

PROJECT: 42338.1.1 ID: B-5163

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	42338.1.1 (B-5163)	1	17

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STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 42338.1.1 (B-5163) F.A. PROJ. BRZ-1354 (2)
COUNTY ROCKINGHAM
PROJECT DESCRIPTION BRIDGE NO. 160 OVER BUFFALO CREEK
ON SR 1354 (BENNETT ROAD)

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 FIELD BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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.

PERSONNEL

J. Howard

W. Wichard

E. Tripp

INVESTIGATED BY AMEC E&I, Inc.

CHECKED BY M. Lear, P.G.

SUBMITTED BY B. Deobald, L.G.

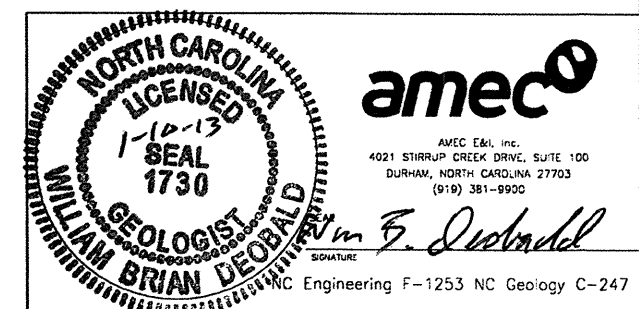
DATE December, 2012

REVISED DATE January, 2013

DRAWN BY: Roya Rahie

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.



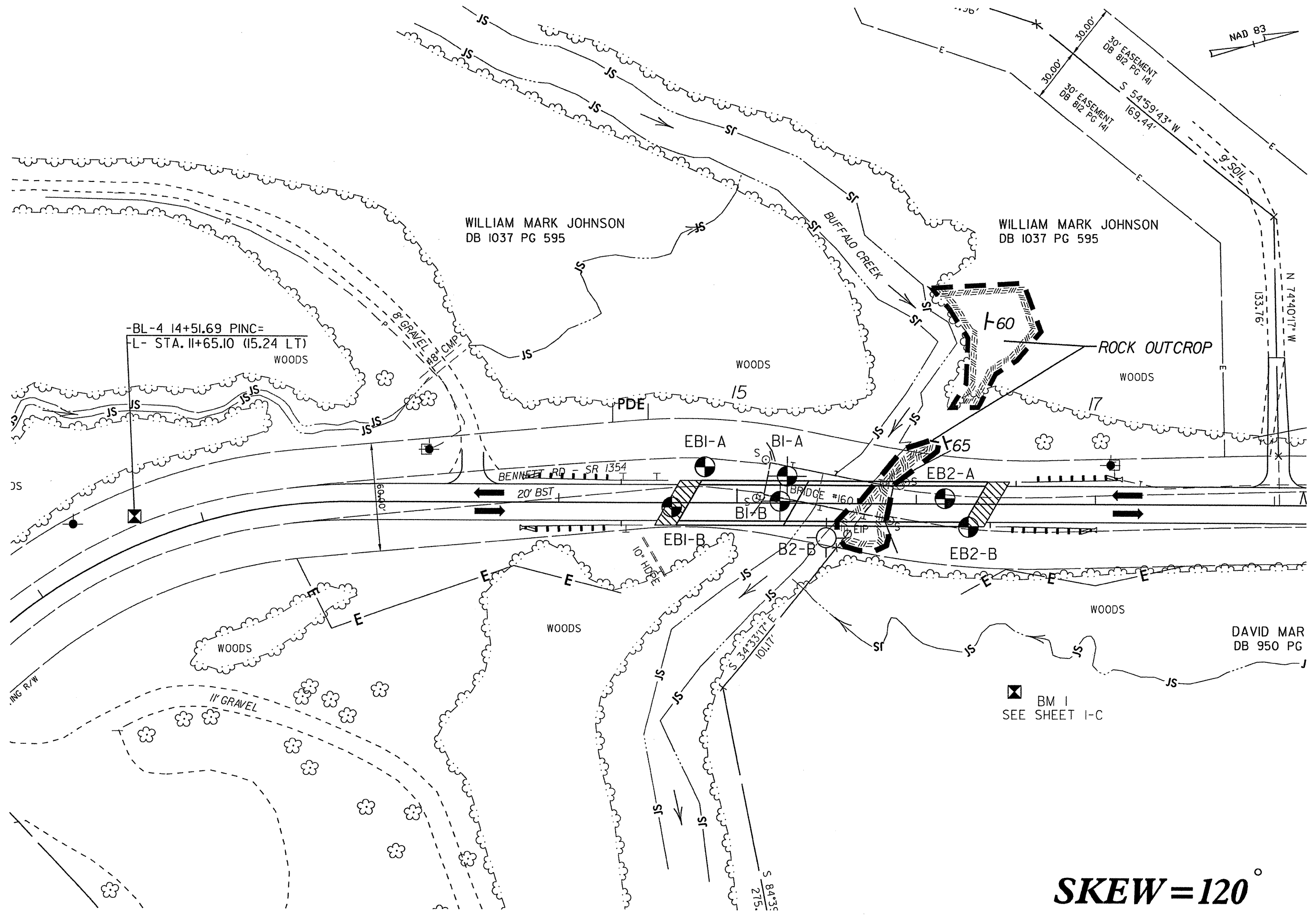
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																																																																																																																																																																				
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE ASHTO SYSTEM. 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, HIGH PLASTIC, A-7-6</i></p>	<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. ALSO POORLY GRADED.</p> <p>GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>	<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF 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.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p> <p>WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p> <p>CRYSTALLINE ROCK (CR) 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>NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLITE, SLATE, SANDSTONE, ETC.</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>	<p>ALLOUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.</p> <p>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.</p> <p>CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>ROCK QUALITY DESIGNATION (RQD) - 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>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>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.</p> <p>STRATA CORE RECOVERY (SRC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>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.</p> <p>TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																																																																				
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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.																																																																																																																																																																																																																																							
MISCELLANEOUS SYMBOLS																																																																																																																																																																																																																																							
	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		TEST BORING																																																																																																																																																																																																																																				
	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT		AUGER BORING																																																																																																																																																																																																																																				
	INFERRED SOIL BOUNDARY		CORE BORING																																																																																																																																																																																																																																				
	INFERRED ROCK LINE		MONITORING WELL																																																																																																																																																																																																																																				
	ALLUVIAL SOIL BOUNDARY		PIEZOMETER INSTALLATION																																																																																																																																																																																																																																				
	DIP & DIP DIRECTION OF ROCK STRUCTURES		SLOPE INDICATOR INSTALLATION																																																																																																																																																																																																																																				
	SOUNDING ROD		CONE PENETROMETER TEST																																																																																																																																																																																																																																				
ABBREVIATIONS																																																																																																																																																																																																																																							
AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST																																																																																																																																																																																																																																					
BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED																																																																																																																																																																																																																																					
CL - CLAY	MOD. - MODERATELY	W - UNIT WEIGHT																																																																																																																																																																																																																																					
CPT - CONE PENETRATION TEST	NP - NON PLASTIC	W - DRY UNIT WEIGHT																																																																																																																																																																																																																																					
CSE. - COARSE	ORG. - ORGANIC																																																																																																																																																																																																																																						
DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	SAMPLE ABBREVIATIONS																																																																																																																																																																																																																																					
DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	S - BULK																																																																																																																																																																																																																																					
e - VOID RATIO	SD. - SAND, SANDY	SS - SPLIT SPOON																																																																																																																																																																																																																																					
F - FINE	SL. - SILT, SILTY	ST - SHELBY TUBE																																																																																																																																																																																																																																					
FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY	RS - ROCK																																																																																																																																																																																																																																					
FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	RT - RECOMPACTED TRIAXIAL																																																																																																																																																																																																																																					
FRAGS. - FRAGMENTS	w - MOISTURE CONTENT	CBR - CALIFORNIA BEARING RATIO																																																																																																																																																																																																																																					
HI. - HIGHLY	v - VERY																																																																																																																																																																																																																																						
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DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:																																																																																																																																																																																																																																					
<input type="checkbox"/> MOBILE B-___	<input type="checkbox"/> CLAY BITS	<input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL																																																																																																																																																																																																																																					
<input type="checkbox"/> CME-55	<input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER	CORE SIZE:																																																																																																																																																																																																																																					
<input type="checkbox"/> CME-45C	<input type="checkbox"/> 8" HOLLOW AUGERS	<input type="checkbox"/> 8																																																																																																																																																																																																																																					
<input type="checkbox"/> CME-55 LC	<input type="checkbox"/> HARD FACED FINGER BITS	<input checked="" type="checkbox"/> N 0																																																																																																																																																																																																																																					
<input type="checkbox"/> PORTABLE HOIST	<input type="checkbox"/> TUNG.-CARBIDE INSERTS	<input type="checkbox"/> H																																																																																																																																																																																																																																					
<input checked="" type="checkbox"/> CME 550	<input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER	HAND TOOLS:																																																																																																																																																																																																																																					
<input checked="" type="checkbox"/> CME 850	<input checked="" type="checkbox"/> TRICONE <input checked="" type="checkbox"/> 2 1/2" STEEL TEETH	<input type="checkbox"/> POST HOLE DIGGER																																																																																																																																																																																																																																					
	<input type="checkbox"/> TRICONE _____ TUNG.-CARB.	<input type="checkbox"/> HAND AUGER																																																																																																																																																																																																																																					
	<input type="checkbox"/> CORE BIT	<input type="checkbox"/> SOUNDING ROD																																																																																																																																																																																																																																					
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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 FEET	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 THE 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: BL-4, N 1013461 E 1701790																																																																																																																																																																																																																																							
ELEVATION: 754.13 FT.																																																																																																																																																																																																																																							
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FIAD	FILLED IMMEDIATELY AFTER DRILLING																																																																																																																																																																																																																																						
CT	CORING TERMINATED																																																																																																																																																																																																																																						
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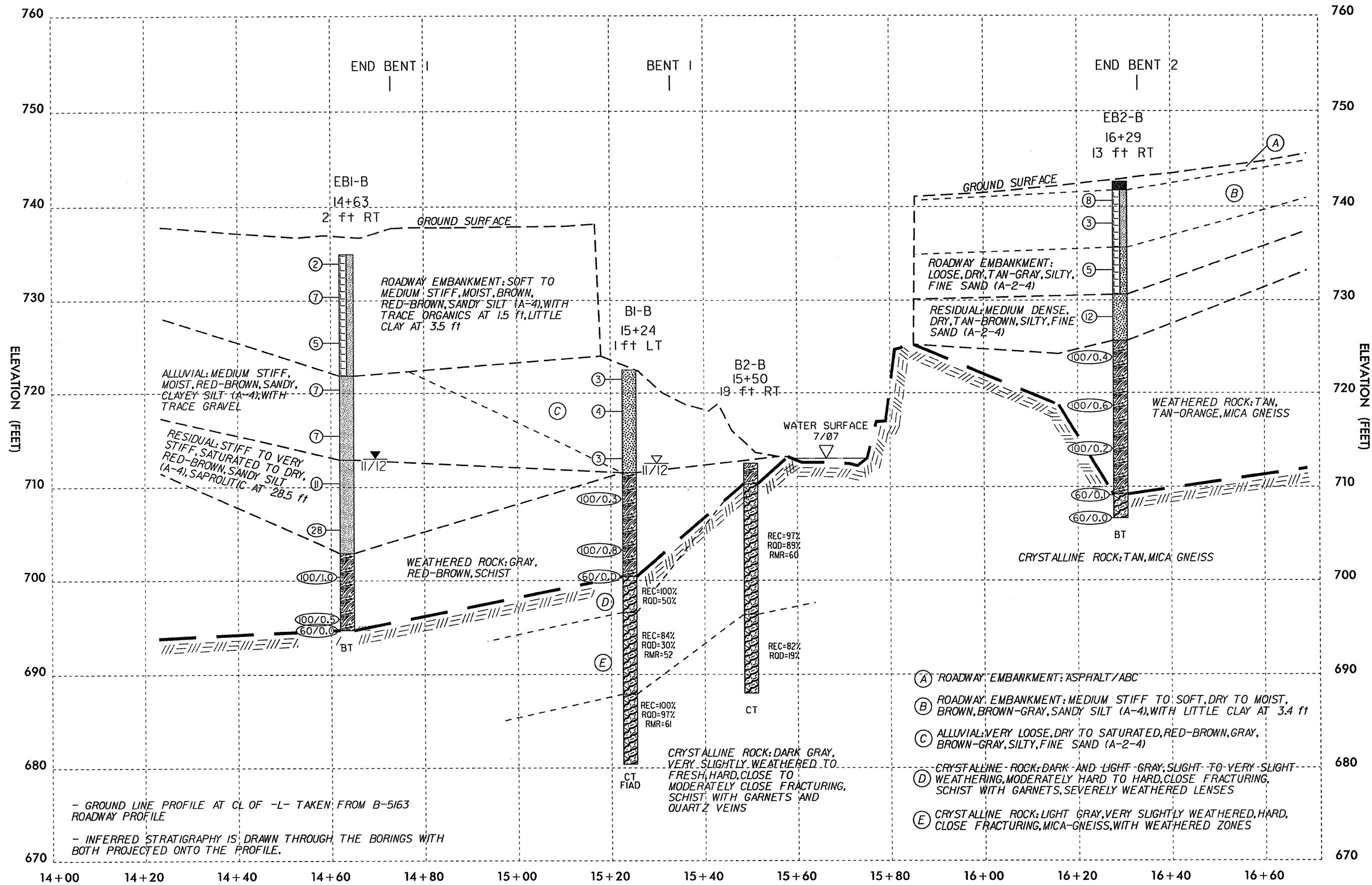
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SKEW = 120°

SHEET No: 3			
AMEC ENVIRONMENT AND INFRASTRUCTURE, INC. DURHAM, NORTH CAROLINA			
REVISIONS DRAWN:	R.R.	DATE: DECEMBER 2012	
JAN. 2013	DFT CHECK: M.B.L.	JOB No.: 6468-12-1223	
	ENG CHECK: W.B.D.	DWG No: 1	
<p>SITE PLAN</p> <p>BRIDGE NO. 160 OVER BUFFALO CREEK ON SR 1354 (BENNETT ROAD) PROJECT REF NO. 42338.1.I (B-5163) FA. PROJ BRZ-1354(2) ROCKINGHAM COUNTY, NORTH CAROLINA</p>			

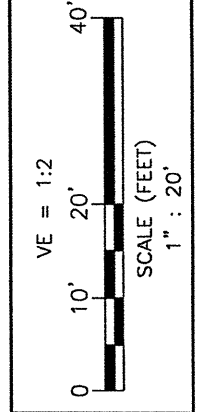
-L-



- GROUND LINE PROFILE AT CL OF -L- TAKEN FROM B-5163 ROADWAY PROFILE
 - INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

- (A) ROADWAY EMBANKMENT: ASPHALT/ABC
- (B) ROADWAY EMBANKMENT: MEDIUM STIFF TO SOFT, DRY TO MOIST, BROWN, BROWN-GRAY, SANDY SILT (A-4), WITH LITTLE CLAY AT 3.4 ft
- (C) ALLUVIAL: VERY LOOSE, DRY TO SATURATED, RED-BROWN, GRAY, BROWN-GRAY, SILTY, FINE SAND (A-2-4)
- (D) CRYSTALLINE ROCK: DARK AND LIGHT GRAY, SLIGHT TO VERY SLIGHT WEATHERING, MODERATELY HARD TO HARD, CLOSE FRACTURING, SCHIST WITH GARNETS, SEVERELY WEATHERED LENSES
- (E) CRYSTALLINE ROCK: LIGHT GRAY, VERY SLIGHTLY WEATHERED, HARD, CLOSE FRACTURING, MICA-GNEISS, WITH WEATHERED ZONES

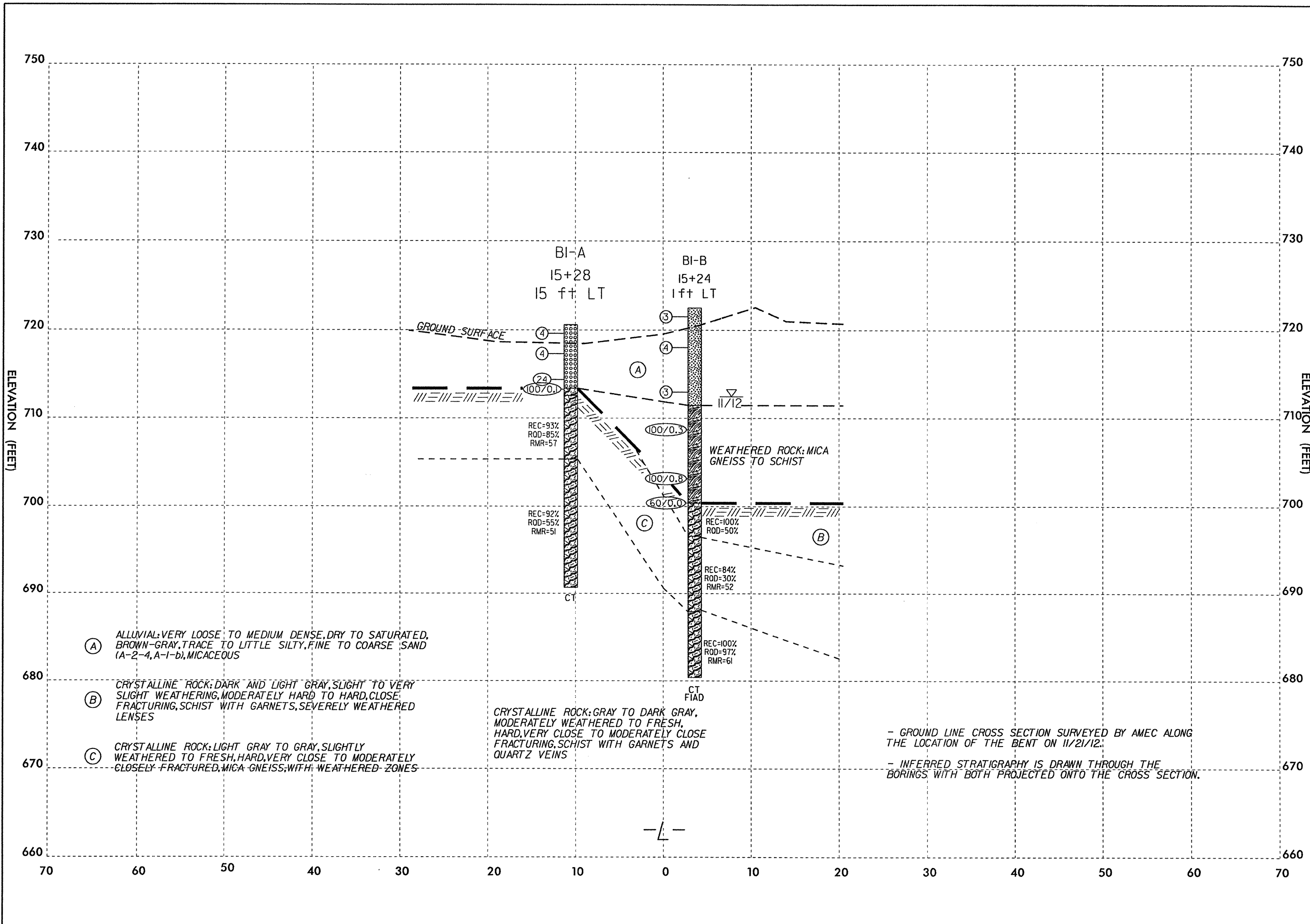
AMEC ENVIRONMENT AND INFRASTRUCTURE, INC. DURHAM, NORTH CAROLINA			
REVISIONS	DRAWN: R.R.	DATE: DECEMBER 2012	
JAN. 2013	DFT CHECK: M.B.L.	JOB No.: 6486-12-1223	
	ENG CHECK: W.B.D.	DWG No: 2	



PROFILE
 BRIDGE NO.160 OVER BUFFALO CREEK ON SR 1354 (BENNETT ROAD)
 PROJECT REF NO. 42338.1.1 (B-5163) FA. PROJ BRZ-1354(2)
 ROCKINGHAM COUNTY, NORTH CAROLINA

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 pouya.rht



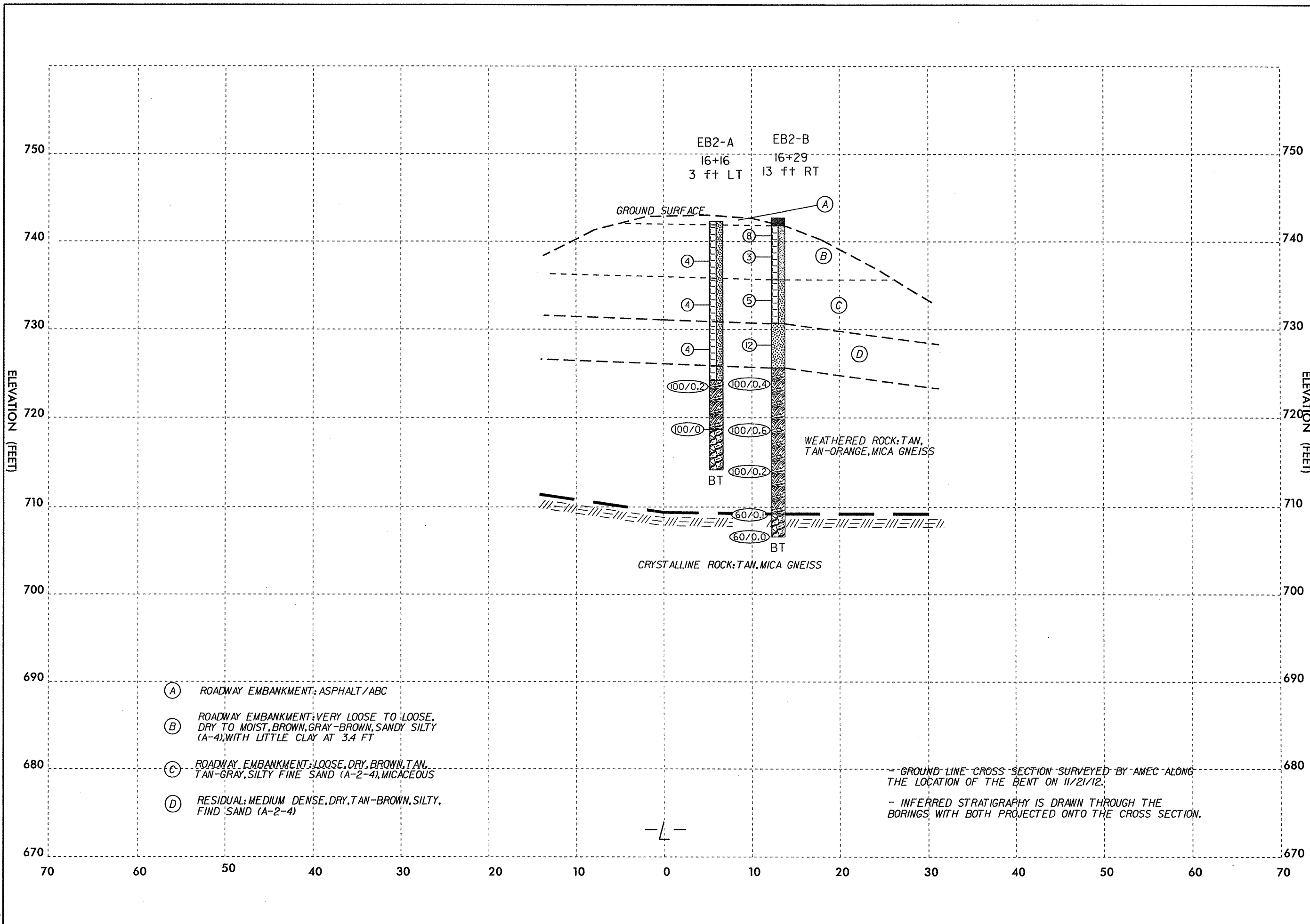
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AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.
 DURHAM, NORTH CAROLINA

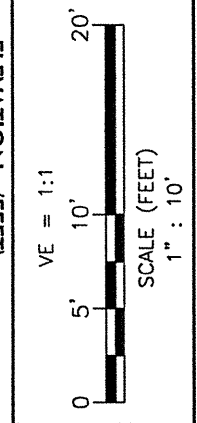
REVISIONS DRAWN:	R.R.	DATE:	DECEMBER 2012
JAN. 2013	DFT CHECK:	M.B.L.	JOB No.: 6468-12-1223
	ENG CHECK:	W.B.D.	DWG No.: 4

CROSS SECTION ALONG BENT 1
 BRIDGE NO. 160 OVER BUFFALO CREEK ON SR 1354 (BENNETT ROAD)
 PROJECT REF NO. 42338.L1 (B-5163) FA. PROJ BRZ-1354(2)
 ROCKINGHAM COUNTY, NORTH CAROLINA

AMEC ENVIRONMENT AND INFRASTRUCTURE, INC. DURHAM, NORTH CAROLINA			
REVISIONS DRAWN:	R.R.	DATE:	DECEMBER 2012
JAN. 2013	DFT CHECK:	M.B.L.	JOB No.: 6468-12-1223
	ENG CHECK:	W.B.D.	DWG No: 5



- (A) ROADWAY EMBANKMENT: ASPHALT/ABC
- (B) ROADWAY EMBANKMENT: VERY LOOSE TO LOOSE, DRY TO MOIST, BROWN, GRAY-BROWN, SANDY SILTY (A-4), WITH LITTLE CLAY AT 3.4 FT
- (C) ROADWAY EMBANKMENT: LOOSE, DRY, BROWN, TAN, TAN-GRAY, SILTY FINE SAND (A-2-4), MICACEOUS
- (D) RESIDUAL: MEDIUM DENSE, DRY, TAN-BROWN, SILTY, FINE SAND (A-2-4)



CROSS SECTION ALONG END BENT II
BRIDGE NO. 160 OVER BUFFALO CREEK ON SR 1354 (BENNETT ROAD)
PROJECT REF NO. 4238.1.1 (B-5163) FA. PROJ BRZ-1354(2)
ROCKINGHAM COUNTY, NORTH CAROLINA

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royalr



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST Oti, O. B.							
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)						
BORING NO. EB1-A		STATION 14+82		OFFSET 20 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 737.6 ft		TOTAL DEPTH 33.7 ft		NORTHING 1,013,775		EASTING 1,701,853							
DRILL RIG/HAMMER EFF./DATE BK 51		DRILL METHOD H.S. Augers		HAMMER TYPE Manual									
DRILLER Conley, H. R.		START DATE 08/21/95		COMP. DATE 08/21/95		SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75				
740													
	737.6	0.0	5	5	5	10					M	GROUND SURFACE	0.0
735	734.3	3.3	2	1	1						M	ROADWAY EMBANKMENT BROWN, RED-BROWN, SANDY SILT (A-4), MICACEOUS	
730	729.3	8.3	2	2	3						M		
725	724.3	13.3	2	2	3						M	ALLUVIAL BROWN, SANDY CLAY (A-6), TRACE MICA	10.0
720	719.3	18.3	10	11	14						M	RESIDUAL TAN-BROWN, SILTY SAND (A-2-4), SAPROLITIC, MICACEOUS	16.6
715	714.3	23.3	14	16	20						M		
710	709.3	28.3	11	16	26						M		
705	704.3	33.3	100/0.4								M	WEATHERED ROCK MICA GNEISS	33.0
													33.7

Boring Terminated at Elevation 703.9 ft IN WR (MICA GNEISS)

WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST J. Howard							
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)						
BORING NO. EB1-B		STATION 14+63		OFFSET 2 ft RT		ALIGNMENT -L-							
COLLAR ELEV. 734.9 ft		TOTAL DEPTH 40.2 ft		NORTHING 1,013,751		EASTING 1,701,870							
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-550 93% 12/08/2011		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER W. Wichard		START DATE 11/19/12		COMP. DATE 11/19/12		SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75				
735	734.9	0.0	2	1	1						M	GROUND SURFACE	0.0
730	731.4	3.5	2	3	4						M	ROADWAY EMBANKMENT BROWN, RED-BROWN, SANDY SILT (A-4), WITH TRACE ORGANICS AT 1.5FT, LITTLE CLAY AT 3.5FT	
725	726.4	8.5	2	2	3						M		
720	721.4	13.5	4	3	4						M	ALLUVIAL RED-BROWN, SANDY, CLAYEY SILT (A-4), WITH TRACE GRAVEL	13.0
715	716.4	18.5	2	3	4						M		
710	711.4	23.5	3	5	6						Sat.	RESIDUAL RED-BROWN, SANDY SILT (A-4), SAPROLITIC AT 28.5FT	22.0
705	706.4	28.5	12	12	16						D		
700	701.4	33.5	27	73/0.5								WEATHERED ROCK RED-BROWN, GRAY, SCHIST	32.0
695	696.4	38.5	100/0.5										
	694.7	40.2	60/0.0										40.2

Boring Terminated with Standard Penetration Test Refusal at Elevation 694.7 ft on Crystalline Rock: Schist

NCDOT BORE DOUBLE B5163 GEO_BRD0160_GINT_NCDOT 2012REV1.GPJ NC_DOT.GDT 1/8/13

WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST Oti, O. B.										
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)									
BORING NO. B1-A		STATION 15+28		OFFSET 15 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 720.6 ft		TOTAL DEPTH 29.9 ft		NORTHING 1,013,818		EASTING 1,701,872										
DRILL RIG/HAMMER EFF./DATE BK 51		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Manual												
DRILLER Conley, H. R.		START DATE 08/23/95		COMP. DATE 08/23/95		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		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
725																
720	720.6	0.0	2	2	2										720.6	GROUND SURFACE
	718.3	2.3	3	2	2											ALLUVIAL BROWN, SILTY COARSE SAND (A-2-4), MICACEOUS
715	715.4	5.2	2	10	14											
	713.4	7.2													713.4	CRYSTALLINE ROCK MICA GNEISS
710															712.6	CRYSTALLINE ROCK MICA GNEISS
705															705.4	GARNET-MICA SCHIST
700																
695																
															690.7	Boring Terminated at Elevation 690.7 ft IN CR (GARNET-MICA SCHIST)

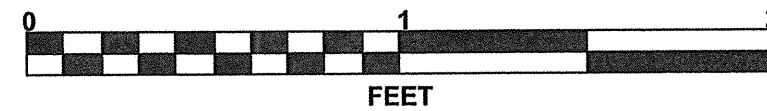
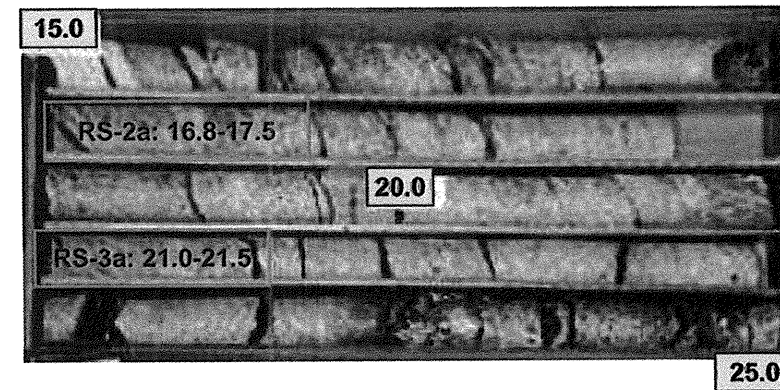
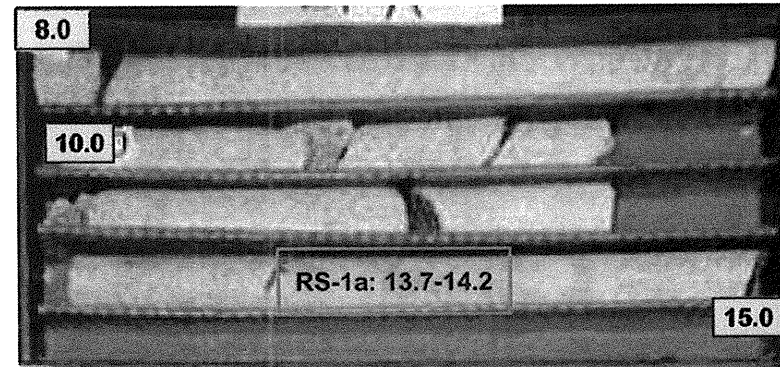
NCDOT BORE SINGLE B5163 GEO_BRD00160_GINT_NCDOT 2012REV1.GPJ NC_DOT.GDT 1/8/13

WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST Oti, O. B.						
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)					
BORING NO. B1-A		STATION 15+28		OFFSET 15 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 720.6 ft		TOTAL DEPTH 29.9 ft		NORTHING 1,013,818		EASTING 1,701,872						
DRILL RIG/HAMMER EFF./DATE BK 51		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Manual								
DRILLER Conley, H. R.		START DATE 08/23/95		COMP. DATE 08/23/95		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	
					REC. (ft) %	ROD (ft) %		REC. (ft) %	ROD (ft) %		ELEV. (ft)	DEPTH (ft)
712.6												Begin Coring @ 8.0 ft
710	712.6	8.0	2.0	0:58	(2.0)	(1.8)		(6.7)	(6.1)		712.6	CRYSTALLINE ROCK
	710.6	10.0	5.0	1:04	100%	90%		93%	85%			GRAY, SLIGHTLY WEATHERED TO FRESH, HARD, V. CLOSE TO MOD. CLOSELY FRACTURED, MICA GNEISS
705	705.6	15.0	5.0	0:43	(4.7)	(4.3)					705.4	R1=4, R2=17, R3=15, R4=15, R5=6, R6=0 TOTAL RMR=57 (CLASS III)
				0:47			RS-1a					GRAY, MODERATELY TO SLIGHTLY WEATHERED, MOD. HARD, V. CLOSE TO CLOSELY FRACTURED, GARNET-MICA SCHIST
				0:53								WR SEAM FROM 23.9-24.1'
700	700.6	20.0	5.0	1:19	(4.2)	(2.4)		(13.5)	(8.1)			R1=3, R2=13, R3=15, R4=15, R5=5, R6=0 TOTAL RMR=51 (CLASS III)
				1:03			RS-2a					
				1:07								
695	695.6	25.0	4.9	0:42	(4.7)	(2.7)						
				0:50			RS-3a					
				0:47								
				0:38								
				0:35			RS-4a					
	690.7	29.9		1:11/0.9							690.7	Boring Terminated at Elevation 690.7 ft IN CR (GARNET-MICA SCHIST)

NCDOT CORE SINGLE B5163 GEO_BRD00160_GINT_NCDOT 2012REV1.GPJ NC_DOT.GDT 1/8/13

CORE PHOTOGRAPHS

B1-A BOXES 1 - 3: 8.0 - 29.9 FEET



WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST J. Howard									
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)								
BORING NO. B1-B		STATION 15+24		OFFSET 1 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 722.5 ft		TOTAL DEPTH 42.1 ft		NORTHING 1,013,810		EASTING 1,701,884									
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 67% 12/08/2011		DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic											
DRILLER W. Wichard		START DATE 11/20/12		COMP. DATE 11/21/12		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					
725															
	722.5	0.0	1	1	2								D	GROUND SURFACE	0.0
	720												D	ALLUVIAL RED-BROWN, GRAY, BROWN-GRAY, SILTY, FINE SAND (A-2-4)	
	719.0	3.5	2	2	2										
	715												Sat.		
	714.0	8.5	2	1	2										
	710													WEATHERED ROCK DARK GRAY, SCHIST	11.0
	709.0	13.5	100/0.3												
	705														
	704.0	18.5	53	47/0.3											
	700													CRYSTALLINE ROCK DARK AND LIGHT GRAY, SCHIST	22.1
	700.4	22.1	60/0.0												
	695														
	696.6													LIGHT GRAY, MICA GNEISS	25.9
	690														
	687.9													DARK GRAY, SCHIST	34.6
	685														
	680.4														
Boring Terminated at Elevation 680.4 ft in Crystalline Rock: Schist															

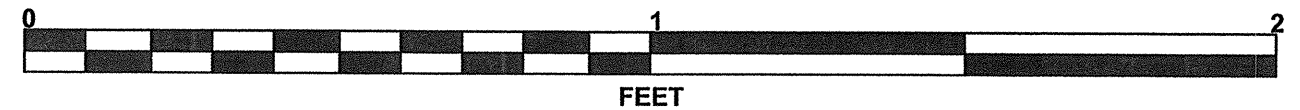
NCDOT BORE SINGLE B5163_GEO_BRDG0160_GINT_NCDOT 2012REV1.GPJ NC_DOT.GDT 1/8/13

WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST J. Howard					
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)				
BORING NO. B1-B		STATION 15+24		OFFSET 1 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 722.5 ft		TOTAL DEPTH 42.1 ft		NORTHING 1,013,810		EASTING 1,701,884					
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 67% 12/08/2011		DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic							
DRILLER W. Wichard		START DATE 11/20/12		COMP. DATE 11/21/12		SURFACE WATER DEPTH N/A					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
	700.4	22.1	5.0	2:00 2:15 2:15 1:45 2:15	(4.8) 96%	(2.2) 44%	(3.8) 100%	(1.9) 50%		Begin Coring @ 22.1 ft	22.1
	695.4	27.1	5.0	1:45 2:15 1:15 1:15	(3.8) 76%	(1.7) 34%	(7.3) 84%	(2.6) 30%		CRYSTALLINE ROCK DARK AND LIGHT GRAY, SLIGHT TO VERY SLIGHT WEATHERING, MODERATELY HARD TO HARD, CLOSE FRACTURING, SCHIST WITH GARNETS, SEVERELY WEATHERED LENSES	25.9
	690.4	32.1	5.0	2:15 3:00 2:45 3:00	(5.0) 100%	(2.9) 58%			RS-1	11 joints at 40-45°, 2 at 85° LIGHT GRAY, VERY SLIGHTLY WEATHERED, HARD, CLOSE FRACTURING, MICA-GNEISS, WEATHER ZONE 30.5-32.1 FT 7 joints at 40-45°, 4 at 30°	34.6
	685.4	37.1	5.0	2:15 2:00 2:30 2:45	(5.0) 100%	(5.0) 100%	(7.5) 100%	(7.3) 97%	RS-2	R1=7, R2=8, R3=10, R4=20, R5=7 TOTAL RMR=52 (CLASS III) DARK GRAY, VERY SLIGHTLY WEATHERED TO FRESH, HARD, CLOSE TO MODERATELY CLOSE FRACTURING, SCHIST WITH GARNETS AND QUARTZ VEINS 2 joints at 30°	34.6
	680.4	42.1	5.0	2:15 2:00 2:30 2:45	(5.0) 100%	(5.0) 100%				R1=4, R2=20, R3=10, R4=20, R5=7 TOTAL RMR=61 (CLASS II) Boring Terminated at Elevation 680.4 ft in Crystalline Rock: Schist	42.1

NCDOT CORE SINGLE B5163_GEO_BRDG0160_GINT_NCDOT 2012REV1.GPJ NC_DOT.GDT 1/8/13

CORE PHOTOGRAPHS

B1-B BOXES 1 & 2: 22.1 - 42.1 FEET



WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST Oti, O. B.										
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)									
BORING NO. B2-B		STATION 15+50		OFFSET 19 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 712.5 ft		TOTAL DEPTH 24.5 ft		NORTHING 1,013,829		EASTING 1,701,910										
DRILL RIG/HAMMER EFF./DATE BK 51		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Manual												
DRILLER Conley, H. R.		START DATE 08/23/95		COMP. DATE 08/23/95		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
715																
														712.5	GROUND SURFACE	0.0
														710.3	WEATHERED ROCK MICA GNEISS	2.2
															CRYSTALLINE ROCK MICA GNEISS	
											RS-5a					
											RS-6a					
											RS-7a					
														696.4	GARNET-MICA SCHIST	16.1
														688.0	Boring Terminated at Elevation 688.0 ft IN CR (GARNET-MICA SCHIST)	24.5

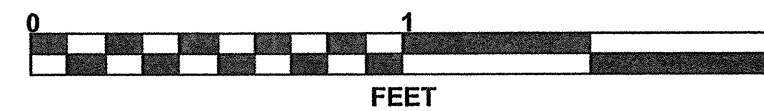
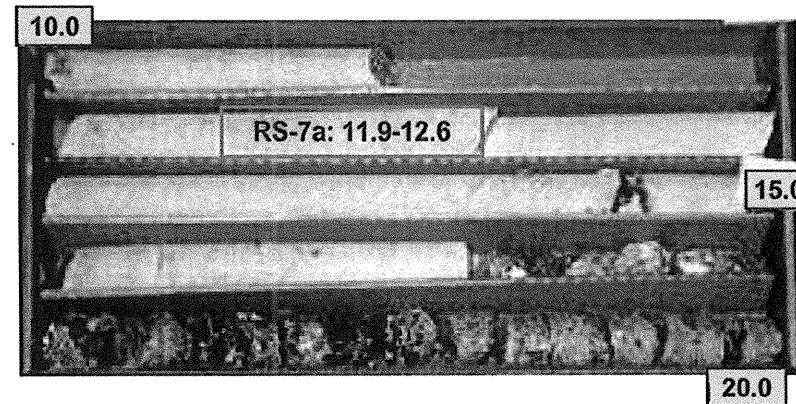
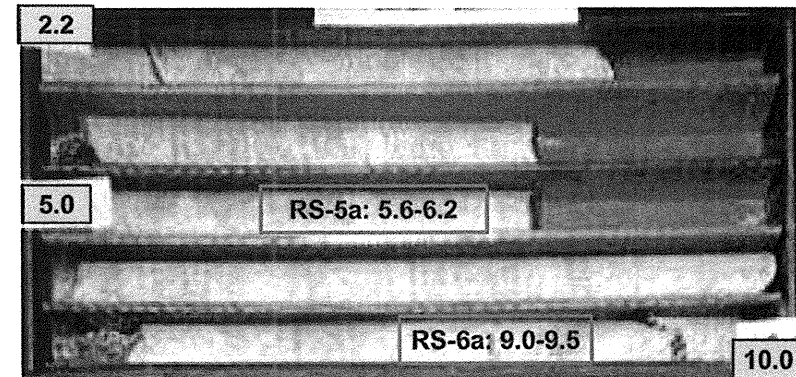
NCDOT BORE SINGLE B5163_GEO_BRD00160_GINT_NCDOT 2012REV1.GPJ NC_DOT_GDT 1/8/13

WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST Oti, O. B.						
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)					
BORING NO. B2-B		STATION 15+50		OFFSET 19 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 712.5 ft		TOTAL DEPTH 24.5 ft		NORTHING 1,013,829		EASTING 1,701,910						
DRILL RIG/HAMMER EFF./DATE BK 51		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Manual								
DRILLER Conley, H. R.		START DATE 08/23/95		COMP. DATE 08/23/95		SURFACE WATER DEPTH N/A						
CORE SIZE NXWL			TOTAL RUN 22.3 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	ROD (ft) %		REC. (ft) %	ROD (ft) %			
	710.3	2.2	2.8	1:20 1:13 1:21/0.8	(2.8) 100%	(2.4) 86%		(13.5) 97%	(12.4) 89%		Begin Coring @ 2.2 ft	2.2
	707.5	5.0		1:11 1:22 1:28 1:29 1:26	(4.8) 96%	(4.4) 88%	RS-5a				GRAY, SLIGHTLY WEATHERED TO FRESH, HARD, V. CLOSE TO MOD. CLOSELY FRACTURED, MICA GNEISS R1=7, R2=17, R3=15, R4=15, R5=6, R6=0 RMR=60 (CLASS III)	
	705		5.0				RS-6a					
	702.5	10.0					RS-7a					
	700		5.0	1:30 1:48 2:05 1:58 2:13	(4.8) 96%	(4.5) 90%						
	697.5	15.0		1:55 1:25 0:32 0:33 0:39	(3.5) 70%	(1.1) 22%		(6.9) 82%	(1.6) 19%			
	695		5.0								GRAY, MODERATELY WEATHERED, MED. HARD, V. CLOSE TO CLOSELY FRACTURED, GARNET-MICA SCHIST	16.1
	692.5	20.0		0:34 0:39 0:43 0:38	(4.5) 100%	(1.6) 36%						
	690		4.5	0:47/0.5								
	688.0	24.5									Boring Terminated at Elevation 688.0 ft IN CR (GARNET-MICA SCHIST)	24.5

NCDOT BORE SINGLE B5163_GEO_BRD00160_GINT_NCDOT 2012REV1.GPJ NC_DOT_GDT 1/8/13

CORE PHOTOGRAPHS

B2-B BOXES 1 - 3: 2.2 - 24.5 FEET





NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST Oli, O. B.										
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 16+16		OFFSET 3 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 742.2 ft		TOTAL DEPTH 28.0 ft		NORTHING 1,013,899		EASTING 1,701,908										
DRILL RIG/HAMMER EFF./DATE BK 51		DRILL METHOD H.S. Augers		HAMMER TYPE Manual												
DRILLER Conley, H. R.		START DATE 01/01/96		COMP. DATE 01/01/96		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						
745																
740	738.7	3.5	1	2	2											742.2
735	733.7	8.5	1	2	2											
730	728.7	13.5	2	2	2											
725	723.7	18.5														724.2
720	718.7	23.5														718.7
715																714.2
Boring Terminated BY AUGER REFUSAL at Elevation 714.2 ft IN CR (MICA GNEISS)																

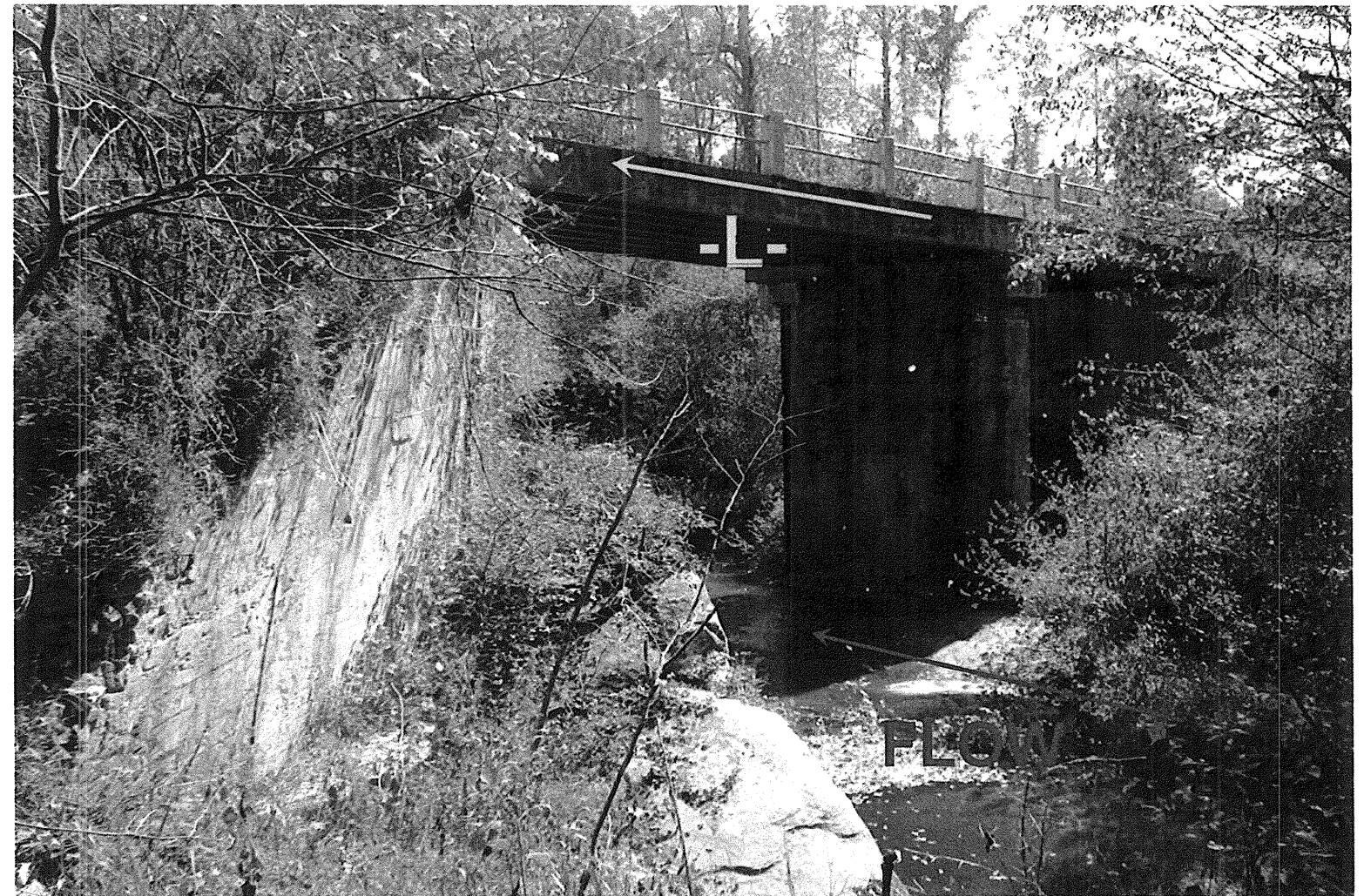
WBS 42338.1.1		TIP B-5163		COUNTY ROCKINGHAM		GEOLOGIST J. Howard										
SITE DESCRIPTION Bridge No. 160 over Buffalo Creek on SR 1354 (Bennett Road)							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 16+29		OFFSET 13 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 742.6 ft		TOTAL DEPTH 36.0 ft		NORTHING 1,013,907		EASTING 1,701,927										
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-550 93% 12/08/2011		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER W. Wichard		START DATE 11/19/12		COMP. DATE 11/19/12		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						
745																
740	741.6	1.0	5	4	4											742.6
735	739.2	3.4	2	1	2											741.7
730	734.2	8.4	2	3	2											735.6
725	729.2	13.4	3	3	9											730.6
720	724.2	18.4														725.6
715	719.2	23.4	85	15	0.1											720.6
710	714.2	28.4														715.6
	709.2	33.4														710.6
	706.6	36.0														706.6
Boring Terminated with Standard Penetration Test Refusal at Elevation 706.6 ft in Crystalline Rock: Mica-Gneiss																

NCDOT BORE DOUBLE B5163_GEO_BRD0160_GINT_NCDOT_2012REV1.GPJ NC_DOT.GDT 1/8/13

ROCK TEST RESULTS							
SAMPLE NO.	OFFSET	STATION	BORING NO.	DEPTH INTERVAL	UNIT WT. lbs/cf	UNCONFINED COMPRESSIVE STRENGTH KSI	ROCK MASS RATING
RS-1	1 LT	15+24	B1-B	28.7-29.4	164.3	9.95	52
RS-2	1 LT	15+24	B1-B	35.7-36.8	194.5	6.7	61
RS-1a	15 LT	15+28	B1-A	13.7-14.2	NA	6.7	57
RS-2a	15 LT	15+28	B1-A	16.8-17.5	NA	3.7	51
RS-3a	15 LT	15+28	B1-A	21.0-21.5	NA	2.4	51
RS-4a	15 LT	15+28	B1-A	26.4-26.9	NA	8.1	51
RS-5a	19 RT	15+50	B2-B	5.6-6.2	NA	11.9	60
RS-6a	19 RT	15+50	B2-B	9.0-9.5	NA	5.3	60
RS-7a	19 RT	15+50	B2-B	11.9-12.6	NA	14.1	60

Note: NA - Information not available

SITE PHOTOGRAPHS



Existing Bridge No. 160, looking down stream