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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4761	1	18

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY HALIFAX  
 PROJECT DESCRIPTION BRIDGE NO. 29 ON NC 561  
OVER LITTLE FISHING CREEK

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

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**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 1919 TOT-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.

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  2. 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.

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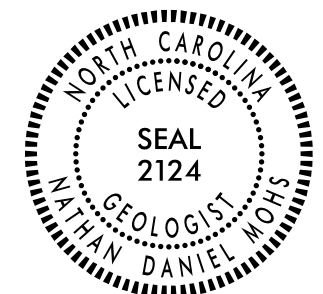
INVESTIGATED BY N.D. MOHS

DRAWN BY W.D. FIELDS

CHECKED BY N.T. ROBERSON

SUBMITTED BY N.T. ROBERSON

DATE JULY 2015



DocuSigned by:

*Nathan Mohs*

7/1/2015

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SIGNATURE

DATE

**REFERENCE: B-4761**

**PROJECT: 38533**

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

## SUBSURFACE INVESTIGATION

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

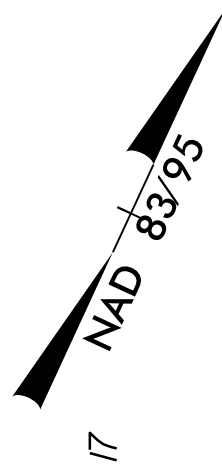
SOIL DESCRIPTION										
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 209, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS 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>										
SOIL LEGEND AND AASHTO CLASSIFICATION										
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	
SYMBOL										
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	51 MN 35 MX 35 MX 35 MX	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX	— NP	40 MX 41 MN 10 MX 11 MN 11 MN	40 MX 41 MN 10 MX 11 MN 11 MN	40 MX 41 MN 10 MX 11 MN 11 MN	40 MX 41 MN 10 MX 11 MN 11 MN	40 MX 41 MN 10 MX 11 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER	HIGHLY ORGANIC SOILS	
GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX		
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 SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR			FAIR TO POOR	POOR	UNSUITABLE	
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30										
CONSISTENCY OR DENSENESS										
PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-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 1.0 1 TO 2 2 TO 4 > 4							
TEXTURE OR GRAIN SIZE										
U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270				
	4.76	2.00	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.)				
GRAIN SIZE	305	75	2.0	0.25	0.05	0.005				
SIZE IN.	12	3								
SOIL MOISTURE - CORRELATION OF TERMS										
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)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE							
OM	OPTIMUM MOISTURE SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE							
SL		- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE							
PLASTICITY										
		PLASTICITY INDEX (PI)	DRY STRENGTH							
NON PLASTIC		0-5	VERY LOW							
SLIGHTLY PLASTIC		6-15	SLIGHT							
MODERATELY PLASTIC		16-25	MEDIUM							
HIGHLY PLASTIC		26 OR MORE	HIGH							
COLOR										
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										

GRADATION																													
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.																													
ANGULARITY OF GRAINS																													
THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.																													
MINERALOGICAL COMPOSITION																													
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.																													
COMPRESSIBILITY																													
SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50																													
PERCENTAGE OF MATERIAL																													
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																										
GROUND WATER																													
	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING																												
	STATIC WATER LEVEL AFTER 24 HOURS																												
	PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA																												
	SPRING OR SEEP																												
MISCELLANEOUS SYMBOLS																													
	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION																												
	SOIL SYMBOL																												
	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT																												
	INFERRED SOIL BOUNDARY																												
	INFERRED ROCK LINE																												
	ALLUVIAL SOIL BOUNDARY																												
	25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES																												
	SPT DMT TEST BORING																												
	AUGER BORING																												
	CORE BORING																												
	MONITORING WELL																												
	PIEZOMETER INSTALLATION																												
	SOUNDING ROD																												
	TEST BORING WITH CORE																												
	SPT N-VALUE																												
	UNDERCUT EXCAVATION																												
	SHALLOW UNDERCUT																												
	UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE																												
	UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK																												
	UNCLASSIFIED EXCAVATION - ACCEPTABLE																												
ABBREVIATIONS																													
AR - AUGER REFUSAL	BT - BORING TERMINATED	CL - CLAY	CPT - COARSE PENETRATION TEST	CSE - COARSE	DMT - DILATOMETER TEST	DPT - DYNAMIC PENETRATION TEST	e - VOID RATIO	F - FINE	FOSS. - FOSSILIFEROUS	FRAC. - FRACTURED, FRACTURES	FRAGS. - FRAGMENTS	HI. - HIGHLY	MED. - MEDIUM	MICA - MICACEOUS	MOD. - MODERATELY	NP - NON PLASTIC	ORG. - ORGANIC	PMT - PRESSUREMETER TEST	SAP. - SAPROLITIC	SD. - SAND, SANDY	SL. - SILT, SILTY	SLI. - SLIGHTLY	TCR - TRICONE REFUSAL	w - MOISTURE CONTENT	V - VERY	VST - VANE SHEAR TEST	WEA. - WEATHERED	γ - UNIT WEIGHT	γ <sub>d</sub> - DRY UNIT WEIGHT
										SAMPLE ABBREVIATIONS																			
										S - BULK																			
										SS - SPLIT SPOON																			
										ST - SHELBY TUBE																			
										RS - ROCK																			
										RT - RECOMPACTED TRIAXIAL																			
										CBR - CALIFORNIA BEARING RATIO																			
EQUIPMENT USED ON SUBJECT PROJECT																													
DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:																											
<input type="checkbox"/> CME-45C	<input type="checkbox"/> CLAY BITS	<input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL																											
<input checked="" type="checkbox"/> CME-55	<input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER	CORE SIZE:																											
<input type="checkbox"/> CME-550	<input checked="" type="checkbox"/> 8" HOLLOW AUGERS	<input type="checkbox"/> -B <input type="checkbox"/> -H																											
<input type="checkbox"/> VANE SHEAR TEST	<input type="checkbox"/> HARD FACED FINGER BITS	<input checked="" type="checkbox"/> -N WC3																											
<input type="checkbox"/> PORTABLE HOIST	<input type="checkbox"/> TUNG-CARBIDE INSERTS	HAND TOOLS:																											
<input type="checkbox"/>	<input checked="" type="checkbox"/> CASING <input checked="" type="checkbox"/> w/ ADVANCER	<input type="checkbox"/> POST HOLE DIGGER																											
<input type="checkbox"/>	<input type="checkbox"/> TRICONE _____ *STEEL TEETH	<input type="checkbox"/> HAND AUGER																											
<input type="checkbox"/>	<input type="checkbox"/> TRICONE _____ *TUNG-CARB.	<input type="checkbox"/> SOUNDING ROD																											
<input type="checkbox"/>	<input checked="" type="checkbox"/> CORE BIT	<input type="checkbox"/> VANE SHEAR TEST																											
<input type="checkbox"/>																													

ROCK DESCRIPTION	
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:	
	WEATHERED ROCK (WR)
	CRYSTALLINE ROCK (CR)
	NON-CRYSTALLINE ROCK (NCR)
	COASTAL PLAIN SEDIMENTARY ROCK (CP)
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 GROUDED 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 GROUDED 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 FINGERNAIL.
FRACTURE SPACING	
TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET
BEDDING	
TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET
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.

TERMS AND DEFINITIONS	
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 (N 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 (SROD) - 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.	
BENCH MARK:	
ELEVATION: FEET	
NOTES:	
BORING ELEVATIONS FROM NCDOT .tin FILE DATED 1/8/2013.	

<b>PROJECT REFERENCE NO.</b> B-4761	<b>SHEET NO.</b> 3
<b>SITE PLAN</b>	
 0                      50                      100 FEET	



17

20

23

WOODS

WOODS

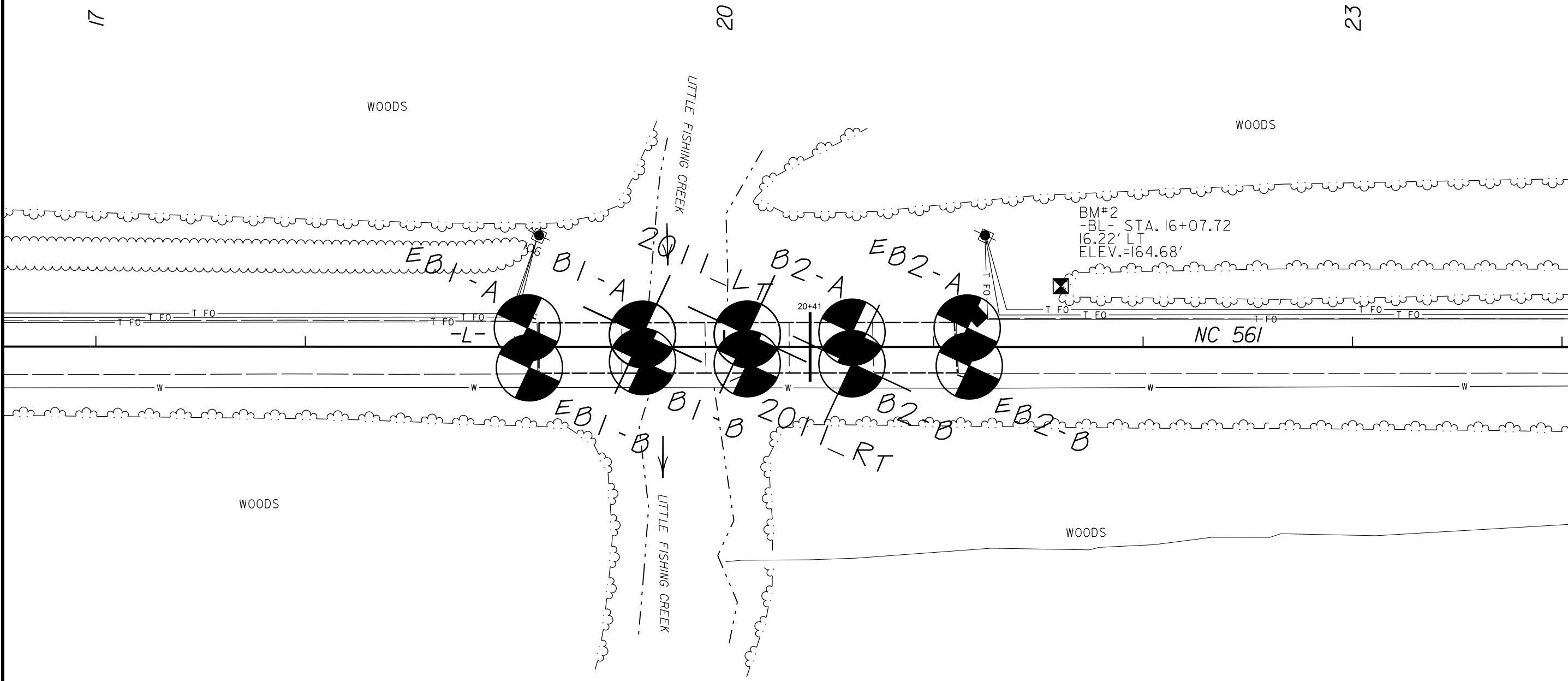
WOODS

WOODS

LITTLE FISHING CREEK

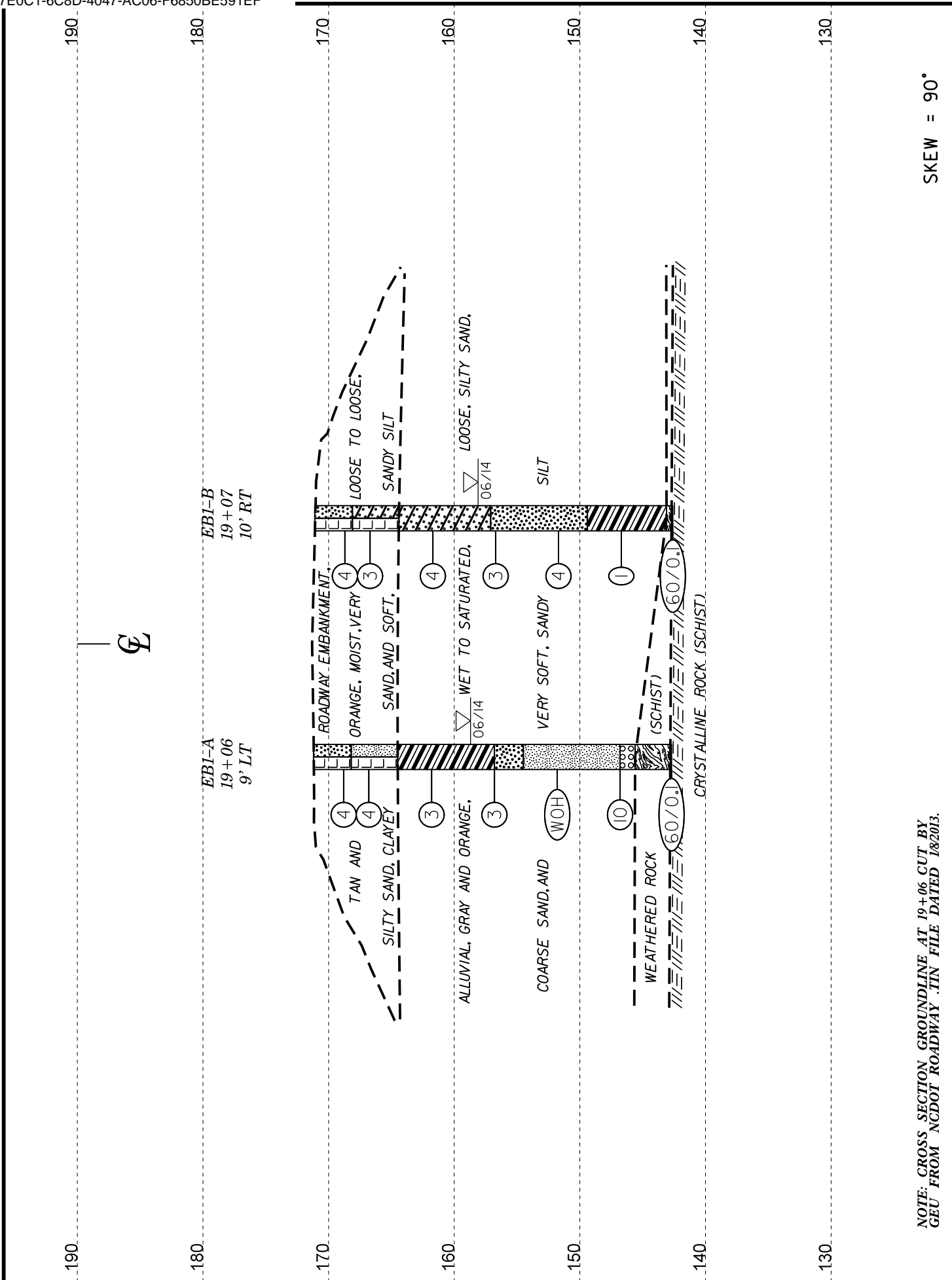
LITTLE FISHING CREEK

BM#2  
-BL- STA. 16+07.72  
16.22' LT  
ELEV.=164.68'

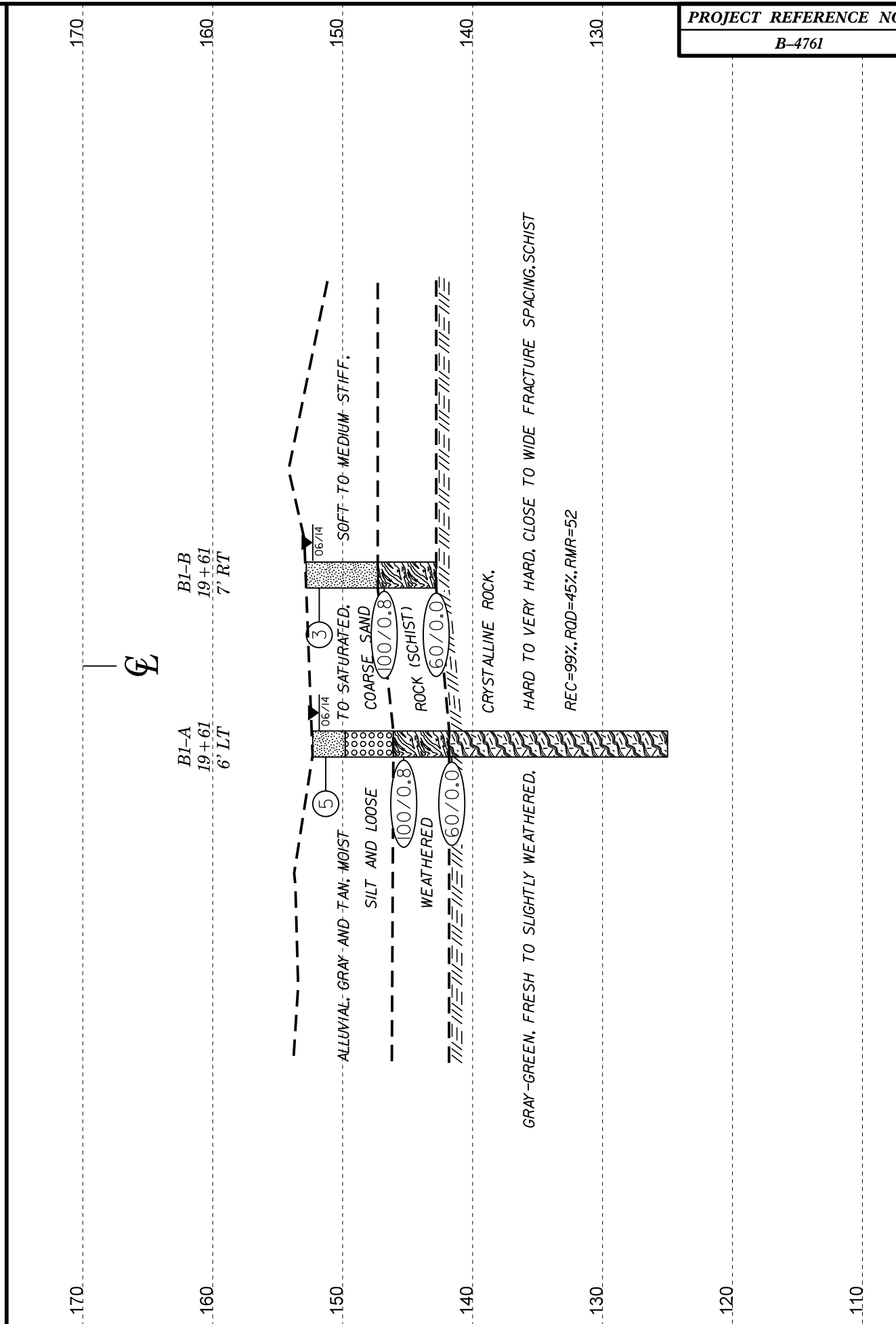


SKEW = 90°





HORIZ. SCALE 0 10 20 (FEET) VE = 1:1 CROSS SECTION THROUGH END BENT 1

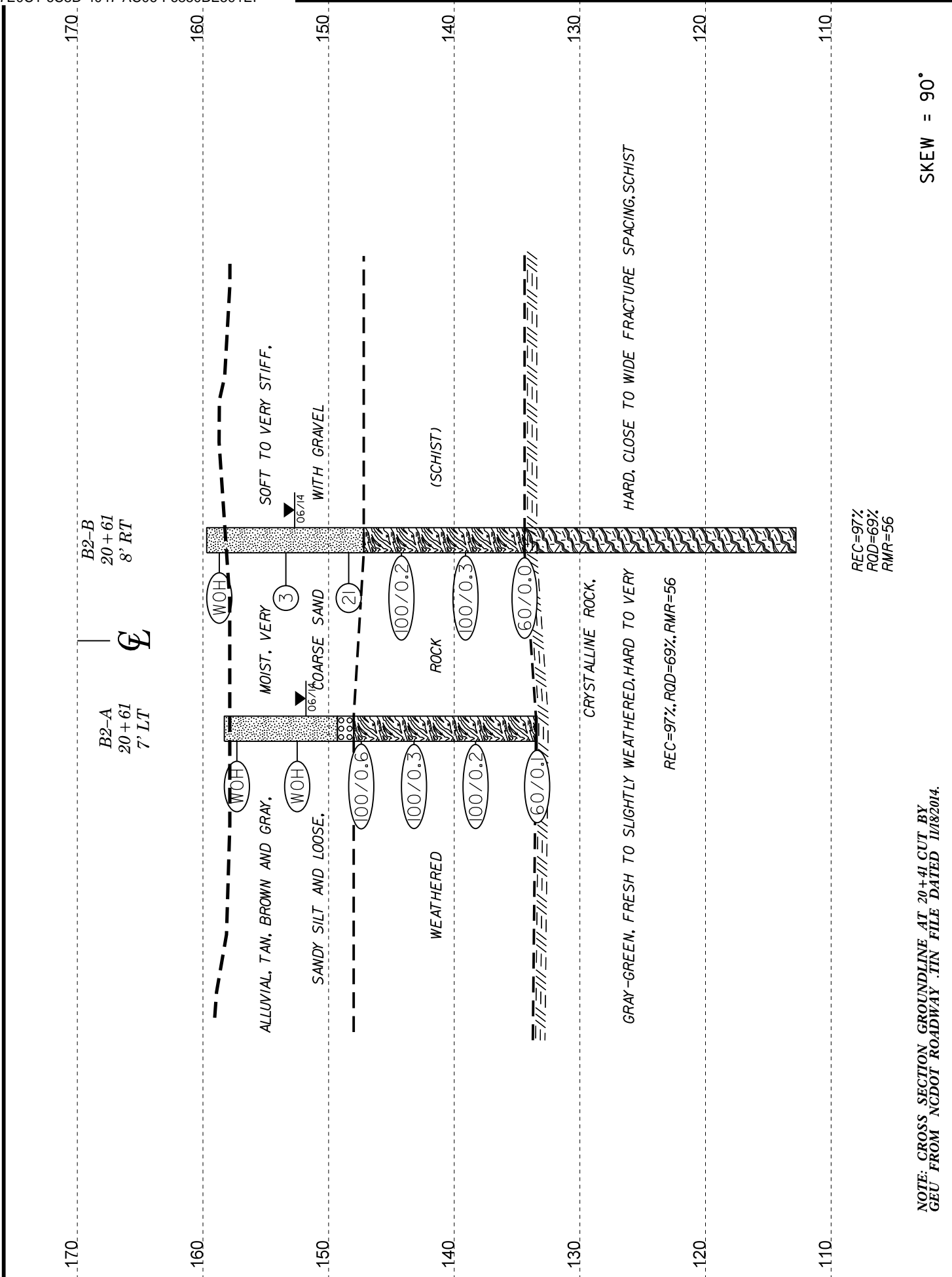


HORIZ. SCALE 0 10 20 (FEET) VE = 1:1 CROSS SECTION THROUGH BENT 1

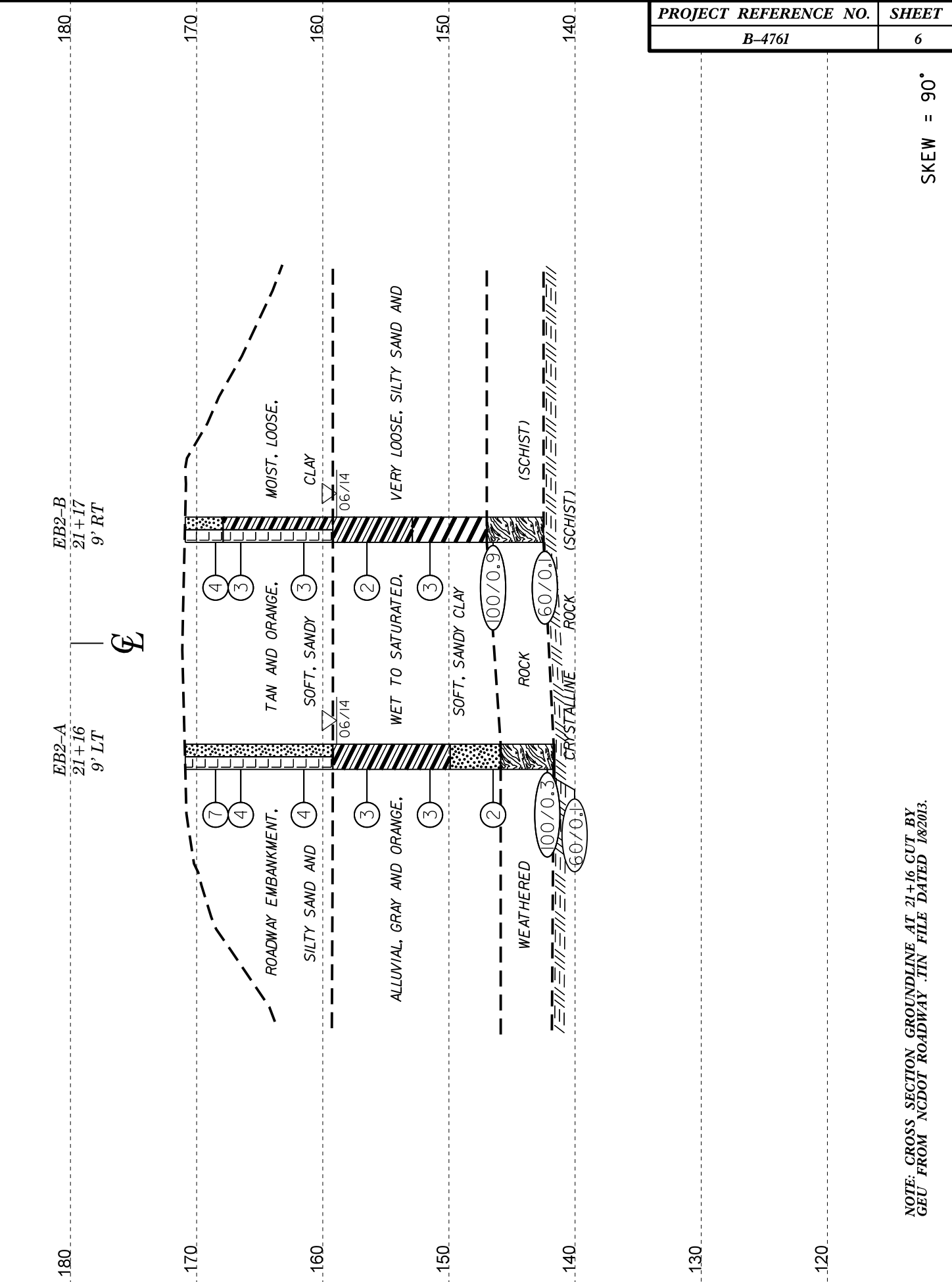
PROJECT REFERENCE NO.	SHEET
B-4761	5

NOTE: CROSS SECTION GROUNDLINE AT 19+61 CUT BY GEU FROM NCDOT ROADWAY .JIN FILE DATED 1/8/2013.

SKEW = 90°



VE = 1:1



VE = 1:1

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

WBS 38533.1.1	TIP B-4761	COUNTY HALIFAX	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK			GROUND WTR (ft)
BORING NO. EB1-A	STATION 19+06	OFFSET 9 ft LT	ALIGNMENT -L-
COLLAR ELEV. 171.2 ft	TOTAL DEPTH 28.5 ft	NORTHING 922,175	EASTING 2,321,596
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011			DRILL METHOD H.S. Augers
DRILLER Conley, H. R.			HAMMER TYPE Automatic
START DATE 06/05/14	COMP. DATE 06/05/14	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					
175															
170	169.8	1.4	2	2	2									171.2	GROUND SURFACE
	167.8	3.4	2	2	2									168.2	ROADWAY EMBANKMENT TAN, SILTY SAND
165														164.5	ORANGE, SANDY SILT
	162.8	8.4	2	1	2									164.5	ALLUVIAL ORANGE, SANDY CLAY
160														156.8	GRAY, SILTY SAND
	157.8	13.4	2	1	2									154.5	GRAY, SANDY SILT
155														146.8	GRAY, COARSE SAND WITH GRAVEL
	152.8	18.4	WOH	WOH	WOH									145.6	WEATHERED ROCK (SCHIST)
150														142.8	CRYSTALLINE ROCK (SCHIST)
	147.8	23.4	1	3	7									142.7	CRYSTALLINE ROCK (SCHIST)
145														142.7	CRYSTALLINE ROCK (SCHIST)
	142.8	28.4	60/0.1											142.7	CRYSTALLINE ROCK (SCHIST)

Boring Terminated with Standard Penetration Test Refusal at Elevation 142.7 ft IN CRYSTALLINE ROCK (SCHIST)  
 \*ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013

WBS 38533.1.1	TIP B-4761	COUNTY HALIFAX	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 19+07	OFFSET 10 ft RT	ALIGNMENT -L-
COLLAR ELEV. 171.1 ft	TOTAL DEPTH 28.5 ft	NORTHING 922,158	EASTING 2,321,605
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011			DRILL METHOD H.S. Augers
DRILLER Conley, H. R.			HAMMER TYPE Automatic
START DATE 06/06/14	COMP. DATE 06/06/14	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					
175															
170	169.7	1.4	2	2	2									171.1	GROUND SURFACE
	167.7	3.4	1	1	2									168.1	ROADWAY EMBANKMENT TAN, SILTY SAND
165														164.4	ORANGE, CLAYEY SAND
	162.7	8.4	2	1	3									164.4	ALLUVIAL GRAY, CLAYEY SAND
160														157.7	GRAY, SILTY SAND
	157.7	13.4	2	2	1									157.1	GRAY, SILTY SAND
155														149.4	ORANGE, SANDY CLAY
	152.7	18.4	4	2	2									149.4	ORANGE, SANDY CLAY
150														143.1	WEATHERED ROCK (SCHIST)
	147.7	23.4	1	0	1									142.7	CRYSTALLINE ROCK (SCHIST)
145														142.6	CRYSTALLINE ROCK (SCHIST)
	142.7	28.4	60/0.1											142.6	CRYSTALLINE ROCK (SCHIST)

Boring Terminated with Standard Penetration Test Refusal at Elevation 142.6 ft IN CRYSTALLINE ROCK (SCHIST)  
 \*ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013

NCDOT BORE DOUBLE B4761\_GEO\_BH\_BRDG0029.GPJ NC\_DOT\_GDT 4/2/15





# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 38533.1.1	TIP B-4761	COUNTY HALIFAX	GEOLOGIST Roberson, N. T.
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK			GROUND WTR (ft)
BORING NO. B1-A	STATION 19+61	OFFSET 6 ft LT	ALIGNMENT -L-
COLLAR ELEV. 152.3 ft	TOTAL DEPTH 27.3 ft	NORTHING 922,195	EASTING 2,321,648
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 06/18/14	COMP. DATE 06/18/14	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					
155															
152.3	152.3	0.0	4	3	2								152.3	GROUND SURFACE	0.0
150													149.8	ALLUVIAL GRAY, SANDY SILT	2.5
146.6	146.6	5.7	16	21	79/0.3								146.1	GRAY, COARSE TO SILTY SAND	6.2
145													141.8	WEATHERED ROCK (SCHIST)	10.5
141.6	141.6	10.7	60/0.0										141.6	CRYSTALLINE ROCK (SCHIST)	10.7
140															
135															
130															
125															

Boring Terminated at Elevation 125.0 ft IN CRYSTALLINE ROCK (SCHIST)  
\*ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013

NCDOT BORE DOUBLE B4761\_GEO\_BH\_BRDG0029.GPJ NC\_DOT.GDT 4/2/15



# NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 38533.1.1	TIP B-4761	COUNTY HALIFAX	GEOLOGIST Roberson, N. T.
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK			GROUND WTR (ft)
BORING NO. B1-A	STATION 19+61	OFFSET 6 ft LT	ALIGNMENT -L-
COLLAR ELEV. 152.3 ft	TOTAL DEPTH 27.3 ft	NORTHING 922,195	EASTING 2,321,648
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 06/18/14	COMP. DATE 06/18/14	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. (%)	RQD (%)		REC. (%)	RQD (%)			
141.6												
140	141.6	10.7	1.6	N=60/0.0 1:44/0.6 1:44/0.6 1:26/1.0 1:27/1.0 1:21/1.0 1:28/1.0 1:10/1.0 1:04/1.0	(1.6) 100%	(0.6) 38%	RS-1	(16.4) 99%	(7.5) 45%		141.6	Begin Coring @ 10.7 ft
			5.0		(5.0) 100%	(3.0) 60%	RS-2					10.7
135	135.0	17.3			(4.8) 96%	(2.9) 58%	RS-3					
			5.0		(5.0) 100%	(1.0) 20%	RS-4					
130	130.0	22.3										
125	125.0	27.3										

Boring Terminated at Elevation 125.0 ft IN CRYSTALLINE ROCK (SCHIST)  
\*ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013

NCDOT CORE DOUBLE B4761\_GEO\_BH\_BRDG0029.GPJ NC\_DOT.GDT 4/2/15

WBS 38533.1.1		TIP B-4761		COUNTY HALIFAX		GEOLOGIST Swartley, J. R.								
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK							GROUND WTR (ft)							
BORING NO. B1-B		STATION 19+61		OFFSET 7 ft RT		ALIGNMENT -L-								
COLLAR ELEV. 152.8 ft		TOTAL DEPTH 10.0 ft		NORTHING 922,183		EASTING 2,321,653								
DRILLER HAMMER EFF. DATE RFO0074 CME-55 92% 07/12/2011				DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic								
DRILLER Conley, H. R.		START DATE 06/09/14		COMP. DATE 06/09/14		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
155														
	152.8	0.0												152.8 GROUND SURFACE 0.0
			1	1	2	3								ALLUVIAL GRAY AND TAN, SANDY SILT
150														
	147.8	5.0	11	68	32/0.3									147.3 WEATHERED ROCK (SCHIST) 5.5
145														
	142.8	10.0												142.8 Boring Terminated with Standard Penetration Test Refusal at Elevation 142.8 ft ON CRYSTALLINE ROCK (SCHIST) 10.0
														*ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 38533.1.1	TIP B-4761	COUNTY HALIFAX	GEOLOGIST Mohs, N. D.
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK			GROUND WTR (ft)
BORING NO. 2011_LT	STATION 20+11	OFFSET 6 ft LT	ALIGNMENT -L-
COLLAR ELEV. 153.7 ft	TOTAL DEPTH 36.0 ft	NORTHING 922,216	EASTING 2,321,693
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 06/16/14	COMP. DATE 06/17/14	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				
155	153.7	0.0	1	0	0								GROUND SURFACE	0.0
150	149.3	4.4	3	45	55/0.3								ALLUVIAL GRAY, SILTY SAND	4.9
145	144.3	9.4											WEATHERED ROCK (SCHIST)	
140	139.3	14.4												
135	134.3	19.4												
130											RS-5 RS-6		CRYSTALLINE ROCK GRAY-GREEN, FRESH TO SLIGHTLY WEATHERED, HARD TO VERY HARD, CLOSE TO WIDE FRACTURE SPACING, SCHIST REC=99% RQD=77% RMR=58	19.4
125											RS-7			
120											RS-8			
													Boring Terminated at Elevation 117.7 ft IN CRYSTALLINE ROCK (SCHIST) *ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013. BORING BASED ON PREVIOUS DESIGN.	36.0

NCDOT BORE DOUBLE B4761\_GEO\_BH\_BRDG0029.GPJ NC\_DOT.GDT 4/2/15



# NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 38533.1.1	TIP B-4761	COUNTY HALIFAX	GEOLOGIST Mohs, N. D.
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK			GROUND WTR (ft)
BORING NO. 2011_LT	STATION 20+11	OFFSET 6 ft LT	ALIGNMENT -L-
COLLAR ELEV. 153.7 ft	TOTAL DEPTH 36.0 ft	NORTHING 922,216	EASTING 2,321,693
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 06/16/14	COMP. DATE 06/17/14	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. (%)	RQD (%)		REC. (%)	RQD (%)			
134.3	134.3	19.4	1.6	N=60/0.0 1:45/1.0 55/0.6	(1.6)	(1.2)	RS-5	(16.4)	(12.7)		Begin Coring @ 19.4 ft	19.4
130	132.7	21.0	5.0	1:30/1.0 1:05/1.0 1:17/1.0 1:29/1.0 1:18/1.0	(4.8)	(4.0)	RS-6	99%	80%		CRYSTALLINE ROCK GRAY-GREEN, FRESH TO SLIGHTLY WEATHERED, HARD TO VERY HARD, CLOSE TO WIDE FRACTURE SPACING, SCHIST REC=99% RQD=77% RMR=58	
125	127.7	26.0	5.0	1:55/1.0 2:05/1.0 1:48/1.0 1:35/1.0 1:13/1.0	(5.0)	(2.1)	RS-7					
120	122.7	31.0	5.0	1:42/1.0 1:14/1.0 2:10/1.0 1:47/1.0 1:44/1.0	(5.0)	(3.2)	RS-8					
	117.7	36.0									Boring Terminated at Elevation 117.7 ft IN CRYSTALLINE ROCK (SCHIST) *ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013. BORING BASED ON PREVIOUS DESIGN.	36.0

NCDOT CORE DOUBLE B4761\_GEO\_BH\_BRDG0029.GPJ NC\_DOT.GDT 4/2/15

WBS 38533.1.1		TIP B-4761		COUNTY HALIFAX		GEOLOGIST Swartley, J. R.								
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK							GROUND WTR (ft)							
BORING NO. 2011_RT		STATION 20+11		OFFSET 8 ft RT		ALIGNMENT -L-	0 HR. N/A							
COLLAR ELEV. 153.1 ft		TOTAL DEPTH 24.4 ft		NORTHING 922,204		EASTING 2,321,699	24 HR. 1.0							
DRILLER HAMMER EFF. DATE RFO0074 CME-55 92% 07/12/2011				DRILL METHOD NW Casting w/ SPT		HAMMER TYPE Automatic								
DRILLER Conley, H. R.		START DATE 06/10/14		COMP. DATE 06/10/14		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
155	153.1	0.0												GROUND SURFACE 0.0
150	148.8	4.3	1	1	1	2	3	70						ALLUVIAL TAN-BROWN, SANDY SILT
145	143.8	9.3												RESIDUAL GRAY-GREEN, SAPROLITIC, SANDY SILT 5.3
140	138.8	14.3												WEATHERED ROCK (SCHIST) 8.0
135	133.8	19.3												
130	128.8	24.3												CRYSTALLINE ROCK (SCHIST) 24.3
														Boring Terminated with Standard Penetration Test Refusal at Elevation 128.7 ft IN CRYSTALLINE ROCK (SCHIST)  *ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013. BORING BASED ON PREVIOUS DESIGN.

WBS 38533.1.1		TIP B-4761		COUNTY HALIFAX		GEOLOGIST Oti, O. B.								
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK							GROUND WTR (ft)							
BORING NO. B2-A		STATION 20+61		OFFSET 7 ft LT		ALIGNMENT -L-	0 HR. N/A							
COLLAR ELEV. 158.3 ft		TOTAL DEPTH 24.9 ft		NORTHING 922,238		EASTING 2,321,738	24 HR. 6.5							
DRILLER HAMMER EFF. DATE RFO0074CME-55 92% 07/12/2011				DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic								
DRILLER Conley, H. R.		START DATE 06/12/14		COMP. DATE 06/16/14		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
160														
	158.3	0.0	WOH	WOH	WOH	0							M	158.3 GROUND SURFACE 0.0
155														ALLUVIAL TAN, BROWN, AND GRAY, SANDY SILT
	153.5	4.8	WOH	WOH	WOH	0							M	
150														
	148.5	9.8	4	37	63/0.1					100/0.6				149.3 9.0 148.0 10.3 GRAY, COARSE SAND AND GRAVEL
145														WEATHERED ROCK (SCHIST)
	143.5	14.8								100/0.3				
140														
	138.5	19.8								100/0.2				
135														
	133.5	24.8								60/0.1				133.5 24.8 133.4 24.9 CRYSTALLINE ROCK (SCHIST)
														Boring Terminated with Standard Penetration Test Refusal at Elevation 133.4 ft IN CRYSTALLINE ROCK (SCHIST)  *ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013



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

WBS 38533.1.1	TIP B-4761	COUNTY HALIFAX	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 21+16	OFFSET 9 ft LT	ALIGNMENT -L-
COLLAR ELEV. 170.9 ft	TOTAL DEPTH 29.3 ft	NORTHING 922,263	EASTING 2,321,787
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD H.S. Augers	
DRILLER Conley, H. R.		START DATE 06/05/14	COMP. DATE 06/05/14
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					
175															
170	169.5	1.4													170.9
	167.5	3.4	2	3	4										170.9
	167.5	3.4	2	2	2										170.9
165															
	162.5	8.4	2	2	2										159.2
160															159.2
	157.5	13.4	1	1	2										159.2
155															159.2
	152.5	18.4	1	1	2										159.2
150															159.2
	147.5	23.4	WOH	1	1										149.9
145															149.9
	142.5	28.4													145.9
	141.7	29.2													145.9
															141.7
															141.6
															141.6

WBS 38533.1.1	TIP B-4761	COUNTY HALIFAX	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 29 ON NC 561 OVER LITTLE FISHING CREEK			GROUND WTR (ft)
BORING NO. EB2-B	STATION 21+17	OFFSET 9 ft RT	ALIGNMENT -L-
COLLAR ELEV. 170.9 ft	TOTAL DEPTH 28.5 ft	NORTHING 922,248	EASTING 2,321,795
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD H.S. Augers	
DRILLER Conley, H. R.		START DATE 06/06/14	COMP. DATE 06/06/14
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					
175															
170	169.5	1.4													170.9
	167.5	3.4	2	2	2										170.9
	167.5	3.4	2	1	2										167.9
165															
	162.5	8.4	1	2	1										159.2
160															159.2
	157.5	13.4	1	0	2										159.2
155															159.2
	152.5	18.4	1	1	2										152.9
150															152.9
	147.5	23.4	WOH	13	87/0.4										147.0
145															147.0
	142.5	28.4													142.5
															142.5

NCDOT BORE DOUBLE B4761\_GEO\_BH\_BRDG0029.GPJ NC\_DOT.GDT 4/2/15

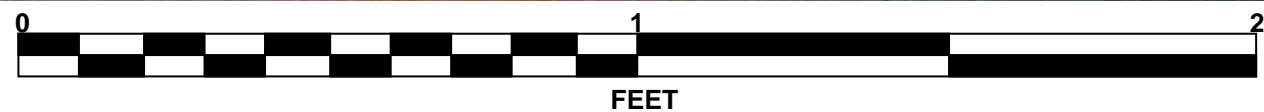
Boring Terminated with Standard Penetration Test Refusal at Elevation 141.6 ft IN CRYSTALLINE ROCK (SCHIST)  
 \*ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013

Boring Terminated with Standard Penetration Test Refusal at Elevation 142.4 ft IN CRYSTALLINE ROCK (SCHIST)  
 \*ELEVATION FROM NCDOT .TIN FILE DATED 1/8/2013

# CORE PHOTOGRAPHS

## B1-A

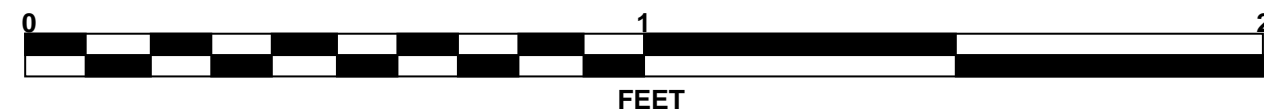
BOXES 1 & 2: 10.7 - 27.3 FEET



FEET

## 2011\_LT

BOXES 1 & 2: 19.4 - 36.6 FEET



FEET



# CORE PHOTOGRAPHS

**B2-B**  
BOXES 1 - 3: 25.3 - 46.9 FEET



<b>ROCK TEST RESULTS</b>									
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	H/D RATIO	UNIT WT lb/ft <sup>3</sup>	Ultimate lb	Ultimate ksi	Ultimate (corrected) ksi	Sec.Mod.@ 40% Mpsi
RS-1	6'LT	19+61	10.7-11.3	1.93	173.6	10430	3.79	3.78	4.6
RS-2	6'LT	19+61	14.8-15.4	1.82	173.8	2300	0.84	0.83	1.61
RS-3	6'LT	19+61	17.3-18.4	1.81	174.8	18440	6.71	6.62	5.50
RS-4	6'LT	19+61	19.7-20.2	1.92	173.5	19440	7.08	7.04	5.54
RS-5	6'LT	20+11	19.7-20.3	1.92	172.7	23400	8.50	8.47	7.55
RS-6	6'LT	20+11	20.3-20.9	1.88	173.9	24300	8.85	8.79	10.13
RS-7	6'LT	20+11	23.8-24.4	1.96	171.4	32000	11.7	11.64	8.59
RS-8	6'LT	20+11	31.4-32.3	1.67	174.5	9560	3.47	3.47	7.77
RS-9	8'RT	20+61	27.5-28.0	1.86	168.3	8110	2.96	2.96	3.68
RS-10	8'RT	20+61	33.4-33.9	1.94	174.0	18680	6.81	6.81	6.36
RS-11	8'RT	20+61	40.7-41.5	1.87	172.8	4170	1.52	1.52	1.25

# SITE PHOTOGRAPH

Bridge No. 29 on NC 561 over Little Fishing Creek



Looking North towards End Bent 2