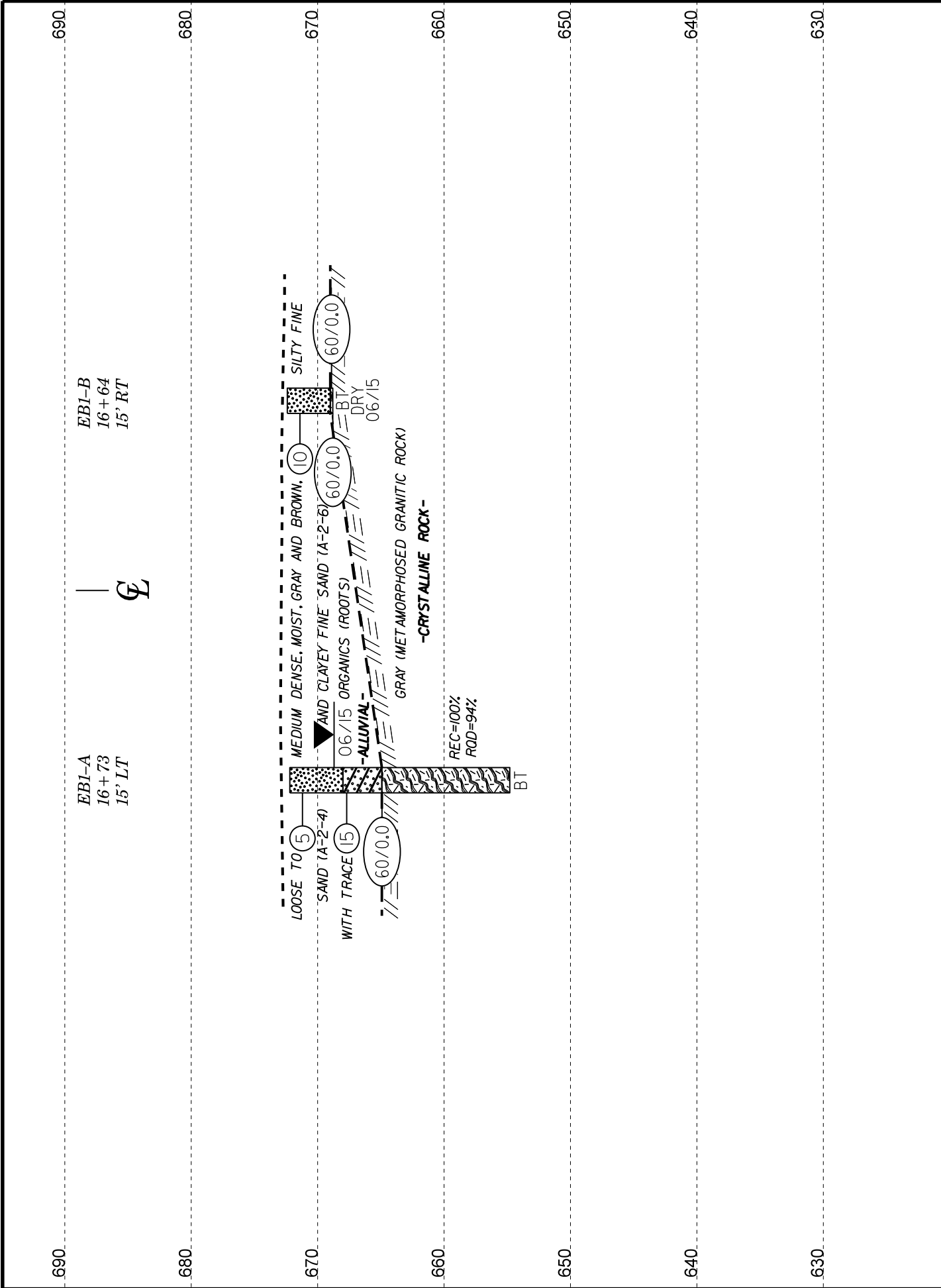
BM #1  
ELEV. = 678.77

↑  
MAD 83°N/SRS 2007

**BEGIN BRIDGE**  
-L- STA. 16+65 +/-

**END BRIDGE**  
-L- STA. 17+75 +/-

SKEW=105°





**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 46058.1.1		TIP B-5344		COUNTY GUILFORD		GEOLOGIST C. Wang										
SITE DESCRIPTION BRIDGE NO. 161 ON SR 2821 OVER SOUTH BUFFALO CREEK							GROUND WTR (ft)									
BORING NO. EB1-A		STATION 16+73		OFFSET 15 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 672.2 ft		TOTAL DEPTH 17.4 ft		NORTHING 860,617		EASTING 1,801,542										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 76% 02/25/2015				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 06/09/15		COMP. DATE 06/09/15		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
675																
	672.2	0.0	1	2	3	5						M	672.2	GROUND SURFACE	0.0	
670	668.7	3.5	4	7	8	15						M	668.0	ALLUVIAL GRAY, SILTY FINE SAND (A-2-4) WITH TRACE ROOTS AND GRAVEL	4.2	
														664.9	GRAY, CLAYEY FINE SAND (A-2-6)	7.3
665	664.9	7.3	60/0.0											664.9	CRYSTALLINE ROCK GRAY (METAMORPHOSED GRANITIC ROCK)	7.3
660																
655														654.8		17.4
Boring Terminated at Elevation 654.8 ft in CRYSTALLINE ROCK (METAMORPHOSED GRANITIC ROCK)																
NOTES: AUGER REFUSAL AT 7.3'																

NCDOT BORE DOUBLE B5344\_GEO\_BH\_BRDG0161.GPJ NC\_DOT.GDT 7/20/15



**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**CORE BORING REPORT**

WBS 46058.1.1		TIP B-5344		COUNTY GUILFORD		GEOLOGIST C. Wang						
SITE DESCRIPTION BRIDGE NO. 161 ON SR 2821 OVER SOUTH BUFFALO CREEK							GROUND WTR (ft)					
BORING NO. EB1-A		STATION 16+73		OFFSET 15 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 672.2 ft		TOTAL DEPTH 17.4 ft		NORTHING 860,617		EASTING 1,801,542						
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 76% 02/25/2015				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic						
DRILLER S. Davis		START DATE 06/09/15		COMP. DATE 06/09/15		SURFACE WATER DEPTH N/A						
CORE SIZE NQ3			TOTAL RUN 10.1 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
664.93	664.9	7.3	5.1	1:05/0.8 1:27/1.0 1:30/1.0 2:15/1.0 1:59/1.0 0:35/0.3	(5.1) 100%	(4.5) 88%		(10.1) 100%	(9.5) 94%		Begin Coring @ 7.3 ft	
660	659.8	12.4	5.0	1:51/1.0 1:30/1.0 1:34/1.0 1:26/1.0 1:45/1.0	(5.0) 100%	(5.0) 100%					CRYSTALLINE ROCK GRAY, VERY SLIGHTLY WEATHERED TO FRESH MODERATELY HARD TO HARD, METAMORPHOSED GRANITIC ROCK, CLOSE TO WIDE FRACTURE SPACING	
655	654.8	17.4									Boring Terminated at Elevation 654.8 ft in CRYSTALLINE ROCK (METAMORPHOSED GRANITIC ROCK)	17.4
NOTES: AUGER REFUSAL AT 7.3'												

NCDOT CORE DOUBLE B5344\_GEO\_BH\_BRDG0161.GPJ NC\_DOT.GDT 7/20/15



**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 46058.1.1		TIP B-5344		COUNTY GUILFORD		GEOLOGIST C. Wang									
SITE DESCRIPTION BRIDGE NO. 161 ON SR 2821 OVER SOUTH BUFFALO CREEK							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 16+64		OFFSET 15 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 672.4 ft		TOTAL DEPTH 3.6 ft		NORTHING 860,589		EASTING 1,801,526									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 76% 02/25/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 06/09/15		COMP. DATE 06/09/15		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
675															
	672.4	0.0	2	6	4									672.4	0.0
670	668.9	3.5												669.0	3.4
	668.8	3.6	60/0.0											668.8	3.6
			60/0.0												

WBS 46058.1.1		TIP B-5344		COUNTY GUILFORD		GEOLOGIST C. Wang									
SITE DESCRIPTION BRIDGE NO. 161 ON SR 2821 OVER SOUTH BUFFALO CREEK							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 17+78		OFFSET 15 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 675.7 ft		TOTAL DEPTH 11.8 ft		NORTHING 860,588		EASTING 1,801,643									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 76% 02/25/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 06/09/15		COMP. DATE 06/09/15		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
680															
	675.7	0.0	1	3	5									675.7	0.0
675	672.2	3.5	3	1	2									672.7	3.0
670	667.2	8.5	3	4	9									667.7	8.0
665	664.0	11.7	60/0.1											664.3	11.4
														663.9	11.8

NCDOT BORE DOUBLE B5344\_GEO\_BH\_BRDG0161.GPJ NC\_DOT\_GDT 7/17/15

NOTES:  
AUGER REFUSAL AT 11.7'



**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**



**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**CORE BORING REPORT**

WBS 46058.1.1		TIP B-5344		COUNTY GUILFORD		GEOLOGIST C. Wang										
SITE DESCRIPTION BRIDGE NO. 161 ON SR 2821 OVER SOUTH BUFFALO CREEK							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 17+69		OFFSET 15 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 673.7 ft		TOTAL DEPTH 19.6 ft		NORTHING 860,561		EASTING 1,801,627										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 76% 02/25/2015				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 06/09/15		COMP. DATE 06/09/15		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
675	673.7	0.0	2	4	3									673.7	GROUND SURFACE	0.0
670	670.2	3.5	2	1	2										ALLUVIAL GRAY, BROWN, AND TAN, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS (ROOTS)	
665	665.2	8.5	44	56/0.2										665.2	WEATHERED ROCK GRAY (METAMORPHOSED GRANITIC ROCK)	8.5
	664.1	9.6	60/0.0											664.1	CRYSTALLINE ROCK GRAY (METAMORPHOSED GRANITIC ROCK)	9.6
660																
655																
														654.1	Boring Terminated at Elevation 654.1 ft in CRYSTALLINE ROCK (METAMORPHOSED GRANITIC ROCK)	19.6

NCDOT BORE DOUBLE\_B5344\_GEO\_BH\_BRDG0161.GPJ\_NC\_DOT.GDT 7/17/15

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DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 76% 02/25/2015				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic						
DRILLER S. Davis		START DATE 06/09/15		COMP. DATE 06/09/15		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft)	ROD (ft)		REC. (%)	ROD (%)			
664.11	664.1	9.6	1.0	3:48/1.0	(0.9)	(0.6)		(9.4)	(8.4)		Begin Coring @ 9.6 ft	
	663.1	10.6	5.0	2:04/1.0	90%	60%					CRYSTALLINE ROCK	9.6
660				2:48/1.0	(4.5)	(3.8)					GRAY, SLIGHTLY WEATHERED TO FRESH, MODERATELY HARD TO HARD, METAMORPHOSED GRANITIC ROCK, CLOSE TO MODERATELY CLOSE FRACTURED SPACING	
	658.1	15.6		3:23/1.0	90%	76%						
	655		4.0	5:58/1.0								
				4:51/1.0	(4.0)	(4.0)						
				6:40/1.0	100%	100%						
	654.1	19.6		10:00/1.0							Boring Terminated at Elevation 654.1 ft in CRYSTALLINE ROCK (METAMORPHOSED GRANITIC ROCK)	19.6

NCDOT CORE DOUBLE\_B5344\_GEO\_BH\_BRDG0161.GPJ\_NC\_DOT.GDT 7/17/15





**CORE PHOTOGRAPHS: Bridge No. 161 on SR 2821 over South Buffalo Creek, EB1-A 16+73, 15' LT**

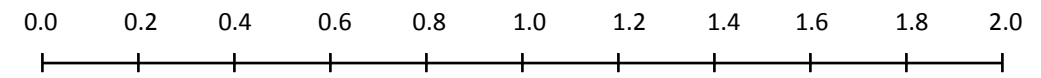
**Begin Run 1  
7.3 feet**



**End Run 1  
12.4 feet**

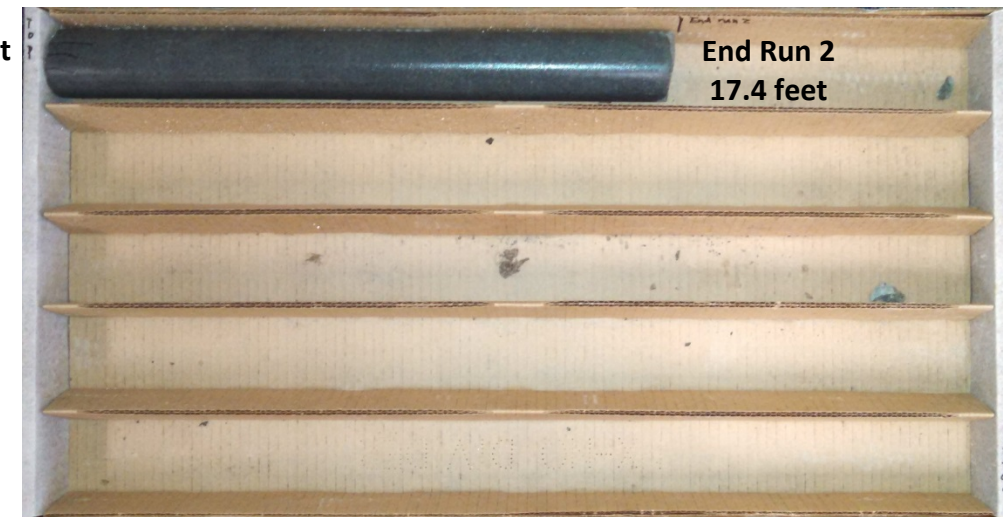
**Begin Run 2  
12.4 feet**

**16.2 feet**

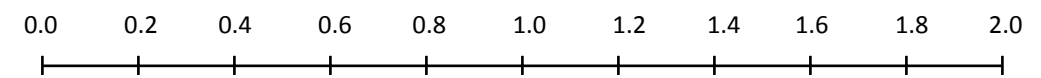


SCALE IN FEET

**16.2 feet**



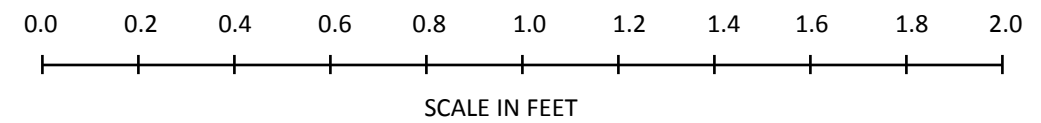
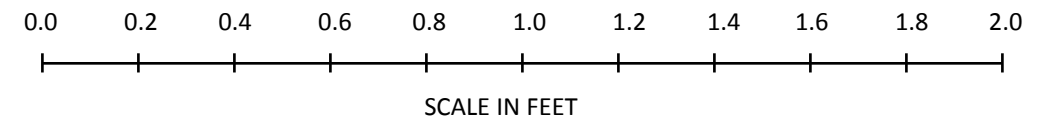
**End Run 2  
17.4 feet**



SCALE IN FEET



### CORE PHOTOGRAPHS: Bridge No. 161 on SR 2821 over South Buffalo Creek, EB2-B 17+69, 15' RT





### Bridge No. 161 on SR 2821 over South Buffalo Creek SITE PHOTOGRAPHS



**Photograph No. 1:** View of existing bridge looking west



**Photograph No. 3:** View of South Buffalo Creek looking upstream



**Photograph No. 2:** View of existing bridge looking east



**Photograph No. 4:** View of South Buffalo Creek looking downstream